



PUBLIC NOTICE

US Army Corps
of Engineers
New York District
Jacob K. Javits Federal Building
New York, N.Y. 10278-0090
ATTN: Regulatory Branch

In replying refer to:

Public Notice Number: NAN-2006-235-WSC
Issue Date: March 15, 2007
Expiration Date: April 16, 2007

To Whom It May Concern:

The New York District, of the U.S. Army Corps of Engineers has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344), and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (33 USC 1413).

APPLICANT: New York City Economic Development Corporation
110 William Street
New York, New York 10038

ACTIVITY: Maintenance dredging, with subsequent placement of the dredged material at the Historic Area Remediation Site (HARS) for the purpose of remediation and at a State approved upland placement site. Barge overflow at the dredging site is proposed for the HARS material. Decanting of excess water is proposed for the upland placement material.

WATERWAY: Hudson River

LOCATION: Manhattan, New York County, New York

A detailed description and plans of the applicant's activity are enclosed to assist in your review.

The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general the needs and welfare of the people. The decision of whether to issue a Department of the Army Permit for placement of the dredged material at the Historic Area Remediation Site (HARS) will also be based on whether the material meets the requirements of applicable implementing regulations. This activity is also being evaluated to determine that the proposed placement of dredged material will not unreasonably degrade or endanger human health, welfare or amenities, the marine environment, ecological systems or economic potentialities.

On September 26, 2000, the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE) signed a joint Memorandum of Agreement (MOA) outlining the steps to be taken to ensure that remediation of the HARS continues in a manner appropriately protective of human health and the aquatic environment. In making the determination evaluating placement of dredged material, the criteria established by the USEPA will be applied, including the interim change to one matrix value for polychlorinated biphenyls (PCB's) as described in the joint MOA. In addition, based upon an evaluation of the potential effect which the failure to utilize this ocean site will have on navigation, economic, and industrial development, and foreign and domestic commerce of the United States, an independent determination will be made of the need to place the dredged material in ocean waters, other possible methods of

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disposal, and other appropriate locations.

The U.S. Army Corps of Engineers neither favors nor opposes permit issuance for the applicant's proposed activity. The purpose of this public notice is to solicit comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

ALL COMMENTS REGARDING THE PERMIT APPLICATION MUST BE PREPARED IN WRITING AND MAILED TO REACH THIS OFFICE BEFORE THE EXPIRATION DATE OF THIS NOTICE. otherwise, it will be presumed that there are no objections to the activity.

Any person may request, in writing, before this public notice expires, that a public hearing be held to collect information necessary to consider this application. Requests for public hearings shall state, with particularity, the reasons why a public hearing should be held. It should be noted that information submitted by mail is considered just as carefully in the permit decision process and bears the same weight as that furnished at a public hearing.

The proposed project was reviewed based upon the "Biological Assessment for the Closure of the Mud Dump Site and Designation of the Historic Area Remediation Site (HARS) in the New York Bight and Apex," (USEPA, 1997). Based upon this review, and a review of the latest public listing of threatened and endangered species, it has been preliminarily determined that the proposed dredging and placement activities for which authorization is sought herein, are not likely to affect the following federally threatened or endangered species (humpback whales, finback whales, right whales, loggerhead turtles, leatherback turtles, green turtles, Kemp's Ridley turtles, and Shortnose sturgeon) or their critical habitat pursuant to Section 7 of the Endangered Species Act (ESA; 16 USC 1531). The USACE New York District is conducting informal consultations with the National Marine Fisheries Service in accordance with Section 7 of the Endangered Species Act.

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires all federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Consultation with the National Marine Fisheries Service regarding EFH impacts and conservation recommendations is being conducted and will be concluded prior to the final decision.

Based upon a review of the latest published version of the National Register of Historic Places, the only known wrecks on or eligible for inclusion on the National Register at the HARS are located in Primary Remediation Area Number 1. As noted in the designation of the HARS, Remediation Material would not be allowed to be placed within 0.27 nautical miles of the identified wrecks or other wrecks that might be found. Otherwise, there are no known sites eligible for, or included in, the National Register within the proposed permit area.

Reviews of the activity pursuant to Section 404 of the Clean Water Act will include application of the guidelines announced by the Administrator, US Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act. The applicant will obtain a water quality certificate or waiver from the appropriate state agency in accordance with Section 401 of the Clean Water Act prior to any final permit decision.

Pursuant to Section 307(c) of the Coastal Zone Management Act of 1972 as amended [16 USC 1456(c)], for activities under consideration that are located within the coastal zone of a state which has a federally approved coastal zone management program, the applicant is responsible for ensuring that the proposed activity complies with, and will be conducted in a manner that is consistent with, the approved state coastal zone management program. By this public notice, we are requesting the States' view on the consistency of this project with the State CZM Program. For activities within the coastal zone of the State of New York, the applicant's certification and accompanying information is available from the Consistency Coordinator, New York State Department of State, Division of Coastal Resources and Waterfront Revitalization, Coastal Zone Management Program, 41 State Street, Albany, New York 12231, Telephone (518) 474-3642. Comments regarding the applicant's certification and copies of any letters addressed to this office commenting on this proposal, should be so addressed.

In addition to any required water quality certificate and coastal zone management program concurrence, the applicant has obtained or requested the following governmental authorization for the proposed activity under consideration: A Protection of Waters Permit from the New York State Department of Environmental Conservation

The proposed work is being coordinated with the following federal, state, and local agencies:

US Environmental Protection Agency;
US Department of the Interior, Fish and Wildlife Service;
US Department of Commerce, National Marine Fisheries Service;
US Coast Guard;
New York State Department of Environmental Conservation, and
New York State Department of State.

It is requested that you communicate the foregoing information concerning this activity to any persons known by you to be interested and who did not receive a copy of this notice.

If you have any questions concerning this application, you may contact this office at (917) 790-8417 and ask for Mr. Steven Schumach. Comments or questions may be FAXED to (212) 264-4260, ATTN: Mr. Schumach. Questions about the HARS can be addressed to Mr. Douglas Pabst, Team Leader, Dredged Material Management Team, US Environmental Protection Agency, Region 2 at (212) 637-3797. For more information on the New York District Corps of Engineers programs, visit our website at <http://www.nan.usace.army.mil>



Richard L. Tomer
Chief, Regulatory Branch

Enclosures

DESCRIPTION OF PROPOSED WORK

The New York City Economic Development Corporation (NYCEDC) has requested a Department of the Army permit to continue to perform annual maintenance dredging activities at the NYC Passenger Ship Terminal in the Hudson River at the foot of West 55th Street in the Borough of Manhattan, New York County, New York. The purpose of this proposed annual maintenance dredging is to continue to maintain sufficient water depths within the NYC Passenger Ship Terminal's berths for continuing safe vessel use.

Approximately 365,000 cubic yards of annual maintenance dredged material would be removed from Sediment Sampling and Testing Reaches 1 and 3 as shown on the attached drawing Sheet 3 of 8. Dredging would be done by an environmental clamshell bucket dredge to a maximum depth of 36 feet below the plane of Mean Low Water (plus two feet of allowable overdepth to assure the needed safe navigation depths). In addition, as it has been previously maintenance dredged, the berths between Piers 88 and 90 would be maintenance dredged on an annual basis to a depth of 44 feet below the plane of Mean Low Water (plus up to two feet of allowable overdepth) within an area 950 feet by 200 feet, known as the "Notch". The notch area is needed to safely berth larger vessels, including active-duty aircraft carriers or other large naval ships which visit during the annual NYC Fleet Week celebration at the end of May. Barge overflow at the dredging site is proposed for the HARS acceptable dredged material. The HARS acceptable dredged material from Sediment Sampling and Testing Reaches 1 and 3 would be transported by ocean-going barges for placement at the Historic Area Remediation Site (HARS) for the purpose of remediation.

The resulting 365,000 cubic yards of HARS acceptable dredged material would be used for remediation purposes at the HARS by placing it over degraded sediments within the site, which is located in the Atlantic Ocean off of Sandy Hook, New Jersey. The proposed dredged material would be transported by bottom-opening barges to the placement site.

The dredged material from Sediment Sampling and Testing Reach 2 has not been maintenance dredged in decades. There is approximately 35,000 cubic yards of dredged material that would be removed from here and not placed at the HARS. This dredged material would be placed at a State-approved upland placement site with decanting of excess river water at the dredging site. The purpose of this work is to provide safer berthing of cruise ships. All of these 35,000 cubic yards will be dredged before any of the HARS acceptable dredged material will be removed south of Pier 88.

Should approval of the requested permit be issued, consideration is being given to issuance of a three-year permit for the annual maintenance work. Subsequent to an initial dredging cycle, the applicant would have to request authorization to perform maintenance dredging during the remaining life of the permit. Such authorization is dependent on the applicant demonstrating that each maintenance event requiring placement at the HARS is in compliance with the Ocean Dumping Regulations cited at 40 CFR Sections 220 - 229 in effect at that time, and will be dependent upon the availability of an approved disposal or remediation site.

INTRODUCTION TO THE HISTORIC AREA REMEDIATION SITE (HARS):

In 1972, the Congress of the United States enacted the Marine Protection, Research and Sanctuaries Act (MPRSA) to address and control the dumping of materials into ocean waters. Title I of the Act authorized the US Environmental Protection Agency (USEPA) and the US Army Corps of Engineers (USACE) to regulate dumping in ocean waters. The USEPA and the USACE share responsibility for MPRSA permitting and ocean disposal site management. Regulations implementing MPRSA can be found at 40 CFR Sections 220 through 229. With few exceptions, MPRSA prohibits the transportation of material from the United States for the purpose of ocean dumping except as may be authorized by a permit issued under the MPRSA. The MPRSA divides permitting responsibility between the USEPA and USACE. Under Section 102 of the MPRSA, USEPA has responsibility for issuing permits for all materials other than dredged material. Under Section 103 of MPRSA, the Secretary of the Army has the responsibility for issuing permits for dredged material. Determinations to issue MPRSA permits for dredged material are subject to USEPA concurrence.

In the fall of 1997, the USEPA de-designated and terminated the use of the New York Bight Dredged Material Disposal Site (commonly known as the Mud Dump Site or MDS). The MDS had been designated in 1984 for the disposal of up to

100 million cubic yards of dredged material from navigation channels and other port facilities within the Port of New York and New Jersey. Simultaneous with the closure of the MDS, the site and surrounding areas that had been used historically as disposal sites for dredged materials were redesignated as the HARS under authority of Section 102(c) of MPRSA at 40

CFR Sections 228.15(d)(6) (See 62 Fed. Reg. 46142 (August 29, 1997); 62 Fed. Reg. 26267 (May 13, 1997)). The HARS will be managed to reduce impacts of historic disposal activities at the site to acceptable levels in accordance with 40 CFR Section 228.11(c). The need to remediate the HARS is supported by the presence of toxic effects, dioxin bioaccumulation exceeding Category 1 levels in worm tissue (a definition of which appears in a memorandum reviewing the results of the applicant's testing), as well as TCDD/PCB contamination in area lobster stocks. Individual elements of those data do not establish that sediments within the Study Area are imminent hazards to the New York Bight Apex ecosystem, living resources, or human health. However, the collective evidence presents cause for concern, and justifies the need for remediation. Further information on the conditions in the Study Area and the surveys performed may be found in the Supplemental Environmental Impact Statement (USEPA, 1997).

The designation of the HARS identifies an area in and around the former Mud Dump Site (MDS) that has exhibited the potential for adverse ecological impacts. The HARS will be remediated with dredged material that meets current Category 1 standards and will not cause significant undesirable effects including through bioaccumulation or unacceptable toxicity, in accordance with 40 CFR 227.6. This dredged material is referred to as "Material for Historic Area Remediation Site (HARS)" or "HARS Material."

As of the end of February 2007, dredged materials from fifty-one different completed and ongoing private and federal dredging projects in the Port of New York and New Jersey have been dredged and placed as Remediation Material in the ocean at the HARS since the closure of the Mud Dump Site and designation of the HARS in 1997. This represents approximately 31,186,000 cubic yards of Remediation Material.

The HARS, which includes the 2.2 square nautical mile area of the MDS, is an approximately 15.7 square nautical mile area located approximately 3.5 nautical miles east of Highlands, New Jersey and 7.7 nautical miles south of Rockaway, New York. The MDS is located approximately 5.3 nautical miles east of Highlands, New Jersey and 9.6 nautical miles south of Rockaway, New York. When determined by bathymetry (a map depicting the relative depths of water in a particular area) that capping is complete, the USEPA will take any necessary rulemaking to de-designate the HARS. The HARS includes the following three areas:

Priority Remediation Area (PRA): A 9.0 square nautical mile area to be remediated with at least 1 meter of Remediation Material. The PRA encompasses the area of degraded sediments as described in greater detail in the SEIS.

Buffer Zone: An approximately 5.7 square nautical mile area (0.27 nautical mile wide band around the PRA) in which no placement of the Material for Remediation will be allowed, but may receive Material for Remediation that incidentally spreads out of the PRA.

No Discharge Zone: An approximately 1.0 square nautical mile area in which no placement or incidental spread of Material for Remediation is allowed.

To improve management and monitoring of placement activities at the HARS, electronic monitoring equipment will be on-board any barges carrying Remediation Material to the HARS. This equipment records vessel positions and scow drafts throughout the duration of each trip to the HARS and during remediation operations. To improve communication reliability between tugs and scows, a prescribed formal communication procedure has been put in place (copies of this procedure are available upon request).

Additional information concerning the HARS can be obtained from Mr. Douglas Pabst of the USEPA, Team Leader of the Dredged Material Management Team, at (212) 637-3797.

TESTING:

Over the past year, the USEPA and USACE have been refining the approach to the technical review and scientific and regulatory analysis of dredging projects proposed for the HARS. A testing evaluation process was developed, which established a basic framework for assessing results of tissue analysis from bioaccumulation testing of dredged material proposed for ocean placement. The framework defines a standard approach for assessing each analyte (an item to be analyzed for as part of the testing), in relation to regulatory standards and human health, and environmental risk factors, to facilitate decisions in accordance with the Marine Protection, Research, and Sanctuaries Act of 1972. USEPA and USACE utilize this testing evaluation process for identifying Category 1 dredged material in determining suitability of dredged materials as material for remediation at the HARS. The Testing Evaluation Memo for this project may be obtained by contacting Mr. Douglas Pabst, Team Leader of the Dredged Material Management Team at (212 637-3797).

Sediment Grain Size Analysis:

As depicted on Sheet 3 of the attached drawings, the proposed maintenance dredging area was divided into three reaches for purposes of sampling and testing. The dredged material proposed for placement at the HARS was characterized by thirteen (13) sediment core samples taken in Reach 1, and five (5) sediment core samples taken in Reach 3. All samples were taken down to 31 or 44 feet plus two feet allowable overdepth, as appropriate. The 13 samples for Reach 1 and 5 samples for Reach 3 were then combined into two separate composite samples which were subjected to chemical and biological testing. Based upon an analysis of sediment samples from the project area submitted by the applicant and their contract laboratory, the grain size characteristics of the proposed dredged material is:

Reach 1:	0 % sand	57.2 % silt	42.8% clay
Reach 3:	1.9 % sand	55.9 % silt	42.2% clay

Results of the chemical and biological testing are summarized below.

Evaluation of the liquid phase: Chemistry

Under the requirements of 40 CFR 227.6(c)(1) and 227.27(a), chemical analysis was conducted on project area site water and elutriate. Results of this evaluation are summarized in Table 1. Please note in reading Table 1 that detection limits have been listed for only those constituents which the laboratory reported as non-detected (ND) in the concentration column (this reporting convention was similarly applied in reporting the results of bioaccumulation potential testing discussed below). If the constituents were detected (above the detection limit), the measured value would appear.

Expected concentrations of chemical constituents in the water column following ocean placement, after allowing for initial mixing, were calculated using the Automated Dredging and Disposal Alternatives Management System (ADDAMS), a mixing model developed by the U.S. Army Corps of Engineers (USACE) Waterways Experiment Station (WES) and described in the joint USEPA/USACE implementation manual entitled "Evaluation of Dredged Material Proposed for Ocean Disposal" (commonly referred to as the National "Green Book"). The material can be considered suitable for ocean disposal only if the concentration of the Suspended Particulate Phase (SPP) of the dredged material, after allowance for the initial mixing, will not exceed the Limiting Permissible Concentration (LPC) beyond the boundaries of the disposal site within the first four hours following dumping or at any point in the marine environment after the first four hours. The ADDAMS Model predicted that applicable marine water quality criteria for listed constituents were not exceeded after allowance for initial mixing [40 CFR 227.29(a)]. Results of this analysis indicate that the LPC will be met for the proposed dredged material from the project area.

Bioassays:

In accordance with 40 CFR Part 227 of the Ocean Dumping regulations, bioassays were performed to assess the toxicities of the suspended particulate, liquid, and solid phases of the proposed dredged material from the proposed project area.

Evaluation of the liquid phase:

Liquid phase bioassays run as part of the suspended particulate phase on three appropriate sensitive marine organisms: a crustacean (a mysid shrimp, *Mysidopsis bahia*), a finfish (*Menidia beryllina*), and the planktonic larvae of a bivalve (the blue mussel, *Mytilus edulis*), show that after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the liquid phase of the material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic to appropriate sensitive marine organisms. Accordingly, it is concluded that the liquid phase of the material would be in compliance with 40 CFR Sections 227.6(c)(1) and 227.27(a). The specific test results and technical analysis of the data underlying this conclusion are described and evaluated in a joint USACE New York District/US Environmental Protection Agency Region 2 memorandum (copies available upon request).

Evaluation of the suspended particulate phase:

The suspended particulate phase of the material was evaluated for compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). Bioassay testing of the suspended particulate phase of the material has been conducted using three appropriate sensitive marine organisms: the mysid shrimp, *Mysidopsis bahia*; a finfish, *Menidia beryllina*; and the planktonic larvae of a blue mussel, *Mytilus edulis*. Median lethal concentrations (LC50), those concentrations of suspended particulate phase resulting in 50% mortality, were determined for all three test species. In addition, the median effective concentration (EC50) based on normal larval development to the D-cell stage, was determined for bivalve larvae. The Limiting Permissible Concentration (LPC) was then calculated as 0.01 of the LC50 or EC50 of the most sensitive organism. In this case, the LPC was calculated at 0.38% for Sediment Sampling and Testing Reach 1 and 0.22% for Sediment Sampling and Testing Reach 3 based on the EC50 of *M. edulis*.

This information shows that when placed in the HARS, and after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the suspended particulate phase of this material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic in the laboratory bioassays, and thus would not result in significant mortality. Moreover, the fact that after placement, the suspended particulate phase would only exist in the environment for a short time, means the suspended particulate phase of each reach would not cause significant undesirable effects, including the possibility of danger associated with bioaccumulation, since these impacts require long exposure durations (see USEPA, 1994). Accordingly, it is concluded that the suspended phase of the material from both Sediment Sampling and Testing Reaches 1 and 3 would be in compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). The results of bioassay tests conducted on proposed dredged sediments are presented in Table 2 of this public notice.

Evaluation of the solid phase:

The solid phase tests the whole dredged material before it has undergone processing that might alter its chemical or toxicological properties. The solid phase was evaluated for compliance with 40 CFR Sections 227.6(c)(3) and 227.27(b). This evaluation was made using the results of two specific types of evaluations on the solid phase of the material from both Sediment Sampling and Testing Reaches 1 and 3, one focusing on the acute (10-day) toxicity of the material, and the other focusing on the potential for the material to cause significant adverse effects due to bioaccumulation. Both types of tests used appropriate sensitive benthic marine organisms according to procedures approved by USEPA and the USACE. The following sections address the results of those tests and further analyze compliance with the regulatory criteria of 40 CFR Sections 227.6(c)(3), 227.27(b), and 228.15 and with USEPA Region 2/USACE New York District guidance.

1. Toxicity:

Ten-day toxicity tests were conducted on proposed project dredged material using a filter feeding mysid shrimp (*Mysidopsis bahia*) and a deposit feeding, burrowing amphipod (*Ampelisca abdita*), which are appropriate sensitive benthic marine organisms. The results from the proposed project material are then compared to results for the same organisms that are exposed to reference sediments. The reference sediments represent existing background conditions in the vicinity of the HARS, removed from the influence of any placement operations. These organisms are good predictors of adverse effects to benthic marine communities (see USEPA, 1996). The toxicity of project sediments was not statistically greater than reference sediments for either mysid, or for amphipods, and the difference between percent survivals in test and reference sediments was less than 10% for mysid shrimp and less than 20% for amphipods.

These results show that the solid phase of the material from both Sediment Sampling and Testing Reaches 1 and 3 would not cause significant mortality and meets the solid phase toxicity criteria of Sections 227.6 and 227.27. The results of the ten-day toxicity test are summarized in Table 2.

2. Bioaccumulation:

Bioaccumulation tests for the sediment were conducted on the solid phase of the project material for contaminants of concern using two appropriate sensitive benthic marine organisms: a burrowing, deposit-feeding polychaete, *Nereis virens*, and a filter-feeding bivalve, *Macoma nasuta*. These species are considered to be good representatives of the phylogenetically diverse base of the marine food chain. Contaminants of concern were identified for the regional testing manual from the NY/NJ Harbor Estuary Program Toxics Characterization report (Squibb, *et al.* 1991). Table 3 of the Public Notice addresses the bioaccumulation of contaminants of concern. Additional information on more rigorous evaluations conducted on individual contaminant values may be found in the Testing Evaluation Memo for this project. Table 3 indicates that several contaminants bioaccumulated above reference in the clam and/or worm. All constituents identified in worm and clam tissue were compared to existing Food and Drug Administration (FDA) action levels for poisonous or deleterious substances in fish and shellfish for human food, regional disposal criteria, background concentrations, and risk-based criteria provided by USEPA. The testing memo further evaluates these contaminants, and concludes that any contaminant that exceeded reference did not exceed any existing regional matrix or dioxin values. Several contaminants which did not have matrix values did exceed background levels, but in no case did any contaminant accumulate to toxicologically important concentrations, even when very conservative assumptions were used in the analysis. Any contaminants that exhibited bioaccumulation test results above reference were all below the acceptable human health risk range and acceptable aquatic effects range, again using conservative approaches and analyses. A discussion of this determination is available in the Testing Evaluation Memo for this project. The bioaccumulation test results were used in evaluating the potential impacts of the material. The determination is that the combined results of the toxicity and bioaccumulation tests indicate that the material from both Sediment Sampling and Testing Reaches 1 and 3 meets the criteria of 40 CFR Sections 227.6(c)(3) and 227.27(b) and 228.15(d)(6)(v)(A) of the Regulations, and that the material is suitable for placement at the HARS.

CONCLUSIONS:

Based upon the results of testing of the sediments proposed for dredging in the applicant's facility and ocean placement the USACE and USEPA have determined that the material is Category 1 meeting the criteria for ocean placement as described in 40 CFR Sections 227.6, 227.27, and 228.15, and is a Remediation Material as defined under the USEPA Region 2/USACE, New York District guidance. The specific test results and technical analysis of the data underlying this conclusion are described in the joint USACE, New York District/USEPA Region 2 memorandum mentioned previously.

Placement of this material at the HARS will serve to reduce impacts to acceptable levels and improve benthic

conditions. Sediments in the HARS have been found to be acutely toxic to sensitive benthic marine organisms in laboratory tests, whereas project sediments used in laboratory acute toxicity tests with the same species were determined not to be toxic. Placement of project material over existing toxic sediments would serve to remediate those areas for toxicity. In addition, by covering the existing sediments in the site with this project material, surface dwelling organisms will be exposed to sediments exhibiting Category 1 qualities whereas the existing sediments exceed these levels.

ALTERNATIVES TO HARS PLACEMENT:

Regarding ocean placement of dredged material, the Ocean Dumping Regulations [Title 40 CFR Sections 227.16(b)] states that "... alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures which need not be competitive with the costs of ocean dumping, taking into account the environmental impacts associated with the use of alternatives to ocean dumping . . ." USACE, New York District has evaluated the regional practicability of potential disposal alternatives in the September, 1999 Draft "Implementation Report for the Dredged Material Management Plan for the Port of New York and New Jersey." The Recommended Plan within the report addresses both the long and short term dredged material placement options in two specific timeframes, heretofore referred to as the 2010 Plan and the 2040 Plan, respectively.

The 2010 Plan relies heavily on the creation, remediation, and restoration of a variety of existing degraded or impacted habitats in the region with material that would be considered unsuitable for HARS restoration. The remaining material is treated and stabilized, as needed, and then applied to remediate degraded and potentially polluting areas such as brownfields, landfills, and abandoned strip mines. Nearly all of the options considered in the 2010 Plan have a placement cost of \$29/cubic yard or higher.

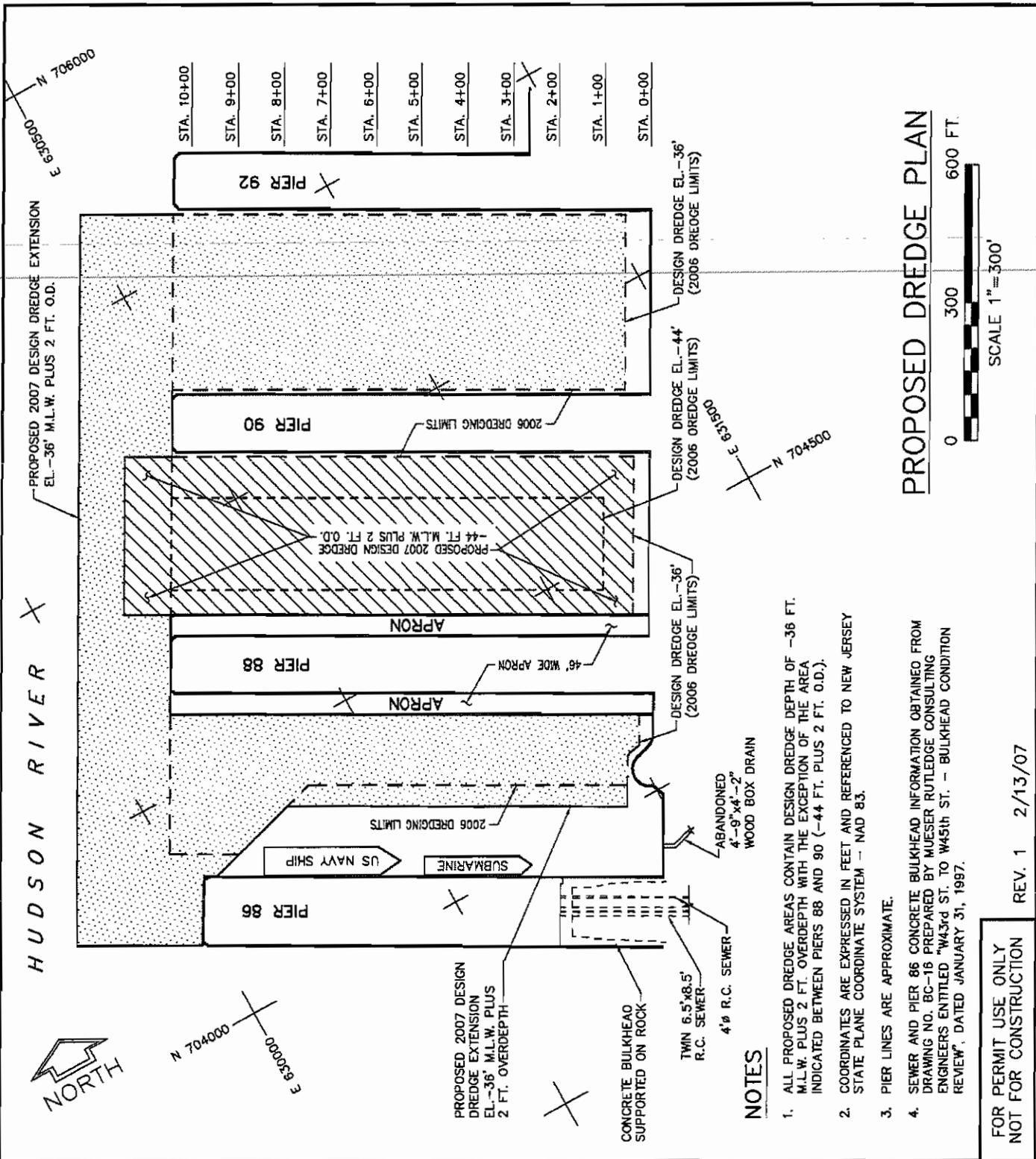
Similar to the 2010 Plan, the 2040 Plan relies heavily upon the use of land remediation and decontamination methods for the management of HARS unsuitable material. As in the 2010 Plan, maximum use of all practicable alternatives to the HARS is envisioned.

Many of the dredged material management options presented in the 2010 Plan however, are not presently permitted and/or are presently under construction at this time and therefore considered unavailable for the purposes of this application. Other options are not available at reasonable incremental costs, thus leaving HARS placement as the preferred alternative.

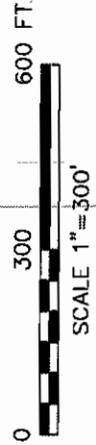
For more information on the New York District Corps of Engineers programs, visit our website at <http://www.nan.usace.army.mil>

COMMUNICATIONS:

For additional information regarding this project or the HARS contact Mr. Steven Schumach, Regulatory Project Manager, USACE, New York District at (917) 790-8417 or Mr. Douglas Pabst, Team Leader, Dredged Material Management Team, USEPA, Region 2 at (212) 637-3797. If the determination is made to issue a permit, the permittee will contact the US Coast Guard with the details of the authorized work.



PROPOSED DREDGE PLAN



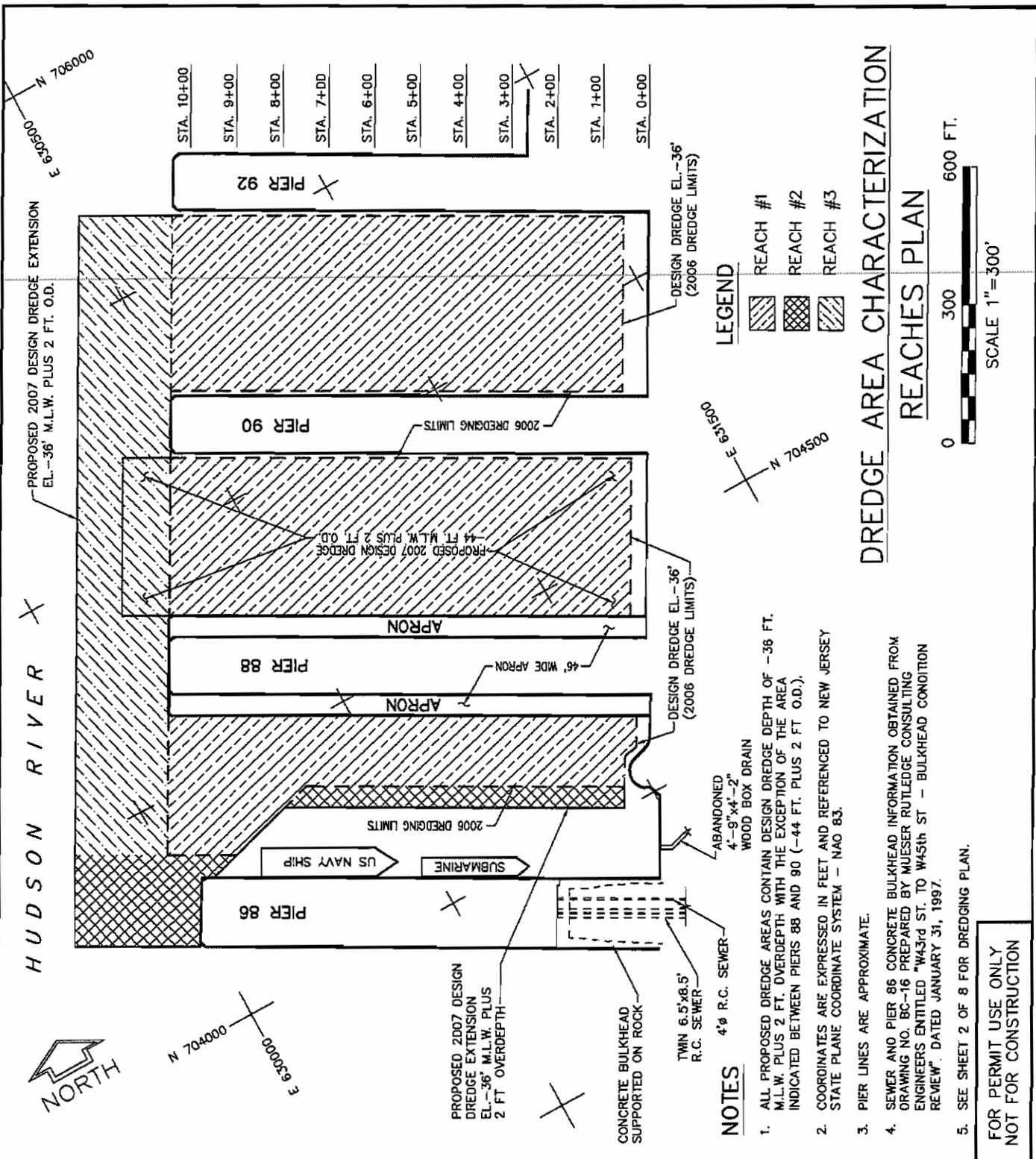
NOTES

1. ALL PROPOSED DREDGE AREAS CONTAIN DESIGN DREDGE DEPTH OF -36 FT. M.L.W. PLUS 2 FT. OVERDEPTH WITH THE EXCEPTION OF THE AREA INDICATED BETWEEN PIERS 88 AND 90 (-44 FT. PLUS 2 FT. O.D.).
2. COORDINATES ARE EXPRESSED IN FEET AND REFERENCED TO NEW JERSEY STATE PLANE COORDINATE SYSTEM - NAD 83.
3. PIER LINES ARE APPROXIMATE.
4. SEWER AND PIER 86 CONCRETE BULKHEAD INFORMATION OBTAINED FROM DRAWING NO. BC-16 PREPARED BY MUESER RUTLEDGE CONSULTING ENGINEERS ENTITLED "W43rd ST. TO W45th ST. - BULKHEAD CONDITION REVIEW", DATED JANUARY 31, 1997.

FOR PERMIT USE ONLY
NOT FOR CONSTRUCTION
REV. 1 2/13/07

PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO EXISTING PIERS
 DATUM: MEAN LOW WATER (M.L.W.)
 ADJACENT PROPERTY OWNERS: SEE APPLICATION
 AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

PROPOSED MAINTENANCE DREDGING
 IN HUDSON RIVER
 CITY OF NEW YORK
 BOROUGH OF MANHATTAN
 STATE OF NEW YORK
 APPLICATION BY: NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION
 DATE: 12/29/06
 Sheet 2 of 10



LEGEND

- REACH #1 (diagonal hatching)
- REACH #2 (cross-hatching)
- REACH #3 (diagonal hatching)

DREDGE AREA CHARACTERIZATION REACHES PLAN



- NOTES**
- ALL PROPOSED DREDGE AREAS CONTAIN DESIGN DREDGE DEPTH OF -36 FT. M.L.W. PLUS 2 FT. OVERDEPTH WITH THE EXCEPTION OF THE AREA INDICATED BETWEEN PIERS 88 AND 90 (-44 FT. PLUS 2 FT. O.D.).
 - COORDINATES ARE EXPRESSED IN FEET AND REFERENCED TO NEW JERSEY STATE PLANE COORDINATE SYSTEM - NAO 83.
 - PIER LINES ARE APPROXIMATE.
 - SEWER AND PIER 86 CONCRETE BULKHEAD INFORMATION OBTAINED FROM DRAWING NO. BC-16 PREPARED BY MUESER RUTLEDGE CONSULTING ENGINEERS ENTITLED "W43rd ST. TO W45th ST - BULKHEAD CONDITION REVIEW", DATED JANUARY 31, 1997.
 - SEE SHEET 2 OF 8 FOR DREDGING PLAN.

FOR PERMIT USE ONLY
NOT FOR CONSTRUCTION

PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO EXISTING PIERS
 DATUM: MEAN LOW WATER (M.L.W.)
 ADJACENT PROPERTY OWNERS: SEE APPLICATION
 AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

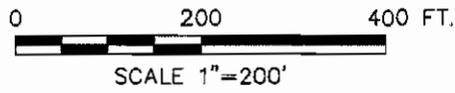
PROPOSED MAINTENANCE DREDGING
 IN HUDSON RIVER
 CITY OF NEW YORK
 BOROUGH OF MANHATTAN
 STATE OF NEW YORK
 APPLICATION BY: NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION
 DATE: 12/29/06
 Sheet 3 of 10

HUDSON RIVER



N 704000
E 630000

EXISTING BATHYMETRY PARTIAL PLAN SHEET 1 OF 2



N 703500
E 630500

PROPOSED 2007 DESIGN
DREDGE EXTENSION
EL. -36' M.L.W. PLUS
2 FT. OVERDEPTH

CONCRETE BULKHEAD
SUPPORTED ON ROCK

TWIN 6.5'x8.5'
R.C. SEWER

4" R.C. SEWER

ABANDONED
4'-9"x4'-2"
WOOD BOX DRAIN

PIER 86

US NAVY SHIP

SUBMARINE

PIER 88

APRON

DESIGN DREDGE EL. -44'
(2006 DREDGE LIMITS)

46' WIDE APRON

DESIGN DREDGE EL. -36'
(2006 DREDGE LIMITS)

MATCH LINE - FOR CONTINUATION, SEE SHEET 4 OF 7

FOR PERMIT USE ONLY
NOT FOR CONSTRUCTION

REV 1 2/13/07

PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO
EXISTING PIERS

DATUM: MEAN LOW WATER (M.L.W.)

ADJACENT PROPERTY OWNERS:
SEE APPLICATION

AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

PROPOSED MAINTENANCE DREDGING
IN HUDSON RIVER

CITY OF NEW YORK
BOROUGH OF MANHATTAN
STATE OF NEW YORK

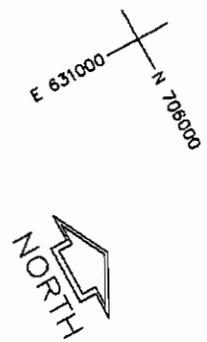
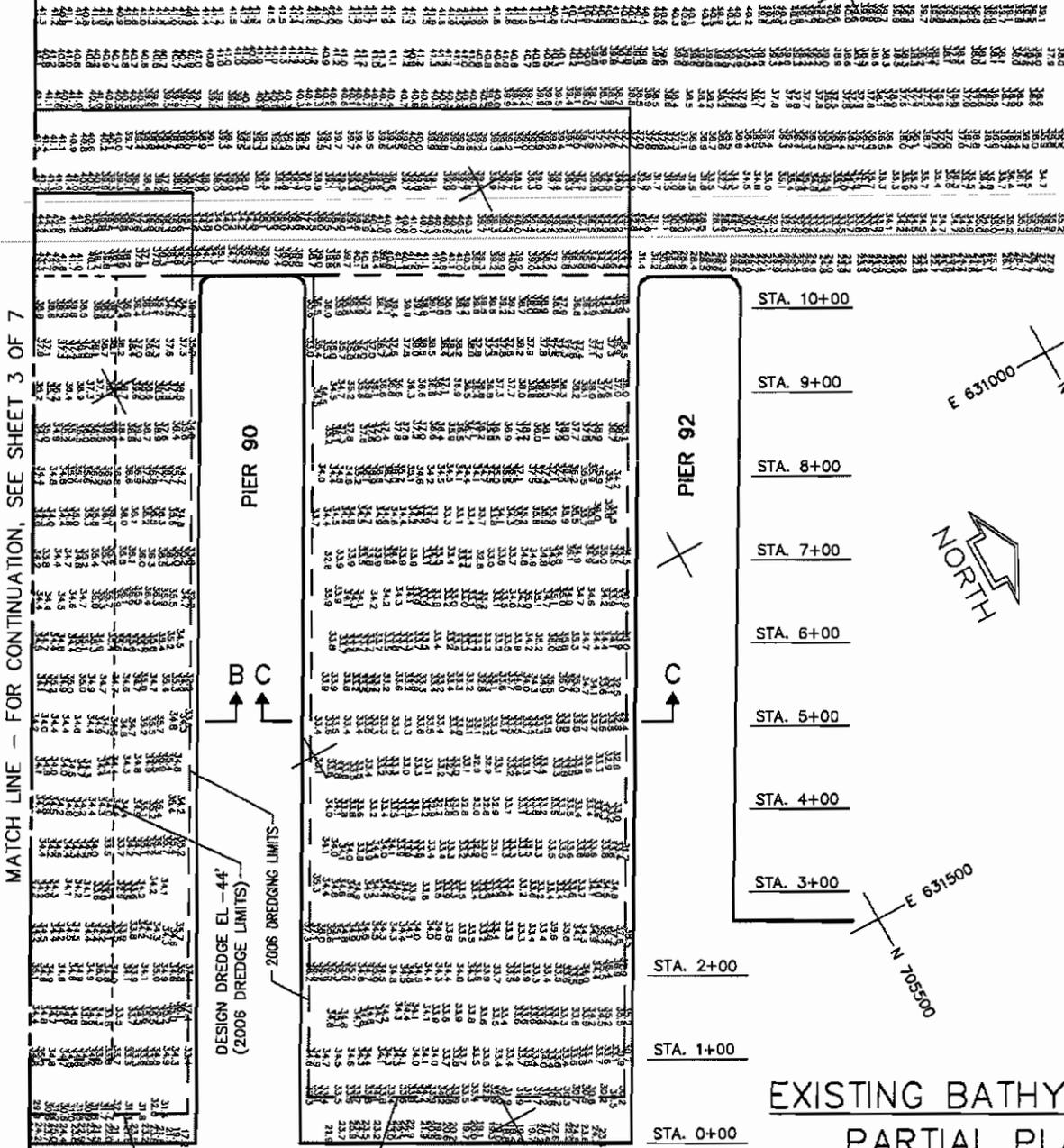
APPLICATION BY: NEW YORK CITY ECONOMIC
DEVELOPMENT CORPORATION

DATE: 12/29/06

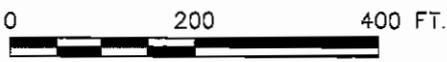
Sheet 4 of 10

HUDSON RIVER

MATCH LINE - FOR CONTINUATION, SEE SHEET 3 OF 7



EXISTING BATHYMETRY PARTIAL PLAN SHEET 2 OF 2



SCALE 1"=200'

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NOT FOR CONSTRUCTION

REV. 1 2/13/07

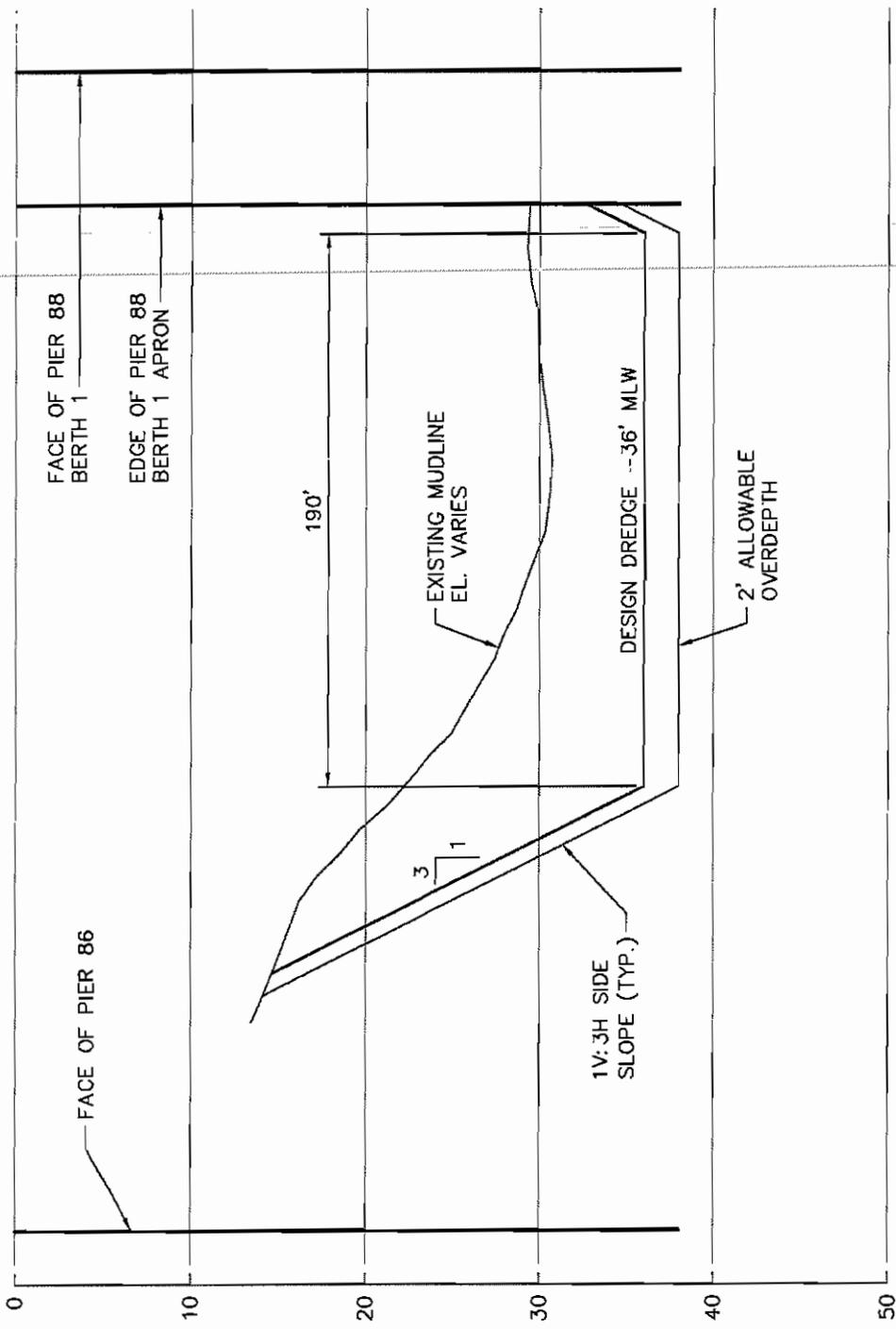
PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO
EXISTING PIERS
DATUM: MEAN LOW WATER (M.L.W.)
ADJACENT PROPERTY OWNERS:
SEE APPLICATION

PROPOSED MAINTENANCE DREDGING
IN HUDSON RIVER
CITY OF NEW YORK
BOROUGH OF MANHATTAN
STATE OF NEW YORK
APPLICATION BY: NEW YORK CITY ECONOMIC
DEVELOPMENT CORPORATION

AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

DATE: 12/29/06

Sheet 5 of 10



SECTION A-A



HORIZ. SCALE 1"=60'-0"



VERT. SCALE 1"=10'-0"

REV. 1 2/13/07

FOR PERMIT USE ONLY
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PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO EXISTING PIERS

DATUM: MEAN LOW WATER (M.L.W.)

ADJACENT PROPERTY OWNERS:
SEE APPLICATION

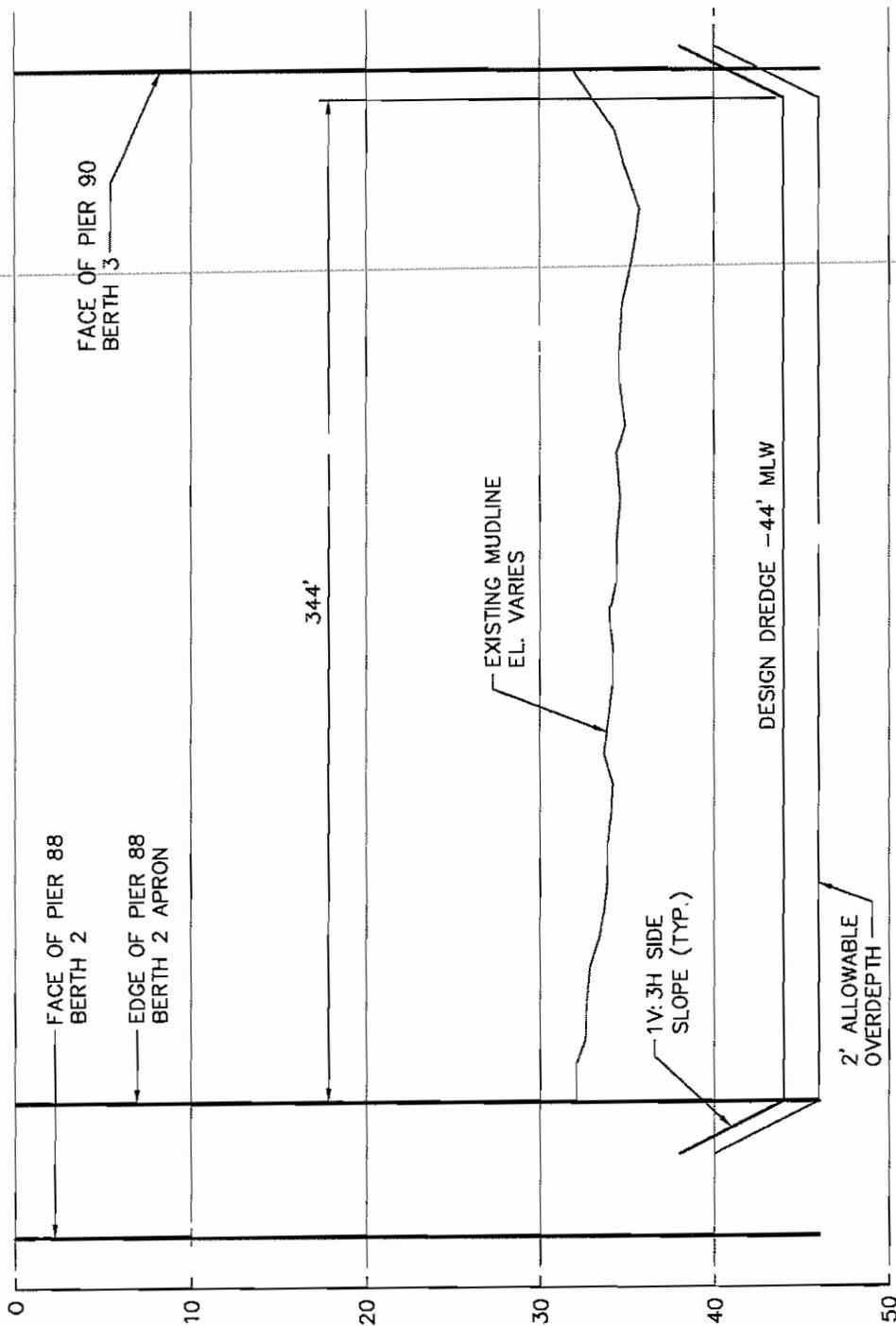
AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

PROPOSED MAINTENANCE DREDGING
IN HUDSON RIVER
CITY OF NEW YORK
BOROUGH OF MANHATTAN
STATE OF NEW YORK

APPLICATION BY: NEW YORK CITY ECONOMIC
DEVELOPMENT CORPORATION

DATE: 12/29/06

Sheet 6 of 10



SECTION B-B



HORIZ. SCALE 1"=60'-0"



VERT. SCALE 1"=10'-0"

REV. 1 2/13/07

FOR PERMIT USE ONLY
NOT FOR CONSTRUCTION

PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO EXISTING PIERS

DATUM: MEAN LOW WATER (M.L.W.)

ADJACENT PROPERTY OWNERS:
SEE APPLICATION

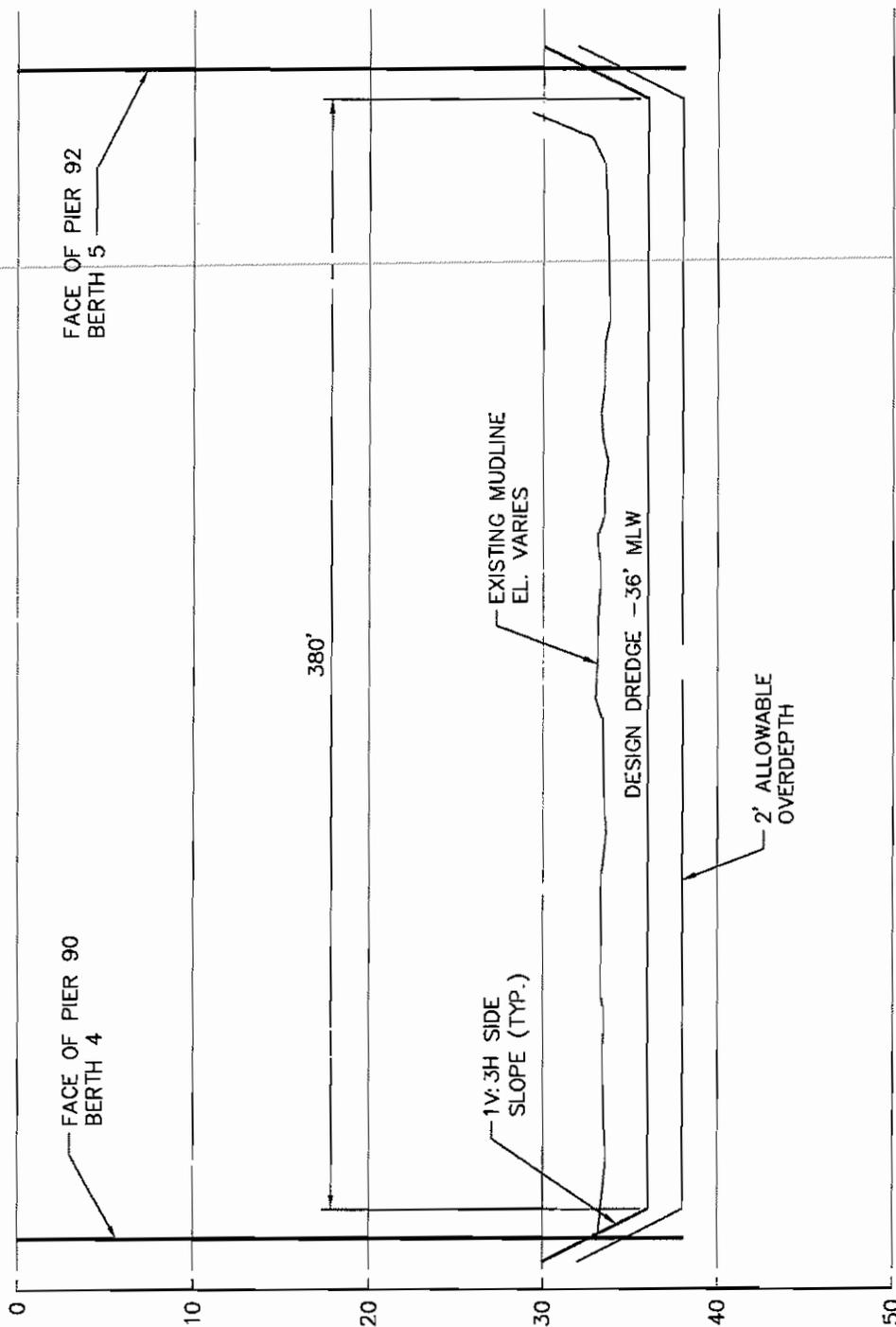
AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

PROPOSED MAINTENANCE DREDGING
IN HUDSON RIVER
CITY OF NEW YORK
BOROUGH OF MANHATTAN
STATE OF NEW YORK

APPLICATION BY: NEW YORK CITY ECONOMIC
DEVELOPMENT CORPORATION

DATE: 12/29/06

Sheet 7 of 10



SECTION C-C



HORIZ. SCALE 1"=60'-0"



VERT. SCALE 1"=10'-0"

REV. 1 2/13/07

FOR PERMIT USE ONLY
NOT FOR CONSTRUCTION

PURPOSE: TO MAINTAIN NAVIGABLE ACCESS TO EXISTING PIERS

DATUM: MEAN LOW WATER (M.L.W.)

ADJACENT PROPERTY OWNERS:
SEE APPLICATION

AGENT: OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.

PROPOSED MAINTENANCE DREDGING
IN HUDSON RIVER

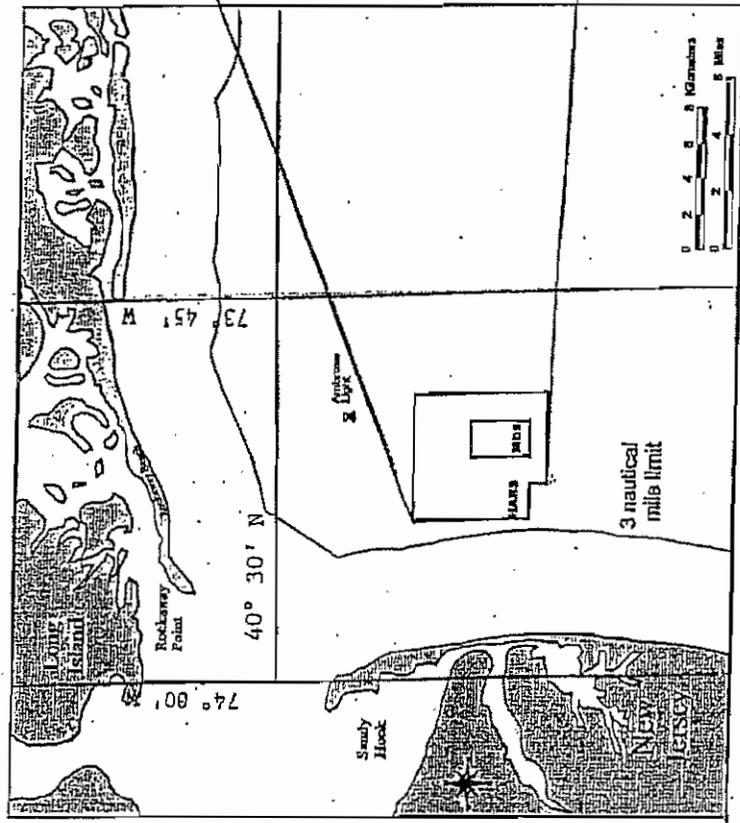
CITY OF NEW YORK
BOROUGH OF MANHATTAN
STATE OF NEW YORK

APPLICATION BY: NEW YORK CITY ECONOMIC
DEVELOPMENT CORPORATION

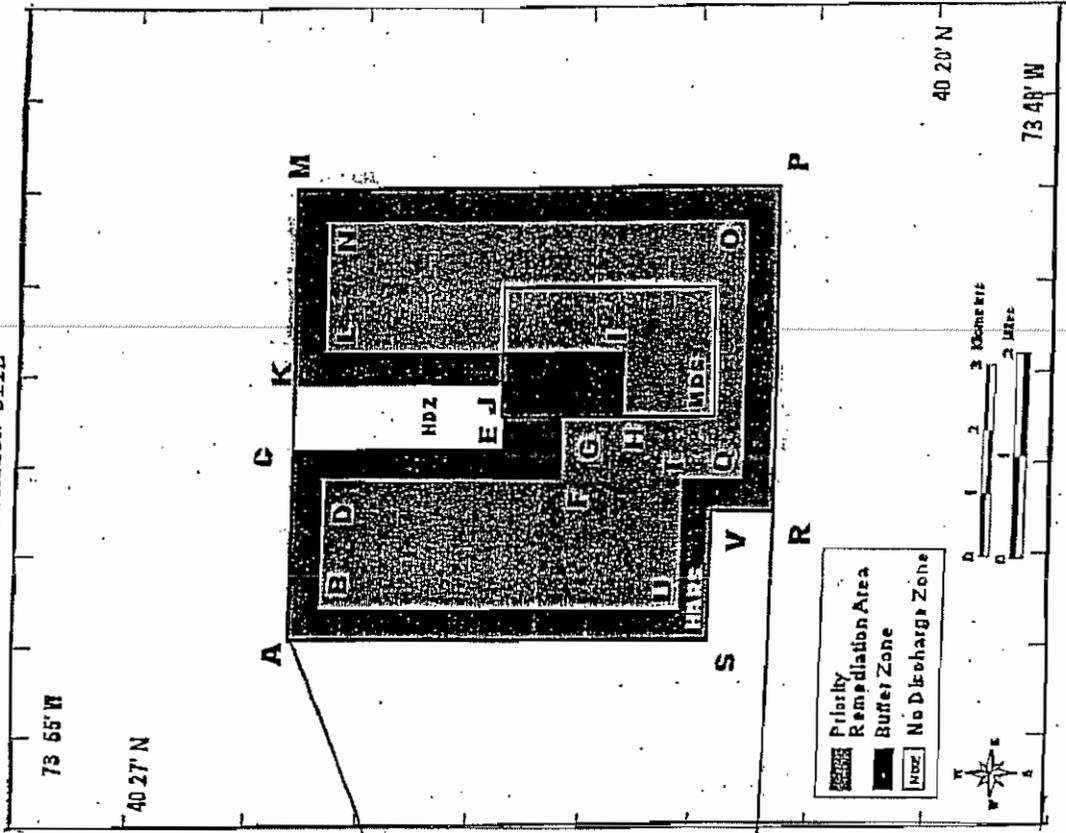
DATE: 12/29/06

Sheet 8 of 10

HISTORIC AREA REMEDIATION SITE LOCATION MAP



LOCATION OF PRIMARY REMEDIATION AREA WITHIN THE HISTORIC AREA REMEDIATION SITE



00900 ATT. A-2

Priority Remediation Area (PRA): 9.0 square nautical mile area to be remediated with at least one meter of Remediation Material, bounded by the following coordinates:

Point	Latitude DMS *	Longitude DMS	Latitude DDM **	Longitude DDM
B	40° 25' 23" N	73° 53' 34" W	40° 25.38' N	73° 53.57' W
D	40° 25' 22" N	73° 52' 08" W	40° 25.37' N	73° 52.13' W
F	40° 23' 13" N	73° 52' 09" W	40° 23.22' N	73° 52.15' W
G	40° 23' 13" N	73° 51' 28" W	40° 23.22' N	73° 51.47' W
H	40° 22' 41" N	73° 51' 28" W	40° 22.68' N	73° 51.47' W
I	40° 22' 41" N	73° 50' 43" W	40° 22.68' N	73° 50.72' W
L	40° 25' 22" N	73° 50' 44" W	40° 25.37' N	73° 50.73' W
N	40° 25' 22" N	73° 49' 19" W	40° 25.37' N	73° 49.32' W

*-- DMS = Degrees, Minutes, Seconds

** -- DDS := Degrees, Decimal Minutes

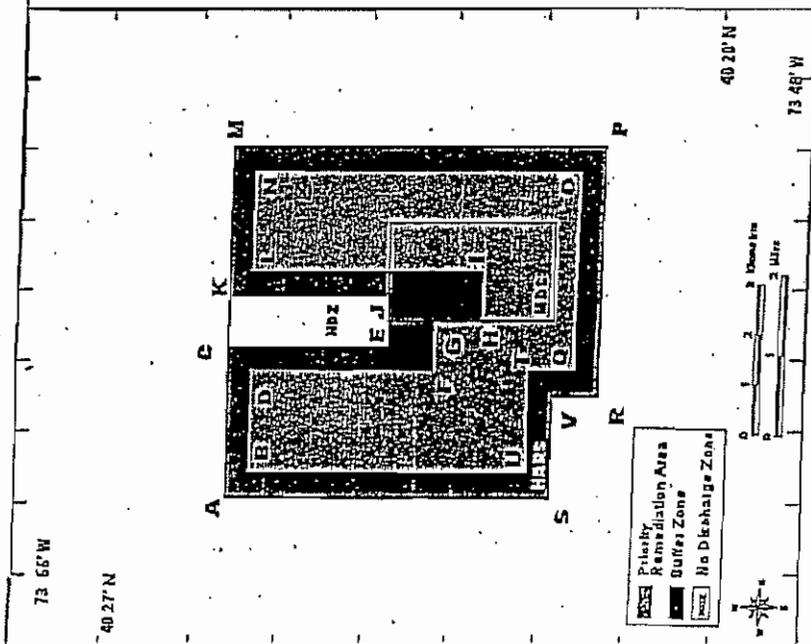


TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
 NYCEDC - Passenger Ship Terminal
 Reach 1

CONSTITUENTS	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb	ppb	ppb	ppb
Ag		0.033		0.117
Cd		0.060		0.021
Cr		0.613		1.763
Cu		2.59		3.380
Hg		0.006		0.025
Ni		1.10		2.19
Pb		0.81		3.01
Zn		8.73		5.86
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.38	ND	0.38	ND
a-Chlordane	0.40	ND		0.483
trans Nonachlor	0.40	ND		0.427
Dieldrin	0.49	ND	0.49	ND
4,4'-DDT	0.44	ND	0.44	ND
2,4'-DDT	0.88	ND	0.88	ND
4,4'-DDD	0.48	ND		1.46
2,4'-DDD	0.59	ND		0.69
4,4'-DDE	0.40	ND		2.13
2,4'-DDE	0.94	ND	0.94	ND
Total DDT		1.9		5.4
Endosulfan I	0.45	ND	0.45	ND
Endosulfan II	0.41	ND	0.41	ND
Endosulfan sulfate	0.41	ND	0.41	ND
Heptachlor	0.36	ND	0.36	ND
Heptachlor epoxide	0.89	ND	0.89	ND
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB 8	0.51	ND	0.51	ND
PCB 18	0.46	ND		1.48
PCB 28	0.38	ND		3.0
PCB 44	0.47	ND		2.26
PCB 49	0.34	ND		2.17
PCB 52	0.41	ND		3.50
PCB 66	0.47	ND		2.49
PCB 87	0.49	ND		0.67
PCB 101	0.83	ND		2.16
PCB 105	0.41	ND		0.62
PCB 118	0.50	ND		1.83
PCB 128	0.56	ND		0.30
PCB 138	0.48	ND		3.44
PCB 153	0.35	ND		3.27
PCB 170	0.64	ND		1.96
PCB 180	0.67	ND		2.27
PCB 183	0.44	ND		0.58
PCB 184	0.66	ND	0.66	ND
PCB 187	0.40	ND		1.36
PCB 195	0.59	ND		0.56
PCB 206	0.44	ND		0.89
PCB 209	0.59	ND		1.50
Total PCB		16.14		74.9

ND = Not detected

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

Total PCB = sum of congeners reported x 2

Concentrations shown are the mean of three replicate analyses.

Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
 NYCEDC - Passenger Ship Terminal
 Reach 3

CONSTITUENTS	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb	ppb	ppb	ppb
Ag		0.033		0.164
Cd		0.060		0.025
Cr		0.613		2.317
Cu		2.59		3.607
Hg		0.006		0.034
Ni		1.10		2.34
Pb		0.81		3.89
Zn		8.73		5.64
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.38	ND	0.38	ND
a-Chlordane	0.40	ND		0.390
trans Nonachlor	0.40	ND		0.320
Dieldrin	0.49	ND	0.49	ND
4,4'-DDT	0.44	ND	0.44	ND
2,4'-DDT	0.88	ND	0.88	ND
4,4'-DDD	0.48	ND		1.11
2,4'-DDD	0.59	ND		0.60
4,4'-DDE	0.40	ND		1.99
2,4'-DDE	0.94	ND	0.94	ND
Total DDT		1.9		4.8
Endosulfan I	0.45	ND	0.45	ND
Endosulfan II	0.41	ND	0.41	ND
Endosulfan sulfate	0.41	ND	0.41	ND
Heptachlor	0.36	ND	0.36	ND
Heptachlor epoxide	0.89	ND	0.89	ND
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB 8	0.51	ND	0.51	ND
PCB 18	0.46	ND		2.02
PCB 28	0.38	ND		3.0
PCB 44	0.47	ND		1.99
PCB 49	0.34	ND		2.51
PCB 52	0.41	ND		3.97
PCB 66	0.47	ND		2.34
PCB 87	0.49	ND		0.56
PCB 101	0.83	ND		2.30
PCB 105	0.41	ND		0.54
PCB 118	0.50	ND		1.75
PCB 128	0.56	ND		0.40
PCB 138	0.48	ND		3.38
PCB 153	0.35	ND		3.15
PCB 170	0.64	ND		1.57
PCB 180	0.67	ND		2.10
PCB 183	0.44	ND		0.52
PCB 184	0.66	ND	0.66	ND
PCB 187	0.40	ND		1.35
PCB 195	0.59	ND		0.53
PCB 206	0.44	ND		0.81
PCB 209	0.59	ND		0.87
Total PCB		16.14		73.6

ND = Not detected

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

Total PCB = sum of congeners reported x 2

Concentrations shown are the mean of three replicate analyses.

Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 2. TOXICITY TEST RESULTS
NYCEDC - Passenger Ship Terminal
Reach 1

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50	LPC (a)
<i>Menidia beryllina</i>	96 hours	(b) 49.3%	0.49
<i>Mysidopsis bahia</i>	96 hours	(b) 82.4%	0.82
<i>Mytilus edulis</i> (larval survival)	48 hours	(b) >100%	>1%
<i>Mytilus edulis</i> (larval normal develop.)	48 hours	(c) 37.9%	0.38

(a) Limiting Permissible Concentration (LPC) is the LC 50 or EC 50 times 0.01.

(b) Median Lethal Concentration (LC50) resulting in 50% mortality at test termination.

(c) Median Effective Concentration (EC50) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival	% Difference Reference - Test	Is difference statistically significant? (a=0.05)
<i>Ampelisca abdita</i>	98%	100%	-2%	no
<i>Mysidopsis bahia</i>	98%	97%	1%	no

TABLE 2. TOXICITY TEST RESULTS
NYCEDC - Passenger Ship Terminal
Reach 3

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50	LPC (a)
<i>Menidia beryllina</i>	96 hours	(b) 39.4%	0.39
<i>Mysidopsis bahia</i>	96 hours	(b) 69.2%	0.69
<i>Mytilus edulis</i> (larval survival)	48 hours	(b) >100%	>1%
<i>Mytilus edulis</i> (larval normal develop.)	48 hours	(c) 22.3%	0.22

- (a) Limiting Permissible Concentration (LPC) is the LC 50 or EC 50 times 0.01.
- (b) Median Lethal Concentration (LC50) resulting in 50% mortality at test termination.
- (c) Median Effective Concentration (EC50) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
<i>Ampelisca abdita</i>	100%	99%	1%	no
<i>Mysidopsis bahia</i>	95%	95%	0%	no

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations
NYCEDC - Passenger Ship Terminal - Reach 1

CONSTITUENTS	<i>Macoma nasuta</i>				<i>Nereis virens</i>			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.04	*	0.04		0.06		0.04
As		2.30	*	2.51		2.57		1.94
Cd		0.03		0.03		0.04		0.04
Cr		0.18	*	0.21		0.12		0.11
Cu		0.99	*	1.25		1.32		1.30
Hg		0.006	*	0.007		0.019		0.016
Ni		0.24	*	0.29		0.11		0.13
Pb		0.16	*	0.38		0.17		0.15
Zn		10.50		10.33		17.50		15.79
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.03	ND		0.03	0.03	ND	0.03	ND
α-Chlordane		0.07	*	0.28		0.28		* 0.54
trans Nonachlor		0.02	*	0.23		0.82		0.74
Dieldrin		0.04	*	0.15		0.34		* 0.57
4,4'-DDT		0.04		0.05		0.08		0.05
2,4'-DDT	0.05	ND		0.05	0.05	ND	0.05	ND
4,4'-DDD		0.04	*	0.39		1.53		1.64
2,4'-DDD	0.06	ND	*	0.24		0.68		0.62
4,4'-DDE		0.10	*	0.93		0.13		* 0.56
2,4'-DDE	0.06	ND		0.05	0.06	ND	0.06	ND
Total DDT		0.26	*	1.66		2.47		2.92
Endosulfan I	0.02	ND		0.02	0.02	ND	0.02	ND
Endosulfan II	0.06	ND		0.06	0.06	ND	0.06	ND
Endosulfan sulfate	0.14	ND		0.14		0.23		0.29
Heptachlor	0.04	ND		0.04	0.04	ND	0.04	ND
Heptachlor epoxide	0.02	ND		0.02	0.02	ND	0.02	ND
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8		0.11		0.17		0.10		* 0.49
PCB 18		0.03	*	0.29		0.23		* 0.73
PCB 28		0.09	*	0.76		0.09		* 0.81
PCB 44		0.05	*	0.70		0.14		* 0.69
PCB 49		0.04	*	1.21		0.18		* 1.14
PCB 52		0.22	*	1.21		0.44		* 1.92
PCB 66	0.03	ND	*	1.01		0.15		* 0.58
PCB 87		0.03	*	0.26		0.09		* 0.23
PCB 101		0.06	*	1.70		0.96		* 1.54
PCB 105		0.03	*	0.15		0.35		* 0.37
PCB 118		0.05	*	0.59		0.53		* 0.85
PCB 128		0.03	*	0.20		0.35		0.32
PCB 138		0.08	*	0.78		2.03		1.99
PCB 153		0.10	*	1.00		2.43		2.49
PCB 170	0.03	ND	*	0.20		0.41		0.44
PCB 180		0.03	*	0.26		0.60		0.57
PCB 183		0.02	*	0.14		0.43		0.38
PCB 184	0.05	ND		0.05	0.05	ND	0.05	ND
PCB 187		0.04	*	0.27		0.93		0.91
PCB 195	0.03	ND		0.03		0.16		0.15
PCB 206		0.01	*	0.05		0.20		0.26
PCB 209	0.03	ND	*	0.05		0.13		0.16
Total PCB		2.19	*	22.12		21.94		* 34.05
1,4-Dichlorobenzene		0.16	*	0.26		0.36		0.44

TABLE 3. (Continued)

NYCEDC - Passenger Ship Terminal - Reach 1

CONSTITUENTS	<i>Macoma nasuta</i>				<i>Nereis virens</i>			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION	CONCEN	DETECTION	CONCEN	DETECTION	CONCEN	DETECTION	CONCEN
	LIMITS	TRATION	LIMITS	TRATION	LIMITS	TRATION	LIMITS	TRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.27	*	0.49		0.54		0.70
Acenaphthylene		0.07	*	0.53		0.16	*	0.40
Acenaphthene		0.15	*	1.46		0.18	*	1.68
Fluorene		0.16	*	1.14		0.12	*	0.35
Phenanthrene		0.74	*	5.39		0.31	*	0.68
Anthracene		0.17	*	2.75		0.09	*	0.43
Fluoranthene		2.55	*	25.26		0.30	*	8.62
Pyrene		1.85	*	29.71		0.20	*	10.20
Benzo(a)anthracene		0.28	*	7.35		0.04	*	0.51
Chrysene		0.35	*	6.05		0.04	*	1.06
Benzo(b)fluoranthene		0.58	*	8.50		0.07	*	0.67
Benzo(k)fluoranthene		0.19	*	2.71		0.04	*	0.38
Benzo(a)pyrene		0.19	*	5.03		0.04	*	0.32
Indeno(1,2,3-cd)pyrene		0.10	*	1.45		0.04	*	0.11
Dibenzo(a,h)anthracene		0.03	*	0.31	0.02	ND	*	0.04
Benzo(g,h,i)perylene		0.13	*	2.07		0.07	*	0.23
Total PAH's		7.83	*	100.21		2.24	*	26.38
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.55	ND	0.49	ND		0.26		0.17
12378 PeCDD	0.89	ND	0.80	ND		0.39		0.21
123478 HxCDD	0.26	ND	0.25	ND		0.37		0.19
123678 HxCDD	0.29	ND	0.24	ND		0.41		0.37
123789 HxCDD	0.26	ND	0.23	ND		0.42		0.27
1234678 HpCDD		0.29	*	1.00		1.60		1.80
1234789 OCDD		2.28	*	9.08		8.12		10.03
2378 TCDF	0.29	ND		0.29		1.13	*	1.47
12378 PeCDF	0.36	ND	0.36	ND		0.27		0.28
23478 PeCDF	0.14	ND		0.17		0.33		0.44
123478 HxCDF	0.14	ND		0.10		0.25		0.24
123678 HxCDF	0.14	ND	0.18	ND		0.27		0.19
234678 HxCDF	0.14	ND	0.17	ND		0.38		0.24
123789 HxCDF	0.15	ND	0.19	ND		0.41		0.21
1234678 HpCDF		0.10	*	0.32		0.67		0.77
1234789 HpCDF	0.18	ND	0.29	ND		0.80		0.60
12346789 OCDF		0.28	*	0.53		3.21		3.19

ND = Not detected

Total PAH = Sum of all PAH's.

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

Total PCB = 2(x), where x = sum of PCB congeners

Concentrations shown are the mean of 5 replicate analyses in wet weight.

Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

* = Statistically significant at the 95% confidence level.

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE

**Wet weight concentrations
NYCEDC - Passenger Ship Terminal - Reach 3**

CONSTITUENTS	<i>Macoma nasuta</i>				<i>Nereis virens</i>			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.04	*	0.04		0.06		0.04
As		2.30	*	2.61		2.57		2.02
Cd		0.03		0.04		0.04		0.04
Cr		0.18	*	0.27		0.12		0.11
Cu		0.99	*	1.21		1.32		1.38
Hg		0.006	*	0.008		0.019		0.017
Ni		0.24	*	0.31		0.11		0.14
Pb		0.16	*	0.44		0.17		0.16
Zn		10.48		10.98		17.50		18.32
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.03	ND	0.03	ND	0.03	ND	0.03	ND
<i>a</i> -Chlordane		0.07	*	0.26		0.28		0.69
trans Nonachlor		0.02	*	0.13		0.82		1.11
Dieldrin		0.04	*	0.27		0.34		0.56
4,4'-DDT		0.04	*	0.06		0.08		0.23
2,4'-DDT	0.05	ND		0.05	0.05	ND	0.05	ND
4,4'-DDD		0.04	*	0.63		1.53		2.62
2,4'-DDD	0.06	ND	*	0.33		0.68		0.85
4,4'-DDE		0.10	*	1.02		0.13		0.75
2,4'-DDE	0.06	ND	*	0.09	0.06	ND		0.04
Total DDT		0.26	*	2.18		2.47		4.51
Endosulfan I	0.02	ND	0.02	ND	0.02	ND	0.02	ND
Endosulfan II	0.06	ND	0.06	ND	0.06	ND	0.06	ND
Endosulfan sulfate	0.14	ND	0.14	ND		0.23	0.14	ND
Heptachlor	0.04	ND	0.04	ND	0.04	ND		0.02
Heptachlor epoxide	0.02	ND	0.02	ND	0.02	ND		0.07
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8		0.11	*	0.50		0.10	0.19	ND
PCB 18		0.03	*	0.59		0.23		1.27
PCB 28		0.09	*	1.34		0.09		1.42
PCB 44		0.05	*	0.82		0.14		1.16
PCB 49		0.04	*	1.67		0.18		1.88
PCB 52		0.22	*	1.76		0.44		3.03
PCB 66	0.03	ND	*	1.04		0.15		0.86
PCB 87		0.03	*	0.29		0.09		0.31
PCB 101		0.06	*	1.51		0.96		1.78
PCB 105		0.03	*	0.16		0.35		0.50
PCB 118		0.05	*	0.74		0.53		1.19
PCB 128		0.03	*	0.16		0.35		0.50
PCB 138		0.08	*	0.84		2.03		2.93
PCB 153		0.10	*	1.13		2.43		3.50
PCB 170	0.03	ND	*	0.14		0.41		0.70
PCB 180		0.03	*	0.35		0.60		1.70
PCB 183		0.02	*	0.12		0.43		0.59
PCB 184	0.05	ND	0.05	ND	0.05	ND	0.05	ND
PCB 187		0.04	*	0.31		0.93		1.24
PCB 195	0.03	ND	*	0.04		0.16		0.25
PCB 206		0.01	*	0.07		0.20		0.32
PCB 209	0.03	ND	*	0.04		0.13		0.23
Total PCB		2.19	*	27.31		21.94		50.96
1,4-Dichlorobenzene		0.16		0.15		0.36		0.46

TABLE 3. (Continued)

NYCEDC - Passenger Ship Terminal - Reach 3

CONSTITUENTS	<i>Macoma nasuta</i>				<i>Nereis virens</i>			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.27		0.54 *		0.54		0.59
Acenaphthylene		0.07		0.59 *		0.16		0.50
Acenaphthene		0.15		1.37 *		0.18		1.55
Fluorene		0.16		1.43 *		0.12		0.37
Phenanthrene		0.74		7.86 *		0.31		1.02
Anthracene		0.17		3.89 *		0.09		0.56
Fluoranthene		2.55		28.45 *		0.30		11.02
Pyrene		1.85		31.09 *		0.20		12.70
Benzo(a)anthracene		0.28		7.99 *		0.04		0.59
Chrysene		0.35		7.11 *		0.04		0.82
Benzo(b)fluoranthene		0.58		9.22 *		0.07		0.88
Benzo(k)fluoranthene		0.19		2.88 *		0.04		0.42
Benzo(a)pyrene		0.19		5.38 *		0.04		0.41
Indeno(1,2,3-cd)pyrene		0.10		1.61 *		0.04		0.12
Dibenzo(a,h)anthracene		0.03		0.32 *	0.02	ND		0.04
Benzo(g,h,i)perylene		0.13		2.14 *		0.07		0.27
Total PAH's		7.83		111.87		2.24		31.86
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.55	ND	0.55	ND		0.26		0.21
12378 PeCDD	0.89	ND	1.45	ND		0.39	0.90	ND
123478 HxCDD	0.26	ND	0.72	ND		0.37	0.48	ND
123678 HxCDD	0.29	ND	0.85	ND		0.41		0.20
123789 HxCDD	0.26	ND	0.75	ND		0.42		0.23
1234678 HpCDD		0.29		1.25 *		1.60		0.78
1234789 OCDD		2.28		8.28		8.12		6.56
2378 TCDF	0.29	ND		0.37 *		1.13		1.29
12378 PeCDF	0.36	ND		0.24		0.27		0.29
23478 PeCDF	0.14	ND		0.23		0.33		0.34
123478 HxCDF	0.14	ND	0.49	ND *		0.25		0.24
123678 HxCDF	0.14	ND	0.50	ND *		0.27		0.23
234678 HxCDF	0.14	ND	0.54	ND *		0.38	0.45	ND
123789 HxCDF	0.15	ND	0.62	ND *		0.41	0.50	ND
1234678 HpCDF		0.10		0.45 *		0.67		0.36
1234789 HpCDF	0.18	ND		0.28		0.80		0.24
12346789 OCDF		0.28		0.97 *		3.21		0.87

ND = Not detected

Total PAH = Sum of all PAH's.

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

Total PCB = 2(x), where x = sum of PCB congeners

Concentrations shown are the mean of 5 replicate analyses in wet weight.

Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

* = Statistically significant at the 95% confidence level.