US Army Corps
of Engineers
New York District
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New York, N.Y. 10278
ATTN: CENANOP-ST

Public Notice

In replying refer to:
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MAINTENANCE DREDGING
N.Y. AND N.J. CHANNELS
(RARITAN BAY REACH) mile 0 to 11

TO WHOM IT MAY CONCERN:

Pursuant to Section 404 (33 U.S.C. 1344) of the Federal Water Pollution Control Act (amended in 1977 and commonly referred to as the Clean Water Act), and Section 103 (33 U.S.C. 1413, 86 Stat. 1052) of the Marine Protection, Research and Sanctuaries Act of 1972 (commonly referred to as the Ocean Dumping Act), notice is hereby given that the U.S. Army Engineer District, New York proposes to perform maintenance dredging in **Raritan Bay Reach of New York and New Jersey Channels, miles 0 to 11**- a federal navigation project (see Map No. 1 of this public notice) and dispose of the dredged material at the approved Mud Dump Site in the Atlantic Ocean.

FEDERAL PROJECT AUTHORIZATION:

The federal navigation project for New York and New Jersey Channels, Raritan Bay Reach mile 0 to 11 was authorized by the Rivers and Harbors Act of 1933 and subsequently modified by the Rivers and Harbors Acts of 1935, 1950 and 1965 and 1985.

FEDERAL PROJECT DESCRIPTION:

The existing Federal project in the States of New York and New Jersey provides for:

a. A channel 37 ft. deep in rock and 35 ft. deep in soft material, 600 ft. wide through Lower New York Bay, Raritan Bay and Arthur Kill to a point 1,000 ft. north of Smith Creek, except in the vicinities of Seguine Point and Ward Point where the width is to be 800 ft.

b. Two anchorages one in the vicinity of Sandy Hook and the other south of Perth Amboy.

c. A secondary channel 30 ft. deep and 400 ft. wide in Raritan Bay connecting with the Raritan River.

DESCRIPTION OF PLANNED FEDERAL ACTION:

The proposed action by the U.S. Army Engineer District, New York involves maintenance dredging of part of the federal navigation project in Raritan Bay Reach of New York and New Jersey Channels, miles 0 to 11 to its

authorized project depths as described below and disposal of the dredged material in the Atlantic Ocean Mud Dump Site. The purpose of the proposed work is to maintain the authorized project dimensions, thereby assuring safe and economical use of the Raritan Bay Reach by shipping interests. The goal of this work is to meet the commitment of the Administration's Plan for dredging Raritan Bay Reach as one of the high priority maintenance dredging projects in New York /New Jersey Harbor in Fiscal Year 1997.

The project area locations proposed for dredging are identified on Map No. 1 of this public notice. A total of 190,000 cubic yards of dredged material to be removed under this plan has met unrestricted ocean disposal criteria, as it has been characterized as Category I, and will be disposed at the ocean Mud Dump Site.

Maintenance dredging of the project is generally accomplished by clamshell dredge or similar plant about once every 6 years (based on a survey of historical dredging records). The entire project area will generally not require maintenance dredging; only areas where shoaling has reduced the depth of the used waterway above authorized levels will be dredged. The channels areas were last dredged in 1989 with the removal of 131,000 cubic yards of material.

ENVIRONMENTAL IMPACT STATEMENT:

An Environmental Impact Statement (EIS) for the New York and New Jersey Channels (Raritan Bay Reach) was prepared by the U.S. Army Engineer District, New York, in April 1973. It has been determined that maintenance dredging of Raritan Bay Reach with the dredged material disposal at the designated ocean dumping site (Mud Dump Site) has no significant adverse environmental impacts on water quality, marine resources, wildlife (including endangered species), recreation, aesthetics and flood protection.

A 404(b) evaluation will be prepared as required by 40 CFR 230 to evaluate the impact of dump scow overflow.

DISPOSAL SITE:

The dredged material will be transported by dump scows to the Atlantic Ocean Mud Dump Disposal Site and deposited using the bottom dumping process.

Mud Dump Site: This Atlantic Ocean site was formally designated by the U.S. Environmental Protection Agency (EPA). The approved Mud Dump Site (see Map No. 2 of this public notice) has an area of 2 square miles and an average depth of 64 feet, having its corner points located at:

LATITUDE			LONGITUDE		
40°	23' 48"	North	73°	51' 28"	West
40°	23' 48"	North	73°	50' 00"	West
40°	21' 48"	North	73°	51' 28"	West
40°	21' 48"	North	73°	50' 00"	West

Table 1 of this public notice. Detection limits are reported for only those constituents, identified by ND in the concentration column, which occurred at concentrations below the method detection limit. (This reporting convention was similarly applied in reporting the results of bioaccumulation potential testing, Table 3 of this public notice).

Expected concentrations of chemical constituents in the water column following disposal, 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 Waterways Experimental Station (WES) and described in the implementation manual entitled "Ecological Evaluation of Proposed Discharge of Dredged Material Into Ocean Water" (commonly referred to as the "Green Book"), published in February 1991 by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. The model predicted that chemical constituents in the water column following disposal of materials from the project area will dilute to concentrations below Federal marine acute water quality criteria within the initial four hour period and within the boundaries of the disposal site (40 CFR 227.29 (a)).

Further Tier III (biological) testing was conducted to determine the suitability of sediments from the project area for ocean disposal.

BIOASSAYS (TOXICITY):
In accordance with 40 CFR Part 227 of the Ocean Dumping Regulations, bioassays were performed to assess the toxicities of the solid phase, liquid phase and suspended particulate phase of the proposed dredged material from the project area. Bioassays were performed using appropriate sensitive marine organisms as discussed below. Bioassay testing conformed to procedures outlined in the 1991 Green Book. The results of bioassay tests conducted on sediments from the project area are provided in Table 2 of this public notice.

The solid phase is the whole test sediment before it has undergone processing that might alter its chemical or toxicological properties. The suspended particulate phase (SPP) is considered to be the supernatant remaining after one hour of undisturbed settling following a vigorous, 30 minute agitation of a 1:4 mixture of bottom sediment and water collected from the dredging site. The suspended particulate phase also contains the liquid phase of the dredged material

For the solid phase bioassay, 10-day toxicity was determined by exposing a filter feeding mysid shrimp *(Mysidopsis bahia)* and a deposit feeding, burrowing amphipod *(Ampelisca abdita)* to a composite of sediment from the project area and comparing mortalities in those treatments to mortalities experienced after exposure to a reference sediment. The reference sediment represents existing background conditions in the vicinity of the dumpsite, removed from the influence of any disposal operation. Results are evaluated for biologically and statistically significant differences in mortality between treatments. The 1991 Green Book indicates that dredged material does not meet the whole sediment toxicity criterion when mortality in the test treatments is a) statistically significant and greater than in

It is estimated that since 1976, on average approximately 6.0 million cubic yards of dredged material have been disposed of annually at this site.

ALTERNATIVES TO THE PROPOSED ACTION:

Dredging: The "no dredge" alternative would result in continued siltation of the existing channel, which would eventually result in a reduction of capacity and consequent loss of accessibility to those activities which depend upon water transportation.

Disposal Options: As stated in EPA's Ocean Dumping Criteria, 40 CFR 227.16(b), "... alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures which need not be competitive with the cost of ocean dumping ..." The New York District has evaluated the practicability of potential disposal alternatives in a report entitled "Managing Dredged Material" (1989). The alternatives considered include land disposal, use of sanitary landfill cover, disposal in subaqueous borrow pits (and possible capping with clean material), creation of islands and/or wetlands, disposal on beaches or wetlands, placement in deep mines, and incineration. At the present time, ocean disposal is the only available disposal option for this project.

The following non-Federal government agencies will be contacted with a view toward identifying any currently suitable sites that can be used for disposal of the dredged material in lieu of ocean disposal:

- Port Authority of New York and New Jersey
- New York State Department of Environmental Conservation
- New York City Department of Economic Development

TESTING:

GRAIN SIZE ANALYSES:

Eight sediment (8) samples were collected from the project area and composited for physical characterization and biological and chemical testing.

The grain size distribution of the material is as follows:

17.5 %SAND, 41.9 %SILT, 40.3 %CLAY

Based on the grain size distribution of sediments and in accordance with Title 40 of the Code of Federal Regulations (CFR), Part 227, further testing was required to determine the suitability of the materials for ocean disposal.

LIQUID PHASE CHEMISTRY:

Under the requirements of 40 CFR Sect. 225.2, chemical analysis was conducted on project sitewater and elutriate for the constituents listed in

the reference sediment and (b) exceeds mortality in the reference treatment by at least 10% for mysid shrimp and 20% for amphipod species. The whole sediment toxicity criterion was not exceeded for either organism exposed to project sediments.

For the liquid and suspended phase bioassay, those concentrations of SPP resulting in 50% mortality (LC50s), were determined for the three animal species tested- a crustacean (*M. bahia*), a finfish (*Menidia beryllina*), and the planktonic larvae of a bivalve (*Mytilus edulis*). The median effective concentration (EC50), based on normal larval development to the D-cell stage, was also calculated for *M. edulis*. The limiting permissible concentration (LPC) of SPP is calculated by multiplying the LC50 or EC50 of the most sensitive organism by a safety factor of 100 (0.01 of the toxic concentration (LC50 or EC50) of the most sensitive organism tested). All LC50s and EC50s were >100%, so the LPC of SPP was conservatively estimated at 1.00%.

In accordance with the provisions of 40 CFR Sect. 227.27 (a)(2), the material can be considered suitable for ocean disposal only if the concentration of the SPP of the dredged material, after allowance for initial mixing, will not exceed the 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.

Initial mixing evaluation of the SPP of the project material was conducted using the ADDAMS mixing model. Results of the analyses indicate that the LPC will be met for the proposed dredged material from the project area.

BIOACCUMULATION POTENTIAL:

An estimate of bioaccumulation potential was made by analyzing the concentrations of contaminants in tissue of organisms surviving 28-day exposure to sediments composited from the project area, and comparing them to tissue levels of organisms exposed to reference sediment. Bioaccumulation potential was analyzed in two organisms, a burrowing, deposit-feeding polychaete (a worm, *Nereis virens*) and a filter-feeding bivalve (a clam, *Macoma nasuta*).

Based on th requirements of 40 CFR Parts 227.6 and 227.27, bioaccumulation analyses were performed for the chemical constituents listed in Table 3 of this public notice. 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 EPA Region II.

Based on the results of the testing performed, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency have determined that the proposed dredged material from New York and New Jersey Channels-Raritan

Bay Reach is considered Category I dredged material and is suitable for unrestricted ocean disposal.

MISCELLANEOUS INFORMATION:

Any person may request, **in writing**, that a public hearing be held to consider the proposed disposal of this dredged material. Requests for a public hearing must state the specific reasons for holding a hearing and why comments cannot be submitted by mail. Comments received by mail are given the same weight as those presented at a public hearing.

Based upon a review of the latest public listing of threatened and endangered species, a preliminary determination indicated that the proposed activity under consideration will not affect those species listed or their critical habitat. See Section 7 of the Endangered Species Act (16 U.S.C. (531)).

There are no known sites within the project area that are eligible for or included in the National Register of Historic Places. Presently, no known archaeological, scientific, prehistorical or historical data are expected to be lost by work accomplished under the required dredging.

Water Quality Certification will be obtained from the New York State Department of Environmental Conservation in accordance with Section 401 of the Clean Water Act prior to the beginning of the proposed action.

The proposed work is being coordinated with the following Federal, State and local agencies:

- U.S. Environmental Protection Agency
- U.S. Department of the Interior, Fish and Wildlife Service
- U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Coast Guard, Third District
- New York State Department of Environmental Conservation
- State of New Jersey Department of Environmental Protection
- Borough of Staten Island

Since this activity is located within the coastal zone of two states which have federally approved coastal zone management programs, the U.S. Army Corps of Engineers is concourently applying to both the State of New York Coastal Management Program for certification and New Jersey Department of Environmental Portection - Division of Coastal Resources for concurence that the proposed action will be conducted in a manner that is consistent with the approved state coastal zone management program. Reference is made to Section 307(c) of the Coastal Zone Management Act of 1972 as amended (16 U.S.C. 1456(c)).

Any criticisms or protests regarding the proposed work should be **PREPARED IN WRITING AND MAILED TO REACH THIS OFFICE** prior to the expiration date of this notice; otherwise, it will be presumed that there are no objections.

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

If you have any questions, please contact Mr. Habib Soltani, Project Manager, Operations Division, Technical Support Section at (212) 264-9030. Comments or questions may be faxed to (212) 264-4260.

John R. Hartmann
Chief, Operations Division

Enclosures
as stated

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE

CONSTITUENTS	RARITAN BAY REACH			
	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
Ag		0.11		0.21
Cd		0.13		0.05
Cr		1.32		2.03
Cu		4.79		4.32
Hg		0.02		0.04
Ni		1.67		3.26
Pb		3.38		4.30
Zn		27.20		11.62
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.36	ND	0.36	ND
alpha-Chlordane	0.49	ND	0.50	ND
trans-Nonachlor	0.65	ND	0.66	ND
Dieldrin	0.47	ND	0.48	ND
4,4-DDT	1.18	ND	1.21	ND
2,4-DDT	3.36	ND	3.43	ND
4,4-DDD		0.26		0.23
2,4-DDD	0.67	ND	0.68	ND
4,4-DDE	1.24	ND	1.26	0.46
2,4'-DDE	8.72	ND	8.89	ND
Total DDT		7.85		8.43
Endosulfan I	6.41	ND	6.53	ND
Endosulfan II	4.82	ND	4.92	ND
Endosulfan sulfate	0.99	ND	1.01	ND
Heptachlor	1.34	ND	1.37	ND
Heptachlor epoxide	0.70	ND	0.71	ND
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB 8	1.04	ND	1.06	ND
PCB 18		4.13		4.45
PCB 28		0.95		0.73
PCB 44	0.80	ND	0.82	ND
PCB 49		0.17	0.87	ND
PCB 52		0.15	0.66	ND
PCB 66		0.27		0.23
PCB 87	1.61	ND	1.64	ND
PCB 101		0.07	0.75	ND
PCB 105	0.81	ND		0.08
PCB 118		0.09		0.10
PCB 128	0.30	ND	0.31	ND
PCB 138		7.36		3.80
PCB 153		0.90		0.14
PCB 170		0.91	1.37	ND
PCB 180		0.10		0.12
PCB 183	1.34	ND	1.36	ND
PCB 184		0.15		0.20
PCB 187	1.10	ND		0.08
PCB 195		0.41	0.62	ND
PCB 206		0.29	0.82	ND
PCB 209		0.17	0.73	ND
Total PCB		45.95		41.60

Concentrations shown are the mean of three replicate analyses.
ND = Not detected
Total PCB = sum of congeners reported*2
Total DDT = sum of 2,4'- and 4'4'-DDE, DDD, and DDT
Means, total PCBs and total DDTs were determined using conservative estimates of concentrations of constituents below the detection limit

TABLE 2. TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50} or EC_{50}	LPC[a]
Menidia beryllina	96 hrs	>100% [b]	>1.00%
Mysidopsis bahia	96 hrs	>100% [b]	>1.00%
Mytilus edulis (larval survival)	72 hrs	>100% [b]	>1.00%
Mytilus edulis (larval normal development)	72 hrs	>100% [c]	>1.00%

(a) Limiting Permissible Concentration (LPC) is the LC_{50} times 0.01.
(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortality at test termination.
(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Test	Difference (Reference-Test)	% Survival in Reference	Is difference statistically significant? (p=0.5)
Ampelisca abdita	93	6%	87	No
Mysidopsis bahia	95	5%	90	No

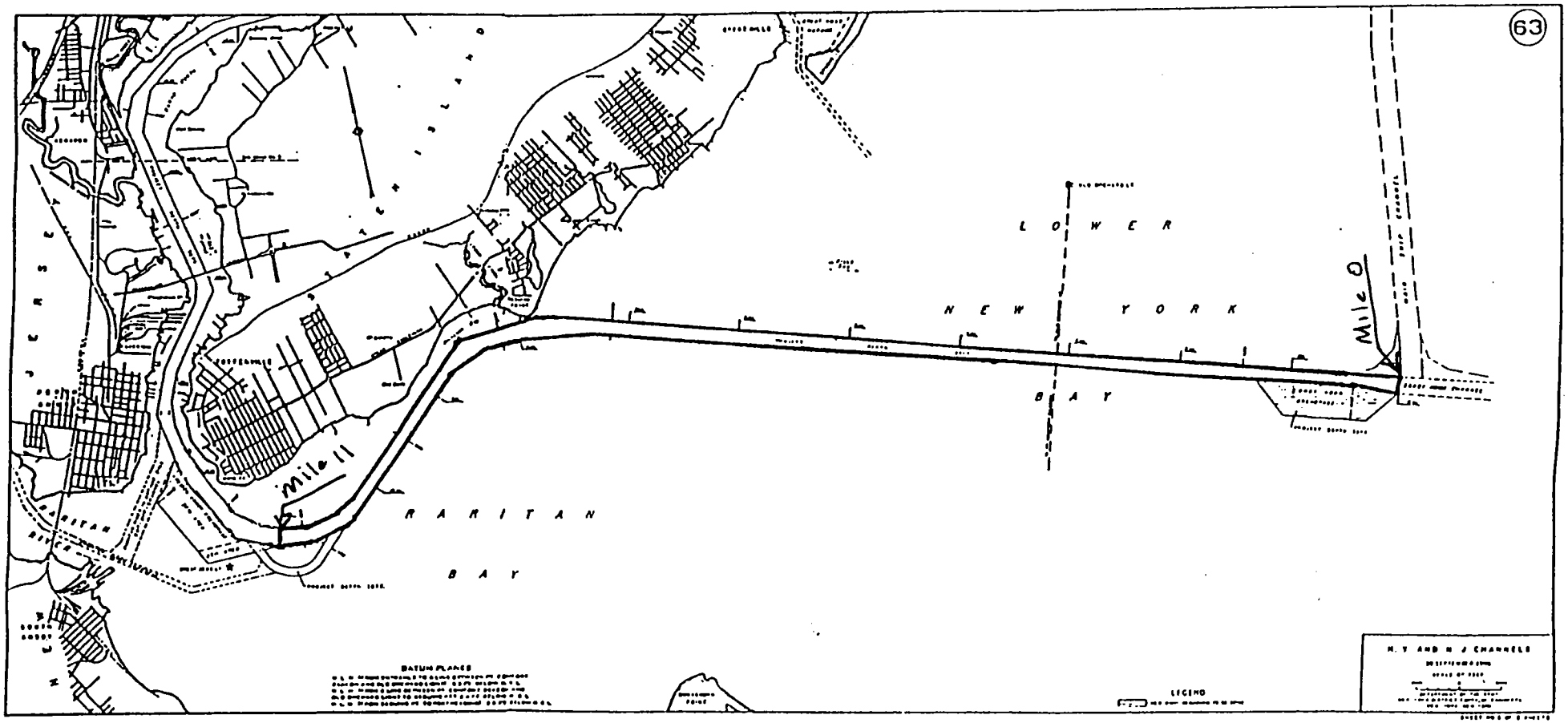
TABLE 3. 28-DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE (In wet weight concentrations)

	RARITAN BAY REACH							
	Macoma nasuta				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
CONSTITUENTS	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		0.03		*0.05	0.02	ND		*0.04
As		1.69		1.79		2.23		1.89
Cd		0.03		0.03		0.05		0.04
Cr		0.24		*0.40		0.50		0.16
Cu		1.85		2.19		1.58		1.48
Hg		0.01		*0.02		0.02		0.01
Ni		0.28		*0.44		0.17		0.19
Pb		0.31		*0.69		0.25		0.24
Zn		12.78		12.00		27.60		22.50
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		0.11	0.21	ND	0.10	ND	0.12	ND
a-Chlordane		0.08		*0.40		0.14		*0.43
trans-Nonachlor		0.05		*0.18		0.41		*0.48
Dieldrin		0.16		*0.53		0.31		*0.85
4,4'-DDT	0.18	ND		0.08		0.05		0.11
2,4'-DDT	0.34	ND		0.16		0.10	0.21	ND
4,4'-DDD		0.32		*2.06		0.23		*0.99
2,4'-DDD		0.06		*0.62		0.14		*0.41
4,4'-DDE		0.22		*3.89		0.10		*0.67
2,4'-DDE		0.11		0.44	0.04	ND	0.05	ND
TOTAL DDT		0.97		*7.25		0.64		*2.31
Endosulfan I	0.20	ND	0.17	ND	0.06	ND		0.03
Endosulfan II	0.15	ND		0.20	0.03	ND		0.03
Endosulfan sulfate		0.06		0.14		0.10		*0.22
Heptachlor	0.16	ND		0.06	0.03	ND		0.03
Heptachlor epoxide		0.04		*0.07		0.08		0.05
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		0.22		*0.46		0.10		0.09
PCB 18		0.23		*0.90	0.14	ND		*1.29
PCB 28		0.12		*2.75		0.07		*1.69
PCB 44		0.06		*1.06		0.07		*0.90
PCB 49		0.04		*2.19		0.08		*1.38
PCB 52		0.13		*2.83		0.17		*2.93
PCB 66		0.13		*2.68		0.12		*1.20
PCB 87		0.05		*0.76		0.06		*0.19
PCB 101		0.25		*2.41		0.33		*1.87
PCB 105		0.07		*0.77		0.15		*0.57
PCB 118		0.17		*2.05		0.26		*1.16
PCB 128		0.26		*0.28		0.19		*0.36
PCB 138		0.27		*1.73		1.13		*2.30
PCB 153		0.40		*2.77		1.56		*2.44
PCB 170		0.10		*0.35		0.60		0.64
PCB 180		0.14		*0.60		0.70		*1.14
PCB 183		0.06		*0.22		0.25		*0.38
PCB 184		0.06		*0.18		0.06		*0.49
PCB 187		0.11		*0.54		0.62		*0.98
PCB 195		0.04		*0.17		0.12		*0.21
PCB 206	0.12	ND		0.05		0.22		*0.33
PCB 209	0.20	ND		0.09		0.23		*0.29
TOTAL PCB		5.82		*51.7		14.40		*45.6
1,4-Dichlorobenzene		2.39		*5.28		1.63		1.86

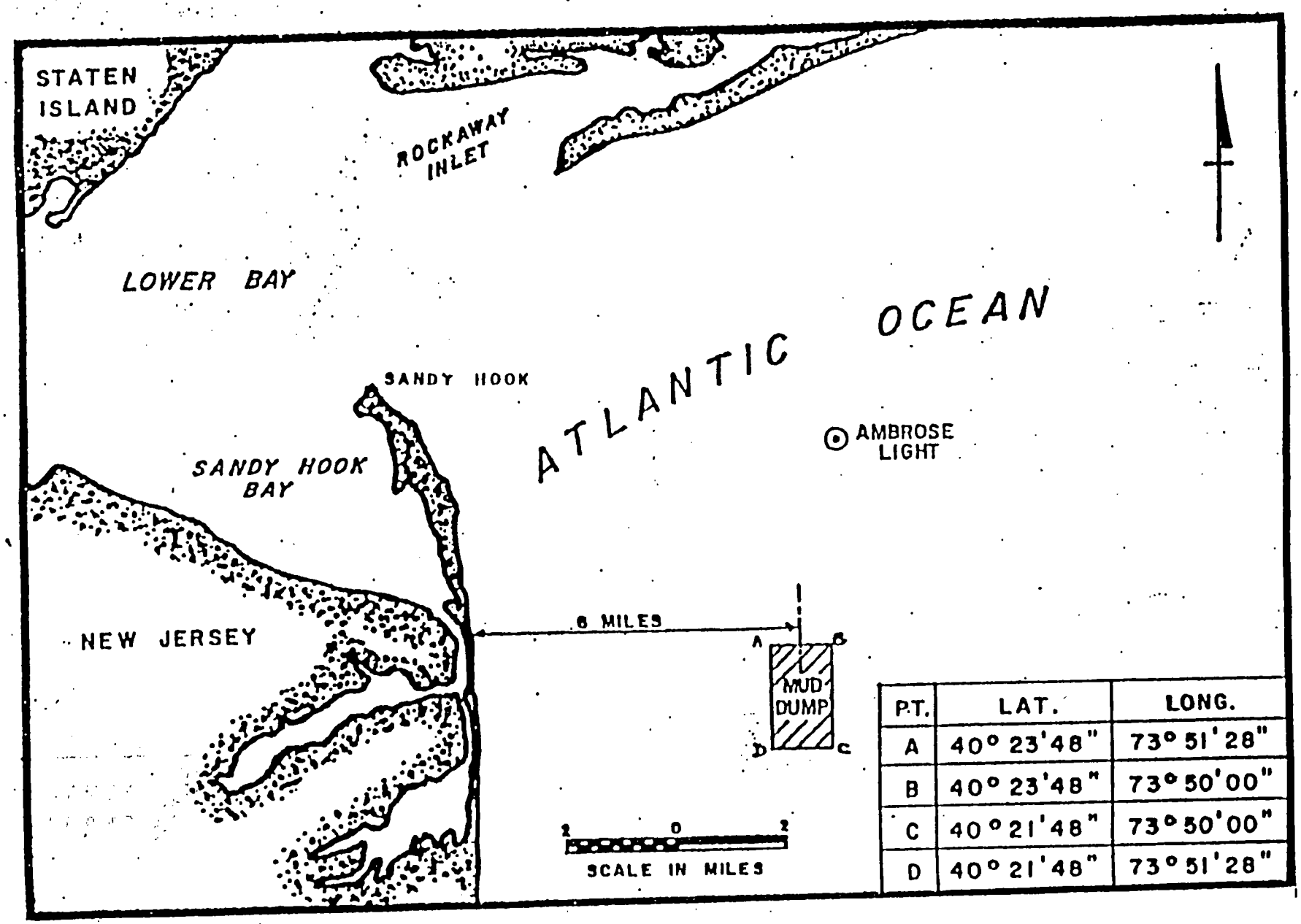
TABLE 3. (Continued)

	RARITAN BAY REACH							
	Macoma nasuta				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
CONSTITIUENTS	DETECTION LIMITS	CONCEN-TRATION	DETECTION LIMITS	CONCEN-TRATION	DETECTION LIMITS	CONCEN-TRATION	DETECTION LIMITS	CONCEN-TRATION
PAHs	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		0.95		*1.63		1.79		2.11
Acenaphthylene	1.34	ND		0.46		0.15		0.19
Acenaphthene	1.77	ND		0.69		0.24		*0.38
Fluorene		0.42		0.49		0.16		0.19
Phenanthrene		0.74		*3.33		0.30		0.35
Anthracene	1.82	ND		*1.41	1.22	ND		0.56
Fluoranthene		2.45		*15.50		0.37		*1.70
Pyrene		2.25		*21.9		0.53		*2.77
Benz[a]anthracene		0.49		*8.04		0.32		0.28
Chrysene		1.02		*11.90		0.16		*1.42
Benzo[b]fluoranthene		1.03		*14.03		0.10		*0.43
Benzo[k]fluoranthene		0.31		*4.45		0.05		*0.21
Benzo[a]pyrene		0.53		*8.92		0.17		0.25
Indeno[1,2,3-cd]pyrene		0.24		*3.91	2.09	ND		0.57
Dibenz[a,h]anthracene		0.17		*1.19	2.07	ND		0.73
Benzo[g,h,i]perylene		0.40		*5.68		0.08		*0.20
Dioxins	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)
2,3,7,8-TCDD		0.19		*0.52		0.22		*0.76
1,2,3,7,8-PeCDD	0.24	ND		0.14		0.39		0.19
1,2,3,4,7,8-HxCDD	0.32	ND		0.12	0.25	ND		0.12
1,2,3,6,7,8-HxCDD		0.15		0.44		0.27		0.43
1,2,3,7,8,9-HxCDD	0.16	ND		0.20		0.20		0.16
1,2,3,4,6,7,8-HpCDD		1.01		*2.71		2.37		1.74
OCDD		6.07		*23.80		26.45		11.70
Furans	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)	ppt (pg/g)
2,3,7,8-TCDF		0.41		*1.15		1.61		*2.01
1,2,3,7,8-PeCDF	0.40	ND		0.28		0.38		0.36
2,3,4,7,8-PeCDF		0.27		0.33		0.77		0.49
1,2,3,4,7,8-HxCDF		0.21		0.34		0.21		0.28
1,2,3,6,7,8-HxCDF	0.18	ND		0.13		0.15		0.15
1,2,3,7,8,9-HxCDF	0.22	ND	0.17	ND		0.10	0.15	ND
2,3,4,6,7,8-HxCDF		0.26		0.43		0.34		0.41
1,2,3,4,6,7,8-HpCDF		0.65		1.10		0.86		0.78
1,2,3,4,7,8,9-HpCDF	0.21	ND	0.21	ND		0.13	0.16	ND
OCDF		0.60		*1.22		1.06		0.97

Concentrations shown are the mean of five replicate analyses
* Significant higher than reference at 95% confidence interval.
-ND = Not detected
Total PCB = 2(x), where x = sum of all PCB congeners detected
Total DDT=sum of 2,4' and 4,4' DDE, DDD, and DDT
Means and statistical comparisons were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit


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L O W E R
N E W Y O R K
B A Y
R A R I T A N
B A Y
Mile 11
Mile 0
J E R S E Y
DATUM PLANES
LEGEND
N. Y. AND N. J. CHANNELS

Map 1



PT.	LAT.	LONG.
A	40° 23'48"	73° 51'28"
B	40° 23'48"	73° 50'00"
C	40° 21'48"	73° 50'00"
D	40° 21'48"	73° 51'28"

Map 2