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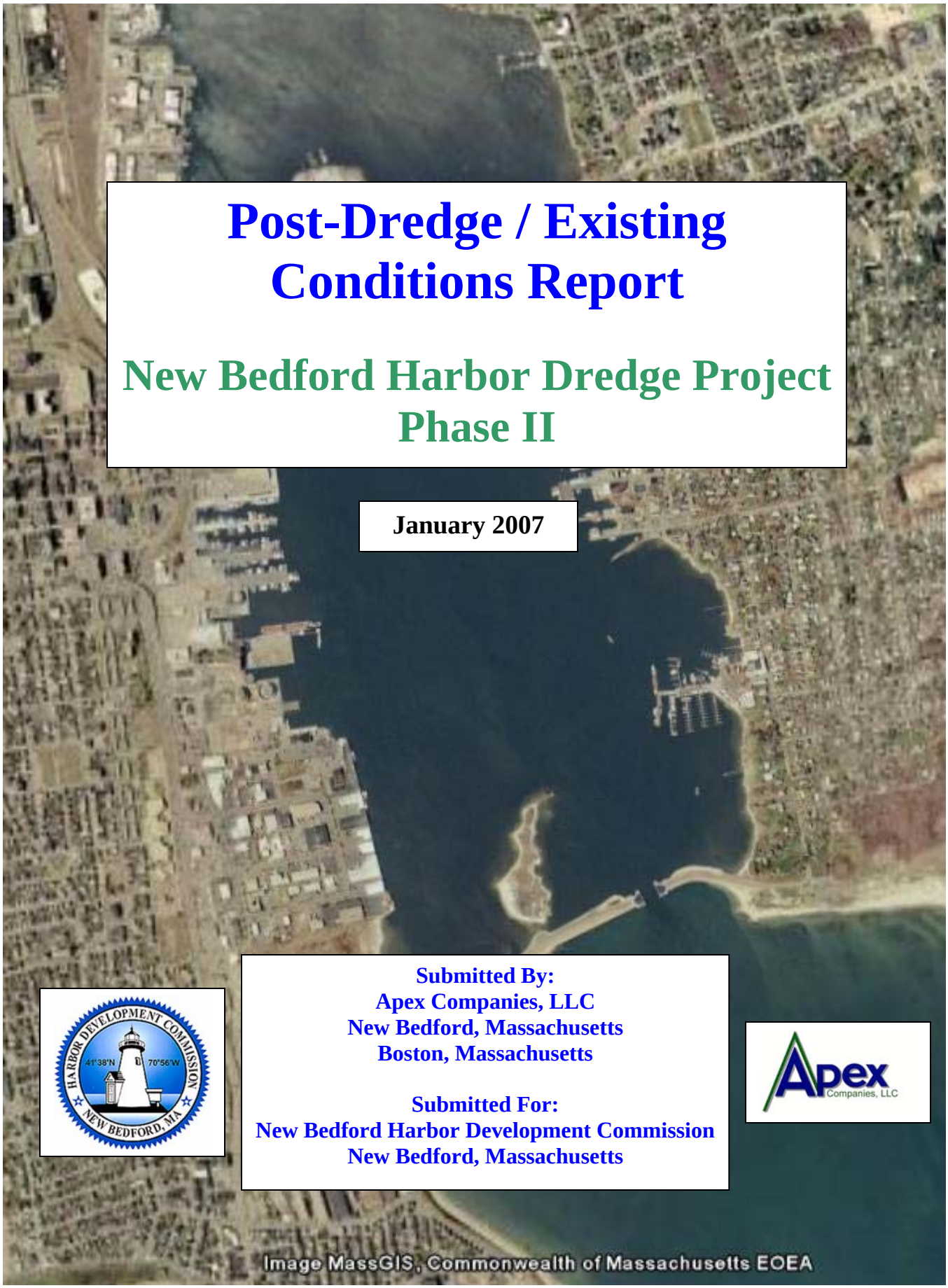

Post-Dredge / Existing Conditions Report

New Bedford Harbor Dredge Project Phase II

January 2007

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Post-Dredge / Existing Conditions Report
New Bedford Harbor Dredge Project – Phase II
January 2007

1.0 Introduction

This Report of Existing Conditions has been prepared by Apex Companies, LLC for the New Bedford Harbor Development Commission (NBHDC) upon completion of the New Bedford Phase II Dredge Project. The New Bedford Harbor Dredge Project – Phase II included the maintenance dredging of portions of Maritime Terminal, Norpel Terminal, Whites Terminal, South-of-Route 6 Bridge, and Niemiec Marine in New Bedford, Massachusetts, and the Warren Alexander Property, D.N. Kelley & Son, Linberg Marine, and Pease Park properties, in Fairhaven, Massachusetts. All work was completed under contract numbers HDC-5-538 and HDC-6-705.

2.0 Background

The City of New Bedford is located on the south coast of Massachusetts between Cape Cod and Fall River, Massachusetts. New Bedford Harbor is an approximately mile-long, narrow, protected embayment that stretches from the mouth of the Acushnet River (at the north), to a large hurricane dyke and flood control structure at the entrance to Buzzards Bay (on the south). Historically, it was one of the dominant shipping ports on the east coast. During the 19th Century, textile mills and manufacturing facilities were built on the edge of the Harbor to take advantage of the access to the working waterfront. Electrical transformer manufacturing industries moved into the New Bedford waterfront area and operated from the 1940's to 1970's. With this electronic component manufacturing came new types of waste discharge into the Harbor. Polychlorinated Biphenyl (PCB) contaminated oils and byproducts made their way into the Harbor through sewer lines and other outfalls, contaminating the sediments on the bottom of the Harbor. By the 1970s, sediment sampling and testing conducted by environmental officials revealed that significant concentrations of metals and PCBs existed in the Harbor bottom sediments.

From the 1970s to the 1990s, the USEPA and the MA Department of Environmental Protection (MassDEP) studied the nature and extent of the contamination in the harbor, collecting the information required to develop a remedy for the problem. In 1998, the USEPA signed the Record of Decision (ROD) for the New Bedford Harbor Superfund Site, which prescribed that the remedy for the Harbor would be focused on the removal of contaminated sediments with PCB concentrations in excess of cleanup standards set for various locations within the Harbor. The cleanup standards varied depending upon the location of the contamination: 50 parts per million (ppm or mg/kg) was designated for deeper water areas, where direct contact was not likely; 10 ppm was designated for mudflat and shallow water areas accessible at low tide; 25 ppm was designated for beach combing shoreline areas; and 10 ppm was designated for residential shoreline areas. This designation effectively split the Harbor into two categories: those areas with sediments exceeding the cleanup standards where contaminated sediments would be removal by the USEPA; and those sediments with PCB concentrations below the cleanup standards that would be left in place. This situation was solved in the ROD, see Section 2.3 below.

Because of the presence of contaminants in most of the sediments from the bottom of New Bedford Harbor, and the high cost and uncertainty of dealing with those contaminated sediments, maintenance dredging of Harbor areas for navigation has not occurred for over 40-years. As a result, sediment has collected in many critical areas within the Harbor: from the Federal Navigational Channel, to the slips and berthings at the piers, to the fairways and driveways of the Harbor wharf areas. As a result, many of the businesses that utilize the pier and wharf areas have experienced a decrease in the amount and type of vessels that can be accommodated. In order to maintain their existing maritime uses, and offer opportunities for growth and development, the City of New Bedford, the Town of Fairhaven, and the New

Bedford Harbor Development Commission (NBHDC) have made maintenance dredging of critical Harbor areas a priority for the new millennium.

2.1 New Bedford Harbor Dredge – Phase I

The first phase of the New Bedford Harbor dredge project began with the deepening of the slip on the south side of the New Bedford State Pier in New Bedford Harbor, and the fairway and a portion of the channel leading up to the Pier. This project was identified by the City of New Bedford as a critical element in the revitalization of the working waterfront, as the City was actively trying to attract new and larger vessels to the City. Sediment build-up at the State Pier had precluded the use of the pier by some of the larger deep draft vessels the City was attempting to attract. Work on Phase I began in 2001, and dredging of the project area was completed by the end of 2002. For this project, approximately 75,000 yards of contaminated sediment was dredged from the area to the south of the State Pier and the fairways leading there-to. The material was dewatered and stabilized with a lime and cement mixture, and was placed on the CSX Rail Site next to New Bedford Harbor. The placed material was utilized to cap areas of the rail-yard site that contained levels of PCB contamination greater than the dredged sediments, utilizing the "anti-degradation" provision (policy, check) in the Massachusetts Contingency Plan. The dredged material was placed into berms around the edge of the rail-yard site, covered with topsoil and seeded with grass. The first phase of the dredging was done without the use of the State Enhanced Remedy (see Section 2.3).

2.2 Pre-Dredge Harbor Conditions Prior to Phase II

The Phase II dredge areas (noted above) were included in the Phase II Dredge Project because of their need for dredging to remove shoaled sediment, and the economic benefit the area would receive form the increase in commerce. Bathymetric soundings of the areas of interest had been collected by Apex, and that information was compared with bathymetric charts and other data previously collected by the U.S. Army Corps of Engineers (USACE) and the US Environmental Protection Agency (USEPA). The data indicated that the conditions in the noted dredge areas represented a safety issue for certain types of vessels that visit those piers and wharfs. In order to address this situation, the New Bedford Harbor Development Commission and the Town of Fairhaven (through the NBHDC), decided to undertake the New Bedford Harbor Dredge Project – Phase II to deepen the aforementioned areas. The design and construction of a transitional Confined Aquatic Disposal (CAD) Cell for the disposal of the contaminated dredge sediment removed from the dredge areas was also necessary as part of the project (see below for additional information on the CAD Cells constructed as part of this project).

2.3 Permitting – State Enhanced Remedy (SER)

Because contaminated sediments exist over much of the bottom of New Bedford Harbor, the usual navigational dredging process would simply not work. Upland disposal of the million or so total cubic yards of material that will ultimately need to be removed from the Harbor to keep it fully functional was not an option, both from a cost standpoint (costs for upland disposal would have been prohibitive), and from a logistics standpoint (there simply was not a local disposal site that could accommodate the volumes). Also, because of the PCB contamination, the USEPA signed a Record of Decision ~~the~~ (ROD) for the remediation of the New Bedford Harbor Superfund Site in 1998. The ROD included a provision called the State Enhanced Remedy (SER) [see 40CFR300.515(f)], which allowed for certain maintenance dredging to fall within the Superfund process. The MassDEP requested that the SER be included in the ROD and was endorsed by the City of New Bedford, Massachusetts Executive Office of Environmental Affairs (EOEA), and the local state representatives. The SER provision allowed for the maintenance dredging to occur without following the full permitting process usually required for maintenance dredge projects. This streamlining of the approval process for individual dredge projects, and the adoption of a

programmatic approach to maintenance dredging in New Bedford Harbor has allowed maintenance dredging to move forward, and allowed the New Bedford Harbor Dredge Project – Phase II to be completed.

The State Enhanced Remedy (SER) under the New Bedford Harbor Superfund Site requires oversight management by the Massachusetts Department of Environmental Protections (MassDEP), with coordination with a number of Federal, State and Local authorities including the Massachusetts Department of Environmental Protections (MassDEP), U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (USEPA), the National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Division of Marine Fisheries (DMF), Massachusetts Coastal Zone Management (MACZM), Executive Office of Environmental Affairs (EOEA), and the Coalition for Buzzards Bay. The SER process requires the completion of As-Built Plans and the submission of After-Action Submittals after the completion of dredge projects completed under the SER.

Under the SER, the NBHDC and Apex discussed project plans and performance standards with the Resource Agencies mentioned above. Project plans and performance standards were reviewed and updated after receiving comments from the Resource Agencies. The NBHDC and Apex attended meetings between Resource Agencies and prepared and submitted planning and information documents for use by Resource Agencies.

The NBHDC and Apex prepared and submitted planning and information documents for applicable Resource Agencies under the SER. These documents included a Project Work Plan, an Essential Fish Habitat and Endangered Species Assessment, and an Underwater Archaeological & Hazards Analysis. Prior to completion of planning documents, Apex discussed project plans with the Town of Fairhaven, the NBHDC and Resource Agencies to determine any requirements and/or concerns that needed to be covered under the information documents. The NBHDC and Apex worked closely with the MassDEP Project Manager to expedite conversations between agencies. The NBHDC and Apex addressed any comments made by agencies and revised documents as necessary.

The NBHDC and Apex conducted the necessary regulatory interface with MassDEP during the course of this work. Regulatory interface was required to ensure that the SER process was followed and that the sampling and analysis activities conducted were consistent with the enhanced remedy. The MassDEP Project Manager was the regulatory point-of-contact for the NBHDC and Apex, and interacted with USEPA and the other State resource agencies as appropriate to ensure that all agencies were afforded appropriate review of SER submittals (i.e. SAP) and input regarding project planning. As part of the regulatory interface the MassDEP conducted field oversight during the dredging.

2.4 Phase II Project Dredge Sediment Disposal

One of the most challenging aspects of the Phase II Dredge Project was identifying a suitable disposal alternative for the dredged contaminated sediments. During the late 1990's and into 2003, the State of Massachusetts Coastal Zoned Management (MACZM) had undertaken a State-wide Dredge Materials Management Plan (DMMP) in order to address the issue of the disposal of contaminated dredge materials, which many of the Cities and Towns within the Commonwealth were wrestling with. As part of the State-wide DMMP study, MACZM evaluated the placement of Confined Aqueous Disposal (CAD) Cells in several harbors, including New Bedford Harbor. After evaluation, MACZM determined that CAD Cells represented a viable sediment disposal alternative for New Bedford Harbor. After completion of a feasibility study and a siting analysis that evaluated several potential CAD Cell locations within the Harbor, MACZM determined that the most advantageous location for CAD Cells in New Bedford Harbor was the area to the north of Popes Island in the middle portion of New Bedford Harbor. A permitting program was undertaken by MACZM that involved all relevant resource and regulatory agencies, and

resulted in the area to the north of Popes Island in New Bedford Harbor being permitted for CAD Cells for maintenance dredge materials.

Upon review of the viable sediment disposal options for maintenance dredge material, the New Bedford Harbor Dredge Project – Phase II project team determined that CAD Cells within New Bedford Harbor represented the most viable option for disposal of the maintenance dredge material from the Phase II Dredge Project. Design of the CAD Cells for the Phase II Project was completed by Apex, and the disposal of maintenance dredge materials from the Phase II Dredge project dredge areas was approved for disposal in the newly designed CAD Cells (see Section 2.5 below for additional information on the construction of the CAD Cells).

2.5 Dredge Area Engineering

The New Bedford Harbor Phase II Dredge Project began in January 2005 and was completed in two parts: the initial area of dredging occurred on the north side of Fish Island in New Bedford Harbor; the second part involved dredging at the remainder of the North Terminal area and other Fairhaven areas. The NBHDC completed Phase II harbor maintenance dredging in January 2006, removing more than 156,000 cubic yards (cy) of material from sites in New Bedford and Fairhaven. The work deepened the approach to New Bedford's North Terminal area and increased berth depths at several locations in the harbor. The project improved access and safety for large vessels and support economic growth in the port's marine industry.

The dredging project, totaled nine locations (See also Figure 1), including:

- Bridge Terminal (Fish Island) – 12,501 cy
- D.W. White Terminal (Pope's Island) – 11,604 cy
- Maritime Terminal – 1,784 cy
- Southwest approach to Route 6 Bridge – 5,430 cy
- Pease Park boat launch – 5,038 cy
- Linberg Marine – 4,297 cy
- Niemiec Marine – 821 cy
- D.N. Kelley & Son, Inc. – 10,436 cy
- Atlantic Shellfish – 401 cy

As part of the dredging project, 103,924 cy of material was excavated to create a CAD cell just north of Fish Island. The CAD cell received sediment from the Phase II dredge sites in New Bedford and Fairhaven, with some additional capacity reserved for future use.

Under this contract and Dredge Project, Apex has submitted the following documents to the New Bedford Harbor Development Commission:

- Contractor Oversight Plan (COP): January 2004
- New Bedford Harbor Development Commission State Enhanced Remedy (SER) Subsurface Data Conditions Report for New Bedford Harbor Dredge – Phase II: North Terminal Maintenance Dredge: November 2004
- Essential Fish Habitat (EFH) and Endangered Species Assessment: November 2004
- EFH and Endangered Species Assessment Update: May 2005
- Site Specific Health and Safety Plan (HASP) for Sediment Sampling and Analysis for the New Bedford Harbor Dredge Project: North Terminal Maintenance Dredge – Phase II: July 2004
- Sampling and Analysis Plan (SAP) for the New Bedford Harbor Dredge Project: North Terminal Maintenance Dredge – Phase II: July 2004
- Underwater Archaeological and Hazards Analysis Remote Sensing Survey: December 2004

- Water Quality Monitoring Report - Dredge and Material Placement Operations: February 2006

2.6 Monitoring and Oversight

Throughout the entirety of this Dredge Project, Apex made sure the work was always monitored thoroughly in order to ensure that work progressed smoothly and as safely as possible, in line with the Healthy and Safety Plan. A member of Apex personnel was always at the site and directly involved with overseeing the project.

In order to monitor the success and progress of the work itself, daily bathymetric surveys were conducted in all excavation and placement areas. The scow location during placement and dewatering of the scows were also closely monitored~~,~~. Apex personnel used a Global Positioning System (GPS) to double check that scows were placed in the correct locations.

Additionally, as a means of monitoring the sediment of the maintenance material, several methods of examination were used on a regular basis. Sediment probes were utilized in order to measure the thickness of the maintenance material. Vibracores were used as a way of surveying the benthic organisms present in the sediment. Furthermore, chemical analyses were frequently done–on the sediments to monitor the levels of various chemicals that may have been present.

3.0 Construction

The NBHDC managed and oversaw the construction activities. Construction operations were performed in such a manner as to comply with the specific performance criteria established during the design phase of the project. Where possible, the intent was to allow the contractor to determine appropriate means and methods of construction, subject to the controls and performance criteria contained in the project specifications. Proposed means and methods and adherence to design and performance criteria were evaluated using the pre-construction submittal review process. A control plan to ensure conformance to performance criteria was a Contractor submittal requirement.

3.1 Construction Oversight – CAD Cells

CAD cell filling operations were subject to operational controls developed during project design. Project-specific water quality criteria developed by MassDEP with the assistance of the Resource Agencies applied to filling operations as well as dredging and other performance standards. Means and methods for discharge of materials into the CAD cell were developed to ensure compliance with water quality criteria. The discussions between MassDEP, and U.S. Army Corps of Engineers (USACE) and USEPA (as part of the design process) regarding previous projects were valuable relative to evaluating discharge requirements. Methods evaluated included use of split hull barges, as well as placement of sediment into the cell using clamshell equipment. Some combination of operational controls were required during filling operations, such as use of silt curtains down-gradient or around the active CAD cell, use of oil-absorbent booms, discharge at depth vs. at surface, etc. Details were determined during the design process.

3.1.1 CAD Cell Construction

The project involved the construction of an 85,000 cubic yard capacity CAD cell north of Fish Island in New Bedford Harbor. Dredging of the CAD cell and placement of material in the pilot cap area began in June 2005, operating 24 hours a day, and was completed in July of 2005. The material removed to creat the CAD had been tested for standard offshore disposal chemical parameters, and the material had been designated as acceptable offshore disposal by the USACE. This clean material (sand) was removed

during the construction of the CAD cell, and transported to an area outside of the New Bedford Harbor hurricane gate to be utilized as part of a cooperative underwater pilot capping study. The area capped is part of the EPA Superfund Site Operable Unit #3 (OU#3).

This project was unique in that it was a continuation of a series of projects the City of New Bedford intends to complete under the SER as well as a cooperative shallow water underwater pilot capping project between the EPA and the NBHDC to cap PCB contaminated sediment.

The construction of the CAD cell was an important aspect of the project because PCB contaminated material located throughout the harbor were removed as part of the New Bedford Harbor Dredge Project – Phase II and disposed of in the CAD cell. The pilot capping project at OU#3 included the precision placement of the removed sand in an approximately 2 foot cap over a 19 acre PCB contaminated area.

During the dredging, Apex provided resident engineering services and acted as Owner's Representative for construction oversight and Quality Control of the project to ensure all phases were performed expeditiously and in accordance with the plans and specifications. Apex closely monitored each placement event, providing precise location oversight, water-quality monitoring, and pre- and post-placement bathymetric surveys. The bathymetric surveys were continually performed during the capping project, and were utilized to asses and evaluate the cap thickness and placement techniques.

The initial scope of work for this project included pre-engineering studies, design, and implementation of the sampling and analysis program. Apex performed a preliminary engineering evaluation during the planning phase of the project. These activities included; establishing preliminary dredge limits with associated volume estimates for the construction of the CAD cell, research and evaluation of disposal options including off-shore disposal in the USACE Cape Cod Bay Disposal Site (CCBDS) and/or the placement of the material as a cap in the OU#3 area, and the preparation of a preliminary conceptual methodology for the project. Apex conducted a sediment sampling and analysis program of the proposed dredge area and the OU#3 area, in addition to completing multiple bathymetric surveys, detailed sediment characterization, and cultural and hazard identification survey utilizing a complimentary suite of marine geophysical techniques, including side-scan sonar, sub-bottom profiling, and marine magnetics.

3.1.2 OU#3 Area Capping

After evaluating many different options for disposal of the clean material from the CAD Cell #1, the decision was made to utilize the material for capping of the USEPA OU#3 area outside the hurricane gates in the outer harbor. The OU#3 project site is located outside of (and adjacent to) the Hurricane Gates within the outer portion of New Bedford Harbor~~,~~ as shown on Figure 1. The proposed study area is a portion of OU#3 of the USEPA New Bedford Superfund Site. The USEPA has (as part of previous studies) sampled and analyzed the area for PCBs; a summary of the sampling locations and results from these previous sampling activities can be found on Figure 2 and listed on Table 1. The levels of PCBs detected in the sediments during previous studies exceeded 10 parts per million (ppm) at some locations, triggering cleanup action as part of the Site. As part of the Superfund Remedy for New Bedford Harbor, the USEPA is performing a remedial action to lessen the impact to human health and the environment due to the high levels of PCB contamination at locations within the Site. The EPA is proposing to conduct a pilot capping program in a portion of the OU#3 area in order to assess the potential for capping as a mechanism to lower the mobility of the PCBs in that area. The proposed area of the pilot capping project is approximately 35 acres, with water depths ranging from between 4 feet to 15 feet mean low lower water (MLLW).

(This indicated a proposed project, why not state what was done, since it is now complete.) The NBHDC and the USEPA jointly proposed to utilize "clean" sandy material (that was dredged out of transitional

confined aquatic disposal (CAD) cell was developed within New Bedford Harbor as part of a companion project (ongoing harbor maintenance dredging) for the NBHDC) was used to cap this area. The "clean" material that was dredged out of the transitional CAD cell and used for the cap is primarily composed of coarse to fine sands.

Process Changes During Construction

Several modifications were made to the placement technique that was implemented over the course of the project in the Operable Unit #3 area in order to meet the Performance Criteria. The changes made during placement activities are as follows:

- The placement lane widths were reduced from 70 feet to 50 feet.
- The placement lane widths were reduced from 50 feet to 35 feet once we understood the characteristics of the material and how it was distributing following placement.
- The scows were pushed up over the western edge of the placement area as requested by the EPA in order to maximize coverage in the shallower areas where there were high concentrations of PCBs.
- Continuous communication between the placement spud barge (A.J.) and the dredge barge (the dredge contractor, Jay Cashman, Inc.) to modify the load drafts based on tide cycle and area within the footprint.
- The hopper of the scow was overlapped approximately 5 feet with the previous placement within the lane to try to maximize the overlap. This was discontinued because the scows would ground on the previous placement loads and/or material would be closed back into the scow due to peaks.
- The scows were loaded with various amounts of material in order to have varying scow drafts. The scows were loaded to 5.5' draft on the western edge, 6.5' draft in the middle of the lane and 7.5' – 8' draft to the eastern portion of the placement area. This was done due to the varying depths of water (based on tide).
- The spud barge utilized for positioning was set-up on an angle in order to land the scow, and then the spud barge was pivoted into position along the lane in order for the scow to be more precise and to avoid the scow grounding on previous piles.
- The Eddie Carroll scow was utilized for material placement along the western edge of the 6' contour peak in the 50 ppm (or above) area. The Eddie Carroll was utilized because of previous data that indicated that it had the best distribution of material and because it had the least draft while maximizing the volume material within the scow.
- The rotation of the scows was modified in order to have a staggered placement of the three scows to avoid having the Eddie Carroll side by side in every lane. This change allowed for a "sandwich affect" where the Eddie Carroll would have one of the smaller scows in between so that the placement of the material was distributed throughout the lanes.
- The placement lengths were adjusted (shortened) because the hopper dimensions of the Mud Cat scow provided by the Contractor were off by approximately 12'.
- Placement of the Mud Cat was doubled in one area because the material did not stand up and the scow appeared to be light loaded based on the tide.
- The Eddie Carroll was loaded evenly from bow to stern.
- The pockets of the Mud Cat and the SEI 2000 scow were loaded evenly. Water was utilized to distribute the material in the pockets to the corners so that there were no peaks within the pocket.
- In some scenarios, differential loading was utilized to maximize material placement. The bow or the stern was loaded with more material based on the placement location and tide in order to avoid grounding of scows and to distribute material evenly during placement.
- Placement of material in "holes" where material was missing has occurred. As of the production of this memo, three strategic locations have had additional material placed to "fill-in" areas that had minimal material during the first phases of material placement.

- The spud barge was moved and positioned differently within the lanes based on opening characteristics. For example, during placement of the Eddie Carroll, which is a split hull barge, the spud barge was positioned an additional 10' feet from the lane (to the south) to accommodate for the movement of the scow during opening.
- Made adjustment to the positioning of the Eddie Carroll by 15' so that the placement would be in the center of each lane instead of to the north.
- Modified technique so that we did several lanes on the western edge during the "higher" tide cycle to avoid rocks and/or grounding of the scows and spud barge.
- Moved the scow placement start point on the western edge so that there was additional overlap on the eastern edge of the footprint.
- Began pulling the Eddie Carroll off of the spud barge before closing as to avoid grounding/closing cap material back in the scow.

3.2 Construction Oversight – Dredge Areas

3.2.1 Dredge Area Introduction

Establishment of performance standards, including water quality criteria, mandated dredging operations. Dredge methods were selected to achieve water quality standards. Dredging of material required implementation of controls such as use of an environmental (sealed) bucket, silt curtains, oil absorbent booms, reduced cycle times, etc. Specifications and requirement details were determined through the design process. In accordance with the New Bedford Harbor Development Commission – Phase II work plan, Apex completed dredging at 9 locations within New Bedford Harbor.

3.2.2 Changes to Initial Work Scope

The initial work plan was dated December 2004. This plan included the dredging of White's Terminal, Maritime Terminal, Fish Island and the area south of the Route 6 swing bridge. Additionally, the construction of the CAD cell was included in the original scope. Subsequent addendums to this work plan proposed additional areas to be dredged. The first addendum, dated May 2005, added the dredging at the Pease Park boat ramp, Lindberg Marine docks and piers, and the D.N. Kelley and Son docks, piers, and boat ramps. Finally, the second addendum of October 2005 proposed dredging to occur at the Niemiec Marine area, the Warren Alexander property, and the Sal Ingrande area. The work performed is described below.

<u>CAD Cell #1</u>
Soft organic maintenance-type material was also removed from the surface of the New Bedford CAD cell #1 as the initial phase of construction of the new subaqueous CAD cell located to the northwest of Popes Island. The initial excavation at the (removal of contaminated organics) CAD cell was dredged to an average depth of -36 MLLW. Dredged material from both the Fish Island and top-of-CAD areas were placed in a pre-existing depression west of Popes Island, filling the depression (also known as the "borrow pit") to -33 MLLW. Approximately 32,300 cy of material was excavated and disposed of as part of this portion of the project (19,731 CY from the top of the CAD).

<u>OU#3 Cap</u>
In June of 2005, dredging to complete the excavation of the CAD cell to its full capacity began. Clean sands were excavated from within the CAD footprint to create the desired disposal volume space, and the clean material removed from the CAD footprint was barged to an area outside of the hurricane gates and used as a cap for an area of PCB contaminated material. This process was completed in cooperation with the (USEPA), the (USACE), the (MADEP), Apex Environmental, Inc., and the NBHDC, as part of the

Operable Unit (OU) #3 Pilot Capping Study. At the completion of the work, 84,193 cubic yards of material had been excavated from the CAD cell. That material was transported out to and placed across an 18.9 acre area of PCB contaminated harbor bottom, resulting in an average cap thickness of over 2.2 feet. The excavation and capping was completed by the end of July of 2005.

Fish Island (Bridge Terminal)

The dredging for the area on the north side of Fish Island, at Bridge Terminal, was the first work done for this NBHDC Dredge Project – Phase II. The maintenance dredging began in January 2005 and was finished on February 12, 2005. Approximately 12,501 cubic yards of sediment was removed from the Bridge Terminal area on the north side of Fish Island. The final bottom contours in the area show an after-dredge stepping from -25' MLLW (Mean Lower Low Water) directly adjacent to the bulkhead, to -27 MLLW, and finally to -30 MLLW approximately twenty feet from the bulkhead. These are all in line with what the targeted elevation mentioned in the Dredge Design.

Maritime Terminal

In September of 2005, work began on the remaining New Bedford and Fairhaven Phase II maintenance dredge areas. These areas were excavated and the dredged material was disposed of in the newly constructed CAD Cell. The New Bedford dredged areas were the first to be excavated, with 1,784 CY of material excavating from the Maritime Terminal dredge area, leaving a bottom elevation of -30 MLLW or below at that location, consistent with the desired elevation. The original estimated volume to be dredged was 1,958 CT. The dredge area was slightly modified to account for a rip-rap wall that was located near the bridge. There was also an undocumented electric cable found in the dredge area, which led to further deviation from the initially planned dredge area. The dredging began on September 6, 2005 and was completed on September 19, 2005.

White's Terminal

The Salt Terminal on Pope's Island (also known as White's Terminal) began on September 15, 2005 and was completed on September 25, 2005. It was dredged to an average depth of -34' MLLW, removing 11,604 CY. The dredge volume was initially estimated to be 13,374 CY in one dredge area. Instead, the area was split into two dredge areas with a new target depth in order to account for possible side slope failure from Pope's Island. Despite the splitting of the dredge area and the removal of less material than expected, the targeted depth of -34 feet was still achieved.

South of Route 6

Dredging on a shoal just south of the Route 6 Bridge began on September 6, 2005 and lasted until October 10, 2005. It was anticipated that 6,113 CY was going to be removed to reach the target depth, but instead, only 5,430 CY of maintenance material was removed from this area. This was done in order to return the federal channel to a bottom elevation of -30MLLW or below on the approach to the bridge in order to allow for the safe navigation of vessels through the Route 6 Bridge and into the North Terminal area. The eastern dredge areas were removed from the work plan because the target depth was near to the existing conditions, making the dredging unnecessary at that location.

D.N. Kelley

Following the completion of the New Bedford dredge areas, the dredging operation moved over to the Fairhaven side of the harbor. A number of small areas were excavated, including the Kelley and Sons Marine facility. There were six locations in this area that were to be dredged to a target depth. These areas were identified as K1 through K6. Work at the K1 area began on September 28, 2005 and continued until October 10, 2005. Parts of the K1 and K2 dredge areas were removed due to concerns of the proximity to existing structures. Work on the K3, K4, and K5 areas began on October 11, 2005 and lasted until October 22, 2005. Slight modifications to these dredge areas included the addition of a new dredge area in the Travel-Lift slip, as well as the removal of parts of the K4 dredge area because of

concerns over the equipment used being too big. The K6 area also had a slight modification, which involved an increase to the dredge area in order to compensate for other areas being removed or decreased. Work on the K6 area began on December 19, 2005 and was completed on January 19, 2006. The estimated volume to be dredge began at 12,045 CY, but only 10,436 CY was dredged after altering the dredge areas mentioned above. In all cases, the desired elevation was achieved, arriving at approximately -18' MLLW for the K1 dredge area, -16' for K2, -11' for the area labeled K3-a and -16' for K3-b. Area K4 was dredge to an elevation of -11' MLLW, while K5 ended up with an elevation of -9' MLLW, and K6 had a final elevation of –11 feet-MLLW.

Linberg Marine

On September 26, 2005, work on the Linberg Marine dredge area began as another part of the second portion of the Phase II project. This maintenance dredging was completed on October 23, 2005. It was expected that 5,207 CY was going to be the necessary volume of dredge material to be removed from two areas in order to arrive at the target depth for the area. The dredge areas and target depths were modified in order to account for an electrical cable that was found at the site. The cable runs through the area to Crow Island. This unexpected feature prohibited dredging from occurring as extensively as initially planned. Rather than 5,207 CY being removed, 4,297 CY of material was dredged. The targeted elevation after dredging was -10' for the L1 area and -7' for the L2 area. Both of these elevations were met and even exceeded by up to a foot.

Pease Park

The area located at the Town of Fairhaven's boat ramp at Pease Park was another targeted dredge area, where two areas were to be dredged to reach the desired depth. It was estimated that 5,370 CY was the volume of dredge material to be removed in order to reach such depth. Even with slight alterations, only 5,038 CY of material was removed. This was the case even after the target depth was increased on the approach of the boat ramp. Work at this dredge area took place between September 25, 2005 and October 31, 2005. During the course of the work on the Fairhaven side of the harbor, dredging had to be suspended because of the difficulty in maneuvering the large dredge equipment around the active small docks and slip spaces. Smaller dredge equipment was mobilized to the harbor to replace the larger dredge plant, and work continued to the completion of the dredging (completed in mid-January of 2006). The P1 dredge area was broken up into two parts, with P1-a requiring a post-dredge elevation of -8' MLLW and P1-b requiring one of -4' MLLW. After dredging was complete, Pl-a had an elevation of -9' MLLW, while P1-b had an elevation of -5' MLLW.

Niemiec Marine

The Niemiec Marine area was another area dredged in the second portion of the Phase II Dredge Project. This small area was not initially included as part of the Work Scope. It was added to the project because available capacity in the CAD cell allowed for more dredge material to be disposed of inside. Available funds also allowed for this dredging to be completed as an addition to the initial Scope of Work. Maintenance dredge work on the Niemiec Marine area was completed between October 20, 2005 and October 31, 2005, removing a total of 821 CY. With only one dredge area in this location, the desired post-dredge elevation was set at -7' MLLW and the actual post-dredge elevation came to -8' MLLW.

Warren Alexander Property

Further dredging occurred at Atlantic Shellfish, Inc. (also known as the Warren Alexander Property), where 401 CY of dredge material was removed. Similar to the Niemiec Marine property, the Warren Alexander Property was not included as one of the original dredge areas in the Work Scope. Once it was known that CAD cell capacity allowed for more material and funds were available to account for this work, work began at this site on December 19, 2005 and lasted until January 19, 2006. This added dredging location included two dredge areas, differing by one foot in their desired post-dredge elevations. With a required elevation of -9', the actual post-dredge elevation following work at the A1 area was -10'

MLLW. The post-dredge elevation at the A2 area was -11', which was sufficient when compared to the desired -10' MLLW.

The total volume dredged as part of the New Bedford Harbor Dredge Project – Phase II was 156,236 cubic yards.

4.0 Monitoring Results

The water quality was monitored during the dredging and material placement operations for the New Bedford Harbor Dredge – Phase II from January 13, 2005 through January 17, 2006. Water quality monitoring was performed in accordance with the Water Quality Monitoring Plan (WQMP) dated January 5, 2005. Following the guidelines of the WQMP, monitoring locations for water turbidity recorded an average turbidity over various water depths, up and down-current from the dredge or material placement operations, depending on tide. The values recorded as the Reference Site Turbidity were taken from up-current monitoring locations, or from monitoring events which occurred before dredge or material placement operations began. The Reference Turbidity Value was then compared to down-current turbidity values measured at regular time intervals after operations had begun.

The monitoring results were broken up into 4 periods of dredging and material placement that Apex oversaw in New Bedford Harbor during Phase II of the State Enhanced Remedy Dredge Project. At each monitoring location, various samples around the area were taken in order to get a thorough indication of water quality.

The first period took place between January 13, 2005 and February 15, 2005 and included approximately 32,000 cubic yards of material being dredged from Fish Island Terminal and the "top" of CAD Cell #1. This was then placed in the "Borrow Pit" northwest of Pope's Island. In monitoring the water quality for the dredging, only one exceedance of the project turbidity occurred on January 21, 2005. A down-current turbidity of 40 NTUs was recorded, which was 9.8 NTUs over the permissible turbidity increase. Additional monitoring was performed at this location 15 and 30 minutes after the exceedance. 15 minutes after the exceedance, the average turbidity at the same location measured 20.0 NTUs (3.9 NTUs below the up-current reference turbidity value of 23.9 NTUs). 30 minutes after the exceedance event, the average turbidity down-current measured 15.0 NTUs (8.9 NTUs below the up-current reference turbidity value), well within the permissible limits set forth in the WQMP.

Water quality monitoring for placement operations also followed the guidelines set forth in the WQMP. Silt curtains were utilized during placement operations, bringing the down-current monitoring locations to within 15 feet of the curtains. Disposal events were monitored on four days, during which, there were no turbidity exceedances to report from any of the disposal events. All values recorded were below the down-current permissible turbidity increase of 40 NTUs.

The second period took place between June 27, 2005 and July 22, 2005 and involved the dredging of CAD Cell #1 and the capping of the PCB contaminated EPA Operable Unit #3 (OU#3). This portion of the project involved dredging clean material from CAD Cell #1 northwest of Pope's Island and placing the material (approximately 84,000 cubic yards) over a 19 acre area south of the Hurricane Barrier. Apex monitored the water quality for both dredging (on ten days) and material placement (for fifteen events). None of these monitoring events yielded turbidity exceedances.

The third period involved the dredging of material from 6 sites around New Bedford Harbor. They include; Maritime and White's Terminals north of Route 6, a shoal south of the Route 6 Bridge, and Pease Park boat ramp, Linberg Marine, and D.N. Kelley and Sons Shipyard all located in Fairhaven. Approximately 35,000 cubic yards of material was dredged from these areas, and disposed of in CAD

Cell #1, northwest of Pope's Island. This portion of dredging and placement occurred between September 6, 2005 and October 21, 2005. Monitoring of water quality during dredging operations was conducted on 12 days, and showed no turbidity exceedances. Water quality monitoring of the placement events occurred during 12 events, again with no turbidity exceedances to report.

The fourth and final period occurred between December 19, 2005 and January 19, 2006 and involved the dredging of material from three locations in New Bedford Harbor, including Niemiec Marine on the north side of Pope's Island, Warren Alexander's Property in Fairhaven, and the remainder of D.N. Kelley and Sons Shipyard. Approximately 5,000 cubic yards of material was dredged from these locations and placed in CAD Cell #1 northwest of Pope's Island. Dredging operations were monitored for water quality on 5 days at each dredging location, with no turbidity exceedances to report during the dredging events.

For this part of the project, dredged material was not immediately disposed of in the CAD Cell as it was in the previous portions of dredging. Instead, a scow transfer system was put in place. Water quality was closely monitored during these scow transfer events, similar to placement events. Four days of water quality monitoring for these transfer events showed no turbidity exceedances. After this middle step, placement did occur, and Apex monitored one of the two placement events for water quality. No turbidity exceedances were reported from this final event.

Of all the events that took place during this Dredge Project, only one exceedance was recorded at the very beginning. Immediately following the turbidity exceedance, the water quality was even more closely observed and tested, and within 30 minutes, the quality of the water was back to normal. Following that peak, proper measures were taken to ensure no repeat incidents would occur.

5.0 Post-Dredge Conditions

Following the completion of the Dredge Project, further monitoring was continued as a means of examining the conditions of the area following the intense work that was done in New Bedford Harbor. Re-sampling and surveying was completed to verify that sustainable conditions were present in the Harbor. Samples of sediment were re-analyzed for the presence of any chemicals. Bathymetric surveys were conducted again by Apex, as well as by a third pay party, in an effort to confirm Apex's findings. Coler and Colantonio was hired to perform additional bathymetric surveys, with the results being consistent with those of Apex. Post-action settlement surveys were conducted three times at the Borrow Pit. Clearly visible from the results of all post-dredge surveys, all conditions for the area post-dredge were met.

Settlement surveys were performed three times on the OU3 Cap to observe the patterns of the sediment. The results show the cap settling and flattening out to become in line with the conditions previously set forth. These findings prove that this OU3 Capping Pilot Program was successful in its accomplishments.

5.1 Sediment Chemistry: Pre- and Post-Dredge

The following sections describe sampling and analysis activities that were conducted prior to dredging of the Phase II dredge areas and sampling and analysis that occurred after the dredging in order to document post-dredge conditions.

5.1.1 Pre-Dredge Sediment Chemistry

Before dredging began in the area, sediment samples were taken in order to get a background reading of the sediment chemistry. The samples were tested for PCBs, using the Aroclor method of PCB recording. Forty samples of sediment were taken throughout the North Terminal region of New Bedford Harbor. In

most samples, PCB testing was done at various depth intervals, ranging from only one depth to eight different depths. In total, 130 sub-samples were tested for PCB levels, with only a few being additionally examined for metals, EPH, and PAH values. Of all the pre-dredge PCB levels recorded, the highest value was 81 ppm. This level was obtained at a depth of only 2-3 feet below ground, in sample #M210-3. The range of PCB levels that was recorded was 0.5 ppm to 81 ppm, with an average PCB level for all locations and all depths was 13.13 ppm. Only 8 samples had supplemental testing done. Pre-dredge sampling locations are shown on Figure 1-3 and Figure 3 in the Pre-Dredge Sediment Chemistry Data Attachement.

On the Fairhaven side of the harbor, twenty samples of sediment were collected and analyzed. Of all sediment samples collected, six reported undetectable levels of PCBs, while the other fourteen had values ranging from 0.216 ppm to 8.16 ppm. These values had a median of 1.39 ppm and an average of 1.89 ppm. Of all the samples taken, an average PCB level obtained was 12.04 ppm between the North Terminal samples (and sub-samples) and the Fairhaven samples.

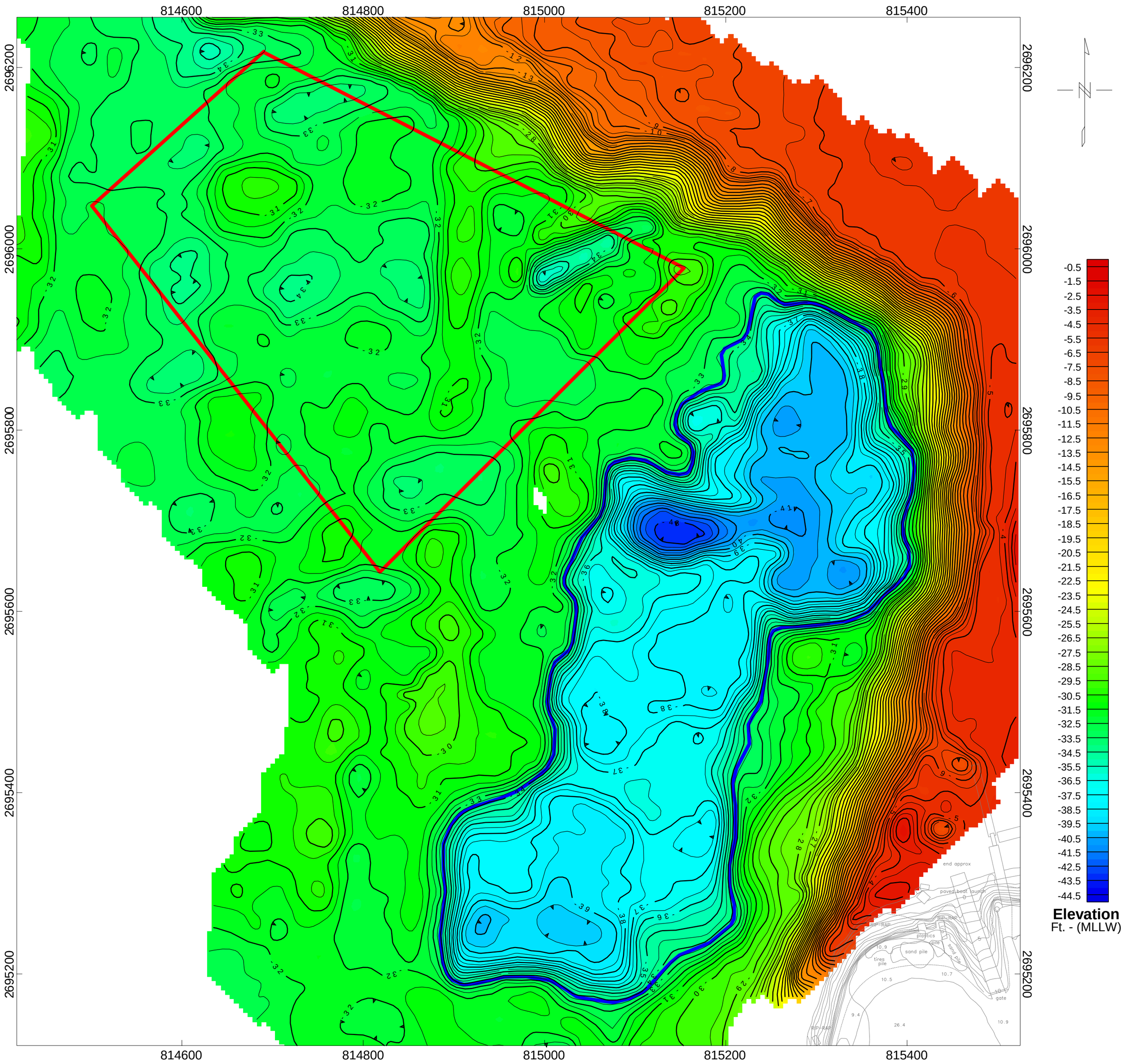
5.1.2 Post-Dredge Sediment Chemistry

In an effort to compare soil contamination with Pre-Dredge conditions, and evaluate the improvement of the area, Apex sampled the sediment and recorded the remaining conditions. After dredging was complete, thirteen sediment samples were collected, all being tested for PCBs, metals, EPH, and PAH values. Again, Aroclor reporting was used, which is consistent with the pre-dredge method. Therefore, comparison of PCB levels provides an accurate representation of the changes made. The samples taken after dredging was complete yield an average PCB level of 1.14 ppm, with a median value of 1.08 ppm. This value is a large decrease from the pre-dredge PCB average of 12.04 ppm, which may even be considered a low value since it included virtually PCB-free sub-samples located below the contaminated depths of sediment. Nonetheless, the post-dredge PCB value shows a clear drop in contamination. The highest reported value of PCBs recorded from the post-dredge samples was 2.85 ppm, from a sample taken in the Maritime Terminal area. The overall range of PCB levels among the samples is 0.38 ppm to 2.85 ppm.

It is apparent that the level of contamination in New Bedford Harbor sediment had dropped significantly. Not only is this clearly indicated in the results of PCB testing, but also in the analysis of metals present in the sediment. The average arsenic level for the seven pre-dredge samples that were tested for metals was 11 ppm, while the post-dredge average was only 4.99 ppm. Another indication is the average value of EPH in the sediment. While the pre-dredge average was 1022 ppb, the post-dredge average came to only 220 ppb. These examples, coupled with the PCB levels, is a clear indication of the improvement made in the harbor sediments as a result of the New Bedford Harbor Maintenance Dredge Program.

Location	Pre-Construction Values	Post-Construction Values
Whites Terminal	0.50 – 46.00 ppm	1.54 ppm
Fish Island North	0.50 – 77.00 ppm	
Maritime Terminal	0.50 – 68.00 ppm	2.85 ppm
South of Route 6	0.50 – 81.00 ppm	1.67 ppm
Warren Alexander	1.172 – 8.16 ppm	1.20 ppm
D.N. Kelley	0.738 – 2.943 ppm	0.86 – 1.43 ppm
Linberg Marine	0.583 – 1.93 ppm	0.40 – 0.90 ppm
Pease Park	0.216 – 2.56 ppm	0.55 – 1.08 ppm
Niemic Marine		0.38 ppm
Average	12.04 ppm	1.14 ppm
Median	36.00 ppm	1.08 ppm

Figures



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON DECEMBER 29, 2004.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:1200

50 0 50 100 150 200

US survey foot

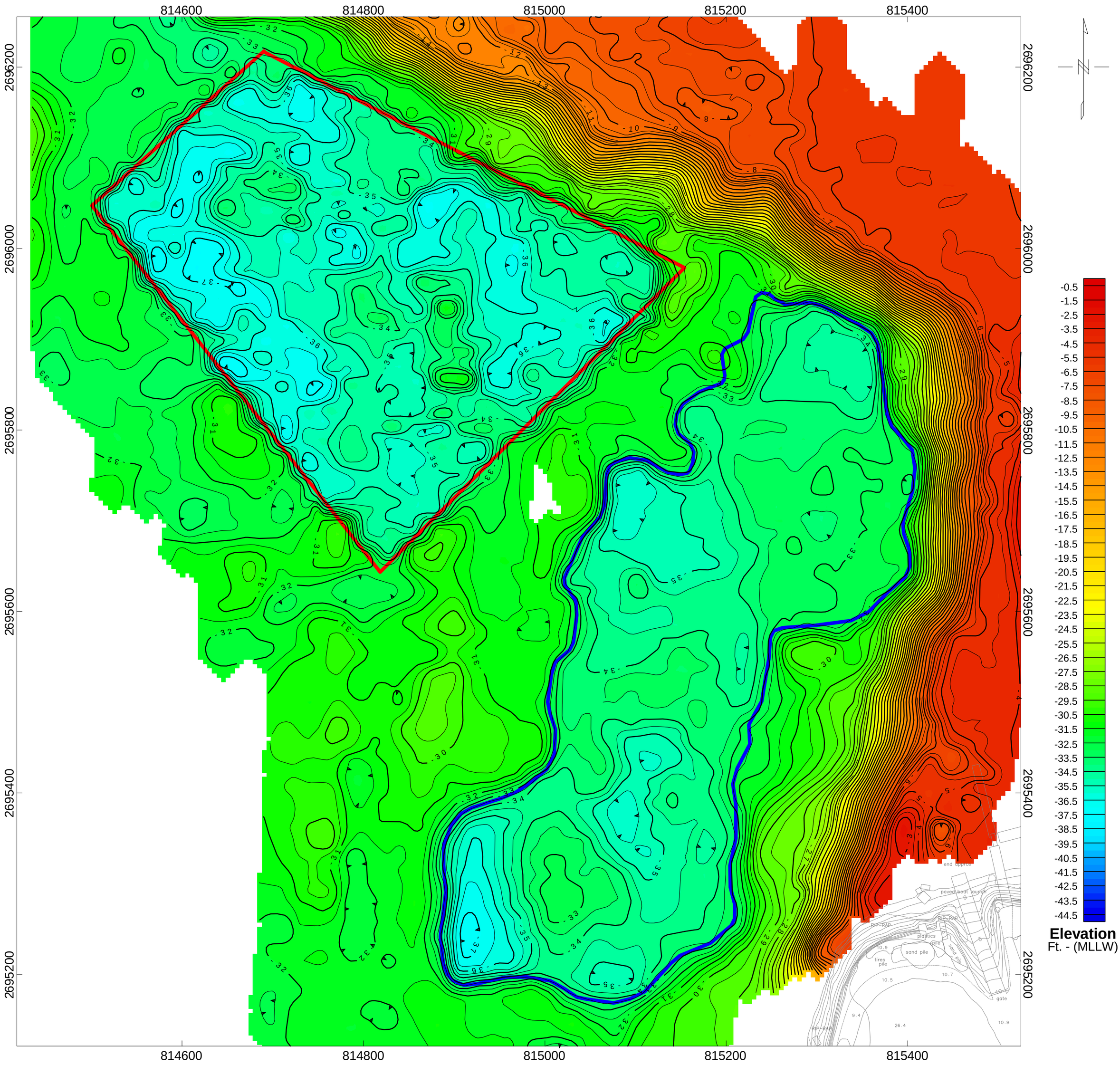
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

CAD Cell #1 and Borrow Pit
Top of CAD and Borrow Pit Pre-Dredge Survey
New Bedford, Massachusetts

Decmeber 29, 2004
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON MARCH 3, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:1200

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US survey foot

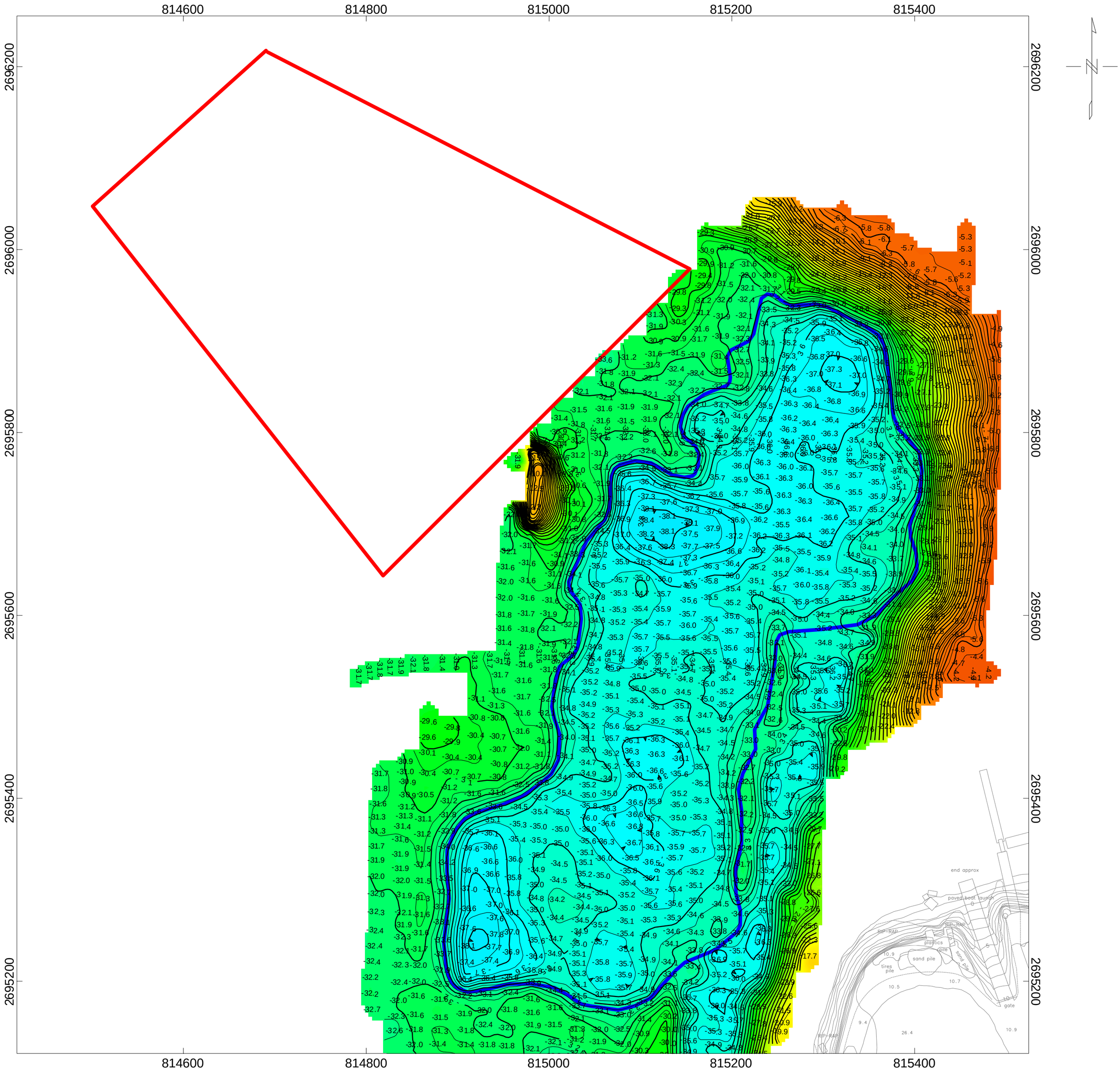
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

CAD Cell #1 and Borrow Pit
Top of CAD and Borrow Pit Post-Dredge Survey
New Bedford, Massachusetts

March 3, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON OCTOBER 7, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:1200

50 0 50 100 150 200

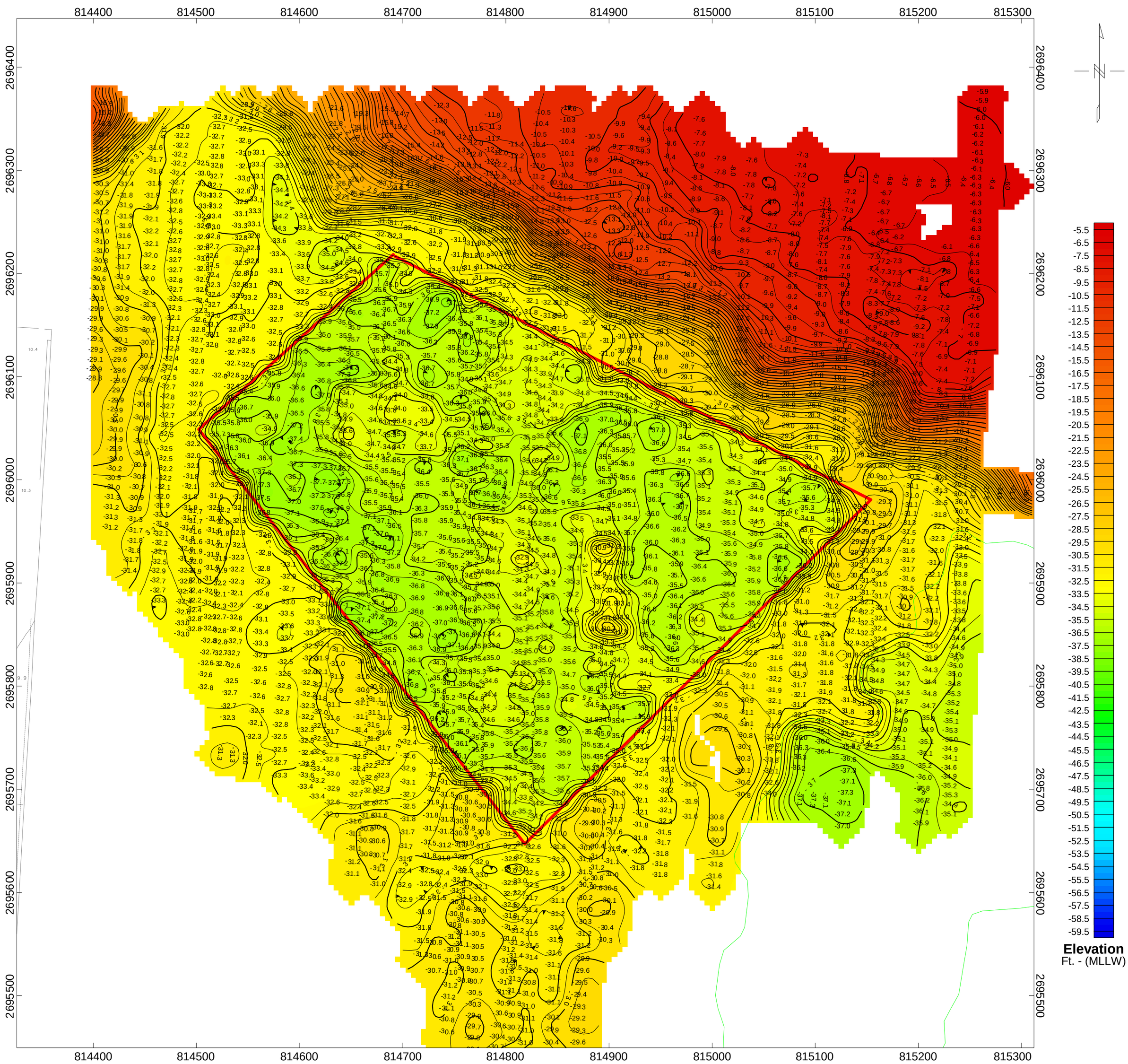
US survey foot

New Bedford Harbor Dredge - Phase II

CAD Cell #1 and Borrow Pit
Borrow Pit Settlement Survey
New Bedford, Massachusetts

October 7, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON JUNE 10, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:960

50 0 50 100 150

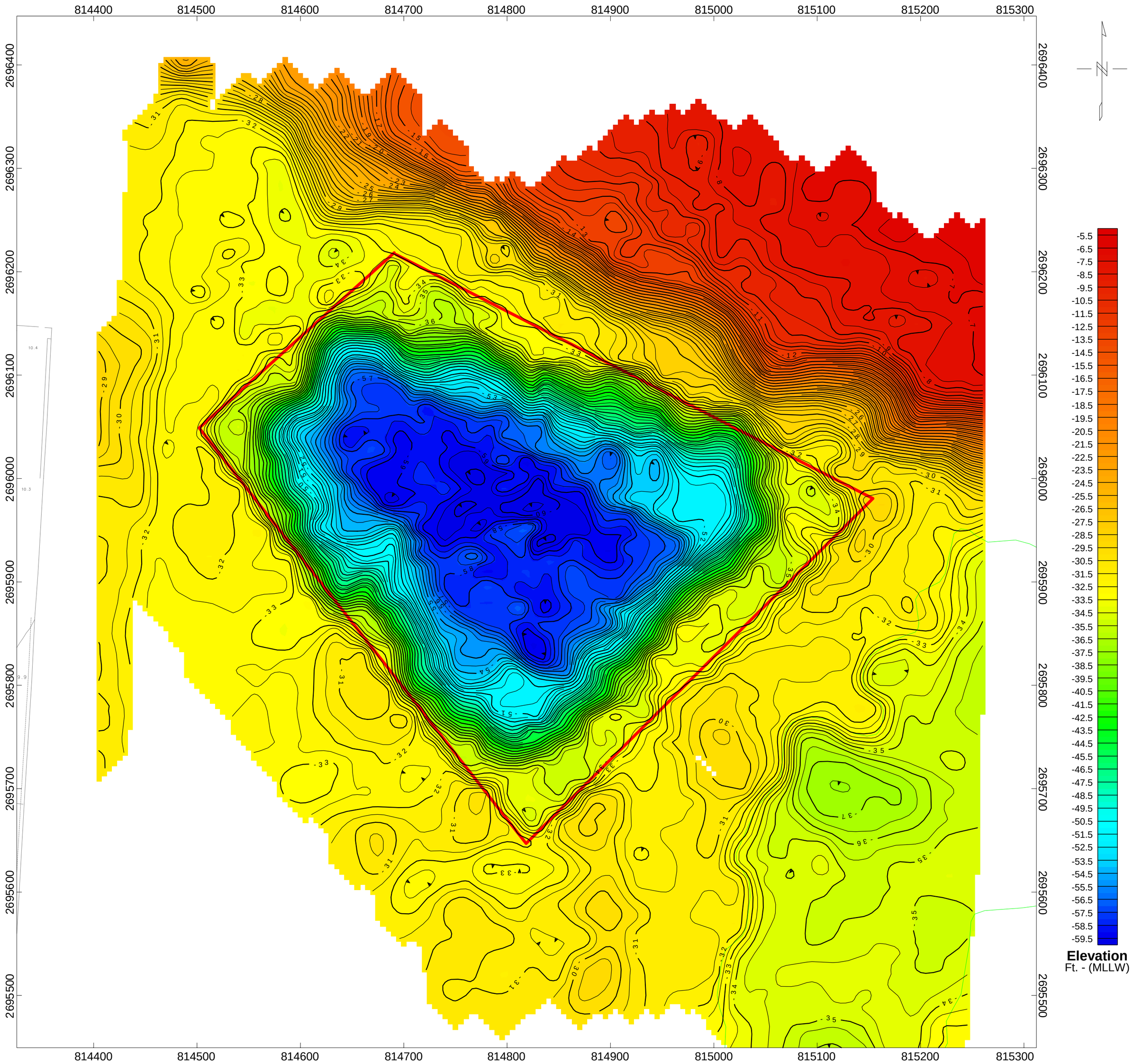
US survey foot

New Bedford Harbor Dredge - Phase II

CAD Cell #1
CAD Cell Pre-Dredge Survey
New Bedford, Massachusetts

June 10, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON JULY 27, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:960

50 0 50 100 150

US survey foot

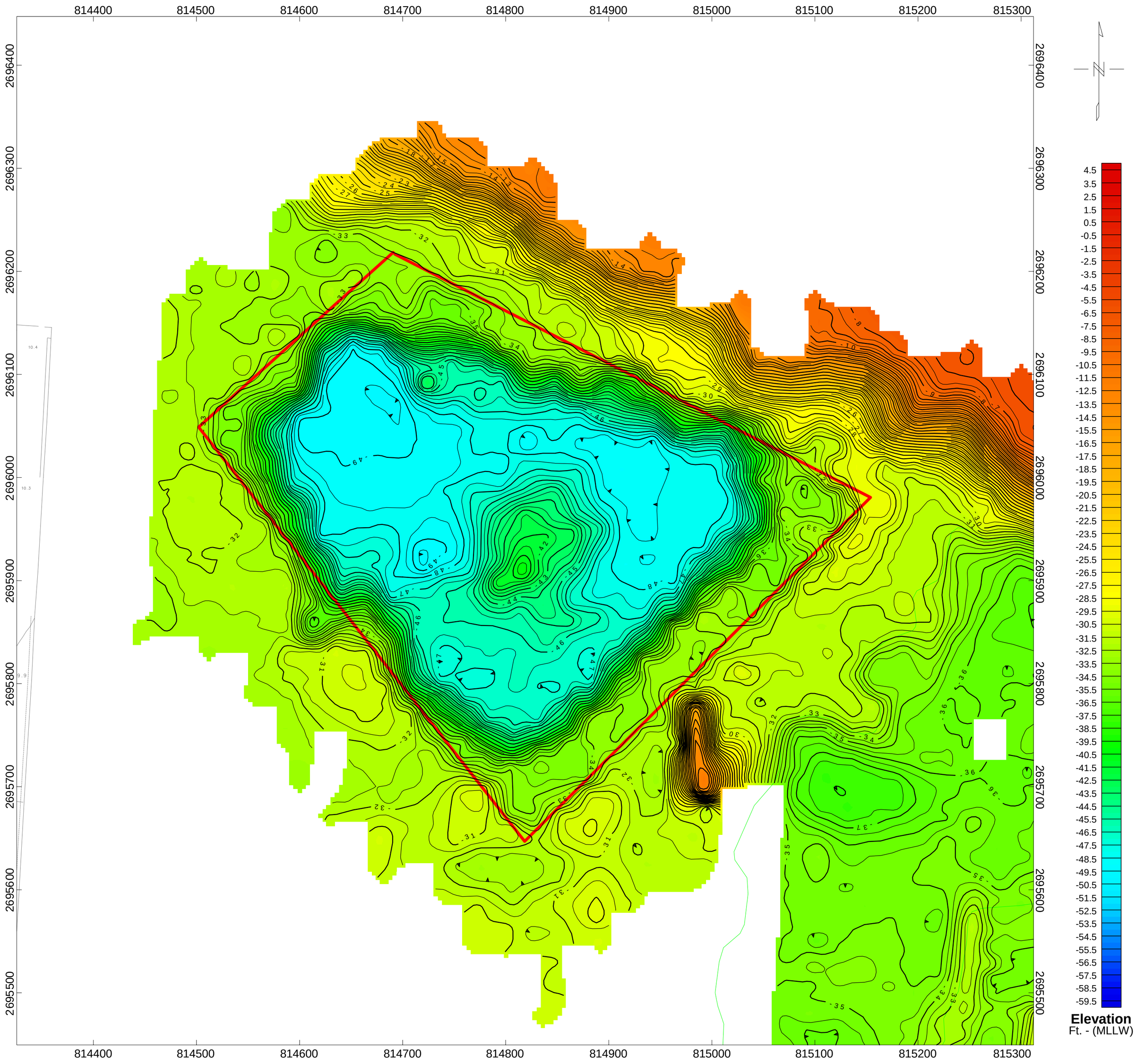
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

CAD Cell #1
CAD Cell Post-Dredge Survey
New Bedford, Massachusetts

July 27, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON FEBRUARY 6, 2006.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:960

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US survey foot

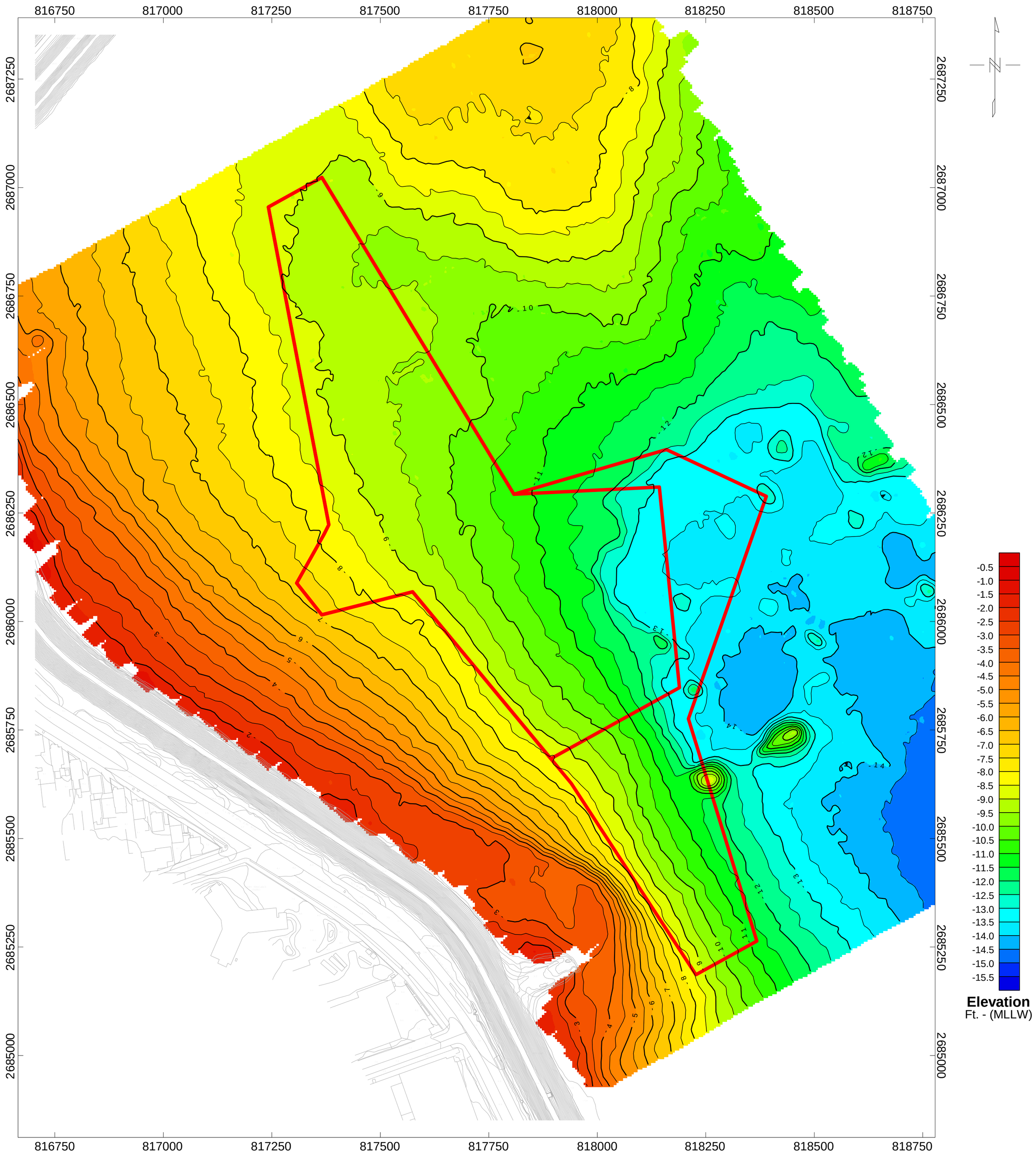
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

CAD Cell #1
CAD Cell Post-Placement Survey
New Bedford, Massachusetts

February 6, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON JUNE 16, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:2400

100 0 100 200 300 400

US survey foot

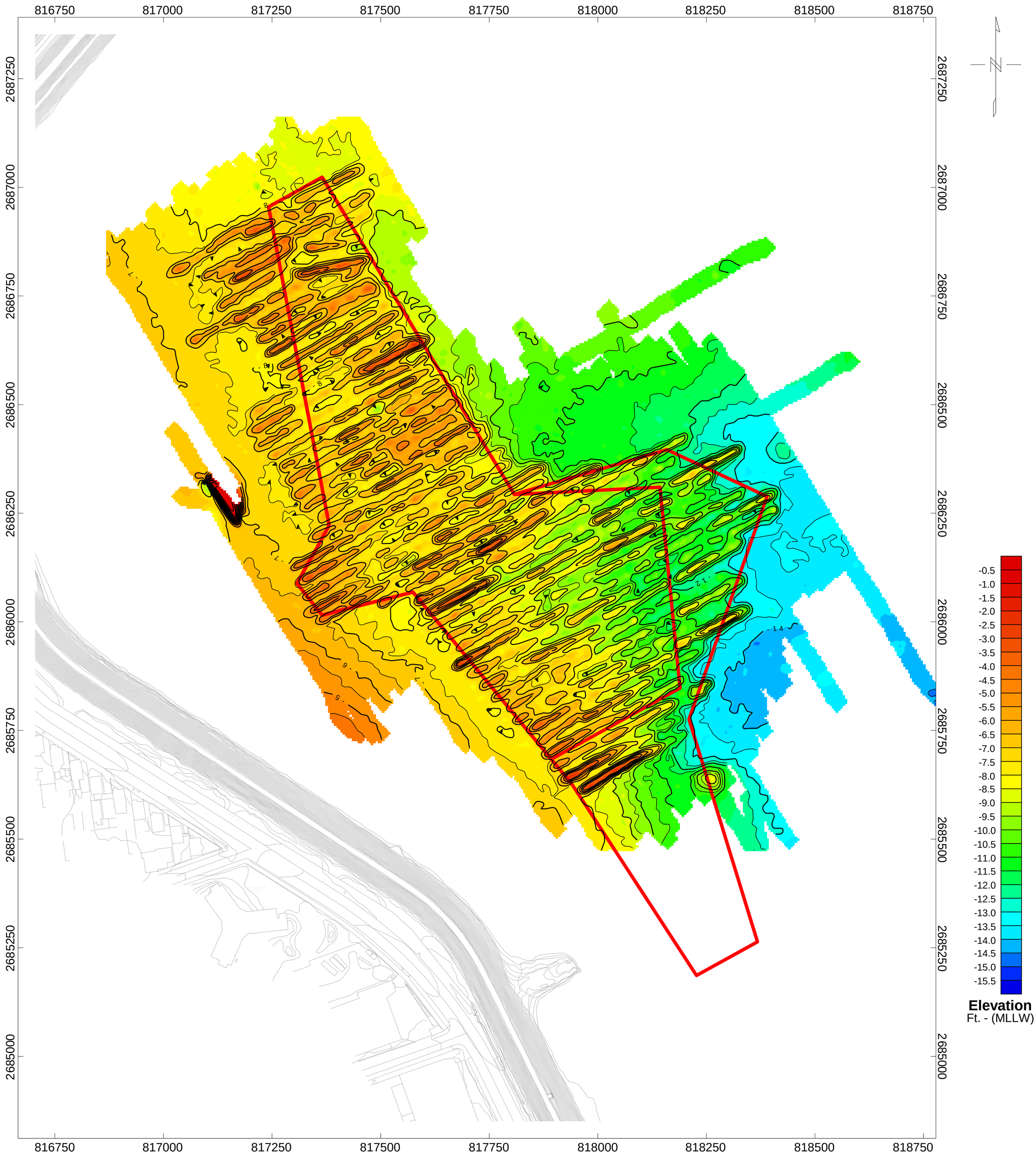
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

USACE Operable Unit #3
OU#3 Pre-Placement Survey
New Bedford, Massachusetts

June 16, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON JULY 26, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:2400

100 0 100 200 300 400

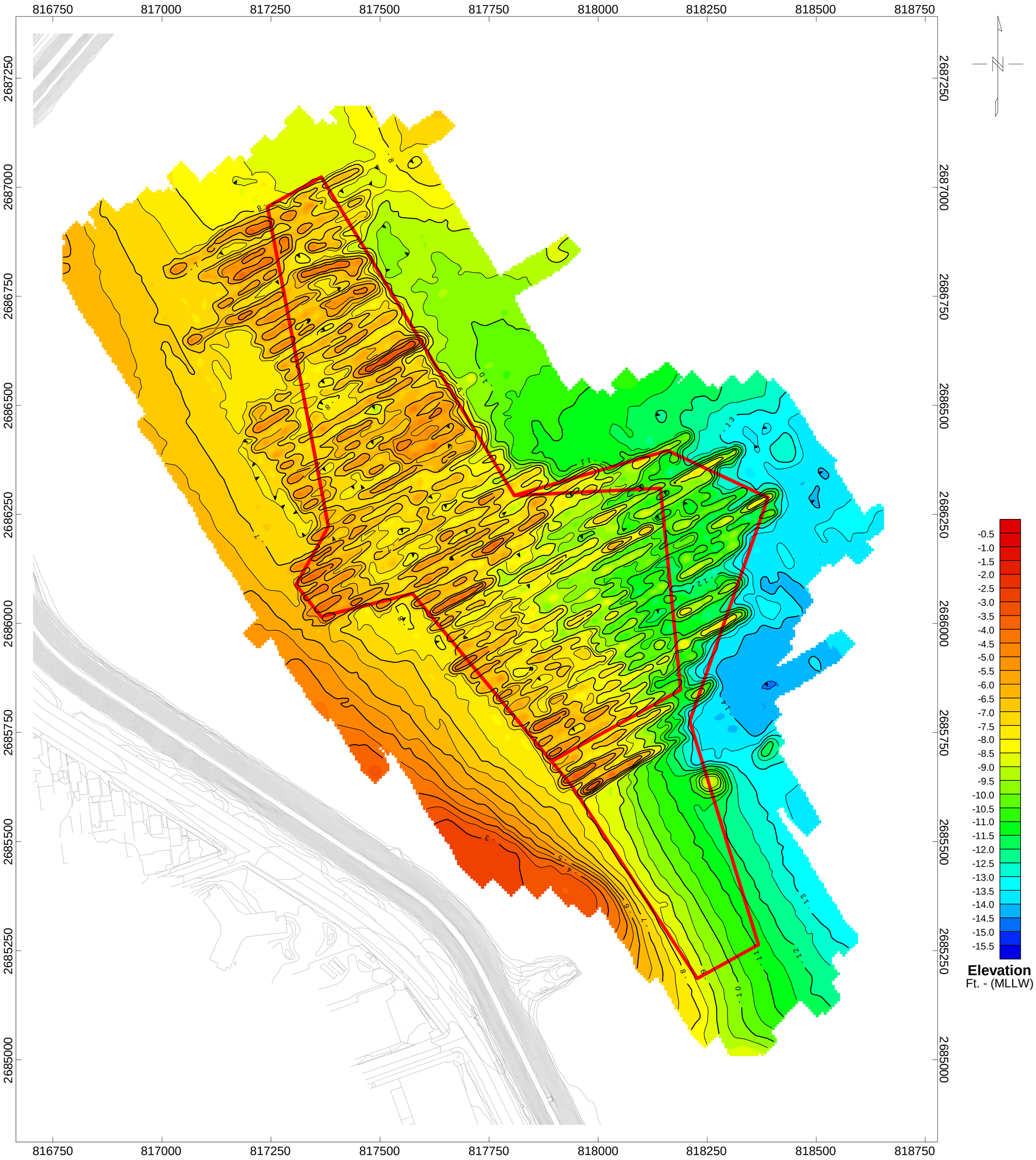
US survey foot

New Bedford Harbor Dredge - Phase II

USACE Operable Unit #3
OU#3 Post-Placement Survey
New Bedford, Massachusetts

July 26, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON OCTOBER 5, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:2400

100 0 100 200 300 400

US survey foot

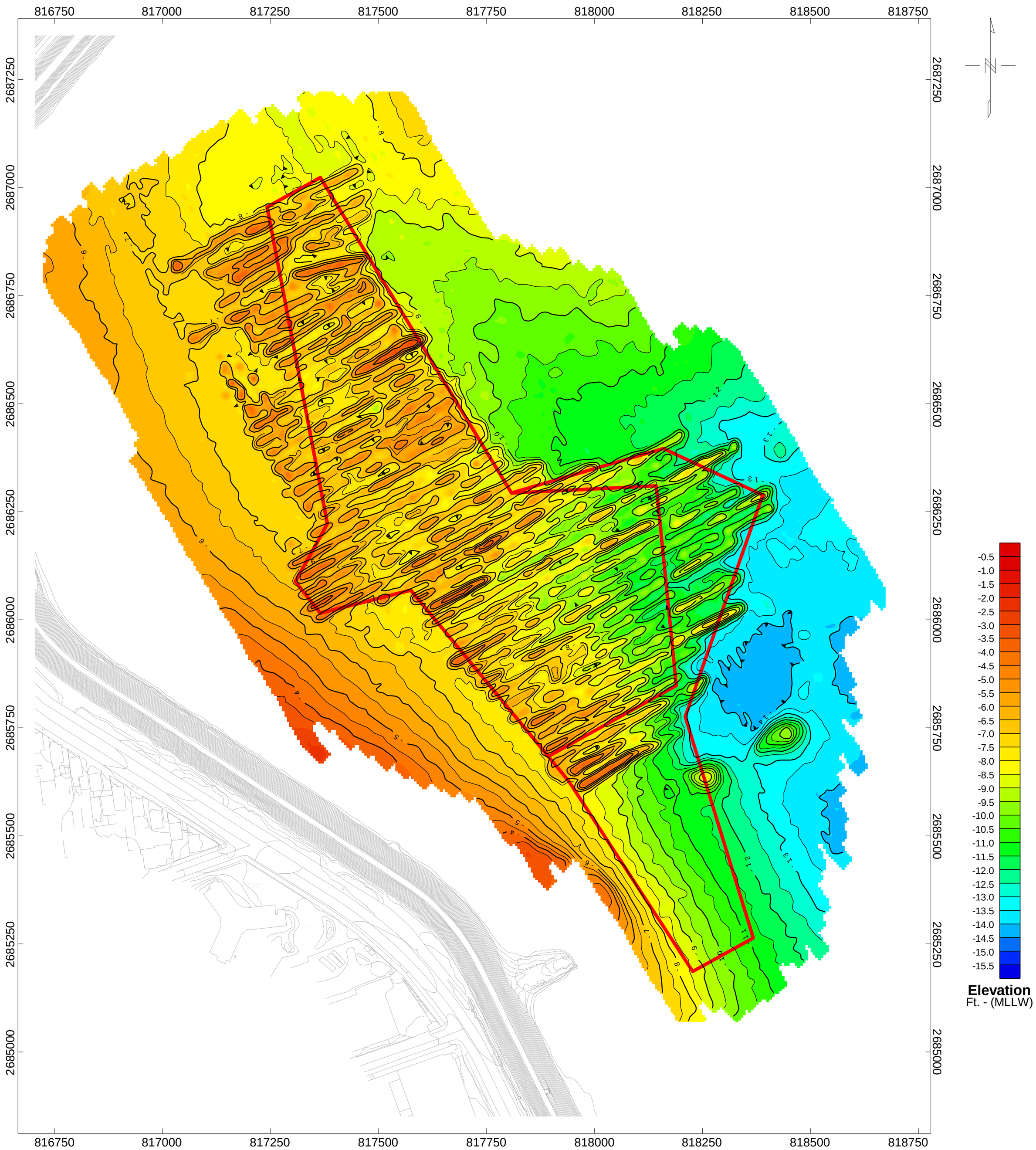
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

USACE Operable Unit #3
OU#3 Post-Placement Settlement Survey
New Bedford, Massachusetts

October 5, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



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2. HYDROGRAPHIC SURVEY WAS PERFORMED BY APEX ENVIRONMENTAL, INC ON JANUARY 12, 2006.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

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Scale 1:2400

100 0 100 200 300 400

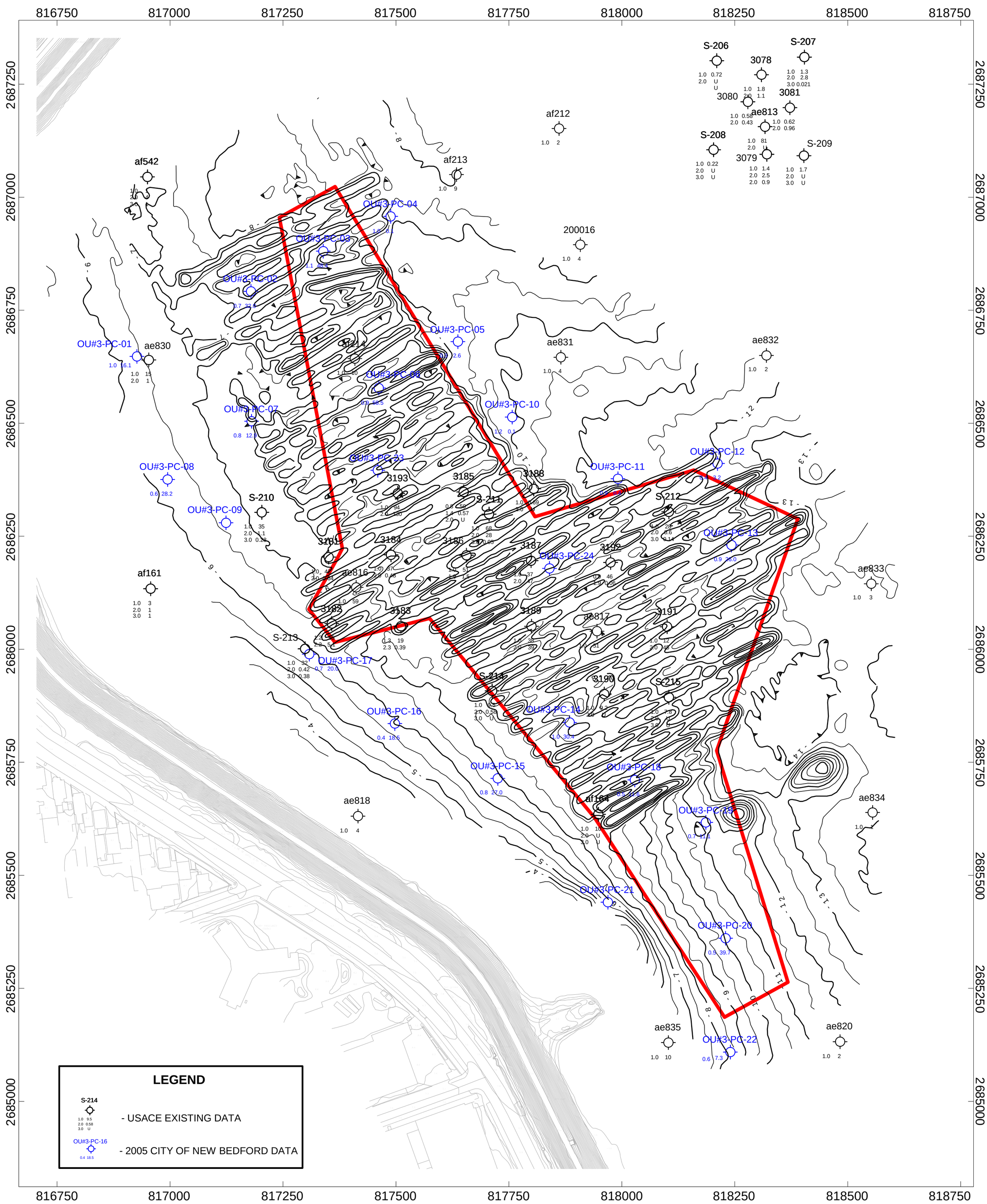
US survey foot

New Bedford Harbor Dredge - Phase II

USACE Operable Unit #3
OU#3 Post-Placement Settlement Survey
New Bedford, Massachusetts

January 12, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



Scale 1:2400

100 0 100 200 300 400

US survey foot

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM,MASSACHUSETTS MAINLAND ZONE 2001, REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83).

2. BASE PLAN OBTAINED FROM U.S. ARMY CORPS OF ENGINEERS.

3. INAPPROPRIATE AND/OR UNAUTHORISED USE OF THIS INFORMATION IS PROHIBITED.

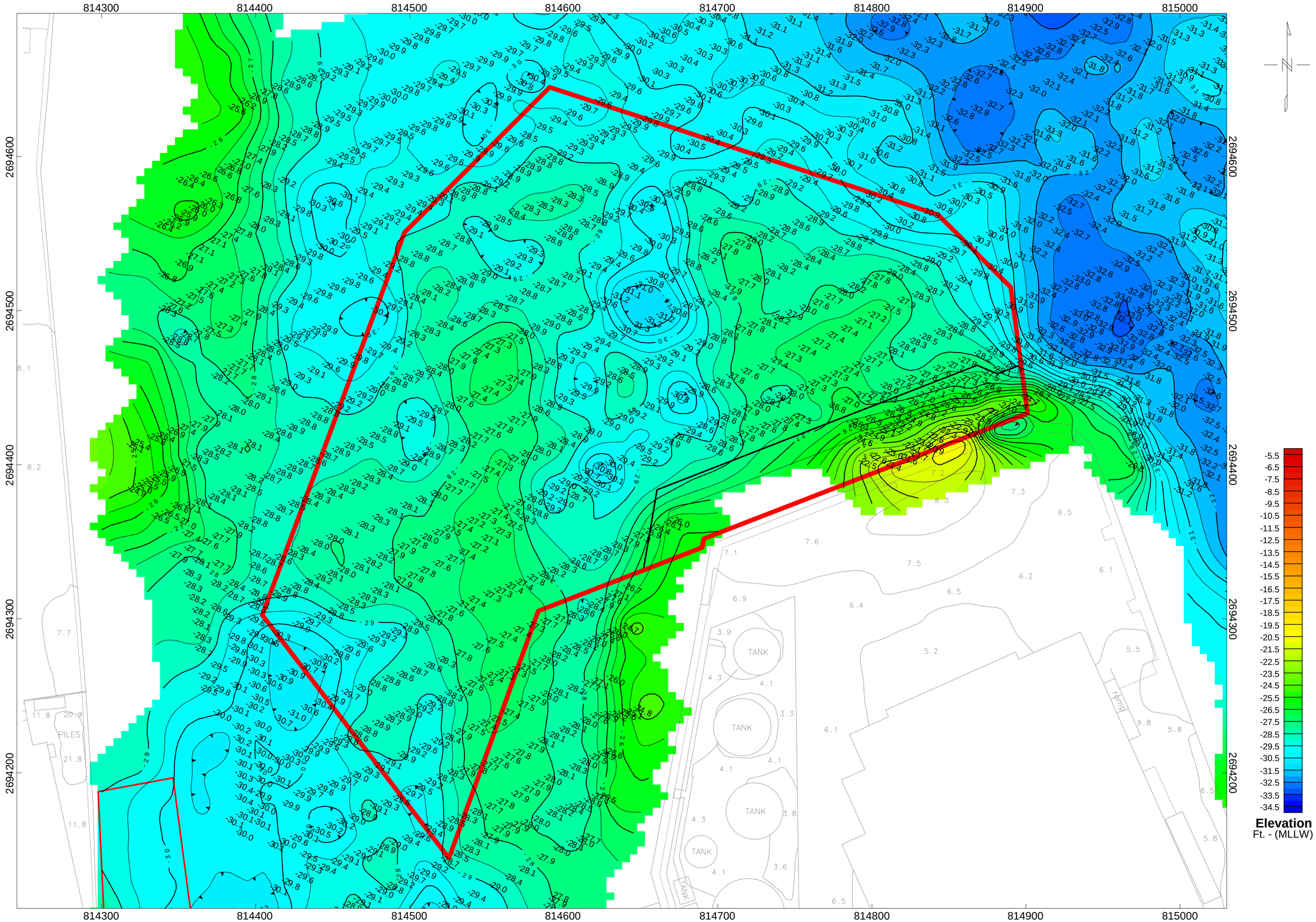
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

USACE Operable Unit #3
OU#3 As Built Plan
New Bedford, Massachusetts

March, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON DECEMBER 29, 2004.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125 150

US survey foot

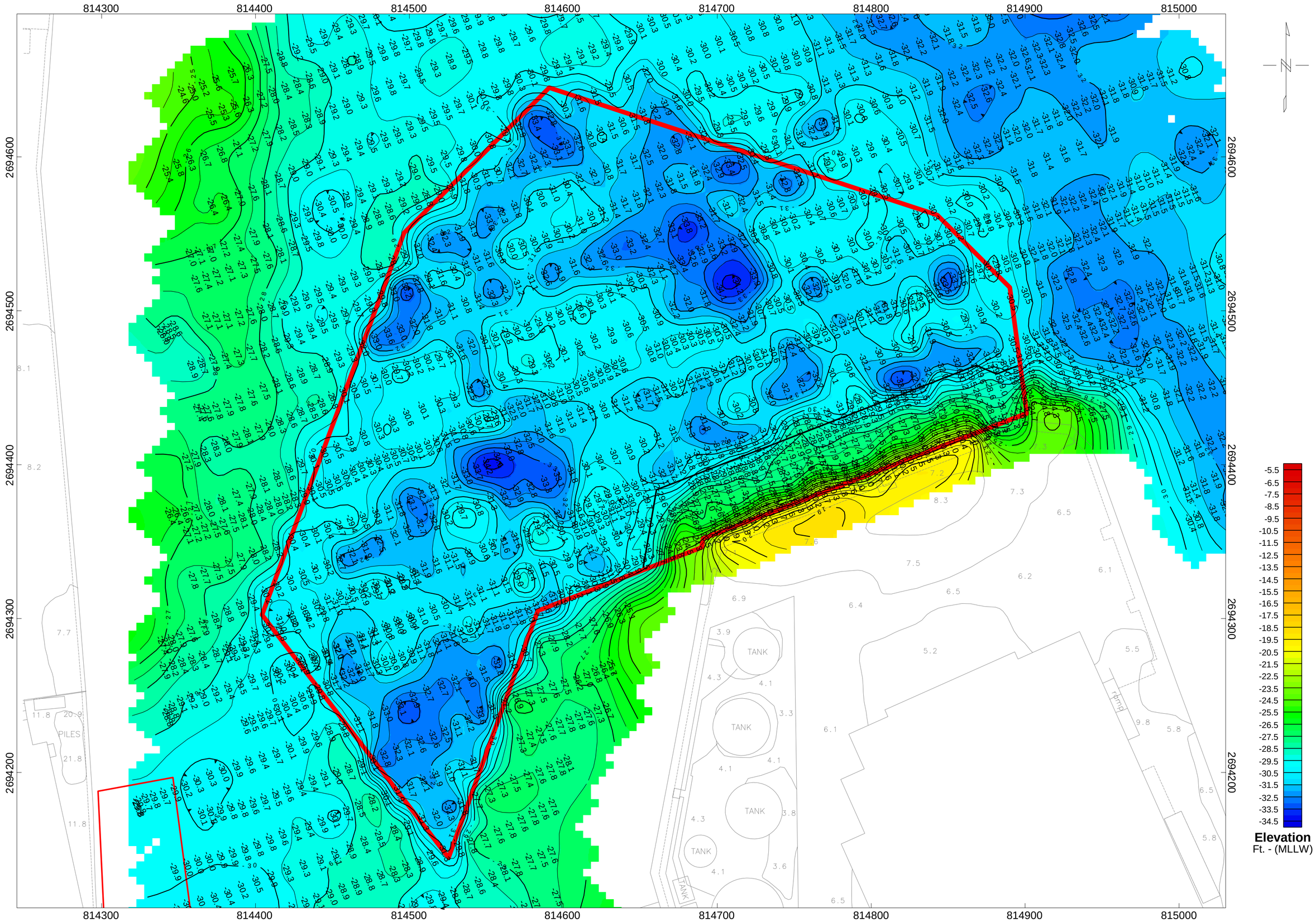
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

Salt Terminal - Fish Island
Fish Island Pre-Dredge Survey
New Bedford, Massachusetts

December 29, 2004
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON FEBRUARY 12, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125 150

US survey foot

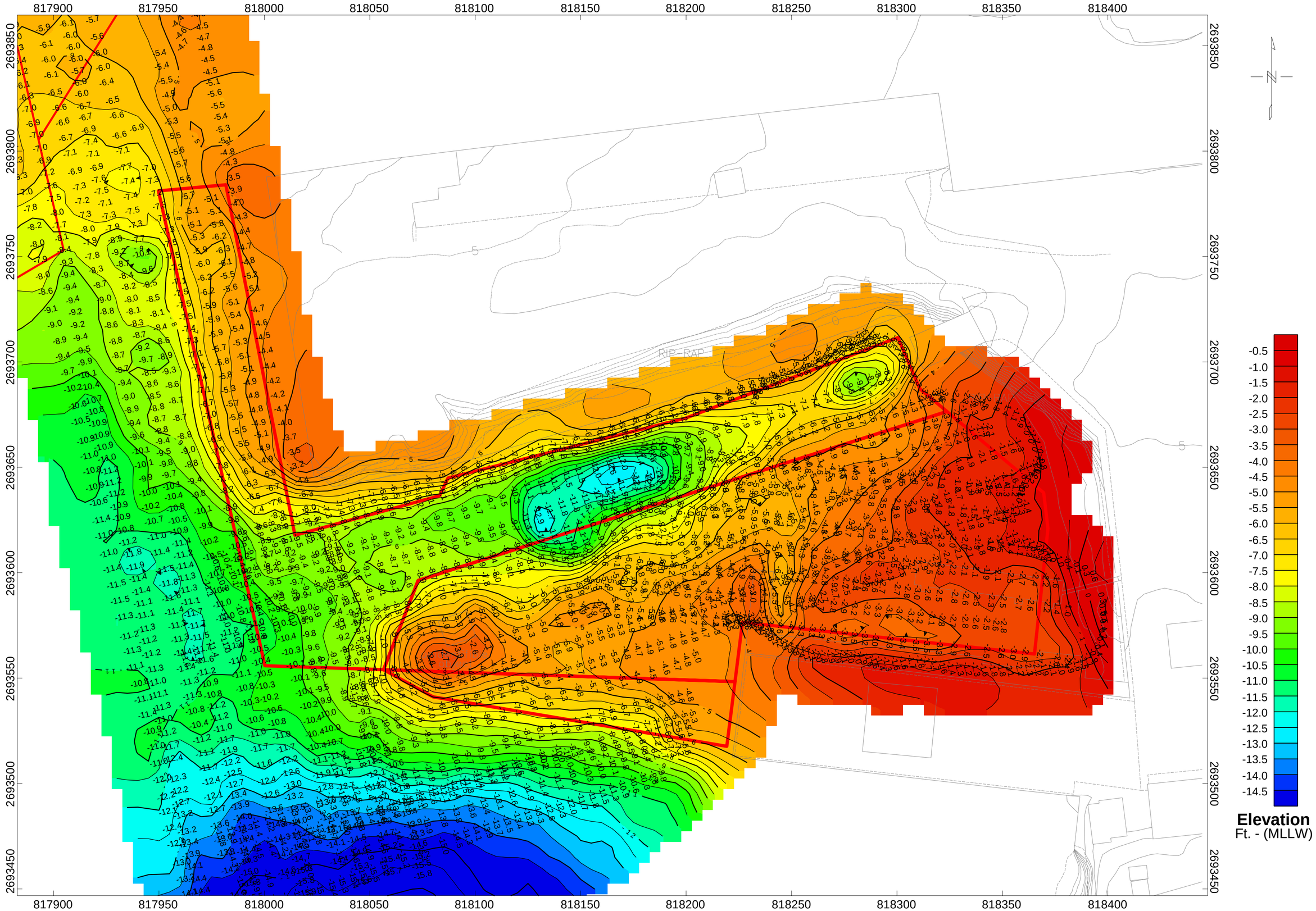
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II

Salt Terminal - Fish Island
Fish Island Post-Dredge Survey
New Bedford, Massachusetts

February 12, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTMEBER 26, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

US survey foot

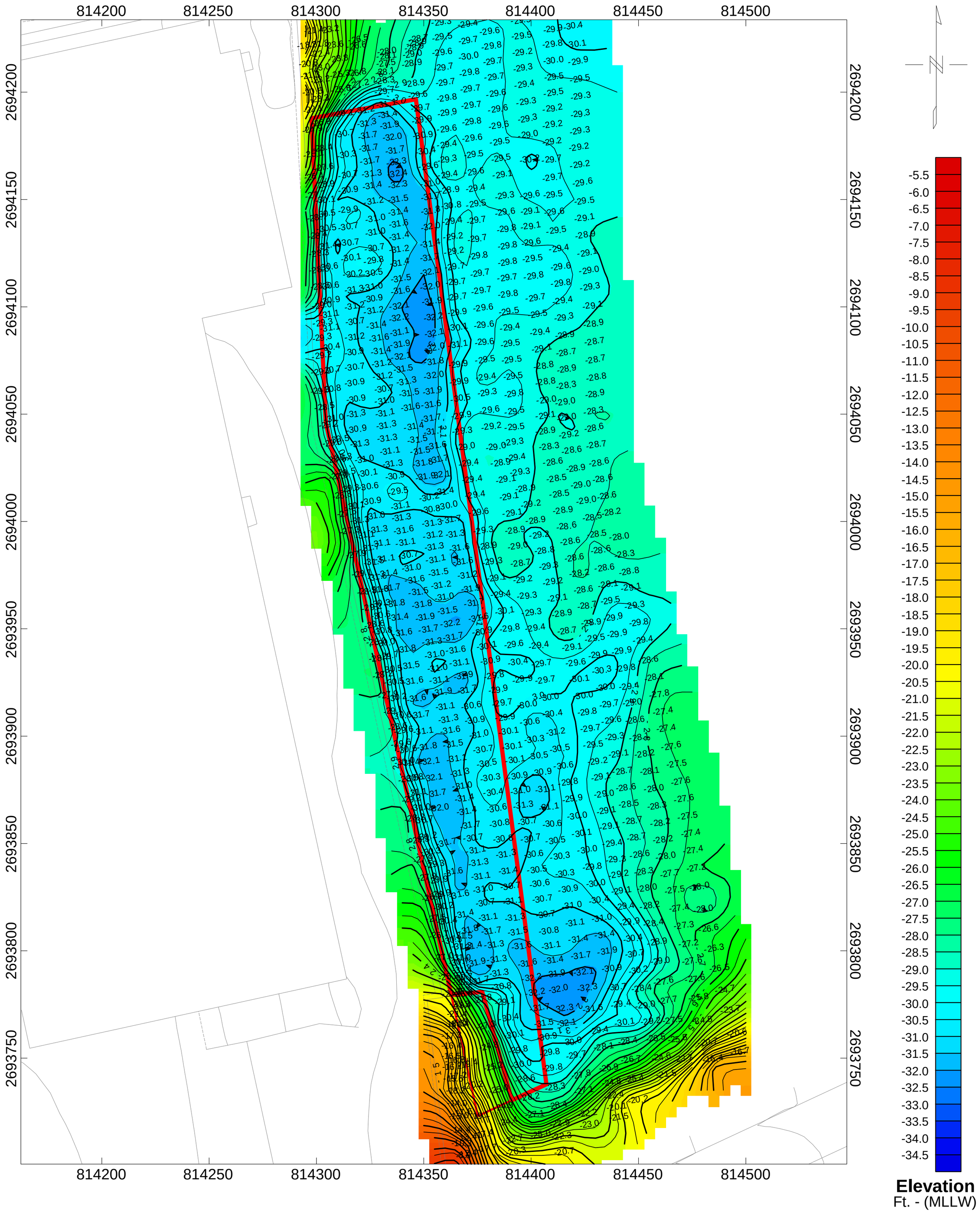
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Linberg Marine
Linberg Marine Pre-Dredge Survey
Fairhaven, Massachusetts

September 26, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 19, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50

US survey foot

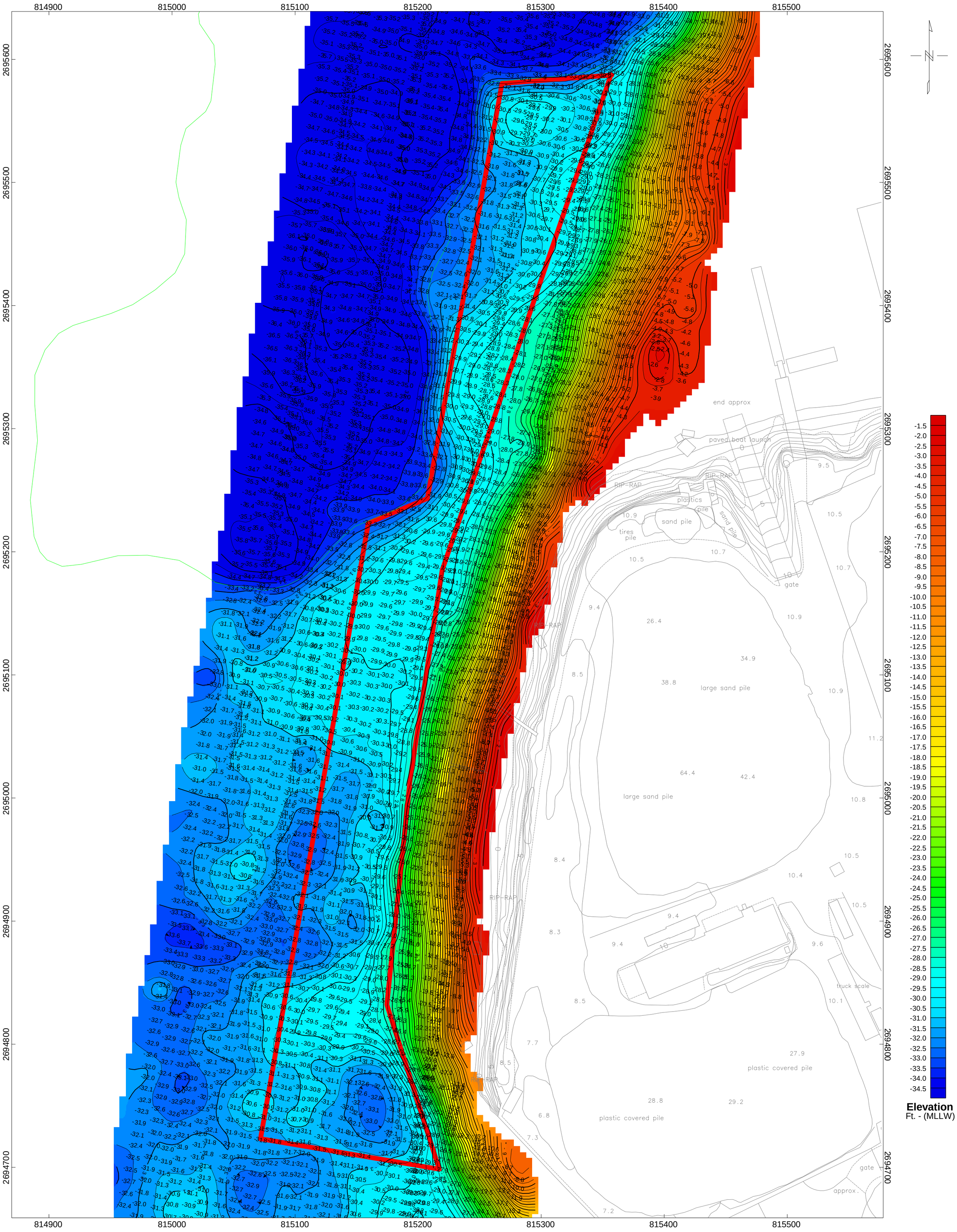
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Maritime Terminal
Maritime Post-Dredge Survey
New Bedford, Massachusetts

September 19, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 15, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125

US survey foot

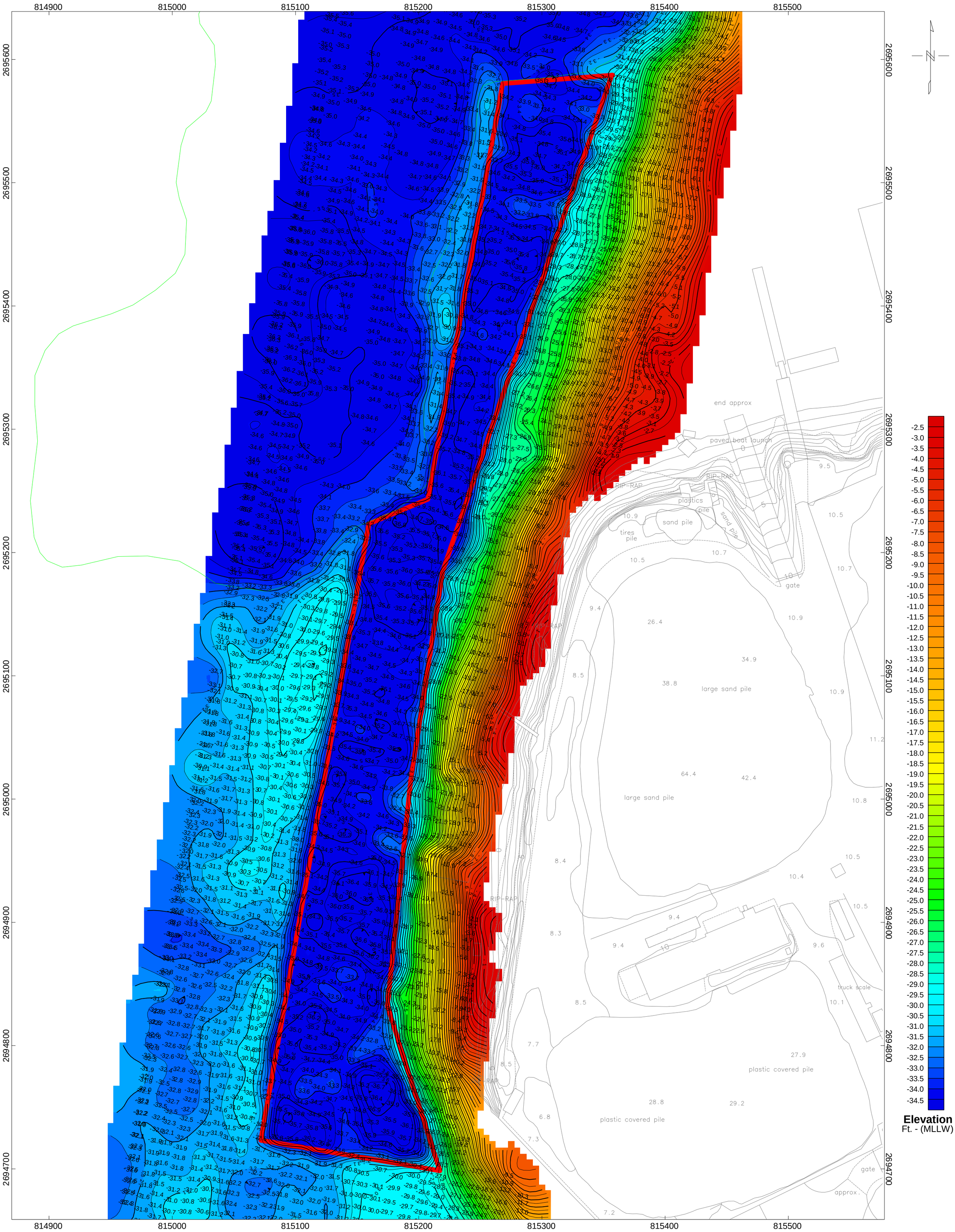
Apex environmental,inc.

New Bedford Harbor Dredge - Phase II Part 2

White's Terminal - Pope's Island
White's Terminal Pre-Dredge Survey
New Bedford, Massachusetts

Septmeber 15, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 25, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125

US survey foot

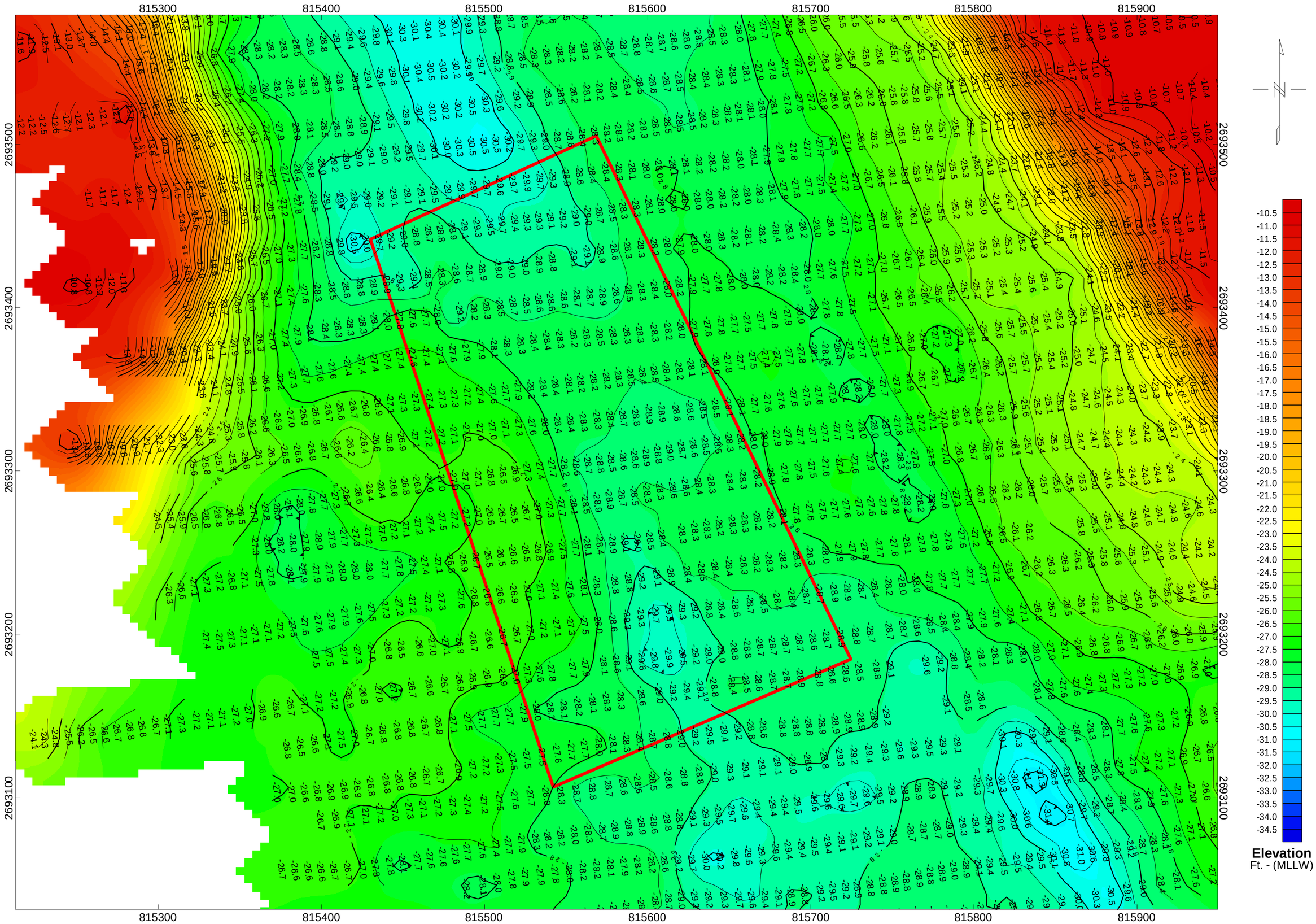
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

White's Terminal - Pope's Island
White's Terminal Post-Dredge Survey
New Bedford, Massachusetts

September 25, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 6, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125

US survey foot

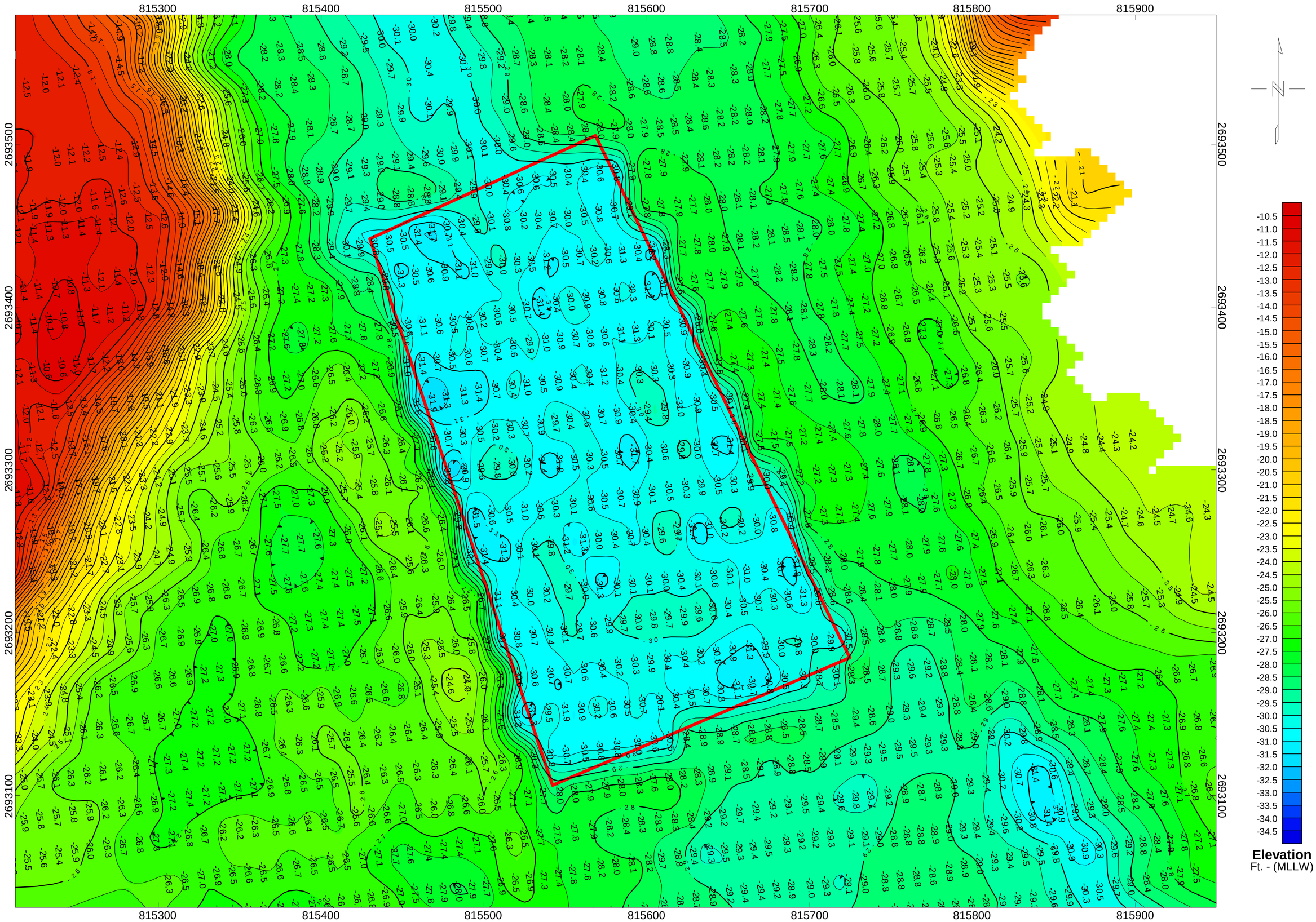
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Shoal South of Route 6 Bridge
SR6 Pre-Dredge Survey
New Bedford, Massachusetts

Septmeber 6, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 10, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125

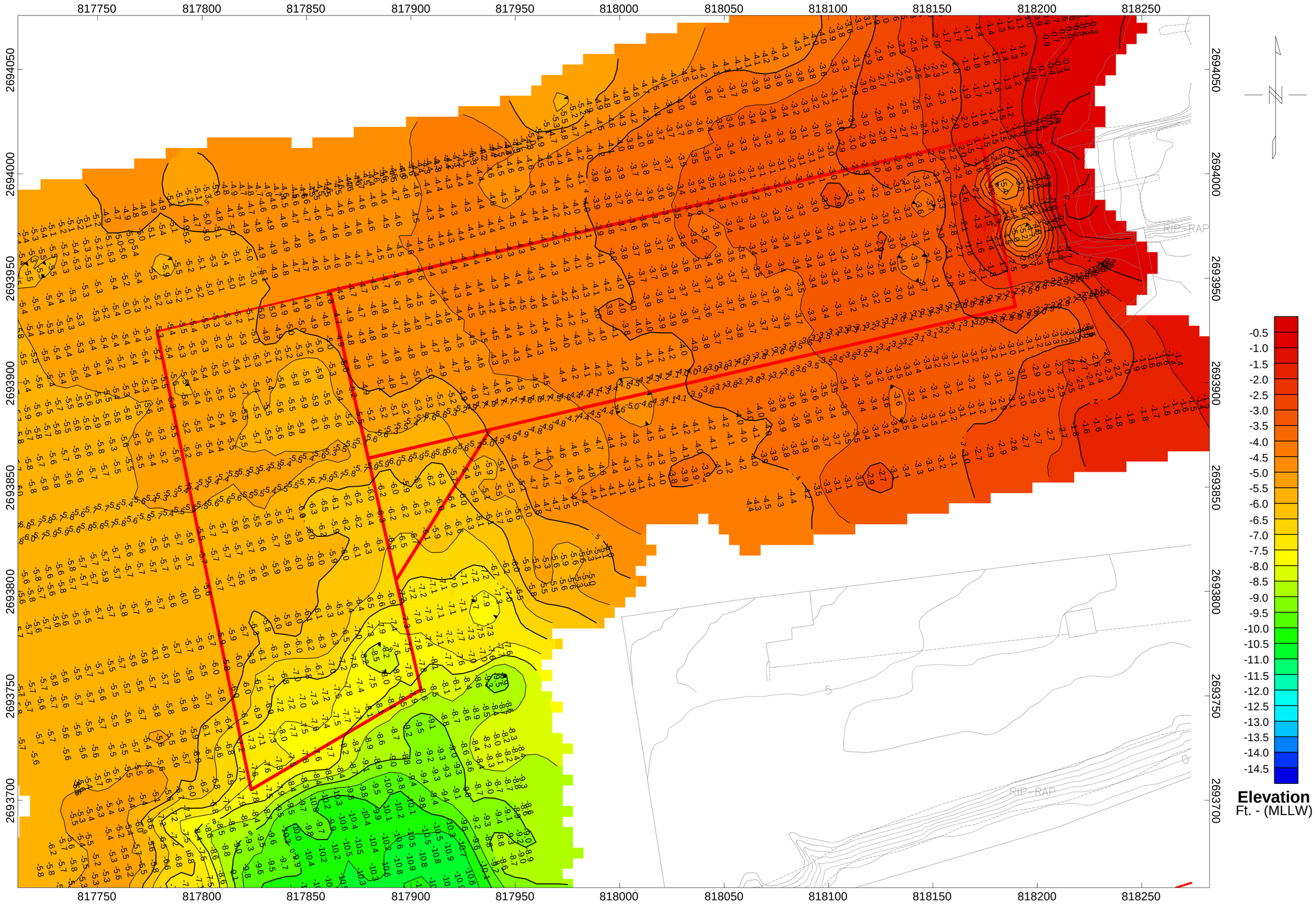
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

Shoal South of Route 6 Bridge
SR6 Post-Dredge Survey
New Bedford, Massachusetts

October 10, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 25, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

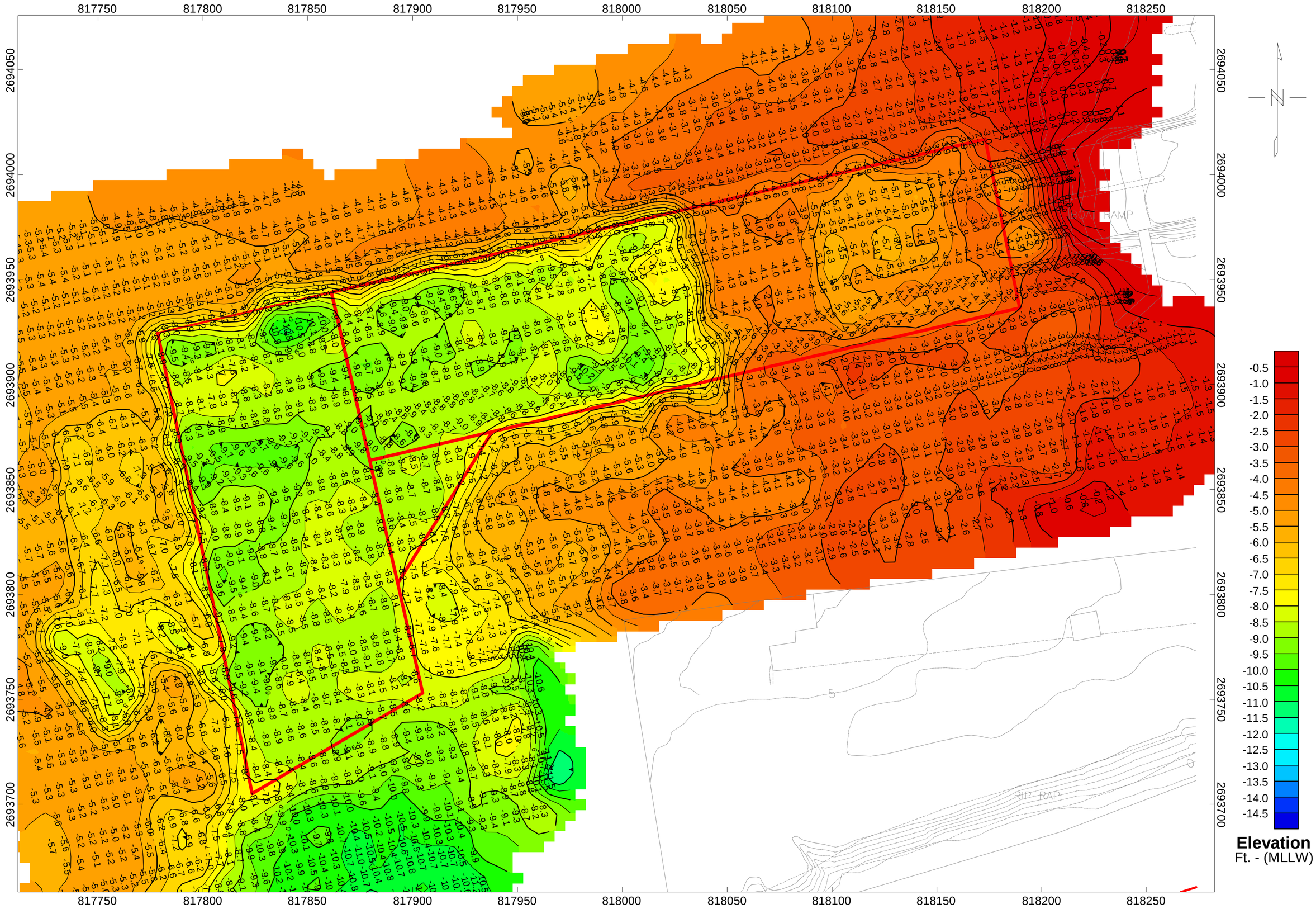
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

Pease Park Boat Ramp
Pease Park Pre-Dredge Survey
Fairhaven, Massachusetts

September 25, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 31, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

US survey foot

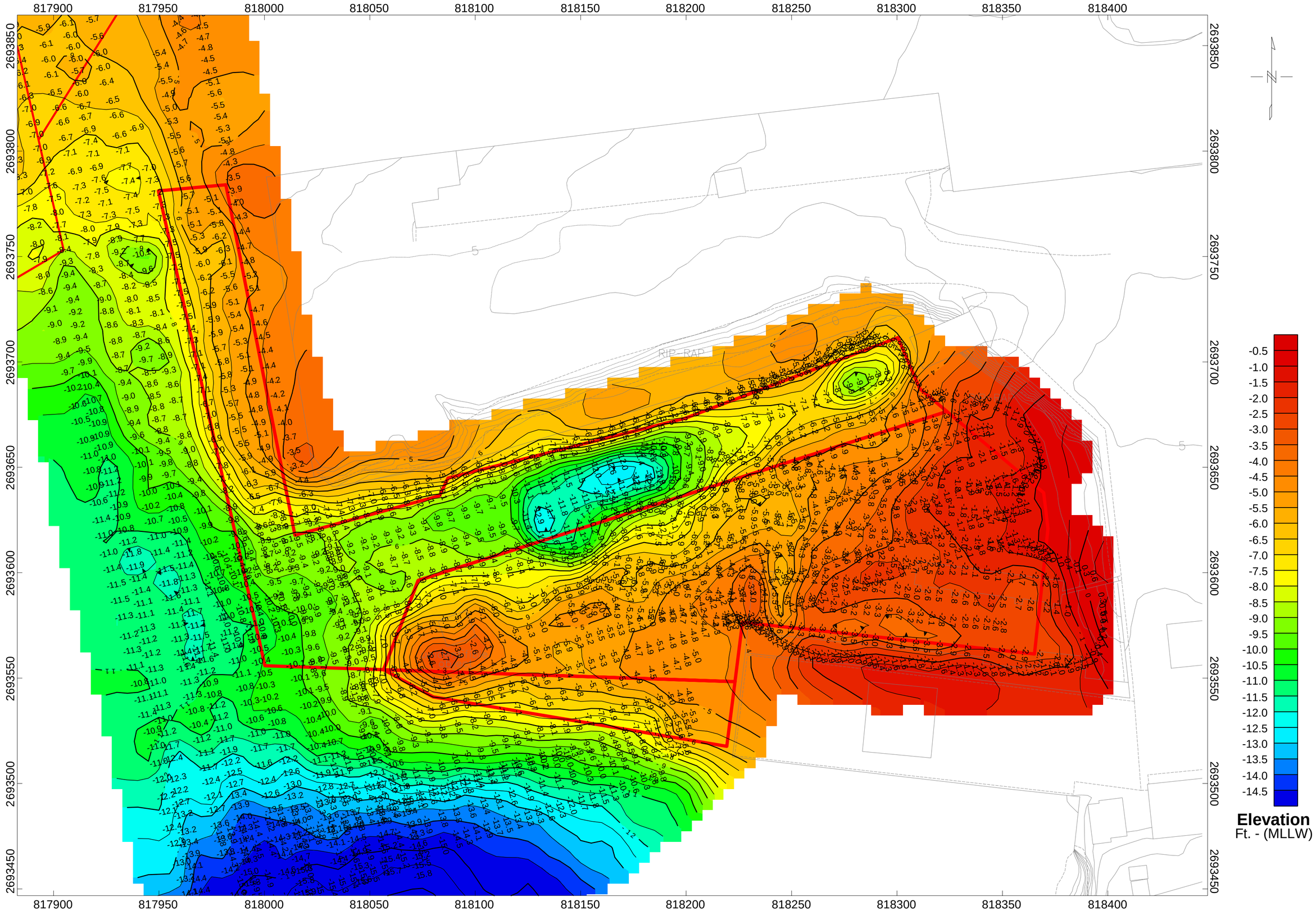
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Pease Park Boat Ramp
Pease Park Post-Dredge Survey
Fairhaven, Massachusetts

October 31, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTMEBER 26, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

US survey foot

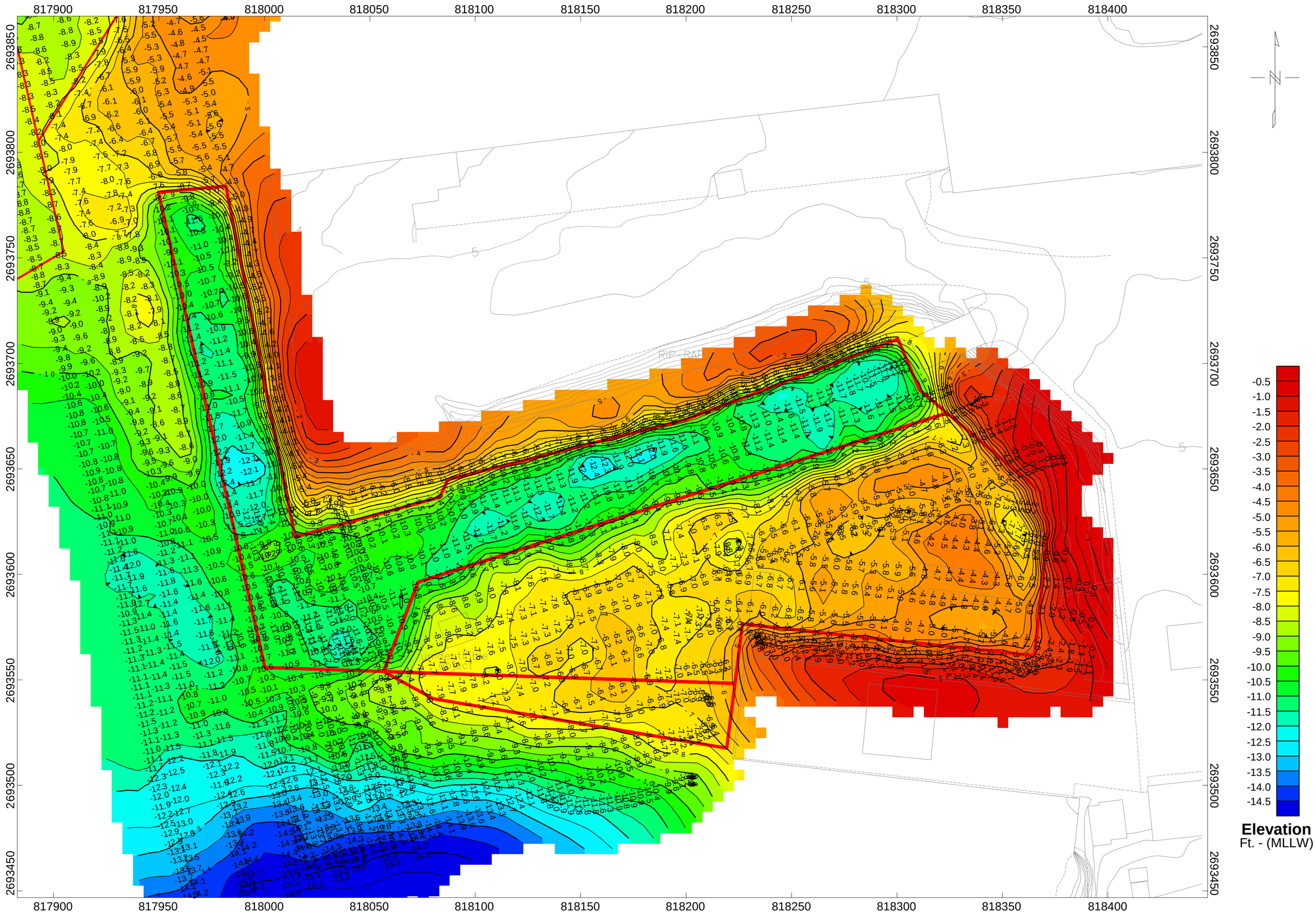
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Linberg Marine
Linberg Marine Pre-Dredge Survey
Fairhaven, Massachusetts

September 26, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 23, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

US survey foot

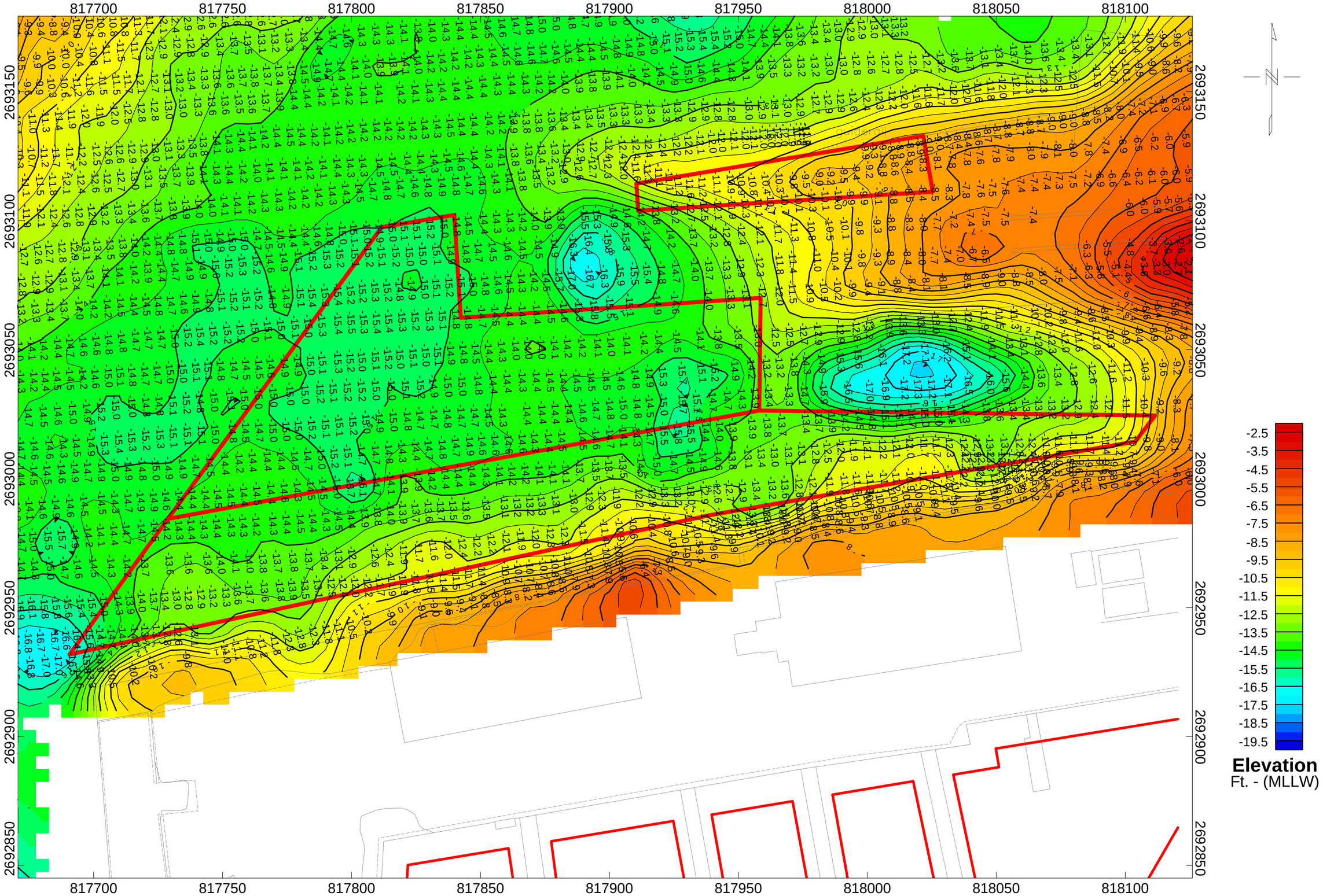
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Linberg Marine
Linberg Marine Post-Dredge Survey
Fairhaven, Massachusetts

October 23, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 28, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75

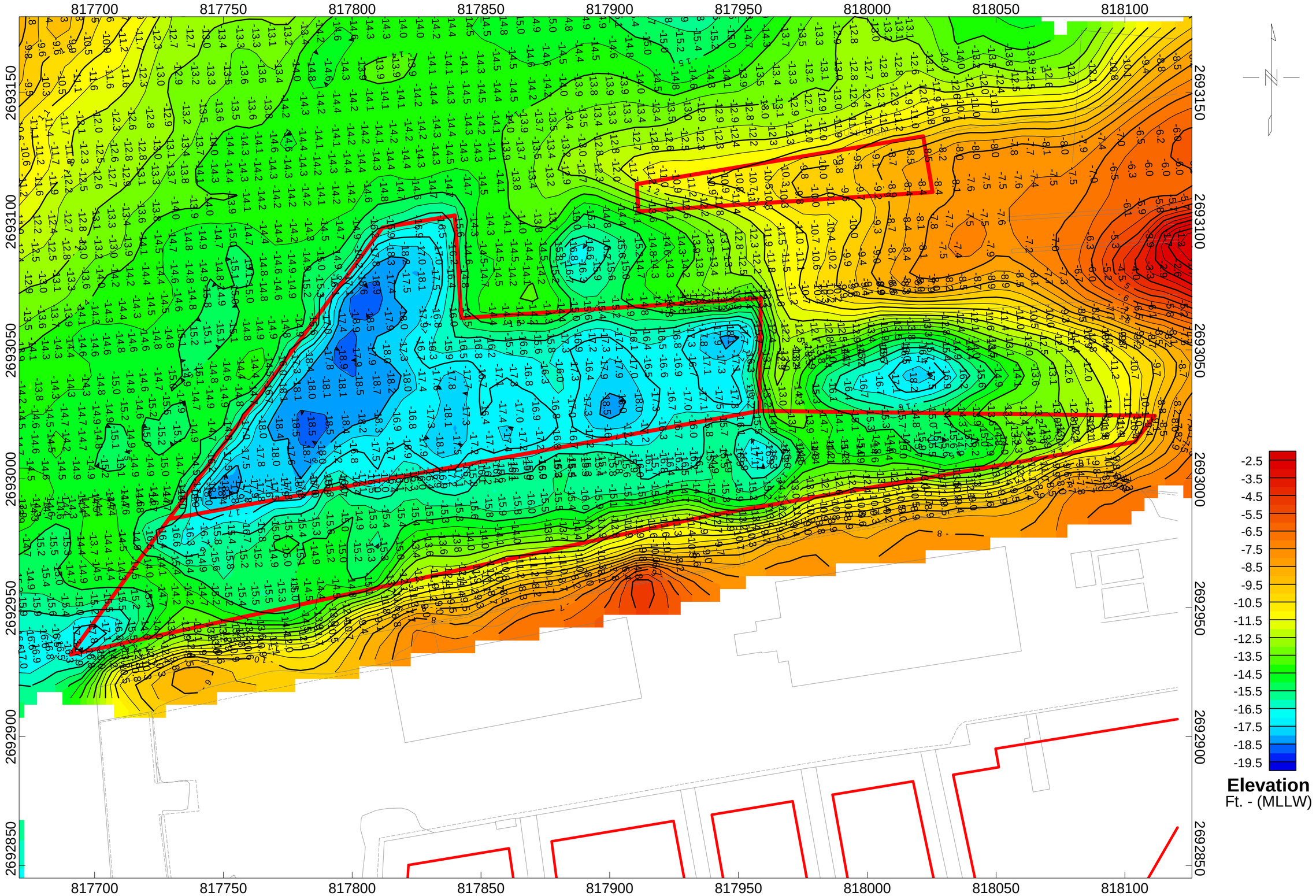
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K1 Dredge Area Pre-Dredge Survey
New Bedford, Massachusetts

September 28, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 10, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75

US survey foot

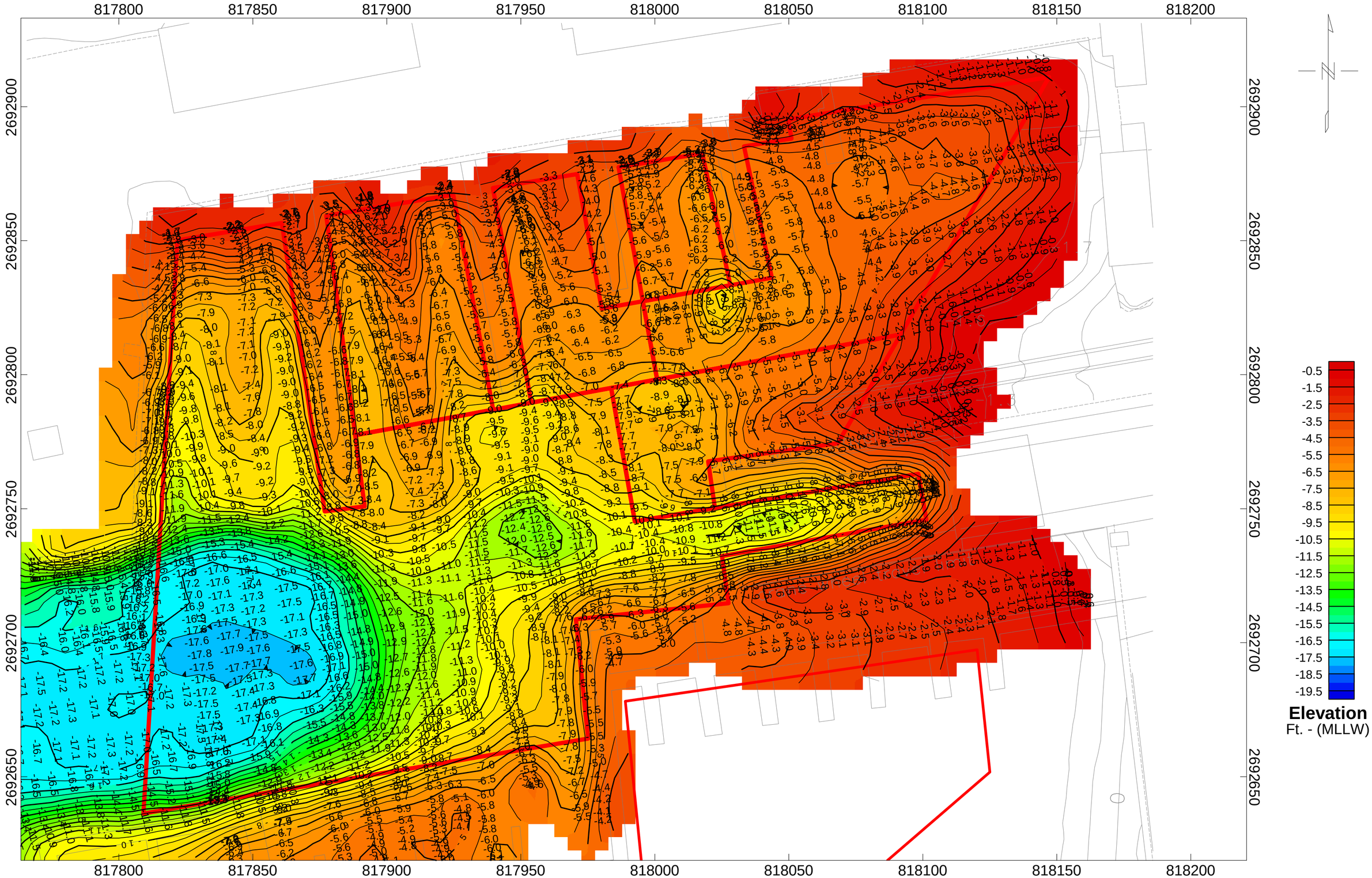
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K1 Dredge Area Post-Dredge Survey
New Bedford, Massachusetts

October 10, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 11, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75

US survey foot

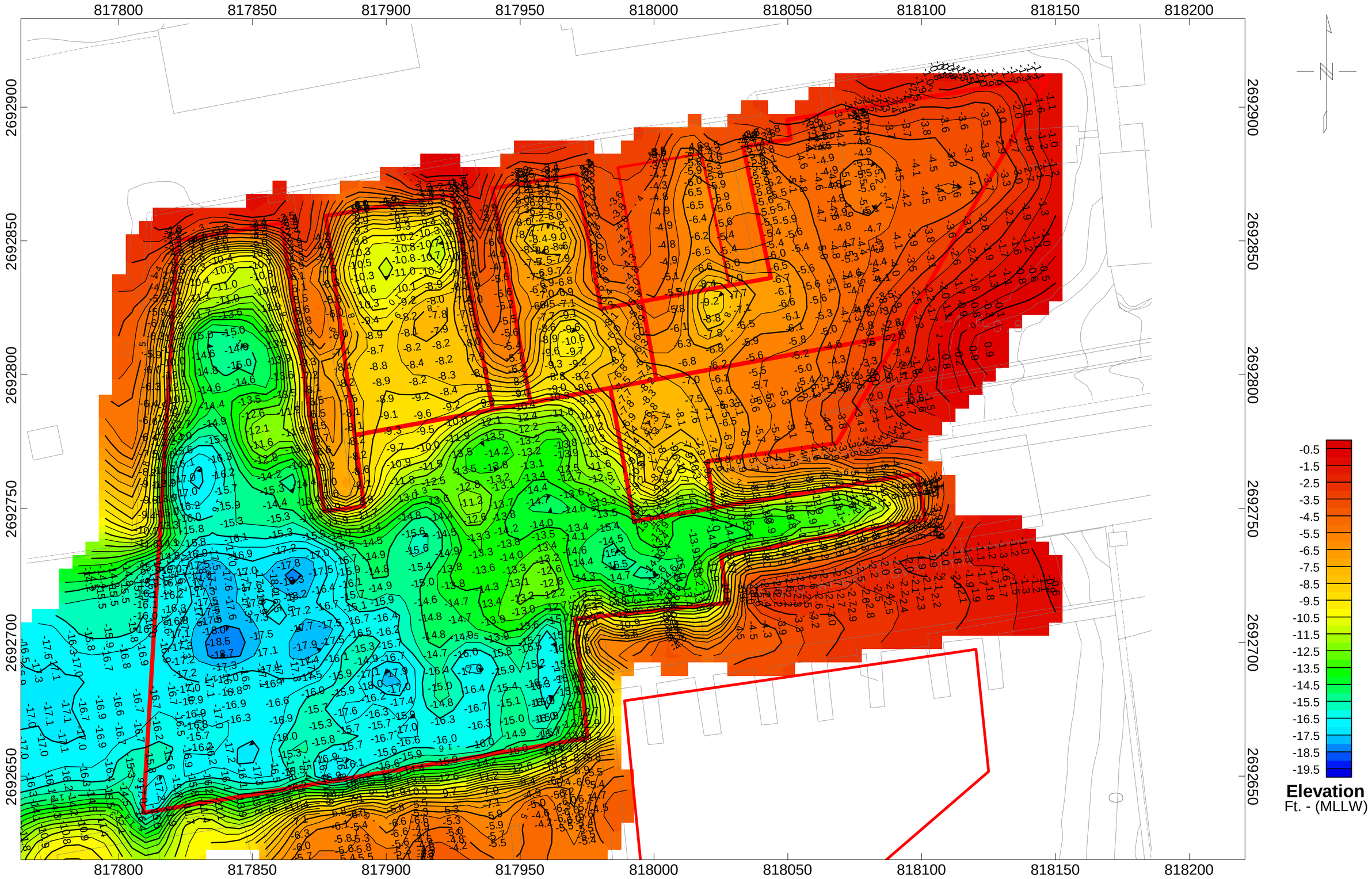
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K3, K4, K5 Dredge Areas Pre-Dredge Survey
New Bedford, Massachusetts

October 11, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 22, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75

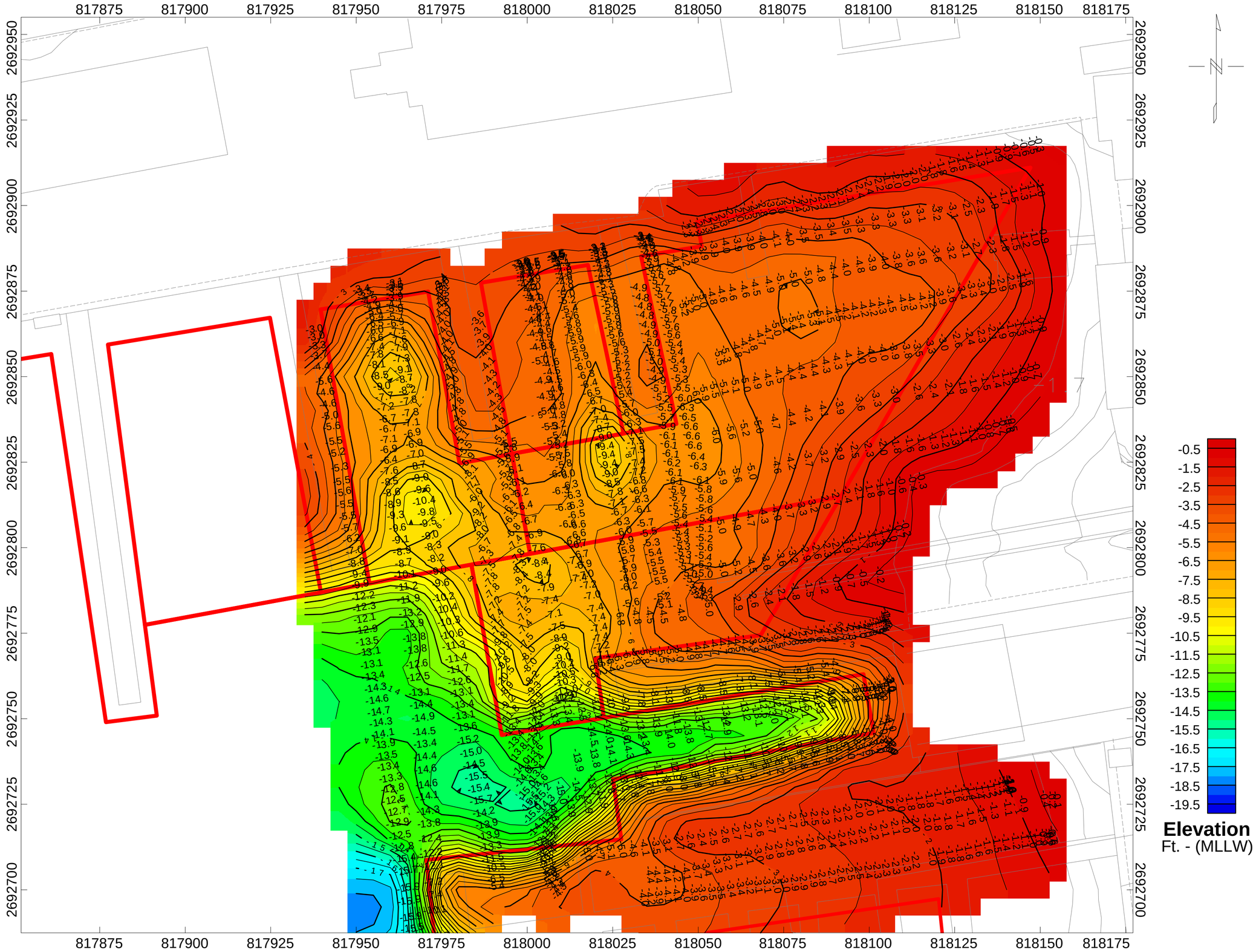
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K3, K4, K5 Dredge Areas Post-Dredge Survey
New Bedford, Massachusetts

October 22, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON DECEMBER 19, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:360

25 0 25 50

US survey foot

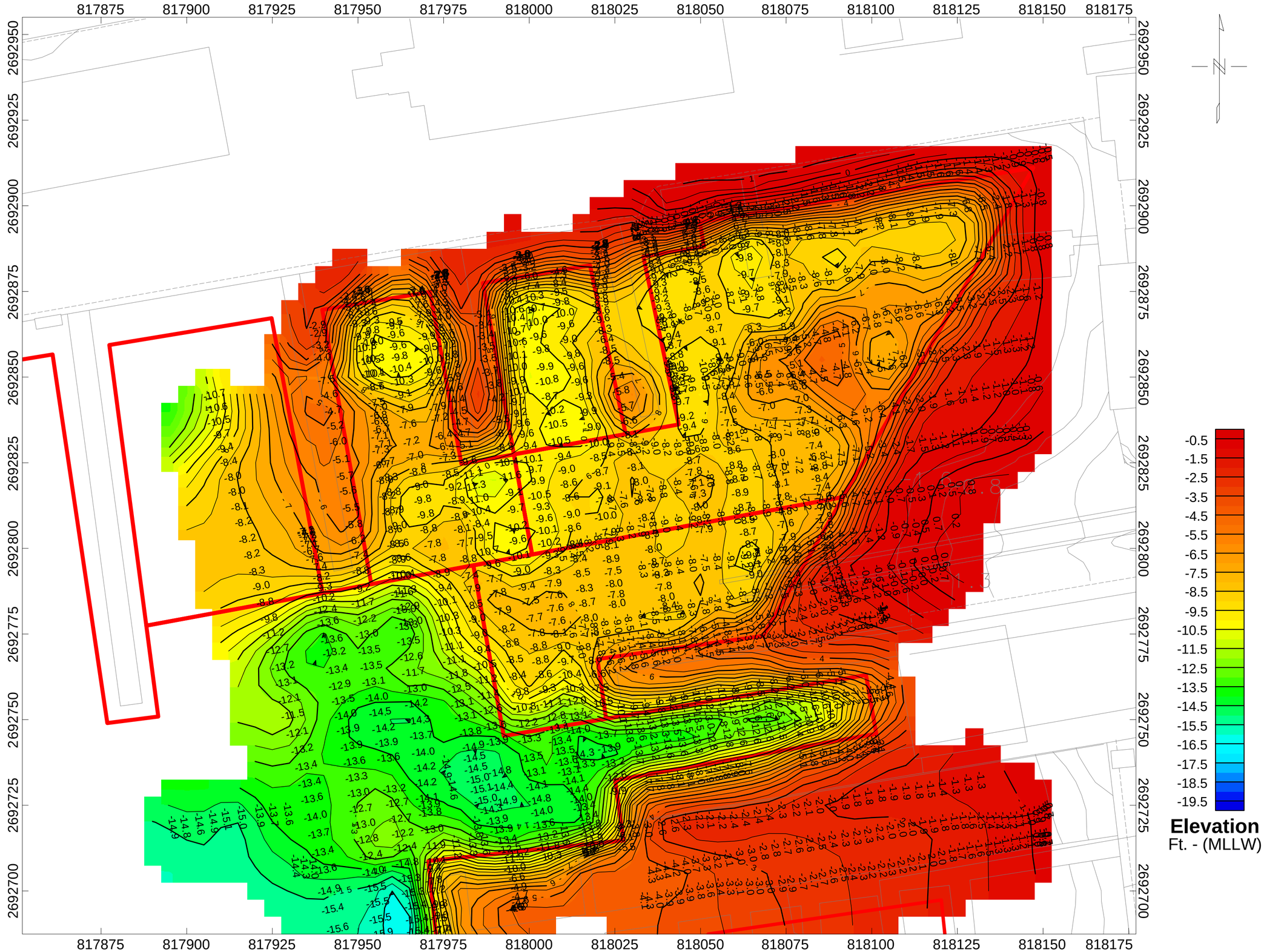
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K4 and K5 Dredge Areas Pre-Dredge Survey
New Bedford, Massachusetts

December 19, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON JANUARY 19, 2006.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:360

25 0 25 50

US survey foot

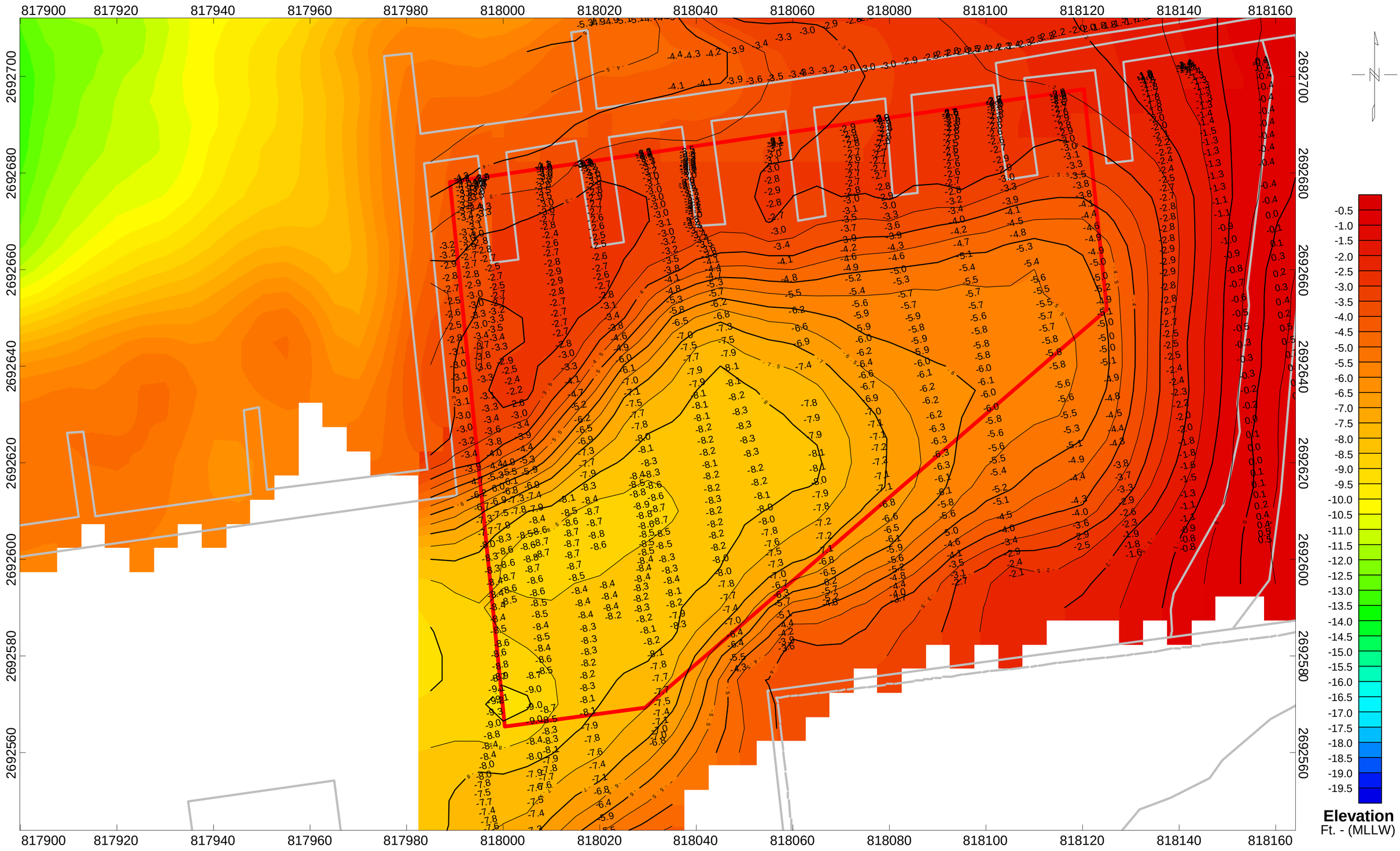
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K4 and K5 Dredge Areas Post-Dredge Survey
New Bedford, Massachusetts

January 19, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON DECEMBER 16, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40 50

US survey foot

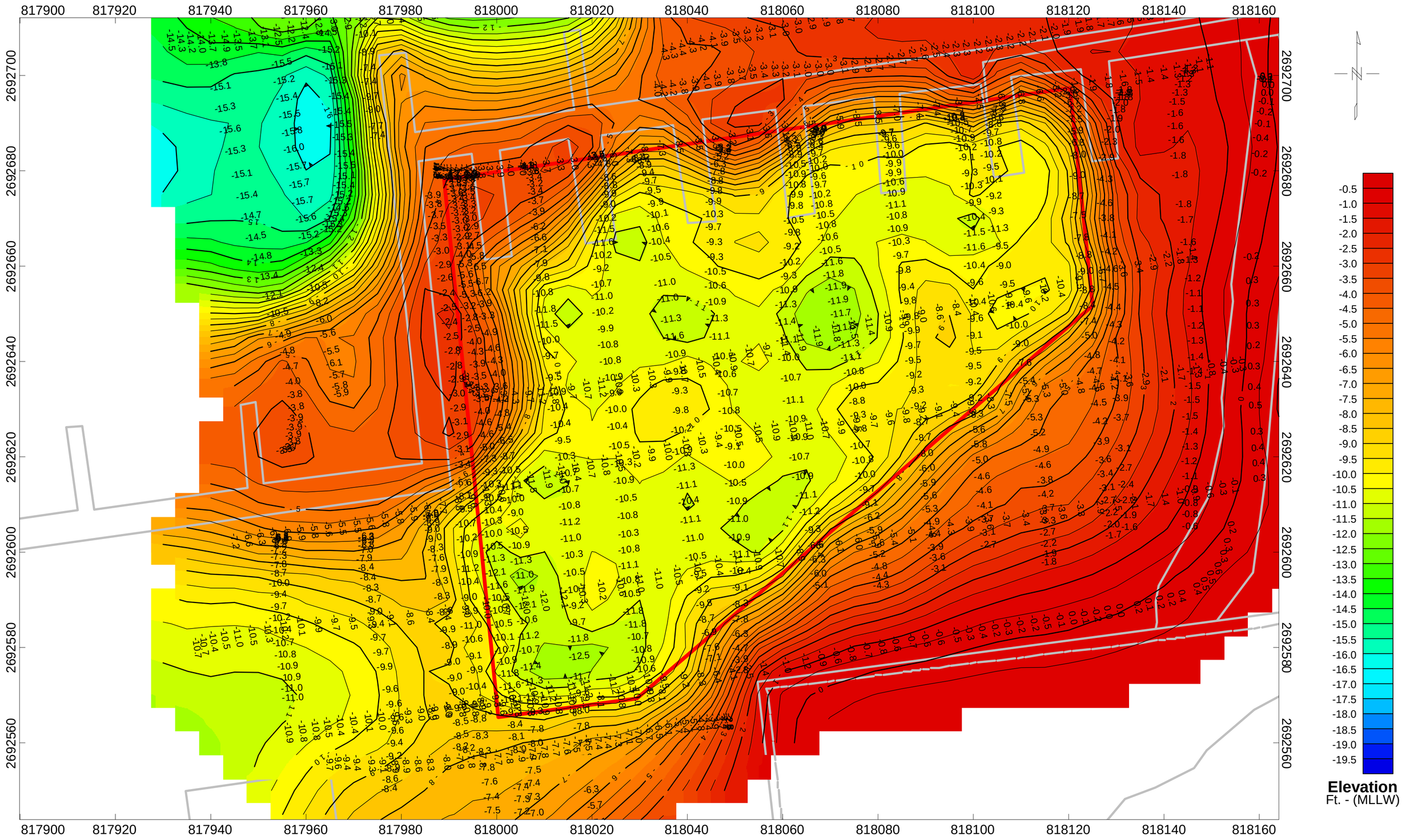
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K6 Pre-Dredge Survey
Fairhaven, Massachusetts

December 16, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON JANUARY 17, 2006.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40 50

US survey foot

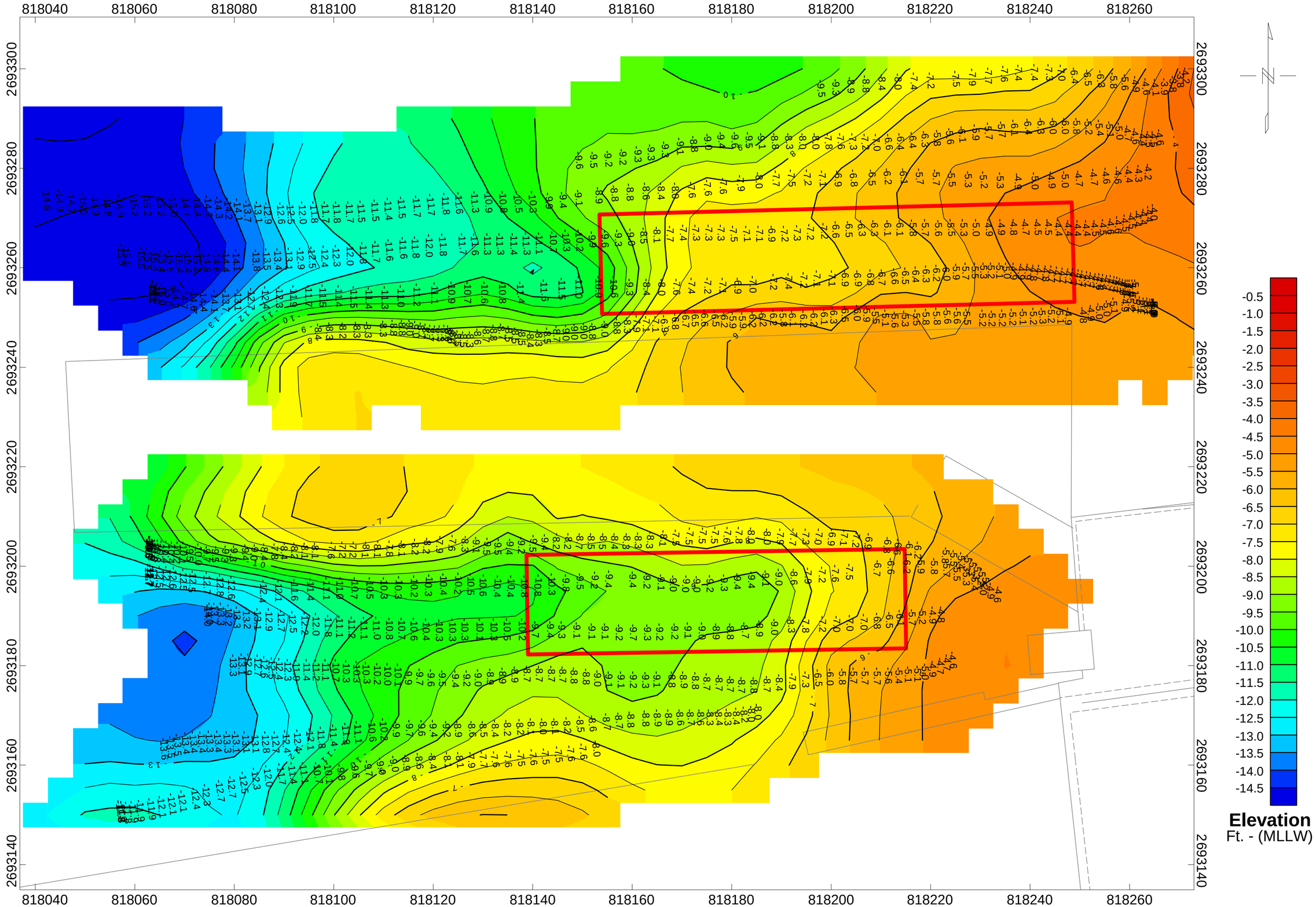
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

D.N. Kelley and Sons Shipyard
K6 Post-Dredge Survey
Fairhaven, Massachusetts

January 17, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON DECEMBER 19, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40

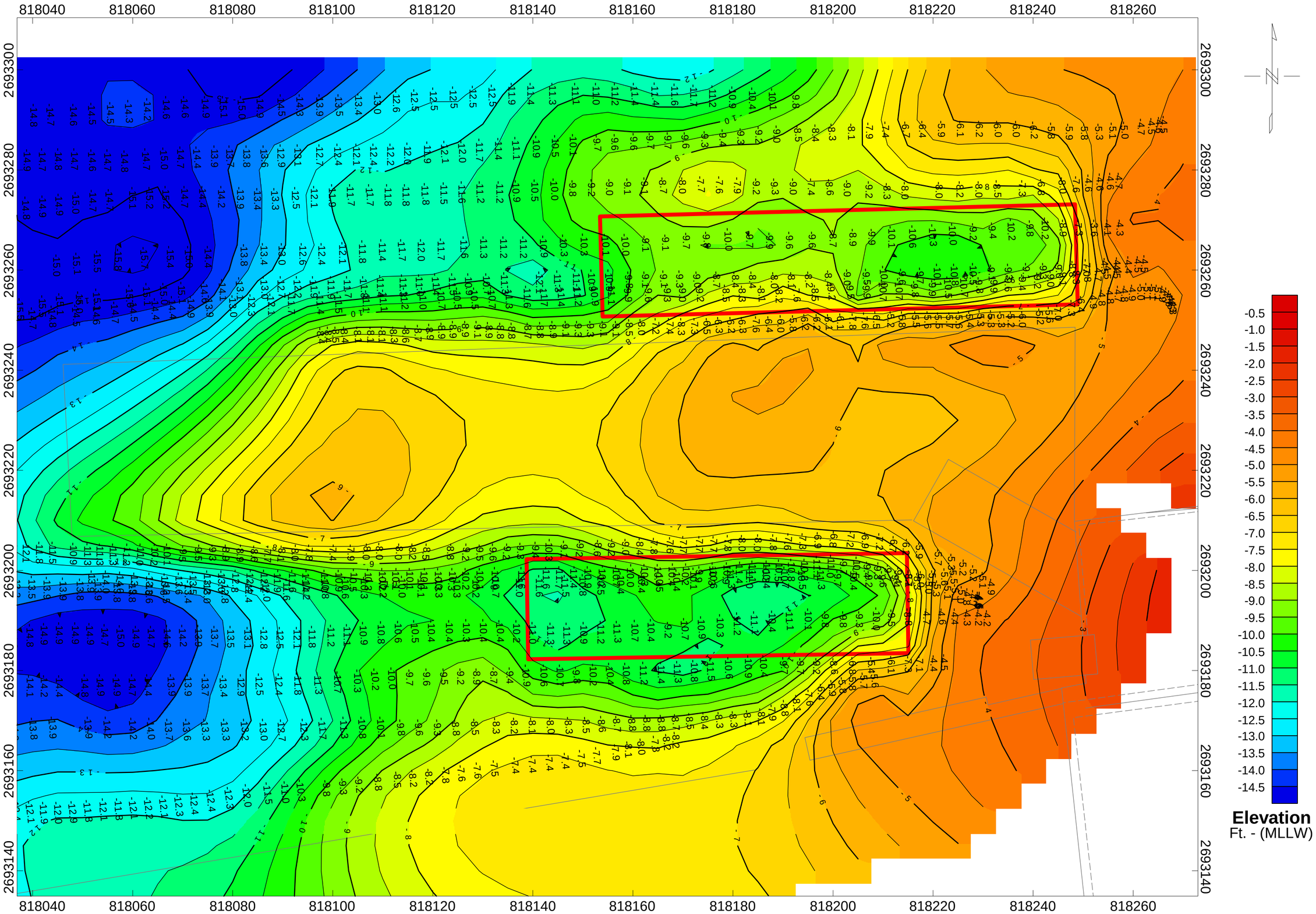
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

Alexander Property - Atlantic Shellfish, Inc.
Alexander Property Pre-Dredge Survey
Fairhaven, Massachusetts

December 19, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON JANUARY 19, 2006.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40

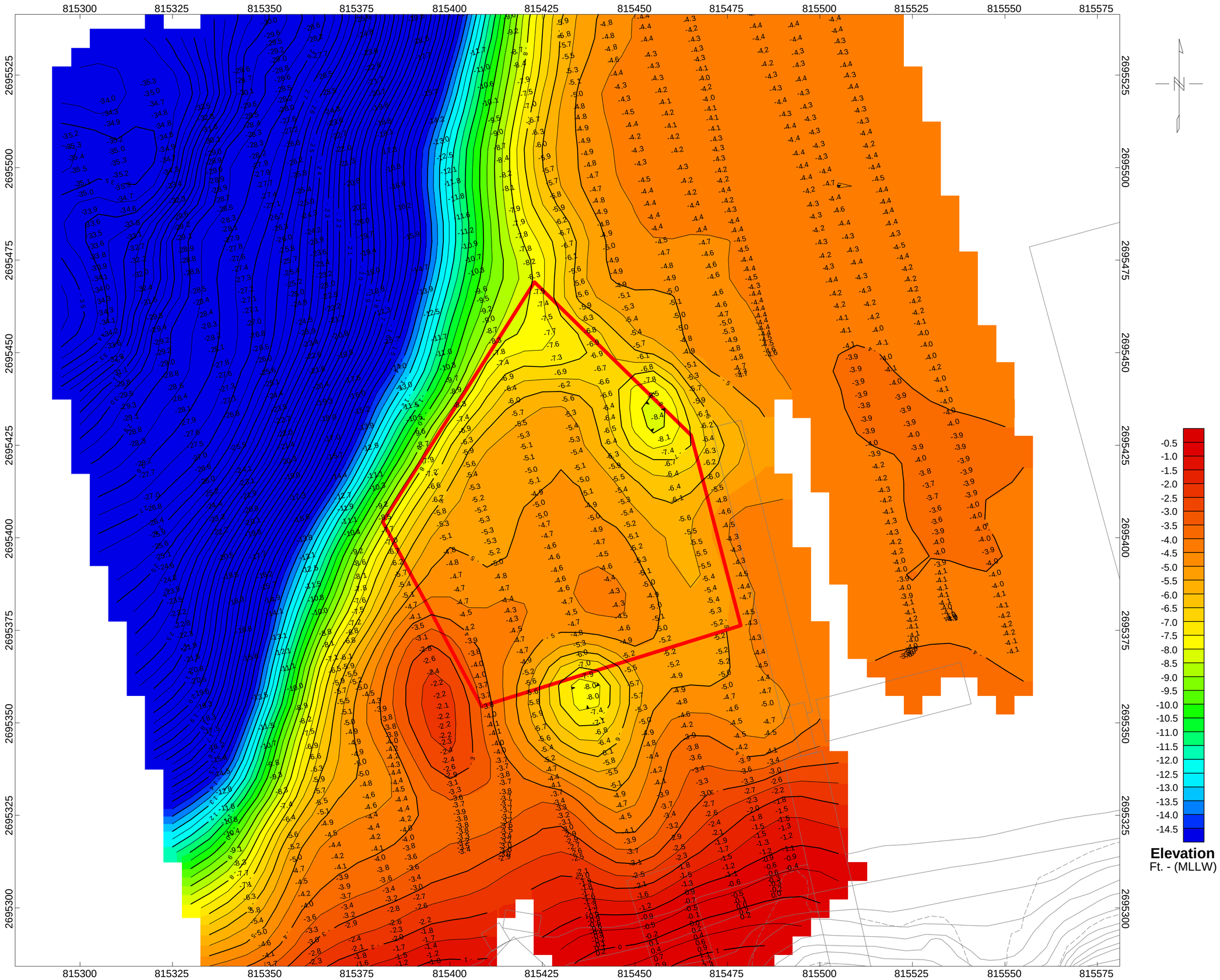
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

Alexander Property - Atlantic Shellfish, Inc.
Alexander Property Post-Dredge Survey
Fairhaven, Massachusetts

January 19, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 20, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40 50

US survey foot

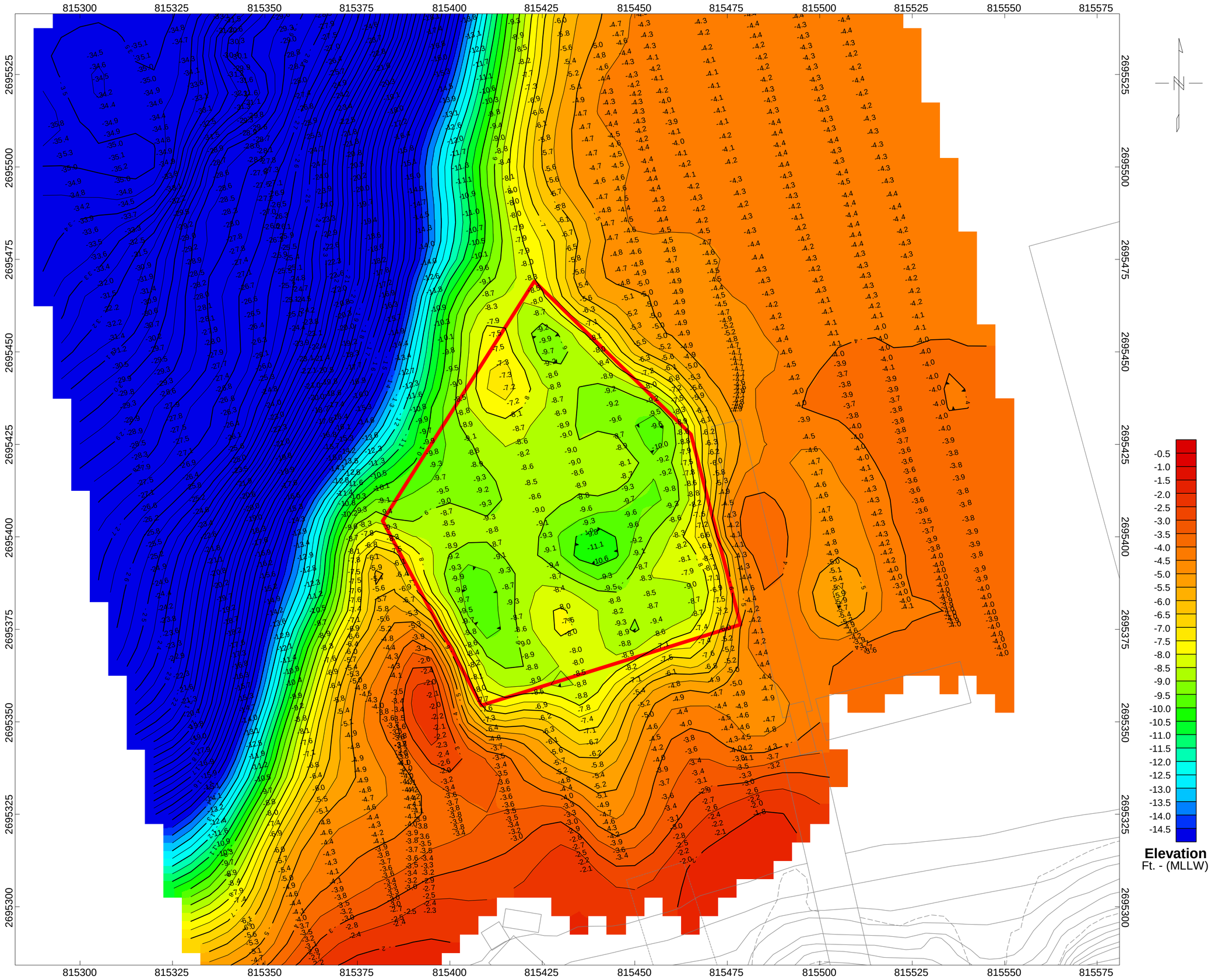
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Niemiec Marine - Pope's Island
Niemiec Marine Pre-Dredge Survey
Fairhaven, Massachusetts

October 20, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 31, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40 50

US survey foot

Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Niemiec Marine - Pope's Island
Niemiec Marine Post-Dredge Survey
Fairhaven, Massachusetts

October 31, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.

Pre-Dredge Sediment Chemistry Data

TABLE 1-1

NEW BEDFORD HARBOR - NORTH TERMINAL DREDGE PROJECT
Summary of Sediment Chemistry Data

Sample ID	Sample Interval (ft)	Total PCBs (ppm)	Metals (ppm)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	TPH (ppm)	EPH	PCB Arochlors (ppm)	Total PAH (ppm)**	Volatile Organics (ppb)**	TOC (%ppm)	Reactive Sulfide (ppm)	TPH Fingerprint	Pesticides	PAHs (ppb)	Napthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)pcrylene	% moisture	Rx sulf	TOC 1	TOC 2
M201-1	0-1	35																																									
M201-2	1-2	29																																									
M201-3	2-3	1.3*																																									
M202-1	0-2	77																																									
M202-2	2-4	4.7*																																									
M203-1	0-1	27		13	5	360	750	260	0.8	40	2.5	540		910									U	U	U	U	U	U	U	1.7	2.2	U	U	U	U	U	U	U	U	65.7	25	3	3.4
M203-2	1-2	71		15	8	770	1600	370	1.2	66	2.9	740		1920									U	U	U	U	U	U	U	2.1	2.6	U	U	1.4	U	U	U	U	U	63.1	25	5	5.7
M203-3	2-3	52																																									
M203-4	3-4	0.5*																																									
M203-5	4-4.5	0.5*																																									
M204-1	0-1	32																																									
M204-2	1-2.5	59																																									
M204-3	2.5-3.5	0.5*																																									
M205-1	0-2	32																																									
M205-2	2-3	43																																									
M205-3	3-4	74																																									
M205-4	4-	43																																									
M206-1	0-1	18.72*																																									
M206-2	1-2	9.62*																																									
M206-3	2-3	0.5*																																									
M206-4	3-4	0.5*																																									
M206-5	4-5	0.5*																																									
M206-6	5-5.5	0.5*																																									
M207-1	0-1	6.73*																																									
M207-2	1-2	15.52*																																									
M207-3	2-3.2	66																																									
M207-4	3.2-4.2	0.5*																																									
M207-5	4.2-5.1	0.5*																																									
M207-6	5.1-6.1	0.5*																																									
M208-1	0-1	8.0*																																									
M208-2	1-2	37																																									
M208-3	2-3	61																																									
M208-4	3-5.4	2.5*																																									
M208-5	5.4-6	0.5*																																									
M209-1	0-1	0.5*																																									
M209-2	1-2	53																																									
M209-3	2-3	70																																									
M209-4	3-4	2.8*																																									
M209-5	4-4.8	0.5*																																									
M210-1	0-1	7.1*																																									
M210-2	1-2	44																																									
M210-3	2-3	81																																									
M210-4	3-4	49		14	3	270	900	290	2.3	31	2.4	500		1560									U	U	U	U	U	1.3	U	2.3	2.9	U	1.3	1.3	U	U	U	U	U	58.7	25	3	3.5
M211-1	0-1	41																																									
M211-2	1-2	54																																									
M211-3	2-3.2	0.5*																																									
M211-4	3.2-4.1	0.5*																																									
M211-5	4.1-5.1	0.5*																																									
M211-6	5.1-6.3	0.5*																																									
M211-7	6.3-	0.5*																																									
M212-1	0-1	41												1070									U	U	U	U	U	U	U	U	1.5	U	U	U	U	U	U	U	U				
M212-2	1-2	75																																									

TABLE 1-1

NEW BEDFORD HARBOR - NORTH TERMINAL DREDGE PROJECT
Summary of Sediment Chemistry Data

Sample ID	Sample Interval (ft)	Total PCBs (ppm)	Metals (ppm)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	TPH (ppm)	EPH	PCB Arochlors (ppm)	Total PAH (ppm)**	Volatile Organics (ppb)**	TOC (%ppm)	Reactive Sulfide (ppm)	TPH Fingerprint	Pesticides	PAHs (ppb)	Napthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)pcrylene	% moisture	Rx sulf	TOC 1	TOC 2
M212-3	2-3	24																																									
M212-4	3-4	0.5*																																									
M212-5	4-4.8	0.5*																																									
M212-6	4.8-5.4	0.5*																																									
M212-7	5.4-6	0.5*																																									
M212-8	6-7	0.5*																																									
M213-1	0-1	7.6*																																									
M213-2	1-2	41																																									
M213-3	3-4	7.5*																																									
M213-4	4-4.7	5.2*																																									
M213-5	4.7-6.5	0.5*																																									
M214-1	0-1.3	3.2*																																									
M216-1	0-1	43		10	9	510	850	210	0.7	37	1.5	420		1200									U	U	U	U	U	U	U	1.1	1.6	U	U	U	U	U	U	U	U	50.9	25	4	3.9
M216-2	1-2.5	25		7	3	240	610	180	0.7	22	1.1	280		625									U	U	U	U	U	U	U	U	1.2	U	U	U	U	U	U	U	U	42.7	25	4	3.5
M216-3	2.5-3.3	0.5*																																									
M216-4	3.3-4.2	0.5*																																									
M217-1	0-1	9.2*																																									
M217-2	1-2	36																																									
M217-3	2-3	0.9*																																									
M217-4	3-4.5	0.5*																																									
M217-5	4.5-6.9	0.5*																																									
M218-1	0-1	3.4*																																									
M218-2	1-2.2	0.57*																																									
M219-1	0-1	46																																									
M219-2	1-2	0.5*																																									
M219-3	2-3	1.3*																																									
M219-4	0-1	0.03*																																									
M220-1	0-1	6.4*																																									
M221-1	1-2.2	28																																									
M221-2	0-1	7.1*																																									
M222-1	1-2.6	24		14	5	360	740	310	0.9	39	2.3	630		1070									U	U	U	U	U	1.7	U	6.8	6.4	1.7	1.8	2	U	U	U	U	U	63.4	25	4	3.4
M222-2	2.6-3	39																																									
M222-3	3-3.6	5.17*																																									
M222-4	0-1	0.81*																																									
M223-1	1-2	23																																									
M223-2	2-3	63																																									
M223-3	3-4.5	68																																									
M223-4	4.5-5.5	1.30																																									
M223-5	0-1	0.5*																																									
M224-1		0.5*		7	0	51	35	32	0	21	1.5	73		U									U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	55.5	25	4	4.1
M-401-1	0 - 1	4.7*																																									
M 401-2	1 - 1.8	8.9*																																									
M402-1	0 - 1	4.4*																																									
M402-2	1 - 1.8	9.8*																																									
M402-3	1.8 - 3	1.7*																																									
M403-1	0 - 1	5.2*																																									
M403-2	1 - 1.9	8.1*																																									
M404-1	0 - 1	4.9*																																									
M404-2	1 - 2	3.8*																																									
M404-3	2 - 3	6.7*																																									
M404-4	3 - 4	0.46*																																									
M405-1	0 - 1.2	4.7*																																									

TABLE 1-1

NEW BEDFORD HARBOR - NORTH TERMINAL DREDGE PROJECT
Summary of Sediment Chemistry Data

Sample ID	Sample Interval (ft)	Total PCBs (ppm)	Metals (ppm)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	TPH (ppm)	EPH	PCB Arochlors (ppm)	Total PAH (ppm)**	Volatile Organics (ppb)**	TOC (%ppm)	Reactive Sulfide (ppm)	TPH Fingerprint	Pesticides	PAHs (ppb)	Napthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)pcrylene	% moisture	Rx sulf	TOC 1	TOC 2
M406-1	0 - 1.4	4.1*																																									
M406-2	1.4 - 2.4	2.5*																																									
M407-1	0 - 1	4.8*																																									
M407-2	1 - 2	4.2*																																									
M407-3	2 - 2.9	6.1*																																									
M408-1	0 - 1	3.5*																																									
M408-2	1 - 2	6.2*																																									
M408-3	2 - 3	6.3*																																									
M409-1	0 - 1	4.5*																																									
M409-2	1 - 2	6.9*																																									
M410-1	0 - 1	4.4*																																									
M410-2	1 - 2	7.2*																																									
M410-3	2 - 3	5.5*																																									
M411-1	0 - 0.8	9.2*																																									
M411-2	0.8 - 1.6	0.71*																																									
M412-1	0 - 1	6.1*																																									
M412-2	1 - 2	0.55*																																									
M413-1	0 - 1	5*																																									
M413-2	1 - 2	7.9*																																									
M414-1	0 - 1	4.2*																																									
M414-2	1 - 2.3	4.4*																																									
M414-3	2.3 - 3.1	0.44*																																									
M415-1	0 - 1.5	6.1*																																									
M416-1	0 - 0.9	6.1*																																									
M417-1	0 - 1.3	5.9*																																									
2000-1	0 - 1'	13.96		10	3	230	520	190	0.5	29		410		1540		250	41		29	U	U	U	U	U	U	U	U	1600	U	2200	3300	1300	1400	1800	U	2100	1700	1700	U				
1001-2	1' - 2'	0.00																																									
2001-1	0 - 1'	15.42		12	6	350	660	230	0.6	37		540		1970		330	39		U	U	U	U	U	U	U	U	U	2100	1400	7800	8300	3400	2900	2700	1600	2900	2600	2600	1900				
1002-2	1' - 2'	0.00																																									
2002-1	0 - 1'	10.48		8	3	220	380	180	0.4	21		390		1540		240	0		U	U	U	U	U	U	U	U	U	1000	1000	2100	4200	1400	1500	1400	1400	2100	1600	1600	1100				
FI-A	0 - 4' (c)	38.0		10	6	410	970	240	1	32		500	5500							U	U	U	300	250	210	140	220	1000	580	2500	3000	1600	1700	2000	690	1800	1100	160	1000				
FI-B	0 - 5' (c)	23.14		8	4	270	730	190	1.4	27		360	2900							U	U	U	260	210	210	180	200	1100	630	2600	2800	1500	1700	2000	660	1700	1000	160	950				
LH-A	0 - 2' (c)	22.70		8	4	210	480	140	1.1	22		300	3900							U	U	U	200	150	170	78	120	630	400	1400	2000	1000	1100	1400	500	1300	790	140	760				
LH-A	2 - 4' (c)	11.86		10	4	250	590	140	0.9	21		290	2400							U	U	U	180	150	140	80	110	550	380	1300	1600	860	880	1000	310	1000	610	100	580				
LH-A(B)	4 - 6.5' (c	15.99		9	2	180	610	160	1.6	18		310	3600							U	U	U	310	230	220	120	190	890	550	2200	2600	1400	1500	1700	112	337	940	180	900				
S-217	0 - 1'														18																												
	1 - 2'														50																												
	2 - 3'														72																												
S-3201	0 - 1'														18																												
	1 - 2'														18																												
	2 - 3'														47																												
	3 - 4'														46																												
S-3221	0 - 1'														17																												
	1 - 2'														16																												
	2 - 3'														33																												
	3 - 4'														41																												
	4 - 5'														19																												
S-201616	0 - 1'														12																												
S-207818	0 - 1'														28																												
AE 852	0 - 0.5'														1.2																												
E 853/MAC 6	0 - 0.5'					290	541	141							4.8																												
AE 854	0 - 0.5'														6.7																												

TABLE 1-1

NEW BEDFORD HARBOR - NORTH TERMINAL DREDGE PROJECT
Summary of Sediment Chemistry Data

Sample ID	Sample Interval (ft)	Total PCBs (ppm)	Metals (ppm)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	TPH (ppm)	EPH	PCB Arochlors (ppm)	Total PAH (ppm)**	Volatile Organics (ppb)**	TOC (%ppm)	Reactive Sulfide (ppm)	TPH Fingerprint	Pesticides	PAHs (ppb)	Napthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)pcrylene	% moisture	Rx sulf	TOC 1	TOC 2
AE825/826	0 - 0.5'														22.7																													
AF 806	0.5 - 1'														59																													
F 113/MAC 6	0 - 0.5'					271	497	179							3.6																													
F 119/MAC 6	0 - 0.5'				5	322	608	147							3.1																													
AF 170	0 - 0.5'														5.2																													
AF 300	0 - 0.5'														29																													
AF 315	0 - 0.5'														2.6																													
AF 393	0 - 0.5'														1.4																													
F 398/MAC 6	0 - 0.5'				11	567	1010	345							6.2																													
AF 399	0 - 0.5'														3.6																													
1020-2	1' - 3'										360				0.00																													
AF 815	0.5 - 1'														7																													
AF 400	1 - 1.5"														6.2																													
AE 851	2 - 3'														1.3																													
MAC 686	0 - 0.5'					353	662	190																																				
MAC 687	1 - 2'					255	497	118																																				
MAC 690	0 - 0.5'					420	737	272																																				
MAC 670	0 - 0.5'				5	269	531	99																																				

Notes:

1. M200 and M400 series explorations were performed by Apex, Environmental in October 2002 and April 2003 for the North Terr
   indicates PCB testing was performed by the EPA at the superfund on-site laboratory. Other chemical analyses was performed by a commercial laboratory.
2. M2000 series explorations were performed by Apex Environmental in November 2001 for the North Terminal dredge project.
3. FI and LH-series samples were collected and analyzed in conjunction with the New Bedford/Fairhaven EIR,

for the Massachusetts Dredged Material Management Plan.

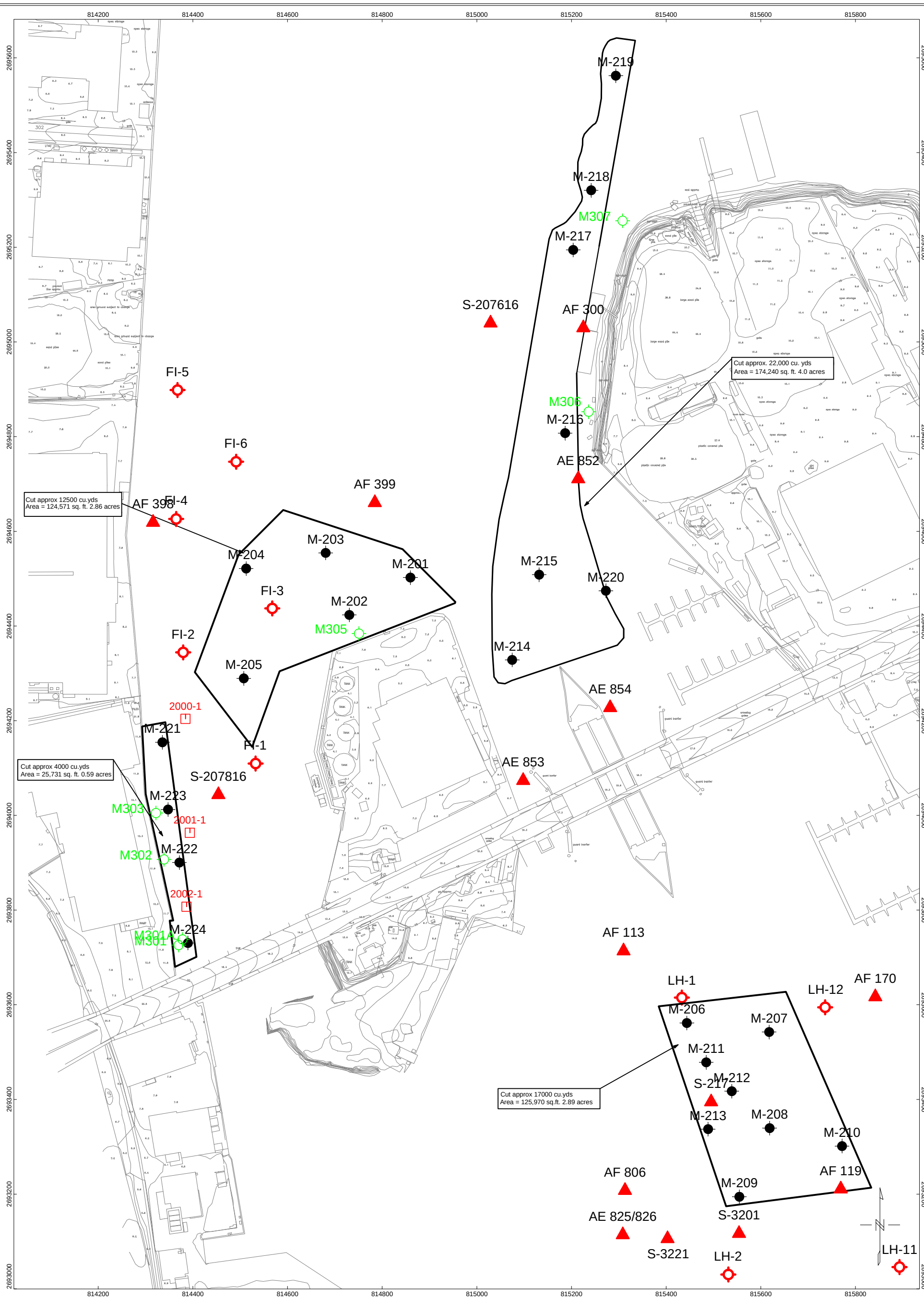
All samples tested are composites as follows:

FI-A is a composite of FI-1 0-3.5' + FI-2 0-4' + FI-3 0-3.5'
FI-B is a composite of FI-4 0-5' + FI-5 0-3' + FI-6 0-4'
LH-A(0-2) is a composite of LH-1 0-2' + LH-2 0-2' + LH-11 0-2' + LH-12 0-2'
LH-A(2-4) is a composite of LH-1 2-4' + LH-2 2-4.5' + LH-11 2-4' + LH-12 2-4'
LH-A(B) is a composite of LH-11 4-4.5' + LH-12 4-6.5'

4. AF and MAC-series samples were collected and analyzed in conjunction with the FS of Remedial Alternatives

for the Estuary and Lower Harbor/Bay - NBH Superfund Project.

5. S series samples were collected and analyzed as part of the on-going NBH Superfund Project.
6. Total PCBs (ppm) are reported as the sum of Homologues for Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268.
7. U indicates the analyte was analyzed for but not detected at the sample specific level reported.



LEGEND

- NORTH TERMINAL DREDGE PROJECT SAMPLE LOCATION
- SUPERFUND SAMPLE LOCATION
- DMMP SAMPLE LOCATION
- TEST BORING LOCATION NORTH TERMINAL DREDGE PROJECT

50 0 50 100 150 200 250 300
US Survey Feet

Figure 1-3: Existing Sampling Locations
Proposed Dredge Areas

New Bedford Harbor Dredge - Phase II/North Terminal Dredge Areas

New Bedford Harbor
Massachusetts
Harbor Development Commission

Apex Environmental, Inc.

New Bedford Harbor Dredge - Phase II (Task 2)

Fairhaven Dredge Sediment Sampling - Chemistry Results

Analysis	Units	202-1	203-1	204-1	206-1	208-1	210-1	212B-1	212B-5	213A-1	213A-2	213B-1	216-1	216-2	220-1	221-1	224B-1	225B-1	225B-2	227B-1	229-1	
Aroclors*	mg/Kg-dry	0.216	2.56	ND	1.0	1.93	0.583	2.269	ND	1.787	0.738	2.943	1.594	ND	ND	1.172	1.147	ND	ND	8.16	0.336	2.20275
MA EPH																						
C19-C36 Aliphatics	mg/Kg-dry	ND	ND	ND	ND	ND	ND	ND	ND	292	ND	ND	ND	ND	ND	190	ND	ND	ND	ND	ND	
C11-C22 Aromatics	mg/Kg-dry	ND	ND	ND	ND	ND	ND	259	ND	ND	ND	ND	ND	ND	311	363	260	ND	ND	313	ND	
Unadjusted C11 - C22 Aromatics	mg/Kg-dry	ND	ND	ND	ND	209	ND	262	ND	ND	ND	ND	ND	ND	314	372	260	ND	ND	316	ND	
Acenaphthene	mg/Kg-dry	ND	ND	ND	ND	1.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Fluoranthene	mg/Kg-dry	ND	ND	ND	3.37	4.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.89	ND	ND	ND	ND	ND	
Pyrene	mg/Kg-dry	ND	ND	ND	3.21	4.87	ND	ND	ND	ND	2.26	ND	ND	ND	ND	2.39	ND	ND	ND	ND	ND	
Benzo(a)Anthracene	mg/Kg-dry	ND	ND	ND	1.84	2.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chrysene	mg/Kg-dry	ND	ND	ND	1.95	2.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.92	ND	ND	ND	ND	ND	
Benzo(b)Fluoranthene	mg/Kg-dry	ND	ND	ND	ND	4.68	ND	ND	ND	ND	1.74	ND	ND	ND	ND	1.7	ND	ND	ND	ND	ND	
Benzo(k)Fluoranthene	mg/Kg-dry	ND	ND	ND	2.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benzo(a)Pyrene	mg/Kg-dry	ND	ND	ND	ND	1.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Metals																						
Mercury	mg/Kg-dry	ND	0.685	0.47	1.09	1.02	0.558	1.46	ND	2.04	0.21	0.836	0.431	ND	0.525	6.37	0.382	0.13	ND	4.15	0.155	
Arsenic	mg/Kg-dry	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.68	ND	ND	ND	ND	ND	
Cadmium	mg/Kg-dry	ND	2.59	ND	1.93	6.07	1.77	1.87	ND	1.84	0.702	2.22	1.21	ND	ND	1.88	1.38	ND	ND	12.7	ND	
Chromium	mg/Kg-dry	12.4	201	28.9	90	323	88.8	131	2.55	108	30.6	138	80.9	10.3	25.5	67.8	46.1	19.7	7.82	384	29.9	
Copper	mg/Kg-dry	38.5	452	81.3	280	685	283	1220	2.59	333	67.8	677	213	10.8	298	621	198	8.28	3.02	1090	78	
Lead	mg/Kg-dry	24.5	133	90.6	188	198	97.6	203	ND	92.4	30.2	138	98.9	11.3	332	670	250	9.4	4.52	400	45.2	
Nickel	mg/Kg-dry	5.07	20.7	11.5	20.6	28.9	13.7	35	ND	21.7	4.97	48	30.8	11.0	13.6	14.9	28.5	10.1	ND	108	ND	
Zinc	mg/Kg-dry	37.4	280	91.4	586	386	294	731	5.12	273	51.3	520	265	26.0	132	533	827	28.2	12	1040	187	
Volatiles by GC/MS	µg/Kg-dry	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
TOC	mg/Kg-dry	3730	36700		29600	44900	27100	44600		23700		28800	12500		42000	78900	18500	37800	4990	69100	25600	
% Moisture	wt%	16.8	48.9	52.5	38.4	43.3	35.9	51.9	13.2	31.0	17.6	39.8	26.8	24.2	55.8	39.9	31.4	34.1	23.7	53.4	52	
Reactive Sulfide	mg/Kg-dry	ND	ND	ND	ND	ND	ND	ND	ND	positive	ND	positive	ND	ND	ND	ND	positive	ND	ND	ND	ND	

* Analysis SW8082: Summation of Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260.

Figure 3

SAMPLING LOCATION MAP
FAIRHAVEN DREDGE AREAS

JOB # 6542.006
DATE: June, 2005
FIGURE 1 of 1

New Bedford Harbor
Fairhaven, MA

1" = 50 '
Scale 1:600
US survey foot

REVISIONS	DATE	BY

6542.006-1.DWG

11/7/2006

OU#3 Pilot Capping - Sediment Sampling

Analysis	Units	PC01-1	PC02-1	PC03-1	PC04B-1	PC05-1	PC06-1	PC07-1	PC08-1	PC09-1	PC10C-1	PC11-1	PC12-1	PC13-1	PC14-1	PC15-1	PC16-1	PC17-1	PC18-1	PC19-1	PC20-1	PC21-1	PC22-1
	Depth (in.)	0-12	0-8	0-13	3-12	0-4	0-11	0-10	0-7	0-8	2-14	3-11	0-5	0-11	0-12	0-9	0-5	0-8	0-6	0-8	0-6	0-8	0-7
PCB Congenors	ppb	6184	12299	18619	28	1017	22491	4977	10836	15274	56	146	1246	9988	11691	10403	7123	7696	4462	4276	6742	4831	2800
PCB Congenors	ppm	6.18	12.30	18.62	0.03	1.02	22.49	4.98	10.84	15.27	0.06	0.15	1.25	9.99	11.69	10.40	7.12	7.70	4.46	4.28	6.74	4.83	2.80
Site Specific Correction Factor	multiplier	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Site Correction Factor Adjusted Concentration	ppm	16.1	32.0	48.4	0.1	2.6	58.5	12.9	28.2	39.7	0.1	0.4	3.2	26.0	30.4	27.0	18.5	20.0	11.6	11.1	17.5	12.6	7.3

* PCB Congeners by SW-846 8082. Results are preliminary and not final.
Yellow represents PCB homologue sample analyzed.

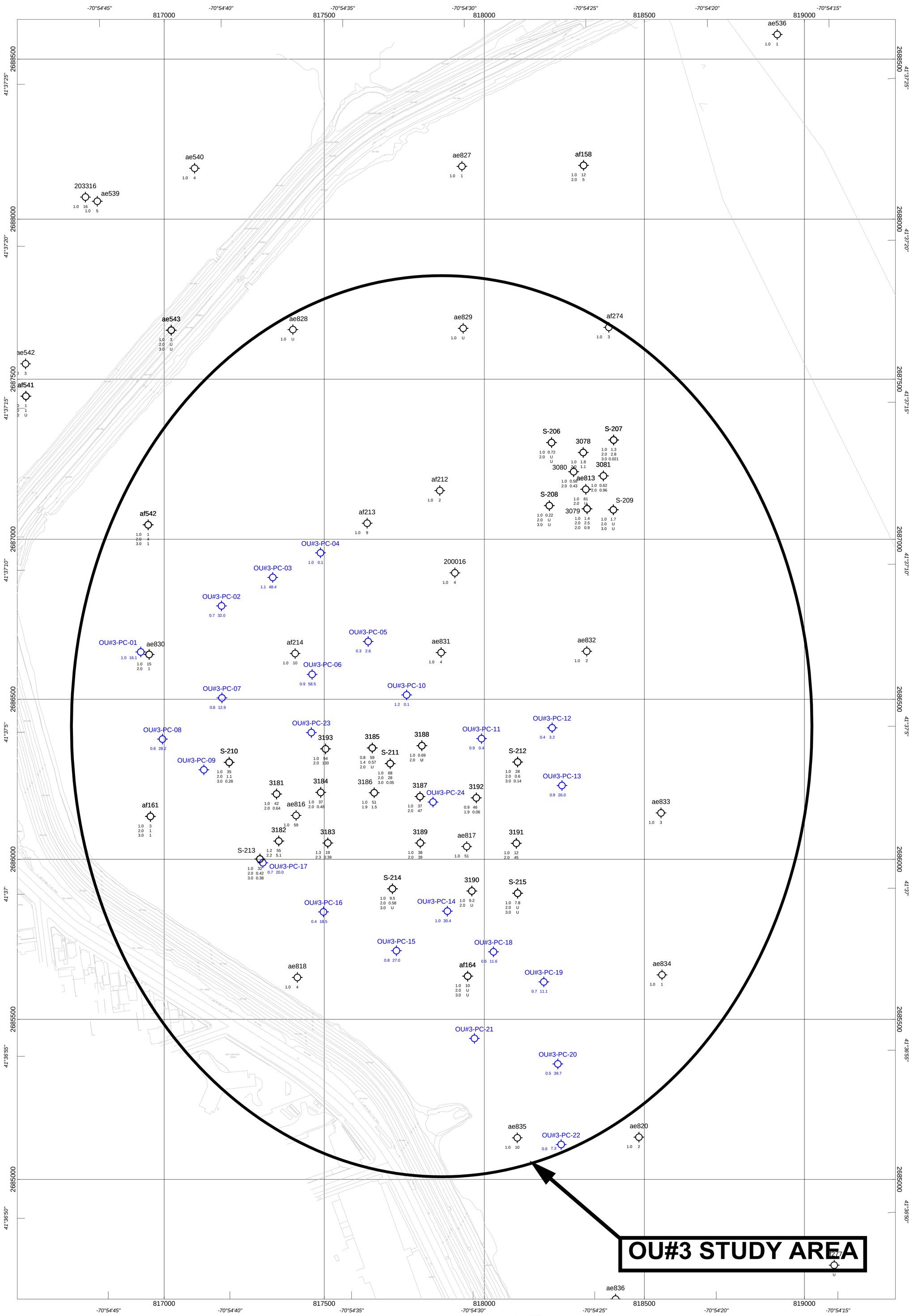
PCB Congener		PC01-1	PC02-1	PC03-1	PC04B-1	PC05-1	PC06-1	PC07-1	PC08-1	PC09-1	PC10C-1	PC11-1	PC12-1	PC13-1	PC14-1	PC15-1	PC16-1	PC17-1	PC18-1	PC19-1	PC20-1	PC21-1	PC22-1
8	ppb	210	1500	2910	2.11	138	2230	365	552	722	1.82	9	24	926	1470	789	346	910	486	455	647	250	402
18	ppb	211	1570	2590	2.49	102	3330	475	494	624	1.45	8.24	32.6	1450	1800	1130	858	1130	660	558	973	456	414
28	ppb	297	2190	3930	3.36	201	3950	568	705	1080	3.25	17.7	76.3	1780	2280	1140	1120	1360	814	672	1120	496	513
44	ppb	454	877	1210	2.57	55.3	2080	388	602	971	4.54	10.9	64.9	938	575	644	615	425	259	275	513	228	173
52	ppb	1080	1900	2450	6.97	123	3920	966	1460	2150	9.6	22.9	138	1630	2670	1960	1450	1370	884	765	1260	778	429
66	ppb	283	845	1510	1.35	81.6	1280	240	567	819	2.71	8.78	72.1	626	584	659	872	496	262	243	463	352	194
77	ppb	0	83.1	134	0	8.73	136	0	0	0	0	1.11	0	66.4	67.7	0	62	45.1	0	27	0	0	0
101	ppb	851	867	1050	2.23	83.4	1500	464	1610	2070	7.04	15.6	201	577	569	1110	646	546	269	324	542	608	193
105	ppb	290	298	375	0.737	28.1	443	178	508	791	2.54	5.87	69.5	245	172	272	68.2	154	87.5	109	122	110	61.6
118	ppb	872	842	1010	2.21	83	1320	446	1570	2130	7.25	16	197	583	554	1040	530	503	271	301	443	589	175
126	ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	ppb	168	129	146	0.567	10.7	209	94.8	285	417	1.74	3.03	36.4	122	93	141	38.4	69.7	46.4	55.2	59.1	78.2	25.9
138	ppb	666	519	564	1.81	42.2	813	365	1170	1640	6.51	12.5	152	465	323	568	151	270	168	203	231	345	92.2
153	ppb	588	475	517	1.71	42.9	880	298	969	1350	5.17	10.3	129	384	362	716	264	300	176	198	264	382	101
169	ppb	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	ppb	75.2	67.2	75.2	0	5.7	128	44	124	184	0.792	1.51	18.3	64.2	55.2	75.7	31.6	36.4	25.4	29	33.6	57.3	12.3
180	ppb	86.4	76.7	86.3	0	6.59	152	49.9	139	210	0.956	1.73	22.3	77.6	63.1	84.1	37.9	44	29.6	33.8	38.9	64.2	0
187	ppb	52.5	60	61.2	0.243	4.77	120	35.1	81.4	116	0.577	1.15	12.6	53.7	53	74.6	33.1	36.8	23.7	28	32.4	37.7	13.5
SUMMATION (µg/Kg)		6184.1	12299	18618.7	28.357	1016.99	22491	4976.8	10836.4	15274	55.945	146.32	1246	9987.9	11691	10403.4	7123.2	7696	4461.6	4276	6742	4831.4	2799.5

**If result was ND, reported as 0.
***If result was an estimated value, reported as that estimated value.

Analysis	Units	PC06-1	PC14-1	PC17-1
	Depth (in.)	0-11	0-12	0-8
PCB Homologue	ppb	96378	40040	22144
PCB Homologue	ppm	96.38	40.04	22.14

PCB Homologue		PC06-1	PC14-1	PC17-1
Monochlorobiphenyl	ppb	290	146	67.2
Dichlorobiphenyl	ppb	10100	4250	1950
Trichlorobiphenyl	ppb	33300	12200	5330
Tetrachlorobiphenyl	ppb	28600	11200	5610
Pentachlorobiphenyl	ppb	16200	8070	6100
Hexachlorobiphenyl	ppb	6820	3690	2780
Heptachlorobiphenyl	ppb	921	432	272
Octachlorobiphenyl	ppb	136	52.3	30
Nonachlorobiphenyl	ppb	10.6	0	4.79
Decachlorobiphenyl	ppb	0	0	0
SUMMATION (ng/g)		96377.6	40040.3	22143.99

**If result was ND, reported as 0.
***If result was an estimated value, reported as that estimated value.
Yellow represents PCB congener sample analyzed.



LEGEND

USACE EXISTING DATA

2005 CITY OF NEW BEDFORD DATA

THE LEFT UNDER THE LOCATION SYMBOL NUMBER DEFINES THE BOTTOM OF THE SAMPLE DEPTH. THE RIGHT NUMBER IS THE TOTAL PCB (mg/Kg) FOR THAT SAMPLE INTERVAL.

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM,MASSACHUSETTS MAINLAND ZONE 2001, REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83).
2. BASE PLAN OBTAINED FROM U.S. ARMY CORPS OF ENGINEERS.
3. INAPPROPRIATE AND/OR UNAUTHORISED USE OF THIS INFORMATION IS PROHIBITED.
4. CITY BORINGS COMPLETED BETWEEN MARCH 14-25, 2005 BY CR ENVIRONMENTAL. ALL BORINGS WERE LOGGED AND SAMPLED BY APEX ENVIRONMENTAL, INC. UNDER THE GUIDELINES OF THE SAMPLING AND ANALYSIS PLAN ISSUED BY APEX ENVIRONMENTAL ON MARCH 11, 2005.
5. USACE DATA COLLECTED AS PART OF THE NEW BEDFORD HARBOR SUPERFUND.

Figure 3

6542.006-OU#3-3

HARBOR DEVELOPMENT COMMISSION 41°38'N 70°56'W NEW BEDFORD, MA

Apex Environmental Inc
374 Congress St
Suite 508
Boston MA 02210
Phone 617-728-0070
Fax 617-728-0080

106 Co-Op Wharf
New Bedford
MA 02740

JOB # 6542.006

DATE: April, 2005

FIGURE 3

AS-BUILT PLAN

USACE OU#3 AREA

BORING AND SAMPLING LOCATIONS

New Bedford Harbor

New Bedford, MA

1" = 150'

Scale 1:1800

100 0 100 200 300 400

US survey foot

NAD83(CSRS98) / Massachusetts CS83 Mainland Zone

	REVISIONS	DATE	BY

Post-Dredge Sediment Chemistry Data

Post-Dredge Sediment Chemistry Sampling Points
New Bedford Harbor Phase II Dredge Project
New Bedford, MA
(Sampling Dates: March 20, 21, 2006)

Sample ID	Location	Total PCBs (ppm)	Metals (ppm)	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	EPH	PAHs (ppb)	Napthalene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Benzo(g,h,i)perylene	% moisture	Rx sulf	TOC 1
SA42292-01	Warren Alexander	1.20		3.43		0.672	36.6	54.7		1.96	85.7							178	179										
SA42292-02	Kelley	1.43		3.45	66.8	0.731	38	108		1.81	126					282		504	527	270	300	207	253	293		166			
SA42292-03	Kelley	0.86		5.83		2.05	83.3	150		2.75	141		190	171		613		746	790	411	465	237	325	416	179	213			
SA42292-04	State Route 6	1.67		5.14	53.9	1.2	41.7	164		2.24	79.2																		
SA42292-05	Lindberg	0.90		4.2		1.63	97.7	71.6		3.32	45.1							188	216										
SA42292-06	Lindberg	0.40		2.67		0.356	20.2	29.5		1.39	36.1							184	203										
SA42292-07	Pease Park	0.55		2.99		0.416	31.2	42.1		1.52	BRL																		
SA42292-08	Pease Park	1.08		3.16		0.665	49.3	46.5		1.67	59.7																		
SA42292-09	Kelley	1.20		8.52	80.1	1.36	65.9	243		2.16	328					234		592	753	396	506	265	429	475	231	282			
SA42292-10	Kelley	0.80		3.65		0.64	33.9	43.8		2.62	68.8							442	333										
SA42292-11	Maritime Terminal	2.85		4.26		2.29	142	81.5		2.67	223			326	161	538	193	1690	1300	626	701	381	399	402	177	179			
SA42292-12	Maritime Terminal	0.38					7.35	7.41		1.05	BRL																		
SA42292-13	White's Terminal	1.54		3.62		1.13	80.6	56.9		2.41	108							227	236										
		1.14		4.994	15.45	21.78	55.98	106.8	0	40.58	220	0	14.62	38.23	12.38	128.3	14.85	365.6	349.2	131	151.8	83.95	108.2	122	45.15	64.62			

Notes:

1. M200 and M400 series explorations were performed by Apex, Environmental in October 2002 and April 2003 for the North Terminal dredge project.
   indicates PCB testing was performed by the EPA at the superfund on-site laboratory. Other chemical analyses was performed by a commercial laboratory.
2. Total PCBs (ppm) are reported as the sum of Homologues for Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, and 1268.
3. U indicates the analyte was analyzed for but not detected at the sample specific level reported.

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON JANUARY 19, 2006.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40

US survey foot

Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Alexander Property - Atlantic Shellfish, Inc.
Alexander Property As-Built Conditions
Fairhaven, Massachusetts

January 19, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM,MASSACHUSETTS MAINLAND ZONE 2001, REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83).
2. BASE PLAN OBTAINED FROM U.S. ARMY CORPS OF ENGINEERS.
3. INAPPROPRIATE AND/OR UNAUTHORISED USE OF THIS INFORMATION IS PROHIBITED.

Scale 1:600

25 0 25 50 75 100 125

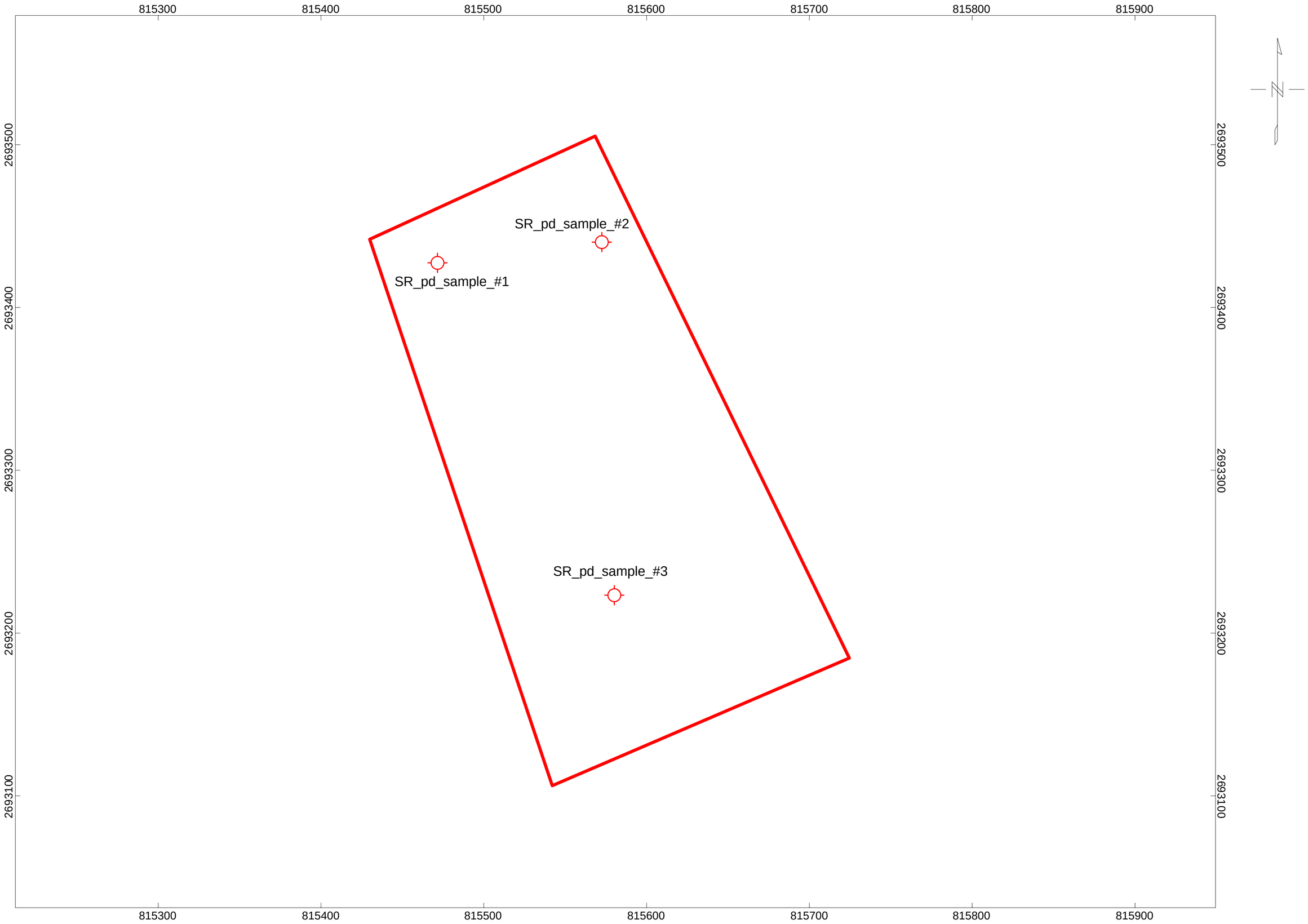
US survey foot

New Bedford Harbor Dredge - Phase II - Part 2

D.N. Kelley and Sons Shipyard
As Built Plan
Fairhaven, Massachusetts

March, 2006
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 10, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125

US survey foot

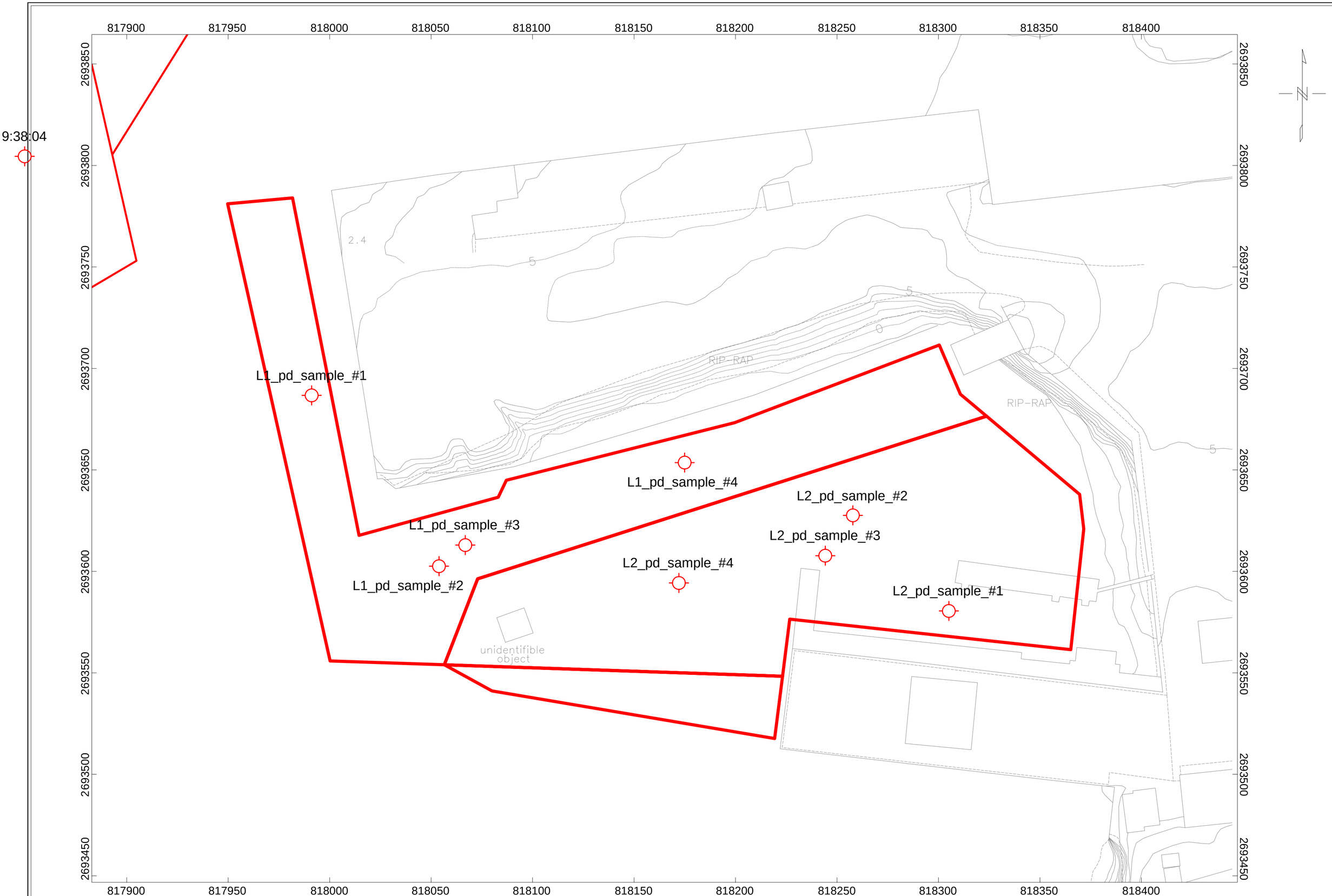
Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Shoal South of Route 6 Bridge
SR6 As-Built Conditions
New Bedford, Massachusetts

October 10, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 23, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

US survey foot

Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Linberg Marine
Linberg Marine As-Built Conditions
Fairhaven, Massachusetts

October 23, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 31, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:480

25 0 25 50 75 100

US survey foot

Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Pease Park Boat Ramp
Pease Park As-Built Conditions
Fairhaven, Massachusetts

October 31, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 25, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50 75 100 125

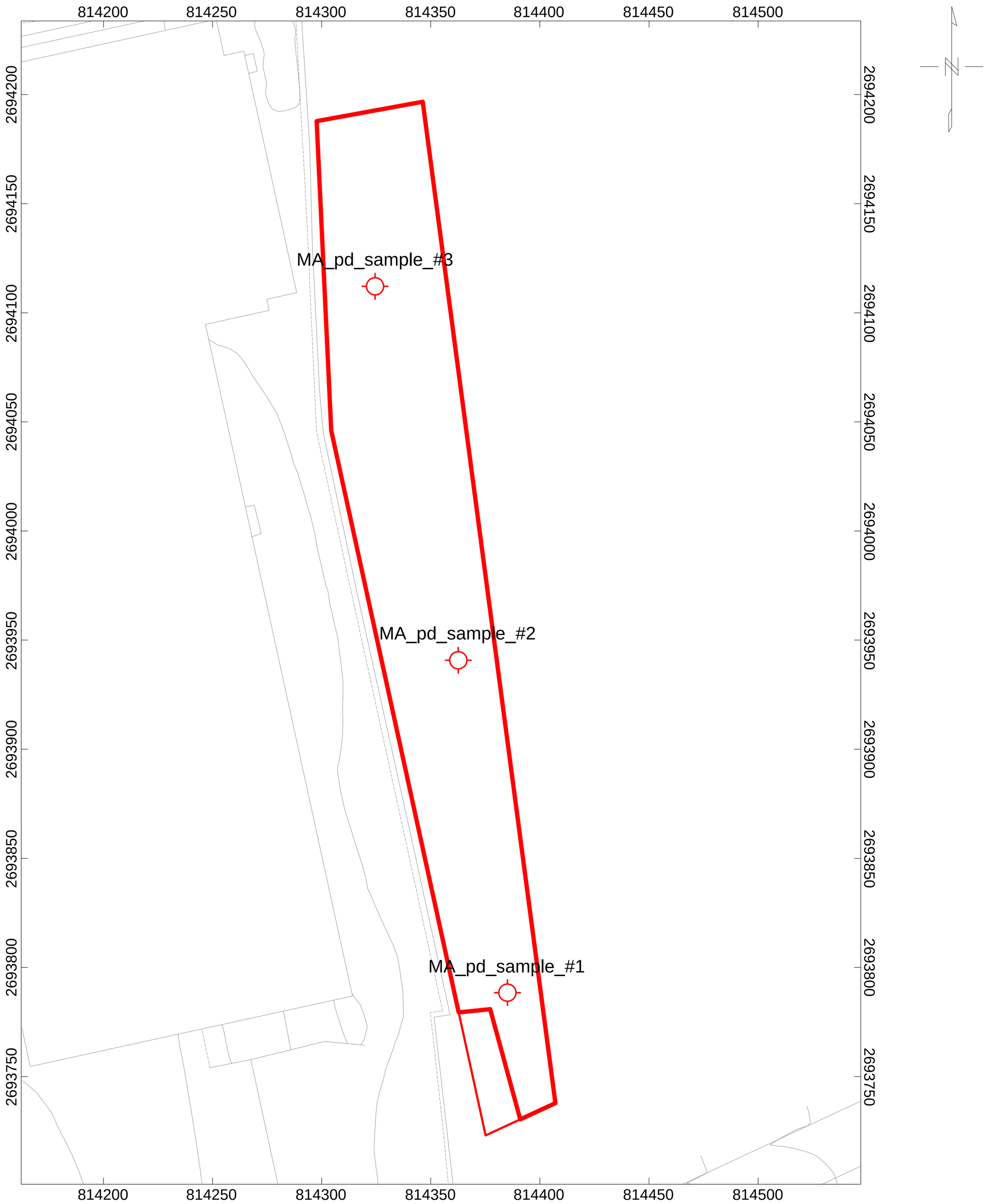
US survey foot

New Bedford Harbor Dredge - Phase II Part 2

White's Terminal - Pope's Island
White's Terminal As-Built Conditions
New Bedford, Massachusetts

September 25, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.



NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON SEPTEMBER 19, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:600

25 0 25 50

US survey foot

New Bedford Harbor Dredge - Phase II Part 2

Maritime Terminal
Maritime As-Built Conditions
New Bedford, Massachusetts

September 19, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.

NOTES:

1. COORDINATES SHOWN ARE IN THE STATE PLANE COORDINATE SYSTEM, MASSACHUSETTS MAINLAND ZONE (2001) REFERENCED TO THE 1983 NORTH AMERICAN DATUM (NAD83). VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW).

2. HYDROGRAPHIC SURVEY WAS PERFORMED BY COLER & COLANTONIO ON OCTOBER 31, 2005.

3. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF THE SURVEY MADE ON THE DATE INDICATED ABOVE, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THE TIME OF THE SURVEY AND AT THE SOUNDING POINTS NOTED ON THE PLAN.

4. CONTOUR INTERVAL IS 0.5 FEET.

5. THIS PLAN SHOULD NOT BE USED FOR NAVIGATION PURPOSES.

Scale 1:240

10 0 10 20 30 40 50

US survey foot

Apex environmental, inc.

New Bedford Harbor Dredge - Phase II Part 2

Niemiec Marine - Pope's Island
Niemiec Marine As-Built Conditions
Fairhaven, Massachusetts

October 31, 2005
Elevation in Mean Lower Low Water (MLLW)

Apex Environmental, Inc.

APPENDIX A

OU3 Cap Design Sampling and Analysis

Sampling and Analysis

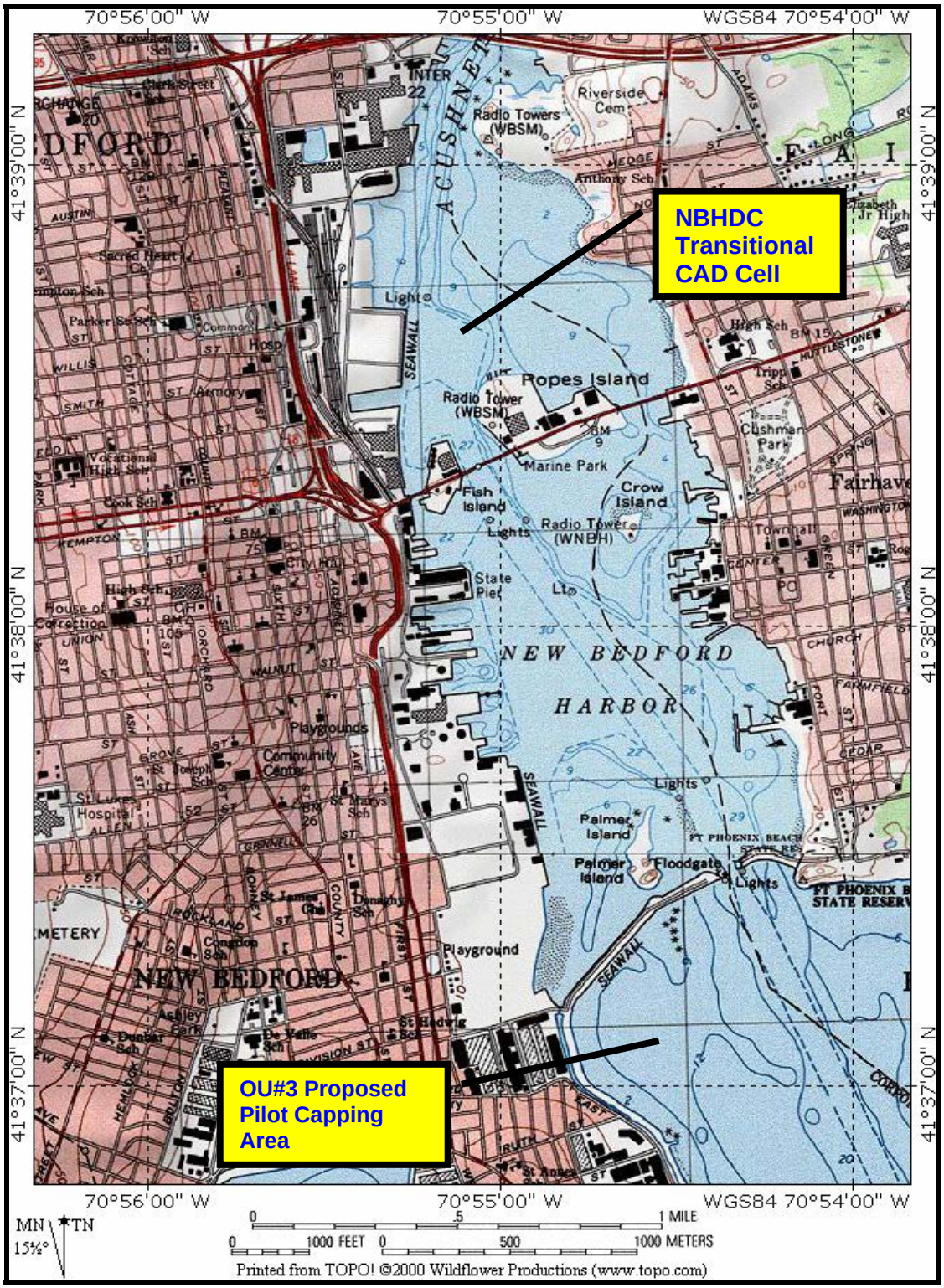
Sampling and analysis of the area to be capped under the pilot capping project are required for the design of the cap. The proposed sampling program for the pilot cap project includes:

- Sediment sampling for PCB chemical analysis;
- Sediment sampling for Geotechnical analysis;
- A bioactivity assessment; and
- An assessment of local current conditions.

The proposed PCB sampling and analysis includes approximately 22 sampling locations in order to better define the area requiring capping as part of the pilot capping project. The proposed geotechnical sampling and analysis includes approximately 10 sampling points (8 of which will be co-located at PCB sampling locations), which will be tested for Grain Size, Atterberg Limits, and Water Content analyses. The geotechnical analyses are being performed in order to compare the density and structural integrity of the material within the proposed pilot cap area to the proposed capping material. The proposed benthic bioactivity assessment for the abundance and diversity of species in the sediment includes approximately 10 sampling points where undisturbed samples of sediment will be collected utilizing a grab sample device. Benthic organisms will be counted and catalogued. A sediment camera is also proposed to augment the sediment data collection at the grab sample sediment sampling locations. The proposed water current assessment includes the collection of current data using an Acoustic Doppler Current Profiler (ADCP) (or equivalent device) along 4-6 transects across the OU#3 area. The transects will be run approximately every hour throughout one tidal period (low tide through high tide). The information collected will enable the project team to establish the direction and velocity of water movement through the various depths of interest in the proposed OU#3 pilot cap area.

Figure 1 – Site Location Map, New Bedford Harbor, Massachusetts

(showing location of Proposed OU#3 Proposed Pilot Cap and NBHDC Transitional CAD Cell)



EXISTING DATA

Existing sediment sampling and analysis, bathymetry and geotechnical data have been collected and reviewed in order to provide an indication of sediment characteristics in the proposed capping area. The existing sediment sampling and analysis has been performed by the USEPA and the United States Army Corp of Engineers (USACE) as part of the ongoing characterization and feasibility studies of the New Bedford Harbor Superfund Site. PCB results and soil type (if noted) from these studies within the area of concern are included in Table 1, and the existing data sampling locations are shown on Figure 2. Bathymetric data of the proposed pilot cap area was collected by Apex in February, 2005, and a copy of the OU#3 Area Hydrographic Information Plan is included as Figure 3.

SAMPLE COLLECTION

The proposed sample locations have been selected based on existing data in order to provide pre-design characterization information to be used to assess the feasibility of capping this area. The PCB sampling will be utilized to better define the area that will be capped as part of the pilot capping project (which is anticipated to be defined by the 10 ppm PCB concentration isopleth). The geotechnical sampling will be undertaken with the goal of determining the physical characteristics of the sediment that is to be capped. The benthic bioactivity assessment will provide information on the diversity and the number of benthic organisms there are in the area of the proposed pilot cap. The water current monitoring data will provide information concerning the potential for deposition and/or erosion of the bottom in the area of the proposed pilot cap.

Sample Locations

The existing sediment characterization data consists of primarily PCB results and some soil type information. The existing PCB data within the area of concern are clustered in the center of the area. This sampling program is designed to augment the existing data in an attempt to better define the 10 ppm PCB isopleth. Additionally, geotechnical sediment analysis sampling will be conducted in order to assess the physical characteristics of the existing sediments, and a current conditions assessment will be undertaken in order to provide information aimed at determining the suitability of this area for a cap.

PCB Chemical Sampling

The proposed PCB chemical sampling program is intended to supplement the existing database, provide better coverage of PCB data for the area of concern (to better define the 10 ppm PCB isopleth). Sampling locations are proposed primarily in the northern and southern portions of the area of concern, since a high number of existing PCB analyses were conducted near the center of the proposed pilot cap area (as part of the New Bedford Harbor Superfund Site project). A total of 22 sampling locations are proposed for PCB analysis. Samples will be taken using a vibracore sampling device from an “A-frame” apparatus mounted on a research vessel, and it is expected that the maximum depths of investigation will be between four (4) and seven (7) feet within the area. It was noted that the existing data shows that the highest PCB levels were found in the organic silt layers and the levels dropped off when sands were encountered. Samples will be taken at one foot intervals and PCB chemical analysis is proposed for the top one-foot of sediment (0-1’). The deeper samples collected (the 1-2’ sample, the 2-3’ sample, etc.) will be frozen and put “on hold” at the laboratory; and a subset of these may be analyzed depending on the results of the 0-1’ sample. Samples will be analyzed for PCBs using both NOAA summation of congeners method and a subset will be analyzed for Aroclor (homologue) identification, as detailed in Section 4.1 of this document. Locations of the PCB sampling locations are shown on Figure 2 and listed on Table 2.

Table 1: Existing Sediment Chemistry from the New Bedford Harbor Superfund Site

Study ID	Sample ID	Northing	Easting	Start Date	Depth Top	Depth Bot	Total Pcb (mg/kg)	Qual	Soil Type	Soil Color
PreROD	200016	2686895	817908		0.	1.	4.0			
PreROD	ae813 - 1	2687156	818317		0.	1.	81.			
PreROD	ae813 - 2	2687156	818317		1.	2.		U		
PreROD	ae816	2686137	817412		0.	1.	59.			
PreROD	ae817	2686040	817945		0.	1.	51.			
PreROD	ae818	2685631	817416		0.	1.	4.0			
PreROD	ae830 - 1	2686640	816953		0.	1.	15.			
PreROD	ae830 - 2	2686640	816953		1.	2.	1.0			
PreROD	ae831	2686646	817865		0.	1.	4.0			
PreROD	ae832	2686650	818320		0.	1.	2.0			
PreROD	ae835	2685130	818103		0.	1.	10.			
PreROD	af161 - 1	2686134	816957		0.	1.	3.0			
PreROD	af161 - 2	2686134	816957		1.	2.	1.0			
PreROD	af161 - 3	2686134	816957		2.	3.	1.0			
PreROD	af164 - 1	2685635	817948		0.	1.	10.			
PreROD	af164 - 2	2685635	817948		1.	2.		U		
PreROD	af164 - 3	2685635	817948		2.	3.		U		
PreROD	af212	2687152	817861		0.	1.	2.0			
PreROD	af213	2687050	817634		0.	1.	9.0			
PreROD	af214	2686643	817409		0.	1.	10.			
PreROD	af542 - 1	2687045	816950		0.	1.	1.0			
PreROD	af542 - 2	2687045	816950		1.	2.	4.0			
PreROD	af542 - 3	2687045	816950		2.	3.	1.0			
PHASEI	0206-1	2687302	818210	10/26/1999	0.	1.	0.72		OL/OH	
PHASEI	0206-2	2687302	818210	10/26/1999	1.	2.		U	OL/OH	
PHASEI	0206-3	2687302	818210	10/26/1999	2.	3.		U	SW	
PHASEI	0207-1	2687310	818404	10/25/1999	0.	1.	1.3		OL/OH	
PHASEI	0207-1DUP	2687310	818404	10/25/1999	0.	1.	2.8		OL/OH	
PHASEI	0207-2	2687310	818404	10/25/1999	1.	2.		U	SW	
PHASEI	0207-3	2687310	818404	10/25/1999	2.	3.	0.021		SW	
PHASEI	0208-1	2687105	818203	10/25/1999	0.	1.	0.22		SM	
PHASEI	0208-2	2687105	818203	10/25/1999	1.	2.		U	SM	
PHASEI	0208-3	2687105	818203	10/25/1999	2.	3.		U	SP	
PHASEI	0209-1	2687092	818403	10/25/1999	0.	1.	1.7		OL/OH	
PHASEI	0209-2	2687092	818403	10/25/1999	1.	2.		U	SW	
PHASEI	0209-3	2687092	818403	10/25/1999	2.	3.		U	SW	
PHASEI	0210-1	2686303	817203	10/25/1999	0.	1.	35.		OL/OH	
PHASEI	0210-2	2686303	817203	10/25/1999	1.	2.	1.1		OL/OH	
PHASEI	0210-2DUP	2686303	817203	10/25/1999	1.	2.	0.88		OL/OH	
PHASEI	0210-3	2686303	817203	10/25/1999	2.	3.	0.28		OL/OH	
PHASEI	0211-1	2686299	817706	10/25/1999	0.	1.	68.		OL/OH	
PHASEI	0211-2	2686299	817706	10/25/1999	1.	2.	28.		OL/OH	
PHASEI	0211-3	2686299	817706	10/25/1999	2.	3.	0.05		SM	
PHASEI	0212-1	2686304	818104	10/25/1999	0.	1.	28.		OL/OH	
PHASEI	0212-2	2686304	818104	10/25/1999	1.	2.	0.6		SW-SM	
PHASEI	0212-3	2686304	818104	10/25/1999	2.	3.	0.14		SW-SM	
PHASEI	0213-1	2686001	817299	10/25/1999	0.	1.	32.		OL/OH	
PHASEI	0213-2	2686001	817299	10/25/1999	1.	2.	0.42		OL/OH	
PHASEI	0213-3	2686001	817299	10/25/1999	2.	3.	0.38		GM	
PHASEI	0213-3DUP	2686001	817299	10/25/1999	2.	3.	0.4		GM	

Table 1 cont.

Study ID	Sample ID	Northing	Easting	Start Date	Depth Top	Depth Bot	Total Pcb (mg/kg)	Qual	Soil Type	Soil Color
PHASEI	0214-1	2685908	817713	10/25/1999	0.	1.	9.5		OL/OH	
PHASEI	0214-2	2685908	817713	10/25/1999	1.	2.	0.58		SM	
PHASEI	0214-3	2685908	817713	10/25/1999	2.	3.		U	SM	
PHASEI	0215-1	2685894	818104	10/25/1999	0.	1.	7.8		OL/OH	
PHASEI	0215-2	2685894	818104	10/25/1999	1.	2.		U	OL/OH	
PHASEI	0215-3	2685894	818104	10/25/1999	2.	3.		U	OL/OH	
PHASE3A	S-3078-0.0-1.0	2687271	818309	08/08/2001	0.	1.	1.8		OL/OH	DKGR
PHASE3A	S-3078-1.0-2.0	2687271	818309	08/08/2001	1.	2.	1.1		OL/OH	DKGR
PHASE3A	S-3079-0.0-1.0	2687095	818321	08/06/2001	0.	1.	1.4		SW	BLACK
PHASE3A	S-3079-1.0-2.0	2687095	818321	08/06/2001	1.	2.	2.5		SW	BLACK
PHASE3A	S-3079-1.0-2.0REP	2687095	818321	08/06/2001	1.	2.	0.9		SW	BLACK
PHASE3A	S-3080-0.0-1.0	2687211	818279	08/06/2001	0.	1.	0.58		SW	DKGR
PHASE3A	S-3080-1.0-2.0	2687211	818279	08/06/2001	1.	2.	0.43		SW	DKGR
PHASE3A	S-3081-0.0-1.0	2687198	818372	08/06/2001	0.	1.	0.62		SP	BLACK
PHASE3A	S-3081-1.0-2.0	2687198	818372	08/06/2001	1.	2.	0.96		SP	BLACK
PHASE3A	S-3181-0.0-1.0	2686204	817351	08/06/2001	0.	1.	42.		OL/OH	DKGR
PHASE3A	S-3181-1.5-2.0	2686204	817351	08/06/2001	1.5	2.	0.64		ML	OLGR
PHASE3A	S-3182-0.0-1.2	2686057	817358	08/07/2001	0.	1.2	55.		OL/OH	DKGR
PHASE3A	S-3182-1.2-2.2	2686057	817358	08/07/2001	1.2	2.2	5.1		ML	OLGR
PHASE3A	S-3183-0.0-1.3	2686051	817511	08/07/2001	0.	1.3	19.		OL/OH	DKGR
PHASE3A	S-3183-1.3-2.3	2686051	817511	08/07/2001	1.3	2.3	0.39		ML	OLGR
PHASE3A	S-3184-0.0-1.0	2686209	817489	08/06/2001	0.	1.	37.		ML	DKGR
PHASE3A	S-3184-1.0-2.0	2686209	817489	08/06/2001	1.	2.	0.48		ML	OLGR
PHASE3A	S-3185-.8-1.4	2686348	817650	08/06/2001	0.8	1.4	0.57		SM	OLGR
PHASE3A	S-3185-0.0-.8	2686348	817650	08/06/2001	0.	0.8	59.		OL/OH	BLACK
PHASE3A	S-3185-1.4-2.0	2686348	817650	08/06/2001	1.4	2.		U	SM	OLGR
PHASE3A	S-3186-.0-1.0	2686208	817656	08/07/2001	0.	1.	51.		OL/OH	DKGR
PHASE3A	S-3186-1.0-1.9	2686208	817656	08/07/2001	1.	1.9	1.5		OL/OH	DKGR
PHASE3A	S-3187-0.0-1.0	2686196	817799	08/07/2001	0.	1.	37.		OL/OH	DKGR
PHASE3A	S-3187-1.0-2.0	2686196	817799	08/07/2001	1.	2.	47.		ML	OLGR
PHASE3A	S-3188-0.0-1.0	2686355	817805	08/06/2001	0.	1.	0.69		SM	OLGR
PHASE3A	S-3188-1.0-2.0	2686355	817805	08/06/2001	1.	2.		U	SM	OLGR
PHASE3A	S-3188-1.0-2.0REP	2686355	817805	08/06/2001	1.	2.		U	SM	OLGR
PHASE3A	S-3189-0.0-1.0	2686051	817800	08/07/2001	0.	1.	38.		OL/OH	DKGR
PHASE3A	S-3189-1.0-2.0	2686051	817800	08/07/2001	1.	2.	39.		OL/OH	DKGR
PHASE3A	S-3190-0.0-1.0	2685901	817961	08/07/2001	0.	1.	9.2		OL/OH	DKGR
PHASE3A	S-3190-1.0-2.0	2685901	817961	08/07/2001	1.	2.		U	ML	OLGR
PHASE3A	S-3191-0.0-1.0	2686050	818100	08/07/2001	0.	1.	12.		OL/OH	BLACK
PHASE3A	S-3191-1.0-2.0	2686050	818100	08/07/2001	1.	2.	45.		OL/OH	BLACK
PHASE3A	S-3192-.9-1.9	2686192	817975	08/07/2001	0.9	1.9	0.063		ML	OLGR
PHASE3A	S-3192-0.0-.9	2686192	817975	08/07/2001	0.	0.9	46.		OL/OH	DKGR
PHASE3A	S-3193-0.0-1.0	2686345	817504	08/06/2001	0.	1.	94.		OL/OH	DKGR
PHASE3A	S-3193-1.0-2.0	2686345	817504	08/06/2001	1.	2.	130.		OL/OH	DKGR

U = Non-detect
R = Rejected
EAM1 = Early Action Post Remediation Samples
Source = where analytical data originated
Results are in mg/kg

EAC = Early Action Confirmatory
S = Sediment
M= Post Remediation
* = Remedidated (Yes or No)

Geotechnical Sampling

The proposed geotechnical sampling program is intended to provide index testing of the sediment in the proposed OU#3 pilot cap area to compare the density and structural integrity of the material in the cap area with that of the material to be used for the cap. The capping material has been previously analyzed for these parameters as part of the transitional CAD design for the New Bedford Harbor Dredge project. A total of 10 sampling locations within the proposed pilot cap area are proposed for geotechnical analysis with eight (8) of the locations also being analyzed for PCBs. The geotechnical samples will be collected utilizing a vibracore sampling device with proposed depths of between 0 – 7 feet. Samples will be taken at one foot intervals and geotechnical analysis for Grain Size, Atterberg Limits, and Water Content are proposed for the top one foot of sediment (0-1'); with the 1-2' (and deeper) samples being put "on hold" at the laboratory. The Geotechnical sampling locations are shown on Figure 2 and listed on Table 2.

Benthic Bioactivity Assessment

The proposed benthic bioactivity assessment program is intended to provide information on the potential bioactivity of the area including diversity and abundance of species. A total of 10 sampling locations are proposed for bioactivity assessment and correspond to the geotechnical sampling locations discussed above. Geotechnical sampling and benthic bioactivity sampling will occur at seven of the same locations. Benthic bioactivity and PCB sampling will occur at eight of the same locations.

A modified van Veen (Ted Young) grab sampling unit will be used to obtain an approximately 0.04 m^3 sample at each location. The benthic grab sampling unit will provide a relatively "undisturbed" sample of the top portion of the sediment. Samples will be assessed as to the number of species encountered and the density of species encountered at each sampling location. The van Veen modified (Ted Young) grab sampling is intended to provide a general overview of the benthic biota present onsite. The sampler has been outfitted with a submersible camera and a stability fin to allow underwater navigation of the sampler to a suitable location. Additionally, the benthos at the sample area will be photographed prior to sampling.

The samples will be washed through a mesh sieve. The residue will be fixed in formaldehyde and preserved in alcohol. Benthic invertebrates will be removed under magnification, sorted by major taxa, identified to the lowest practical taxonomic level (generally species) and counted. Species distribution, species richness (or total number of species at each station), and abundance will be determined and recorded for each sampling location. The proposed benthic grab sampling locations are shown on Figure 2 and listed in Table 2.

Current Monitoring

Apex proposes to monitor the local currents to provide information on the erosion potential for the proposed cap. Approximately 6 current-monitoring traverses will be monitored for current data throughout one tidal period (over an approximately 13-hour period). The ADCP (or equivalent current monitoring device) is proposed for this assessment in order to enable the measurement of water movement throughout the water column. Sampling traverse locations are shown on Figure 2.

Table 2: Proposed Sampling Locations

Station	Sample ID	Sample Interval (ft)	Sampling Method	PCBs	Geotechncial	Biological Assesment
1	OU#3-PC1-1	0 - 1'	Vibracore & Grab Sample	x	x	x
1	OU#3-PC1-2	1' - 2'	Vibracore	+	+	
2	OU#3-PC2-1	0 - 1'	Vibracore	x		
2	OU#3-PC2-2	1' - 2'	Vibracore	+		
3	OU#3-PC3-1	0 - 1'	Vibracore & Grab Sample	x	x	x
3	OU#3-PC3-2	1' - 2'	Vibracore	+	+	
4	OU#3-PC4-1	0 - 1'	Vibracore	x		
4	OU#3-PC4-2	1' - 2'	Vibracore	+		
5	OU#3-PC5-1	0 - 1'	Vibracore	x	x	
5	OU#3-PC5-2	1' - 2'	Vibracore	+	+	
6	OU#3-PC6-1	0 - 1'	Vibracore & Grab Sample	x		x
6	OU#3-PC6-2	1' - 2'	Vibracore	+		
7	OU#3-PC7-1	0 - 1'	Vibracore	x		
7	OU#3-PC7-2	1' - 2'	Vibracore	+		
8	OU#3-PC8-1	0 - 1'	Vibracore	x		
8	OU#3-PC8-2	1' - 2'	Vibracore	+		
9	OU#3-PC9-1	0 - 1'	Vibracore	x	x	
9	OU#3-PC9-2	1' - 2'	Vibracore	+	+	
10	OU#3-PC10-1	0 - 1'	Vibracore & Grab Sample		x	x
10	OU#3-PC10-2	1' - 2'	Vibracore		+	
11	OU#3-PC11-1	0 - 1'	Vibracore	x		
11	OU#3-PC11-2	1' - 2'	Vibracore	+		
12	OU#3-PC12-1	0 - 1'	Vibracore & Grab Sample	x		x
12	OU#3-PC12-2	1' - 2'	Vibracore	+		
13	OU#3-PC13-1	0 - 1'	Vibracore & Grab Sample	x	x	x
13	OU#3-PC13-2	1' - 2'	Vibracore	+	+	
14	OU#3-PC14-1	0 - 1'	Vibracore & Grab Sample		x	x
14	OU#3-PC14-2	1' - 2'	Vibracore		+	
15	OU#3-PC15-1	0 - 1'	Vibracore	x		
15	OU#3-PC15-2	1' - 2'	Vibracore	+		
16	OU#3-PC16-1	0 - 1'	Vibracore	x	x	
16	OU#3-PC16-2	1' - 2'	Vibracore	+	+	
17	OU#3-PC17-1	0 - 1'	Vibracore	x		
17	OU#3-PC17-2	1' - 2'	Vibracore	+		
18	OU#3-PC18-1	0 - 1'	Vibracore	x		
18	OU#3-PC18-2	1' - 2'	Vibracore & Grab Sample	+		x
19	OU#3-PC19-1	0 - 1'	Vibracore	x		
19	OU#3-PC19-2	1' - 2'	Vibracore	+		
20	OU#3-PC20-1	0 - 1'	Vibracore & Grab Sample	x	x	x
20	OU#3-PC20-2	1' - 2'	Vibracore	+	+	
21	OU#3-PC21-1	0 - 1'	Vibracore	x		
21	OU#3-PC21-2	1' - 2'	Vibracore	+		
22	OU#3-PC22-1	0 - 1'	Vibracore	x		
22	OU#3-PC22-2	1' - 2'	Vibracore	+		
23	OU#3-PC23-1	0 - 1'	Vibracore	x		
23	OU#3-PC23-2	1' - 2'	Vibracore	+		
24	OU#3-PC24-1	0 - 1'	Vibracore & Grab Sample	x	x	x
24	OU#3-PC24-2	1' - 2'	Vibracore	+	+	

Sample Collection Method

Samples will be collected at each sampling location identified on Figure 2 over the proposed pilot cap area. Based on the relatively shallow depths within the sample area, and the proposed analytical testing, two methods of sample collection will be utilized. Sampling equipment will include a 3" diameter hydraulic vibracore device (mounted on the back of a research vessel designed for the purpose), as well as utilizing a free-fall sediment grab sampler. The vibracore unit will be used for chemical and geotechnical testing, and the grab sample unit will be used for bioactivity assessment in order to analyze an "undisturbed" sample. The sampling will be led in the field by an experienced sediment sampler. This Field Operations Lead (FOL) will have discretion (within the parameters of this sampling plan) to make decisions in the field concerning the sampling program. Sampling will be conducted from a research vessel equipped with an "A-frame" and appropriate sampling and positioning equipment. As-built sample locations will be documented using a Global Positioning System (GPS).

Once the sampling vessel is on station, the as-built coordinates and water depth will be logged. The vibracore unit will be deployed at every sampling location proposed for PCB and geotechnical analyses. The box-coring unit will be used to collect a composite sample of the surficial sediments (0-1') at 10 of the sampling locations for bioactivity assessment. Soils will be logged in the field in accordance with ASTM 2488-93 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." Each vibracore will be into one-foot sample increments (0-1 foot, 1-2 foot, etc.); unless visual observation of the core indicates that the sediment classification changes within the proposed composite depths (in which case, like materials will be composited within a depth range). Table 2 contains a summary description of sample methods and analyses at each station.

<u>PCB Homologues Analysis and PCB Congener Reporting</u>

In order to be consistent with USEPA sampling methodologies for the New Bedford Superfund Project, homologue analysis will be conducted on three of the PCB samples collected. The homologue samples will be collected as "splits" of the PCB congener samples. In an attempt to provide correlation between the two sampling methodologies, an attempt will be made to collect one homologue "split" sample from an area where the PCBs are thought to be elevated (as determined from the existing PCB data), one homologue "split" sample from an area where the PCBs are thought to be moderate (for this area), and one homologue "split" from an area where the PCB concentrations are thought to be relatively low (for this area). The exact location of the three homologue "split" samples will be determined in the field by the field sampling team, taking into consideration the location of the samples relative to the previous (USEPA) sampling and the amount and type of sediment collected in the vibracore tube. Proposed sampling locations are included on Figure 2.

PCB congeners will be reported utilizing the New Bedford Harbor Superfund Project PCB reporting equation, presenting the sum of the NOAA congeners multiplied by 2.5.

Sample Handling

Sampling equipment for chemical analyses will be cleaned following standard decontamination procedures prior to individual sample collection. The vibracore equipment utilizes a pre-cleaned inner plastic lining as a core catching implement. A new core-tube liner will be utilized for each vibracore. Sediment samples will be logged and visually characterized prior to collection in laboratory-supplied pre-cleaned and pre-preserved jars. Samples will be stored in sample coolers on the vessel prior to shipment to the laboratory. Chain-of-custody forms will be filled out and will accompany each sample shipment to the laboratory. Standard quality control and quality assurance (QA/QC) samples (including trip and rinseate blanks) will be collected as part of the sampling protocol. The sampling protocol includes the

collection of duplicate, blank, and split samples at a rate sufficient to meet EPA guidelines.

SAMPLE ANALYSIS

Samples will be sent to an USEPA approved offsite laboratory (or laboratories) for chemical analysis and analysis of physical parameters. Samples will be delivered to the laboratory on-ice in sample coolers in order to maintain appropriate sample conditions.

Analytical Parameters

Chemical Analysis

Sample locations for PCB chemical analysis were selected in order to better define the 10 ppm PCB isopleth in the area of concern. PCBs will be analyzed by NOAA summation of congeners. Additionally, 3 samples will also be analyzed for aroclor (homologue) identification and quantification using EPA method 8082 in order to quantify the site specific correlation factor between PCB congeners and aroclors. Approximately 22 sampling locations with approximately two to five samples from each core in one foot interval will be collected. The top foot of material collected will be analyzed for PCB congeners and the 1-2' (and deeper intervals) samples will be frozen and put "on-hold" at the laboratory, to be analyzed at a later date if the results from the top foot warrant additional testing. The resulting data, along with grain size analyses for the representative strata (if available) and the boring logs, will be submitted to the USEPA for review.

Geotechnical Analysis

Physical characterization of the sediment is required to provide information of the geotechnical properties of the sediments in the area to be capped including stability and structural integrity. Geotechnical testing for characterization is anticipated to consist of a combination of grain size analyses Atterberg Limits and water content. The analytical methods to be used are: for grain size distribution, ASTM D 422 using sieve numbers 4, 10, 40, 60, 200; for Atterberg Limits, ASTM D 4318; and for water content, a gravimetric method reporting to the nearest percent. Representative samples will be selected for testing based on strata descriptions indicated on the boring logs and visual logging of the soil samples.

Benthic Bioactivity Assessment

Benthic bioactivity assessment of the sediment is proposed to include both species distribution, richness and abundance for a composite sample of the shallow subsurface. The assessment will include categorizing and counting of each species encountered in the grab samples by a marine biologist.

Laboratory Methods

Samples will be sent to a USEPA approved laboratory or laboratories. Chemical analytical methods will be performed in accordance with USEPA protocol and Massachusetts MCP Guidelines. Grain size distribution and Atterberg Limits testing (on selected samples) will be performed in accordance with applicable ASTM specifications.

Samples obtained during the benthic bioactivity assessment will be presorted by gross characteristics. An experienced marine biologist will taxonomically identify the samples to the furthest practicable level using industry-standard procedures

APPENDIX B

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New Bedford Harbor Dredge Project – Phase II

Post-Dredge Conditions
Sampling and Analysis Plan

1.0 INTRODUCTION AND PURPOSE

This sampling and analysis plan has been prepared by Apex Environmental, Inc. (Apex) on behalf of the New Bedford Harbor Development Commission (HDC) for the purpose of obtaining Post-Dredge sediment characterization data for the portions of New Bedford Harbor that were dredged under Phase II. The areas dredged under Phase II include portions of Maritime Terminal, Norpel Terminal, Whites Terminal, South-of-Route 6 Bridge, and Niemiec Marine in New Bedford, Massachusetts, and the Warren Alexander Property, D.N. Kelley & Son, Linberg Marine, Atlantic Shellfish and Pease Park properties, in Fairhaven, Massachusetts.

This document is intended to provide a sampling work plan, which describes proposed sampling activities, sampling methods, laboratory parameters and field/laboratory quality assurance/quality control (QA/QC) procedures, as well as depicts sample locations, and provides a sampling schedule. This Sampling Plan is required by the MADEP, and is intended for use in the field to coordinate sampling activities aimed at characterizing the remaining sediment located at the areas dredged as part of the New Bedford Harbor Phase II Dredge Project. As contaminated sediment was removed from the various dredged areas, Apex expects to see a substantial decrease in the Total PCB levels and in Target Metal concentrations.

2.0 EXISTING DATA

Prior to the start of the Phase II dredging, the chemical and geotechnical parameters of the sediments to be dredged were characterized. The samples collected by Apex Environmental in the North Terminal area for the Pre-Dredge Characterization were broken into the M200 series and were collected in October 2002 and April 2003. These samples were obtained using the hydraulic Vibracore method and each sample was sub-divided by strata and/or depth interval. In total, 130 sub-samples were tested for PCB levels. Several of the samples were examined for metals, EPH, and PAH values. Of all the pre-dredge PCB levels recorded, the highest value was 81 ppm. This level was obtained at a depth of only 2-3 feet below ground, in sample #M210-3. The range of PCB levels that was recorded was 0.5 ppm to 81 ppm, with an average PCB level for all locations and all depths was 13.13 ppm. Only 8 samples had supplemental testing done.

On the Fairhaven side of the harbor, twenty samples of sediment were collected and analyzed for PCB and metal composition. Of all sediment samples collected, six reported undetectable levels of PCBs, while the other fourteen had values ranging from 0.216 ppm to 8.16 ppm. These values had a median of 1.39 ppm and an average of 1.89 ppm. Of all the samples taken, an average PCB level obtained was 12.04 ppm between the North Terminal samples (and sub-samples) and the Fairhaven samples. PCB levels were

analyzed by Aroclor for this Phase. The attached tables and figures depict the results of the pre-dredge sediment analysis.

3.0 SAMPLE COLLECTION

The proposed test boring locations have been selected to provide sediment chemistry data for the areas that have been dredged under Phase II of the New Bedford Harbor Dredging. A total of thirteen composite samples will be analyzed for PCB and metals chemistry. Sampling locations were distributed throughout each dredged area, in order to get a composit sample that is representative of the areas dredged.

3.1 Sample Locations

The proposed test boring program has been developed to provide detailed chemical information within each dredged area. Core samples will be retrieved from the borings and submitted for chemical analyses, to characterize the sediment at each area dredged under Phase II. It is anticipated that the PCB and target metal concentrations observed during the Post-Dredge Sampling will be significantly lower than the Pre-Dredge levels.

A total of thirteen samples will be analyzed. The proposed program consists of collecting 46 borings, located as shown on the attached Figures. The samples will be composited in the field, prior to being submitted for analysis. Multiple boring locations from each dredged area have been strategically grouped together, as depicted on the attached figures. On the New Bedford Side of the Harbor, there are a total of fourteen proposed sample locations. Four evenly-spaced sampling points are proposed at the areas dredged in White's Terminal; three are proposed at Maritime Terminal; and four samples are proposed at the Niemic Marine dredge area. Three sample locations are proposed within the dredged area South of Route 6. The samples within each area will be composited prior to analysis.

A total of thirty two boring locations are proposed on the Fairhaven side of the Harbor. There are six sample locations proposed at the Pease Park Boat ramp, eight sample locations proposed at the Linberg Marine Dredge areas, four sample locations proposed at the Atlantic Shellfish areas that were dredged; and a total of fourteen sample stations proposed at the D.N. Kelly and Sons Shipyard. The samples will be composited together

3.2 Sample Collection Method

Test borings will be collected using a hydraulic vibrocore apparatus. A clean liner will be inserted in the vibrocore, which will then be advanced into the sediment. The sediment will be characterized and samples will be taken. Apex personnel will remove samples from each vibro-coring and then composit samples together, as indicated on the attached figures i.e. all Samples from White's Terminal will be composited together. Samples collected for chemical analysis will be preserved in accordance with applicable EPA guidelines, based on the analyte being tested for.

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Test boring locations will be documented using a Global Positioning System (GPS). Once the vibrocore is on station, the as-built coordinates and water depth will be logged. Soils will be logged in the field in accordance with ASTM 2488-93 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." Boring logs will be prepared, and will document soil descriptions, sampling depths, standard penetration resistance, etc. as applicable.

3.3 Sample Handling

Sampling equipment will be cleaned following standard decontamination procedures prior to individual sample collection. Sediment samples will be logged and visually characterized prior to collection in laboratory-supplied pre-cleaned and pre-preserved jars. Samples will be stored in sample coolers on the vessel prior to shipment to the laboratory. Chain-of-custody forms will be filled out and will accompany each sample shipment to the laboratory. Standard quality control and quality assurance (QA/QC) samples (including trip and rinseate blanks) will be collected as part of the sampling protocol. The sampling protocol includes the collection of duplicate, blank, and split samples at a rate sufficient to meet EPA guidelines.

3.4 Sampling Schedule

The proposed sampling fieldwork is anticipated to be conducted in March, 2006. It is anticipated that the sampling will take Apex two days to complete. Chemical analysis will begin immediately following completion of field activities. Samples will be processed using standard turnaround times. A report containing the results of the sampling and analysis program will be submitted approximately two weeks after all analytical results have been reported.

4.0 SAMPLE ANALYSIS

The analytical testing program will address the chemical characterization of the Post-Dredge sediments remaining after the Phase II round of dredging. It is anticipated that the Post-dredge PCB and heavy metal concentrations will be significantly lower than the elevated levels of PCBs and metals in the in the upper soft sediment, prior to dredging.

Samples will be sent to an EPA approved offsite chemical analysis laboratory. Samples will be hand-delivered or couriered to the laboratory in sample coolers in order to maintain appropriate sample conditions.

4.1 Analytical Parameters

<u>Chemical Analysis</u>

Analytical parameters for the samples were selected in order to match the pre-dredge sampling parameters, so that a direct comparison can be made between the pre-dredge and post-dredge conditions.

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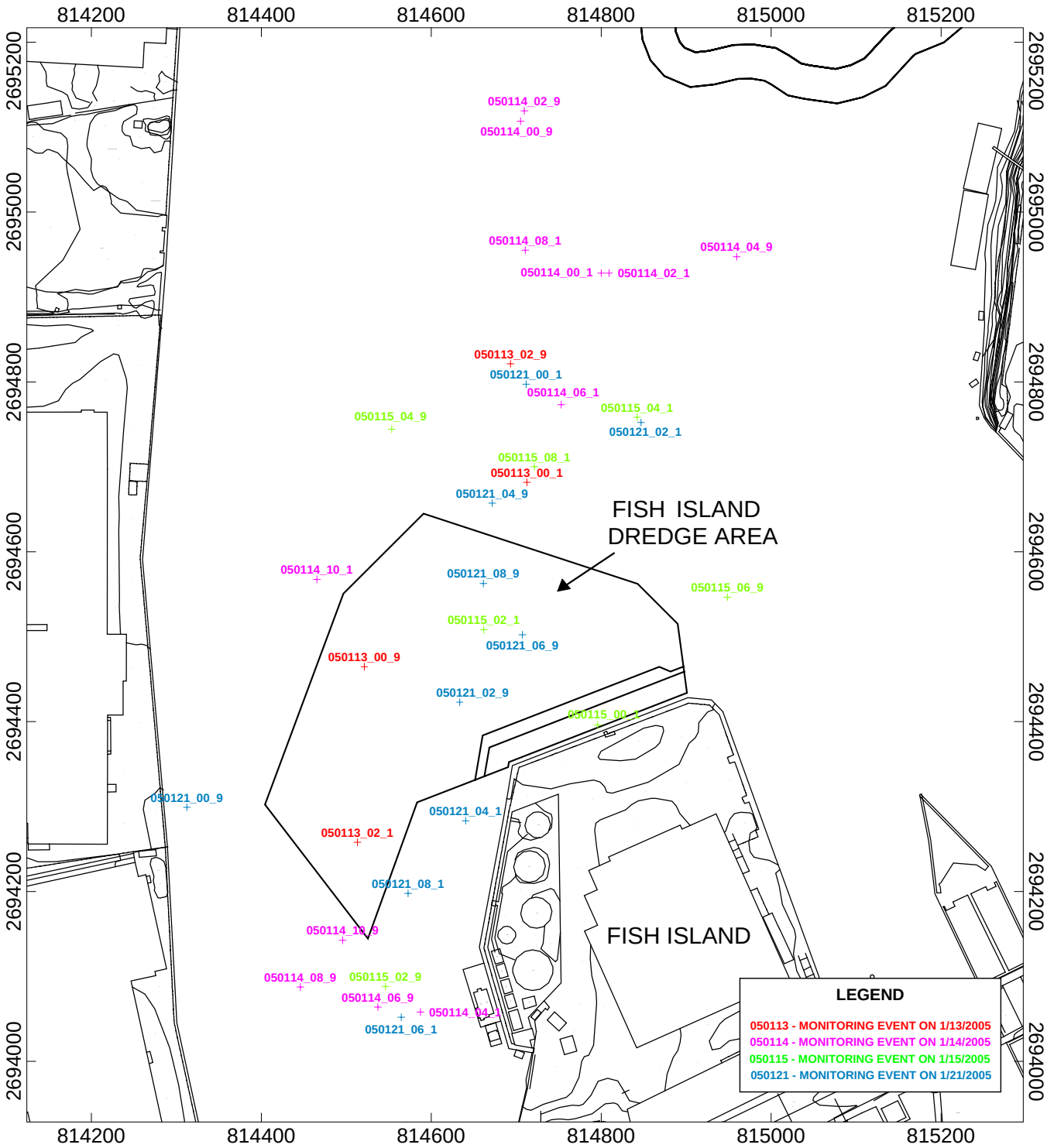
Composite samples will be prepared in accordance with recommendations of the USACE. Composite samples will then be submitted for analyses consisting of the following: Total PCBs, Arsenic, Barium, Cadmium, Chromium, Lead, Silver, EPH, and PAHs.

4.2 Laboratory Methods

Samples will be sent to a USEPA approved laboratory. Chemical analytical methods will be performed in accordance with USEPA protocol and Massachusetts MCP Guidelines. Grain size distribution and Atterberg Limits testing (on selected samples) will be performed in accordance with applicable ASTM specifications. Laboratory methods for the proposed analysis are shown on *Attachment 1*.

Water Quality Monitoring Tables



N

Scale 1" = 175'

100 0 100

US survey foot

NEW BEDFORD HARBOR DREDGE - PHASE II

WATER QUALITY MONITORING LOCATIONS
1/13/05 - 1/21/05

APEX ENVIRONMENTAL, INC.

1/13/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 10:01				Current		(NTUs)	Increase (NTUs)		Traffic
	13:30	050113_00_1_05	N:2694684.583	Up	5	2.3		Foggy, Cold	None
	13:32	050113_00_1_15	E:814715.222	Up	10	1.9		Light N Wind	None
	13:34	050113_00_1_25		Up	25	1.9			None
					AVERAGE	**2.0**	**22.0**		
	13:42	050113_00_9_05	N:2694464.650	Down	5	2.4		Foggy, Cold	None
	13:45	050113_00_9_12	E:814525.369	Down	12	2.5		Light N Wind	None
	13:47	050113_00_9_20		Down	20	2.3			None
Low 15:56					**AVERAGE**	**2.4**	(19.6 Below Limit)		
	18:44	050113_02_1_05	N:2694258.072	Up	5	2.8		Cloudy, ~40F	None
	18:45	050113_02_1_14	E:814513.105	Up	14	2.7		Light SW Wind	None
	18:50	050113_02_1_22		Up	22	2.4			None
					AVERAGE	**2.6**	**22.6**		
	18:56	050113_02_9_05	N:2694824.140	Down	5	2.8		Cloudy, ~40F	None
	18:58	050113_02_9_14	E:814696.050	Down	14	2.8		Light SW Wind	None
	18:59	050113_02_9_25		Down	25	2.7			None
					AVERAGE	**2.7**	(19.9 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

1/15/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 4:59				Current		(NTUs)	Increase (NTUs)		Traffic
	6:31	050115_00_1_05	Fish Isl.	Up	5	3.8		Partly Cloudy, 30 Degrees	None
	6:31	050115_00_1_15		Up	10	3.5		E Wind ~5 Knots	None
	6:31	050115_00_1_25		Up	25	3.5			None
					AVERAGE	**3.6**	**23.6**		
	8:30	050115_02_1_05	N:2694508.091	Up	5	3.6		Sunny, ~30 Degrees	None
	8:32	050115_02_1_15	E:814661.751	Up	15	3.4		Light Wind	None
	8:33	050114_02_9_25		Up	25	3.1			None
					AVERAGE	**3.4**	**23.4**		
	8:35	050115_02_9_05	N:2694088.242	Down	5	6.0		Sunny, ~30 Degrees	None
	8:36	050115_02_9_15	E:814546.150	Down	15	3.8		Light Wind	None
	8:37	050115_02_9_25		Down	25	3.8			None
					AVERAGE	**4.5**	(18.9 Below Limit)		
	10:48	050115_04_1_05	N:2694758.328	Up	5	4.0		Sunny, ~35 Degrees	None
	10:49	050115_04_1_15	E:814842.285	Up	15	3.6		Light Wind	None
	10:49	050115_04_1_25		Up	25	3.6			None
					AVERAGE	**3.7**	**23.7**		
	10:57	050115_04_9_05	N:2694802.673	Down	5	7.5		Sunny, ~35 Degrees	None
	10:58	050115_04_9_15	E:814217.831	Down	25	4.2		Light Wind	None
	10:59	050115_04_9_25		Down	25	4.0			None
High 11:47					**AVERAGE**	**5.2**	(18.5 Below Limit)		
	12:30	050115_06_1_05	N:2693165.688	Up	5	3.9		Sunny, ~40 Degrees	None
	12:31	050115_06_1_15	E:814634.427	Up	15	4.8		Light Wind	None
	12:32	050115_06_1_25		Up	25	4.0			None
					AVERAGE	**4.2**	**24.2**		
	12:35	050115_06_9_05	N:2694546.483	Down	5	8.8		Sunny, ~40 Degrees	None
	12:36	050115_06_9_15	E:814948.512	Down	15	25.3		Light Wind	None
	12:37	050115_06_9_25		Down	25	25.3			None
					AVERAGE	**19.8**	(4.4 Below Limit)		
	14:30	050115_08_1_05	N:2694702.864	Up	5	3.0		Sunny, ~35 Degrees	None
	14:31	050115_08_1_15	E:814724.210	Up	15	4.0		Light Wind	None
	14:32	050115_08_1_25		Up	25	3.5			None
					AVERAGE	**3.5**	**23.5**		
	14:35	050115_08_9_05	N:2694282.427	Down	5	3.6		Sunny, ~35 Degrees	None
	14:36	050115_08_9_15	E:8145222.051	Down	15	6.0		Light Wind	None
	14:37	050115_08_9_25		Down	25	10.5			None
Low 17:20					**AVERAGE**	**6.7**	(16.8 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

1/14/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring

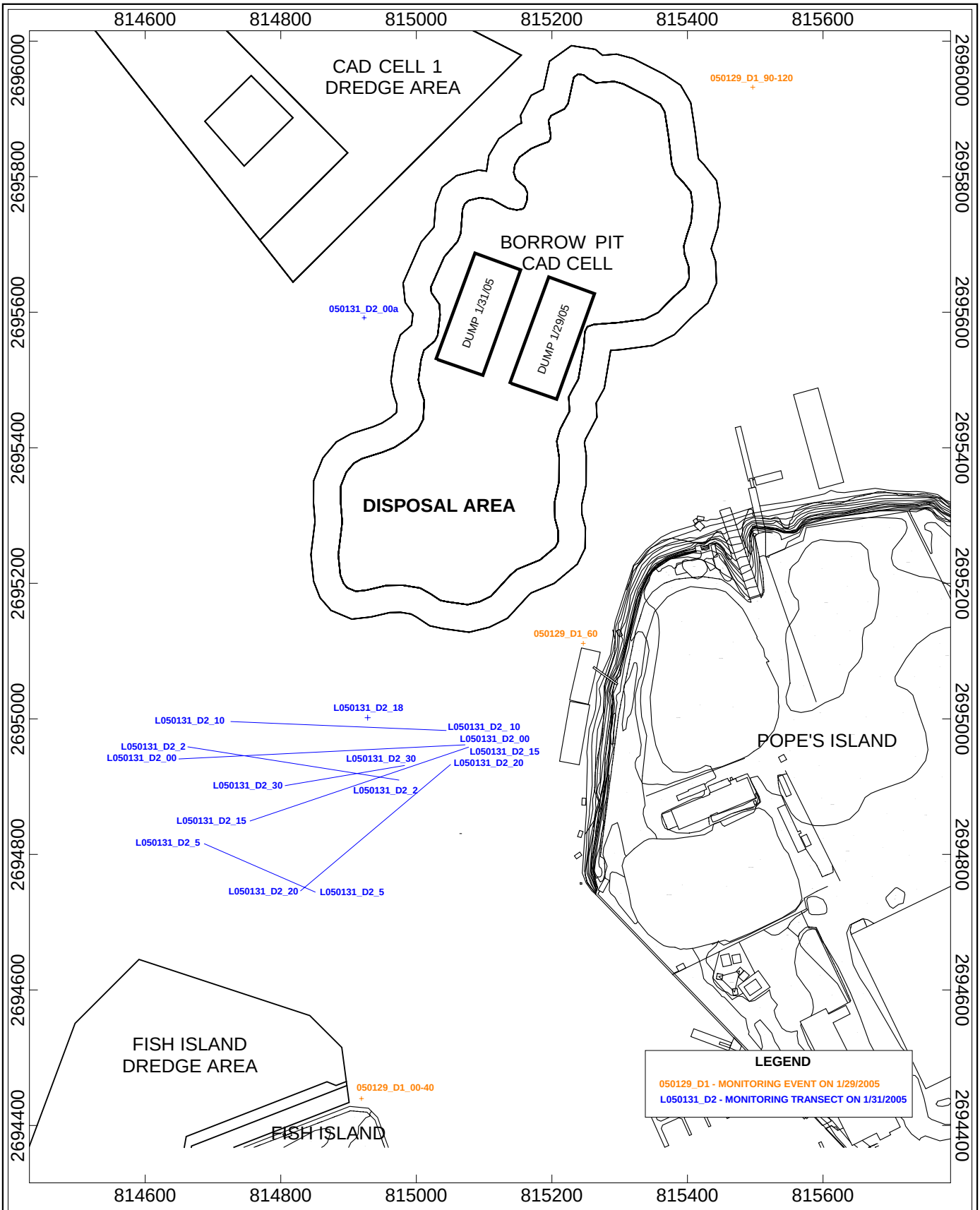
Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 4:03				Current		(NTUs)	Increase (NTUs)		Traffic
	7:02	050114_00_1_05	N:2694928.096	Up	5	2.0		Partly Cloudy, 35 Degrees	None
	7:03	050114_00_1_15	E:814800.127	Up	10	2.1		S Wind ~15 Knots	None
	7:04	050114_00_1_24		Up	24	2.0			None
					AVERAGE	**2.0**	**22.0**		
	6:52	050114_00_9_05	N:2695109.669	Down	5	2.5		Partly Cloudy, 35 Degrees	None
	6:53	050114_00_9_10	E:814707.776	Down	10	2.6		S Wind ~15 Knots	None
	6:54	050114_00_9_25		Down	25	2.8			None
					AVERAGE	**2.6**	(19.4 Below Limit)		
	8:55	050114_02_1_05	N:2694928.158	Up	5	2.4		Cloudy, 25 Degrees	None
	8:55	050114_02_1_15	E:814809.238	Up	15	2.5		Strong S Wind	None
	8:56	050114_02_9_25		Up	25	2.1			None
					AVERAGE	**2.3**	**22.3**		
	8:45	050114_02_9_05	N:2695121.846	Down	5	3.5		Cloudy, 25 Degrees	None
	8:46	050114_02_9_15	E:814712.249	Down	15	2.4		Strong S Wind	None
	8:47	050114_02_9_25		Down	25	2.4			None
High 10:54					**AVERAGE**	**2.8**	(19.5 Below Limit)		
	11:18	050114_04_1_05	N:2694058.155	Up	5	2.4		Cloudy, 35 Degrees	None
	11:19	050114_04_1_15	E:814587.358	Up	15	2.5		Strong W Wind	None
	11:19	050114_04_1_24		Up	24	2.6			None
					AVERAGE	**2.5**	**22.5**		
	11:30	050114_04_9_05	N:2694947.400	Down	5	3.4		Cloudy, 35 Degrees	None
	11:32	050114_04_9_18	E:814959.449	Down	18	3.7		Strong W Wind	None
	11:34	050114_04_9_30		Down	30	2.2			None
					AVERAGE	**3.1**	(19.4 Below Limit)		
	13:01	050114_06_1_05	N:2694775.958	Up	5	3.0		Rainy, 40 Degrees	None
	13:02	050114_06_1_15	E:814755.603	Up	15	3.1		N Wind ~ 15 Knots	None
	13:02	050114_06_1_25		Up	25	2.9			None
					AVERAGE	**3.0**	**23.0**		
	13:08	050114_06_9_05	N:2694063.888	Down	5	0.6		Rainy, 40 Degrees	None
	13:09	050114_06_9_15	E:814537.203	Down	15	4.0		N Wind ~ 15 Knots	None
	13:10	050114_06_9_25		Down	25	8.0			None
					AVERAGE	**4.2**	(18.8 Below Limit)		
	14:55	050114_08_1_05	N:2694957.872	Up	5	6.5		Rainy, 40 Degrees	None
	14:56	050114_08_1_15	E:814713.364	Up	15	4.0		N Wind ~25 Knots	None
	14:57	050114_08_1_25		Up	25	8.0			None
					AVERAGE	**6.2**	**26.2**		
	14:47	050114_08_9_05	N:2694087.562	Down	5	11.0		Rainy, 40 Degrees	None
	14:48	050114_08_9_15	E:814445.923	Down	15	10.0		N Wind ~25 Knots	None
	14:49	050114_08_9_25		Down	25	10.0			None
Low 15:56					**AVERAGE**	**10.3**	(15.9 Below Limit)		
	17:00	050114_10_1_05	N:2694567.491	Up	5	3.6		Rainy, 30 Degrees	None
	17:01	050114_10_1_15	E:814465.444	Up	15	5.8		N Wind ~25 Knots	None
	17:03	050114_10_1_25		Up	25	5.0			None
					AVERAGE	**4.8**	**24.8**		
	16:55	050114_10_9_05	N:2694142.560	Down	5	7.0		Rainy, 30 Degrees	None
	16:56	050114_10_9_15	E:814495.665	Down	15	7.1		N Wind ~25 Knots	None
	16:56	050114_10_9_25		Down	25	4.0			None
					AVERAGE	**6.0**	(18.8 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

1/21/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 5:05				Current		(NTUs)	Increase (NTUs)		Traffic
	6:50	050121_00_1_05	N:2694799.971	Up	5	3.1		Clear, ~5 Degrees	None
	6:50	050121_00_1_15	E:814714.437	Up	10	3.3		N Wind ~10 Knots	None
	6:51	050121_00_1_24		Up	24	3.1			None
					AVERAGE	**3.1**	**23.1**		
	7:01	050121_00_9_05	N:2694299.223	Down	5	3.0		Clear, ~5 Degrees	None
	7:02	050121_00_9_10	E:814312.363	Down	10	4.1		N Wind ~10 Knots	None
	7:03	050121_00_9_25		Down	25	3.2			None
					AVERAGE	**3.4**	(19.7 Below Limit)		
	10:08	050121_02_1_05	N:2694752.286	Up	5	1.3		Clear, ~5 Degrees	None
	10:09	050121_02_1_15	E:814846.881	Up	15	1.8		N Wind ~10 Knots	None
	10:10	050121_02_9_25		Up	25	11.5			None
					AVERAGE	**4.8**	**24.8**		
	10:15	050121_02_9_05	N:2694422.975	Down	5	3.7		Clear, ~5 Degrees	None
	10:16	050121_02_9_15	E:814648.662	Down	15	8.4		N Wind ~10 Knots	None
	10:17	050121_02_9_25		Down	25	6.8			None
Low 11:30					**AVERAGE**	**6.3**	(18.5 Below Limit)		
	12:02	050121_04_1_05	N:2694283.231	Up	5	5.5		Clear, ~10 Degrees	None
	12:03	050121_04_1_15	E:814640.500	Up	15	7.5		N Wind ~10 Knots	None
	12:03	050121_04_1_24		Up	24	5.0			None
					AVERAGE	**6.0**	**26.0**		
	12:10	050121_04_9_05	N:2694660.012	Down	5	0.4		Clear, ~10 Degrees	None
	12:11	050121_04_9_18	E:814674.386	Down	18	4.3		N Wind ~10 Knots	None
	12:12	050121_04_9_30		Down	30	9.0			None
					AVERAGE	**4.6**	(21.5 Below Limit)		
	14:27	050121_06_1_05	N:2694051.928	Up	5	0.9		Clear, ~5 Degrees	None
	14:29	050121_06_1_15	E:814564.621	Up	15	9.0		N Wind ~10 Knots	None
	14:30	050121_06_1_25		Up	25	20.0			None
					AVERAGE	**10.0**	**30.0**		
	15:39	050121_06_9_05	N:2694502.328	Down	5	12.5		Clear, ~5 Degrees	None
	15:40	050121_06_9_15	E:814707.350	Down	15	13.0		N Wind ~10 Knots	None
	15:41	050121_06_9_25		Down	25	20.5			None
					AVERAGE	**15.3**	(14.7 Below Limit)		
	16:22	050121_08_9_05	N:2694562.749	Up	5	3.0		Clear, ~5 Degrees	None
	16:22	050121_08_9_15	E:814661.380	Up	15	4.3		N Wind ~10 Knots	None
	16:23	050121_08_9_25		Up	25	4.5			None
					AVERAGE	**3.9**	**23.9**		
	16:14	050121_08_1_05	N:2694197.744	Down	5	7.5		Clear, ~5 Degrees	None
	16:15	050121_08_1_15	E:814572.742	Down	15	9.0		N Wind ~10 Knots	None
	16:16	050121_08_1_25		Down	25	14.0			None
					AVERAGE	**10.2**	(13.7 Below Limit)		
	16:27	050121_08_9a_05	N:2694197.744	Down	5	12.5		Clear, ~5 Degrees	None
	16:28	050121_08_9a_15	E:814572.742	Down	15	50.0		N Wind ~10 Knots	None
	16:29	050121_08_9a_25		Down	25	57.5			None
					AVERAGE	**40.0**	**(16.1 Above Limit)**		
	16:45	050121_08_9b	N:2694197.744	Down	15	20.0	(3.9 Below Limit)		None
High 17:24	17:00	050121_08_9b	E:814572.742	Down	15	15.0	(8.9 Below Limit)		None

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1" = 200'

100 0 100

US survey foot

NEW BEDFORD HARBOR DREDGE - PHASE II

WATER QUALITY MONITORING LOCATIONS - DISPOSAL 1/29/05 & 1/31/05

APEX ENVIRONMENTAL, INC.

1/29/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Disposal Operations

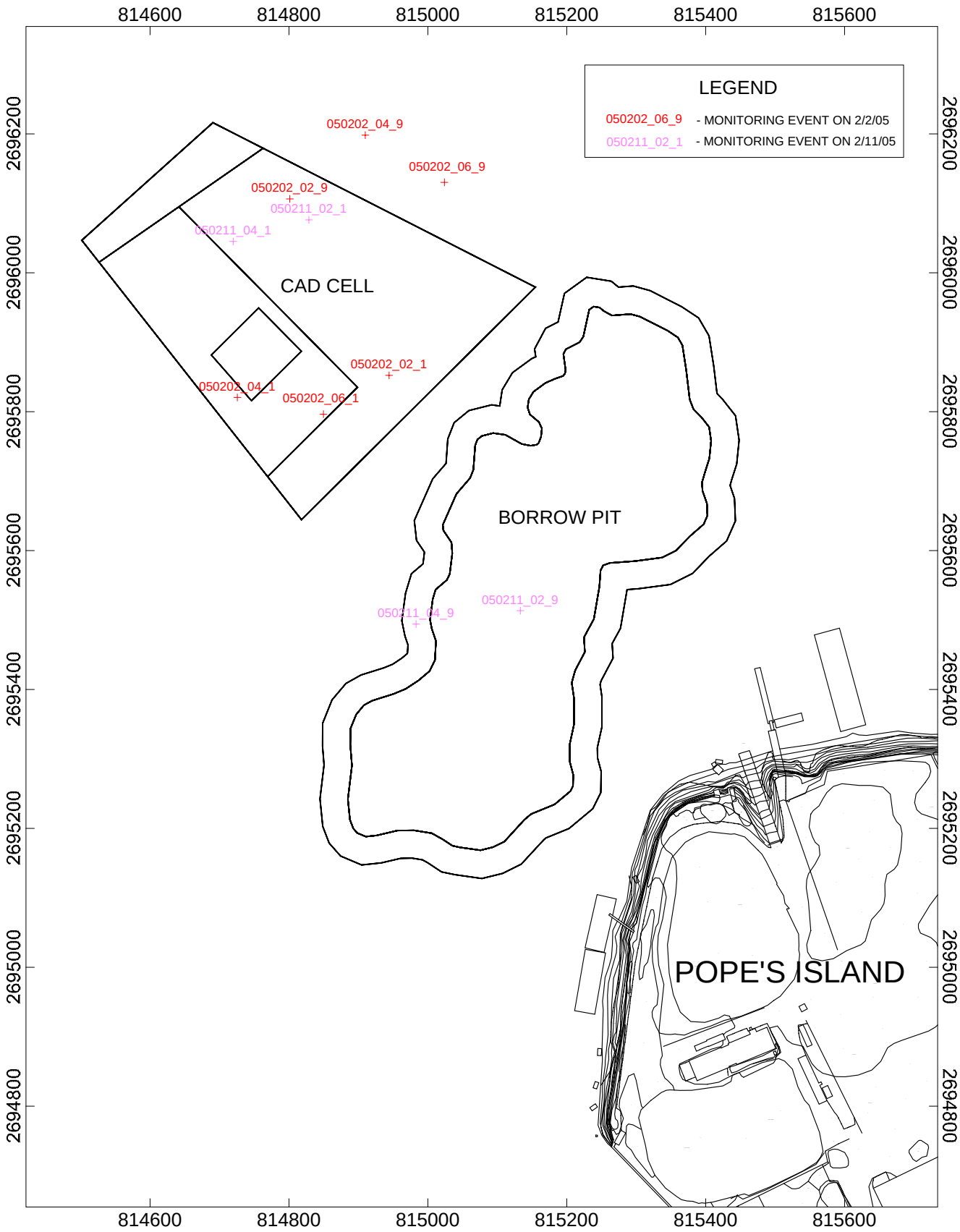
Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
10:10 High				Current		(NTUs)	Increase (NTUs)		Traffic
	14:55	050129_D1_00	Fish Island	Down	15	6.5		Clear, ~25 Degrees	None
	14:56	050129_D1_00_1	Fish Island	Down	15	6.8		N Wind ~5 Knots	
	15:10	**DISPOSAL**	**STARTED**						
					AVERAGE	**6.6**	**46.6**		
	15:20	050129_D1_10	Fish Island	Down	15	11.5		Clear, ~25 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**11.5**	(35.1 Below Limit)		
	15:23	050129_D1_20	Fish Island	Down	15	9.0		Clear, ~25 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**9.0**	(38.5 Below Limit)		
	15:35	050129_D1_30	Fish Island	Down	15	7.5		Clear, ~25 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**7.5**	(39.1 Below Limit)		
	15:41	050129_D1_40	Fish Island	Down	15	8.6		Clear, ~25 Degrees	None
								N Wind ~5 Knots	
15:51 Low					**AVERAGE**	**8.6**	(38.0 Below Limit)		
	16:15	050129_D1_60	Pope's Island	Down	10	7.8		Clear, ~20 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**7.8**	(38.8 Below Limit)		
	16:23	050129_D1_70	Pope's Island	Up	10	7.5		Clear, ~20 Degrees	None
								NW Wind ~10 Knots	
					AVERAGE	**7.5**	**47.5**		
	16:56	050129_D1_90	N:815431.19	Down	6	17.5		Clear, ~15 Degrees	X
			E:2695916.29					NW Wind ~10 Knots	
	17:00	**DISPOSAL**	**STOPPED**						
	17:02				10	17.5			None
	17:04				15	42.5			None
	17:06				18	17.5			None
					AVERAGE	**23.8**	(23.7 Below Limit)		
	17:11	050129_D1_120	N:815431.19	Down	10	22.5		Clear, ~15 Degrees	None
			E:2695916.29					NW Wind ~10 Knots	
	17:15	**DISPOSAL**	**CONTINUED**						
					AVERAGE	**22.5**	(25 Below Limit)		
	17:27	050129_D1_140	N:815431.19	Down	10	15.0		Clear, ~12 Degrees	X
	17:58		E:2695916.29	Down	10	25.0		NW Wind ~10 Knots	
					AVERAGE	**20.0**	(27.5 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

1/31/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Disposal Operations

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
15:51 Low				Current		(NTUs)	Increase (NTUs)		Traffic
	16:08	050131_D2_00	W-E Transect	Down	10	4.0		Clear, ~40 Degrees	None
	16:12				20	4.5		N Wind ~5 Knots	None
	16:16				20	3.9			None
					AVERAGE	**4.1**	**44.1**		
	16:20	050131_D2_00a	GPS Target 1621	Down	5	4.9		Clear, ~40 Degrees	None
					15	4.0		N Wind ~5 Knots	
	16:23	**DUMPING**	**STARTED**		25	3.6			
					AVERAGE	**4.2**	**44.2**		
	16:24	050131_D2_2	W-E Transect	Down	20	4.3		Clear, ~35 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**4.3**	(39.9 Below Limit)		
	16:28	050131_D2_5	E-W Transect	Down	25	3.8		Clear, ~35 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**3.8**	(40.4 Below Limit)		
	16:32	050131_D2_10	W-E Transect	Down	15	4.3		Clear, ~30 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**4.3**	(39.9 Below Limit)		
	16:35	050131_D2_15	E-W Transect	Down	5	3.8		Clear, ~30 Degrees	None
					15	4.1		N Wind ~5 Knots	
					25	3.6			
					AVERAGE	**3.8**	(40.4 Below Limit)		
	16:37	050131_D2_18	W-E Transect	In Sheen	5	5.0		Clear, ~30 Degrees	None
					15	4.2		N Wind ~5 Knots	
					25	3.8			
					AVERAGE	**4.3**	(39.9 Below Limit)		
	16:40	050131_D2_20	W-E Transect	Down	20	4.5		Clear, ~30 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**4.5**	(39.7 Below Limit)		
	16:47	050131_D2_30	E-W Transect	Down	35	3.8		Clear, ~30 Degrees	None
								N Wind ~5 Knots	
					AVERAGE	**3.8**	(40.4 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:2400

100 0 100

US survey foot

1" = 200'

NEW BEDFORD HARBOR DREDGE - PHASE II

WATER QUALITY MONITORING LOCATIONS
2/5/05 & 2/11/05

APEX ENVIRONMENTAL, INC.

2/2/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring

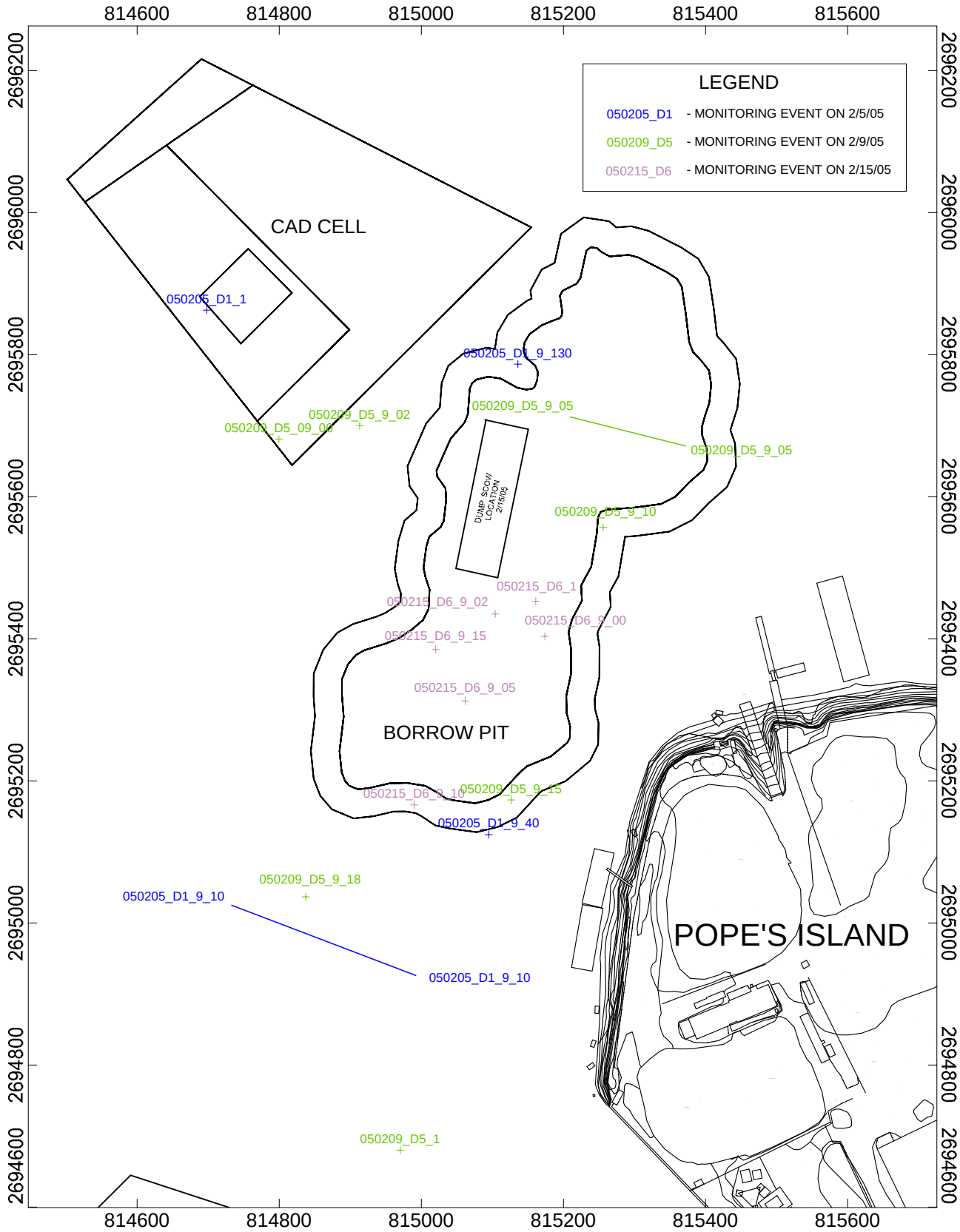
Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 5:41				Current		(NTUs)	Increase (NTUs)		Traffic
	10:27	050202_02_1	2695852.23	Up	5	5.8		Clear, ~38 Degrees	None
			814944.175		10	4.3		NE Wind ~10 Knots	
					25	3.3			
					AVERAGE	**4.4**	**24.4**		
	10:32	050202_02_9	2696106.339	Down	5	7.5		Clear, ~38 Degrees	None
			814801.221		10	11.3		NE Wind ~10 Knots	
					25	50.0			
					AVERAGE	**22.9**	(1.5 Below Limit)		
	12:42	050202_04_1	2695820.376	Up	5	2.0		Clear, ~40 Degrees	None
			814725.721		15	3.4		NE Wind ~10 Knots	
					25	3.0			
					AVERAGE	**2.8**	**22.8**		
	12:47	050202_04_9	2696198.18	Down	5	20.0		Clear, ~40 Degrees	None
			814909.93		15	15.0		NE Wind ~10 Knots	
					25	15.0			
High 13:23					**AVERAGE**	**16.7**	(6.1 Below Limit)		
	14:32	050202_06_1	2694283.231	Up	5	15.0		Clear, ~40 Degrees	None
			814925.126		15	30.0		NE Wind ~10 Knots	
					25	7.5			
					AVERAGE	**17.5**	**32.5**		
	14:27	050202_06_9	2694333.149	Down	5	3.8		Clear, ~40 Degrees	None
			814836.066		15	5.6		NE Wind ~10 Knots	
					25	7.5			
					AVERAGE	**5.6**	(26.9 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

2/11/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 9:38				Current		(NTUs)	Increase (NTUs)		Traffic
	9:39	050211_02_1	2696076.16	Up	5	6.5		Sunny, ~28 Degrees	None
			814828.76		10	11.0		NW Wind ~25 knots	None
					25	12.5			None
					AVERAGE	**10.0**	**30.0**		
	9:46	050211_02_9	2695513.409	Down	5	8.5		Sunny, ~28 Degrees	None
			815133.267		10	6.5		NW Wind ~25 knots	None
					25	14.0			None
					AVERAGE	**9.7**	(20.3 below limit)		
	12:03	050211_04_1	2696045.05	Up	5	5.3		Sunny, ~30 Degrees	None
			814719.637		15	5.5		NW Wind ~20 knots	None
					25	7.0			None
					AVERAGE	**5.9**	**25.9**		
	12:09	050211_04_9	2695494.165	Down	5	16.0		Sunny, ~30Degrees	None
			814983.059		15	19.0		NW Wind ~20 knots	None
					25	7.5			None
Low 15:21					**AVERAGE**	**14.2**	(11.7 below limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:2400

100 0 100

US survey foot

1" = 200'

NEW BEDFORD HARBOR DREDGE - PHASE II

WATER QUALITY MONITORING LOCATIONS - DISPOSAL 2/5/05, 2/9/05, 2/15/05

APEX ENVIRONMENTAL, INC.

2/5/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Disposal Operations

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 4:16				Current		(NTUs)	Increase (NTUs)		Traffic
	8:57	050205_D1_1	2695862.702	Up	5	2.7		Sunny, ~40 Deg. F	None
			814698.099		10	2.5		N Wind ~10 knots	
					22	4.0			
					AVERAGE	**3.1**	**43.1**		
	9:29	050205_D1_9_10	2694917.407	Down	5	4.0		Sunny, ~40 Deg. F	None
			815014.323		15	5.0		N Wind ~10 knots	
					25	4.0			
					AVERAGE	**4.3**	(38.8 below limit)		
	10:00	050205_D1_9_40	2695124.451	Down	20	4.0		Sunny, ~40 Deg. F	None
			815094.917		20	6.0		N Wind ~10 knots	
Low 10:41					**AVERAGE**	**5.0**	(38.1 below limit)		
	11:26	050205_D1_9_130	2695786.73	Down	10	35.0		Sunny, ~40 Deg. F	None
			815135.959					N Wind ~10 knots	
					AVERAGE	**35.0**	(8.1 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

2/9/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Disposal Operations

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 8:00				Current		(NTUs)	Increase (NTUs)		Traffic
	7:13	050209_D5_1	2694680.246	Up	5	2.8		Overcast, ~35 Deg.	None
			814970.38		10	2.5		Minimal wind	
					25	2.5			
	7:33	**DISPOSAL**	**STARTED**						
					AVERAGE	**2.6**	**42.6**		
	7:34	050209_D5_09_00	2695681.191	Down	5	3.4		Overcast, ~35 Deg.	None
			814799.558		10	3.3		Minimal wind	
					25	2.6			
					AVERAGE	**3.1**	(39.5 Below Limit)		
	7:36	050209_D5_9_02	2695700.186	Down	15	2.4		Overcast, ~35 Deg.	None
			814913.321		25	2.6		Minimal wind	
					AVERAGE	**2.5**	(40.1 Below Limit)		
	7:39	050209_D5_9_05	2695714.257	Down	15	3.1		Overcast, ~35 Deg.	None
			815195.677		25	3.3		Minimal wind	
					AVERAGE	**3.2**	(39.4 Below Limit)		
	7:42	050209_D5_9_10	2695556.76	Down	15	2.8		Overcast, ~35 Deg.	None
			815255.975		25	3.1		Minimal wind	
					AVERAGE	**2.9**	(39.7 Below Limit)		
	7:45	050209_D5_9_15	2695173.254	Down	5	3.8		Overcast, ~35 Deg.	None
			815126.475		15	7.0		Minimal wind	
					25	13.0			
					AVERAGE	**7.9**	(34.7 Below Limit)		
	7:48	050209_D5_9_18	2692864.793	Down	5	2.9		Overcast, ~35 Deg.	None
			815041.977		15	3.6		Minimal wind	
					25	2.8			
Low 14:03					**AVERAGE**	**3.1**	(39.5 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.

2/15/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Disposal Operations

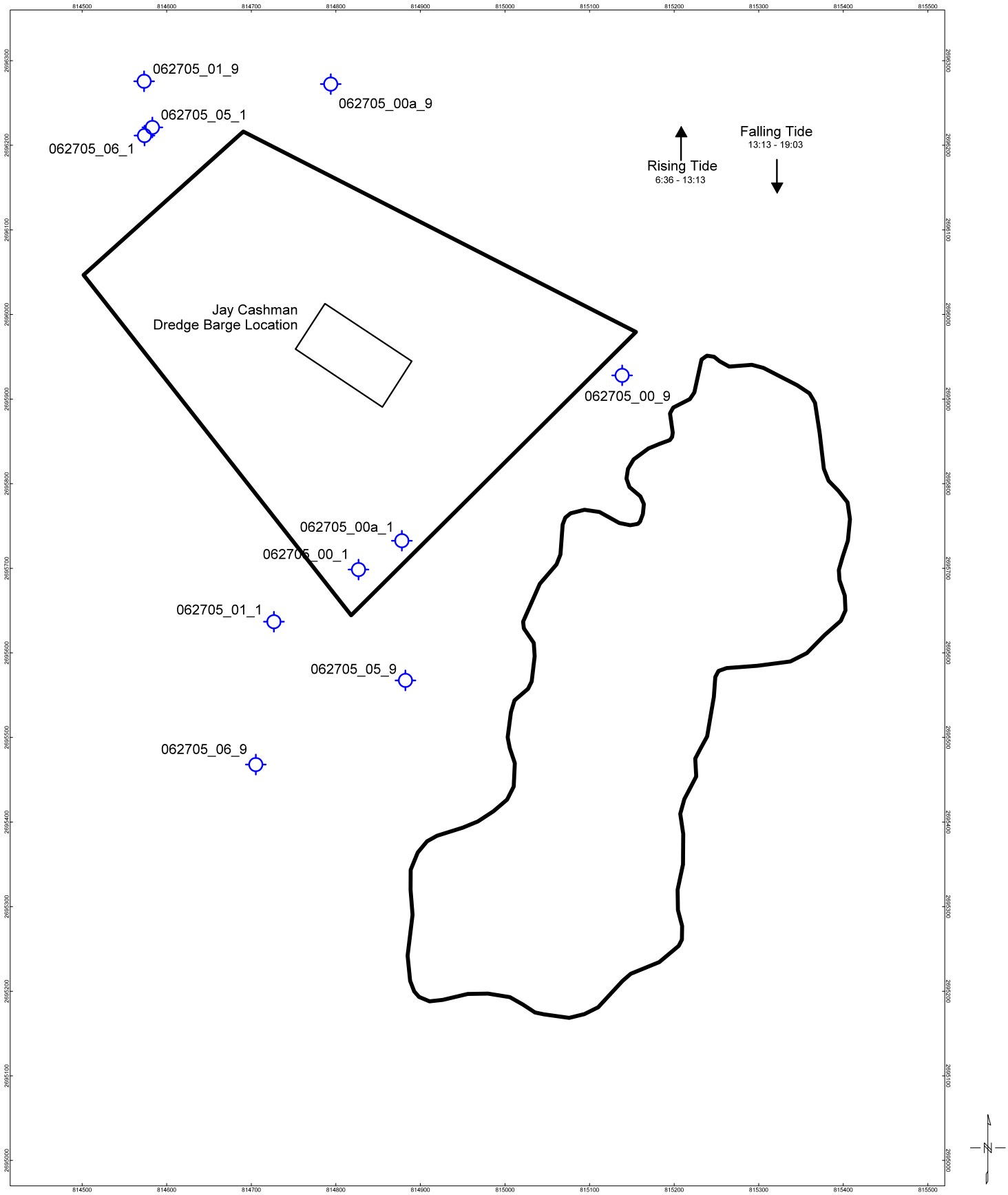
Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 13:54				Current		(NTUs)	Increase (NTUs)		Traffic
	15:42	050215_D6_1	2695452.865	Up	5	1.0		Clear, ~45 Degrees	None
			815161.014	Up	15	1.5		W Wind ~10 Knots	
				Up	25	2.8			
					AVERAGE	**1.8**	**41.8**		
	15:53	**DISPOSAL**	**STARTED**						
	15:53	050215_D6_9_00	2695440.594	Down	5	0.3		Clear, ~45 Degrees	None
			815142.875					W Wind ~10 Knots	
					AVERAGE	**0.3**	(41.5 Below Limit)		
	15:54	050215_D6_9_02	2695440.346	Down	5	0.7		Clear, ~45 Degrees	None
			815106.431		10	4.0		W Wind ~10 Knots	
					15	2.6			
					20	8.5			
					25	10.0			
					AVERAGE	**5.2**	(36.6 Below Limit)		
	15:59	050215_D6_9_05	2695312.5	Down	5	6.0		Clear, ~45 Degrees	None
			815061.745		10	8.0		W Wind ~10 Knots	
					15	9.0			
					20	11.5			
					25	10.5			
					30	10.0			
					15	11.5			
					10	9.0			
					5	7.0			
					AVERAGE	**9.2**	(32.6 Below Limit)		
	16:01	050215_D6_9_10	2695166.249	Down	5	6.5		Clear, ~45 Degrees	None
			814989.849		10	7.3		W Wind ~10 Knots	
					15	10.0			
					20	10.5			
					25	10.0			
					30	8.0			
					20	11.8			
					15	8.5			
					10	7.0			
					5	6.0			
					AVERAGE	**8.6**	(33.2 Below Limit)		
	16:05	050215_D6_9_15	2695385.098	Down	5	6.8		Clear, ~45 Degrees	None
			815020.248		10	7.0		W Wind ~5 Knots	
					15	7.5			
					20	6.5			
					25	10.5			
					30	11.9			
					25	13.0			
					20	6.5			
					15	27.5			
					10	7.3			
					5	6.3			
Low 18:54					**AVERAGE**	**10.1**	(31.7 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity

6/27/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 6:36				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	7:39	062705_00_1	814882.29	Up	5	2.3		Sunny, ~82 Degrees	None
		(Background)	2695567.46		10	2.8		W Wind 0-5 knots	
					15	2.8			
					20	2.3			
					25	2.2			
					30	2.5			
					AVERAGE	**2.5**	**22.5**		
	7:47	062705_00_9	814793.96	Down	5	7.0		Sunny, ~82 Degrees	None
			2696272.35		10	4.3		W Wind 0-5 knots	
					15	2.6			
					20	2.5			
					25	2.8			
					30	4.3			
					AVERAGE	**3.9**	(18.6 Below Limit)		
	12:13	062705_00a_1	814726.76	Up	5	2.8		Sunny, ~85 Degrees	None
		(Background)	2695636.82		10	3.5		W Wind 1-5 knots	
					15	2.4			
					20	2.1			
					25	2.2			
					30	8.5			
					AVERAGE	**3.6**	**23.6**		
	12:21	062705_00a_9	814573.74	Down	5	2.6		Sunny, ~85 Degrees	None
			2696211.51		10	2.1		W Wind 1-5 knots	
					15	5.6			
					20	4.9			
					25	5.0			
					30	5.0			
					AVERAGE	**4.2**	(19.4 Below Limit)		
	12:33	062705_01_1	814878.05	Up	5	2.9		Sunny, ~85 Degrees	None
		(Background)	2695732.56		10	2.8		W Wind 1-5 knots	
					15	2.6			
					20	2.4			
					25	2.6			
					30	4.0			
					AVERAGE	**2.9**	**22.9**		
	12:40	062705_01_9	814573.31	Down	5	2.7		Sunny, ~85 Degrees	None
			2696275.65		10	2.8		W Wind 1-5 knots	
					15	3.0			
					20	5.8			
					25	6.3			
					30	5.5			
High 13:13					**AVERAGE**	**4.3**	(18.6 Below Limit)		
Falling Tide	14:18	062705_05_1	814583.06	Up	5	3.1		Sunny, ~85 Degrees	None
		(Background)	2696221.14		10	3.3		W Wind 1-5 knots	
					15	3.2			
					20	4.8			
					25	6.8			
					30	6.3			
					AVERAGE	**4.6**	**24.6**		
	14:10	062705_05_9	814789.66	Down	5	2.5		Sunny, ~85 Degrees	None
			269578.51		10	5.5		W Wind 1-5 knots	
					15	10.0			
					20	24.0			
					25	6.5			
					30	5.0			
					AVERAGE	**8.9**	(15.7 Below Limit)		
	15:40	062705_06_1	814782.92	Up	5	3.2		Sunny, ~85 Degrees	None
		(Background)	269618.36		10	2.9		S Wind 5-10 knots	
					15	6.1			
					20	6.5			
					25	15.5			
					30	17.0			
					AVERAGE	**8.5**	**28.5**		
	15:48	062705_06_9	814705.34	Down	5	4.2		Sunny, ~85 Degrees	None
			2695467.98		10	6.3		S Wind 5-10 knots	
					15	8.0			
					20	8.5			
					25	7.8			
					30	10.0			
Low 19:03					**AVERAGE**	**7.5**	(21.0 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

25 0 25 50 75 100 125 150

US survey foot

06/27/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

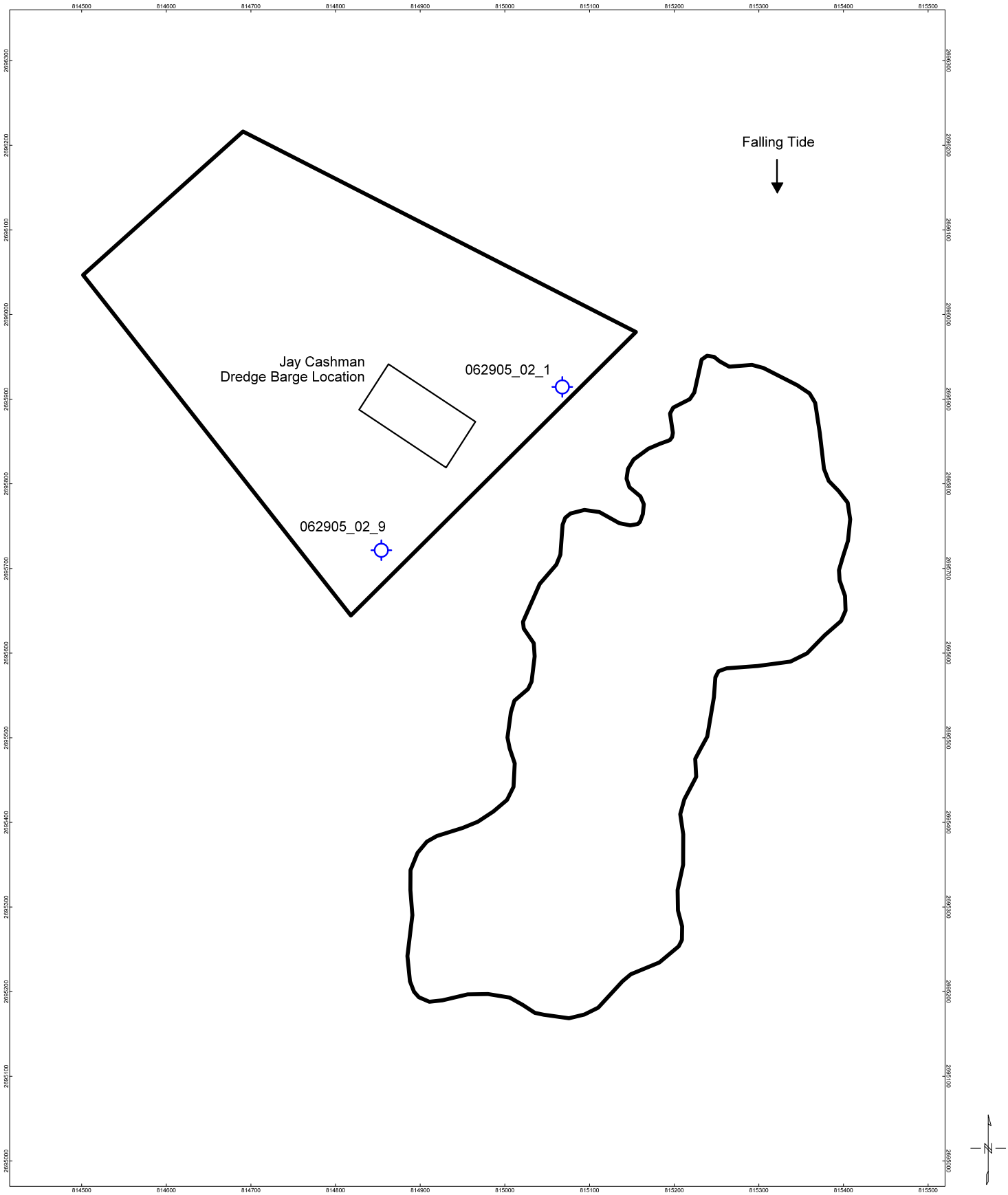
Water Quality Stations

Apex Environmental, Inc.

6/29/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 2:33				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	8:16	062905_02_1	814854.04	Up	5	4.9		Sunny, ~80 Degrees	None
		(Background)	2695721.48		10	4.8		W Wind 5-10 knots	
					15	6.3			
					20	11.0			
					25	4.7			
					30	4.3			
					AVERAGE	**6.0**	**26.0**		
	8:22	062905_02_9	815067.86	Down	5	14.0		Sunny, ~80 Degrees	None
			2695914.44		10	24.0		W Wind 5-10 knots	
					15	10.5			
					20	12.5			
					25	13.5			
					30	15.0			
Low 8:26					**AVERAGE**	**14.9**	11.1 NTUs		
							Below Permissible Turbidity Increase Limit		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

25 0 25 50 75 100 125 150

US survey foot

06/29/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

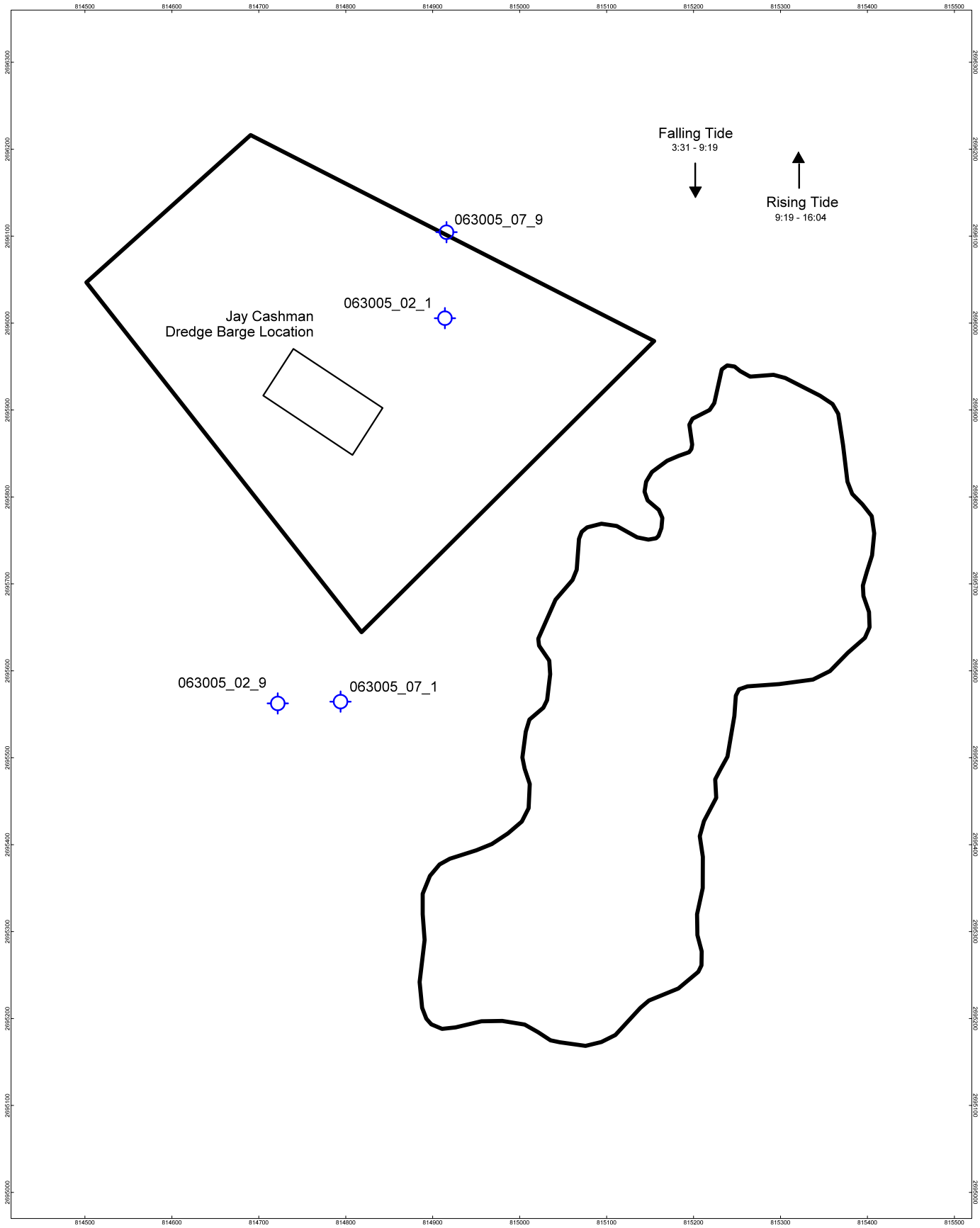
Water Quality Stations

Apex Environmental, Inc.

6/30/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 3:31				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	8:53	063005_02_1	814721.76	Up	5	5.5		Rainy, ~75 Degrees	None
		(Background)	2695562.44		10	10.0		W Wind 5-10 knots	
					15	7.0			
					20	12.0			
					25	12.5			
					30	8.5			
					AVERAGE	**9.3**	**29.3**		
	9:00	063005_02_9	814914.04	Down	5	5.0		Rainy, ~75 Degrees	None
			2696005.58		10	5.1		W Wind 5-10 knots	
					15	3.1			
					20	19.0			
					25	30.0			
					30	42.0			
Low 9:19					**AVERAGE**	**17.4**	11.9 NTUs		
Rising Tide	14:16	063005_07_1	814793.99	Up	5	1.5	Below Permissible	Rainy, ~75 Degrees	None
		(Background)	2695564.51		10	1.7	Turbidity Increase Limit	SW Wind 5-10 knots	
					15	1.6			
					20	1.7			
					25	2.1			
					30	2.0			
					AVERAGE	**1.8**	**21.8**		
	14:07	063005_07_9	814915.86	Down	5	6.0		Rainy, ~75 Degrees	None
			2696104.53		10	11.0		SW Wind 5-10 knots	
					15	9.0			
					20	12.0			
					25	9.5			
					30	9.0			
High 16:04					**AVERAGE**	**9.4**	(12.3 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

25 0 25 50 75 100 125 150

US survey feet

06/30/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

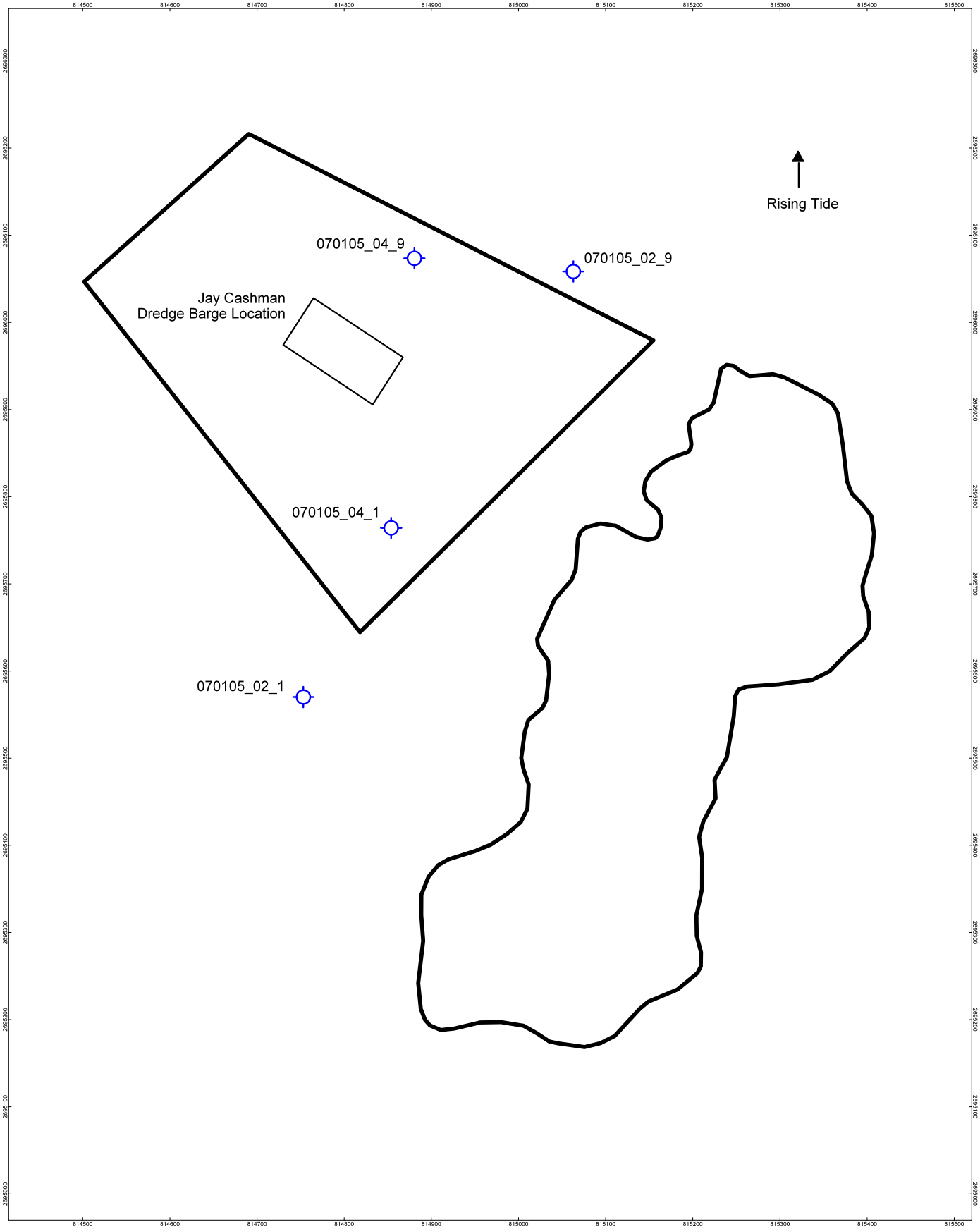
Water Quality Stations

Apex Environmental, Inc.

7/1/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 10:04				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	12:19	070105_02_1	814753.16	Up	5	3.8		Cloudy, ~72 Degrees	None
		(Background)	2695570.14		10	5.3		S Wind 5-10 knots	
					15	5.5			
					20	9.0			
					25	10.0			
					30	3.5			
					AVERAGE	6.2	26.2		
	12:28	070105_02_9	815062.91	Down	5	9.5		Cloudy, ~72 Degrees	None
			2696058.4		10	12.8		S Wind 5-10 knots	
					15	10.0			
					20	11.5			
					25	9.0			
					30	18.0			
					AVERAGE	11.8	14.4 NTUs		
	14:35	070105_04_1	814915.86	Up	5	1.9	Below Permissible	Cloudy, ~72 Degrees	None
		(Background)	2696104.53		10	2.0	Turbidity Increase Limit	S Wind 5-10 knots	
					15	2.0			
					20	1.9			
					25	5.5			
					30	12.0			
					AVERAGE	4.2	24.2		
	14:39	070105_04_9	814793.99	Down	5	22.5		Cloudy, ~72 Degrees	None
			2695564.51		10	5.7		S Wind 5-10 knots	
					15	8.0			
					20	10.2			
					25	10.0			
					30	8.7			
High 17:04					AVERAGE	10.9	(13.3 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/01/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

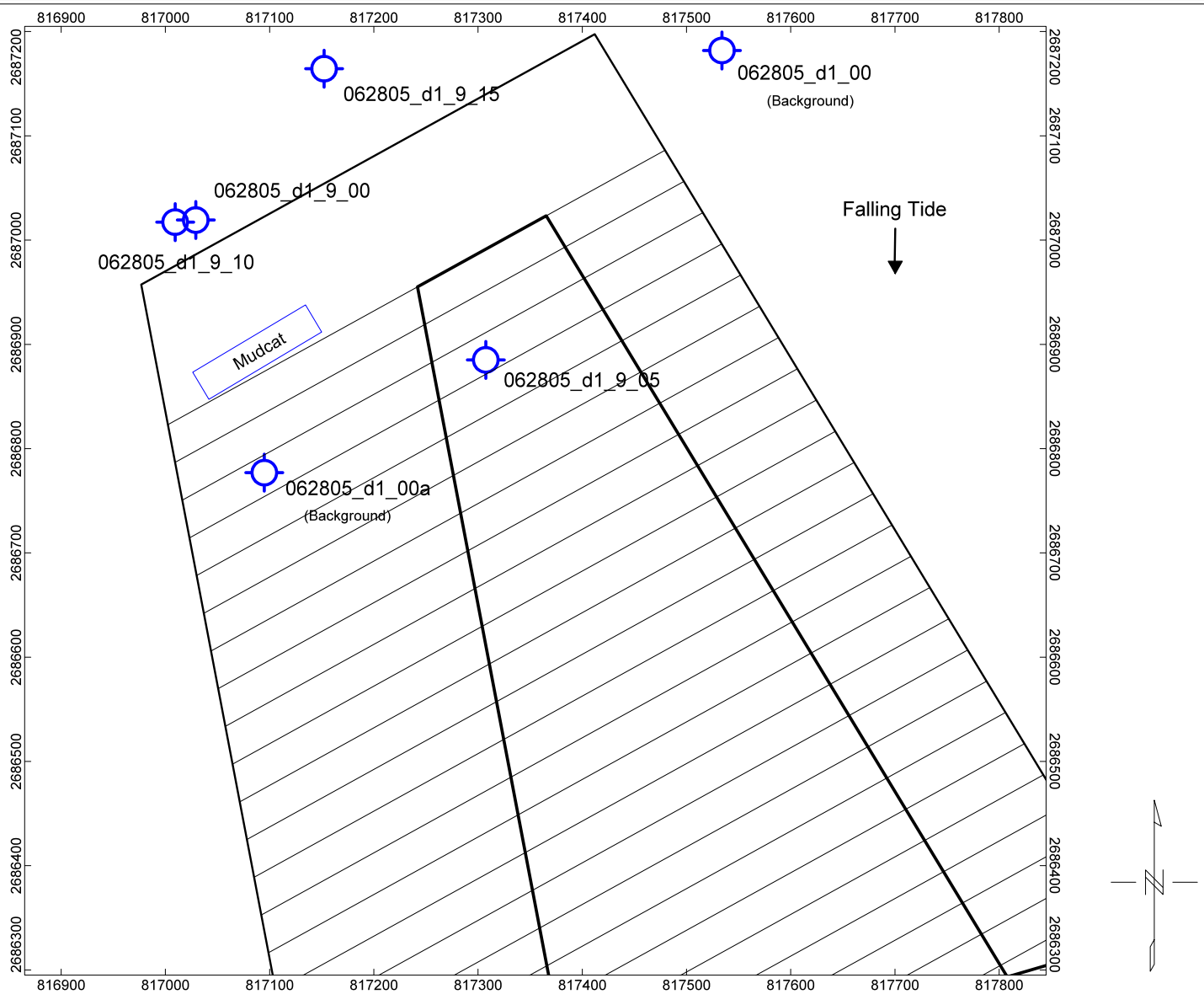
Water Quality Stations

Apex Environmental, Inc.

6/28/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 7:30				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	10:22	062805_d1_00	817780.5	Up	2	4.5		Sunny, ~85 Degrees	None
		(Background)	2687437.15		4	4.0		W Wind ~10 Knots	
					6	3.6			
					8	4.5			
					AVERAGE	4.1	44.1		
	10:46	062805_d1_00a	817159.23	Down	2	2.3		Sunny, ~85 Degrees	None
		(Background)	2686632.01		4	3.0		W Wind ~10 Knots	
					6	7.5			
					8	9.5			
					AVERAGE	2.3	42.3		
	11:30	PLACEMENT 1	STARTED						
	11:30	062805_d1_9_00	817014.81	Down	2	1.7		Sunny, ~85 Degrees	None
			2687052.69		4	3.5		W Wind ~10 Knots	
					6	5.0			
					8	6.0			
					6	4.5			
					8	2.5			
					10	3.8			
					AVERAGE	4.5	37.8 NTUs		
	11:35	062805_d1_9_05	817023.65		2	20.0	Below Permissible	Sunny, ~85 Degrees	None
			2687068.38		4	11.0	Turbidity Increase Limit	W Wind ~10 Knots	
					6	7.0			
					8	18.0			
					AVERAGE	7.3	(35.0 Below Limit)		
	11:39	062805_d1_9_10	817006.35	Down	10	6.0		Sunny, ~85 Degrees	None
			2687052.69		6	8.0		W Wind ~10 Knots	
					8	9.0			
					10	11.5			
					AVERAGE	8.6	(33.7 Below Limit)		
	11:43	062805_d1_9_15	817233.98	Down	10	5.5		Sunny, ~85 Degrees	None
			2687271.84		8	6.5		W Wind ~10 Knots	
					6	4.5			
					4	2.5			
					2	4.0			
High 14:09					AVERAGE	4.6	(37.7 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity



Scale 1:1200

50 0 50 100 150

US survey foot

06/28/05 Placement #1
OU#3 Area Water Quality Location Map

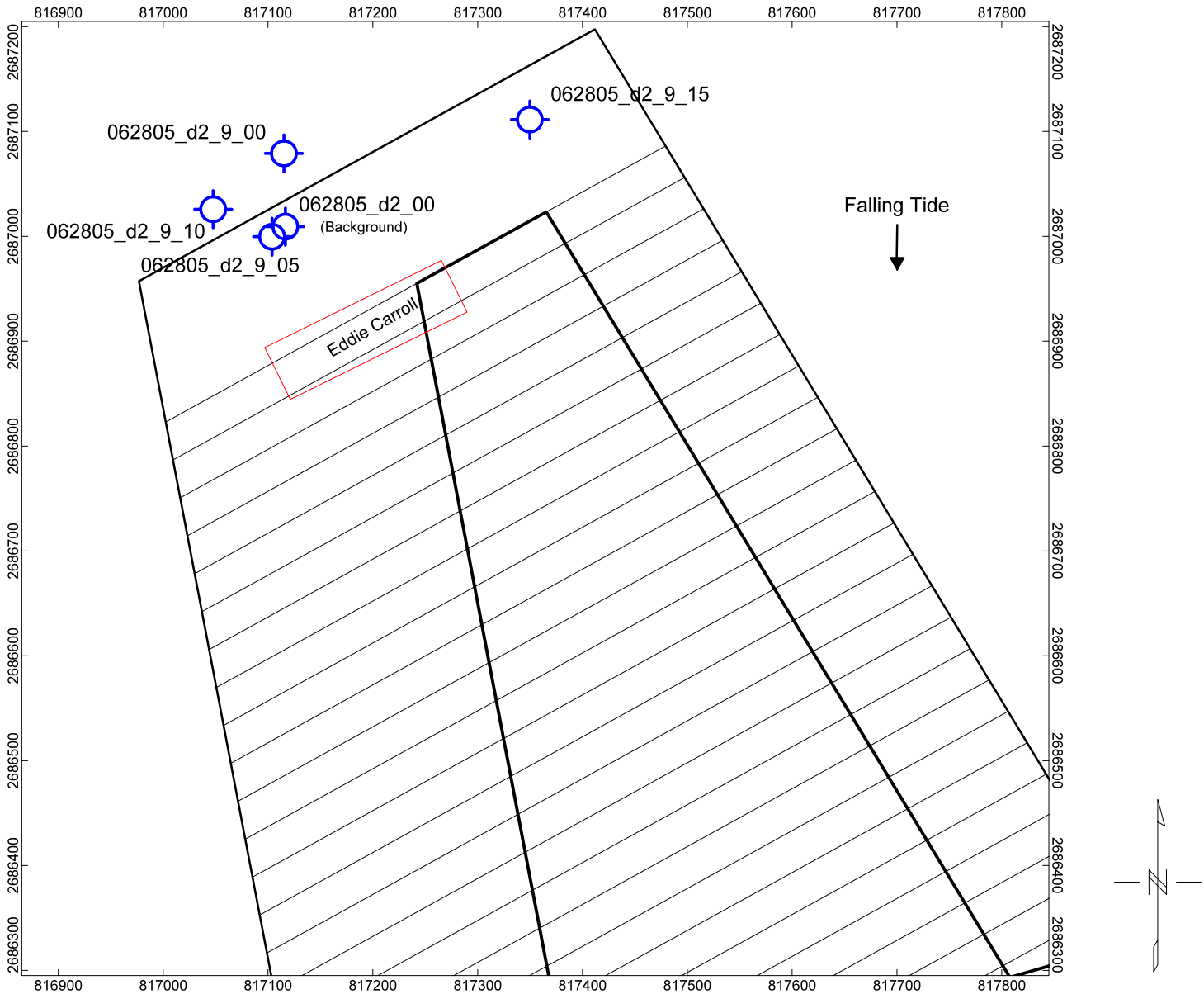
Water Quality Stations

Apex Environmental, Inc.

6/28/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OUI#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 14:09				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	14:42	062805_d2_00	817102.22	Down	2	3.5		Cloudy, ~80 Degrees	None
		(Background)	2687100.03		4	3.8		SW Wind ~10 Knots	
					6	3.9			
					8	3.7			
					AVERAGE	**3.7**	**43.7**		
	15:25	**PLACEMENT 2**	**STARTED**						
	15:25	062805_d2_9_00	817142.09	Down	2	3.4		Cloudy, ~80 Degrees	None
			2687139.84		4	3.5		SW Wind ~10 Knots	
					6	3.5			
					8	3.8			
					10	12.0			
					12	16.0			
					10	12.5			
					8	7.0			
					AVERAGE	**7.7**	36.0 NTUs		
	15:30	062805_d2_9_05	817142.2	Down	8	7.5	Below Permissible	Cloudy, ~80 Degrees	None
			2687080.87		6	13.0	Turbidity Increase Limit	SW Wind ~10 Knots	
					4	12.0			
					8	27.0			
					10	34.0			
					8	15.0			
					6	5.0			
					AVERAGE	**16.2**	(27.5 Below Limit)		
	15:35	062805_d2_9_10	817154.12	Down	10	27.0		Sunny, ~85 Degrees	None
			2687090.14		8	13.0		W Wind ~10 Knots	
					6	4.0			
					4	0.7			
					2	0.3			
					4	0.5			
					6	2.5			
					8	11.5			
					10	25.0			
					AVERAGE	**9.4**	(34.3 Below Limit)		
	15:40	062805_d2_9_15	817355.87	Down	2	0.4		Sunny, ~85 Degrees	None
			2687144.62		4	0.5		W Wind ~10 Knots	
					6	1.0			
					8	1.8			
					10	2.3			
Low 20:45					**AVERAGE**	**6.0**	(37.7 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity



Scale 1:1200

50 0 50 100 150

US survey foot

06/28/05 Placement #2
OU#3 Area Water Quality Location Map

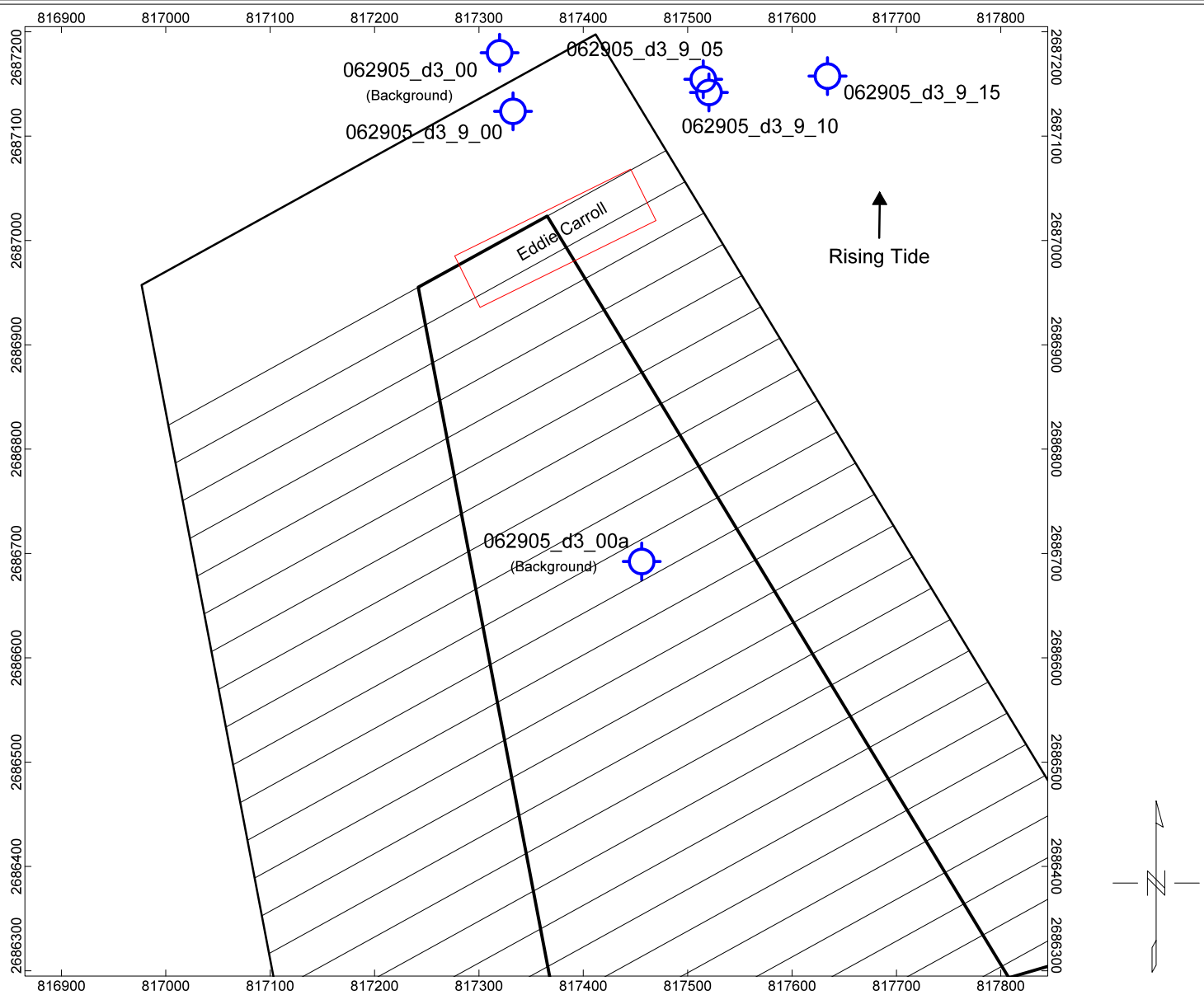
Water Quality Stations

Apex Environmental, Inc.

6/29/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 8:26				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	8:42	062905_d3_00	817378.02	Up	2	2.0		Hazy, ~80 Degrees	None
		(Background)	2687268.54		4	1.9		SW Wind ~10 Knots	
					6	2.0			
					8	2.3			
					AVERAGE	2.0	42.0		
	9:09	062905_d3_00a	817461.49	Down	2	1.8		Hazy, ~80 Degrees	None
		(Background)	2686770.79		4	2.1		SW Wind ~10 Knots	
					6	2.5			
					8	2.5			
					AVERAGE	2.2	42.2		
	9:12	PLACEMENT 3	STARTED						
	9:12	062905_d3_9_00	817382.95	Down	2	7.0		Hazy, ~80 Degrees	None
			2687227.96		4	2.0		SW Wind ~10 Knots	
					6	2.3			
					8	7.0			
					6	6.5			
					AVERAGE	5.0	37.0 NTUs		
	9:17	062905_d3_9_05	817549.98	Down	2	6.0	Below Permissible	Hazy, ~80 Degrees	None
			2687276.36		4	8.5	Turbidity Increase Limit	SW Wind ~10 Knots	
					6	7.0			
					8	10.5			
					6	11.0			
					4	4.5			
					AVERAGE	7.9	(34.1 Below Limit)		
	9:22	062905_d3_9_10	817558.03	Down	2	7.5		Hazy, ~80 Degrees	None
			2687268.82		4	9.0		SW Wind ~10 Knots	
					6	8.0			
					8	10.0			
					AVERAGE	8.5	(33.6 Below Limit)		
	9:26	062905_d3_9_15	817608.51	Down	2	6.0		Hazy, ~80 Degrees	None
			2687283.65		4	8.5		SW Wind ~10 Knots	
					6	9.0			
					8	10.0			
High 4:14					AVERAGE	8.4	(33.7 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidit



Scale 1:1200

50 0 50 100 150

US survey foot

06/29/05 Placement #3
OU#3 Area Water Quality Location Map

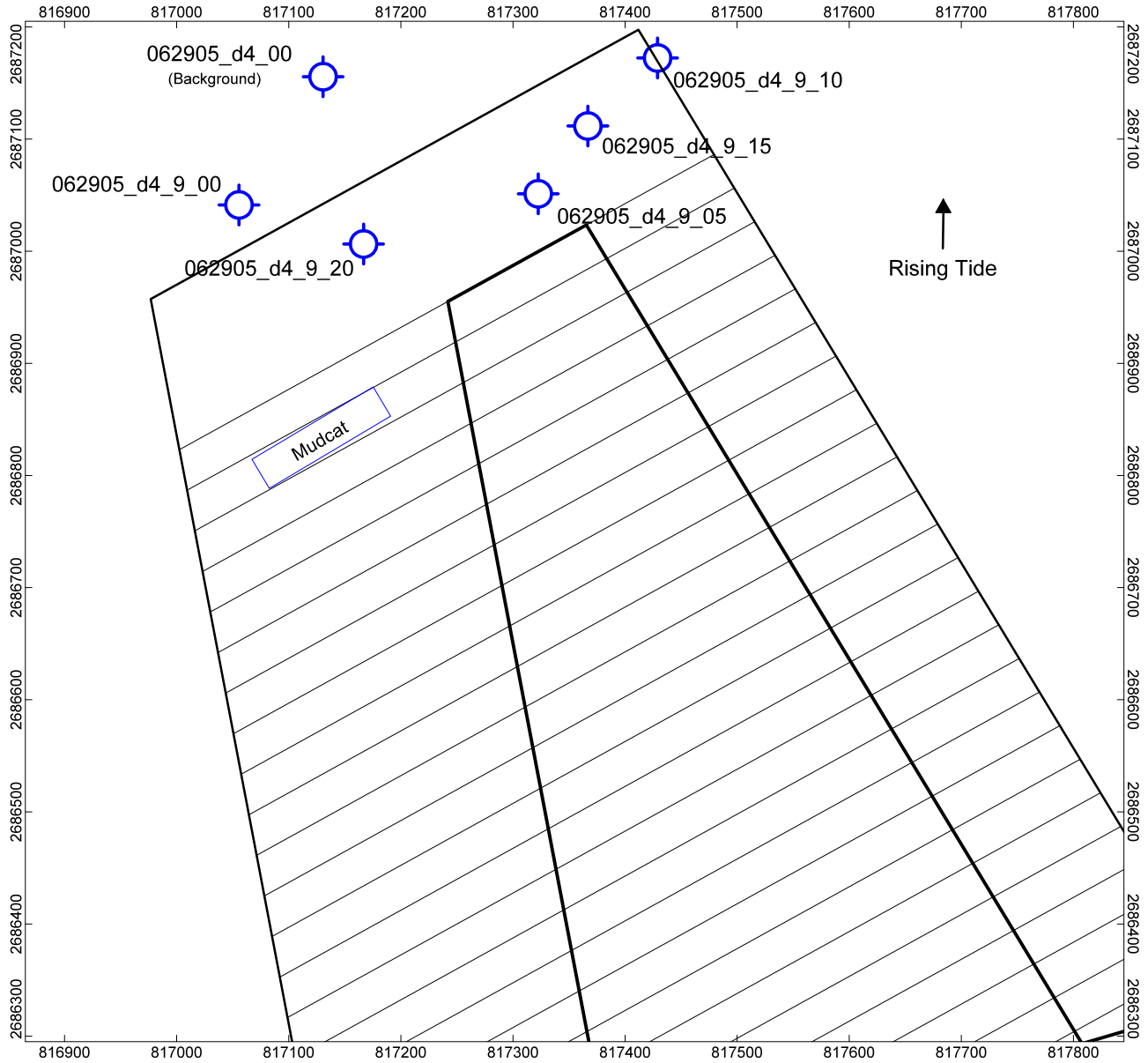
Water Quality Stations

Apex Environmental, Inc.

6/29/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 8:26				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	11:38	062905_d4_00	817169.09	Up	2	11.0		Sunny, ~80 Degrees	None
		(Background)	2687165.38		4	12.0		SW Wind ~10 Knots	
					6	12.5			
					8	11.9			
					AVERAGE	11.9	51.9		
	12:09	PLACEMENT 4	STARTED						
	12:09	062905_d4_9_00	817196.47	Down	2	1.8		Sunny, ~80 Degrees	None
			2687034.69		4	2.1		SW Wind ~10 Knots	
					6	2.5			
					8	2.5			
					AVERAGE	2.2	49.7 NTUs		
	12:14	062905_d4_9_05	817328.15	Down	2	16.0	Below Permissible	Sunny, ~80 Degrees	None
			2687051.98		4	17.0	Turbidity Increase Limit	SW Wind ~10 Knots	
					6	12.0			
					8	11.0			
					6	7.6			
					8	14.0			
					AVERAGE	12.9	(39.0 Below Limit)		
	12:19	062905_d4_9_10	817441.07	Down	2	14.0		Sunny, ~80 Degrees	None
			2687198.78		4	16.0		SW Wind ~10 Knots	
					6	23.0			
					8	28.0			
					6	30.0			
					AVERAGE	22.2	(29.7 Below Limit)		
	12:24	062905_d4_9_15	817386.58	Down	2	12.5		Sunny, ~80 Degrees	None
			2687114.23		4	8.0		SW Wind ~10 Knots	
					6	7.0			
					8	30.0			
					6	11.0			
					8	35.0			
					AVERAGE	18.0	(33.9 Below Limit)		
	12:29	062905_d4_9_20	817401.1	Down	2	12.0		Sunny, ~80 Degrees	None
			268147.32		4	13.0		SW Wind ~10 Knots	
					6	10.0			
					8	20.0			
					6	16.0			
					4	8.0			
					6	7.5			
					8	5.0			
High 4:14					AVERAGE	12.2	(39.7 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity



Scale 1:1200

50 0 50 100 150

US survey foot

06/29/05 Placement #4
OU#3 Area Water Quality Location Map

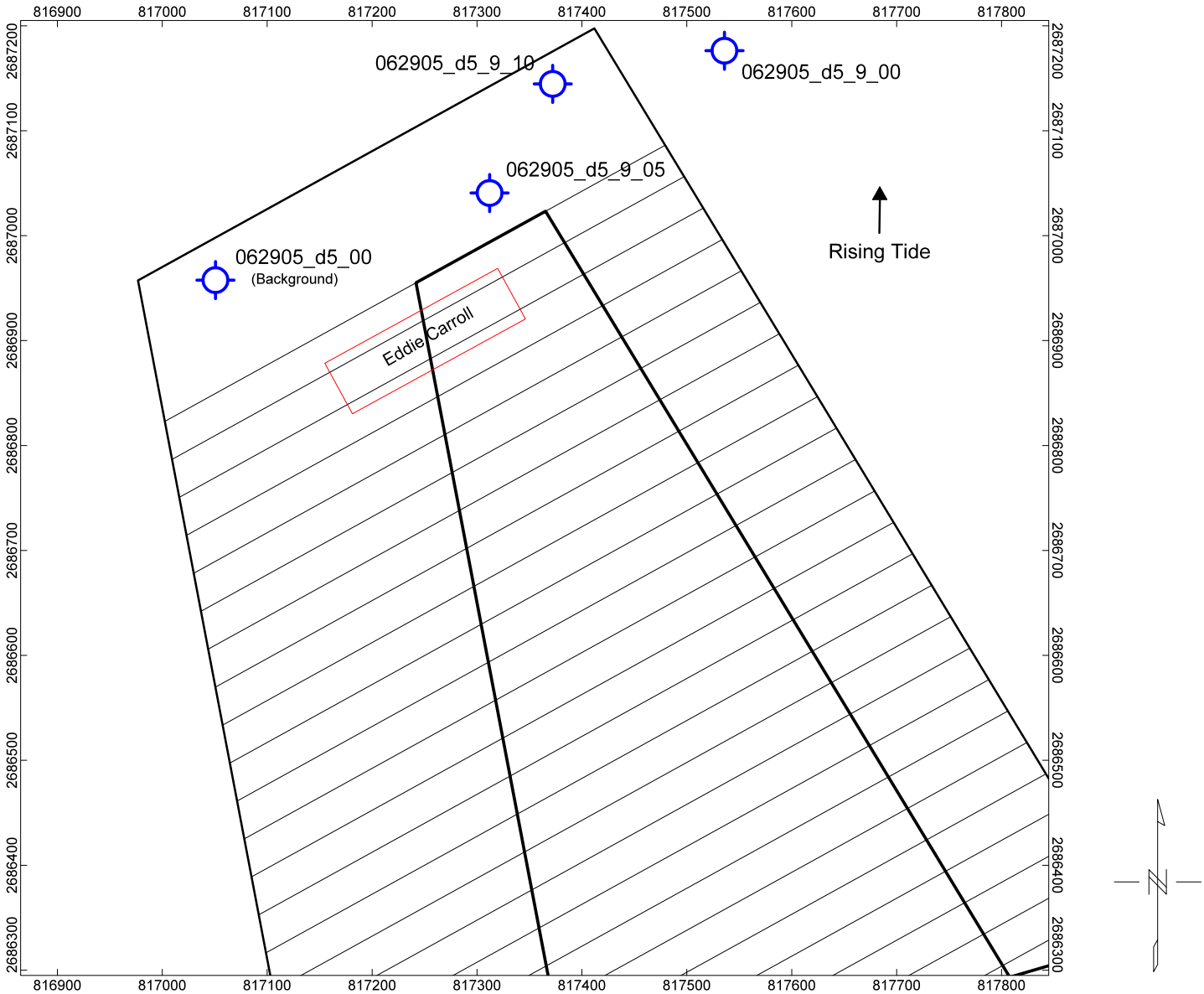
Water Quality Stations

Apex Environmental, Inc.

6/29/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 8:26				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	14:45	062905_d5_00	817088.64	Down	2	2.9		Sunny, ~80 Degrees	None
		(Background)	2687018.04		4	2.8		W Wind ~10 Knots	
					6	3.0			
					8	2.9			
					10	4.0			
					AVERAGE	**3.1**	**43.1**		
	15:13	**PLACEMENT 5**	**STARTED**						
	15:13	062905_d5_9_00	817556.14	Down	2	13.0		Sunny, ~80 Degrees	None
			2687248.75		4	10.0		W Wind ~10 Knots	
					6	11.0			
					8	21.0			
					10	35.0			
					AVERAGE	**18.0**	25.1 NTUs		
	15:18	062905_d5_9_05	817328.15	Down	2	16.0	Below Permissible	Sunny, ~80 Degrees	None
			2687051.98		4	17.0	Turbidity Increase Limit	W Wind ~10 Knots	
					6	12.0			
					8	11.0			
					6	7.6			
					8	14.0			
					AVERAGE	**12.9**	(30.2 Below Limit)		
	15:23	062905_d4_9_10	817441.07	Down	2	9.0		Sunny, ~80 Degrees	None
			2687198.78		4	12.3		W Wind ~10 Knots	
					6	14.0			
					8	55.0			
High 4:14					**AVERAGE**	**22.6**	(20.5 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity



Scale 1:1200

50 0 50 100 150

US survey foot

06/29/05 Placement #5
OU#3 Area Water Quality Location Map

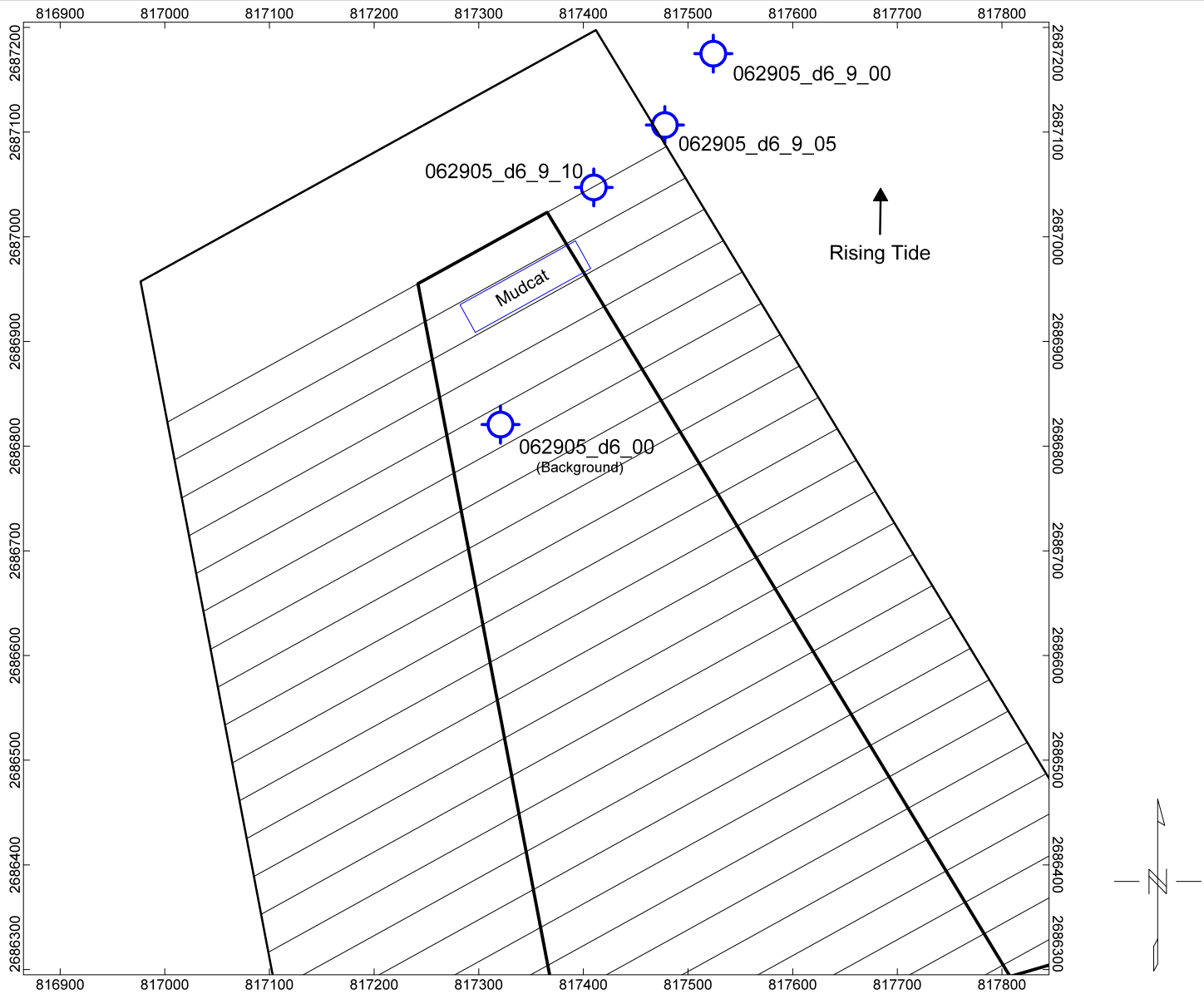
Water Quality Stations

Apex Environmental, Inc.

6/29/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 8:26				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	17:04	062905_d6_00	817140.14	Up	2	4.8		Sunny, ~80 Degrees	None
		(Background)	2682753.9		4	4.5		W Wind ~10 Knots	
					6	5.0			
					8	4.8			
					AVERAGE	4.8	44.8		
	17:09	PLACEMENT 6	STARTED						
	17:09	062905_d6_9_00	817504.71	Down	2	4.1		Sunny, ~80 Degrees	None
			2687251.9		4	6.1		W Wind ~10 Knots	
					6	4.4			
					8	5.8			
					6	5.3			
					4	5.6			
					AVERAGE	5.2	39.6 NTUs		
	17:14	062905_d6_9_05	817498.04	Down	2	16.0	Below Permissible	Sunny, ~80 Degrees	None
			2687155.56		4	17.0	Turbidity Increase Limit	W Wind ~10 Knots	
					6	12.0			
					8	11.0			
					6	7.6			
					4	14.0			
					AVERAGE	12.9	(31.9 Below Limit)		
	15:23	062905_d6_9_10	817402.84	Down	2	5.8		Sunny, ~80 Degrees	None
			2687051.81		4	6.2		W Wind ~10 Knots	
					6	9.5			
					8	10.0			
High 4:14					AVERAGE	7.9	(36.9 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity



Scale 1:1200

50 0 50 100 150

US survey foot

06/29/05 Placement #6
OU#3 Area Water Quality Location Map

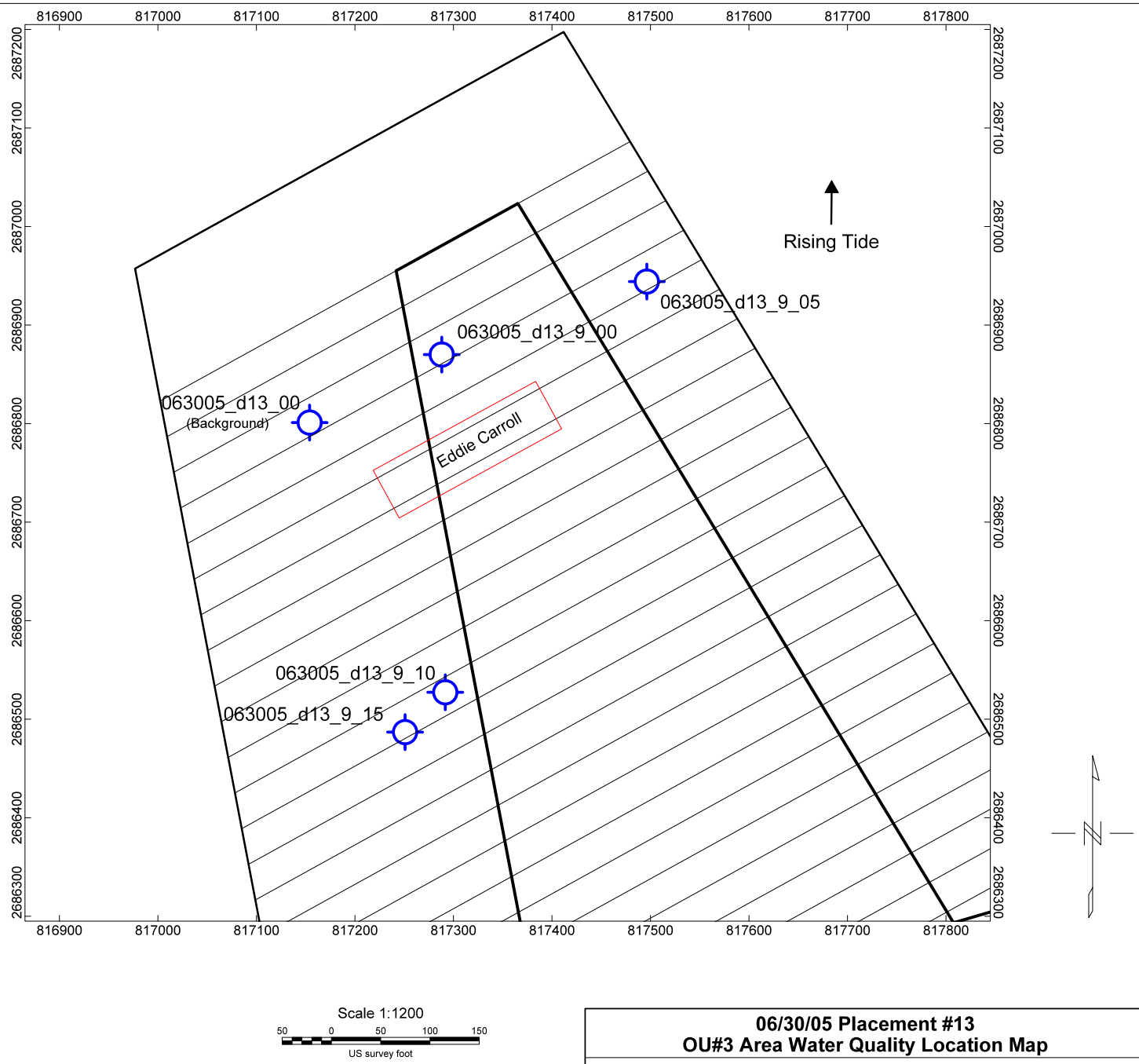
Water Quality Stations

Apex Environmental, Inc.

6/30/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 8:26				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	12:56	063005_d13_00	817140.14	Down	2	3.3		Cloudy, ~70 Degrees	None
		(Background)	2682753.9		4	3.5		W Wind ~10 Knots	
					6	7.5			
					8	8.0			
					AVERAGE	**5.6**	**45.6**		
	13:05	**PLACEMENT 13**	**STARTED**						
	13:05	063005_d13_9_00	817504.71	Down	2	6.5		Cloudy, ~70 Degrees	None
			2687251.9		4	6.9		W Wind ~10 Knots	
					6	8.0			
					8	8.5			
					6	15.0			
					4	9.5			
					2	8.5			
					AVERAGE	**9.0**	36.6 NTUs		
	13:09	063005_d13_9_05	817498.04	Down	2	8.5	Below Permissible	Cloudy, ~70 Degrees	None
			2687155.56		4	7.5	Turbidity Increase Limit	W Wind ~10 Knots	
					6	7.0			
					8	10.1			
					6	13.3			
					4	12.0			
					2	5.0			
					AVERAGE	**9.0**	(36.6 Below Limit)		
	13:20	063005_d13_9_10	817402.84	Up	2	4.0		Cloudy, ~70 Degrees	None
			2687051.81		4	3.8		W Wind ~10 Knots	
					6	4.5			
					8	6.0			
					AVERAGE	**4.6**	(41.0 Below Limit)		
	13:25	063005_d13_9_15		Up	2	10		Cloudy, ~70 Degrees	None
					4	12.5		W Wind ~10 Knots	
					6	16.75			
					8	6.5			
					6	5.9			
					8	5.7			
High 15:06					**AVERAGE**	**8.7**	(36.9 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



06/30/05 Placement #13
OU#3 Area Water Quality Location Map

Water Quality Stations

Apex Environmental, Inc.

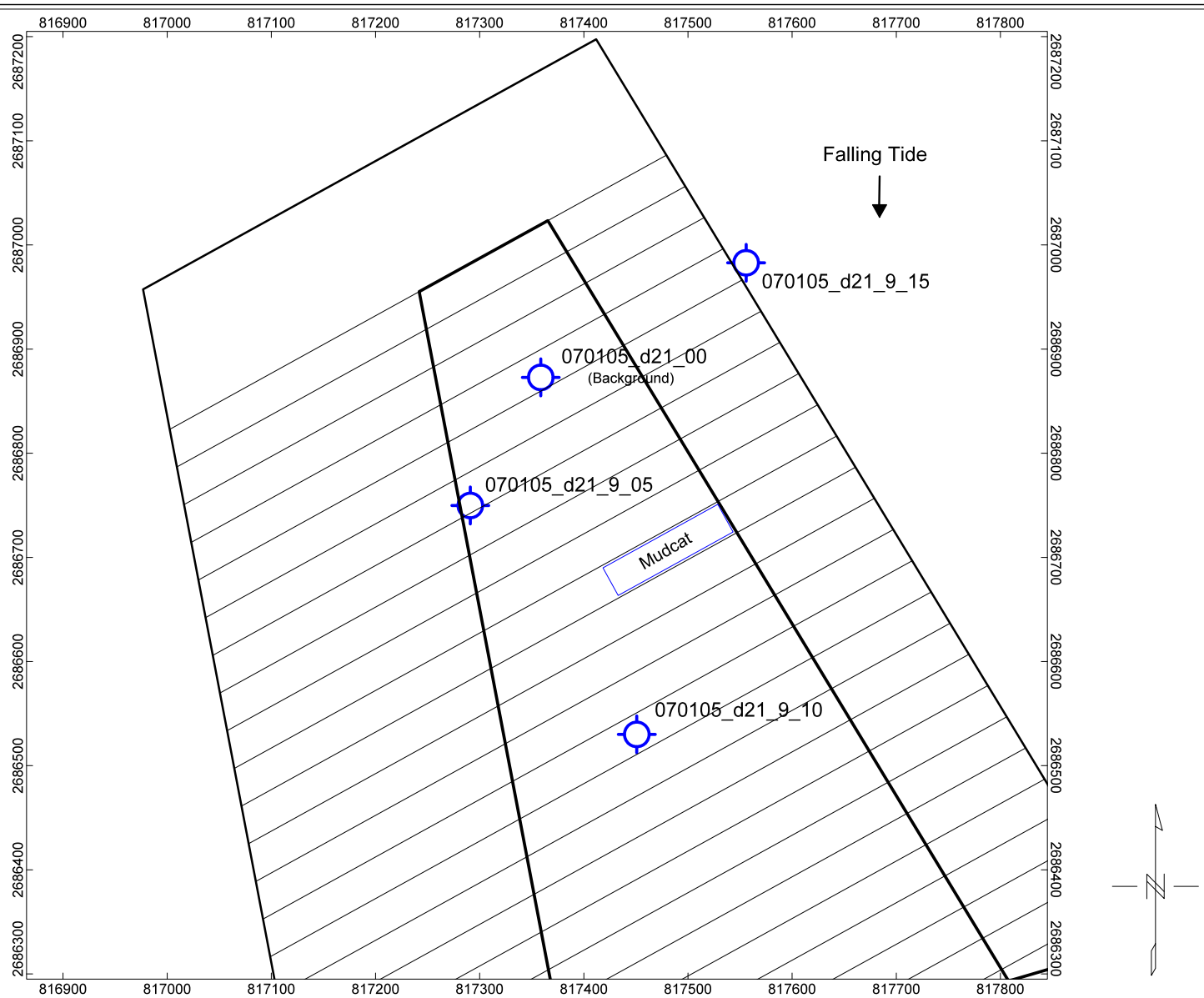
7/1/2005

New Bedford Harbor Dredge Project - Phase II

Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 10:04				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	10:36	070105_d21_00	817562.15	Up	2	3.5		Cloudy, ~72 Degrees	None
		(Background)	2686529.48		4	3.0		S Wind ~10 Knots	
					6	3.5			
					8	4.0			
					10	7.5			
					AVERAGE	**4.3**	**44.3**		
	10:37	**PLACEMENT 21**	**STARTED**						
	10:39	070105_d21_9_05	817284.95	Up	2	14.3		Cloudy, ~72 Degrees	None
			2686765.33		4	19.0		S Wind ~10 Knots	
					6	21.0			
					8	6.0			
					AVERAGE	**15.1**	29.2 NTUs		
	10:45	070105_d21_9_10	817348.66	Down	2	22.5	Below Permissible	Cloudy, ~72 Degrees	None
			2686862.68		4	24.5	Turbidity Increase Limit	S Wind ~10 Knots	
					6	8.1			
					7	6.0			
					AVERAGE	**15.3**	(29.0 Below Limit)		
	10:49	070105_d21_9_15	817578.57	Up	2	6.8		Cloudy, ~72 Degrees	None
			2686934.87		4	11.0		S Wind ~10 Knots	
					6	24.0			
					8	30.0			
Low 17:03					**AVERAGE**	**18.0**	(26.3 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:1200

50 0 50 100 150

US survey foot

07/01/05 Placement #21
OU#3 Area Water Quality Location Map

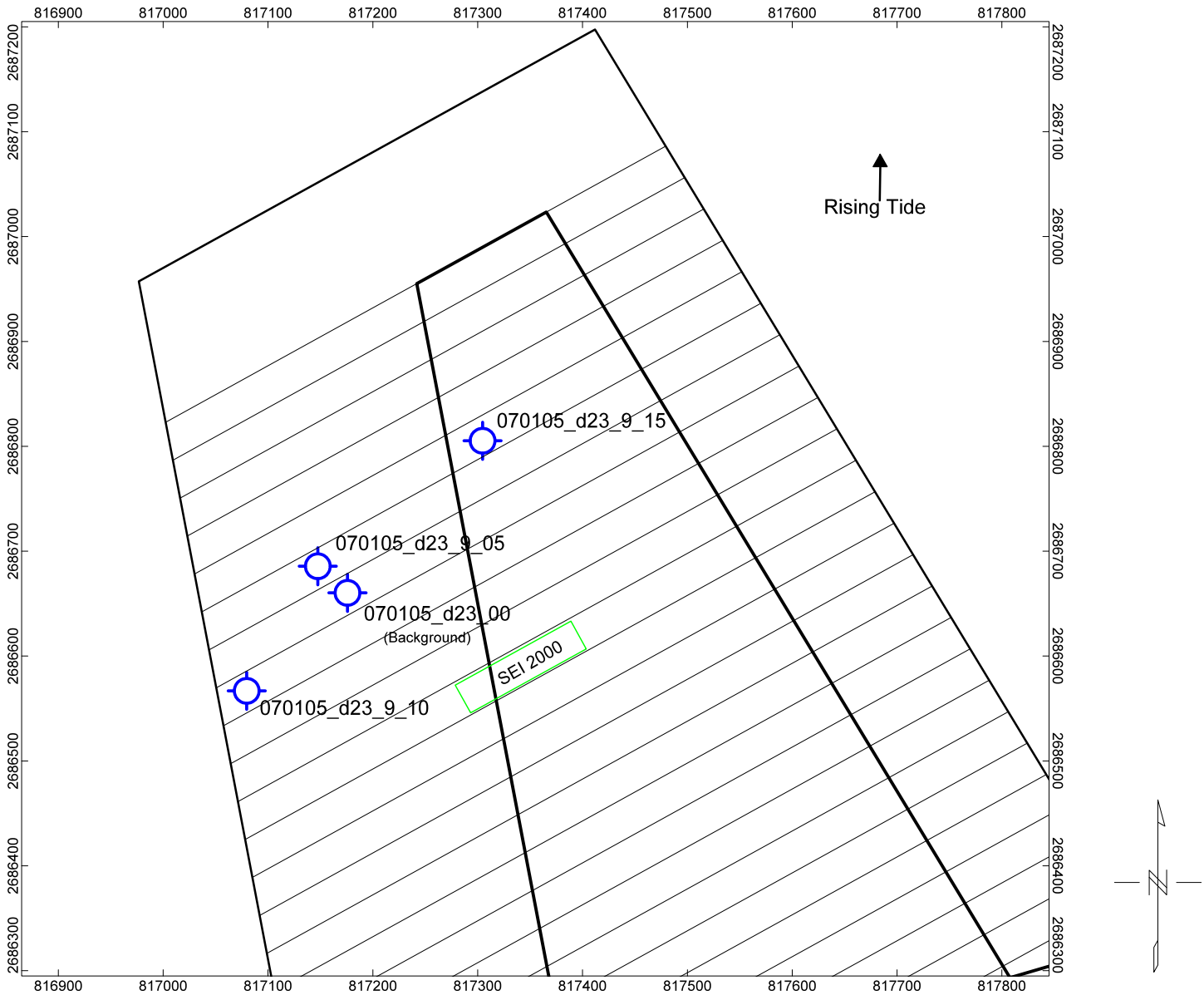
Water Quality Stations

Apex Environmental, Inc.

7/1/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 10:04				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	12:42	070105_d23_00	817329.23	Down	2	3.8		Cloudy, ~75 Degrees	None
		(Background)	2686350.62		4	4.0		S Wind ~10 Knots	
					6	3.5			
					8	4.3			
					AVERAGE	3.9	43.9		
	13:18	PLACEMENT 23	STARTED						
	13:18	070105_d23_9_05	817190.63	Down	2	9.0		Cloudy, ~75 Degrees	None
			2686732.17		4	8.5		S Wind ~10 Knots	
					6	10.0			
					8	7.5			
					AVERAGE	8.8	35.1 NTUs		
	13:22	070105_d23_9_10	817087.58	Down	2	12.0	Below Permissible	Cloudy, ~75 Degrees	None
			2686622.32		4	15.5	Turbidity Increase Limit	S Wind ~10 Knots	
					6	14.0			
					8	16.3			
					AVERAGE	14.4	(29.5 Below Limit)		
	13:32	070105_d23_9_15	817348.05	Down	2	9.3		Cloudy, ~75 Degrees	None
			2686808.55		4	9.8		S Wind ~10 Knots	
					6	10.0			
					8	11.5			
High 17:03					AVERAGE	10.1	(33.8 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:1200

50 0 50 100 150

US survey foot

07/01/05 Placement #23
OU#3 Area Water Quality Location Map

Water Quality Stations

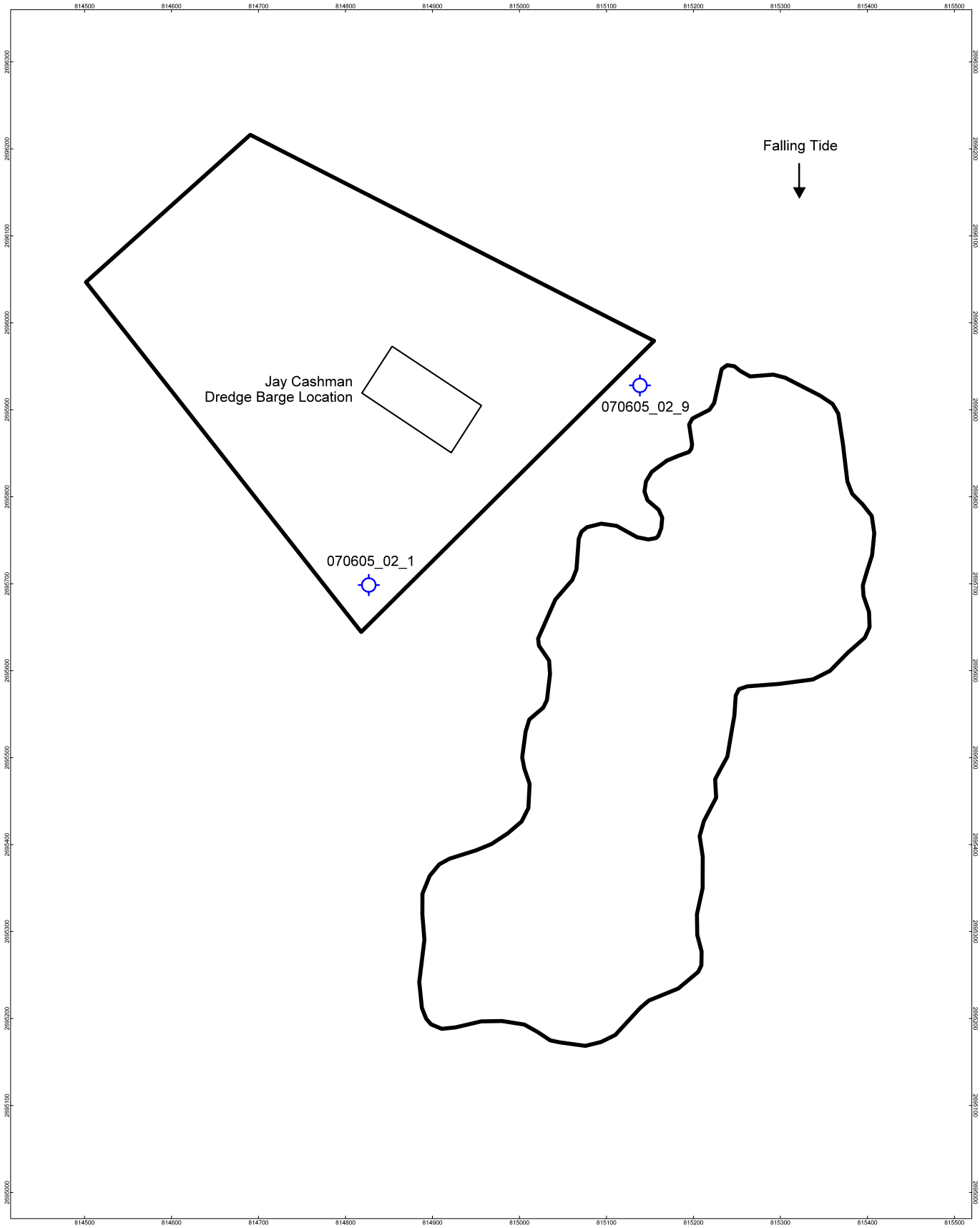
Apex Environmental, Inc.

7/6/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 8:40				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	12:00	070605_02_1	814826.81	Up	5	2.8		Cloudy, ~80 Degrees	None
		(Background)	2695698.48		10	2.5		S Wind 1-5 knots	
					15	4.7			
					20	6.0			
					25	6.0			
					30	3.5			
					AVERAGE	4.3	24.3		
	11:50	070605_02_9	815138.52	Down	5	9.5		Cloudy, ~80 Degrees	None
			2695928.02		10	10.0		S Wind 1-5 knots	
					15	14.5			
					20	21.5			
					25	10.5			
					30	9.0			
Low 13:40					AVERAGE	12.5	11.8 NTUs		

Below Permissible
Turbidity Increase Limit

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

25 0 25 50 75 100 125 150

US survey foot

07/06/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

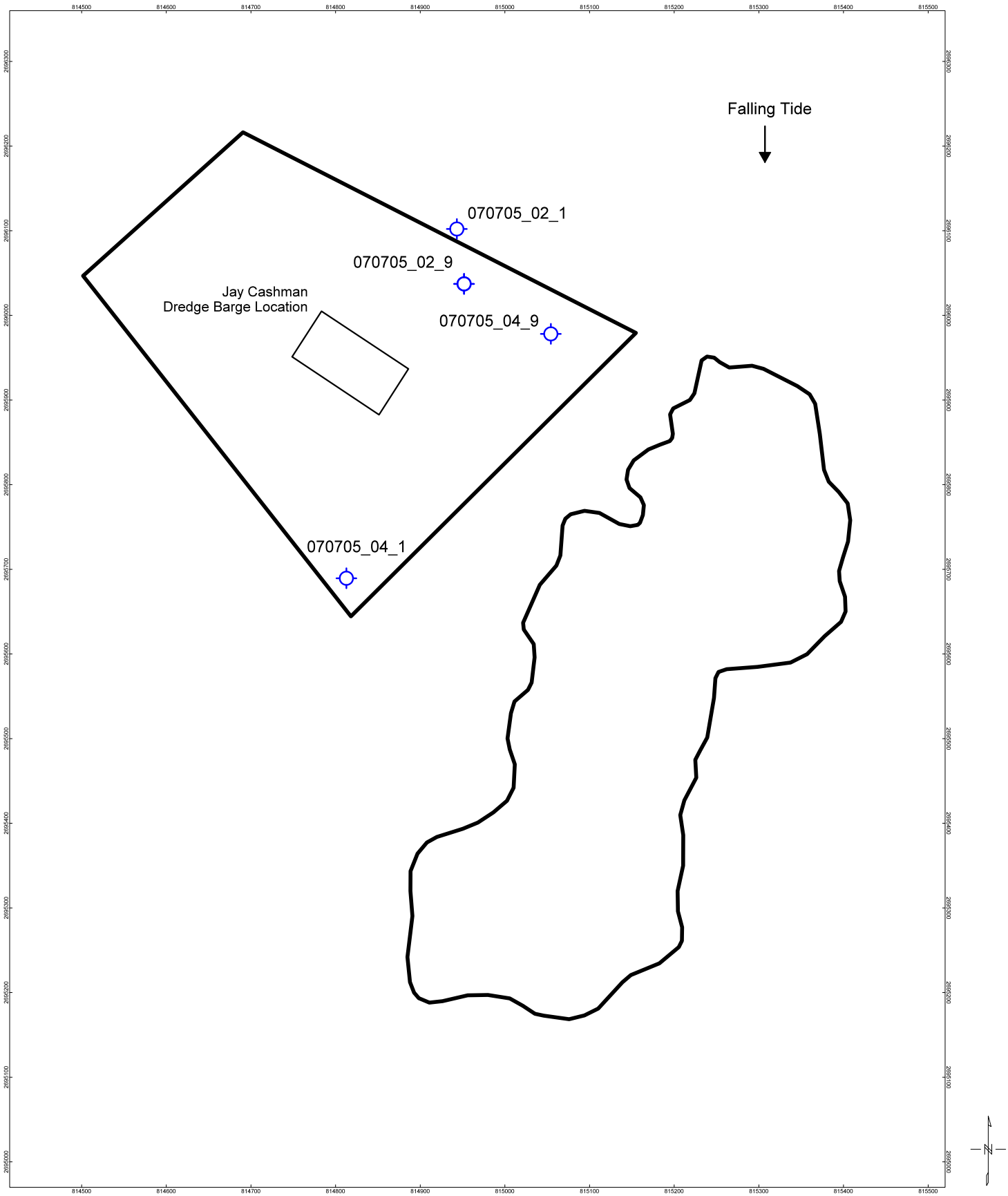
Water Quality Stations

Apex Environmental, Inc.

7/7/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 9:21				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	11:56	070705_02_1	814943.23	Up	5	5.5		Cloudy, ~70 Degrees	None
		(Background)	2696102.07		10	6.0		N Wind 5-15 knots	
					15	6.3			
					20	11.0			
					25	17.0			
					30	22.5			
					AVERAGE	**11.4**	**31.4**		
	12:05	070705_02_9	815780.97	Down	5	6.5		Cloudy, ~70 Degrees	None
			2695561.53		10	8.0		N Wind 5-15 knots	
					15	7.5			
					20	9.5			
					25	13.5			
					30	7.5			
					AVERAGE	**8.8**	22.6 NTUs		
	13:17	070705_04_1	814951.76	Up	5	6.5	Below Permissible	Cloudy, ~70 Degrees	None
		(Background)	2696037.2		10	6.5	Turbidity Increase Limit	N Wind 5-15 knots	
					15	22.0			
					20	11.7			
					25	16.0			
					30	16.0			
					AVERAGE	**13.1**	**33.1**		
	13:23	070705_04_9	814812.74	Down	5	2.2		Cloudy, ~70 Degrees	None
			2695689.43		10	2.6		N Wind 5-15 knots	
					15	2.3			
					20	3.6			
					25	4.8			
					30	10			
Low 14:47					**AVERAGE**	**4.3**	(28.8 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

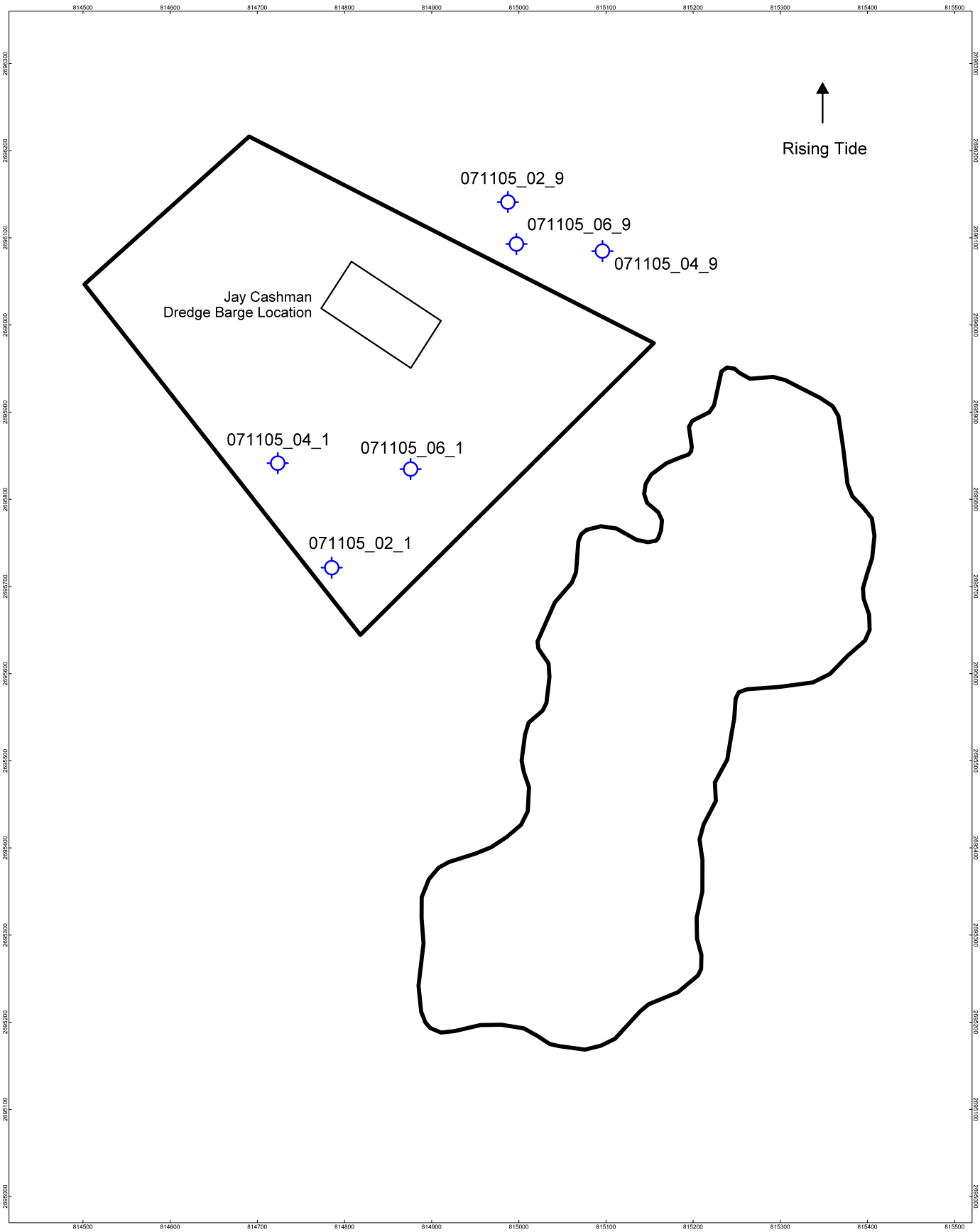
US survey foot

07/07/05 Dredge Operations Water Quality
CAD Cell Area Water Quality Monitoring Locations
Water Quality Stations
Apex Environmental, Inc.

7/11/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 5:14				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	8:43	071105_02_1	814739.92	Up	5	4.8		Sunny, ~80 Degrees	None
		(Background)	2695456.99		10	4.8		NE Wind 5-10 knots	
					15	5.0			
					20	4.2			
					25	4.4			
					30	5.5			
					AVERAGE	4.8	24.8		
	8:53	071105_02_9	814987.43	Down	5	10.5		Sunny, ~80 Degrees	None
			2696141.02		10	15.0		NE Wind 5-10 knots	
					15	7.1			
					20	35.0			
					25	11.0			
					30	22.0			
					AVERAGE	16.8	8.0 NTUs		
	10:04	071105_04_1	814982.98	Up	5	2.6	Below Permissible	Sunny, ~80 Degrees	None
		(Background)	2695576.6		10	3.0	Turbidity Increase Limit	NE Wind 5-10 knots	
					15	3.0			
					20	2.4			
					25	1.6			
					30	1.8			
					AVERAGE	2.4	22.4		
	10:15	071105_04_9	815095.87	Down	5	5.7		Sunny, ~80 Degrees	None
			2696084.83		10	5.5		NE Wind 5-10 knots	
					15	4.8			
					20	5			
					25	8.5			
					AVERAGE	5.9	(16.5 Below Limit)		
	10:46	071105_06_1	815116.14	Up	5	2.3		Sunny, ~80 Degrees	None
		(Background)	2695747.5		10	3.0		NE Wind 5-10 knots	
					15	6.0			
					20	6.5			
					25	6.5			
					30	3.5			
					AVERAGE	4.6	24.6		
	10:54	071105_06_9	814997.22	Down	5	2.8		Sunny, ~80 Degrees	None
			2696092.99		10	4.3		NE Wind 5-10 knots	
					15	5			
					20	10			
High 12:04					AVERAGE	5.5	(19.1 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

US survey foot

07/11/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

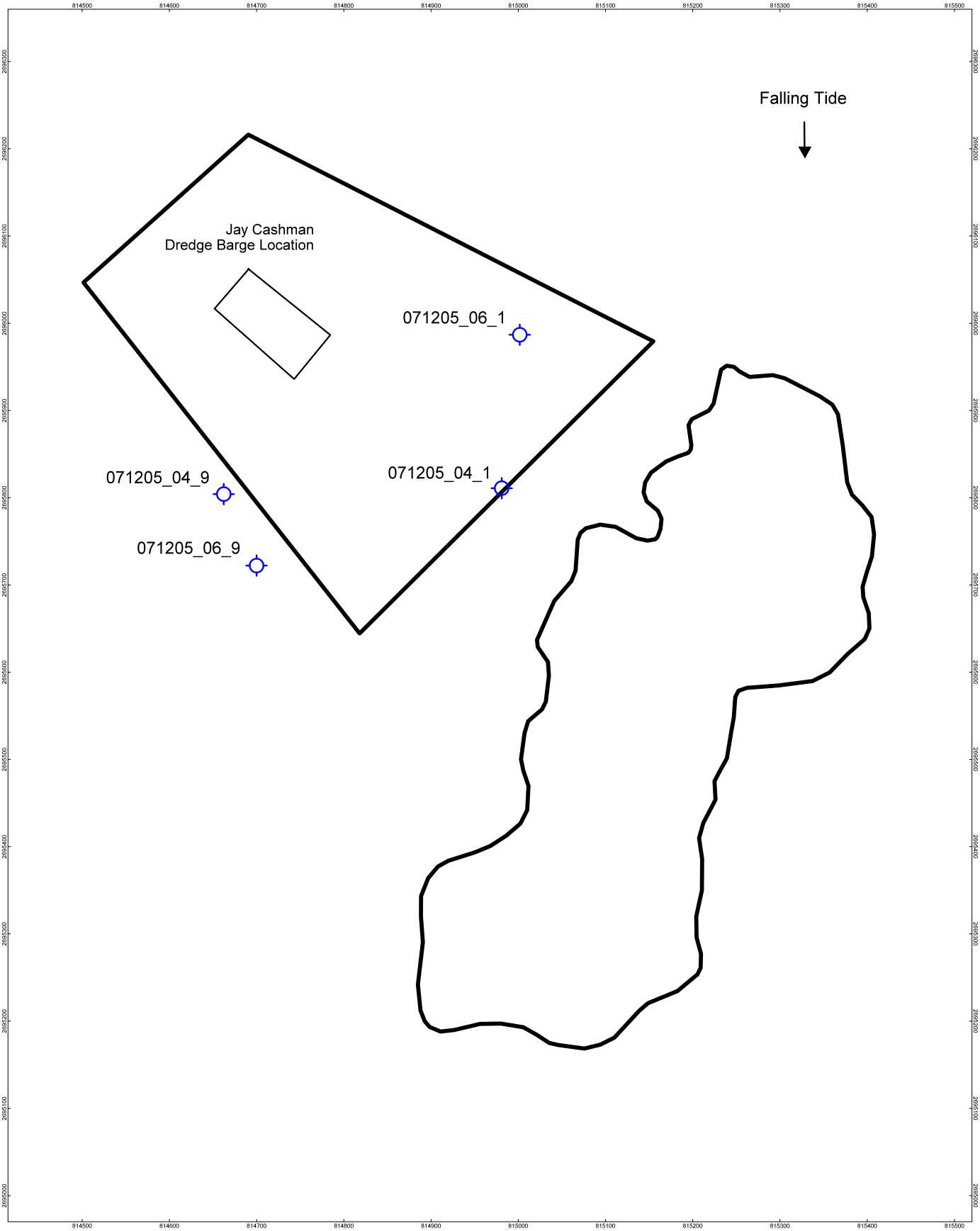
Water Quality Stations

Apex Environmental, Inc.

7/12/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 12:44				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	15:22	071205_04_1	814980..58	Up	5	1.8		Sunny, ~80 Degrees	None
		(Background)	2695810.92		10	1.9		NE Wind 5-10 knots	
					15	3.0			
					20	4.1			
					25	5.5			
					30	12.0			
					AVERAGE	4.7	24.7		
	15:30	071205_04_9	814662.38	Down	5	1.9		Sunny, ~80 Degrees	None
			2695804.14		10	2.6		NE Wind 5-10 knots	
					15	4.9			
					20	4.8			
					25	5.4			
					30	3.5			
					AVERAGE	3.9	20.8 NTUs		
	15:52	071205_06_1	815001.71	Up	5	2.0	Below Permissible	Sunny, ~80 Degrees	None
		(Background)	2695986.79		10	2.8	Turbidity Increase Limit	NE Wind 5-10 knots	
					15	2.1			
					20	3.0			
					25	11.0			
					30	13.5			
					AVERAGE	5.7	25.7		
	15:58	071205_06_9	814699.98	Down	5	2		Sunny, ~80 Degrees	None
			2695722.2		10	3.3		NE Wind 5-10 knots	
					15	5.5			
					20	2.6			
					25	6.2			
					30	6			
Low 17:47					AVERAGE	4.3	(21.4 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

25 0 25 50 75 100 125 150

US survey foot

07/12/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

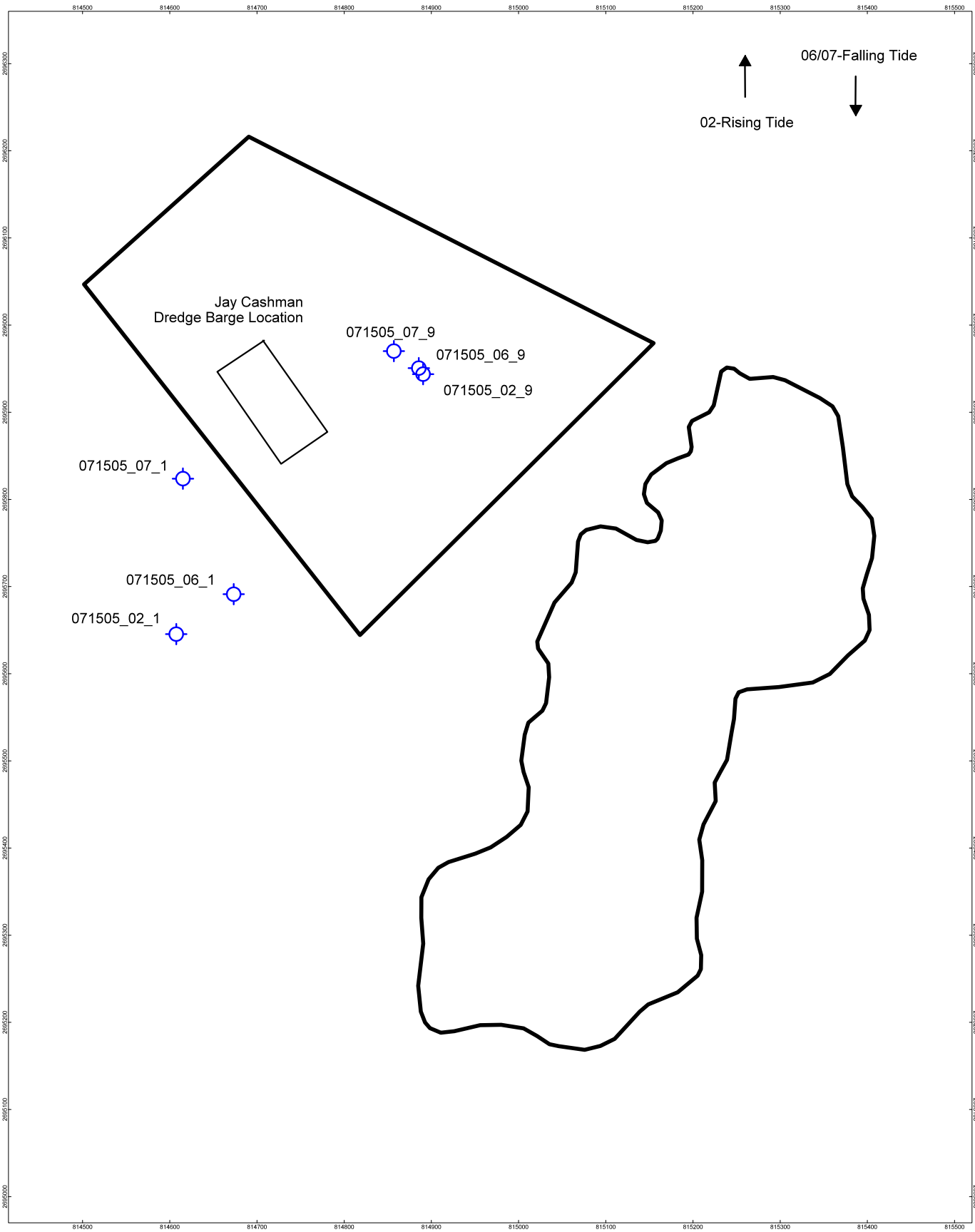
Water Quality Stations

Apex Environmental, Inc.

7/15/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 8:01				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	12:03	071505_02_1	814607.4	Up	5	2.5		Cloudy, ~80 Degrees	None
		(Background)	2695645.46		10	3.2		NE Wind 0-5 knots	
					15	3.2			
					20	3.0			
					25	2.0			
					30	3.5			
					AVERAGE	**2.9**	**22.9**		
	12:09	071505_02_9	814890.48	Down	5	3.0		Cloudy, ~80 Degrees	None
			2695943.76		10	2.3		NE Wind 0-5 knots	
					15	1.9			
					20	2.0			
					25	2.1			
					30	3.2			
High 15:08					**AVERAGE**	**2.4**	20.5 NTUs		
Falling Tide	17:18	071505_06_1	814673.28	Up	5	2.8	Below Permissible	Sunny, ~85 Degrees	None
		(Background)	2695691.25		10	3.6	Turbidity Increase Limit	NE Wind 0-5 knots	
					15	3.1			
					20	3.4			
					25	2.6			
					30	2.5			
					AVERAGE	**3.0**	**23.0**		
	17:23	071505_06_9	814885.59	Down	5	3.8		Sunny, ~85 Degrees	None
			2695950.67		10	6.3		NE Wind 0-5 knots	
					15	9.0			
					20	7.8			
					25	1.3			
					30	1.7			
					AVERAGE	**5.0**	(18.0 Below Limit)		
	17:33	071505_07_1	814615.08	Up	5	2.9		Sunny, ~85 Degrees	None
		(Background)	2695823.84		10	4.0		NE Wind 0-5 knots	
					15	4.2			
					20	4.6			
					25	5.0			
					30	3.8			
					AVERAGE	**4.1**	**24.1**		
	17:38	071505_07_9	814856.96	Down	5	4.8		Sunny, ~85 Degrees	None
			2695970.18		10	5.8		NE Wind 0-5 knots	
					15	6.4			
					20	11.0			
					25	10.0			
					30	14.0			
Low 21:18					**AVERAGE**	**8.7**	(15.4 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

US survey foot

07/15/05 Dredge Operations Water Quality

CAD Cell Area Water Quality Monitoring Locations

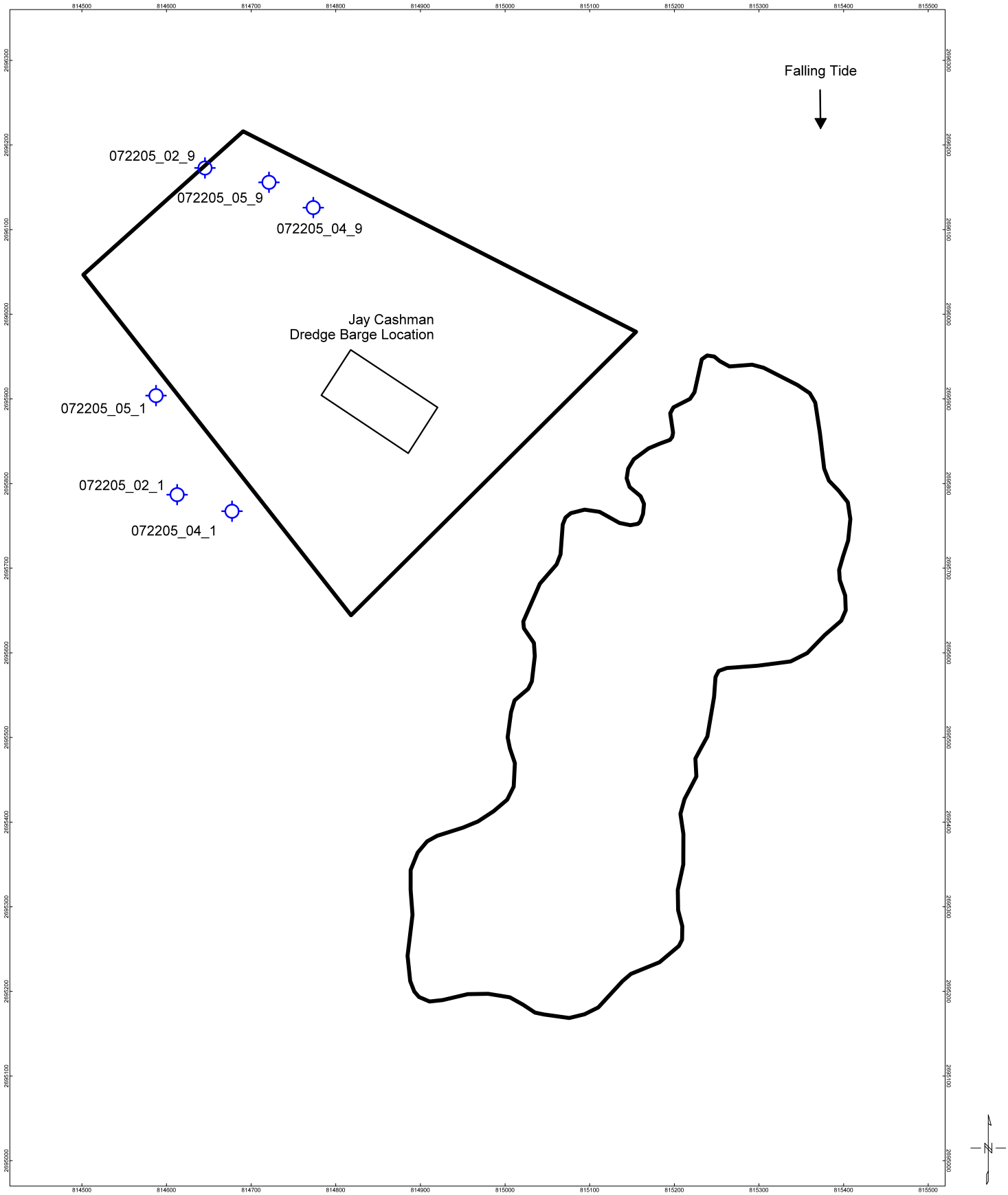
Water Quality Stations

Apex Environmental, Inc.

7/22/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - CAD Cell Excavation Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 9:13				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	10:10	072205_02_1	814612.57	Up	5	0.2		Sunny, ~80 Degrees	None
		(Background)	2695786.89		10	2.4		SE Wind 5-10 knots	
					15	2.6			
					20	2.6			
					25	2.7			
					30	2.6			
					AVERAGE	2.2	22.2		
	10:17	072205_02_9	814645.5	Down	5	1.1		Sunny, ~80 Degrees	None
			2696172.85		10	1.4		SE Wind 5-10 knots	
					15	2.0			
					20	2.6			
					25	2.2			
					30	8.0			
					AVERAGE	2.9	19.3 NTUs		
	12:43	072205_04_1	814677.39	Up	5	2.6	Below Permissible	Sunny, ~80 Degrees	None
		(Background)	2695767.28		10	2.7	Turbidity Increase Limit	SE Wind 5-10 knots	
					15	2.6			
					20	2.8			
					25	3.4			
					30	5.0			
					AVERAGE	3.2	23.2		
	12:48	072205_04_9	814644.69	Down	5	5.2		Sunny, ~80 Degrees	None
			2696093.75		10	9.5		SE Wind 5-10 knots	
					15	11.0			
					20	12.0			
					25	19.0			
					30	17.0			
					AVERAGE	12.3	(10.9 Below Limit)		
	12:54	072205_05_1	814773.41	Up	5	2.8		Sunny, ~80 Degrees	None
		(Background)	2696126.03		10	2.9		SE Wind 5-10 knots	
					15	2.6			
					20	2.7			
					25	2.6			
					30	2.8			
					AVERAGE	2.7	22.7		
	12:57	072205_05_9	814808	Down	5	3.4		Sunny, ~80 Degrees	None
			2605789.33		10	4.7		SE Wind 5-10 knots	
					15	10.5			
					20	7.4			
					25	16.0			
					30	19.0			
Low 14:47					AVERAGE	10.2	(12.6 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

25 0 25 50 75 100 125 150

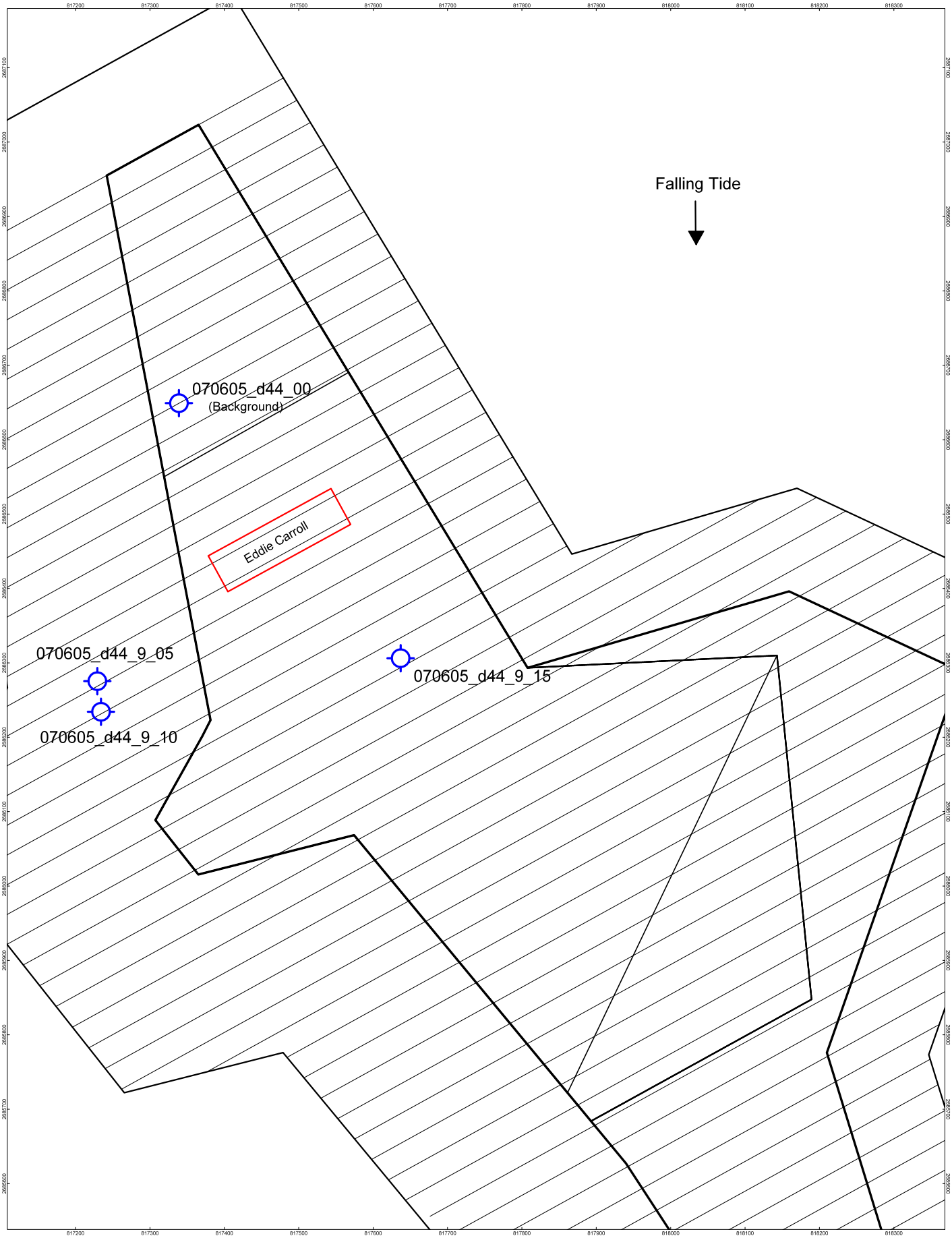
US survey foot

07/22/05 Dredge Operations Water Quality
CAD Cell Area Water Quality Monitoring Locations
Water Quality Stations
Apex Environmental, Inc.

7/6/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 8:40				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	12:33	070605_d44_00	817338.98	Up	2	7.8		Cloudy, ~80 Degrees	None
		(Background)	2686649.09		4	9.5		S Wind 1-5 Knots	
					6	11.5			
					7	9.5			
					AVERAGE	9.6	49.6		
	12:55	PLACEMENT 44	STARTED						
	13:00	070605_d44_9_05	817229.27	Down	2	2.9		Cloudy, ~80 Degrees	None
			2686275.37		4	3.5		S Wind 1-5 Knots	
					6	3.1			
					8	2.8			
					AVERAGE	3.1	46.5 NTUs		
	13:06	070605_d44_9_10	817234.23	Down	2	13.0	Below Permissible	Cloudy, ~80 Degrees	None
			2686234.23		4	12.5	Turbidity Increase Limit	S Wind 1-5 Knots	
					6	10.5			
					8	16.3			
					AVERAGE	13.1	(36.5 Below Limit)		
	13:12	070605_d44_9_15	817636.99	Down	2	8.5		Cloudy, ~80 Degrees	None
			2686306.24		4	6.8		S Wind 1-5 Knots	
					6	7.5			
					8	10.0			
Low 13:40					AVERAGE	8.2	(41.4 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/06/05 Placement #44
OU#3 Area Water Quality Location Map

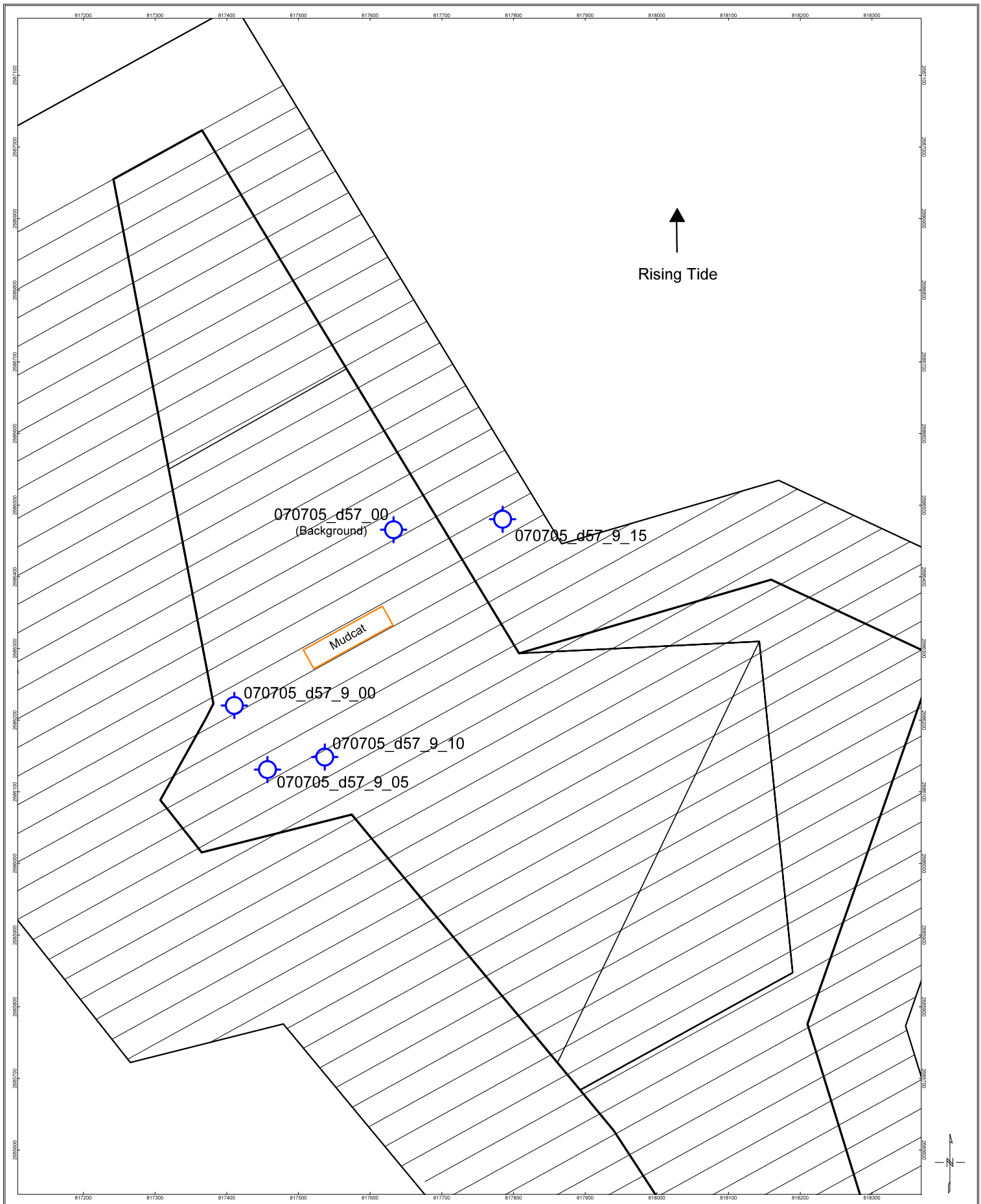
Water Quality Stations

Apex Environmental, Inc.

7/7/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 14:59				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	15:54	070705_d57_00	817632.68	Down	2	6.0		Cloudy, ~70 Degrees	None
		(Background)	2686465.82		4	7.0		N Wind 5-15 Knots	
					6	9.0			
					8	10.0			
					AVERAGE	8.0	48.0		
	15:59	PLACEMENT 57	STARTED						
	16:00	070705_d57_9_00	817410.56	Down	2	7.0		Cloudy, ~70 Degrees	None
			2686220.56		4	9.0		N Wind 5-15 Knots	
					6	13.0			
					8	16.5			
					AVERAGE	11.4	36.6 NTUs		
	16:05	070705_d57_9_05	817456.77	Up	2	11.0	Below Permissible	Cloudy, ~70 Degrees	None
			2686131.07		4	12.0	Turbidity Increase Limit	N Wind 5-15 Knots	
					6	12.0			
					8	18.0			
					AVERAGE	13.3	(34.7 Below Limit)		
	16:08	070705_d57_9_10	817536.68	Up	2	12.0		Cloudy, ~70 Degrees	None
			2686148.56		4	14.0		N Wind 5-15 Knots	
					6	16.0			
					8	17.0			
					AVERAGE	14.8	(33.2 Below Limit)		
	16:15	070705_d57_9_15	817784.8	Up	2	2.0		Cloudy, ~70 Degrees	None
			2686480.46		4	2.1		N Wind 5-15 Knots	
					6	2.2			
					8	2.8			
High 21:36					AVERAGE	2.3	(45.7 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/07/05 Placement #57
OU#3 Area Water Quality Location Map

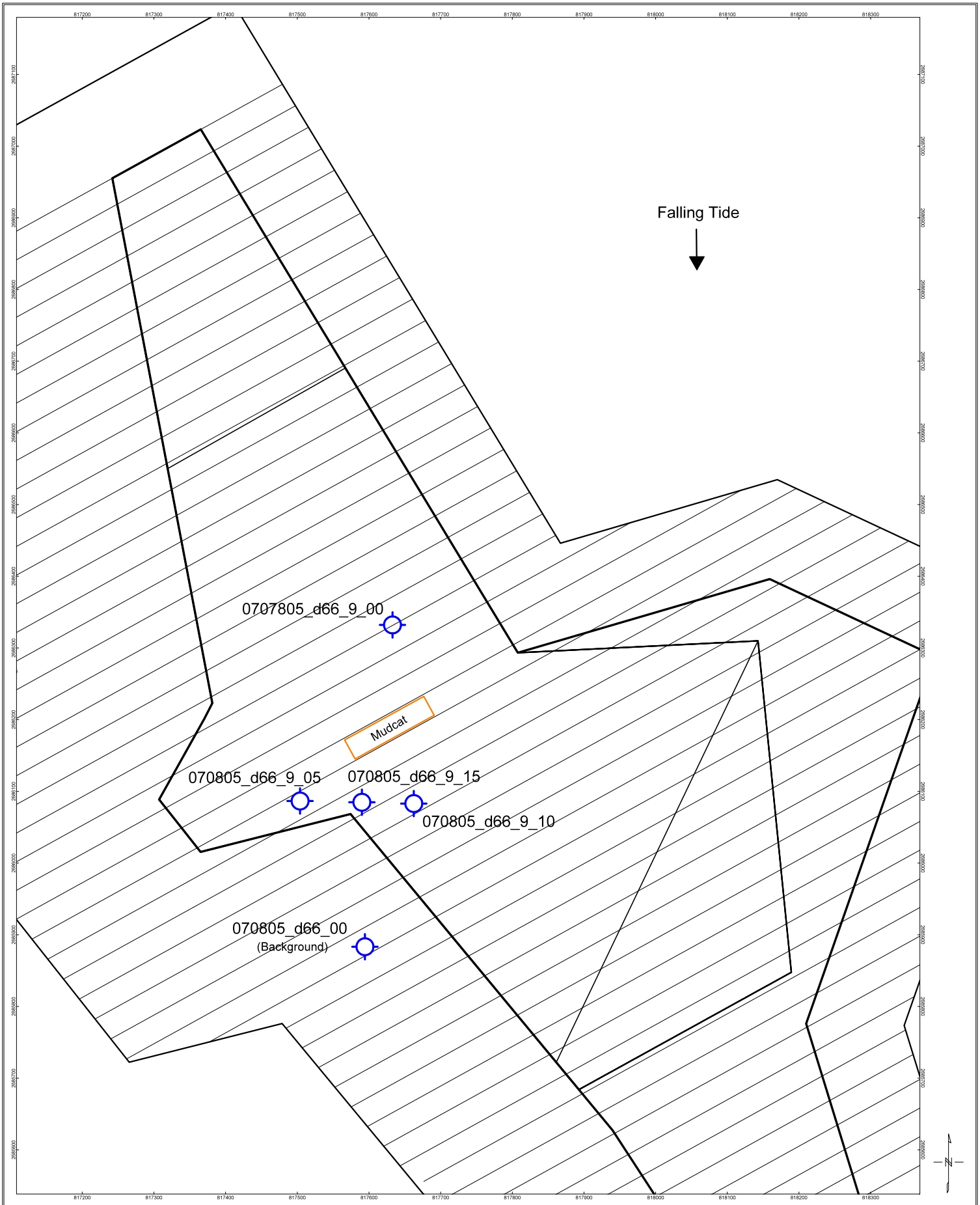
Water Quality Stations

Apex Environmental, Inc.

7/8/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High10:02				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	9:33	070805_d66_00	817594.42	Down	2	4.0		Cloudy,~65 Degrees	None
		(Background)	2685883.24		4	4.2		E,SE Wind 5-10 Knots	
					6	4.5			
					8	4.5			
					10	4.4			
					AVERAGE	4.3	44.3		
	9:38	PLACEMENT 66	STARTED					Cloudy,~65 Degrees	
	9:39	0707805_d66_9_00	817632.84	Up	2	2.3		E,SE Wind 5-10 Knots	None
			2686332.16		4	2.6			
					6	2.6			
					8	2.7			
					10	2.5			
					AVERAGE	2.5	41.8 NTUs		
	9:44	070805_d66_9_05	817503.9	Down	2	5.0	Below Permissible	Cloudy,~65 Degrees	None
			2686086.51		4	4.4	Tubidity Increase Limit	E,SE Wind 5-10 Knots	
					6	5.0			
					8	4.5			
					AVERAGE	4.7	(37.1 Below Limit)		
	9:49	070805_d66_9_10	817662.58	Down	2	2.6		Cloudy,~65 Degrees	None
			2686082.98		4	2.4		E,SE Wind 5-10 Knots	
					6	2.9			
					8	2.7			
					10	2.7			
					AVERAGE	2.7	(34.4 Below Limit)		
	9:53	070805_d66_9_15	817590.14	Down	2	4.2		Cloudy,~65 Degrees	None
			2686084.76		4	4.4		E,SE Wind 5-10 Knots	
					6	4.5			
					8	4.7			
					10	4.6			
Low 15:13					AVERAGE	4.5	(29.9 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/08/05 Placement #66
OU#3 Area Water Quality Location Map

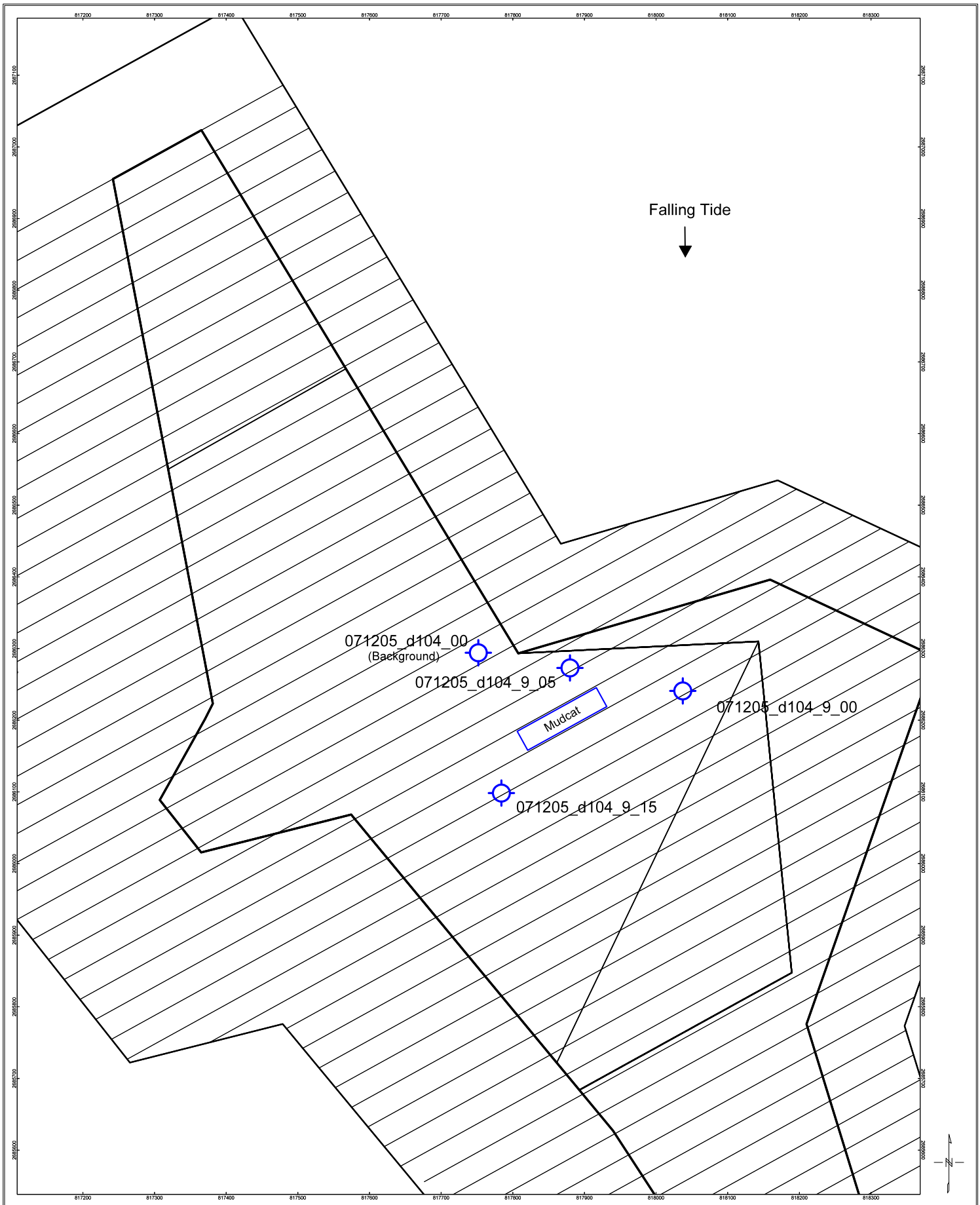
Water Quality Stations

Apex Environmental, Inc.

7/12/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 12:44				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	16:10	071205_d104_00	818012.77	Up	2	5.0		Cloudy,~65 Degrees	None
		(Background)	2696359.72		4	4.0		E,SE Wind 5-10 Knots	
					6	4.4			
					8	6.0			
					AVERAGE	**4.9**	**44.9**		
	16:15	**PLACEMENT 104**	**STARTED**					Cloudy,~65 Degrees	
	16:20	071205_d104_9_05	817879.82	Up	2	37.0		E,SE Wind 5-10 Knots	None
			2686272.97		4	36.0			
					6	34.0			
					8	40.0			
					AVERAGE	**36.8**	8.1 NTUs		
	16:25	071205_d104_9_10	817751.93	Down	2	12.0	Below Permissible	Cloudy,~65 Degrees	None
			2686294.06		4	11.8	Turbidity Increase Limit	E,SE Wind 5-10 Knots	
					6	18.0			
					8	4.0			
					AVERAGE	**11.5**	(33.4 Below Limit)		
	16:28	071205_d104_9_15	827729.61	Down	2	12.0		Cloudy,~65 Degrees	None
			2686205.92		4	14.0		E,SE Wind 5-10 Knots	
					6	20.0			
					8	19.5			
Low 17:22					**AVERAGE**	**16.4**	(28.5 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/12/05 Placement #104
OU#3 Area Water Quality Location Map

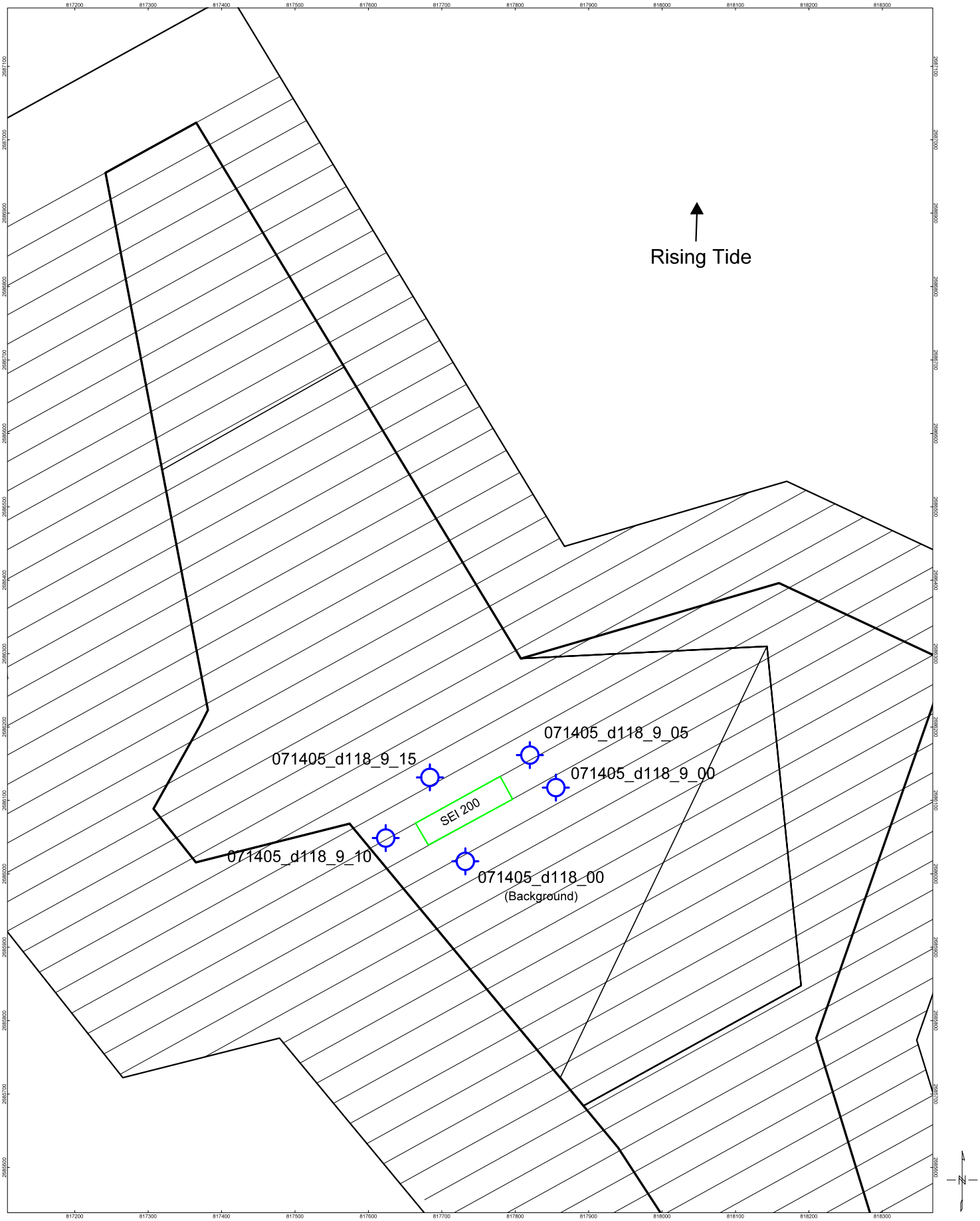
Water Quality Stations

Apex Environmental, Inc.

7/14/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
Low 7:08				Current		(NTUs)	Increase (NTUs)		Traffic
Rising Tide	9:20	071405_d118_00	817819.92	Up	2	1.3		Cloudy,~75 Degrees	None
		(Background)	2686161.75		4	1.5		SW Wind 5-10 Knots	
					6	1.6			
					8	1.8			
					AVERAGE	**1.6**	**41.6**		
	9:42	**PLACEMENT 118**	**STARTED**					Cloudy,~75 Degrees	
	9:42	071405_d118_9_00	817855.33	Down	2	1.2		SW Wind 5-10 Knots	None
			2686117.46		4	2.5			
					6	4.2			
					8	5.0			
					AVERAGE	**3.2**	38.3 NTUs		
	9:46	071405_d118_9_05	817732.02	Down	2	1.4	Below Permissible	Cloudy,~75 Degrees	None
			2686016.99		4	2.5	Turbidity Increase Limit	SW Wind 5-10 Knots	
					6	2.2			
					8	2.1			
					AVERAGE	**2.1**	(39.5 Below Limit)		
	9:51	071405_d118_9_10	817692.5	Down	2	1.8		Cloudy,~75 Degrees	None
			2685808.39		4	2.5		SW Wind 5-10 Knots	
					6	2.2			
					8	10.0			
					AVERAGE	**4.1**	(37.4 Below Limit)		
	9:56	071405_d118_9_15	818008.59	Down	2	12.0		Cloudy,~75 Degrees	Yes
			2685744.23		4	14.0		SW Wind 5-10 Knots	
					6	10.0			
					8	11.0			
High 14:11					**AVERAGE**	**11.8**	(29.8 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/18/05 Placement #118
OU#3 Area Water Quality Location Map

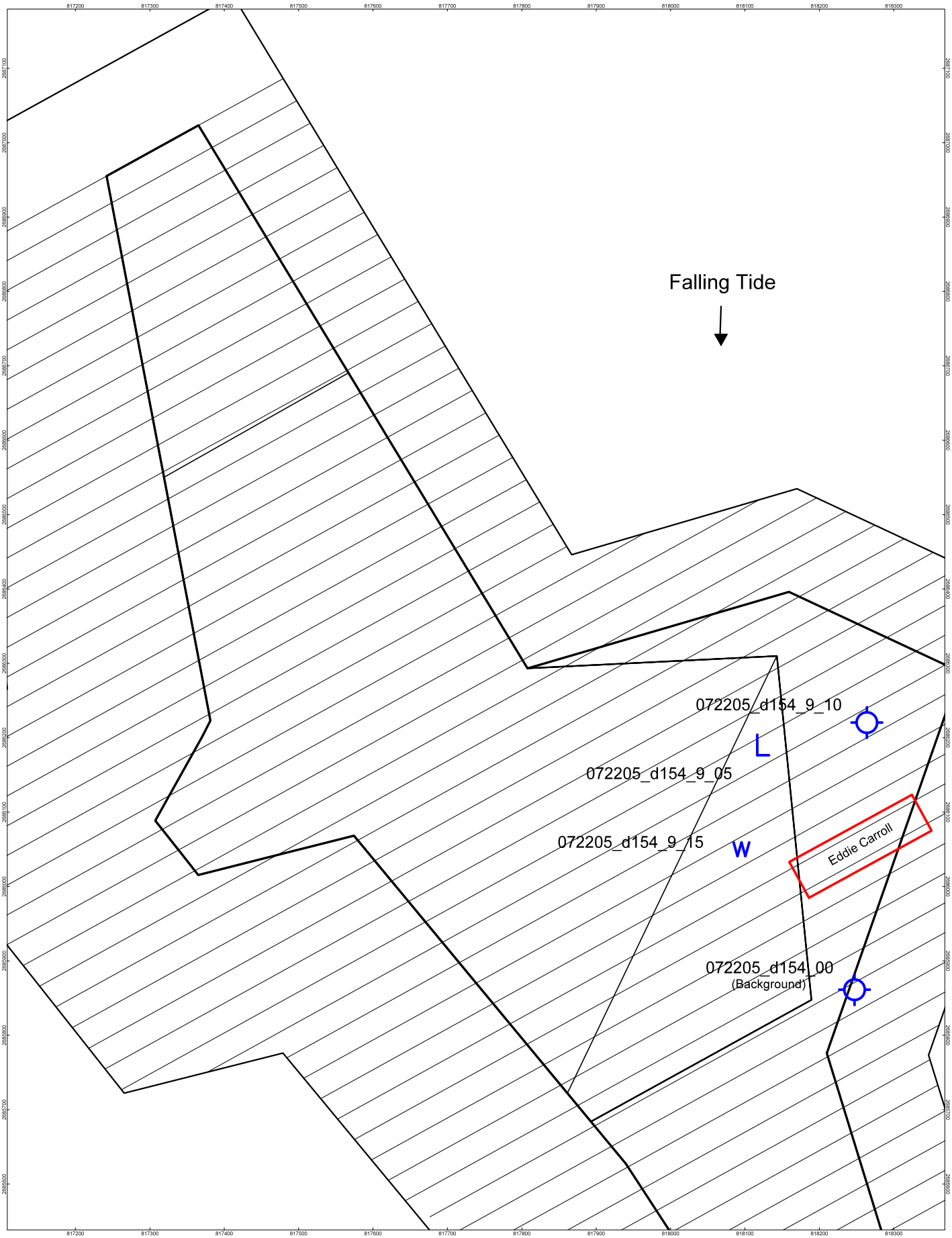
Water Quality Stations

Apex Environmental, Inc.

7/22/2005
New Bedford Harbor Dredge Project - Phase II
Water Quality Monitoring - Placement Operations - OU#3 Cap Area

Tide Time	Time	ID	Coordinates	Up/Down	Depth (ft.)	Ave. Turbidity	Permissible Turbidity	Weather Conditions	Vessel
High 9:13				Current		(NTUs)	Increase (NTUs)		Traffic
Falling Tide	11:23	071405_d154_00	818247.33	Down	2	1.2		Sunny,~80 Degrees	None
		(Background)	2685861.26		4	1.0		SE Wind 5-10 Knots	
					6	1.1			
					8	1.0			
					10	1.0			
					AVERAGE	1.1	41.1		
	12:00	PLACEMENT 154	STARTED					Sunny,~80 Degrees	
	12:03	071405_d154_9_05	818111.32	Up	2	14.0		SE Wind 5-10 Knots	Yes
			2686176.54		4	22.0			
					6	24.0			
					8	20.0			
					10	12.0			
					AVERAGE	18.4	22.7 NTUs		
	12:08	071405_d154_9_10	818263.87	Up	2	1.0	Below Permissible	Sunny,~80 Degrees	None
			2686220.39		4	1.5	Turbidity Increase Limit	SE Wind 5-10 Knots	
					6	1.2			
					8	3.9			
					10	5.0			
					12	13.0			
					AVERAGE	4.3	(36.8 Below Limit)		
	12:15	071405_d154_9_15	818080.84	Up	2	1.3		Sunny,~80 Degrees	None
			2686040.82		4	15.0		SE Wind 5-10 Knots	
					6	10.0			
					8	31.0			
					10	18.0			
					12	20.0			
Low 14:47					AVERAGE	15.9	(25.2 Below Limit)		

Notes: An X in the vessel traffic column indicates that either a vessel had passed or there was a movement of spuds that may have had an effect on turbidity.



Scale 1:600

07/22/05 Placement #154
OU#3 Area Water Quality Location Map

Water Quality Stations

Apex Environmental, Inc.

Change Orders

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-5-538

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-5-538
CRN #:
CRN –001

☐ ***Cost***
☐ ***No-Cost***

Date: 1/10/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC –5-538 New Bedfrod Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 374 Congress St.- Suite 508 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☒ Change in Conditions (Client Directed)
☐ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☐ Change in Scope (Contractor Initiated)
☐ Other: (describe): _____

Estimated Cost of Change (if cost change)**:**
$ 50,000

Impact of Change: (Check box – provide detail in sections below)
Cost: ☒ Increase ☐ Decrease ☐ No Change
Schedule: ☐ Increase ☐ Decrease ☒ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): _____ days/weeks

Reference Documents: (This Change Request Refers to the Following):
Drawing: C-1 Specification: Section 02482 Part 3.4a RFI No.: _____
Other: (describe) _____
Atachments: Refer to the attached letter (faxed copy) from Cashman, Inc. dated January 6, 2005 requesting the use of a spud barge as an alternative to State Pier.

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
Cashman Inc. will supply a 180' x 54' spud barge in order to store barges/scows during dredging activities. The spud barge will be placed south of CAD cell #1 approximately 150 feet east of the western shore of the bulkhead (approximately 814603 East/2695598 North). See attached map for approximate location of proposed positioning of spud barge and scows.

Reason for Change:
The spud barge is necessary because the State Pier berthing area that was originally slated to be used is no longer available for use due to a scheduling conflict with the State Pier Operator. Temporary alternatives were provided but it was determined that the spud barge was a permanent solution to storing the dump scows required to perform the dredging activities.

CHANGE REQUESTED BY: ☒ **Contractor** ☐ **Engineer** ☐ **Client**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:
☐ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)
☒ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**
(State Reason Below)

Distribution:
John Simpson (NBHDC)
Diana Konstantakos (HDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Tim Mannering (Apex/Site)
Karen Hartel (Apex/Boston)
Bruce Wood (Contractor)
Site File / Boston Office File

SIGNATURES:
Requestor: _____ (Print Name: _____Representing:_____Date:_____)
Engineer: _____ (Print Name: _____Representing:_____Date:_____)
Client: _____ (Print Name: _____Representing:_____Date:_____)
Other: _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-5-538

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-5-538

CRN #:
CRN –002

☐ ***Cost***
☐ ***No-Cost***

Date: 1/12/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC –5-538 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 374 Congress St.- Suite 508 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☒ Change in Conditions (Contractor Directed)
☐ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☐ Change in Scope (Contractor Initiated)
☐ Other: (describe):_____

Estimated Cost of Change (if cost change)**:**
Not Applicable

Impact of Change: (Check box – provide detail in sections below)
Cost: ☐ Increase ☐ Decrease ☒ No Change
Schedule: ☐ Increase ☐ Decrease ☒ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): _____ days/weeks

Reference Documents: (This Change Request Refers to the Following):
Drawing: Specification: RFI No.: _____
Other: **Change Request Notification #: 1 (CRN-001)**
Attachments:

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
Jay Cashman, Inc. will supply a 180' x 54' spud barge in order to store barges/scows during dredging activities. The spud barge was originally going to be placed south of CAD cell #1 approximately 150 feet east of the western shore of the bulkhead (approximately 814603 East/2695598 North). At the request of Cashman, Inc., the spud barge is now going to be placed north of the borrow pit CAD cell. See attached map for approximate positioning of the spud barge and scows (approximately 815330 East/2696000 North). If it is necessary to move the spud barge and attached scows during disposal of sediment into the borrow pit CAD cell, it is understood by Jay Cashman, Inc. that the spud barge and attached scows will be moved as a no-cost change.

Reason for Change:
Due to the original discussed placement of the spud barge in the vicinity of the Federal shipping channel and the insufficient depths of water in the alternative spud barge area requested in CRN-001, Jay Cashman, Inc. requested to place the spud barge north of the borrow pit CAD cell where water depths were adequate for the spud barge.

CHANGE REQUESTED BY: ☒ **Contractor** ☐ **Engineer** ☐ **Client**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:
☒ **Engineer Only (**Allowed for: No-cost/No-schedule Changes Only)
☐ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**
(State Reason Below)

Distribution:
John Simpson (NBHDC)
Diana Konstantakos (HDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Tim Mannering (Apex/Site)
Karen Hartel (Apex/Boston)
Bruce Wood (Contractor)
Site File / Boston Office File

SIGNATURES:
Requestor: _____ (Print Name: _____Representing:_____Date:_____)
Engineer: _____ (Print Name: _____Representing:_____Date:_____)
Client: _____ (Print Name: _____Representing:_____Date:_____)
Other: _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-5-538

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-5-538
CRN #:
CRN –003

☐ ***Cost***
☐ ***No-Cost***

Date: 1/19/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC-5-538 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf – New Bedford, MA 02740 **&** 374 Congress St.- Suite 508 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☐ Change in Conditions (Contractor Directed)
☐ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☒ Change in Scope (Contractor Initiated)
☐ Other: (describe): _____

Estimated Cost of Change (if cost change)**:**
Not Applicable

Impact of Change: (Check box – provide detail in sections below)
Cost: ☐ Increase ☐ Decrease ☒ No Change
Schedule: ☐ Increase ☐ Decrease ☒ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): _____ days/weeks

Reference Documents: (This Change Request Refers to the Following):
Drawing: Specification: Contract Performance Standards RFI No.: _____
Other: (describe) _____
Attachments: ACE Environmental "Dirtbag" specifications
Yardney 3-Pod Sand Filter System

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
In accordance with the proposed performance standards included in the contract, "water discharged from the barge shall be appreciably free of suspended sediment and meet the water quality criteria established. Any free liquid flowing from the barge in the harbor shall be passed through a sand media filter or equivalent filtration system."

Change: Due to weather conditions (extreme cold), the current pumping system and sand media filter (Yardney 3-Pod Sand Filter System (see attached specifications)) are not working properly due to freezing. The contractor has requested that an alternative method be utilized to dewater the scows. The contractor has requested approval for the use of the ACF Environmental "Dirtbag" as an alternative filtering system.

Approval with conditions: The requested change has been approved with the following conditions.

1. The style of the "Dirtbag" will be Dirtbag 55 (see attached specifications).
2. A turbidity verification test will be performed by APEX Environmental, Inc. (Apex) at the start of use.
3. The "Dirtbag" system must meet the water quality standards established in the contract.
4. When temperatures allow for the use of the sand media filter (Yardney 3-Pod Sand Filter System), the contractor will utilize the sand media filter instead of the "Dirtbag" system.
5. Apex has the right to recind approval of the use of the "Dirtbag" system at any time based on water quality sampling results, visual observations of discharge, weather, any situation that affects water quality during dewatering activities or as they see necessary.

Reason for Change:
The current pumping system and sand media filter are not working properly due to extreme cold conditions.

CHANGE REQUESTED BY: ☒ **Contractor** ☐ **Engineer** ☐ **Client**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

HDC-5-538
CRN #:
CRN –003

APPROVALS REQUIRED: ☒ **Engineer Only (**Allowed for: No-cost/No-schedule Changes Only) ☐ **Client & Engineer** (Required for All Cost and Schedule Changes)	**Distribution:** John Simpson (NBHDC) Diana Konstantakos (HDC) Jay Borkland (Apex/Boston) Steve Tobin (Apex/Site) Tim Mannering (Apex/Site) Karen Hartel (Apex/Boston) Bruce Wood (Contractor) Site File / Boston Office File
DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED** **(State Reason Below)**	

SIGNATURES:

Requestor: _____ (Print Name: _____Representing:_____Date:_____)

Engineer: _____ (Print Name: _____Representing:_____Date:_____)

Client: _____ (Print Name: _____Representing:_____Date:_____)

Other: _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-5-538

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-5-538
CRN #:
CRN –004

☐ ***Cost***
☐ ***No-Cost***

Date:6/14/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC –5-538 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 374 Congress St.- Suite 508 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☐ Change in Conditions (Client Directed)
☒ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☐ Change in Scope (Contractor Initiated)
☐ Other: (describe): _____

Estimated Cost of Change (if cost change)**:**
$ 882,184.50

Impact of Change: (Check box – provide detail in sections below)
Cost: ☒ Increase ☐ Decrease ☐ No Change
Schedule: ☒ Increase ☐ Decrease ☐ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): 6 wks. days/weeks

Reference Documents: (This Change Request Refers to the Following):

Drawings: C-7 CAD cell 1 – Existing Conditions
C-8 CAD cell 1 – Dredge Design and Limits
C-9 CAD cell 1 – Sections
C-10 USACE OU#3 Area – Existing Conditions
C-11 USACE OU#3 Area – Disposal Design and Limits

Specification: Section 02482 (attached)

Other: 1. *Bid #528 Harbor Dredging CAD Cell excavation & Disposal* letter dated June 14, 2005 prepared by Jay Cashman, Inc. (attached)

2. *Contract No. HDC-5-538* dated January 5, 2005 between the City of New Bedford and Jay Cashman, Inc.
3. *ACORD Certificate of Liability Insurance* dated June 7, 2005 (General and Umbrella Liability and Pollution Liability)
4. *ACORD Certificate of Insurance* dated January 11, 2005 (Worker's Compensation and Employer's Liability)
5. *Travelers Casualty and Surety Company of America Performance and Payment Bonds (Bond No. 104327954)* dated June 8, 2005

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
Cashman Inc. will finish the initial construction of CAD cell #1 by dredging the remaining 80,000 cubic yards. Operations will include removal of material from CAD cell #1 and disposal of the material in the EPA Superfund location Operable Unit #3 (OU #3) in accordance Contract No. HDC-5-538 and revised Dredging Specification Section 02482 (attached). OU #3 is located outside of the New Bedford Harbor hurricane gates, as shown in Drawings C-10 and C-11. The cost breakdown for CRN #4 is as follows:

Original contract value for HDC-5-538: $1,834,700.00
Payment for completion of work under HDC-5-538: $1,336,883.50
Remaining from original contract value: $ 497,815.50

Values for CRN #4 (per Jay Cashman, Inc. letter dated June 14, 2005 (see attached)):
Mobilization/Demobilization - $460,000
Dredging/Disposal - $920,000 ($11.50/c.y.)
Total to complete initial construction of CAD cell: $1,380,000

The change in total budget will be **$882,184.50** based on the the following:

The total budget for Contract No. HDC-5-538 as revised including CRN #1 through CRN #4 is: $2,716,884.50

Reason for Change:
The change is to finalize the initial construction of CAD cell #1 in order for the CAD cell to be operational during dredging operations that will be performed by others under a separate contract.

CHANGE REQUESTED BY: ☐ **Contractor** ☐ **Engineer** ☒ **Client**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:
☐ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)
☒ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**
(State Reason Below)

Distribution:
John Simpson (NBHDC)
Debbie Yuille (NBHDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Tim Mannering (Apex/Site)
Karen Hartel (Apex/Boston)
Bruce Wood (Contractor)
Site File / Boston Office File

SIGNATURES:
Requestor: _____ (Print Name: _____Representing:_____Date:_____)
Engineer: _____ (Print Name: _____Representing:_____Date:_____)
Client: _____ (Print Name: _____Representing:_____Date:_____)
Other: _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-5-538

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-5-538
CRN #:
CRN –005

☒ ***Cost***
☐ ***No-Cost***

Date:9/19/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC –5-538 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 374 Congress St.- Suite 508 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
- ☐ Change in Conditions (Client Directed)
- ☒ Change in Scope (Client Directed)
- ☐ Change in Scope (Engineer Directed)
- ☐ Change in Scope (Contractor Initiated)
- ☐ Other: (describe):_____

Estimated Cost of Change (if cost change)**:**
$ 72,329.50

Impact of Change: (Check box – provide detail in sections below)
Cost: ☒ Increase ☐ Decrease ☐ No Change
Schedule: ☒ Increase ☐ Decrease ☐ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): 1-2 day increase

Reference Documents: (This Change Request Refers to the Following):
Section 02482 – Dredging, section 1.5 Quantity Of Material.

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
This Change Request Notification allows Jay Cashman, Inc to excavate an additional 4,193 cubic yards of material from within the design limits of the CAD Cell #1. The total material allowed to be dredged from CAD #1 will be 84,193 cubic yards. Payment will be made on the excavation and placement of material at the contract rate of $17.25 per cubic yard in accordance with the specifications.

Reason for Change:
To Allow addition storage capacity within the CAD cell.

CHANGE REQUESTED BY: ☐ **Contractor** ☐ **Engineer** ☒ **Client**

Requestor Name: John Simpson _____ Signature: _____ Date: _____

Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:

☐ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)

☒ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**

(State Reason Below)

Distribution:

John Simpson (NBHDC)
Diana Konstantakos (NBHDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Tim Mannering (Apex/Site)
Karen Hartel (Apex/Boston)
Norm Bourque (Contractor)
Site File / Boston Office File

SIGNATURES:

Requestor: _____ (Print Name: _____Representing:_____Date:_____)

Engineer: _____ (Print Name: _____Representing:_____Date:_____)

Client: _____ (Print Name: _____Representing:_____Date:_____)

Other: _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-6-705

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-6-705
CRN #:
CRN–006

☐ ***Cost***
☐ ***No-Cost***

Date: 10/24/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC–6-705 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 286 Congress St.- Suite 610 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☐ Change in Conditions (Client Directed)
☐ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☐ Change in Scope (Contractor Initiated)
☒ Other: Change in Conditions – Contractor Error

Estimated Cost of Change (if cost change)**:**
Not Applicable

Impact of Change: (Check box – provide detail in sections below)
Cost: ☐ Increase ☐ Decrease ☒ No Change
Schedule: ☒ Increase ☐ Decrease ☐ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): **2** days/weeks

Reference Documents: (This Change Request Refers to the Following):
Drawing: Specification: RFI No.: _____
Attachments: See attached material thickness maps for White's Area and South Route 6.

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
The change is due to areas outside of the dredge footprint in the White's Area and South of Route 6 Area that had material added to it during dredging operations. The pre and post dredge surveys performed by Coler & Colantonio show an increase in elevation up to 1.75 feet of material along the western slope of the two dredge areas. The material added by the contractor will need to be removed to an elevation equal to that of the predredge survey. It is believed that the material may have been released from the scows utilized during dredging.

Reason for Change:
The change is being directed because material was added outside of the dredge footprint during dredging operations. The change is a no cost change due to contractor error.

CHANGE REQUESTED BY: ☐ **Contractor** ☒ **Engineer** ☐ **Client** ☐ **Other**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:
☒ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)
☐ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**
(State Reason Below)

Distribution:
John Simpson (NBHDC)
Diana Konstantakos (HDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Karen Hartel (Apex/Boston)
Norm Bourque (Contractor)
Site File / Boston Office File

SIGNATURES:
Requestor: _____ (Print Name: _____Representing:_____Date:_____)
Engineer: _____ (Print Name: _____Representing:_____Date:_____)
Client: _____ (Print Name: _____Representing:_____Date:_____)
Contractor _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-6-705

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-6-705
CRN #:
CRN–007

☐ ***Cost***
☐ ***No-Cost***

Date: 10/27/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC–6-705 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 286 Congress St.- Suite 610 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☐ Change in Conditions (Client Directed)
☐ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☒ Change in Conditions (Contractor Initiated)
☐ Other: Change in Conditions

Estimated Cost of Change (if cost change)**:**
Not Applicable

Impact of Change: (Check box – provide detail in sections below)
Cost: ☐ Increase ☐ Decrease ☒ No Change
Schedule: ☒ Increase ☐ Decrease ☐ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): **4 weeks** days/weeks

Reference Documents: (This Change Request Refers to the Following):
Drawing: Specification: RFI No.: _____
Attachments: See attached letter from Jay Cashman, Inc. dated October 26, 2005.

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
In a letter dated October 26, 2005, the contractor (Jay Cashman, Inc.) requested permission to demobilize from the harbor after all the deep water dredging that can be completed with the dredge Wood 1 was completed. The contractor does not have the equipment available at this point to complete the remaining work in K-5 and K-6. The contractor will remobilize with the equipment necessary to complete the work by mid December. The request made by Jay Cashman, Inc. will be a no-cost change.

Reason for Change:
The change is due to two reasons (see attached JCI letter dated 10/26/05). The reasons are as follows:

1. The subcontractor scheduled to do the work with smaller equipment could not be secured.
2. The availability of other JCI equipment better suited for the shallow water operation is scheduled to come free in the near future.

CHANGE REQUESTED BY: ☒ **Contractor** ☐ **Engineer** ☐ **Client** ☐ **Other**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:
☐ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)
☒ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**
(State Reason Below)

Distribution:
John Simpson (NBHDC)
Diana Konstantakos (HDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Karen Hartel (Apex/Boston)
Norm Bourque (Contractor)
Site File / Boston Office File

SIGNATURES:
Requestor: _____ (Print Name: _____Representing:_____Date:_____)
Engineer: _____ (Print Name: _____Representing:_____Date:_____)
Client: _____ (Print Name: _____Representing:_____Date:_____)
Contractor _____ (Print Name: _____Representing:_____Date:_____)

Comments:

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-6-705

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-6-705
CRN #:
CRN–008

☒ Cost
☐ No-cost

Date: 12/7/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC–6-705 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 286 Congress St.- Suite 610 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☒ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☐ Change in Scope (Contractor Initiated)
☒ Other: Change in Scope (Property owner directed (Warren Alexander)

Estimated Cost of Change (if cost change)**:**
$20,050

Impact of Change: (Check box – provide detail in sections below)
Cost: ☒ Increase ☐ Decrease ☐ No Change
Schedule: ☒ Increase ☐ Decrease ☐ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): **4** days

Reference Documents: (This Change Request Refers to the Following):
Drawing: **C-12**
Attachments: 1. See attached Plan C-12. Attached 11x17 plan is not to scale.
2. See Watermark Letter for Engineer Stamp and approval of Plan C-12.

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
The owner of the partially sunken barge located west of Harbor Hydraulics (Mr. Warren Alexander), requested that the north and south areas of the existing partially sunken barge be dredged to a depth of –9 MLLW to the north and -10MLLW to the south of the barge with a one foot overdredge. The dredge footprint requested by Mr. Alexander is depicted on the attached Plan C-12. The additional area, volume (vertical cut w/overdredge) and cost change (increase) is as follows:

Alexander A-1 (north): 249 cubic yards (vertical cut w/ overdredge) ($50/c.y.) = $12,450.
Alexander A-2 (south): 152 cubic yards (vertical cut w/ overdredge) ($50/c.y.) = $7,600.

Total (north and south) volume: **401 cubic yards (vertical cut w/ overdredge)**
Total price increase: **$20,050**

Note: Material actually removed, within the limits approved by the Owner's Representative, to provide for final project slope as shown on the drawings at 1 vertical on 3 horizontal, but not in excess of the amount originally lying above these limiting side slopes, will be estimated and paid for.

Reason for Change:
The request was made by the property owner and the client to dredge the area depicted on Plan C-12. The additional area has been approved as a modification to the Work Plan for the New Bedford Harbor Dredge – Phase II by the Portsfield Group (including MA DEP and EPA). The change in scope is consistent with the goals of the Contract (HDC-6-705).

CHANGE REQUESTED BY: ☐ **Contractor** ☐ **Engineer** ☒ **Client** ☒ **Other**

Requestor Name: _____ Signature: _____ Date: _____

Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:

☐ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)

☒ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**

(State Reason Below)

Distribution:

John Simpson (NBHDC)
Diana Konstantakos (HDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Karen Hartel (Apex/Boston)
Norm Bourque (Contractor)
Site File / Boston Office File

SIGNATURES:

Requestor: _____ (Print Name: _____Representing:_____Date:_____)

Engineer: _____ (Print Name: _____Representing:_____Date:_____)

Client: _____ (Print Name: _____Representing:_____Date:_____)

Contractor _____ (Print Name: _____Representing:_____Date:_____)

Comments: Scaled plans (five copies) of the Alexander dredge area (Plan C-12) have been transmitted to the Contractor with this CRN #8. Additionally, a CD was provided to the Contractor containing:

- Electronic Files – Plan C-12
- Electronic Files – Point File containing vertices of each of the dredge areas (**TO BE USED DURING DREDGING**)

City of New Bedford Harbor Development Commission
New Bedford Harbor Dredge – Phase II Project
Contract No. HDC-6-705

CHANGE REQUEST NOTIFICATION (CRN)

(Cost and No-Cost Project Change Form)

HDC-6-705
CRN #:
CRN–009

☒ Cost
☐ No-cost

Date: 12/7/05

Client:	**Engineer:**	**Contractor:**
New Bedford Harbor Development Commission 106 Co-Op Wharf – New Bedford, MA Contract No.: HDC–6-705 New Bedford Harbor Dredge – Phase II	Apex Environmental, Inc. 106 Co-Op Wharf–New Bedford, MA 02740 **&** 286 Congress St.- Suite 610 Boston, MA 02210	Jay Cashman, Inc. 549 South Street P.O. Box 692396 Quincy, MA 02269

Type of Change:
☐ Change in Scope (Client Directed)
☐ Change in Scope (Engineer Directed)
☐ Change in Scope (Contractor Initiated)
☒ Other: Change in Scope (Property owner directed (David Kelley)

Estimated Cost of Change (if cost change)**:**
$16,800

Impact of Change: (Check box – provide detail in sections below)
Cost: ☒ Increase ☐ Decrease ☐ No Change
Schedule: ☒ Increase ☐ Decrease ☐ No Change

Task/Subtask(s) Affected:
_____

If Schedule Impact :
Number of days/weeks (increase/decrease): **2** days

Reference Documents: (This Change Request Refers to the Following):
Drawing: **Revised Plans C-4 and C-5**
Attachments:

1. See attached revised Plans C-4 and C-5. Attached 11x17 plans are not to scale.
2. See Watermark Letter for Engineer Stamp and approval of revised Plans C-4 and C-5.

Description of Change: (Include additional information, sketches, etc.; attach extra sheets as necessary)
The owner of D.N. Kelley and Son Marine (Mr. David Kelley) requested that a small area adjacent to dredge area K-5 be included with the dredge footprint depicted in Plans C-4 and C-5. Mr. Kelley requested that the additional area (K-5 add-on) dredge footprint remain 5' away from the travel lift. The addition will be consistent with K-5 (8 foot dredge cut with a 1 foot overdredge). The additional area, volume (vertical cut w/ overdredge) and cost change (increase) is as follows:

Kelley K-5 add-on: 336 cubic yards (vertical cut w/ overdredge) ($50/c.y.) = $16,800.

Note: Material actually removed, within the limits approved by the Owner's Representative, to provide for final project slope as shown on the drawings at 1 vertical on 3 horizontal, but not in excess of the amount originally lying above these limiting side slopes, will be estimated and paid for.

Reason for Change:
The request was made by the property owner to make sure that water depth in the vicinity of K-5 was consistent following removal of the abandoned railway. The railway was/will be removed under a direct contract between D.N. Kelley & Son and the Contractor.

CHANGE REQUESTED BY: ☐ **Contractor** ☐ **Engineer** ☐ **Client** ☒ **Other**
Requestor Name: _____ Signature: _____ Date: _____
Requestor Name: _____ Signature: _____ Date: _____

APPROVALS REQUIRED:

☐ **Engineer Only** (Allowed for: No-cost/No-schedule Changes Only)

☒ **Client & Engineer** (Required for All Cost and Schedule Changes)

DISPOSITION: ☒ **APPROVED** ☐ **NOT APPROVED**

(State Reason Below)

Distribution:

John Simpson (NBHDC)
Diana Konstantakos (HDC)
Jay Borkland (Apex/Boston)
Steve Tobin (Apex/Site)
Karen Hartel (Apex/Boston)
Norm Bourque (Contractor)
Site File / Boston Office File

SIGNATURES:

Requestor: _____ (Print Name: _____Representing:_____Date:_____)

Engineer: _____ (Print Name: _____Representing:_____Date:_____)

Client: _____ (Print Name: _____Representing:_____Date:_____)

Contractor _____ (Print Name: _____Representing:_____Date:_____)

Comments: Scaled plans (five copies) of the revised Plans C-4 and C-5 have been transmitted to the contractor with this CRN #9. Additionally, a CD was provided to the Contractor containing:

- Electronic Files – Revised Plans C-4 and C-5
- Electronic Files – Point File containing vertices of each of the dredge areas (**TO BE USED DURING DREDGING**)