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FINAL DRAFT

NEW BEDFORD HARBOR DESCRIPTION OF ALTERNATIVE DISPOSAL SITES RANKING AND SELECTION FOR EVALUATION IN THE OVERALL NEW BEDFORD FEASIBILITY STUDY

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1.0 BACKGROUND

The objective of this report is to identify and describe alternative disposal sites for evaluation in the overall New Bedford Harbor Feasibility Study (FS) for cleanup of PCB contaminated sediments. In addition to descriptive information on the sites, available information on disposal costs and evaluations of disposal that will be performed in the FS are described.

Alternative sites are generally of two types: off-site outside of the confines of the Acushnet River Estuary and New Bedford Harbor, or on-site within the confines of the Acushnet River and New Bedford Harbor. EPA's National Contingency Plan (40 CFR 300.68(f)(1)(i)) requires that remedial alternatives include treatment or disposal at an off-site facility.

In this report, off-site disposal is described in Section 2.0 - Existing PCB Approved Landfills and in Section 3.0 - Disposal at Upland Sites in the Vicinity of New Bedford. On-site disposal, including shoreline, is described in Section 4.0 - Disposal at Sites Within New Bedford Harbor, including shoreline, Section 5.0 - Contained Aquatic Disposal, and Section 6.0 - Ocean Disposal.

Sources of information for this report include evaluations of disposal sites by NUS Corporation (NUS) in 1984 and 1986, and the ongoing US Army Corps of Engineers dredged material disposal studies for the Acushnet River.

NUS has conducted the major disposal site studies completed to date. During the process of conducting the 1984 Fast-Track Feasibility Study for cleanup of PCB contaminated sediments in the Acushnet River Estuary, New Bedford Harbor, NUS completed an interim report titled "Initial Evaluation of Potential Disposal Sites for Contaminated Dredged Materials," June 1984. The report included an initial identification, evaluation, and ranking of potential sites, both upland and shoreline. Both EPA and the Massachusetts Interagency Task Force for New Bedford Harbor participated in establishing criteria for screening the identified sites. These criteria are listed in the above-mentioned report. In addition to the Interagency Task Force, state and local governmental information on siting was obtained from previous solid waste disposal and regional planning studies.

For upland sites, thirty-seven potential disposal sites remained following the first phase screening by NUS. In the second phase, the five highest ranking sites were determined. The first phase screening identified sites with "critical flaws," such that they would cause the sites to be eliminated from further screening. These flaws included being located in close

proximity to developed/populated areas, state parks or wildlife management areas; public drinking water supply watersheds; highly productive stratified glacial deposits, including aquifers used for public water supplies; and wetlands. As described in Section 3.0 of this report, these five sites listed on Table 1 will be evaluated further when upland disposal is studied in the overall New Bedford FS.

For on-site disposal NUS, in the 1984 Interim Siting Report, identified twelve sites which were then screened to a subset of five using the factors listed in Table 2.

Following public comment on the Fast-Track Feasibility Study in 1984, EPA decided that further evaluation of potential in-harbor disposal sites was warranted. NUS completed the evaluation in April 1986; the results are described in the report "Investigation and Ranking of Potential In-Harbor Disposal Sites." The April 1986 report identified fifteen potential in-harbor disposal sites as the most promising. The identification was based upon a quantitative ranking procedure similar to that used in the 1984 siting study by NUS. For purposes of the overall New Bedford FS, the fifteen in-harbor sites identified by NUS will receive further evaluation when the in-harbor disposal alternative is studied.

TABLE 1

UPLAND DISPOSAL SITING CHARACTERISTICS

* = Optimal Feature

Site:	S-5	L-6	L-16	L-4	S-22A
FACTOR	SITE DESCRIPTION				
Site Specific Factors					
Storage Capacity (cu. yds)	6,290,000	1,700,000 (min. est.)	1,700,000 (min. est.)	1,700,000 (min. est.)	31,460,000
Current Land Use	Woodland	* Inactive Gravel Pit	* Inactive Gravel Pit	Woodland	Woodland
Surface Conditions					
- Cover Type	* Dense Woodland; Med. Size Trees	Gravel Pits, High Relief	Gravel Pit, High Relief	* Woodland, Med. Size Trees	* Woodland, Med. Med. Size Trees
- Site Drainage	* Good	Poor	Moderate	Moderate	Poor to Good
- Onsite Streams	* None	Ponded Water	One Stream	One Intermittent	One Stream
Subsurface Conditions					
- Soil	Loose Fine Sandy Silt; Peat, Dense Till	No Surface Soil; Located in Gravel Pit	Not Investigated, Till Present	No Surface Soil; Located in Gravel Pit	Not Investigated, Till Present
- Depth to Bedrock	* 21, 47, 50, 56, 66, 83 ft.	> 20 ft.	> 22 ft., > 27 ft. > 29 ft.	> 20 ft.	> 10 ft., > 12 ft., > 16 ft.
- Depth to Groundwater	Wetland at/near Surface 4.0 - 12.0 ft.	* 15 ft.	3 ft., 9 ft.	* 15 ft.	0 ft., 1 ft., 4 ft.
Regional Factors					
Transport Distance	9.9 Miles	6.7 Miles	* 3.5 Miles	6.7 Miles	8.1 Miles
- Type & Condition of Road	Good 2 lane; 2nd, 1° Highway	Fair 2nd Highway	Good 2 Lane; 2nd Highway	* Interstate	Fair/Good 2nd Highway
- Traffic Density	* Light	* Light	Heavy	Moderate	* Light
- Site Accessability	Poor/No Access	* Good Access	* Good Access	Poor/No Access	* Good Access
Environmental Conditions					
- Habitat Valve	Woodland	Barren Gravel Pits; Woodland	* Barren Gravel Pit	Woodland	Woodland; Some Wetlands
- Surrounding Land Use	* Primarily Woodland; Habitat Conservation	Woodland; Agriculture	Woodland; Agriculture; Services	* Woodland; Gravel Pits Industrial	Woodland; Waste Disposal; Agriculture
Public Health Considerations					
- Buffer Zones	* Good	Poor	Adequate	Adequate	* Good
- Receiving Streams	Acushnet Cedar Swamp	Noquochoke Lake	Acushnet River	Noquochoke Lake	Haskell Swamp, Brook River, Sippican River
- Development along Route	28.3 Houses/Mile	33.3 Houses/Mile	51.4 Houses/Mile	33.3 Houses/Mile	* 24.8 Houses/Mile
- Development around Site	Largely undeveloped; few homes to east	Undeveloped	Undeveloped	Undeveloped	Undeveloped

Data compiled from NUS Report: "Initial Evaluation of Potential Disposal Sites for Contaminated Dredge Materials", June 1984

2.0 EXISTING PCB APPROVED LANDFILLS

2.1 INTRODUCTION

There are nine Environmental Protection Agency/Resource Conservation and Recovery Act (EPA/RCRA) permitted landfills, that are in substantial compliance, currently operating within the United States for the disposal of materials containing PCBs. In their Draft FS of August 1984, NUS identified CECOS International (CECOS) in Niagara Falls, New York as the closest of these facilities, but this facility is not currently capable of accepting EPA hazardous wastes due to cited operational violations. SCA Chemical Services now operates a facility in Model City, New York. This facility is in close proximity (in relation to New Bedford Harbor) to the aforementioned CECOS facility. The next closest site for disposal of PCB containing wastes is located in Williamsburg, Ohio, and is operated by CECOS.

2.2 IDENTIFICATION OF FACILITIES

The SCA Chemical Services hazardous waste treatment and disposal facility in Model City requires that soils including dredged materials be "legally landfillable" in accordance with state regulations. This neccessitates a 150 lbs./ft.^{2} load bearing capacity and the absence of all free liquids. SCA has no limit on the concentration of PCBs in the soils and sediment which they will accept for landfilling. A flat rate of $175.00 per ton of material was quoted. This facility would have the capacity to handle 100,000 cubic yards of material, as long as its delivery for disposal was spaced over time.

SCA will also dispose of free liquids by incineration, the cost of which is concentration dependent. Liquids containing < 1,000 ppm total PCB would cost $3.40 per gallon and range up to nearly twice that for > 100,000 ppm total PCBs.[1]

The facility that CECOS operates in Williamsburg, Ohio accepts PCB contaminated dredge spoils of any concentration. $5,000,000 liability insurance is required, to be supplied by the generator, or hauler, for the deposition of material at this facility to cover accidental spillage, etc. during transport. These spoils must be able to withstand the load bearing capacity of facility equipment as indicated by passing the compaction test (40 CFR 261 Appendix 2 (B)). The spoils must also pass the "paint filter liquids test" (50 CFR 28742, 7/15/85; EPA Pub. No. SW846 Method 9095) to assure the absence of all free liquids.

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[1]Telecon: H-P Krahn (E.C. Jordan) with P. Cook (SCA Chemical Services), 10/01/86, (716) 754-8231

CECOS will accept liquids for incineration, the price of which is BTU dependent. The cost of disposal of material at the Ohio facility would be $205 per ton.[2]

Trucking the material to the New York facility would cost approximately $130.00 per ton and $170.00 per ton to the CECOS Ohio site.[3] Rail costs, by comparison, are $35.00 per ton to Model City, New York, and $52.00 per ton to the Williamsburg, Ohio site.[4] Neither the CECOS nor SCA facilities have direct access to their sites by rail. Thus a transfer would be necessary from rail to truck to complete the transport of material from New Bedford Harbor to the designated facility. At up to approximately 10 miles of trucking from the rail yard, the additional charge would be approximately $5.00 per ton for that transfer.

2.3 DESCRIPTION OF ALTERNATIVE

The individual steps required to implement this disposal alternative are discussed in the NUS feasibility study. The dredged material would undergo secondary dewatering in order to pass the compression test required by the facilities. Methods of secondary dewatering described in the NUS report include vacuum filters, contrifuges, filter presses, belt filters, and drying beds. The material would then be loaded into railcars or trucks via conveyor belts or front end loaders for transport to the designated facility. If transport were by rail, the dredged material would be transferred and trucked to the landfill.

The detailed evaluation of this disposal alternative in the FS will identify opportunities for PCB and metals exposure during material handling and transport to the appropriate facility.

2.4 ADDITIONAL EVALUATION FACTORS

As mentioned above, nine landfills are currently approved by EPA. Of those, only three are located east of the Mississippi River. The volume of material that may be dredged from the harbor and then disposed has not yet been determined. This volume could range from zero to greater than 1,000,000 cubic yards of sediments. The utilization of significant capacity of

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[2]Telecon: H-P Krahn (E.C. Jordan) with D. Krause (CECOS International), 10/01/86, 10/27/86, (716) 282-2676

[3]Telecon: H-P Krahn (E.C. Jordan) with T. Calter (Clean Harbors Industries), 10/02/86, (617) 849-1800

[4]Telecon: H-P Krahn (E.C. Jordan) with T. Cooke (Conrail Railroad), 10/24/86, (617) 828-3356

EPA-approved PCB facilities must be considered in light of the limited space available.

Another issue that will be considered is the emphasis on permanent remedies under the recently promulgated Superfund Amendments and Reauthorization Act (SARA) of 1986. The amendments stress permanent treatment of waste and the application of technical state standards, should they be more stringent. If non-permanent remedies are employed, EPA would have to review site status every five years.[5, 6]

2.5 SUMMARY

The SCA Chemical Services facility in Model City, New York, due to its relative proximity to New Bedford, will be retained in this report for further evaluation as the existing "out of state" facility. Transport of the sediments to the facility should occur primarily by rail, with transfer of the material to truck for the portion of route that rail service does not cover. These transport methods should minimize the costs of this alternative.

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[5] Superfund Amendment and Reauthorization Act of 1986 (SARA), Title 1, Section 121 - Clean-Up Standards, October 17, 1986, 99th Congress, USA

[6] Engineering Times, September 1986, Vol. 8, No. 9, National Study of Professional Engineers, Alexandria, Virginia

3.0 DISPOSAL AT UPLAND SITES IN THE VICINITY OF NEW BEDFORD

3.1 INTRODUCTION

A second option for the disposal of the New Bedford Harbor sediments contaminated by PCBs is upland disposal. Thirty-seven sites were identified within a ten-mile radius of the harbor for the potential development of a harbor sediment storage facility. This initial task of site selection was conducted by NUS with input from EPA and the New Bedford Harbor Task Force, including the Massachusetts Department of Environmental Quality Engineering (DEQE), Southeast Regional Planning and Economic Development District, U.S. Department of Fish and Wildlife, U.S. Department of Energy, U.S. Soil Conservation Service, and the Massachusetts Water Resources Commission. Seventeen of the 37 sites had previously been identified through solid waste and regional planning studies by some of the above-mentioned agencies. This selection process is discussed in the NUS report "Initial Evaluation of Potential Disposal Sites for Contaminated Dredge Materials, New Bedford Site, Bristol County, Massachusetts," June 1984.

3.2 IDENTIFICATION OF THE SCREENING PROCESS

As discussed in the NUS report, the initial task in the site selection process was to screen out those sites containing "critical flaws"; features which would prove prohibitive to waste disposal site development. These features included developed/populated areas, state parks, state wildlife use, watersheds, wetlands, and highly productive stratified glacial deposits used for public drinking water supplies.

All potential sites identified within a ten mile road distance from the dredging activity (based upon treatment near the Coggeshall Street bridge) were screened. In addition, a 50-acre minimum size was established based on anticipated sediment volumes to be disposed. This screening selected the 37 upland sites for further evaluation of regional and site-specific factors.

The regional factors that NUS considered consisted of transport distance, route conditions, environmental conditions, and public health considerations. Site-specific factors included storage capacity, current land use, surface conditions, and subsurface conditions. Property ownership is currently unknown. A detailed description of these factors is given in the aforementioned NUS report.

The NUS study assigned values to each factor from +1 to -1 for rating the various sites. Some criteria such as storage capacity were based on a linear interpolation of storage volume between the maximum and minimum storage values of the 37 sites in question, the largest volume receiving a +1 rating. Other

criteria received one of the three values (+1, 0, -1), depending on their applicability to the requirements for an ideal storage facility. For example, cover types were categorized in three groups; open fields being rated +1 due to ease and cost of preparation, woodlands were rated 0, and quarries and pits a -1 due to the anticipated need to grout joints and fractures and regrade the area.

Next, the NUS siting study attached a weighting factor to each criterion such that the more "important" criteria received greater emphasis than the ones of lesser importance. This weighting was developed by NUS with input from the USEPA and the New Bedford Harbor Task Force. Public health considerations, for example, were given a greater weighting factor than transport distance. The explanation given suggests that the difference in cost of hauling the material between the closest and furthest (ten miles) site is small relative to the total cost of remediation. Public health considerations are weighted heavily, due to the potential for contaminant releases via air and surface routes and the risk of exposure for the local residents.

Using the +1 to -1 rating factor and then multiplying that number by a given weighting factor, NUS completed a quantitative ranking of the 37 sites in question from best to worst. Due to the subjectivity of this ranking process, this report has taken the five highest rated sites from the NUS study and has identified the most desirable characteristics in each category. The specific characteristics of each site and those considered most desireable are given in Table 1. The FS will use the specific characteristics of each of these sites to perform the screening process. The locations of these five sites are identified on Figures 1a, 1b, and 1c.

3.3 DESCRIPTION OF ALTERNATIVE

The upland disposal alternative entails transporting dredged materials from the temporary storage area/dewatering facility by truck to the designated site. The storage facility would be constructed in accordance with the current RCRA, TSCA, and MA DEQE requirements to include two or more liners with a leachate-collection system above and between the liners.

The costs incurred to implement this alternative would include approximately five dollars per cubic yard for transport of the material plus the cost of constructing an approved double-lined landfill with a leachate collection system. The cost of constructing a facility capable of containing one million cubic yards is approximately 8.5 million dollars.[7]

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[7] E.C. Jordan: Pre-Feasibility Study cost calculations for the construction of upland disposal sites, 10/22/86, Appendix A.

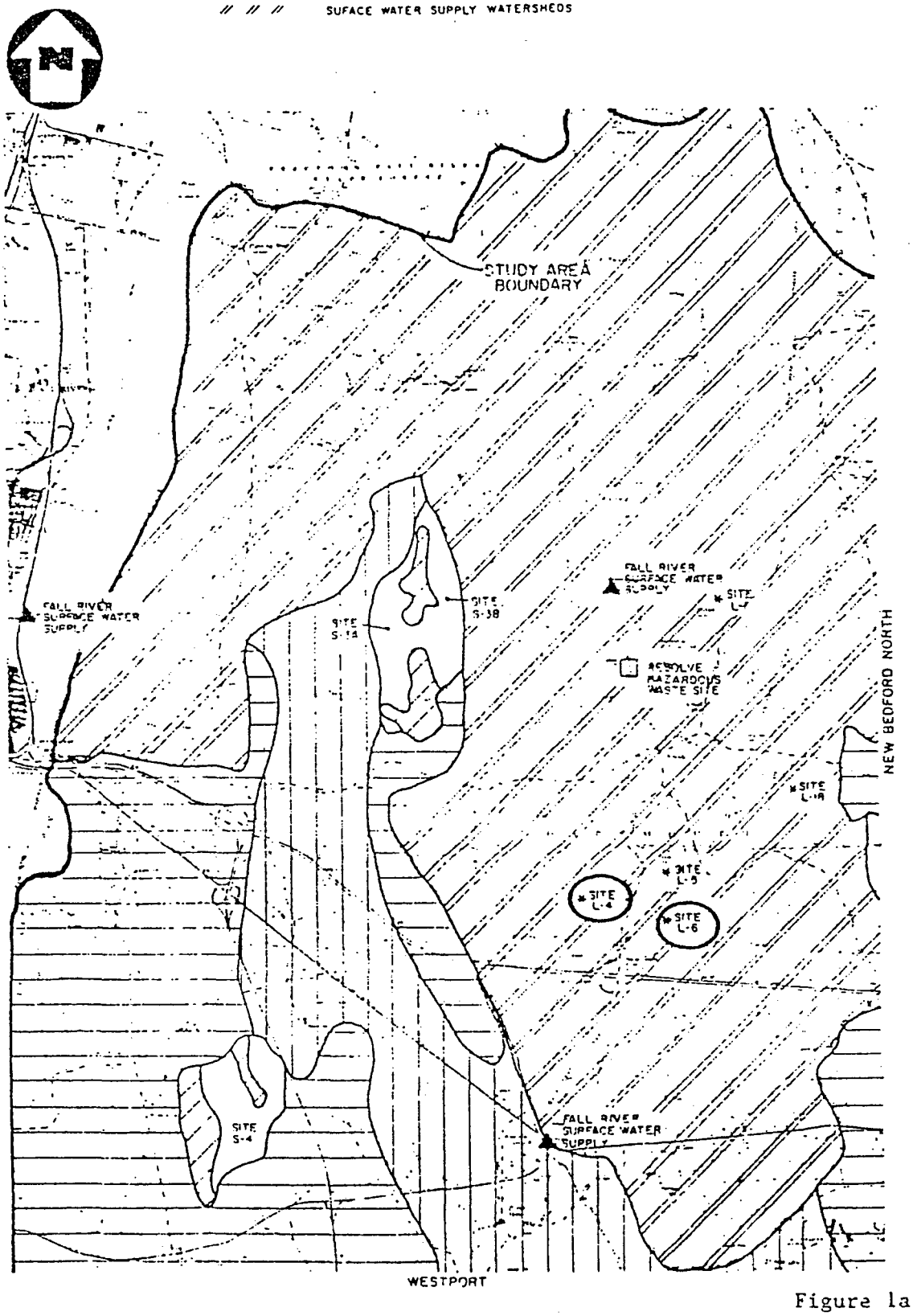
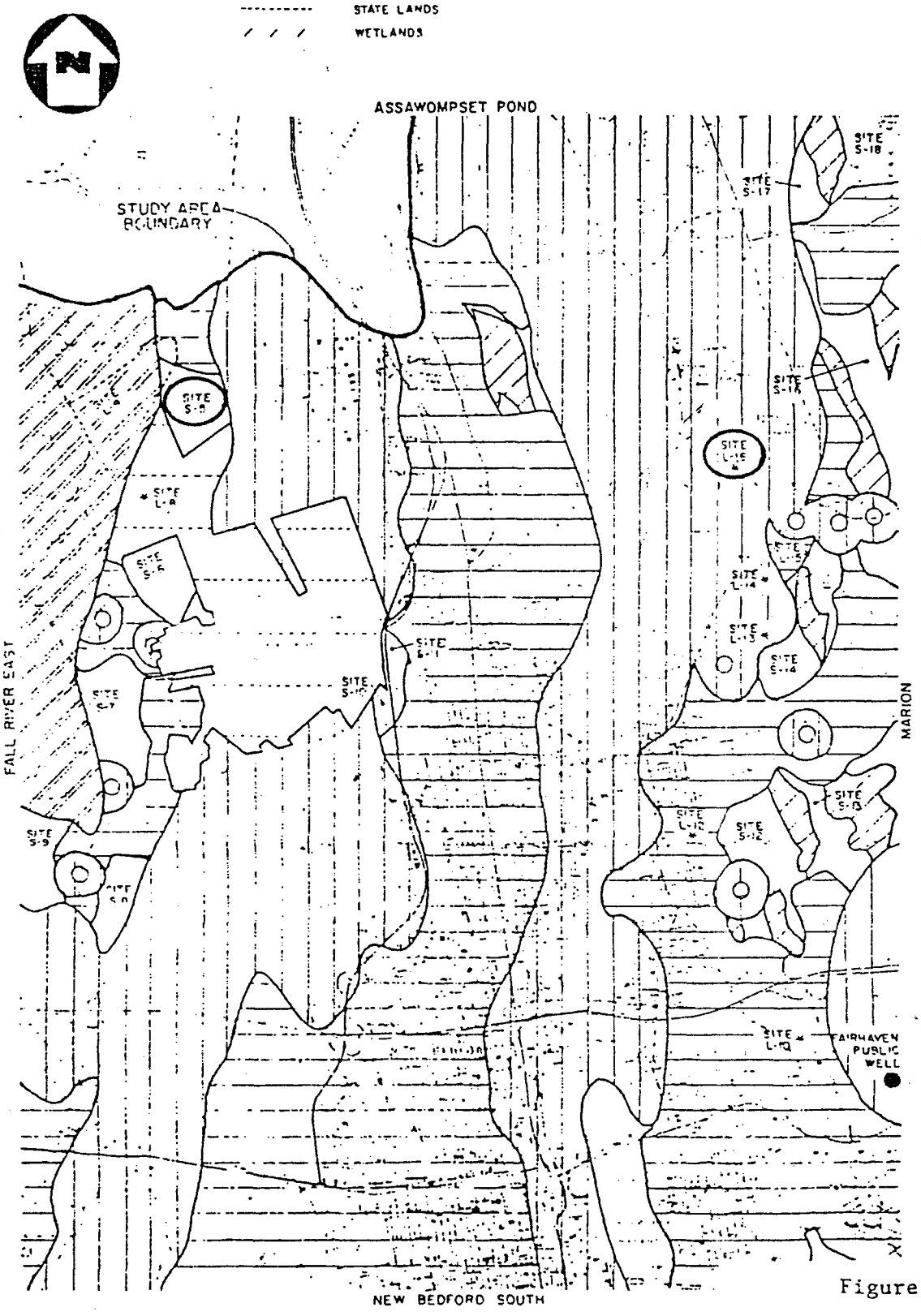


Figure 1a

FALL RIVER EAST QUADRANGLE
NEW BEDFORD HARBOR SITING STUDY, NEW BEDFORD, MA
SCALE 1"=4166'

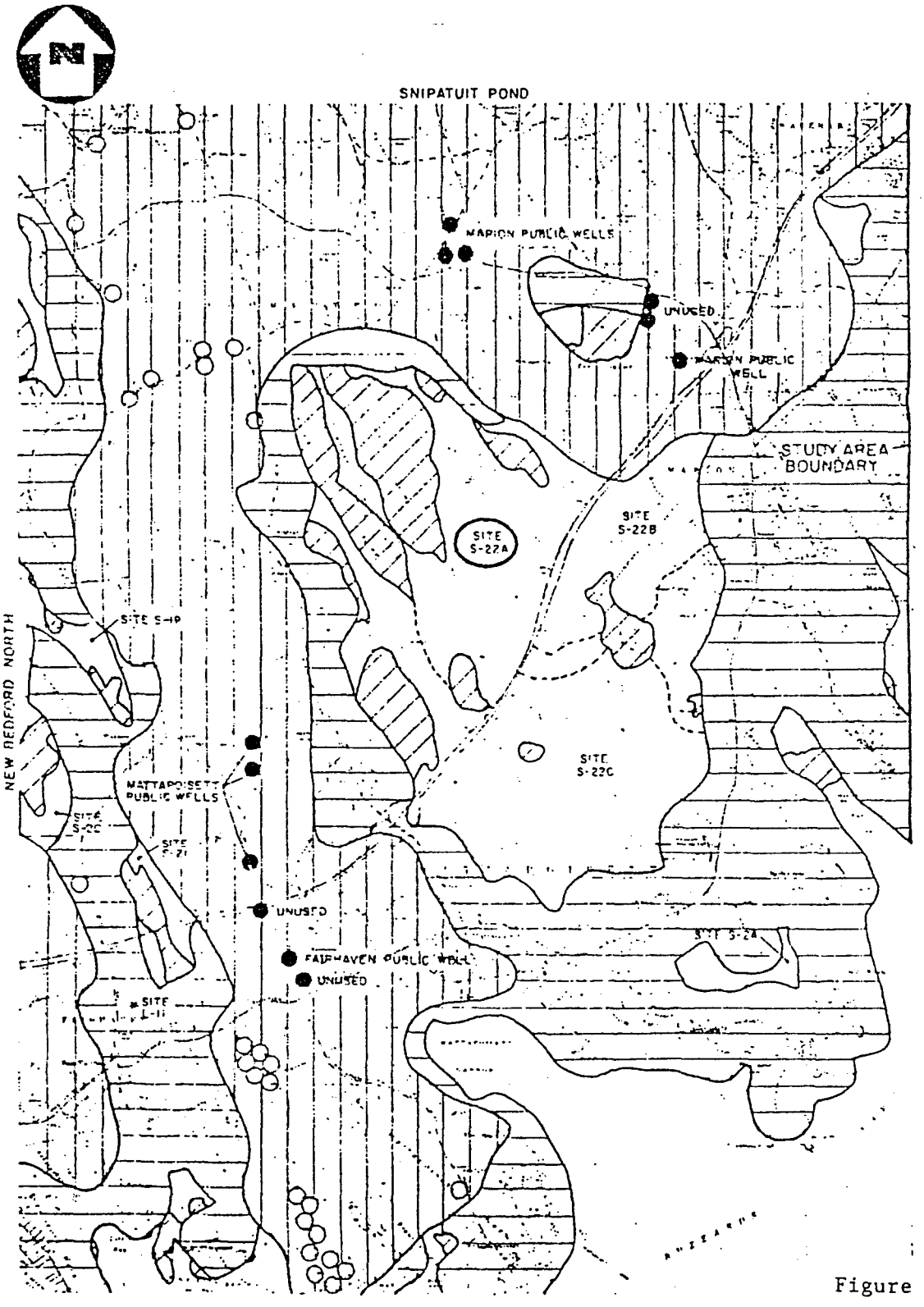
Reproduced from NUS Report: "Addendum - Draft Feasibility Study of Remedial Action Alternatives", September 198. Figure A-3



NEW BEDFORD NORTH QUADRANGLE
NEW BEDFORD HARBOR SITING STUDY, NEW BEDFORD, MA
SCALE 1" = 4166'

Figure 1b

Reproduced from NUS Report: "Initial Evaluation of Potential Disposal Sites for Contaminated Dredge Materi



MARION QUADRANGLE

NEW BEDFORD HARBOR SITING STUDY, NEW BEDFORD, MA

SCALE 1" = 4166'

Figure 1c

Reproduced from NUS Report: "Addendum - Draft Feasibility Study of Remedial Action Alternatives", September 1984, Figure A-

TABLE 2(A)
IN-HARBOR DISPOSAL SITING CHARACTERISTICS

Factor	Site #1 Western Cove	Site #1A Cove Extension SE	Site #1B Cove Extension N	Site #2 Sycamore Road Lowland
I. Current Site Conditions				
Current Use	*Undevel. Land; Open Water	*Undevel. Land; Open Water	*Undevel. Land; Open Water	Salvage Yard;Forest;Wetland
+Footage of Waterfront Lost	2.83	3.28	1.79'	4.87'
Property Ownership	Municipal; Private	Municipal; Private	Municipal; Private	Municipal; Private
II. Engineering Feasibility				
Depth to Bedrock	37.5'	65'	45'	50'
Depth to Water	0.5'	1.25'	1.7'	0.65'
Sediment Characteristics	Deep Muck	Deep Muck	Varies; Muck, Silts/Sands	Onshore; Silts/Sands
% Land	35%	25%	24% Present	83%
Existing Discharges	One Present	One Present	Multiple Present	*None Known
+Length of Embankment	5.87'	*5.22'	11.83'	8.17'
III. Site Access				
Distance to Dredge	3,000'	3,000'	*500'	1,500'
Route Conditions	*River Transport (Pipeline)	*River Transport (Pipeline)	*River Transport (Pipeline)	*River Transport (Pipeline)
IV. Storage Capacity				
Capacity to +10 MSL	459,850 Cu. Yd.	671,700 Cu. Yd.	*726,910 Cu. Yd.	688,000 Cu. Yd.
Change per 1' Increase	44,800 Cu. Yd.	61,100 Cu. Yd.	65,800 Cu. Yd.	*68,340 Cu. Yd.
V. Environmental Factors				
+Acres of Open Water Lost	0.04	0.04	0.04	0.01
+Acres of Wetlands Lost	0.006	>0.004	>0.004	0.06
VI. Public Health Considerations				
Short-Term Exposure (Ind/Comm)	High	High	High	Medium
Long-Term Exposure (Resident)	High	High	High	High
Buffer Zones	Poor	Poor	Poor	Poor

+ = Per 1,000 C.Y. of Capacity
* = Optimal Feature
(Ind/Comm) = Industrial/Commercial

Data compiled from NUS Report "Investigation and Ranking of Potential In-Harbor Disposal Sites", Appendix A, April 1986

TABLE 2(B)
IN-HARBOR DISPOSAL SITING CHARACTERISTICS
(continued)

Factor	Site #3 Shoreline N of Cogg.	Site #4 Area between Cogg. and I 195	Site #5 Area S of I 195	Site #6 Marsh Island
I. Current Site Conditions				
Current Use	Open Water	Open Water	*Undevel. Land; Open Water	Valued Env't; Light Comm'l
+Footage of Waterfront Lost	7.88'	3.2'	3.12	2.81'
Property Ownership	Private	Private	Private	Private
II. Engineering Feasibility				
Depth to Bedrock	50'	62.5'	37.5'	*0'
Depth to Water	0.3'	5'	6'	*Landbased
Sediment Characteristics	Deep Muck	Deep Muck	*Near Bedrock Outcrop	*Near Bedrock Outcrop
% Land	None	None	None	*100%
Existing Discharges	*None Known	*None Known	*None Known	*None Known
+Length of Embankment	10.7'	13.2'	10.78'	8.30'
III. Site Access				
Distance to Dredge	3,300'	3,500'	4,300'	4,300'
Route Conditions	*River Transport (Pipeline)	*River Transport (Pipeline)	River Transport (Barge)	River Transport (Barge)
IV. Storage Capacity				
Capacity to +10 MSL	291,890 Cu. Yd.	125,000 Cu. Yd.	160,000 Cu. Yd.	177,800 Cu. Yd.
Change per 1' Increase	27,400 Cu. Yd.	8,330 Cu. Yd.	14,440 Cu. Yd.	17,800 Cu. Yd.
V. Environmental Factors				
+Acres of Open Water Lost	0.06	0.04	0.04	*0
+Acres of Wetlands Lost	*None	*None	0.012	0.03
VI. Public Health Considerations				
Short-Term Exposure (Ind/Comm)	Medium	Medium	Medium	Medium
Long-Term Exposure (Resident)	High	High	Medium	Medium
Buffer Zones	Poor	Poor	Poor	*Adequate

+ = Per 1,000 C.Y. of Capacity
* = Optimal Feature
(Ind/Comm) = Industrial/Commercial

Data compiled from NUS Report "Investigation and Ranking of Potential In-Harbor Disposal Sites", Appendix A, April 1986

TABLE 2(C)
IN-HARBOR DISPOSAL SITING CHARACTERISTICS
(continued)

Factor	Site #7 North Terminal	Site #8 Pope Island Ext.	Site #9 Crow Island Ext.	Site #10 South Terminal
I. Current Site Conditions				
Current Use	Commercial; Open Water	Open Water	Open Water	Recreational
+Footage of Waterfront Lost	3.35'	5.26'	*None	3.84'
Property Ownership	*Municipal	Private	Unknown	Private
II. Engineering Feasibility				
Depth to Bedrock	62.5'	75'	52.5	35'
Depth to Water	5'	6.5'	4'	*Landbased
Sediment Characteristics	Fill Area; Silt/Sand	Deposition Area; Silt/Sand	*Near Bedrock Outcrop	Historic Fill
% Land	47%	0%	0%	*100%
Existing Discharges	Present	*None Known	*None Known	*None Known
+Length of Embankment	7.32'	8.91'	21.28'	6.33'
III. Site Access				
Distance to Dredge	6,500'	8,500'	10,200'	14,000'
Route Conditions	River Transport (Barge)	River Transport (Barge)	River Transport (Barge)	River Transport (Barge)
IV. Storage Capacity				
Capacity to +10 MSL	477,800 Cu. Yd.	171,100 Cu. Yd.	148,000 Cu. Yd.	390,740 Cu. Yd.
Change per 1' Increase	37,800 Cu. Yd.	10,370 Cu. Yd.	None Possible	39,100 Cu. Yd.
V. Environmental Factors				
+Acres of Open Water Lost	0.03	0.04	0.04	*0
+Acres of Wetlands Lost	None	None	None	None
VI. Public Health Considerations				
Short-Term Exposure (Ind/Comm)	High	High	*Low	High
Long-Term Exposure (Resident)	*Low	*Low	*Low	High
Buffer Zones	Poor	Poor	*Adequate	Poor

+ = Per 1,000 C.Y. of Capacity
* = Optimal Feature
(Ind/Comm) = Industrial/Commercial

Data compiled from NUS Report "Investigation and Ranking of Potential In-Harbor Disposal Sites", Appendix A, April 1986

TABLE 2(D)
IN-HARBOR DISPOSAL SITING CHARACTERISTICS
(continued)

Factor	Site #10A South Terminal Ext.	Site #11 Cove S of Marsh Island	Site #12 Conrail Railyard
I. Current Site Conditions			
Current Use	Open Water; Recreational	Open Water	Active/Inactive Railyard
+Footage of Waterfront Lost	3.84	6.29'	*None
Property Ownership	Private	Municipal; Private	Municipal; Private
II. Engineering Feasibility			
Depth to Bedrock	37.5'	50'	22.5'
Depth to Water	6'	4'	*Landbased
Sediment Characteristics	Deposition Area; Silt	Deposition Area; Silt/Sand	*Firm; Previous Use
% Land	86%	None	*100%
Existing Discharges	*None Known	*None Known	*None Known
+Length of Embankment	5.95'	9.54'	7.34'
III. Site Access			
Distance to Dredge	14,000'	5,800'	5,000'
Route Conditions	River Transport (Barge)	River Transport (Barge)	Road Transport
IV. Storage Capacity			
Capacity to +10 MSL	491,480 Cu. Yd.	238,500 Cu. Yd.	381,480 Cu. Yd.
Change per 1' Increase	45,370 Cu. Yd.	17,000 Cu. Yd.	38,150 Cu. Yd.
V. Environmental Factors			
+Acres of Open Water Lost	0.01	0.05	*None
+Acres of Wetlands Lost	*None	0.01	*None
VI. Public Health Considerations			
Short-Term Exposure (Ind/Comm)	High	*Low	High
Long-Term Exposure (Resident)	High	High	Medium
Buffer Zones	Poor	Poor	Poor

+ = Per 1,000 C.Y. of Capacity
* = Optimal Feature
(Ind/Comm) = Industrial/Commercial

Data compiled from NUS Report "Investigation and Ranking of Potential In-Harbor Disposal Sites", Appendix A, April 1986

3.4 ADDITIONAL EVALUATION FACTORS

The soils underlying the study area are of glacial origin. They consist of a heterogenous mixture of clay, silt, gravel, and boulders, varying in size and shape, and are not an effective barrier to contaminant migration.

The depth to groundwater within the study area has been identified to be generally less than ten feet from the surface. The greater the distance to the shallow aquifer, the more time would be available to contain accidental spills before reaching the saturated zone. The bedrock aquifer is also relatively close, generally within 25 feet of the surface elevation.

These geologic conditions will be evaluated in detail in the FS. SARA requirements will be addressed during this evaluation.

3.5 SUMMARY

The NUS screening process numerically ranked the 37 sites in question. Only five of these sites were determined to have a positive final value (see NUS report: "Initial Evaluation of Potential Disposal Sites for Contaminated Dredge Materials," June 1984). These five upland disposal sites have been retained after this initial screening for further evaluation as a New Bedford Harbor sediment depository. One additional upland site has been retained for further evaluation, despite the low scoring received for subsurface conditions, environmental conditions, and public health considerations in the NUS ranking system. This site consists of an active quarry and gravel pits in close proximity to the upper reaches of the Acushnet River Estuary (less than one mile).

4.0 DISPOSAL AT SITES WITHIN NEW BEDFORD HARBOR

4.1 INTRODUCTION

A third disposal option involves depositing the contaminated harbor sediments along the eastern or western shoreline in one or more of the fifteen identified sites. The sites are identifed in Figure 2. These sites would be constructed of earthen materials so as to isolate them from the harbor waters. NUS suggested two variations of this option: 1) a partially lined disposal site, and 2) a fully lined disposal site.

The partially lined site would contain an impermeable synthetic material only along the sides of the disposal site. The fully lined site would have the impermeable membrane liner extend beneath the site. This second option would require removal of contaminated sediments within the disposal site prior to liner placement. After the site is filled with the dewatered sediments, the permanent containment site would be capped to further isolate the contaminated sediments.

NUS has recently completed an investigation of this disposal option and presented the information in the report: "Investigation and Ranking of Potential In-Harbor Disposal Sites - New Bedford Site, Bristol County, Massachusetts," April 1986. The fifteen sites are identified and characterized in this report. A more detailed study of this disposal option was performed by NUS under the title "Conceptual Development of an On-Site Sediment Disposal Facility," September 1986.

4.2 IDENTIFICATION OF THE SCREENING PROCESS

The screening process employed by NUS for the in-harbor disposal sites was similar to that used to screen the various upland sites, although the factors considered were somewhat different. Both regional and site-specific factors were used. The regional factors included environmental, public health, and socioeconomic considerations involved with the development and operation of the hazardous waste facility. Site-specific factors include physical characteristics that would affect the engineering feasibility, and features important to regulatory and environmental controls (such as proximity to wetlands or current land use). A more detailed description of each factor can be found in the above mentioned NUS report.

As was the case with the upland site ranking, each factor was assigned a numeric score ranging from +1 for the maximum value to -1 for the minimum value. Each ranking factor was then assigned a weighting factor to reflect its relative importance among the factors. "Public health considerations" assigned a weighting factor of (1.3) for example, receive more weighting than "current site conditions" (0.6).

BASE MAP IS A PORTION OF THE USGS NEW BEDFORD NORTH, MA QUADRANGLE (1979) AND A PORTION OF THE NEW BEDFORD SOUTH, MA QUADRANGLE (1977), 7.5 MINUTE SERIES, CONTOUR INTERVAL 10'

POTENTIAL IN-HARBOR DISPOSAL SITES
OF THE ACUSHNET ESTUARY/ NEW BEDFORD - FAIRHAVEN HARBOR
NEW BEDFORD SITE, NEW BEDFORD, MA
SCALE - 1" = 2000'

Figure 2

Reproduced from NUS report: "Investigation and Ranking of Potential In-Harbor Disposal Sites", April 1986, Figure 2-1

As with the upland site ranking, the most desirable characteristics for each in-harbor site have been identified without the attached score due to the potential subjectivity discussed earlier. The specific characteristics of each site and those considered to be most desirable are shown on Table 2.

4.3 DESCRIPTION OF ALTERNATIVE

This siting alternative consists of the disposal of contaminated sediments along the harbor's shoreline. The dredged sediments would be transported to a temporary storage area for dewatering and potential treatment/detoxification. The dewatered and potentially treated sediments are then moved into the chosen site(s). This site would be segregated from the harbor's water by means of an earthen dike and impermeable liner. A variation includes removal of the sediments at the storage site and then lining the bottom with an impermeable liner. Once full, a cap would be placed over the sediments for permanent containment.

NUS has developed a preliminary cost estimate of approximately $14,000,000 for this alternative in the 1984 Draft FS.

4.4 ADDITIONAL EVALUATION FACTORS

During public review of the NUS FS, a variation of the in-harbor disposal site option was proposed along the northern embankment of the Coggeshall Street Bridge that then follows the western shoreline (the New Bedford shore) north (Site 1B). The embankment would be constructed in such a manner as to support a roadway, which would create better access to the industrial and commercial properties along the New Bedford shore.

Another site identified for disposal is located along the eastern shore of the Acushnet Estuary and is currently being used as an automobile junkyard. Due to the limited size of this area (and thus storage capacity), this site was dismissed from further consideration.

4.5 SUMMARY

Although the screening conducted by NUS has favored certain in-harbor sites, all of the fifteen sites have been retained for potential detailed evaluation. Once the disposal volume is determined, the appropriate number of sites can be determined.

Due to the favorable review of this disposal option, NUS has conducted a more detailed analysis of some of the higher ranked sites. This data can be found in their report: "Conceptual Development of an On-Site Sediment Disposal Facility," September 1986.

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reversibly damaging or
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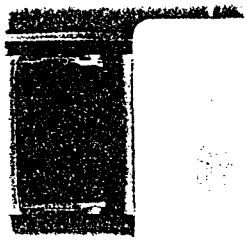

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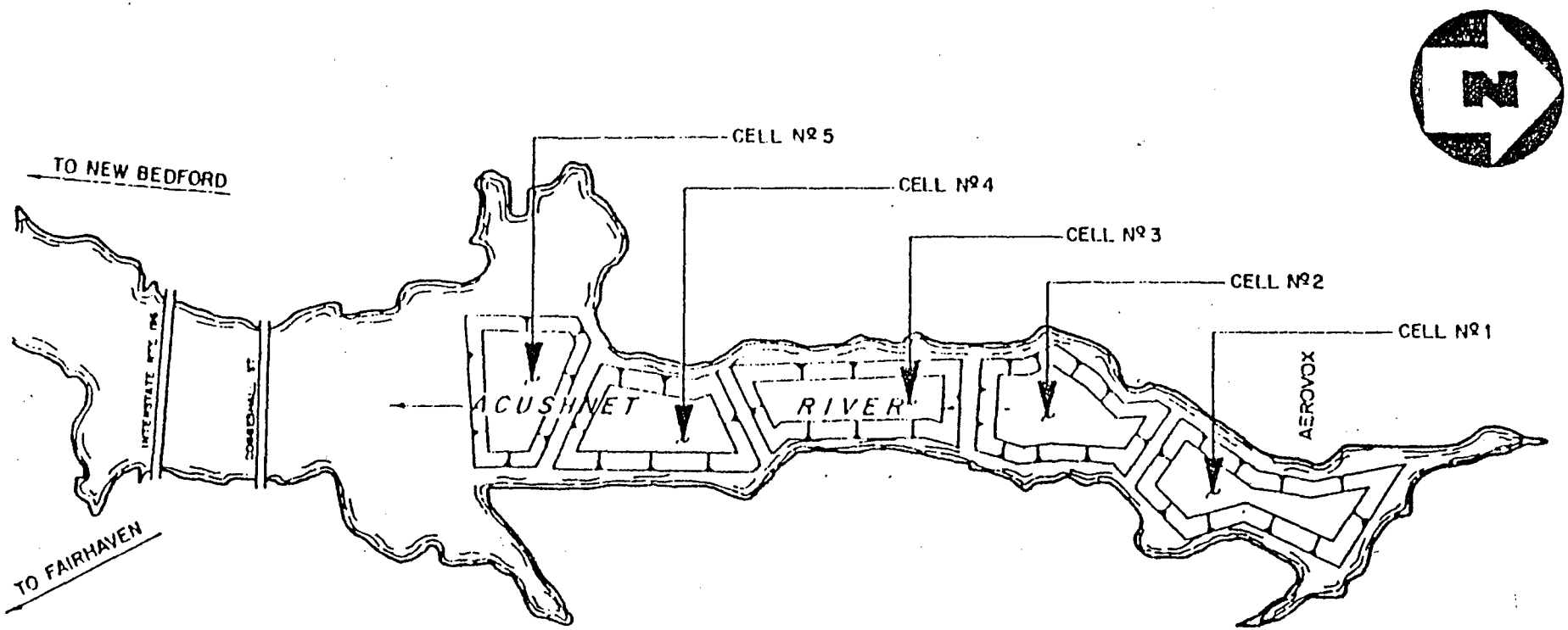

NOTE: CAPACITY OF EACH CELL IS APPROXIMATELY 200,000 CU.YD.

PLAN VIEW ILLUSTRATING DISPOSAL CELL LOCATIONS
SUBSURFACE DISPOSAL ALTERNATIVE
NEW BEDFORD SITE, NEW BEDFORD, MA

Figure 3

Reproduced from NUS Report:
"Addendum - Draft Feasibility Study of Remedial Action Alternatives", September 1984, Figure 2-5

5.3 ADDITIONAL EVALUATION FACTORS

As a result of their comments on the NUS Draft FS for the Acushnet River Estuary, USACE is conducting detailed laboratory studies on the feasibility of CAD and is also developing a pilot dredging program that will evaluate this disposal alternative. They will determine the feasibility of implementing this alternative along with various dredging techniques.

A concern associated with this study relates to the potential deposition of contaminated material into subsurface cells. Currently under investigation is the feasibility of treating/detoxifying the sediments. The cost effectiveness of the treatment will also be studied.

5.4 SUMMARY

The NUS Addendum to the Feasibility Study has identified five in-harbor sites which could be used in an application of CAD. These five sites would be used in sequence (depending on volumes removed) for deposition of dredged material and have been retained for further evaluation pending results of the more detailed USACE study.

As identifed above, one of the key advantages to this option is the minimization of effects to the public and environment.

6.0 OCEAN DISPOSAL

6.1 INTRODUCTION

Open water dumping has been a common means of sediment disposal from harbor dredging. Current federal requirements preclude the dumping of contaminated harbor sediments in the ocean due to the potential impacts on the marine ecosystem (40 CFR 227.4). Nevertheless, should a treatment technology render the New Bedford Harbor sediments "non-toxic," ocean disposal may be viable due to the cost of implementation.

6.2 DESCRIPTION OF ALTERNATIVE

The sediments dredged during the clean-up operation would be transported to a temporary storage site for treatment/ dewatering. After the sediments have been detoxified to the appropriate action levels (see "ARARs"), they would be loaded onto barges or scows for transport to the dump site.

Three ocean disposal sites have been identified in the general vicinity of New Bedford Harbor. The "Foul Area" is located off of the Boston shoreline, the New London site is located off of the Connecticut shoreline, and the "West Island Spoil Area" site is located south of West Island in Buzzards Bay. One of the most significant cost factors for this alternative is the transport distance of the barge to the site. For purposes of this evaluation, the dredge spoils would be disposed of at the West Island site due to its proximity to New Bedford Harbor. This site is identified in Figure 4.

Due to the high operation/leasing costs, the costs of ocean dumping are contingent on the efficiency of the loading and transport of the sediments to the dump site. By performing the loading operation non-stop with a ten-cubic-yard bucket for sediment transfer, as compared to six days per week and twelve hour days with a six cubic yard bucket, costs can almost be halved. Given the above scenario, an approximate cost comparison of the disposal of 100,000 cubic yards disposal is $440,000 as compared with $800,000 for the twelve hour/day and six day/week routine.[8]

6.3 SUMMARY

Due to the stringent requirements for ocean disposal, a more detailed analysis of treatment technologies is necessary before a realistic assessment can be made of the feasibility for the use of an ocean site. If the sediments can be detoxified/ solidified to the levels stipulated, ocean disposal can be utilized. Thus the West Island facility will be retained for further evaluation because of the cost of disposal.

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[8] Telecon: H-P Krahn (E.C. Jordan) with P. Rubinoff (USACE), 10/23/86

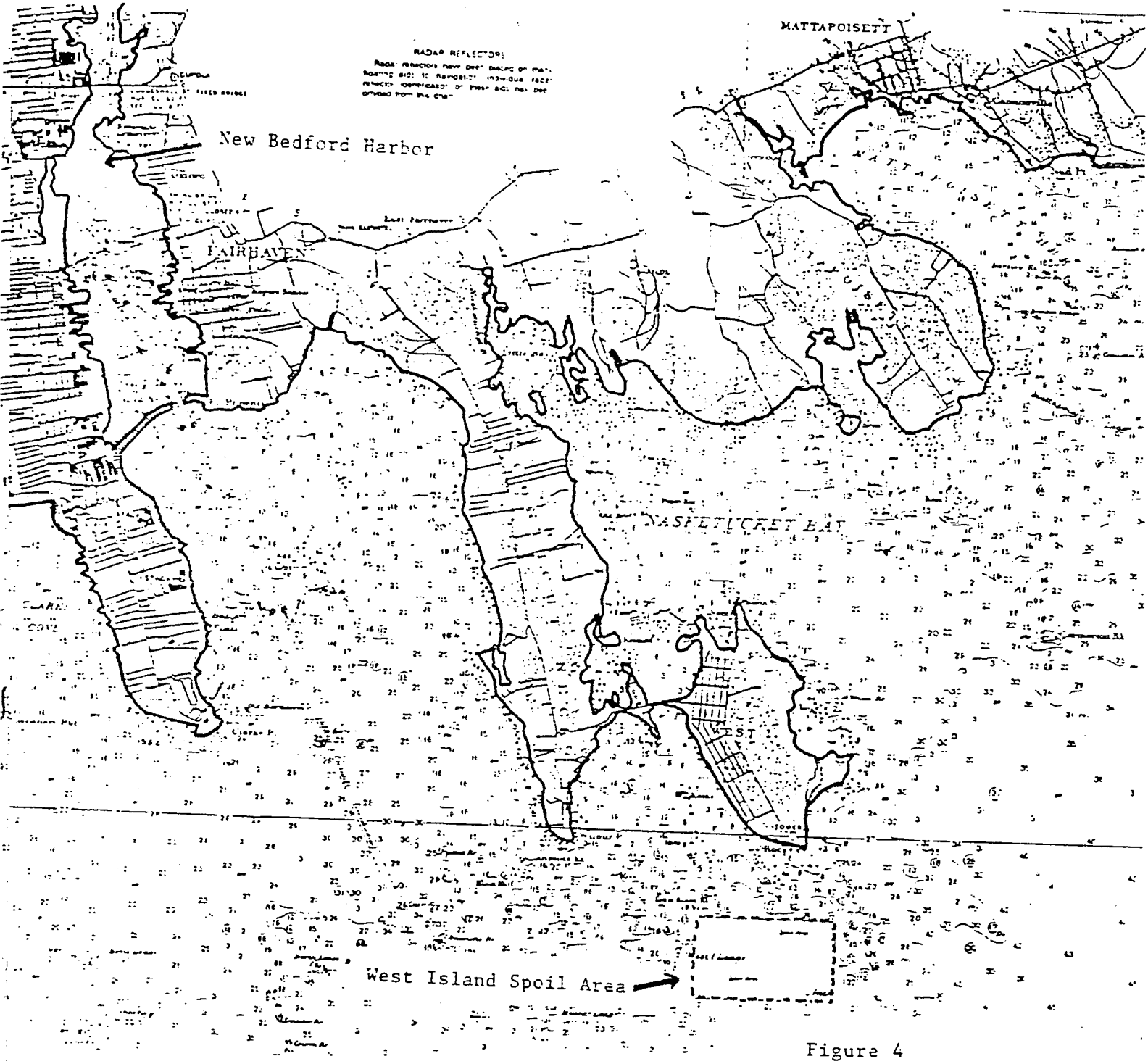

Figure 4

Ocean Disposal Site
West Island Spoil Area
Reproduced from U.S.
Dept. of Commerce National
Oceanographic & Atmospheric
Administration Nautical Map
#13230

7.0 ADDITIONAL CRITERIA FOR EVALUATION

In addition to factors specific to each disposal option, each option will also be evaluated with respect to public health and environmental risks. Applicable or relevant and appropriate requirements (ARARs) will also be addressed in the FS.

7.1 RISK ASSESSMENT

An integral part of the remedial investigation/feasibility study (RI/FS) process currently in progress for the New Bedford Harbor site is a risk assessment of the baseline no-action alternative. This assessment will provide information for all potential routes of exposure to the PCBs and metals and is necessary to develop hypothetical exposure scenarios suitable for estimating the incurred body dose level of a contaminant for routes of exposure determined to be significant. Battelle/HydroQual model results will be used to determine the future extent and level of contamination in all media.

The principal routes of exposure identified include direct contact with the sediment, ingestion of aquatic biota, and inhalation of airborne contaminants. An additional route of exposure to both PCBs and metals may be through the ingestion of terrestrial or avian biota. These routes of exposure will be the focus of the quantitative baseline risk assessment.

Toxicological information will be collected as part of the risk assessment to determine dose-response information. Absorbtion rates, additive, synergistic and/or antagonistic effects, and carcinogenic or non-carcinogenic effects will be included.

This risk assessment will be used as a baseline from which the various alternatives will be evaluated for public health and environmental effects (including a wetlands assessment). This evaluation will include both short-term and long-term effects of the activities associated with the alternative in question. Activities involved in off-site disposal may increase the opportunity for exposure due to transport of material through some populated areas, as well as increase traffic and associated noise. Accidental spillage could contaminate areas not currently affected by pollutants contained in the removed sediments.

Activities involved in in-harbor disposal may adversely impact the wetlands, the storage capacity of tidal waters (especially during storm conditions), and the benthic environment. The concerns mentioned as well as all other potential public health and environmental effects will be addressed and evaluated in the FS.

7.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Dredging, transport, and disposal of harbor sediments containing PCBs and heavy metals would involve federal and state ARARs. These ARARs are listed in the report "Draft Regulation Assessment (Task 63) for New Bedford Harbor, Massachusetts," October 1986, E.C. Jordan Co./Ebasco Services, Incorporated for all of the disposal alternatives except ocean disposal.

The environmental requirements will prove the most significant constraints in implementing the ocean siting alternative. Regulation 40 CFR 227 Subpart B (Environmental Impacts) identifies many unacceptable materials for ocean deposition including organohalogen compounds, oil of any kind or in any form, or known or suspect (by responsible scientific opinion) carcinogens, mutagens, or teratogens. "No wastes will be deemed acceptable for ocean dumping unless such wastes can be dumped so as not to exceed the limiting permissible concentration as defined in Section 227.27" (Sect. 227.8). Furthermore, the liquid phase must meet the marine water quality criteria (after allowance for initial mixing). Bioassay results must not indicate significant mortality or significant adverse sublethal effects, including bioaccumulation, due to the dumping of the sediments. The volume of material to be disposed could also be the limiting factor due to the potential for damage to the ocean environment.

Other regulations applicable to ocean dumping are contained in 40 CFR 220-225 and 227-229.

8.0 ESTIMATED DISPOSAL COSTS

The various disposal site descriptions discussed in Sections 2.0 through 6.0 of this report have included preliminary cost estimates in the reference documents. Although the cost estimates are preliminary, the costs for the disposal portion of the overall remedial alternative have been summarized here. Since the different remedial options vary, the individual elements of disposal costs also vary, and thus need to be examined within that context. For example, the cost of dredging the contaminated sediments was not included in any of the disposal alternatives, although the cost for dredging of clean sediments was estimated for the Contained Aquatic Disposal.

Costs for the various support actions necessary to fulfill the requirements of the different disposal options have not been included. The off-site disposal option, for example, does not include the costs for the extensive handling and dewatering of dredged material that would be necessary prior to transport and disposal because these activities have not yet been evaluated. The ocean disposal alternative will require complete detoxification/fixation of the sediment to meet the stringent ocean disposal requirements. These costs have not been included because the feasibility of such treatment has not yet been evaluated.

The estimated disposal costs have been summarized in Table 3 with supporting information contained in Appendices A, B, and C.

TABLE 3
PRELIMINARY COST COMPARISON FOR DISPOSAL
AT ALTERNATIVE CATEGORIES OF SITES

Volume (cu. yds.)	Existing PCB Approved Facility	Upland Disposal Facility	In-Harbor Disposal Facility	Contained Aquatic Disposal	Ocean Disposal
	(1)	(3)	(4)	(6)	(7)
20,000	$6,100,000				$200,000
100,000	$31,000,000	$1,400,000			$800,000
1,000,000	$310,000,000	$14,000,000	$15,000,000	$14,000,000	$7,600,000
	(2)		(5)		(8)
20,000	$4,300,000				$160,000
100,000	$22,000,000				$440,000
1,000,000	$220,000,000		$38,000,000		$3,700,000

(1) Costs assume $175/ton deposition at SCA/Model City facility and $130/ton transporting costs by truck.

(2) Costs assume $175/ton deposition at SCA/Model City facility and $40/ton transporting cost by rail/truck.

(3) Costs include $5/cu. yd. (ton) transport by truck. See Appendix A for landfill costs.

(4) Costs derived from NUS 1984 cost calculations for Alternative IIa (Unlined) 07/11/84. These are 1984 cost estimates. See Appendix B-1.

(5) Costs derived from NUS 1984 cost calculations for Alternative IIb (Lined) 07/10/84. These are 1984 cost estimates. See Appendix B-2.

(6) Costs derived from NUS 1984 cost calculations for Alternative VIII 09/07/84. These are 1984 cost est. See Appendix C.

(7) Cost assumes 2-1,500 cu. yd. scows, 1-12 hr. shift/day, 6 day wk, mob/demob from Boston, USACE supervision, 15 nautical mile R/T to disposal site, 6 cu. yd. bucket for transfer of material.

(8) Cost assumes 2-1,500 cu. yd. scows, 2-12 hr. shift/day, 7 day wk, mob/demob from Boston, USACE supervision, 15 nautical mile R/T to disposal site, 10 cu. yd. bucket for transfer of material.

APPENDIX A
NEW BEDFORD HARBOR
GENERIC UPLAND DISPOSAL SITE SUMMARY* CAPITAL COST ESTIMATE

1 Million Cubic Yards of Volume
Height: 40 Feet
Area: 21 Acres
Property: 31 acres

ITEM	CONSTRUCTION COSTS	COMMENTS
Land Aquisition	$62,000	31 acres
Clearing/Grubbing	45,000	10% > Landfill area
Access Road	36,000	
Excavation	432,000	average excavation over cell
Clay Recompaction and Dikes	441,000	2-ft depth, clay on-site, 3:1 slope
Basal Sand	266,000	12 inches sand
Liner Materials	1,570,000	2 liners (1 composite)
Leachate Collection System	1,055,000	piping, drainage sand, liners, pump station, manholes
Site Drainage	290,000	12 inch drainage sand, ditch
Final Cover	1,153,000	2 ft. clay, membrane, topsoil, seeding
SUBTOTAL	~$5,400,000	
INDIRECTS (35%)	$1,800,000	
CONTINGENCY (25%)	$1,300,000	
TOTAL (Est.)	$8,500,000	

Note: Costs do not include leachate treatment, long term monitoring.

* = Summary of more detailed breakdown of landfill costs - October 22, 1986, E.C. Jordan Co.

APPENDIX B-1
NEW BEDFORD HARBOR
GENERIC UNLINED IN-HARBOR DISPOSAL FACILITY

ITEM	MATERIAL	E&L	TOTAL
Construct Containment Site	$1,164,970	$1,874,503	$3,039,473
Pump Sediments to Containment Site		104,000	104,000
Cap Containment Site	2,997,880	2,496,104	5,493,984
Mobilization/ Demobilization		20,000	20,000
SUBTOTAL			$8,657,457
Health & Safety Monitoring (4%)			346,298
			$9,003,755
Level D Mark-Up (15% Total Labor)			674,191
			9,677,946
Contingency (20%)			1,935,589
			11,613,535
Overhead + Profit (10%)			1,161,354
			12,774,889
Engineering (15%)			1,916,233
		TOTAL:	~$15,000,000

APPENDIX B-2
NEW BEDFORD HARBOR
GENERIC LINED IN-HARBOR DISPOSAL FACILITY

ITEM	MATERIAL	E&L	TOTAL
Construct Containment Site	$7,635,060	$7,206,681	$14,841,741
Pump Sediments to Containment Site		611,200	611,200
Cap Containment Site	3,871,000	3,223,000	7,094,000
Mobilization/ Demobilization		20,000	20,000
SUBTOTAL			$22,566,941
Health & Safety Monitoring (4%)			902,678
			$23,469,619
Level D Mark-Up (15% Total Labor)			1,659,132
			25,128,751
Contingency (20%)			5,025,750
			30,154,501
Overhead + Profit (10%)			3,015,450
			33,169,951
Engineering (15%)			4,975,493
		TOTAL:	~$38,000,000

APPENDIX C
NEW BEDFORD HARBOR
CONTAINED AQUATIC DISPOSAL SITE SUMMARY COST ESTIMATE

1 million cubic yards of volume

ITEM	MATERIAL COST	E&L	TOTAL
Construct Temp. Containment Site (Clean Sediments)	$503,580	$1,223,179	$1,726,759
Dredge Clean Sediments		5,400,000	5,400,000
Transport Contam. Sediments from Contaminated Site		490,000	490,000
Transport Clean Sediments from Contaminated Site		850,000	850,000
SUBTOTAL:			$8,466,759
Health & Safety (4%)			338,670
			8,805,429
Level D Monitoring Markup (15% of Total E&L Cost ($615,775)			92,366
			8,897,795
Contingency (20%)			1,779,559
			10,677,354
Overhead & Profits (10%)			1,067,735
			11,745,089
Engineering (15%)			1,761,763
TOTAL (Est.)			~$14,000,000

APPENDIX D
NEW BEDFORD HARBOR
RESPONSE TO COMMENTS - DISPOSAL SITE SELECTION

NEW BEDFORD HARBOR
RESPONSE TO COMMENTS - DISPOSAL SITE SELECTION

D-1 INTRODUCTION

The draft report on disposal site selection, "New Bedford Harbor, Description of Alternative Disposal Sites Ranking and Selection for Evaluation in the Overall New Bedford Feasibility Study," November 1986, has been reviewed by various agencies, including: the U.S. EPA Region I (Wetlands Program); the U.S. Department of Interior, Fish and Wildlife Service; the Commonwealth of Massachusetts, Office of Coastal Zone Management; Massachusetts Department of Environmental Quality Engineering; and the U.S. Army Corps of Engineers, New England Division. Comments and questions on the Site Ranking Draft Report by these agencies are presented. Although an attempt was made to respond to all comments, many comments cannot be fully answered until ongoing and planned studies are completed as part of the overall New Bedford Harbor FS.

D-2 U.S. DEPARTMENT OF INTERIOR - FISH & WILDLIFE SERVICE

Comment: "There are serious reservations regarding the ability of the existing testing protocol to accurately predict bioaccumulation and associated environmental risks" (re: bioassay and bioaccumulation studies as evaluation criteria for ocean disposal alternatives).

Response: Should ocean disposal become a likely disposal alternative (i.e., a technology is incorporated that suitably detoxified the sediment by removing or solidifying the PCBs and metals prior to disposal, as demonstrated in bench scale and pilot studies), then the applicable regulations (e.g., including 40 CFR 209, 40 CFR 227, 40 CFR 228, and 40 CFR 230) will be applied utilizing current information and analytical tools. Among these are the Battelle/HydroQual contaminant migration/food-chain models which are being developed for this site.

D-3 U.S. EPA - WETLANDS PROGRAM

1) Comment: "We recommend that as part of the ongoing alternatives study, EPA meet with the NBHDC to discuss dredge material disposal site needs and potential conflicts with proposed industrial developments."

Response: Initial contact has already been made with the New Bedford Harbor Development Commission (NBHDC)

to address this issue. Industrial development plans for New Bedford Harbor will be considered in the potential disposal site evaluation.

2) Comment: "At some point in the analysis, we should consider various combinations of alternatives."

Response: The FS process, as promulgated by the National Contingency Plan and amended by the Superfund Amendments and Reauthorization Act (SARA), includes certain steps that ultimately will result in a list of feasible alternatives for site remediation. These steps include the identification of potential technologies, their initial screening, and their detailed screening prior to combination into various alternatives that will be used in the decision-making process for remediation of the site.

The New Bedford Harbor FS will be assessing risk to public health and environment and the subsequent clean-up goals (i.e., sediment volume estimates for removal and information on the treatment/detoxification technologies (volume and/or toxicity reduction). We will then be better able to determine siting requirements, including various combinations of sites for sediment disposal.

3) Comment: P.1 "What USACE dredge material disposal studies?"

Response: The U.S. Army Corps of Engineers is conducting an Engineering Feasibility Study to evaluate in detail the feasibility of dredging and disposal of PCB contaminated sediments in the Acushnet River Estuary. Task 3 in this study includes collection and analysis of sediment core samples for chemical contaminants and geotechnical properties. USACE is also conducting a topographic survey for a baseline map of the upper estuary in Task 11. Other tasks related to disposal siting are: Task 12 - Upper Estuary Sediment Characterization; Task 13 -Upper Estuary Geotechnical Investigation; Task 14 - Upper Estuary Contaminant Migration Studies; Task 16 - Composite Sample Sediment Testing (to include elutriate, leaching, settling, and consolidation tests); Task 17 - Conceptual Dredging and Disposal Alternatives/Sediment Contaminant Structure Evaluation.

4) Comment: P.2 "Does paragraph 2 intend to refer to Table 2 or Table 1?"

Response: Paragraph 2 discusses on-site disposal alternatives which are listed on Table 2. To clarify this, we have referred paragraph 1 to Table 1 (upland disposal).

5) Comment: P.6 "The 50 acre minimum size may be too large for purposes of a combined alternatives approach."

Response: This size may also be too large for a single alternative approach, but since we do not yet know the quantity nor the chemical contents of the sediment (that may be disposed), we chose to be conservative with the size requirements. Also, this is a criterion carried forth from the NUS FS-1984.

6) Comment: P.7 This discussion indicates that upland disposal is feasible from a cost standpoint.

Response: This is correct, however, the various ARARs pertaining to this alternative need also be addressed for feasibility before upland disposal can be chosen as the siting option.

7) Comment: Table 2 a) "could be improved by using the site names in addition to the number"
b) the final site scores which NUS prepared ... should also be shown."

Response: a) Site names have been added for clarification,
b) As discussed on page 7 and again on page 14 (newly added clarifers), the individual scores have been replaced with the actual characteristics.

8) Comment: Table 2A a) "The CSO's at Site #1 should be indicated for existing discharges."; b) "The acres of open water lost would be better shown as a total capacity to +10 msl rather than per 1,000 cubic yards of capacity."; c) "Consideration should be given to creating disposal sites higher than +10 msl to maximize site capacity and potentially lessen wetland impacts."

Response: a) The CSO which discharges at the outer edge of Site 1 (#023) has been added to Table 2A.
b) A wetlands assessment is being conducted as part of the Feasibility Study for the estuary and

lower harbor and bay. With data from this study, we will be better able to evaluate impacts on wetlands and mudflats from the shoreline disposal sites.

c) This additional height increase for the disposal sites has been taken into consideration, as shown by the storage capacity increase per one foot increase in height. The costs involved in this increase may be disproportionately greater, though, due to the increase in base required. Aesthetics will also be considered when increasing the height of the disposal site is evaluated.

9) Comment: a) "Site #'s 1,3,4,5 contain wetland resources (salt marsh) although the table indicates none exist."

b) Site #1, and 1A has poor buffer zones yet Table 2 shows an adequate buffer zone for site 1B. Site 1B should also be considered poor."

Response: a) 2.7 acres of wetlands have been included in the report based on the "Waterfront Park" E.I.R. by J. Cortell. Wetlands were not recognized by the Environmental Photographic Interpretation Center (EPIC) in their "Wetlands Identification and Assessment", April 1985 for the areas corresponding to sites 3 and 4. The data included in the siting report was taken from the NUS "In Harbor Disposal Siting Report", April 1986, which also did not recognize wetlands in those areas. The wetlands assessment being conducted for the FS will evaluate these areas and will also be used to rank the various siting alternatives in the detailed screening. Two acres of wetlands have been estimated for site 5 and have been incorporated in the report.

b) Data has been taken directly from the NUS reports on siting, including buffer zone characteristics. It seems NUS was separating some of the data for sites 1, 1A, and 1B. To be consistent with the text, site 1B buffer zone has been changed to 'poor'."

10. Comment: "Wetland areas should be quantified for each of these sites. In addition, acres of intertidal mudflat should be separately listed..."

Response: The detailed analysis of disposal sites will include wetland and mudflat quantification based upon the wetland assessment being conducted for the FS.

11. Comment: "Consideration should be given for the use of steel sheet pile instead of earthern dikes ... lessen impacts on wetlands ... increase disposal site volume."

Response: NUS has looked into the use of sheet piles. Stability analysis performed for cantilever sheetpiles determined that sections of the harbor/estuary provide inadequate depth of overburden (to bedrock) to support the required embankment. Thus inadequate resistence is present to prevent overturning failure. Other types of sheetpile construction can be used but are much more costly. Also, the longevity or permanence of this type of barrier in a saline tidal environment comes in question, especially in light of the new emphasis on permanence of a remedy in the SARA amendments to the NCP.

12) Comment: P.14 a) Have any areas been identified for temporary storage, dewatering and potential treatment/detoxification?
b) What potential conflicts exist for the use of site 1 for this purpose and the proposed pilot study by the USACE?

Response: No areas have been identified specifically for purposes of temporary storage and/or treatment. Some areas of interest are the railyard (site 12) and site 1. The quarry and auto junkyard (although this was dismissed as a permanent site due to its small size) are other possibilities that will be investigated. The pilot program at site 1 will not conflict with or compromise the use of site 1 as a temporary storage or treatment facility because the pilot program is not intended to be permanent.

13) Comment: P.15 "Information concerning the possible use (any restrictions on use) of a disposal site after covering is needed" ... to support a roadway. "What extra costs are involved to 'harden' the sediments so that a roadway can be supported?"

Response: A more detailed discussion of the in-harbor disposal site, site 1, 1A, and 1B is given in the NUS September 1986 report, 'Conceptual Development of an On-Site Sediment Disposal Facility'. The siting report (p.15) was unclear about the roadway, as it would be constructed on top of the embankment, not the disposed

sediments. Changes to that effect have been made in the text.

14) Comment: P.15 "The site and storage capacity of the automobile junkyard should be identified. Is adjacent land available..."

Response: The automobile junkyard discussed in the siting report is located just over the city line of Fairhaven in the town of Acushnet. The property lies between Porter and Lawson Streets and is bordered to the north, west, and south by the Acushnet River wetlands. Residential homes border the site to the east. The site is roughly the same size as site 5; approximately 6 acres. The greater majority of adjacent land is wetland and thus would not be ideally suited for sediment deposition. This site (including any adjacent properties) is poorly buffered from the public. Technically, the junkyard may be considered an upland site, as it may be outside of the Superfund site boundaries.

15) Comment: P.15-17 "What is the optimal depth of excavation for a CAD cell?"

Response: The Army Corps of Engineers is currently evaluating this question through literature searches, bench scale testing, and the pilot study in the area of site 1.

16) Comment: P.18-20 "...the section 404 requirements are no less stringent" than ocean disposal constraints.

Response: The major difference between ocean dumping and the shoreline disposal is that the wetlands that may be impacted by the deposition are within the limits of the Superfund site and in some areas highly contaminated. SARA requirements strongly discourage the movement of contaminants from within the limits of a designated hazardous waste site to offsite areas.

17) Comment: P.21 "The last sentence of paragraph 4 is confusing. It quotes 404(b)(1) Guidelines [Sec 230.10(a)] in the middle of a discussion of ocean dumping requirements. Moreover, 40 CFR 230 does not apply ... to ocean waters."

Response: The inclusion of the referenced sentences was an error and has been removed from the paragraph.

18) Comment: P.22 "Cost estimates shown in Table 3 Appendix A, B-1, and B-2, and C should be revised to

reflect the additional costs discussed on this page."

Response: The costs cited in the above mentioned appendices and tables were given to illustrate the approximate costs for the different siting alternatives. These costs were neither detailed nor, in some cases, up-to-date (i.e., NUS FS costs of 1984 were used for some siting alternatives). The detailed screening of the remaining sites will include a comprehensive cost assessment to include capital costs, operation, and maintenance costs, and present worth and sensitivity analysis.

These costs will then be combined with removal and treatment technologies to develop a variety of remedial alternatives, recognizing the NCP and SARA requirements.

D-4 COMMONWEALTH OF MASSACHUSETTS - COASTAL ZONE MANAGEMENT

1) Comment: "None of the alternatives in the November 1986 report are "permanent"..."

Response: Among the alternatives for remediation under consideration is dredging or excavation of the contaminated sediments. If removed, these sediments may need to be disposed of somewhere. The objective of this report is to identify various options for disposal. This does not exclude any form of treatment that may be performed on the sediments to create a "permanent" solution, be it detoxification, solidification, incineration, etc.

2) Comment: "Major challenges of this project are the problems associated with dredging, namely, resuspension of sediments..."

Response: These are important considerations in evaluating the alternatives and are being addressed under separate tasks in "New Bedford Harbor Feasibility Study - Non-Removal and Removal Technologies - Initial Screening Report", February 1987.

3) Comment: "Despite the costs, it may be worth removing the more contaminated sediments to these upland sites." (Existing Approved Landfills).

Response: These landfills have been retained for detailed analysis primarily for the disposal of smaller

quantities of highly contaminated materials due to the high cost of transportation and disposal. NUS has already determined that it would not be feasible nor cost effective to transport 1,000,000 cubic yards of material to an approved facility. The deposition of material at an approved facility is also not consistent with the recently promulgated SARA requirements emphasizing permanence.

4) Comment: "The upland site identified as S-5 on the New Bedford South map (Figure A-4, NUS, June 1984) has wetlands on it...the extent of wetlands within this site needs to be further described."

Response: Data on the upland sites was compiled from previously printed NUS reports. The detailed screening of upland sites will reevaluate present conditions, including: potential wetlands; productive aquifers; and subsurface geology, to identify an optimum upland site, if such a site exists.

5) Comment: "It seems prudent to assume all in-harbor sites need to be fully lined."

Response: The USACE is evaluating the need for liners in the shoreline sites both at a bench-scale level and in an upcoming pilot study. This will identify liner requirements and what type would be necessary to fulfill the requirements for permanence.

6) Comment: "Four sites have salt marshes and/or wetlands associated with them, e.g., sites 1, 1A, 2, and 6...Filling of such areas generally violates most recommended and/or legislated criteria."

Response: Since the in-harbor sites are within the bounds of the New Bedford Superfund site and much of the wetlands have been found to be contaminated with PCBs and heavy metals, storing the sediments on-site may be a prudent siting alternative. The detailed screening will narrow the list of in-harbor sites to one or more optimal ones, if they exist. The 404(b) guidelines state that "no discharge of dredged or filled material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." Moving contaminated sediments to a "clean" area

off-site may have more significant consequences than creating a shoreline facility.

7) Comment: "There is confusion about the capacity of 10A which is listed as both 30,000 c.y. and 491,480 c.y...."

Response: There is an error in the NUS FS report that has accidentally been transcribed to the siting report. Site 10A has approximately 25% additional storage capacity as compared to site 10. (491,481 cu. yds. will be retained pending detailed screening of the in-harbor sites.)

8) Comment: "The area ranked second highest (Marsh Island extension) would involve filling in considerable marshland and potentially productive tidelands."

Response: Currently all in-harbor sites have been retained for detailed screening without any subjective ranking. Once data on the wetlands and geotechnical investigations become available, an informed decision can be made in choosing the optimum in-harbor site(s).

9) Comment: "Problems associated with placement of fine-grained sediments in underwater containment areas should be addressed with some supporting data before this is chosen as a final alternative."

Response: The USACE will be conducting a pilot dredging study within the Acushnet Estuary which will evaluate the effectiveness of the CAD cell system. The study will include groundwater monitoring which will help determine what impacts the CAD system will have on groundwater (and contaminant) movement. An evaluation of the hydrologic setting around the New Bedford site is on-going and data acquired will be used in the detailed screening of siting alternatives.

10) Comment: "Another consideration with CADs is the effectiveness of capping."

Response: "Cap thickness" is another parameter that will be studied within the dredging and disposal feasibility study and the pilot study being conducted by the USACE.

D-5 MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

1) Comment: "The Department recommends option 1A and 1B be evaluated further as a preferred disposal site."

Response: The in-harbor sites 1A and 1B are among those which have been retained for detailed screening that may later be incorporated into the final remedial alternative selection.

2) Comment: "The Department further recommends that, if this option is chosen, replication of the two salt marshes destroyed be considered."

Response: The USACE wetlands evaluation includes those wetlands that may be used for disposal. As part of the evaluation, means to mitigate impacts will be considered, including replacement.

3) Comment: "Compensatory storage would be required" (for any filling of the harbor).

Response: The USACE is currently compiling flood data and storage requirements given different flood frequencies, including the 100 year flood. This study will also evaluate the different changes in flood storage capacity caused by construction of the in-harbor sites, including the need for compensatory storage.

D-6 US ARMY CORPS OF ENGINEERS - NEW ENGLAND DIVISION

1) Comment: P. 18 The 'West Island Spoil Area' is not currently a disposal area for use and would need to be reopened. The 'Foul Area' off the Boston shoreline is an area being used presently.

Response: The 'West Island Spoil Area' was retained for detailed screening of siting alternatives due to the proximity to the dredging operation. The feasibility of reopening this site or transporting the material to another ocean disposal site will be evaluated in the detailed site screening.

2) Comment: P. 18 The buckets discussed in the last paragraph hold ten cubic yards and six cubic yards, respectively, not cubic feet.

Response: The appropriate corrections have been make in the text.

3) Comment: Table 3 footnote (8) uses a 6 cubic yard bucket. This should be a 10 cubic yard bucket instead.

Response: The correction has been made on the table.

4) Comment: P. 25 Appendix B-1 vs. B-2. The costs for preparing the sediments seem very low in Appendix B-1. There also seems to be quite a discrepancy in the pumping costs between the lined and unlined in-harbor disposal facilities. It would also be helpful if the assumptions for the costs were given as for Appendix A, as an example.

Response: An appropriate cost estimate was completed for only the disposal of sediments without the ancillary dredging or treatment/dewatering necessary. Thus the pumping costs involve only pumping material from the temporary facility to the permanent site. Due to the additional volume of material that needs to be dredged from the site of the permanent lined facility, a greater volume needs to be pumped back to the site after liner placement. The unlined site would not be dredged prior to sediment deposition. The costs given are taken from the NUS FS, August 1984, and are thus not current. The detailed screening will include a comprehensive cost analysis with appropriate assumptions documented.

5) Comment: P. 27 Appendix C. The costs for the CAD cell alternative seem confusing. Also, can the costs to transport the contaminated and clean sediments from the contaminated site be separated out, as has been done?

Response: Again an attempt was made to separate out the dredging from the disposal of material. The costs documented were taken directly from the NUS FS Addendum, September 1984, page 2-32. As discussed above, these costs will be updated and assumptions documented in the detailed screening phase of the FS.