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Memorandum

To: New Bedford Harbor Development Commission

From: Apex Companies, LLC (Apex) Engineering Design Team

Date: February 16, 2012

Re: Lower Harbor CAD Cell (LHCC)
Data Package Summary Memorandum

This Memorandum is submitted by the Lower Harbor CAD Cell Design Team (Apex Companies, LLC), on behalf of the New Bedford Harbor Development Commission, as a companion document to the attached Data Package, in order to clarify the contents and relevance associated with the enclosed items, in association with the design of the Lower Harbor CAD Cell (LHCC).

The data contained within the Data Package includes both historic data and new data generated from pre-design investigations. New data generated from pre-design investigations includes:

- Bathymetric Data;
- Figures;
- Boring logs; and
- Partial Geotechnical Analytical Data.

There are nine figures that have been generated as part of the preparation of this data package. They are:

- *Figure 1 – Bathymetric Data Plan* (Bathymetry Data Section)
- *Figure 2 - Boring Location Plan* (Boring Data Section)
- *Figure 3 - Historic Vibracore Location Plan* (Vibracore Data Section)
- *Figure 4: Conceptual LHCC Location Plan 1* (Conceptual LHCC Siting Plans Section)
- *Figure 5: Conceptual LHCC Location Plan 2* (Conceptual LHCC Siting Plans Section)
- *Figure 6: Conceptual LHCC Location Plan 3* (Conceptual LHCC Siting Plans Section)
- *Figure 7: Conceptual LHCC Location Plan 4* (Conceptual LHCC Siting Plans Section)
- *Figure 8: Conceptual LHCC Location Plan 5* (Conceptual LHCC Siting Plans Section)

- Figure 9: *Conceptual LHCC Location Plan 6* (Conceptual LHCC Siting Plans Section)

The Data Package is organized into multiple categories. These are:

1. **Bathymetry Data**
2. **Boring Data**
3. **Historical Data**
4. **Seismic Data**
5. **Vibracore Data**
6. **Conceptual LHCC Siting Plans**

The following is a brief explanation of each category, the data contained within each, and its relevance to the LHCC design.

1. Bathymetry Data

This information outlines the existing bathymetry, measured in feet below Mean Lower Low Water, of the existing bottom of the harbor within the area anticipated to be utilized to construct the LHCC. It includes the following figure, which is a visual representation of the bathymetry:

a. *Figure 1 – Bathymetric Data Plan, Apex Companies, LLC.* This plan shows existing bathymetry.

2. Boring Data

This information includes both historic and more recent borings, as well as geotechnical analytical data generated from those borings, that have been advanced within the area where the LHCC is being considered to be sited. Geotechnical analytical data is also included that is representative of material to be placed into the LHCC. The data includes the following:

a. *Historic Boring Logs:* Historic boring logs within the vicinity of the area anticipated to be utilized to construct the LHCC.

b. *Historic Geotechnical Analytical Data.* Historic geotechnical analytical data within the vicinity of the area anticipated to be utilized to construct the LHCC. This data is typically associated with samples collected at various depths from Historic Boring Logs.

c. *Historic Organic Silt-Clay Hydraulic Conductivity Data.* This document provides historic hydraulic conductivity analyses shallow, contaminated material that is representative of material that will be placed within the LHCC. The material is a black, organic silt or clay, the upper one to two feet of which has been shown historically by EPA to be impacted by PCBs of varying concentrations. A map showing the locations of the historic samples is included, as well as a calculation of the average hydraulic conductivity of the material.

d. *LHCC Boring Logs:* Boring logs completed in association with design of the LHCC.

e. *Partial LHCC Geotechnical Analytical Data:* Geotechnical analytical data collected from the first six boring logs advanced in association with the design of the LHCC. This data is associated with the LHCC Boring Logs and includes data for bulk density, sieve size, hydraulic conductivity, and total organic carbon.

f. *Figure 2 - Boring Location Plan, Apex Companies, LLC.* Shows location of historic borings as well as the location of borings associated with the LHCC design. Please note that Figure 1 is the *Bathymetric Data Plan*.

3. Historical Data

This is historic information that is relevant to the siting and design of the LHCC. It is organized into a number of sub-categories as follows:

- Historic Air Evaluations;
- Historic New Bedford Harbor Superfund Site Risk Assessments;
- Historic USEPA LHCC Feasibility Assessments;
- Historic Background Material and Literature;
- Historic Remote Sensing Reports;
- Historic Navigational Dredging Water Quality Measurements;
- Historic Suspended Sediment Transport Modeling and Measurement; and
- Historic Toxicity Testing.

Historic Air Evaluations:

This information has been provided (along with the New Bedford Superfund Site Risk Assessments) to address concerns by the public regarding the risks associated with concentrations of PCBs in air. It includes the following reports:

a. *Evaluation of the Impact of Dredging and CAD Cell Disposal on Air Quality, Jacobs Engineering Group, June 2010:* This report was promulgated by Jacobs Engineering on behalf of USACE to evaluate the impact of CAD Cell Disposal and Dredging on air quality.

Historic New Bedford Harbor Superfund Risk Assessments:

This information has been provided to provide a background for the human health and ecological risks associated with PCBs in New Bedford Harbor that drove the 1998 Record of Decision and subsequent Explanations of Significant Differences, including the Lower Harbor CAD Cell. It includes the following reports:

b. *Draft Final Baseline Public Health Risk Assessment, EBASCO, August 1989:* This is

the human health risk assessment conducted by EBASCO for USEPA that assesses the risks associated with the PCB impacts to sediment in New Bedford Harbor.

c. *Draft Final Baseline Ecological Risk Assessment, EBASCO, April 1990.* This is the ecological risk assessment conducted by EBASCO for USEPA that assesses the risks to the environment associated with the PCB impacts to sediment in New Bedford Harbor.

Historic USEPA LHCC Feasibility Assessments:

This information has been provided to outline the assessments USEPA conducted prior to implementing the Explanation of Significant Differences associated with the LHCC. It includes the following reports:

d. *Assessment of Contaminant Loss and Sizing for Proposed Lower Harbor Confined Aquatic Disposal (CAD) Cell, USACE Engineer Research and Development Center, May 2010.* This assessment was performed by USACE to estimate how the LHCC would perform geotechnically, and to estimate the potential losses of sediment associated with disposal, capping, and long-term maintenance of the LHCC.

e. *Turbidity Monitoring and Plume Sampling Results for City Dredge Disposal at the New Bedford Harbor CAD Cell #2, Battelle, December, 2009.* This is a report summarizing monitoring of disposal events at CAD Cell #2 during Navigational Dredging, and was utilized by EPA to assess potential loss of sediment when conducting disposal events at a potential future LHCC.

Historic Background Material and Literature:

This information has been provided to outline background information regarding CAD Cells, as well as some background information regarding the mass of PCBs associated with the New Bedford Harbor Superfund Site. It includes the following reports:

f. *Estimate of Mass of PCBs in New Bedford Harbor, EBASCO, April, 1989.* This assessment was part of the 1998 Record of Decision and provides an estimate of the mass of PCBs associated with the New Bedford Superfund Site, as well as the approximate areal distribution of that mass.

g. *USACE Leaching/Pore Water Analysis.* This table summarizes the results of the Sequential Batch Leaching Tests (SBLT) performed by USACE when assessing contaminant loss from the LHCC. The SBLTs are estimates of pore water concentrations once material is placed within the LHCC. The total PCB concentration is indicated for each SBLT pore water result. Massachusetts Contingency Plan Method 1 GW-3 standards are included within the table as a basis of comparison.

h. *Understanding the Physical and Environmental Consequences of Dredged Material*

Disposal: History in New England and Current Perspectives, Fredette and French, 2004. This is a paper written by representatives from USACE, associated with historic use of disposal sites in New England, both open ocean sites and CAD Cells, through the approximately 35 years of the DAMOS program.

i. *Why Confined Aquatic Disposal Cells Often Make Sense, Fredette, 2005.* This is a paper written by a representative from USACE, associated with the issues involved in utilizing CAD Cells.

Historic Remote Sensing Reports:

This information includes remote sensing reports that have been prepared within the area where the LHCC is being considered to be sited:

j. *Underwater Archeological Remote Sensing Survey, Dolan Research, Inc., January 2000 (Revised March 2001).* Remote sensing report prepared in association with the Superfund investigation process.

k. *Underwater Archeological and Hazards Analysis, Remote Sensing Survey, Apex Environmental, Inc., March 2003.* Remote sensing report prepared in association with the Dredge Material Management Plan process.

Historic Navigational Dredging Water Quality Measurements:

This information includes water quality measurements that have been completed associated with the Phase II and Phase III Navigational Dredging program, which included mechanical dredging, and placement of material into CAD Cells. Also see: *Turbidity Monitoring and Plume Sampling Results for City Dredge Disposal at the New Bedford Harbor CAD Cell #2, Battelle, December, 2009,* which includes additional analysis on turbidity generation during CAD Cell disposal events.

l. *Phase II Water Quality Monitoring.* Results of turbidity measurements collected during Phase II of Navigational Dredging. Outlines both mechanical dredging measurements and CAD Cell disposal measurements.

m. *Phase III Water Quality Monitoring.* Results of turbidity measurements collected during Phase III of Navigational Dredging. Outlines both mechanical dredging measurements and CAD Cell disposal measurements.

Historic Suspended Sediment Transport Modeling and Measurement:

This information includes transport modeling associated with CAD Cell planning associated with the Dredge Material Management Plan process as well as a flux analysis conducted by EPA indicating the quantity of contaminated sediment entering Buzzard's Bay under existing conditions.

n. *Dredge Material Transport Modeling Analysis, Maguire Group, July 2003.* Dredge disposal modeling associated with potential sediment re-suspension related to CAD Cell usage associated with the Dredge Material Management Plan process.

o. *New Bedford Harbor PCB Flux Study, Woods Hole Group, Inc., August 2010.* Results of analysis conducted by USEPA associated with determining the quantity of PCB mass that fluxes out of New Bedford Harbor into Buzzard's Bay on a daily basis.

Historic Toxicity Testing:

This information includes toxicity testing associated with suspended sediment anticipated to be generated during placement of contaminated material into CAD Cells.

p. *Task 2A: Suspended Particulate Phase Acute Toxicity Testing with Mysids, Maguire Group, July 2003.* Toxicity testing report instituted to assess potential toxicity associated with re-suspension of sediment associated with CAD Cell usage as part of the Dredge Material Management Plan.

q. *Task 2B: Toxicity Identification Evaluation Testing with Mysids and Sea Urchins, Maguire Group, July 2003.* Additional toxicity testing report instituted to assess potential toxicity associated with re-suspension of sediment associated with CAD Cell usage as part of the Dredge Material Management Plan.

4. Seismic Data

This information includes geophysics reports (seismic and sub-bottom analyses) that have been prepared for the area anticipated to be utilized to construct the LHCC. This information is primarily historic. Information to supplement this data is currently being generated, but is not currently available:

a. *CDF D Geophysics.* Mapped data showing the results of a geophysical investigation conducted in order to assess subsurface sediment and bedrock elevations in the vicinity of the proposed CDF D.

b. *Report of Marine Geophysical Surveys: Seismic Refraction, Sub-Aqueous Disposal Cell Feasibility Studies, Apex Environmental, Inc., 2001.* Geophysics report prepared in association with the Dredge Material Management Plan process.

c. *Addendum To Marine Geophysical Surveys: Seismic Refraction, Sub-Aqueous Disposal Cell Feasibility Studies, Updated Data and Model Revision, Maguire Group, 2003.* Addendum to geophysics report prepared in association with the Dredge Material Management Plan process.

5. Vibracore Data

This information includes vibracores that have been advanced within the area where the LHCC is being considered to be sited. This information is primarily historic. Information to supplement this data is currently being generated, but is not currently available:

a. *Historic Vibracore Logs.* Historic vibracore logs within the area anticipated to be utilized to construct the LHCC.

b. Figure 3 - Historic Vibracore Location Plan, Apex Companies, LLC. This plan shows the location of historic vibracores. Please note that Figures 1 and 2 are the *Bathymetric Data Plan and Boring Location Plan.*

6. Conceptual LHCC Siting Plans

These figures have been generated to outline a number of conceptual locations for the proposed LHCC. Once a location has been finalized, final design of the LHCC will begin. Please note that Figures 1 through 3 are the *Bathymetric Data Plan, Boring Location Plan, and Historic Vibracore Location Plan*, respectively:

a. Figure 4: *Conceptual LHCC Location Plan 1:* Shows one potential location for the Lower Harbor CAD Cell.

b. Figure 5: *Conceptual LHCC Location Plan 2:* Shows one potential location for the Lower Harbor CAD Cell.

c. Figure 6: *Conceptual LHCC Location Plan 3:* Shows one potential location for the Lower Harbor CAD Cell.

d. Figure 7: *Conceptual LHCC Location Plan 4:* Shows one potential location for the Lower Harbor CAD Cell.

e. Figure 8: *Conceptual LHCC Location Plan 5:* Shows one potential location for the Lower Harbor CAD Cell.

f. Figure 9: *Conceptual LHCC Location Plan 6:* Shows one potential location for the Lower Harbor CAD Cell. This particular scenario assumes that the LHCC would be combined with a CAD Cell needed for future Navigational Dredging.