

**NEW BEDFORD HARBOR DEVELOPMENT COMMISSION
STATE ENHANCED REMEDY
TASK NO. 2**

**ADDENDUM #2
WORK PLAN
FOR
NEW BEDFORD HARBOR DREDGE – PHASE II
TASK 2: FAIRHAVEN AREAS and ADDITIONAL NEW BEDFORD AND FAIRHAVEN AREAS**

New Bedford/Fairhaven, Massachusetts

October 2005

**Addendum to:
WORK PLAN
Rev.2
FOR
NEW BEDFORD HARBOR DREDGE – PHASE II
NORTH TERMINAL MAINTENANCE DREDGE (December 2004)**

Prepared for

City of New Bedford Harbor Development Commission
New Bedford, Massachusetts

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ABBREVIATIONS AND ACRONYMS

APEX	Apex Environmental, Inc
CAD	Confined Aqueous Disposal
COP	Contractor Oversight Plan
cy	cubic yards
DMMP	Dredged Material Management Plan
EFHA	Essential Fish Habitat Assessment
EOEA	Executive Office of Environmental Affairs
EPH	Extractable Petroleum Hydrocarbons
FEIR	Final Environmental Impact Report
HASP	Health and Safety Plan
IFB	Invitation for Bid
iscy	in situ cubic yards
MADEP	Massachusetts Department of Environmental Protection
MADMF	Massachusetts Division of Marine Fisheries
MBUA	Massachusetts Board of Underwater Archaeology
MLLW	mean lower low water
MOA	Memorandum of Agreement
NBHDC	New Bedford Harbor Development Commission
NMFS	National Marine Fisheries Service
PCB	polychlorinated biphenyls
QA/QC	Quality Assurance/Quality Control
SAP	Sampling and Analysis Plan
SER	State-Enhanced Remedy
TOC	Total Organic Carbon
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compounds
WQMP	Water Quality Monitoring Plan

1.0 GENERAL INFORMATION

1.1 Introduction

The New Bedford Harbor Development Commission (NBHDC) and its consultant, Apex Environmental, Inc. (Apex) has prepared this Addendum #2 to Work Plan Rev. 2¹ for the dredging, transport and disposal of contaminated and non-contaminated sediments from the New Bedford Harbor Dredge – Phase II (Task 2: Fairhaven Areas and Additional Fairhaven and New Bedford Areas). This work is to be performed as Task 2 under the State Enhanced Remedy (SER). See Figure 1-1 for Site Locus Map and Figure 1-3 showing site layout, locations of the New Bedford Harbor Dredge – Phase II (Task 2: Fairhaven Areas and Additional New Bedford and Fairhaven Areas) and the Confined Aquatic Disposal (CAD) cell location.

This Addendum to the Work Plan Rev. 2 is divided into four sections. Section 1.0 provides an introduction and overview of the project, including a brief outline of the project's major work elements that affect the development of this Work Plan. Section 2.0 is a discussion of the SER approach. Section 3.0 is the Scope of Work. Section 4.0 presents the Project Schedule for the referenced work.

The New Bedford/Fairhaven Harbor Plan, approved by the Secretary of the Massachusetts Executive Office of Environmental Affairs (EOEA) on September 24, 2002, represents the City of New Bedford's and Town of Fairhaven's joint harbor maintenance and future development plans. The work scope for this project (Task 2) represents high-priority areas requiring dredging under the Harbor Plan. The New Bedford and Fairhaven waterfront has established a reputation for excellent marine service, vessel repair and recreational facilities, and maintaining these industries is vital to the economy of the harbor.

The recreational and marine industrial facilities that have been identified in the New Bedford and Fairhaven Harbor Plan (Section 6, page 52) as requiring dredging include the harbor areas adjacent to the following sites:

- Town of Fairhaven Pease Park boat ramp,
- Portions of Linberg Marine, Inc. docks and piers,
- Portions of D.N. Kelley and Son, Inc. docks, piers and boat ramps,
- Portions of Niemiec Marine (New Bedford),
- Portions of the property currently owned by Warren Alexander (Harbor Hydraulics) listed in the Harbor Plan as Acushnet Fish Company (Fairhaven), and
- Portions of the property currently owned by Sal Ingrande (Olde North Wharf Fisheries, LLC.) listed in the Harbor Plan as Acushnet Fish Company (Fairhaven).

Previously completed and proposed dredging projects for New Bedford and Fairhaven are as follows:

New Bedford State Pier Dredge Project – Phase I (completed 2002)

New Bedford Harbor Dredge – Phase II: New Bedford and Fairhaven Facilities

Task 1: New Bedford North Terminal Dredge Areas and initial CAD cell Construction (partially complete)

Task 2: Fairhaven Facilities Dredging and Any Additional Areas

¹ Apex Environmental, Inc., *Work Plan Rev. 2 for New Bedford Harbor Dredge – Phase II North Terminal Maintenance Dredge*. New Bedford Harbor Development Commission, New Bedford, Massachusetts. December 2004.

1.2 Project Purpose and Summary

The intent of the dredging is to restore the water depth of the proposed docks, piers and boat ramps in Fairhaven which are currently limited by the shallow operating depths. Dredging in these areas will provide increased and enhanced berthing opportunities to safely accommodate larger vessels during all tidal situations. To that end, the New Bedford Harbor Dredge – Phase II (Task 2) Addendum to Work Plan Rev. 2 calls for deepening of the following areas:

- Town of Fairhaven Pease Park boat ramp,
- Portions of Linberg Marine, Inc. docks and piers,
- Portions of D.N. Kelley and Son, Inc. docks, piers and boat ramps,
- Portions of Niemiec Marine boat launch,
- Portions of Harbor Hydraulics pier,
- Portions of Olde Wharf Fisheries, LLC., and
- Placement of the dredged sediments into the CAD cell located to the north of the Route 6 swing bridge.

In order to achieve the above-noted activities, the following work scope items will be completed as part of Task 2 under the SER:

- Perform pre-design investigations.
- Design of the New Bedford Harbor Dredge – Phase II (Task 2) dredge areas.
- Prepare and submit a Work Plan, Health and Safety Plan (HASP), Contractor Oversight Plan (COP), and Design Documents.
- Dredge approximately 28,000 in-situ cubic yards (iscy) from within areas indicated on Figure 1-1 and Figure 1-3 for the New Bedford Harbor Dredge – Phase II (Task 2).
- Transport dredged material to the Transitional CAD cell location.
- If required, process dredge materials (i.e. dewater scows in accordance with the water quality performance standards) for disposal.

All work associated with the New Bedford Harbor Dredge – Phase II (Task 2) and sediment transfer operations will be managed by the NBHDC. Work will be conducted under the SER as set forth in the Memorandum of Agreement (MOA) between the NBHDC and the Massachusetts Department of Environmental Protection (MADEP) and the MOA between the U.S. Environmental Protection Agency (USEPA) and the MADEP.

This Work Scope is intended to present an outline of the project flow and process that will be undertaken in order to achieve the stated project goals. Project-specific design elements, field data collection, and construction activities will be determined and detailed in subsequent design documents as the project progresses.

1.3 Summary of Scope of Work

The total approximate dredge volume is anticipated to be approximately 28,000 iscy for the six proposed

dredge areas. The contaminated sediments will be dredged into containers, such as scows or similar, and then transported from the dredge area to the CAD cell. The specific dredging means and methods will be determined during the engineering design phase. Dredging methods and engineering controls will be designed and implemented to minimize water quality impacts (i.e. **if practical, the** use of environmental bucket when dredging contaminated upper sediments).

Prior to and concurrent with operations conducted by a Dredging Contractor, selected by the City, NBHDC and its agents will perform the following additional activities:

- Geotechnical investigations, sampling and analysis, and characterization of material;
- Dredging engineering design;
- SER consultation with the MADEP Project Manager to ensure concurrence with the proposed approach;
- Management and oversight of dredging activities;
- Hydrographic Surveys including pre-dredge and post-dredge surveys;
- Water quality monitoring.

As currently anticipated, it is expected that the City of New Bedford will contract with a dredger to conduct the New Bedford and Fairhaven dredging, transport from dredge areas to **the** CAD cell, material processing (if necessary) and placement/disposal in the CAD cell. The NBHDC will use a best-value approach in selecting a Dredging Contractor which will be based on contractor qualifications, approach, and rates (Quality-based selection).

1.4 Assumptions

This section outlines major assumptions made during Work Plan preparation.

NBHDC had developed this Work Plan based upon the following assumptions:

- All contaminated material removed will be transported to the CAD cell constructed as part of the New Bedford Harbor Dredge – Phase II (Task 1).
- An aggressive schedule will be undertaken in order to complete this project as dictated by the needs of the users of the Harbor.
- The schedule for overall project completion will be based upon obtaining necessary stakeholder support and the Harbor needs.

Figure 1-1 Site Locus Map

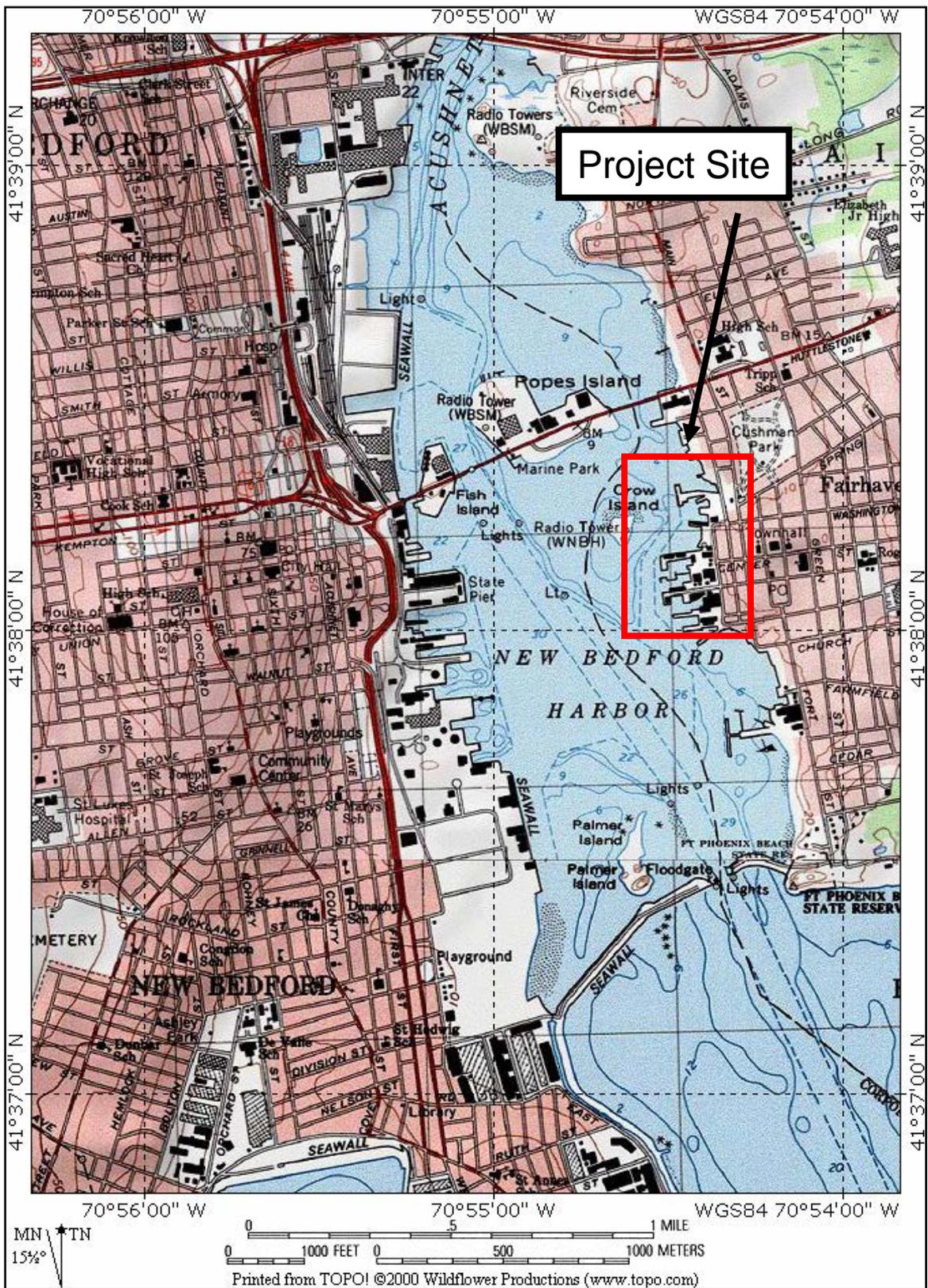


Figure 1-1: Project Site Locus Map
 New Bedford Harbor Dredge – Phase II (Task 2)
 Fairhaven, Massachusetts

2.0 STATE ENHANCED REMEDY PROCESS

A description of the State Enhanced Remedy (SER) process and the various decisions and/or agreements that preceded and/or are part of the implementation of the SER are included in Section 2.0 of the Work Plan Rev. 2 for New Bedford Harbor Dredge – Phase II North Terminal Maintenance Dredge (December 2004). The following is a list of submittals currently identified for SER review:

- Statement of Work
- Sampling and Analysis Plan (SAP) – to include field and analytical quality assurance/quality control (QA/QC)
- Design Documents (Basis of Design Summary Report, contract drawings & specifications, project data)
- Contractor Oversight Plan (COP) - for construction
- Health and Safety Plan (HASP) – for construction
- Water Quality Monitoring Plan (WQMP) – for construction

3.0 SCOPE OF WORK

New Bedford Harbor Dredge – Phase II (Task 2) involves the dredging and disposal of sediment generated as a result of the required New Bedford and Fairhaven maintenance dredging in the previously constructed CAD cell. It was determined that harbor CAD cell(s) are the most-effective and protective solution for sediment disposal. The disposal of contaminated maintenance dredge material on-site (i.e. within the limits of the New Bedford Harbor Superfund Site) allows for the work to be conducted under the SER.

3.1 General Approach

Pre-design activities, including sampling and analytical programs, bathymetric surveys, and remote sensing surveys were all completed prior to design. This information will allow for consultation with Resource Agencies and a number of information documents, such as an update of the Essential Fish Habitat and Endangered Species Assessment (EFHA) (based on the EFHA from Task 1) to the National Marine Fisheries Services (NMFS) and the Massachusetts Division of Marine Fisheries (MADMF), an Underwater Archaeological and Hazards Analysis for the Massachusetts Board of Underwater Archaeology (MBUA), and discussions with the City of New Bedford Conservation Commission on local concerns.

Dredging of the proposed areas in Fairhaven and the estimated volumes for each dredge area are as follows:

- Town of Fairhaven Pease Park Boat Ramp: 5,000 cy
- Linberg Marine, Inc: 5,000 cy
- D.N. Kelley and Son, Inc: 15,000 cy
- Niemiec Marine: 1,000 cy
- Harbor Hydraulics: 1,000 cy
- Olde North Wharf Fisheries, LLC.: 1,000 cy
- **TOTAL:** **28,000 cy**

It is anticipated that the majority of the sediment generated from the proposed maintenance dredging will consist of fine-grained organic silt material with varying levels of contamination. The following sections describe the scope of work to be completed for this project.

3.2 Design Considerations

A design process will be undertaken to design the various pieces of the project. The design process will include the collection of necessary data concerning the characterization of the sediments and adjacent structures, designing the limits of the dredging and determining the dredge disposal scenario and necessary monitoring and controls.

3.2.1 New Bedford Harbor Dredge – Phase II (Task 2)

o Sampling and Analysis

Several phases of subsurface explorations will be completed at the proposed dredge areas. Initially, a program of vibracore sampling was performed in March 2005 to provide analytical data for design. The sample locations (201-229, shown on Figure 1-2) were selected to provide chemical and geotechnical data over the footprints of each of the proposed dredge areas. The vibracore sampler was hydraulically

advanced to depths corresponding to the approximate proposed dredge depths, accounting for allowable overdredge, or to refusal.

Samples were retrieved from the cores and submitted to a laboratory for chemical analysis. Samples were analyzed for polychlorinated biphenyls (PCB) aroclors, extractable petroleum hydrocarbons (EPH), metals, volatile organic compounds (VOCs), total organic carbons (TOCs), reactive sulfide, and moisture content. Analytical data is summarized on Table 1-1.

- o Dredge cuts

Design dredge cuts will be established based on discussions with the NBHDC and the three pier or terminal operators. The three proposed dredge areas require dredging to achieve and maintain the following design mudlines (design depths vary with respect to location):

- Town of Fairhaven Pease Park Boat Ramp: -4 & -8 MLLW
- Linberg Marine, Inc.: -8 & -10 MLLW
- D.N. Kelly and Sons: -8, -10, -15 & -20 MLLW
- Niemiec Marine: -7 MLLW
- Harbor Hydraulics: -10 MLLW
- Olde North Wharf Fisheries, LLC.: -6, -7, -8, -9 & -10 MLLW

Dredge cuts and slopes immediately adjacent to bulkheads or other shoreline structures will be designed based on evaluation of the adjacent structures, as well as terminal operators' specific vessel requirements.

3.2.2 Dredge Material Disposal

The proposed New Bedford Harbor Dredge – Phase II (Task 2) dredging will generate approximately 28,000 iscy of dredge material, which is primarily composed of fine grained sediments with minor amounts of surficial contamination. The sediment throughout the footprints of the proposed dredge areas is contaminated primarily with varying amounts of PCBs and metals. The sediment will be disposed of in the CAD cell located within the New Bedford Harbor Superfund Site north of Route 6 and Fish Island.

3.3 Construction Considerations

The NBHDC will manage and oversee the construction activities. Construction operations will be 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 will be 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 will be evaluated using the pre-construction submittal review process. A control plan to ensure conformance to performance criteria will be a Contractor submittal requirement.

3.3.1 Dredging

Establishment of performance standards, including water quality criteria, will mandate dredging operations. Dredge methods will be selected to achieve water quality standards. Dredging of material may require implementation of controls such as use of an environmental (sealed) bucket, silt curtains, oil absorbent booms, reduced cycle times, etc. Specifications and requirement details will be determined through the design process.

Water quality monitoring will be conducted during dredging operations, following a pre-determined schedule. Monitoring will likely include measurement of turbidity or total suspended solids, as well as sampling and analysis of the water column for contaminants of concern. It is anticipated that the specific monitoring requirements and schedule will be determined in conjunction with MADEP and other Resource Agencies as the project design advances. All dredging and disposal will be performed in such a manner as to minimize impacts to fish, critical habitats, and other wildlife. Contingency plans detailing engineering controls will be prepared by the Contractor in the event that water quality is impacted.

Where encountered, it will be necessary to screen debris from the dredge material using debris screens or other methods. Debris will be segregated and stockpiled for off-site disposal at a pre-determined location.

3.3.2 CAD cell filling

CAD cell filling operations will be subject to operational controls to be developed during project design. Project-specific water quality criteria developed by MADEP with the assistance of the Resource Agencies will apply to filling operations as well as dredging and other performance standards. Means and methods for discharge of materials into the CAD cell will be developed to ensure compliance with water quality criteria. It is anticipated that discussions between MADEP, and U.S. Army Corps of Engineers (USACE) and USEPA (as part of the design process) regarding previous projects will be valuable relative to evaluating discharge requirements. Methods to be evaluated include use of split hull barges, as well as placement of sediment into the cell using clamshell equipment. Some combination of operational controls will likely be 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 are to be determined during the design process.

Figure 1-2 Fairhaven Areas As-built Sampling Locations

817500 817600 817700 817800 817900 818000 818100 818200 818300 818400 818500

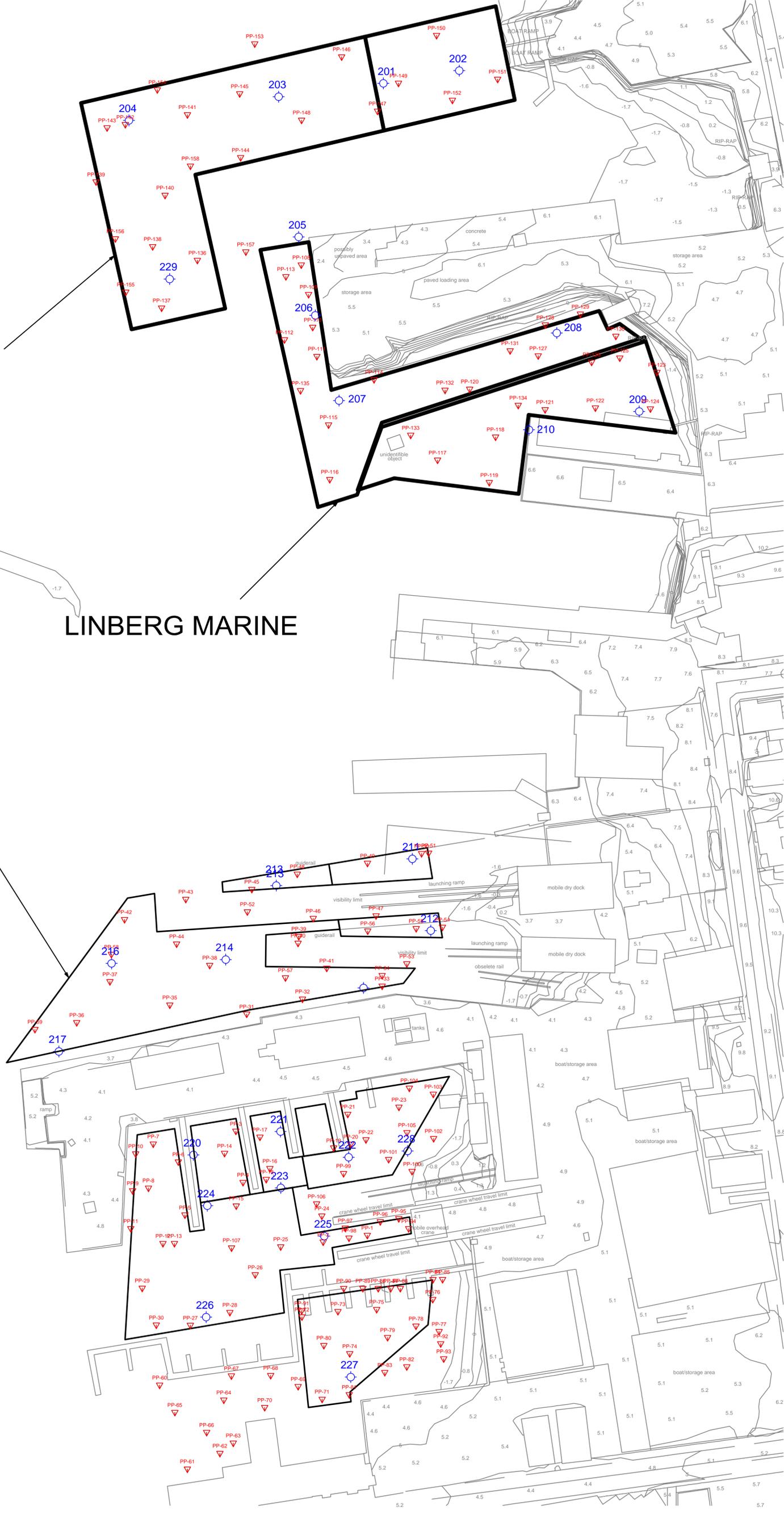
2694000
2693900
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2693700
2693600
2693500
2693400
2693300
2693200
2693100
2693000
2692900
2692800
2692700
2692600
2692500

PEASE PARK

LINBERG MARINE

D.N. KELLY & SONS, INC



LEGEND

- ⊙ VIBRACORE LOCATION
- ▼ PROBE TO REFUSAL LOCATION

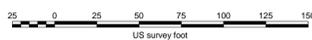
Figure
1-2

**SAMPLING LOCATION MAP
FAIRHAVEN DREDGE AREAS**

JOB # 6542.006
DATE: June, 2005

**New Bedford Harbor
Fairhaven, MA**

FIGURE 1 of 1



REVISIONS

DATE BY

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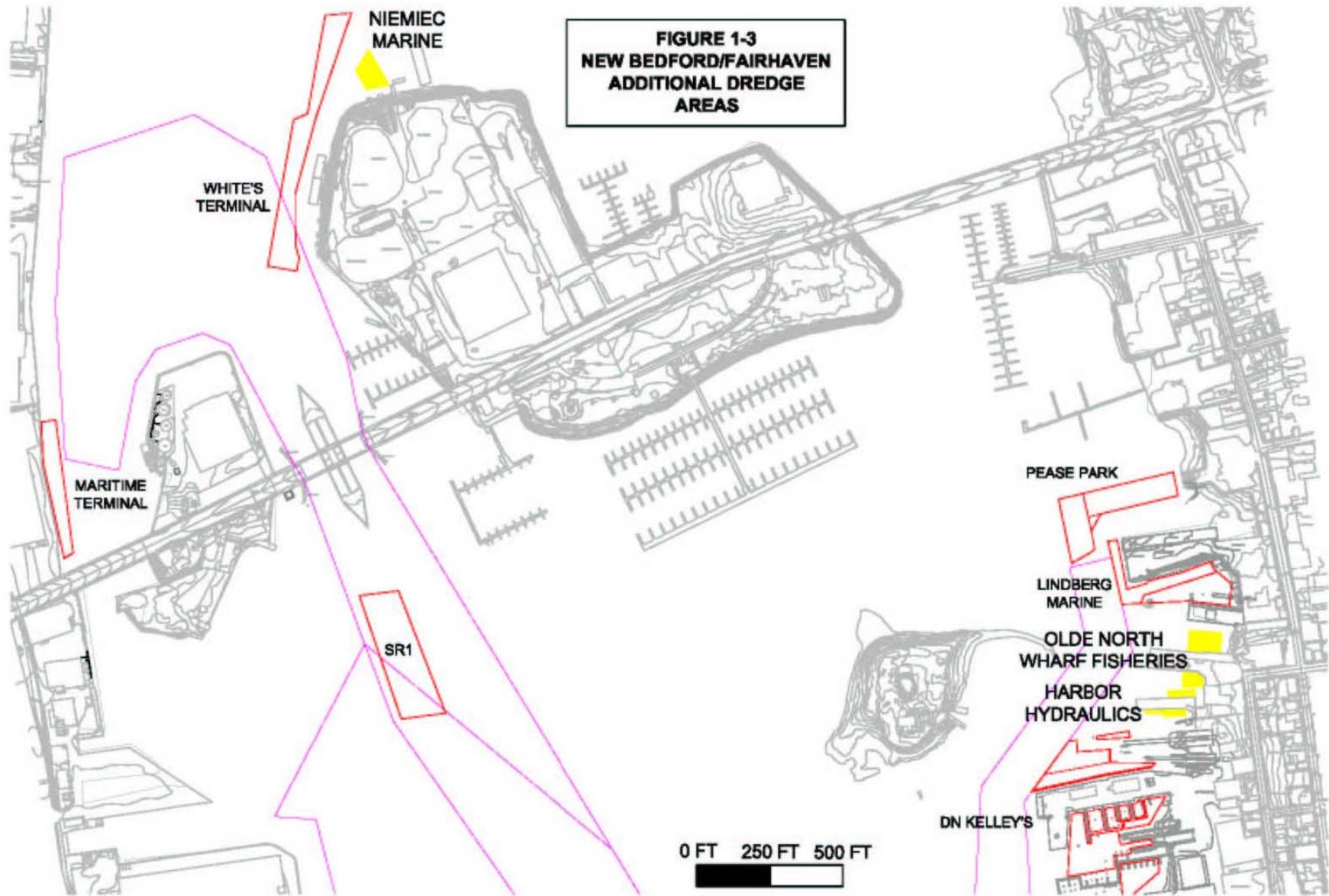


Table 1-1 Fairhaven Areas Analytical Data Results

New Bedford Harbor Dredge - Phase II (Task 2)

Table 1-1 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	
MA EPH																						
C19-C36 Aliphatics	mg/Kg-dry	ND	ND	292	ND	ND	ND	ND	ND	190	ND	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	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	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	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	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	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	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	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	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	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	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	ND
Arsenic	mg/Kg-dry	ND	ND	ND	ND	ND	ND	ND	ND	9.68	ND	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	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	ND
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	ND
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	ND
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	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	ND
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	ND
TOC	mg/Kg-dry	3730	36700		29600	44900	27100	44600		23700		28800	12500		42000	78900	18500	37800	4990	69100	25600	ND
% 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	ND
Reactive Sulfide	mg/Kg-dry	ND	ND	positive	ND	positive	ND	ND	ND	ND	positive	ND	ND	ND	ND	ND						

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

4.0 PROJECT SCHEDULE

The following critical path project milestones have been identified for New Bedford Harbor Dredge – Phase II (Task 2):

- NBHDC submits Addendum to Work Plan
- Submission of the Underwater Archaeological and Hazards Analysis for MBUA
- Submission of the EFHA Update
- Complete engineering design (plans and specifications)
- Issue dredging contract Invitation for Bid (IFB)
- Award dredging contract
- Dredge contractor mobilize to site
- Commence dredging at the proposed dredge areas
- Commence disposal at the CAD cell
- Complete dredging work under New Bedford Harbor Dredge – Phase II (Task 2) contract

The Conceptual Project Schedule is presented below. Actual construction schedule will be based on the schedule developed during design and in coordination with the Resource Agencies, the City of New Bedford, the Town of Fairhaven, the pier owners, and Dredging Contractor. The schedule presented is conceptual.

Spring 2005:

- Preparation and submittal of SER Regulatory Documents
- Design of the Fairhaven project dredge areas
- Issue IFB

Summer/Fall 2005:

- Award Dredging Contract
- Conduct New Bedford and Fairhaven project area dredging and disposal

5.0 REFERENCES

Maguire Group, Inc. 2003. Dredged Material Management Plan (DMMP) Final Environmental Impact Report (FEIR) for New Bedford and Fairhaven, Massachusetts: Prepared for The Office of Coastal Zone Management; Foxborough MA.

Vanasse Hangen Brustlin (VHB). 2000. New Bedford/Fairhaven Harbor Plan: Prepared for the City of New Bedford/Town of Fairhaven Harbor Master Plan Committee.

Attachment A

Geotechnical Boring Logs

New Bedford Harbor Dredge – Phase II (Task 2: Fairhaven Areas)

(Copies of the Geotechnical Boring Logs were provided as part of the Addendum #1 (May 2005) to the Work Plan for New Bedford Harbor Dredge – Phase II North Terminal Maintenance Dredge (December 2004)

Attachment B
Proposed Project Performance Standards

NBH Dredge – Phase II (Task 2: Fairhaven Areas)
Proposed Performance Standards

I MADEP 401 Water Quality Program Standards:

1. Anti-degradation provisions of the Massachusetts Surface Water Quality Standards protect all waters, including wetlands. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner, which will avoid violations of said standards.
2. Prior to the start of in-water work, the SER Project Manager (SER PM) shall be notified of any proposed change(s) in plans that may affect waters or wetlands.
3. As proposed, if water quality standards are exceeded, silt-curtains and absorbent booms shall be deployed to enclose the area being dredged. The contractor’s plan for deployment of the silt curtains/absorbent booms shall be submitted to the SER PM for review prior to the start of in-water work. Should the deployment of silt-curtains prove not feasible or be unsuccessful, the SER PM will be notified prior to any dredging without silt curtains.
4. Water Quality Monitoring:
 - a. **When the dredging operation is contained within a silt-curtained area,** the following water-quality monitoring program shall be carried out daily for the first three days of dredging and once a week thereafter:
 - i. A reference location shall be established outside of and approximately 200-feet from the silt-curtained area and a monitoring location shall be established outside of and within 15-feet of the silt-curtain.
 - ii. Turbidity shall be measured, using an optical backscatter sensor, at both the reference and monitoring locations, at established depths: near the water’s surface, at the mid-point of the water column and near the bottom. The three values obtained shall be averaged, such that a single, representative turbidity value is calculated for the monitoring site and a single, representative value is calculated for the reference site.
 - iii. Turbidity shall be measured at both the monitoring and reference site prior to the start of dredging, and once every two hours during dredging.
 - iv. An exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the monitoring site exceeds the average reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

Reference Site Turbidity (NTUs)	Permissible Turbidity Increase
<10	Reference plus 20 NTUs
11-20	Reference plus 15 NTUs
>21	Reference plus 30% of reference

- v. If, in two consecutive monitoring events, the average turbidity at the monitoring site exceeds the average turbidity at the reference site by more than the permissible turbidity increase, then water samples, composited over the entire water column, from both the monitoring and reference sites shall be collected and submitted for analysis of Total Suspended Solids, dissolved PCBs, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc. When samples are submitted to the laboratory, a 36-hour turn-round time shall be requested. Additionally, the Proponent, or their contractor, shall take operational action(s) designed to limit such exceedances, such as increasing the dredge cycle time, inspection and any necessary repair, of the silt curtains, deployment of an additional row of silt curtains or other mitigation measures. Turbidity monitoring shall continue on the schedule outlined in Section 6.a.iii, until compliance is reestablished.
 - vi. If compliance can not be reestablished within 48 hours, dredging shall cease and Department and any other interested local, state, or federal agency staff, in consultation with the Proponent, their contractors and/or consultants shall review the operational actions undertaken, the results of the analyses of the water samples and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.
- b. **When the dredging operation is not contained within a silt-curtained area**, the following water-quality monitoring program shall be carried out daily for the first three days of dredging and twice a week thereafter:
- i. A reference location shall be established approximately 200-feet up-current from the dredge and a monitoring location shall be established 200-feet down-current from the dredge at the edge of the mixing zone.
 - ii. Turbidity shall be measured, using an optical backscatter sensor, at both the reference location and the monitoring location, at established depths: near the water's surface, at the mid-point of the water column and near the bottom. The three depth values obtained shall be averaged, such that a single, representative turbidity value is calculated for the reference location and a single, representative turbidity value is calculated for the monitoring location.
 - iii. Turbidity shall be measured at both the reference location and at the edge of the mixing zone prior to the start of dredging, and once every two hours of dredging.
 - iv. An exceedance of the project turbidity standard shall be attributed to project activities when the average turbidity at the edge of the mixing zone exceeds the reference site turbidity plus the permissible turbidity increase, as outlined in the following table:

Reference Site Turbidity (NTUs)	Permissible Turbidity Increase
<10	Reference plus 20 NTUs
11-20	Reference plus 15 NTUs
21-30	Reference plus 10 NTUs
>31	Reference plus 30% of reference

- v. If, in two consecutive monitoring events, the average turbidity at the edge of the mixing zone exceeds the average turbidity at the reference site plus the permissible turbidity increase, then water samples, composited over the entire water column, from both the reference location and the edge of the mixing zone shall be collected and submitted for analysis of Total Suspended Solids, dissolved PCBs, arsenic, cadmium, copper, chromium, lead, mercury, nickel, and zinc. When samples are submitted to the laboratory, a 36-hour turn-round time shall be requested. Additionally, the Proponent, or their contractor, shall take operational action(s) designed to limit such exceedances, such as increasing the dredge cycle time, inspection and any necessary repair, of the silt curtains, deployment of an additional row of silt curtains or other mitigation measures. Turbidity monitoring shall continue on the schedule outlined in Section 6.b.iii, until compliance is reestablished.
 - vi. If compliance cannot be reestablished within 48 hours, dredging shall cease and the Department and any other interested local, state or federal agency staff, in consultation with the Proponent, their contracts and/or consultants shall review the operational actions undertaken, the results of the analyses of the water samples and evaluate the biological significance of the available data and determine the requirements for additional mitigation, if any.
5. As proposed, dredging of contaminated, silty sediment shall be done using a closed, environmental, clamshell bucket. Where pilings or other debris are found to interfere with environmental bucket closure or equipment operation, a conventional clamshell bucket may be used to extract the pilings/debris. Sediment removal during such activity shall be minimized to the greatest extent practicable. Should dredging with the environmental bucket become unfeasible or unsuccessful, the SER PM must be notified prior to any contaminated sediment dredging not using the environmental bucket, and the contractor must also continue to meet the project water quality standard performance standards.
 6. Water discharged from the barge shall be appreciably free of suspended sediment and meet the water quality criteria established in Section 4 (above). Any free liquid flowing from the barge in the harbor shall be passed through a sand media filter or equivalent filtration system (which must be approved by the project Resident Engineer) prior to discharge.
 7. Diesel-powered equipment shall be fitted with after-engine emissions controls such as oxidation catalysts or particulate filters.
 8. Within 30 days of the completion of the initial dredging, a bathymetric, survey of the dredge footprint, depicting post-dredge conditions, shall be sent to the MADEP SER Project Manager.
 9. Disposal of any volume of dredged material at any location in tidal waters is subject to approval by the Department and the Massachusetts Coastal Zone Management office.

II MADEP Chapter 91 Waterways Standards:

1. Acceptance of these Waterways Conditions shall constitute an agreement by the Proponent to conform to all terms and conditions herein.
2. All subsequent maintenance dredging and transportation and disposal of this dredge material, during the term of this Project shall conform to all standards and conditions applied to the original dredging operation performed under this Project.
3. After completion of the work authorized, the Proponent shall furnish to the Department a suitable plan showing the depths at mean low water over the area dredged. Dredging under this Project shall be conducted so as to cause no unnecessary obstruction of the free passage of vessels, and care shall be taken to cause no shoaling. If, however, any shoaling is caused, the Proponent shall at his/her expense, remove the shoal areas. The Proponent shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the Proponent shall pay all costs associated with such work.
4. The Proponent shall assume and pay all claims and demands arising in any manner from the work authorized herein, and shall save harmless and indemnify the Commonwealth of Massachusetts, its officers, employees, and agents from all claims, audits, damages, costs, and expenses incurred by reason thereof.
5. The Proponent shall, at least three days prior to the commencement of any dredging in tide water, give written notice to the Department of the time, location, and amount of the proposed work.

Special Waterways Conditions

1. Dredge material shall be transported to suitable disposal facilities; unregulated dumping of dredge materials is not permitted.
2. The Proponent shall develop and implement a Navigation Plan to address and mitigate temporary impacts to navigation during dredging activities.
3. The Proponent shall provide and maintain in good working order appropriate United States Coast Guard (USCG) approved navigation aids to assist mariners in avoiding work areas as required by the USCG.
4. The Proponent shall maintain vehicular access to water-dependent users throughout construction activities.
5. The Proponent shall remove and properly dispose of all temporary structures and debris no later than three (3) months after completion of the dredging and disposal.
6. Modification to this Project: the SER PM, may review on an individual basis, modifications to construction activities and/or temporary structures which represent an insignificant deviation from original specifications, in terms of configuration, materials or other relevant design or fabrication parameters as determined by DEP within all areas of construction. Such review shall be in accordance with the following procedure:

- a. The Proponent shall submit a written request describing the proposed modifications to the work accompanied by plans, for prior review of the DEP. The DEP will consider comments submitted within ten (10) days of the DEP's receipt of the request. The DEP will send any significant modifications to the Resource Agencies for review and comment and to identify any future Performance Standards, if necessary. EPA will also have the opportunity to make a consistency determination if the change is significant, as necessary. The DEP will notify the Resource Agencies of any minor modifications.
7. After completion of the work authorized the Proponent shall furnish the Department a suitable plan showing the depths at mean low water over the areas dredged within 90 days of completion of each phase of the dredging.