

**NEW BEDFORD HARBOR SUPERFUND SITE (NEW BEDFORD, MA)  
(MCSS DATABASE PROJECTS 01-02 AND 01-08)**

**Site Description**

New Bedford Harbor comprises 18,000 acres that includes Upper, Lower, and Outer Harbors and Buzzard's Bay. This includes a 1,000-acre tidal estuary/harbor/bay and 50 acres of bordering marshland. The site has been a federal NPL site since 1983 due to the presence of elevated PCBs and metals in sediment and biota. The site has been divided into three operable units (OUs) for purposes of evaluation and remediation. The primary area of concern is designated OU1, which comprises the 187-acre Upper Harbor and localized areas in the Lower Harbor. OU2 comprises six hot spot areas totaling five-acres near the former Aerovox mill. OU3 comprises the entire 17,000-acre Outer Harbor (Buzzards Bay) area. A Record of Decision (ROD) for OU 3 has yet to be issued.

The Coggeshall Street Bridge marks the separation of the Upper and Lower Harbors; the Harbor is 110 feet wide and 18 feet deep at the bridge. The Upper Harbor has a maximum width of 250 feet near the Coggeshall Street Bridge and water depth gradually decreases from about 18 feet to six feet near the north end and further decreases to two feet at the head of the Upper Harbor. Sediments in the Upper Harbor are primarily organic silts and marine clays. Water depths in the Lower Harbor range between 6 and 12 feet, except in the shipping channel that is 30-50 feet deep. Sediment in the Lower Harbor is primarily silty sand.

The site is being addressed as a fund-lead under the federal Superfund program.

**Site History**

The site was contaminated by PCBs and heavy-metal wastes primarily from two electrical-equipment manufacturing plants, which discharged into the harbor and river, and through New Bedford's sewerage system from the 1940s until the 1970s. Sediments have been periodically remediated at the Site since 1988. In 1988-89, a dredge pilot study was performed to evaluate the possibility of removal of contaminated sediment using dredging.

In 1994-1995, an interim remedial action was performed by EPA that resulted in the removal of 14,000 cy of PCB-contaminated sediments from the OU2 five-acre hot spot areas that had been identified as containing the most highly contaminated sediments. Sediments above 4,000 ppm PCBs were removed using a 10-inch horizontal auger dredge and temporarily stored in a nearshore confined disposal facility (CDF) pending disposal. The cost for the sediment removal was \$20.1 million (includes construction of CDF and 350 gpm wastewater treatment plant and disposal in the CDF) (\$1436/cy). The original plan for incineration of the removed sediment was abandoned in July 1994 due to public opposition. In 1999, the sediment was removed from the CDF, stabilized with lime, transported via truck and disposed of at a landfill in Model City, NY. The cost of disposal was an additional \$8 million bringing the total unit cost for the removal action to >\$2000/cy.

The ROD for OU1 was issued in 1998 and specified the dredging of 433,000 cy of PCB-contaminated sediment from the Upper Harbor to <10 ppm PCBs and 17,000 cy from the Lower Harbor and Bay, combined, to <50 ppm PCBs. Additionally, areas of public access and where residences abut primarily the Upper Harbor would be dredged to <25 ppm and <1 ppm, respectively. The removed sediment was to be deposited into four new nearshore CDFs (CDFs A,

B, C, and D) totaling 43 acres. The remedial plan estimated that it would take ten years to complete: two years for design and CDF construction and eight years for removal using two dredges simultaneously. EPA estimated that it would take another ten years following remediation until PCB levels in fish were reduced to below site-specific risk levels and fish advisories could be lifted.

In the summer of 2000, a dredge evaluation program was implemented over a five-day period within a single test cell located in the Upper Harbor to select an optimum dredge for remediation. The dredge equipment tested comprised a 4.5 cy Horizontal Profiling Grab bucket, the Bean patented Slurry Processing Unit, and a Crane Monitoring System.

In 2001 in preparation for remedial dredging, underwater electric cables were relocated outside of the targeted dredge areas. In September 2001, EPA issued an Explanation of Significant Differences (ESD) to the OU1 ROD for five design modifications: 1) adding mechanical dewatering to reduce the volume of sediment requiring disposal and likely eliminating the need for two of the four CDFs proposed in the ROD, 2) revising the wall design for CDF D, 3) adding the construction of a rail spur to the CDF D area, 4) requiring the removal of additional intertidal sediments along the Acushnet River and along River Road, and 5) allowing the use of the existing Sawyer Street CDF as a temporary TSCA facility.

In August 2002, EPA issued a second ESD to the OU1 ROD that eliminated the use of CDFs as a disposal option and changed the method of disposal for the removed sediment to offsite landfilling. This ESD also specified mechanical coarse separation of the sediment at the Sawyer Street location and subsequent transfer of finer grained material by a double-walled underwater pipeline to a dewatering facility located at Hervey Tichon Avenue. The estimated cost for the revised project was projected at \$317 million based on a total removal volume of 507,100 cy.

During the period November 2002 to March 2003, EPA completed an accelerated cleanup of 15,500 cy of contaminated sediment in a 6.5-acre area of the Acushnet River at a cost of \$5.96 million. In August 2003, EPA began dredging an estimated 4,500 cy of sediment from an area of the harbor in the vicinity of the Herman Melville Shipyard.

By June 2004 when dredging in OU1 began, the estimated volume for OU1 had risen to 867,000 cy of sediment from the harbor at a cost estimated at \$400 million.

In 2005, a pilot capping project was performed in OU3 over a 19-acre area just south of the New Bedford Harbor hurricane barrier in shallow water near the Cornell-Dubilier mill. The upper foot of covered sediment had been found to contain PCBs ranging from 1 to 94 ppm and averaging 32 ppm over the entire area, and somewhat higher PCB levels at a depth of two feet. This area contained an estimated 25,000 cy of sediment originally targeted for dredging. The cap material was clean sand and gravel taken from a navigational confined disposal location located in the harbor. The cap material was placed using a split-hull scow with the goal of initially obtaining at least one-foot of cap over the entire area and an average two-foot thick cap over the entire area over time. Follow-up sampling of the top three inches of cap material performed one month after cap placement in August 2005 and then a year later in September 2006. Results from August 2005 indicated PCB levels ranged from 0.4 to 9.8 ppm and averaged 3.1 ppm and the September 2006 results indicated PCB levels ranged from 0.04 to 17 ppm and averaged 2.9 ppm. Annual sampling and analysis for PCBs of cap material is ongoing.

Also in 2005, EPA performed a five-year review of the site to evaluate whether the proposed remedy for the site was protective of public health and the environment and functioning as designed. EPA summarized the five-year review by stating, "EPA continues to expect the upper

and lower harbor OU1 remedy to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled to the maximum extent practicable.”

As of 2007, a total volume of 150,000 of sediment had been remediated through various early action dredging or capping projects (including 83,000 cy dredged in OU1).

### **Potentially Responsible Parties (PRPs)**

PRPs include the AVX Corporation (formerly Aerovox, Inc.), located at 740 Belleville Avenue (north of a hurricane barrier in the Upper Harbor), and Cornell-Dubilier Electronics Corporation, located at 1605 East Rodney French Boulevard (south of the hurricane barrier). However, both companies are defunct and the site is being addressed as fund-lead.

### **Threats and Contaminants**

The primary contaminants of concern are PCBs (Aroclors 1016, 1242, 1254) and metals. PCB levels in Upper Harbor sediment were historically measured as high as 50,000 ppm in areas other than the OU2 areas. PCBs concentrations in OU2 area sediment were detected as high as 200,000 ppm and were found in the range of 50 to 100 ppm in isolated areas of the Outer Harbor. In 1979, the Massachusetts’ Department of Public Health issued restrictions on fishing and lobstering, based on health risks, of which all remain in effect.

### **Selected Remedy**

Beginning in 2004, full scale dredging began in the Upper Harbor with EPA authorizing the expenditure of \$15 million annually for the removal, treatment and subsequent offsite disposal of contaminated sediments. Due to limited funding, sediment is being addressed on a “worst-first basis,” generally from north (head of harbor) to south. As a component of the dredging project, construction of a marine bulkhead around the shoreline, a 55,000 sq. ft. dewatering building and equipment (Hervey Tichon Avenue), and a rail spur to the adjacent redeveloped city rail yard were constructed and completed in 2004 prior to initiation of dredging. Additionally, construction of the desanding facility at Sawyer Street, and installation of various marine pipelines and pumping systems began in the spring of 2004.

The selected dredge contractor for the project is Severson and to-date dredging has been performed over four dredging events during summer/fall 2004, 2005, 2006 and 2007, the duration of each dredging event being approximately 45 days. Dredge operations have been relatively consistent from year to year. Severson is utilizing three hydraulic horizontal auger dredges (two active and one standby) to remove the sediment from the designated areas. Typically only one active dredge is operated at a time, one located to operate during high tide and one located to operate during low tide. An overdredge allowance of 4 to 6 inches is being implemented and confirmation samples are being collected. In 2006 and 2007, EPA is collecting “progress verification samples” to monitoring the effectiveness of the dredge to remove the targeted sediment. Once sufficient area is dredged to the target depth, EPA then anticipates the contractor performing a final cleanup pass over the entire area followed by the collection of another set of verification samples to be used to evaluate whether dredging within the entire area may be considered complete. EPA has selected this method of collecting verification samples for evaluating the completion of dredging since it will result in a larger data set for statistical comparison to the target cleanup concentration of 10 ppm PCBs in the top six inches of sediment.

A floating pipeline transports the dredge slurry from the dredge to the desanding facility at Sawyer Street where coarse material (e.g., sand and gravel) is separated from finer sediment materials. Shoreline-based booster pumps are used to assist with transporting the dredge slurry to the desanding facility. A submerged double-walled underwater pipeline then transports the finer sediment material approximately 1.4 miles further down the harbor to the Hervey Tichon Avenue dewatering, water treatment and transfer facility. The removed coarse material is being stored near the desanding facility and will be sampled for PCB content and disposed of as either non-hazardous (if concentrations are less than 50 ppm PCBs) waste or hazardous waste (if concentrations are equal to or greater than 50 ppm PCBs). The desanding operation has resulted in a 12.5% and 20.6% reduction in the weight of sediment requiring offsite transport and disposal during 2005 and 2006, respectively.

Dewatering of the finer sediment material is by nine plate and frame filter presses. The removed water is treated and discharged back to the harbor under a site-specific NPDES permit. Dewatered sediment is loaded onto railcars for transport and disposal at the Wayne Disposal, Inc. landfill in Belleville, Michigan (a commercial hazardous waste landfill).

Results of OU1 dredging by year are:

- August to November 2004: Dredging removed 14,000 cy of sediment that was desanded and dewatered, and then transported offsite by truck for disposal.
- September to November 2005: Dredging removed 25,000 cy of sediment from an approximate eight-acre area. Desanding removed approximately 2,300 tons of sand and approximately 16,000 tons of dewatered sediment was transported offsite by rail (this was the first year for rail transport) for disposal. Approximately 20 million gallons of water was treated and discharged back to the harbor.
- August to October 2006: Dredging removed 20,000 cy of sediment from an approximate seven-acre area. Desanding removed approximately 3,500 tons of sand and approximately 13,500 tons of dewatered sediment was transported offsite by rail for disposal. Approximately 20 million gallons of water was treated and discharged back to the harbor.
- August to October 2007: Dredging removed 24,000 cy of sediment from two areas totaling approximately ten acres. Dredging was performed between 7 am and 7 pm Monday through Friday. Desanding removed approximately 3,600 tons of sand and approximately 15,000 tons of dewatered sediment was transported offsite by rail for disposal. Approximately 24 million gallons of water was treated and discharged back to the harbor.

During the dredging operations water turbidity is being monitored at 300 and 600 feet downstream of the silt curtains that are installed around the active dredging areas. If the turbidity is greater than 50 NTU above background at 300 feet downstream of the silt curtains then various additional activities are performed including verifying that the exceeded turbidity level is attributable to the dredging operations, implementing a variety of chemical and toxicity sampling, and monitoring for turbidity at 600 feet downstream of the dredging operations. If the turbidity reaches greater than 50 NTU above background at 600 feet downstream of the dredge, project activities must cease until turbidity levels drop.

### **Future Activities**

Since 1983, EPA has spent more than \$244 million in planning, engineering and construction costs on the harbor cleanup that has resulted in a total of approximately 150,000 cy of sediment being remediated. Of this volume, 83,000 cy has been removed as part of the OU1 dredging. Of the total

target volume within OU1 of 867,000 cy, this leaves 784,000 cy remaining to be dredged from OU1. At the current rate of funding (approximately \$15 million per year) and removal (approximately 25,000 cy per year) the project will not be completed for another three decades. EPA is currently attempting to obtain additional funding to expedite this schedule to the extent possible. Dredging in 2008 will depend on the level of funding obtained.

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