

4.1.3



SDMS DocID 46228

Superfund Records Center

October 23, 1990

SITE: New Bedford

BREAK: 04.01

OTHER: 46228

Prog/Proj Mgmt Directorate
Project Management Division

Kenneth Finkelstein, Ph.D.
NOAA Coastal Resource Coordinator
EPA Waste Management Division
John F. Kennedy Building (HSL-CAN3)
Boston, Massachusetts 02203

Dear Dr. Finkelstein:

I have developed some conceptual approaches and estimated the cost of remediating several areas within the New Bedford Harbor Superfund site that are located outside (south) of the hurricane barrier. This work was performed as a result of the 18 October meeting held in Mary Sanderson's office. A detailed cost estimate and discussion is attached and the results are summarized in the following paragraphs.

Area Opposite Cornell-Dubelier Facility

This area could be remediated using either dredging or capping. Approximately 31 acres would be remediated requiring the removal of 50,000 cubic yards of sediment or the placement of 150,000 cubic yards of cap material. Additional disposal facilities would not be required for this area. The estimated cost of each option is shown below:

Dredging	\$2,300,000
Capping	\$3,700,000

New Bedford Outfall

This area could also be remediated using either dredging, capping, or a combination of both methods. Approximately 100 acres would be remediated requiring the removal of approximately 300,000 cubic yards of sediment or the placement of 450,000 cubic yards of cap material. If dredging were selected, additional disposal facilities would definitely be needed which would significantly increase the cost. The estimated cost of each option is shown below:

Capping Option #1	\$2,800,000
Capping Option #2	\$7,700,000

SUBJECT New Bedford Harbor Superfund Site

COMPUTATION Cost Estimate - Remedial Actions South of Hurricane Barrier

COMPUTED BY MARK OTIS CHECKED BY _____ DATE 19 October

Two sites immediately south of hurricane barrier (Figure 2-4 of FS) have PCB levels greater than 10 ppm. The area of these sites is computed below:

$$\begin{aligned} \text{site \#1} & 700\text{ft} \times 1,300\text{ft} = 910,000\text{ft}^2 \\ \text{site \#2} & 700\text{ft} \times 600\text{ft} = \underline{420,000\text{ft}^2} \\ & 1,330,000\text{ft}^2 \end{aligned}$$

This area could be remediated using either dredging or capping. Volumes of material associated with both of these approaches are computed below.

* Dredging Option (Assume 1' of material is removed)

$$1,330,000\text{ft}^2 \times 1\text{ft} = 1,330,000\text{ft}^3 / 27 = 49,259\text{cy} \text{ say } \underline{50,000\text{cy}}$$

* Capping Option (Assume 3ft of cap material)

$$1,330,000\text{ft}^2 \times 3\text{ft} = 3,990,000\text{ft}^3 / 27 = 147,778\text{cy} \text{ say } \underline{150,000\text{cy}}$$

possible armoring with crushed stone (assume 6" lift)

$$1,330,000\text{ft}^2 \times 0.5\text{ft} = 665,000\text{ft}^3 / 27 = 24,630 \text{ say } \underline{25,000\text{cy}}$$

Cost estimates for three different remedial approaches are computed below:

a) Dredging option #1: The areas would be dredged using a small cutterhead dredge. A temporary CDF would be constructed on the Standard Times Field to initially dewater the sediments. Final disposal of sediments would be in a CDF in the upper harbor.

CDF construction: Site required would be approximately 600' x 600'

Dikes: 22,500 cy of material @ \$7/cy =	\$157,500
Liner: 40,000 cy @ \$2.25/cy =	\$90,000
Removal of contaminated sediment 60,000 cy x \$20/cy =	\$1,200,000
Removal of clean material 22,500 cy x \$10/cy =	\$225,000

subtotal \$1,672,500

SUBJECT New Bedford Harbor Superfund Site
 COMPUTATION Cost Estimate - Remedial Actions South of Hurricane Barrier
 COMPUTED BY Mark Otis CHECKED BY _____ DATE 19 October

Dredging: Cutterhead dredge operating 8 hours per day removing 50 cy per hour. 137 days required which includes 10% downtime due to weather.

Dredging: $137 \text{ days} / 26 \text{ days per month} = 5.3 \text{ months} \times \$75,000 \text{ month} = \$397,500$
 Water Treatment: $168,180,000 \text{ gallons} / 1000 \times \$9.64 = \$1,625,250$
 Assumes 5% solids content ↑
 SUBTOTAL \$2,018,750

SUMMARY - Dredging Option #1

CDF Construction	\$1,672,500
Dredging & Water Treatment	<u>\$2,018,750</u>
	\$3,691,250
20% contingency	<u>738,250</u>
TOTAL	<u><u>\$4,429,500</u></u>

- 1) Water treatment costs based on information provided in WES report on Pilot Study Evaluation of Carbon and UV/Hydrogen Peroxide Treatment
- 2) Other cost data taken from Report 11 of EFS. A 10% increase was added to these cost figures.

b) Dredging Option #2: The areas would be dredged using a small cutterhead dredge. The dredged material would be pumped into a scow/barge (3,000 cy capacity) which would then be towed to the upper harbor and emptied (pumped out) into a CDF. The production rate would 400 sy per day and 137 days would be required to complete the dredging.

Dredging: $\$75,000 / \text{month} \times 5.3 \text{ months} =$	\$397,500
Scows (2): $\$20,000 / \text{month} \times 5.3 \text{ months} =$	\$106,000
Tugboat: $\$30,000 / \text{month} \times 5.3 \text{ months} =$	\$159,000
Scow pumpout operation: $\$100,000 / \text{month} \times 5.3 \text{ months} =$	\$530,000
Water Treatment: $168,180,000 / 1000 \text{ gallons} \times \$4.40 =$	<u>\$739,992</u>
	\$1,932,492
20% contingency	<u>306,498</u>
TOTAL	<u><u>\$2,318,990</u></u>

SUBJECT New Bedford Harbor Superfund Site

COMPUTATION Cost Estimate - Remedial Actions South of Hurricane Barrier

COMPUTED BY Mark Otis

CHECKED BY _____

DATE 19 October

note: Water treatment costs reduced by 50% since an existing setup will be utilized.

c) Capping Option: Material will be obtained from a land source and trucked to New Bedford, loaded into barges in the lower harbor, and placed by a small mechanical dredge. Production rate of 100 cy per hour which will require 190 days (7.3 months) to complete capping operation. Downtime due to weather is included.

Deliver Material:	150,000 cy x \$7/cy =	\$ 1,050,000
	25,000 cy x \$10/cy =	\$ 250,000
Load Material:	175,000 x \$5/cy =	\$ 875,000
Barges (2)	: \$10,000/month x 7.3 months =	\$ 73,000
Tugboat	: \$30,000/month x 7.3 months =	\$ 219,000
Small Mechanical Dredge:	\$80,000/month x 7.3 months =	\$ 584,000

\$ 3,051,000

20% contingency

610,200

\$ 3,661,200

27 Sept 49

CORPS OF ENGINEERS, U.S. ARMY

PAGE 4 of 7SUBJECT New Bedford Harbor Superfund SiteCOMPUTATION Cost Estimate - Remedial Actions South of Hurricane BarrierCOMPUTED BY Mark Otis

CHECKED BY _____

DATE 22 OctoberNew Bedford Outfall Area

Area computed from attached drawing:

$$600 \text{ meters} \times 500 \text{ meters} = 300,000 \text{ m}^2$$

$$300 \text{ meters} \times 300 \text{ meters} = 90,000 \text{ m}^2$$

$$\frac{390,000 \text{ m}^2 \times 10.8 \text{ ft}^2/\text{m}^2}{27} = 4,212,000 \text{ ft}^2$$

Volumes of material associated with either dredging or capping of this area.

* Dredging Option: A large mechanical dredge would be used to dredge this area which would result in excess material being removed (assume 2' lift).

$$4,212,000 \text{ ft}^2 \times 2 \text{ ft} = 8,424,000 \text{ ft}^3 / 27 = \underline{\underline{312,000 \text{ cy}}}$$

* Capping Option: (Assume 3' cap)

$$4,212,000 \text{ ft}^2 \times 3 \text{ ft} = 12,636,000 \text{ ft}^3 / 27 = \underline{\underline{468,000 \text{ cy}}}$$

Cost estimates for the two different remedial approaches are computed below:

a) Capping: Assume a hopper dredge is used to dredge up capping material from areas adjacent to the navigation channel and then dump material on contaminated areas.

production rate (24 hour operation) - 8,000 cy/day

$$468,000 / 8,000 = 58 \text{ days}$$

$$\$40,000 \text{ day} \times 58 \text{ days} = \$2,320,000$$

$$20\% \text{ contingency} = \underline{\$464,000}$$

$$\text{TOTAL} \quad \underline{\underline{\$2,784,000}}$$

SUBJECT New Bedford Harbor Superfund Site

COMPUTATION Cost Estimate - Remedial Actions South of Hurricane Barrier

COMPUTED BY Mark Otis

CHECKED BY _____

DATE 22 October

Capping this area with material obtained from a land source would be considerably more expensive and time consuming. A source of this quantity of material would also be difficult to locate.

Production Rate 1000 cy/day

468 days to complete \approx 22 months

Deliver Material	468,000 cy \times 7 cy =	\$ 3,276,000
Load Material	468,000 cy \times 5 cy =	\$ 2,340,000
Scows (1)	\$5,000/month \times 22 months =	\$ 110,000
Tugboat	\$30,000 month \times 22 months =	\$ 660,000

\$ 6,386,000

20% contingency \$ 1,277,200

TOTAL \$ 7,663,200

Dredging Option: (24 hr per day operation)

production rate = 1,500 cy/day = 208 days = 8 months

Dredge:	\$150,000/month \times 8 months =	\$ 1,200,000
Tugboat:	\$50,000/month \times 8 months =	\$ 400,000
launch:	\$20,000/month \times 8 months =	\$ 160,000
scows (3):	\$15,000/month \times 8 months =	\$ 120,000
offloading operation:	\$150,000/month \times 8 months =	\$ 1,200,000

\$ 3,080,000

20% contingency \$ 616,000

\$ 3,696,000

SUBJECT New Bedford Harbor Superfund Site
COMPUTATION Cost Estimate - Remedial Actions South of Hurricane Barrier
COMPUTED BY Mark Otis CHECKED BY _____ DATE 22 October

The removal of 312,000 cy of material from this area would require the construction of additional CDFs (likely 2). This would result in a cost of \$5-10 million depending on the location of the CDFs.

Clarks Cove Outfall Area

Assume a 1,000' x 1,000' area will be remediated

Dredging: A small cutterhead dredge would be used to pump material into scows/bergs which would then be taken into New Bedford Harbor and offloaded into a CDF.

Quantity of sediment removed: $1,000' \times 1,000' \times 1' = 1,000,000 \text{ ft}^3 / 27$
 $= 37,000 \text{ cy}$

Production rate: 400 cy/day * 93 days = 4 months

Dredge: \$75,000/month * 4 = \$300,000
Scows (2): \$10,000/month * 4 = \$40,000
Tug: \$30,000/month * 4 = \$120,000
Scow pumpout: \$100,000 * 4 = \$400,000
Water Treatment: $124,451,880 / 1000 \text{ gal/m}^3 \times 4.40 = \$547,588$

subtotal \$1,407,588

20% contingency \$281,518

TOTAL \$1,689,100

SUBJECT New Bedford Harbor Superfund Site
COMPUTATION Cost Estimate - Remedial Actions South of Hurricane Barrier
COMPUTED BY Mark Otis CHECKED BY _____ DATE 22 October

Recreational Areas (Beaches)

Dredging of shoreline areas in the vicinity of beaches is probably not feasible due to the rough sea conditions in these areas, capping may be the more feasible approach where the sand would be obtained from a land source, trucked to the site and hydraulically placed.

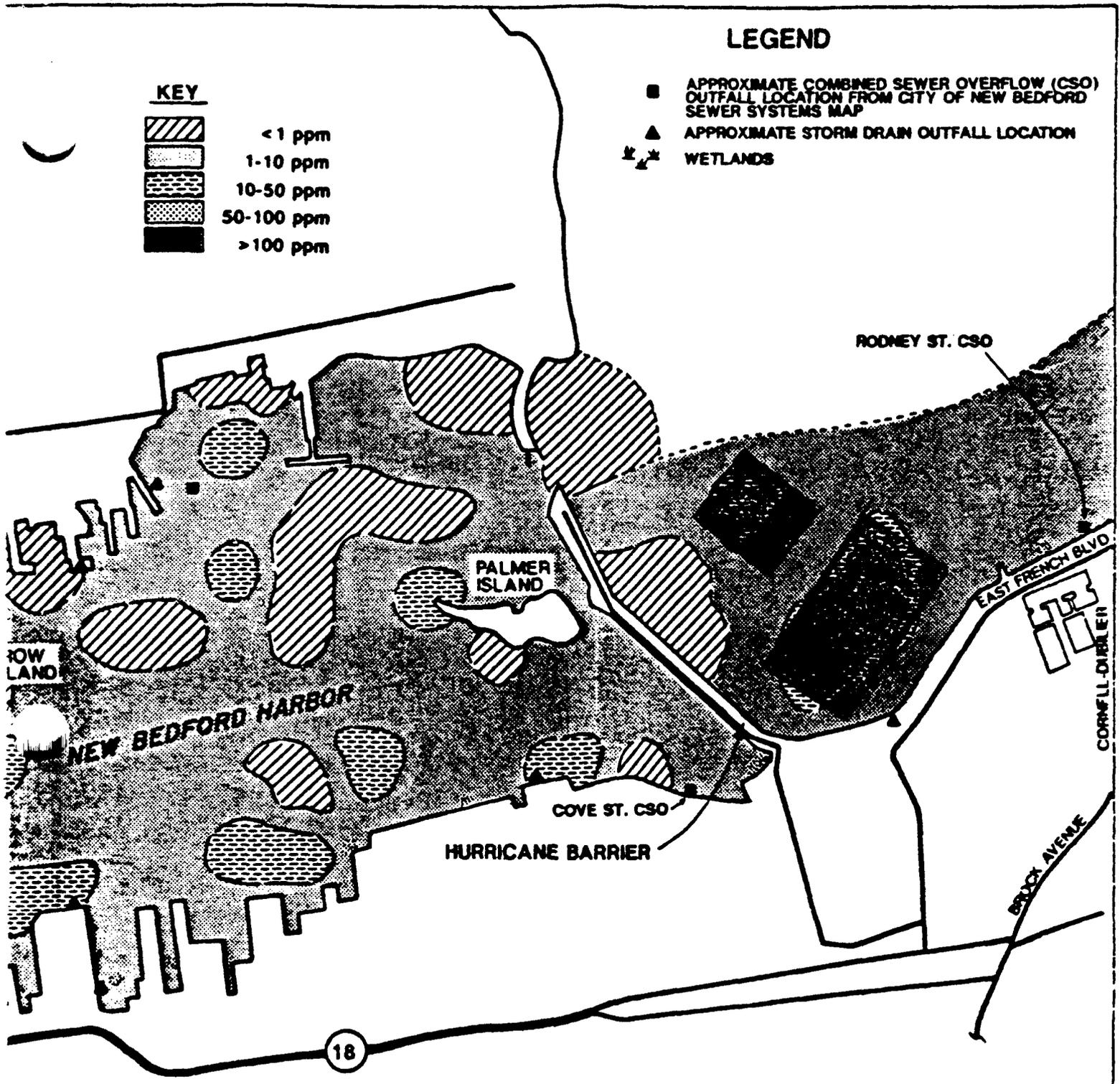
Typical
Beach Area: $300' \times 200' = 60,000 \text{ sf} \times 3' \text{ cap} = \frac{180,000 \text{ ft}^3}{27} \approx 6,700 \text{ cy}$

Material delivered to site	$6700 \text{ cy} \times \$7 =$	$\$46,900$
place material	$6700 \text{ cy} \times \$10 =$	$\$67,000$
		<hr/>
		$\$113,900$
20% contingency		$\$22,780$
		<hr/>
		$\$136,680$
		<hr/> <hr/>

Commercial Facilities (Marinas etc.)

Dredging of all areas subject to vessel traffic would result in the removal of a considerable amount of material and would likely require the construction of additional CDFs at considerable expense. Some general cost information is shown below.

- Dredging of a $100' \times 100'$ area results in the removal of approximately 370 cy of sediment
- Dredging cost are approx. $\$9 \text{ cy}$



KEY

	< 1 ppm
	1-10 ppm
	10-50 ppm
	50-100 ppm
	> 100 ppm

LEGEND

- APPROXIMATE COMBINED SEWER OVERFLOW (CSO) OUTFALL LOCATION FROM CITY OF NEW BEDFORD SEWER SYSTEMS MAP
- APPROXIMATE STORM DRAIN OUTFALL LOCATION
- WETLANDS

NEW BEDFORD

Scale: 1 inch = 1,000 feet

**FIGURE 2-4
 INTERPRETATION OF TOTAL PCB CONCENTRATIONS
 DEPTH: ZERO TO 6 INCHES
 ESTUARY AND LOWER HARBOR AND BAY
 FEASIBILITY STUDY
 NEW BEDFORD HARBOR**