Action Memorandum for Inner and Outer Pier 1

at

Naval Submarine Base New London

Groton, Connecticut

Naval Facilities Engineering Command Mid-Atlantic

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ACRONYMS

ARAR	applicable or relevant and appropriate requirement
AVS/SEM	Acid Volatile Sulfide/Simultaneously Extracted Metals
BAF	bioaccumulation factor
BERA	Baseline Ecological Risk Assessment
bss	below sediment surface
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	CERCLA Identification System
cf	Cubic foot/feet
CFR	Code of Federal Regulations
CGS	Connecticut General Statutes
CIF	Controlled Industrial Facility
COC	chemical of concern
COPC	chemical of potential concern
CSF	Cancer Slope Factor
CTDEP	Connecticut Department of Environmental Protection
CWA	Clean Water Act
cy	cubic yard
DOT	Department of Transportation
DQO	Data quality objective
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERM	Effects range median
ERM-Q	Effects Range Median-Quotient
ETPH	Extractible total petroleum hydrocarbons
FFA	Federal Facility Agreement
FS	Feasibility Study
HMW	High-molecular weight
HQ	Hazard quotient
IRIS	Integrated Risk Information System
LMW	Low-molecular weight
LOAEL	lowest-observed-adverse-effect level
LUC	land use control
µg/kg	micrograms per kilogram

mg/kg	milligrams per kilogram
MLLW	mean lower low water
MNR	Monitored natural recovery
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NERP	Navy Environmental Restoration Program
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NOAEL	no-observed-adverse-effect level
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
NSB-NLON	Naval Submarine Base - New London
NTCRA	Non-Time-Critical Removal Action
O&M	Operation and maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
POTW	Publicly-owned treatment works
ppt	Part per thousand
PRG	Preliminary remediation goal
RAB	Restoration Advisory Board
RAC	Remedial Action Contractor
RAO	Removal Action Objective
RCRA	Resource Conservation and Recovery Act
RCSA	Regulations of Connecticut State Agencies
RfD	Reference Dose
RI	Remedial Investigation
RSC	Rapid Sediment Characterization
SAIC	Science Applications International Corporation
SARA	Superfund Amendments and Reauthorization Act
sf	square foot
SLERA	Screening-Level Ecological Risk Assessment
SUF	Site Use Factor
SVOC	Semivolatile organic compound
TBC	To be considered
TCLP	Toxicity characteristic leaching procedure
TOC	Total organic carbon

TRV	Toxicity reference value
TSCA	Toxic Substances Control Act
TSS	Total suspended solids
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper Confidence Limit
USC	United States Code

I PURPOSE

The purpose of this Action Memorandum is to document the decision made to proceed with a non-time-critical removal action (NTCRA) for Inner and Outer Pier 1 sediment at Naval Submarine Base-New London (NSB-NLON) located in Groton, Connecticut. The Department of Navy (Navy) is identified as the lead agency for this NTCRA. This Action Memorandum has been completed in accordance with the removal program requirements defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), United States Environmental Protection Agency (EPA) Superfund Removal Procedures, Action Memorandum Guidance (EPA, 1990), and Navy Environmental Restoration Program (NERP) Manual (2006).

The sediment to be addressed at Inner and Outer Pier 1 by the NTCRA is located in the Thames River adjacent to former Pier 1. Elevated levels of several chemicals of concern (COCs) including polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), pesticides, and metals have been identified in Inner and Outer Pier 1 sediment. Concentrations of these COCs are greater in Inner and Outer Pier 1 sediment than in sediment at other offshore locations along the Lower Subase, and they are greatest in Inner Pier 1 sediment. These elevated concentrations of COCs pose the greatest potential risk to ecological receptors as a result of exposure to contaminated sediment. Therefore, the Removal Action Objective (RAO) for the Inner and Outer Pier 1 NTCRA is to minimize the potential migration of, and mitigate the risk to ecological receptors posed by, COCs in Inner and Outer Pier 1 sediment.

II SITE CONDITIONS AND BACKGROUND

Inner and Outer Pier 1 are part of Operable Unit (OU) 4, which includes the CERCLA sites (10, 11, 13, 17, 19, 21, 22, 24, and 25) located in the Lower Subase at NSB-NLON. The Lower Subase is an industrialized area at NSB-NLON that contains piers and berths for submarine docking; facilities for submarine maintenance, repair, and overhaul; and administrative buildings. Figure 1 shows the location of Inner and Outer Pier 1 at NSB-NLON. They are located at the southern end of the Lower Subase.

A SITE DESCRIPTION

Pier 1 is located in the southwestern portion of NSB-NLON (see Figures 1 and 2), along the shore of the Thames River, and was the location of a former Marine Railway that operated from approximately 1930 to 1960. This railway was used to pull ships and submarines out of the water for sandblasting, paint scraping, and maintenance. Paint scraping activities often took place on the apron of the pull-out area. Several PCB-containing transformers were located adjacent to Pier 1, and when these transformers were removed in 1996, there was no evidence of staining. Pre-construction surveys for the Controlled Industrial Facility (CIF), which was constructed across the northern end of the Marine Railway site in 1998, found elevated concentrations of PAHs and lead in subsurface soil and sediment that necessitated removal and off-site disposal, in compliance with the Resource Conservation and Recovery Act (RCRA), of soil and sediment from within the building footprint. Subsequent investigations of sediment in Inner and Outer Pier 1 adjacent to the CIF found that it also contained elevated concentrations of PAHs and PCBs (SAIC, 2000; Battelle and Neptune & Company, 2004; and TtNUS, 2008).

1 Removal Site Evaluation

The Navy as the lead agency has determined that a NTCRA is necessary for sediment at Inner and Outer Pier 1 to address unacceptable risks to ecological receptors. Environmental investigations of Inner and Outer Pier 1 have been conducted since 1999, and data from these investigations were used to support assessment of the nature and extent of contamination and risks associated with the contaminated sediments. The results of the investigations have been documented in a series of reports (SAIC, 2000; Battelle and Neptune & Company, 2004; TtNUS, 2008; and TtNUS, 2009). From the investigations, it was concluded that concentrations of PAHs, PCBs, pesticides, and metals in Inner and Outer Pier 1 sediment pose unacceptable risks to ecological receptors.

2 Physical Location

NSB-NLON is located along the eastern bank of the Thames River, approximately 6 miles north of Long Island Sound, and occupies more than 687 acres. The Lower Subase is a narrow strip of land that

generally forms the western boundary of NSB-NLON and parallels the Thames River. Pier 1 is located in the southwestern portion of NSB-NLON, in the Lower Subase, along the shore of the Thames River. Inner Pier 1 is directly open to the Thames River along its southern limit (see Figure 2).

3 Site Characteristics

Pier 1 was the location of a former Marine Railway that operated from approximately 1930 to 1960. Operation of the Marine Railway, which included pulling ships and submarines out of the water for sandblasting, paint scraping, and maintenance, resulted in the release and deposition of contaminants into the surrounding sediments. Several PCB-containing transformers were located adjacent to Pier 1 and may have been the source of some of the contamination found in the sediment. There are no current activities being conducted at Pier 1.

Inner Pier 1 covers a surface area of approximately 18,500 square feet (sf) or 0.42 acre. The western boundary of Inner Pier 1 is Pier 1 itself, the northern part is constructed on a solid concrete foundation extending approximately 175 feet from the CIF building into the Thames River. The remainder of the pier south of this solid concrete foundation was demolished in August 2009. Previously, Pier 1 extended to the southwestern limit of Inner Pier 1 and was flow-through (i.e., the pier was constructed on piles and not a solid foundation). Steel interlocking sheet-pile extended from several feet above high water to several feet below bedrock to form a quay wall along the eastern side of this portion of Pier 1 and prevented the mass exchange of sediment and surface water directly between Inner Pier 1 and the area under or west of Pier 1 (see Figures 1 and 2). The eastern boundary of Inner Pier 1 is a sheer bedrock wall, except for approximately 30 feet at the far southeastern corner of Inner Pier that consists of a steel and interlocking sheet-pile structure similar to former Pier 1. This small area of sheet-pile quay wall in the southeastern portion of Inner Pier 1 forms a small man-made peninsula that separates Inner Pier 1 from an adjacent concrete boat ramp.

Inner Pier 1 is directly open to the Thames River along its southern limit, beyond the quay walls described above. Surface water depth in Inner Pier 1 is generally on the order of 3 feet relative to Mean Lower Low Water (MLLW) nearest the CIF building (i.e., to the north), and approaches 11 to 12 feet relative to MLLW near the mouth of Inner Pier 1 (i.e., to the south). The surface water level is tidally influenced in Inner Pier 1, demonstrating between 1.5 and 2 feet of tidal fluctuation (Battelle, 2003). The predominant direction of flow in the Thames River is towards Long Island Sound, or generally southward.

Sediment in Inner Pier 1 typically consists of a 1- to 5-foot-thick layer of fine-grained, soft, organic-rich material overlying bedrock, with an average sediment depth of approximately 3.5 feet. Larger grain-size material (i.e., sand) is present in the sediment, and the proportion of larger grain-size material tends to increase with distance away from the CIF building (Battelle, 2003). In addition, construction activities for

the CIF building removed soil and sediment from the northern portion of Inner Pier 1, leaving behind little sediment material above bedrock. Historically measured levels of total organic carbon (TOC) in Inner Pier 1 sediment have generally been between 2 and 5 percent, and historically measured solids content in Inner Pier 1 sediment have generally ranged from 23 percent to 64 percent (SAIC, 2000).

Outer Pier 1 consists of natural bedrock shoreline and vertical-face C-lock bulkhead on the eastern side and the former open-pile portion of Pier 1 on the western side (see Figure 2). Sediment in Outer Pier 1 consists of soft organic-rich silt with some sand, clay, and shell material, similar to that found in Inner Pier 1. Sediment thickness and water depth increased with distance from the shoreline and Inner Pier 1.

The shallow sediment at Inner and Outer Pier 1 provides suitable habitat for benthic organisms (i.e., benthic invertebrates). Inner Pier 1 is otherwise devoid of aquatic vegetation, and the area around Pier 1 generally does not support substantial upland or emergent habitat, with the exception of shrubby vegetation at ground surface (i.e., at the top of the natural geologic wall) along the northeastern Inner Pier 1 boundary.

To date, no removal actions under CERCLA have been conducted at Inner or Outer Pier 1. The Navy may conduct other actions for Outer Pier 1 sediment after the Lower Subase Feasibility Study (FS) is completed.

4 Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant, or Contaminant

Previous investigations that have occurred in the Pier 1 area include work by SAIC, Battelle and Neptune & Company, and Tetra Tech NUS, Inc. (TtNUS). A summary of the results of these investigations is provided below. Historical sediment sampling locations in the Pier 1 area are shown on Figure 2. The analytical data associated with the investigations are provided in Tables 1 through 4 in Attachment 1.

Pier 1 Marine Railway Investigation

Sediment from the Pier 1 Marine Railway area was sampled by SAIC in October 1999 after evidence of marine vessel overhaul activities was discovered during the draining of the railway for a building construction project. A total of seven surface sediment samples (SBP-1 to SBP-7) were collected and analyzed. The sample locations are shown on Figure 2. The purpose of the investigation was to evaluate whether chemicals from these activities had been released and transported to sediment in the Thames River. Results of this small-scale study indicated that concentrations of metals, PAHs, and PCBs in sediment exceeded ecologic benchmark values and that concentrations of these chemicals decreased from north to south away from the new building location (SAIC, 2000).

Rapid Sediment Characterization Pilot Study

A Rapid Sediment Characterization (RSC) Pilot Study was conducted in June 2003 to evaluate the potential for unacceptable ecological risk in three areas (Zone 4, Zone 7, and Pier 1) of the Lower Subase (Battelle, 2003). Twelve surface sediment samples were collected and analyzed by rapid (i.e., in-situ) screening techniques for metals, PCBs, and PAHs. A subset of confirmatory samples were also analyzed at a laboratory (P1-48, P1-50, P1-53, and P1-55) (see Figure 2). Results of the RSC Study were used to develop data quality objectives (DQOs) and to develop a Screening-Level Ecological Risk Assessment (SLERA) (Battelle and Neptune & Company, 2004).

Validation Study

Surface and subsurface sediment samples were obtained from a total of 11 locations (P1, P1-C1, P2, P1-C2, P3, P1-C3, P4, P1-C4, P5, P1-C5, and P6) in the Pier 1 area in 2004 (see Figure 2) as part of the scope of a Validation Study for Thames River Zone 4, Zone 7, and Outer Pier 1 (Battelle and Neptune & Company, 2004). Samples were characterized for physical and chemical parameters including grain size, TOC, acid volatile sulfide/simultaneously extracted metals (AVS/SEM), metals, PCBs, PAHs, and pesticides. Fish tissue samples were collected from the Pier 1 area and the results were paired with available sediment chemistry from the areas of collection to calculate bioaccumulation factors (BAFs) for evaluation of potential ecological risk.

Risk to ecological receptors, including benthic invertebrates and upper-trophic level piscivorous birds (represented by the double breasted cormorant) were evaluated in the Baseline Ecological Risk Assessment (BERA) completed for the Validation Study. To assess potential risk to benthic invertebrates, a 28-day laboratory bioassay was conducted. Results were evaluated for survival, growth, and reproduction using sediment data collected in 2007. Concentrations of chemicals of potential concern (COPCs) in whole body forage fish tissue collected in 2004 were used to estimate a range of site-specific BAFs to calculate dose inputs to the food-chain model. Exposure point concentrations (EPCs) for estimating ingestion doses in each area were calculated using the 95-percent upper confidence limits (UCLs) of the mean sediment COPC concentrations.

Dose modeling to piscivorous birds showed potential low-level risk from mercury in Outer Pier 1 because hazard quotients (HQs) exceeded no-observed-adverse-effect level (NOAEL) toxicity reference values (TRVs). Doses did not exceed lowest-observed-adverse-effect level (LOAEL) TRVs for any constituent. Evaluation of uncertainties associated with BAFs and cormorant site use factors (SUFs) combined with the low HQ for mercury in Outer Pier 1 suggests that mercury does not pose an unacceptable risk to piscivorous birds in the area.

Bioassay results were compared to chemistry results, including Effects Range Median-Quotients (ERM-Qs), metals ERM-Q, and total PCB concentrations. From these correlations, the following preliminary remedial goals (PRGs) were identified:

- Total ERM-Qs associated with 30-percent reduction in survival (1.43), 30-percent reduction in growth (1.54), 50-percent reduction in growth (2.34), 25-percent reduction in offspring (0.53), and 50-percent reduction in offspring (1.17).

- Metals ERM-Q associated with a 30-percent reduction in survival (1.64).

- Total PCB concentrations associated with 30-percent reduction in growth (270 µg/kg), 50-percent reduction in growth (387 µg/kg), 25-percent reduction in offspring (121 µg/kg), and 50-percent reduction in offspring (208 µg/kg).

Lower Subase Feasibility Study

The Navy planned to address Outer Pier 1 through the CERCLA Remedial Investigation (RI)/FS process but subsequently decided to address a majority of it through a removal action to expedite remediation of the area and minimize remediation costs. As part of the Lower Subase FS (TtNUS, 2008), a total of 10 surface sediment and core samples (TRP1-SD-001 through TRP1-SD-010) were collected in Outer Pier 1 during November 2008 (see Figure 2) to determine the lateral and vertical extent of contamination. At each sampling location, one 6-foot-long sediment core (Core A) and one 1-foot-long sediment core (Core B) were collected. For Core A, sampling intervals were 0 to 2 feet below sediment surface (bss), 2 to 4 feet bss, and 4 to 6 feet bss. For Core B, the sampling interval was 0 to 1 feet bss. Samples were analyzed for PAHs, metals, Toxicity Characteristic Leaching Procedure (TCLP) metals, pesticides, PCB congeners, PCB Aroclors, extractible total petroleum hydrocarbons (ETPH) and other parameters (pH, salinity, TOC, grain size distribution, moisture content, and bulk density).

A collective summary of the PAH, PCB congener, pesticide, and metals analytical results from all investigations are provided in the next section. These parameters were used to determine ecological risk and the extent of contaminated sediment. The following is a summary of the remaining parameters collected during the 2008 investigation in Outer Pier 1 (see Tables 1 and 2):

- TCLP metals were detected in 2 to 28 of the 28 samples that were collected and analyzed. Maximum TCLP metals concentrations of arsenic (31.2 µg/L), barium (541 µg/L), cadmium (3.1 µg/L), chromium (20.5 µg/L), lead (484 J µg/L), and mercury (0.18 µg/L) were significantly less than concentrations that would indicate the sediment was characteristic hazardous waste [i.e., arsenic (5,000 µg/L),

barium (100,000 µg/L), cadmium (1,000 µg/L), chromium (5,000 µg/L), lead (5,000 µg/L), and mercury (200 µg/L)].

- Only two PCB Aroclors (Aroclor-1254 and Aroclor-1260) were detected in the sediment samples. Aroclor-1254 was detected in 19 of 27 samples at concentrations ranging from 57 to 890 µg/kg. Aroclor-1260 was detected in 2 of 28 samples at concentrations at concentrations of 160 and 360 µg/kg. Concentrations of individual and total Aroclors were significantly less than 50,000 µg/kg, which is the concentration at which the sediment would be considered a Toxic Substances Control Act (TSCA) waste.

- ETPH was detected in all 28 sediment samples at concentrations ranging from 160 mg/kg to 7,300 mg/kg.

- The pH of sediment samples ranged from 7.7 and 9, and the salinity of the samples ranged from 0.5 to 0.9 part per thousand (ppt).

- TOC in sediment samples ranged from 2.3 to 4.5 percent.

- The sediment samples contained varying amounts of silt/clay, sand, and gravel. A majority of the samples contained significant amounts of silt/clay and sand, but only a few samples contained notable amounts of gravel.

- The moisture content of the samples ranged from 52.9 to 179 percent.

- The dry bulk density of the sediment samples ranged from 28.2 to 74.1 pounds per cubic foot, and the wet bulk density ranged from 76.5 to 113 pounds per cubic foot.

Nature and Extent of Contamination

Results from the previous site investigations established that Inner and Outer Pier 1 sediment is contaminated with a wide range of contaminants including high-molecular weight (HMW) and low-molecular weight (LMW) PAHs, PCBs, pesticides, and metals. A summary of the analytical data is provided in Table 3.

HMW PAHs included benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, pyrene and LMW PAHs included 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene. Detected PCBs included the following 18

congeners: Cl2(08), Cl3(18), Cl4(28), Cl4(44), Cl4(52), Cl5(66), Cl5(101), Cl5(105), Cl5(118), Cl6(128), Cl6(138), Cl6(153), Cl7(170), Cl7(180), Cl7(187), Cl8(195), Cl9(206), and Cl10(209). Pesticides included alpha-chlordane and 4,4'-DDD, 4-4'-DDE, and 4-4'-DDT, characterized as 4-4'-DDx. Metals included arsenic, cadmium, chromium, copper, lead, nickel, selenium, and zinc.

Concentrations of sediment COCs were typically greatest in Inner Pier 1. Concentrations of HMW PAHs ranged from 7.6 to 1,254.6 mg/kg in Inner Pier 1 compared to 3.2 to 119 mg/kg in Outer Pier 1. Concentrations of LMW PAHs ranged from 1.5 to 466.3 mg/kg in Inner Pier 1 compared to 0.6 to 15.2 mg/kg in Outer Pier 1. Concentrations of total PCB congeners ranged from 131.1 to 19,190.6 µg/kg in Inner Pier 1 compared to 38.4 to 1,186.8 µg/kg in Outer Pier 1. Concentrations of total pesticides ranged from 2.0 to 151.2 µg/kg in Inner Pier 1 compared to 3.4 to 142.8 µg/kg in Outer Pier 1. Concentrations of total metals ranged from 1,126.1 to 20,642.9 mg/kg in Inner Pier 1 compared to 289.9 to 15,140.2 mg/kg in Outer Pier 1.

Based on the available data, it can be concluded that sediment contamination extends throughout Inner Pier 1 and down to bedrock. Outer Pier 1 sediment contamination is present mostly in the area adjacent to Inner Pier 1 and to an estimated depth of up to 6 feet bss.

Risk Evaluation

The human health risk assessment concluded that there are no unacceptable human health risks associated with sediment at Inner and Outer Pier 1 because, under the current site use scenario, there is no potential for direct or indirect (through the food chain) human contact with the sediment.

The BERA conducted as part of the Thames River Validation Study (Battelle and Neptune & Company, 2008) established unacceptable risks to ecological receptors as a result of direct and indirect (food chain) exposure to contaminated sediment. The BERA identified several COCs including the previously mentioned PCBs, PAHs, metals, and pesticides. To better evaluate cumulative risk from a wide range of COCs that are not always spatially correlated, ERM-Q composite indices were developed for the 13 identified COCs (see Table 4). The BERA developed PRGs including a Total ERM-Q of 1.17 and a Total PCB congener concentration of 208 µg/kg, both of which correspond to a 50-percent reduction in offspring. Subsequently, the New London Partnering Team reached a consensus that a Total ERM-Q of 1.17 was the predominant PRG (i.e., results in the largest area and volume of sediment to be addressed) and that the Total PCB congener PRG could be increased to 1,000 µg/kg.

Table 4 provides a summary of the calculated Total ERM-Qs. The Total ERM-Qs and Total PCB congener data were used to determine the extent of contaminated sediment (i.e., sediment with Total ERM-Qs greater than 1.17 and Total PCB congener concentrations greater than 1,000 µg/kg). Figures 3

through 5 show Total ERM-Qs in sediment at 0 to 2 feet, 2 to 4 feet, and 4 to 6 feet, respectively, and the limits that exceed the PRGs. The depth-specific limits of contaminated sediment based on Total ERM-Qs were combined on Figure 6 to show the maximum extent of contaminated sediment. Figures 7 through 9 show similar depth-specific limits of contamination for Total PCB congener data. The extent of contamination using the Total PCB congener data is less than and included within the extent based on Total ERM-Q data.

5 National Priorities List Status

NSB-NLON was placed on the National Priorities List (NPL) on August 30, 1990. The CERCLA Identification System (CERCLIS) Number for NSB-NLON is CTD980906515. The Navy, EPA, and State of Connecticut signed the Federal Facility Agreement (FFA) for NSB-NLON in 1995 (EPA, 1995). The agreement is used to ensure that environmental impacts associated with past and present activities at NSB-NLON are thoroughly investigated and that the appropriate actions are pursued to protect human health and the environment.

6 Maps, Pictures, and Other Graphic Presentations

The figures referenced throughout this document are provided in Attachment 2.

B OTHER ACTIONS TO DATE

1 Previous Actions

The pile-supported portion (flow-through) of Pier 1 was demolished by the Navy in August 2009. The demolition provided access to potentially contaminated sediment under the pier. Without the demolition, contaminated sediment under Pier 1 could not have been addressed during the NTCRA.

The Navy has conducted community relations activities for the Installation Restoration Program at NSB-NLON since 1988. A RAB was established in 1994 to increase public participation in the program. The RAB provides a forum for discussion and exchange of information on environmental restoration activities between the Navy, regulatory agencies, and the community.

The final Engineering Evaluation/Cost Analysis (EE/CA) for Inner and Outer Pier 1 was prepared and provided to the local Information Repositories on October 14, 2009. The notice of availability of the EE/CA was published in the New London Day on October 17, 2009 and copies of the notice were sent to Restoration Advisory Board (RAB) members on October 19, 2009. A copy of the notice is included in Attachment 3. No public comments were received during the public comment period, held from October 17, 2009 to November 16, 2009; therefore, a Responsiveness Summary was not prepared. The

Navy anticipates conducting a meeting with RAB members in December 2009 to discuss the status of the NTCRA.

2 Current Actions

There are no other government or private activities currently being performed within Inner and Outer Pier 1.

C STATE AND LOCAL AUTHORITIES' ROLES

1 State and Local Actions to Date

Executive Order 12580 delegates to the Department of Defense the President's authority to undertake CERCLA response actions at military facilities. Congress further outlined this authority in the Defense Environmental Restoration Program Amendments under 10 United States Code, Sections 2701 through 2705. CERCLA Section 120 requires the Navy to apply state removal and remedial action law requirements at its facilities.

2 Potential for Continued State/Local Response

It is expected that the Navy will continue to be the lead agency and that the Navy's Installation Restoration Program will continue to be the exclusive source of funding for this removal action. EPA and CTDEP will continue to be consulted during and until actions addressing the contaminated sediment at Inner and Outer Pier 1 are determined complete.

III THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

As the lead agency, the Navy has determined that an NTCRA is necessary for sediment in Inner and Outer Pier 1 to address unacceptable risks to ecological receptors. The Navy considered the eight factors in the NCP to determine whether a removal action was warranted for Inner and Outer Pier 1 sediment [40 Code of Federal Regulations (CFR) § 300.415 (b)(2)]. A removal action can be justified if any of the eight factors apply. The circumstances related to the release of contaminants at Inner and Outer Pier 1 primarily satisfy one of the eight criteria, namely:

- Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances, or pollutants or contaminants.

The Inner and Outer Pier 1 risk assessment concluded that unacceptable risks are present for ecological receptors. The risk assessment also concluded that there are no reasonable human receptor/pathway combinations and no potential for unacceptable human health risks from contaminated sediment in Inner or Outer Pier.

Other NCP factors considered to apply to the contaminated sediment at Inner and Outer Pier 1 include the following:

- High levels of hazardous substances or pollutants or contaminants in soil largely at or near the surface that may migrate. High concentrations of contaminants have been detected in shallow sediment at Inner and Outer Pier 1, and there is potential for them to migrate.

- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released. Storm events and wave action in the Thames River may cause contaminated sediment to migrate from Inner and Outer Pier 1.

The following Navy criteria were also considered to justify that a removal action was warranted for Inner and Outer Pier 1:

- The source of contamination could be removed quickly and effectively
- Access to the contamination could be limited (ecological receptor exposure is substantially reduced)
- A removal action is the most expeditious manner of remediating the site

A THREATS TO THE PUBLIC HEALTH OR WELFARE

Inner and Outer Pier 1 are located in a secure area of NSB-NLON and are not accessible to the general public. An evaluation of human health risks concluded that there are no unacceptable human health risks associated with sediment at Inner and Outer Pier 1 because, under the current site use scenario, there is no potential for direct or indirect (through the food chain) human contact with the sediment. However, the contaminated sediment is exposed to open water and has the potential to migrate into nearby areas.

B THREATS TO THE ENVIRONMENT

The contaminated sediment at Inner and Outer Pier 1 is likely adversely impacting ecological receptors (benthic organisms). From previous investigations, it was concluded that concentrations of PAHs, PCBs, pesticides, and metals in the Inner and Outer Pier 1 sediment pose unacceptable risks to ecological receptors. These contaminated sediments also have the potential to migrate to other areas in the Thames River. PRGs (Total ERM-Qs less than or equal to 1.17 and Total PCB congener concentrations less than or equal to 1,000 µg/kg) that are protective of ecological receptors were identified to facilitate cleanup of the contaminated sediment.

Inner Pier 1 covers approximately 18,500 sf (0.42 acre), and the depth of sediment in Inner Pier 1 averages approximately 3.5 feet. The in-situ volume of Inner Pier 1 sediment with concentrations exceeding PRGs was estimated to be 2,740 cubic yards (cy). Outer Pier 1 sediment with concentrations of contaminants greater than the PRGs extends to a depth of 6 feet bss and covers approximate surface areas of 5,100 sf from 0 to 2 feet bss, 20,800 sf from 2 to 4 feet bss, and 27,300 sf from 4 to 6 feet bss. Accordingly, the total in-situ volume of contaminated Outer Pier 1 sediment has been estimated at approximately 3,940 cy. However, because of the necessity to cut back the wall of the removal area for slope stability and to overdredge, the estimated total in-situ volume of Outer Pier 1 sediment addressed by the removal action is approximately 6,670 cy.

IV ENDANGERMENT DETERMINATION

Actual or threatened releases of pollutants or contaminants from Inner and Outer Pier 1, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V PROPOSED ACTIONS AND ESTIMATED COSTS

A PROPOSED ACTION

1 Proposed Action Description

The removal action alternative proposed for Inner Pier 1 sediment is Alternative IP-3 as described in the EE/CA (TtNUS, 2009) and consists of water-based dredging to bedrock, dewatering, direct discharge of free draining water and off-site disposal of dewatered sediment and retained fluid. Confirmation sampling will not be required for Inner Pier 1 because dredging will continue to bedrock. Inner Pier 1 covers approximately 18,500 sf or 0.42 acre. Sediment depth in Inner Pier 1 ranges from 1 to 5 feet, with an average depth of approximately 3.5 feet. The Inner Pier 1 removal action area will include the entire boundary of Inner Pier 1 to a depth of approximately 4 feet for an estimated in-situ volume of 2,740 cy. Figure 10 shows the approximate removal action boundary.

A similar approach is proposed for Outer Pier 1 sediment with EE/CA Alternative OP-4, which consists of dredging to meet PRGs, dewatering, direct discharge of free draining water, and off-site disposal of dewatered sediment and retained fluid. Confirmation sampling will be completed in Outer Pier 1 to verify that dredging removed the contaminated sediment and met the PRGs. Based on results of field investigations, Outer Pier 1 sediment with concentrations of COCs greater than the PRGs extends to a depth of 6 feet bss and covers approximate surface areas of 5,100 sf from 0 to 2 feet bss, 20,800 sf from 2 to 4 feet bss, and 27,300 sf from 4 to 6 feet bss. Dredging will target a depth of 6 feet bss plus 1 foot of allowable overdredge to account for the imprecision with depth determination during the dredging process. Therefore, the estimated total in-situ volume of Outer Pier 1 sediment addressed by the removal action is approximately 6,670 cy. Figure 10 shows the approximate boundary of the Outer Pier 1 portion of the removal action.

A separate area of sediment, contaminated with similar COCs, has also been identified in Outer Pier 1 (see Figure 10). This area is circular in shape, covers an estimated 14,400 sf, and is present at a depth of 4 to 6 feet bss around the southern tip of former Pier 1 in the vicinity of sediment sample location TRP1-SD-005. Due to the depth of contaminated sediment in this area, a significant amount of uncontaminated sediment would need to be removed to access it. Because the current risks to ecological receptors associated with the shallow sediment (0 to 1 foot bss) in this area are low and the cost associated with dredging this area is high, the Navy will not address it through the NTCRA but will address it as appropriate through the Lower Subase FS and CERCLA process.

The scope of the removal action is to remove approximately 9,500 in-situ cy (or 11,300 tons) of sediment containing COCs of concentrations greater than PRGs from Inner and Outer Pier 1. The following methodologies will be utilized during the removal action:

- Mechanical Dredging – A long-reach excavator will be used to dredge from a barge platform.

- Dewatering – Gravity drainage of dredged sediment will be conducted on a specially modified barge. Free draining water will directly discharge to the Thames River. Dewatering will be enhanced by use of an additive such as fly ash (8 percent by weight) to adsorb retained fluid.

- Disposal – Dewatered sediment will be disposed at an off-site landfill, and retained fluid will be disposed at a waste water treatment facility.

- Transportation – Trucks will be used to transport the dewatered/stabilized sediment and retained fluid for disposal.

The goals of the removal action include the following:

- Dredge with sufficient accuracy such that contaminated sediment is removed and PRGs are met, without excessive removal of clean sediment. Confirmation sampling will be conducted in Outer Pier 1 to verify that PRGs have been met. The exposed surface remaining after dredging will be adequate habitat for ecological receptors, and no restoration activities will be completed.

- Dredge the sediment within a reasonably short period of time, if possible within the restrictions of the State of Connecticut environmental dredging window, and in a condition compatible with subsequent transport for treatment or disposal. If the environmental window is missed, approval will have to be obtained from the State of Connecticut to proceed outside of the dredging window.

- Minimize and/or control resuspension of contaminated sediment, downstream transport of resuspended sediment, and releases of contaminants to water and air. Monitoring will be conducted to verify that there are no impacts.

- Dredge the sediment such that generation of residual sediment (i.e., sediment suspended during dredging operations that settles out of suspension after dredging is completed) is minimized or controlled.

Prior to the start of dredging activities, a floating turbidity curtain will be installed along the perimeter of Inner and Outer Pier 1 to minimize migration of sediment during the project. Except for brief periodic openings to allow for barge movement, the silt curtain will remain in place until the end of the removal action. Turbidity monitoring will be used to determine when the curtain can be opened for barge movement and the curtain can be removed.

Bathymetric surveys will be conducted before and after the completion of the project to confirm the progress of the removal action. Soundings will also be taken throughout the removal action to provide real-time updates on the progress of the removal action.

Sediment removal will be performed from a barge. A long-reach excavator will be situated on the barge deck that is anchored over a portion of the removal area. Dredged sediment will be loaded onto a dewatering and transfer barge, the perimeter of which will be lined with jersey barriers to form a bin on the deck. Geotextile filter fabric will be attached to the surface of the jersey barriers to filter the free liquid that drains from the sediment. The free liquid will discharge directly to the Thames River.

When the dewatering and transfer barge is filled, a tug boat will be used to move it to a mooring location adjacent to Outer Pier 1. The filled barge will remain at the mooring location until waste characterization analytical results are received and an appropriate disposal facility is identified. Following characterization sampling, a chemical agent such as fly ash or Portland cement will be added to the dewatered sediment to adsorb any residual free water and to further stabilize the material for transportation and disposal. Typical fly ash analysis will be obtained from the supplier and spot checks will be performed to verify that addition of this material does not change the character of the dewatered sediment and make it unacceptance for off-site disposal.

The dewatering and transfer barge will then be moved to an off-loading facility, and any ponded water on the dredged sediment (referred to as dewatering fluid) will be pumped into a frac tank for storage. Waste characterization will be performed on the dewatering fluid prior to off-site disposal. Dredged and dewatered sediment will be loaded by crane into trucks for transportation to an off-site disposal facility. A layer of polyethylene sheeting will be installed between the barge and dock areas to contain any materials that spill during barge off-loading activities. Sediment transport will be performed in compliance with United States Department of Transportation (DOT) and Connecticut Department of Environmental Protection (CTDEP) hazardous waste regulation requirements. The dewatered sediment and dewatering fluid will be transported to and disposed at a properly licensed and Navy-approved off-site landfill and wastewater disposal facility, respectively.

2 Contribution to Remedial Performance

The Inner and Outer Pier 1 removal action will be implemented in accordance with all the administrative procedures in the NCP for NTCRAs. The removal action will mitigate direct contact risks to ecological receptors posed by the contaminated sediment at Inner and Outer Pier 1. This is anticipated to be the final action for the areas involved, and it is expected that after the removal action, the area will be available for unrestricted use. Contaminated sediment in areas outside of this project scope will be addressed through other CERCLA actions.

The primary objective of the NTCRA for Inner and Outer Pier 1 sediment is to minimize the potential migration of, and mitigate the risk to ecological receptors posed by, contaminants in Inner and Outer Pier 1 sediment. Contaminated sediment (Total ERM-Q greater than 1.17 and Total PCB congener concentrations greater than 1,000 µg/kg) will be dredged and disposed offsite to meet this objective.

3 Description of Alternative Technologies

During screening of potential removal action technologies for development of alternatives for Inner and Outer Pier 1 sediment, greater emphasis was placed on technologies capable of achieving cleanup in a timely fashion. In-situ treatment technologies are generally not proven, particularly for the mixed nature of Inner and Outer Pier 1 contaminants, and monitored natural recovery would likely take many years to achieve the RAO, while the contaminated sediment would continue to present unacceptable risks to ecological receptors. The dredging/excavation technology is considered the most effective and reliable for the cleanup of impacted sediment and it was used in the EE/CA to develop appropriate alternatives for Inner and Outer Pier 1. Removal, treatment, and disposal of the contaminated sediment will eliminate current and potential future exposure of ecological receptors to the contaminated sediment and the risks associated with that exposure.

4 Engineering Evaluation/Cost Analysis

An EE/CA for only Inner Pier 1 was initially prepared by Battelle (2008) and it contained an evaluation of alternatives considered for contaminated sediment. TtNUS subsequently prepared a revised EE/CA in 2009 for Inner and Outer Pier 1 that included updated and new alternatives. The revised EE/CA also refined the scope, quantities, methods, and costs for the removal action. The following removal action alternatives were evaluated for Inner Pier 1 sediment:

Alternative IP-1: No Action.

Alternative IP-2: Land-Based Dredging to Bedrock, Dewatering, and Off-Site Disposal of Dewatered Sediment and Dewatering Fluid.

Alternative IP-3: Water-Based Dredging to Bedrock, Dewatering, and Off-Site Disposal of Dewatered Sediment and Dewatering Fluid.

Alternative IP-4: Land-Based Dredging to Bedrock, Dewatering, On-Site Treatment and Discharge of Dewatering Fluid, and Off-Site Disposal of Dewatered Sediment.

Alternative IP-5: Water-Based Dredging to Bedrock, Dewatering, On-Site Treatment and Discharge of Dewatering Fluid, and Off-Site Disposal of Dewatered Sediment.

Alternative IP-6: Drainage of Inner Pier 1, Excavation to Bedrock, Dewatering, On-Site Treatment and Discharge of Surface Water and Dewatering Fluid, and Off-Site Disposal of Dewatered Sediment.

The following alternatives were evaluated for Outer Pier 1 sediment:

Alternative OP-1: No Action.

Alternative OP-2: Capping with Pre-Dredging to Meet the RAO, Dewatering, Off-Site Disposal of Dewatered Sediment and Dewatering Fluid, Land Use Controls (LUCs), and Monitoring.

Alternative OP-3: Capping with Pre-Dredging to Meet the RAO, Dewatering, On-Site Treatment of Dewatering Fluid, Off-Site Disposal of Dewatered Sediment, LUCs, and Monitoring.

Alternative OP-4: Dredging to Meet PRGs, Dewatering, and Off-Site Disposal of Dewatered Sediment and Dewatering Fluid.

Alternative OP-5: Dredging to Meet PRGs, Dewatering, On-Site Treatment and Discharge of Dewatering Fluid, and Off-Site Disposal of Dewatered Sediment.

Alternatives IP-3 and OP-4 are the alternatives selected in this Action Memorandum to address contaminated sediment at Inner and Outer Pier 1.

5 Applicable or Relevant and Appropriate Requirements

The term applicable or relevant and appropriate requirements (ARARs) is defined in the NCP (40 CFR §300.5) as follows:

- Applicable requirements mean those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

- Relevant and appropriate requirements mean those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to these encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

ARARs are classified into three broad categories based on the manner in which they are applied during a removal action. These categories are as follows:

- Chemical-specific ARARs were developed to provide health- or risk-based concentration (RBC) limits for environmental media. These limits are specific for an individual chemical or group of chemicals, and often these ARARs are used to determine the extent of site remediation. Chemical-specific ARARs may be concentration-based cleanup goals or may provide the basis for calculating such levels. In cases where no chemical-specific ARAR exists, chemical advisories may be used to develop removal objectives.

- Location-specific ARARs are considered in view of natural or man-made site features. These ARARs are intended to limit activities within designated areas.

- Action-specific ARARs pertain to the implementation of a given remedy. These ARARs control or restrict hazardous substance- or pollutant-related activities and are considered when specific removal activities are planned for a site.

The proposed removal action will mitigate unacceptable ecological risks and comply with applicable or relevant and appropriate federal and state ARARs. This removal action satisfies the statutory preference (CERCLA § 121 (b)(11)) for remedies that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances. Chemical-, location-, and action-specific ARARs for the proposed removal action for Inner and Outer Pier 1 sediment are provided in Tables 5, 6, and 7, respectively.

6 Project Schedule

The NTCRA is expected to start in December 2009 and last 3 to 6 months.

B ESTIMATED COSTS

The total cost of the removal action for the Inner and Outer Pier 1 is approximately $3,957,000. This estimate is based on the detailed EE/CA cost estimates for Alternatives IP-3 and OP-4 that are provided in Attachment 4.

VI EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

A delay or lack of action would allow continued impact to ecological receptors and increase the potential for contaminated sediment to migrate into other areas.

VII OUTSTANDING POLICY ISSUES

There are no outstanding policy issues that have not been discussed.

VIII ENFORCEMENT

The Navy is the lead agency responsible for the investigation and cleanup of contaminated sites at NSB-NLON under the Installation Restoration Program. The Navy will provide funding for the NTCRA; therefore, enforcement actions do not apply to this removal action.

IX RECOMMENDATIONS AND NAVY APPROVAL

This Action Memorandum (November 2009) presents the selected removal action for Inner and Outer Pier 1 sediment at NSB-NLON, Groton, Connecticut, developed in accordance with CERCLA, as amended by Superfund Amendments and Reauthorization Act (SARA), and is consistent with the NCP. Conditions at Inner and Outer Pier 1 meet the NCP Section 300.415(b)(2) factors and Navy criteria for removal actions; therefore, Naval Facilities Engineering Command Mid-Atlantic recommends approval of the proposed NTCRA. EPA and CTDEP have provided their concurrence on the recommended removal action. No public comments on the proposed removal action were received during the EE/CA comment period held from October 17, 2009 to November 16, 2009.

Environmental investigations of Inner and Outer Pier 1 sediment identified elevated concentrations of several chemicals including PCBs, PAHs, pesticides, and metals. Although there are no current human health risks, these contaminants could harm the environment. Approximately 9,500 cy of sediment with concentrations greater than the PRGs (Total ERM-Q of 1.17 and Total PCB congener concentration of 1,000 µg/kg) have been identified at Inner and Outer Pier 1. Various alternatives were evaluated to address the contaminated sediment during the EE/CA, with the RAO being to minimize the potential migration of, and mitigate the direct contact risks to ecological receptors posed by, contaminants in Inner and Outer Pier 1 sediment. Based on the results of this evaluation, dredging, dewatering, and off-site disposal of the contaminated sediment at both Inner and Outer Pier 1 is the Navy's preferred method for meeting the objective of the NTCRA. This is anticipated to be the final action for the areas involved, and it is expected that after the removal action, the area will be available for unrestricted use.

The total project cost is estimated to be $3,957,000. The removal action is currently scheduled to start in December 2009 and last 3 to 6 months. The action should commence as soon as practical due to the potential threat to the environment.

By: _____ Date: 17 NOV 09

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ATTACHMENT 1

TABLES

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-001 20081106 0 2 FT	TRP1-SD-001 20081106 2 4 FT	TRP1-SD-001 20081106 4 6 FT	TRP1-SD-001 20081106 0 1 FT	TRP1-SD-002 20081107 0 2 FT	TRP1-SD-002 20081107 2 4 FT	TRP1-SD-002 20081107 4 6 FT	TRP1-SD-002 20081107 0 1 FT	TRP1-SD-003 20081107 0 2 FT	TRP1-SD-003 20081107 2 4 FT	TRP1-SD-003 20081107 0 1 FT	TRP1-SD-004 20081107 0 2 FT	TRP1-SD-004 20081107 2 4 FT	TRP1-SD-004 20081107 4 6 FT
PAHs (µg/kg)														
1-METHYLNAPHTHALENE		28	32	17		6.9 U	180	14		15	17		85	100
2-METHYLNAPHTHALENE		49	50	28		58	150	20		24	23		53	65
ACENAPHTHENE		92	77	40		110	660	31		20	32		790	450
ACENAPHTHYLENE		340	180	290		560	360	220		120	220		150	140
ANTHRACENE		960	590	780		1900	1500	380		150	430		480	620
BENZO(A)ANTHRACENE		2100	1400	2900		4500	2400	1200		350	1000		1100	1100
BENZO(A)PYRENE		1600	1100	1900		3100	1900	1400		390	1300		620	720
BENZO(B)FLUORANTHENE		2600	1600	3100		4600	2300	2000		520	1800		1100	1100
BENZO(G,H,I)PERYLENE		660	430	600		1600	600	450		230	530		350	310
BENZO(K)FLUORANTHENE		1200	650	1200		2700	1900	1100		290	1000		370	490
CHRYSENE		2700	1700	3800		6100	3000	1600		430	1500		1200	1200
DIBENZO(A,H)ANTHRACENE		230	140	220		370	220	160		68	170		110	97
FLUORANTHENE		4200	3800	1400		8900	8500	1700		600	1700		3400	4100
FLUORENE		220	130	110		310	600 J	76		45	78		690	520 J
HEXACHLOROBENZENE		7.5 U	6.2 U	7.2 U		6.9 U	7 U	7.8 U		5.2 U	7.4 U		6.9 U	5.9 U
HIGH MOLECULAR WEIGHT PAHS		15930	10940	16220		32370	22420	8860		3238	8270		9630	10017
INDENO(1,2,3-CD)PYRENE		630	410	580		1600	590	470		200	490		310	280
LOW MOLECULAR WEIGHT PAHS		2636	1568	1747		4718	5420	1087		600	1269		3918	3869
NAPHTHALENE		85	71	49		80	250	30		31	36		55	74
PHENANTHRENE		890	470	450		1700	1900	330		210	450		1700	2000
PYRENE		5100	2800	6000		9400	6400	2800		1400	2600		3200	2800
Pesticides/PCBs (µg/kg)														
4,4'-DDD		15 U	6.2 U	5.7 U		3.6 J	14 U	7.8 U		3.8 J	4.5 U		14 UJ	65 J
4,4'-DDE		39	7.5	5.7 U		5.8 J	14 J	7.8 U		3.8 J	4.5 U		14 UJ	12 U
4,4'-DDT		72 J	6.2 U	7 J		13 J	29 J	12 R		5.8 R	7.2 R		18 J	32 R
ALDRIN		7.6 U	3.2 U	2.9 U		0.72 U	7.2 U	4 U		0.49 J	2.3 U		7 UJ	6.1 U
ALPHA-CHLORDANE		7.6 U	3.2 U	2.9 U		1.1 J	7.2 U	4 U		0.54 U	2.3 U		7 U	6.1 U
AROCLOR-1016	71 U	74 UJ	62 U		83 U	70 U	70 U		62 UJ	52 UJ		90 UJ	69 U	59 U
AROCLOR-1221	71 U	74 UJ	62 U		83 U	70 U	70 U		62 UJ	52 UJ		90 UJ	69 U	59 U
AROCLOR-1232	71 U	74 UJ	62 U		83 U	70 U	70 U		62 UJ	52 UJ		90 UJ	69 U	59 U
AROCLOR-1242	71 U	74 UJ	62 U		83 U	70 U	70 U		62 UJ	52 UJ		90 UJ	69 U	59 U
AROCLOR-1248	71 U	74 UJ	62 U		83 U	70 U	70 U		62 UJ	52 UJ		90 UJ	69 U	59 U
AROCLOR-1254	82 J	75 J	62 U		83 U	170	770		190 J	57 J		90 UJ	140	59 U
AROCLOR-1260	71 U	74 UJ	62 U		83 U	70 U	360		160 J	52 UJ		90 UJ	69 U	59 U
CIS-NONACHLOR		55 J	3.2 UJ	4.4 R		7 R	14 R	5.2 R		4.9 J	3.8 R		8.3 R	6.1 UJ
DIELDRIN		15 U	6.2 U	5.7 U		1.9 J	14 U	7.8 U		7.1 J	4.5 U		14 U	12 U
ENDOSULFAN I		9.2 J	3.2 U	2.9 U		0.72 U	7.2 U	4 U		0.54 U	2.3 U		7 UJ	6.1 U
ENDOSULFAN II		15 U	6.2 U	5.7 U		1.4 U	14 U	7.8 U		1 U	4.5 U		14 U	12 U
ENDRIN		15 U	6.2 U	5.7 U		1.4 U	14 U	7.8 U		1 U	4.5 U		14 UJ	12 U
GAMMA-BHC (LINDANE)		7.6 U	3.2 U	2.9 J		1.4 R	7.2 U	4 U		0.61 J	2.3 U		7 UJ	6.1 U
GAMMA-CHLORDANE		7.6 U	3.2 U	4.2		2.1 J	7.2 U	4 U		0.54 U	2.3 U		7 UJ	6.1 U
HEPTACHLOR		7.6 U	3.2 U	2.9 U		0.72 U	7.2 U	4 U		0.54 U	2.3 U		7 UJ	6.1 U
HEPTACHLOR EPOXIDE		27 J	3.2 U	2.9 U		4.4 J	13 J	4 U		0.69 J	2.3 U		7 UJ	6.1 U
METHOXYCHLOR		76 U	32 U	29 U		7.2 U	72 U	40 U		7 J	23 U		70 U	61 U
OXYCHLORDANE		7.6 U	12	2.9 U		0.72 U	31 J	28		0.55 R	2.3 U		32	15 J
PCB-101		12 J	3.3 R	16		17	48	6.2 J		5.6	16		28	2.8 R
PCB-105		7.9 J	3.2 J	4.1 J		5 J	16 J	2.4 U		2.1 J	4.1 J		8.2 J	3 J
PCB-118		13 J	6.3 J	13 J		12 J	30 J	8.6 J		3.8 J	9.9 J		16 J	5.2 J
PCB-128		2.2 U	1.8 U	2.2 U		2.1 U	4.7 R	2.4 U		1.5 U	2.2 U		2.3 R	1.7 U
PCB-138		12 J	7.3 J	13 J		13 J	38 J	6.5 J		5.2 J	12 J		20 J	6.2 J
PCB-153		14	9.4 J	13 J		13	36	6.1 J		5.2 J	12		21 J	8.1 J
PCB-170		5.6 J	3.5 R	2.2 U		3 R	12 J	2.4 U		5 J	3.7 R		5.6 R	2.6 R

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-001 20081106 02 FT	TRP1-SD-001 20081106 24 FT	TRP1-SD-001 20081106 46 FT	TRP1-SD-001 20081106 01 FT	TRP1-SD-002 20081107 02 FT	TRP1-SD-002 20081107 24 FT	TRP1-SD-002 20081107 46 FT	TRP1-SD-002 20081107 01 FT	TRP1-SD-003 20081107 02 FT	TRP1-SD-003 20081107 24 FT	TRP1-SD-003 20081107 01 FT	TRP1-SD-004 20081107 02 FT	TRP1-SD-004 20081107 24 FT	TRP1-SD-004 20081107 46 FT
Pesticides/PCBs (µg/kg) Continued														
PCB-18		3.2 J	1.8 U	7.3 J		6.8	18 J	4.4 J		1.5 U	5.6 J		7.4 J	1.7 U
PCB-180		7.5 J	3.3 R	6.5 J		8	21 J	2.7 J		3.5 J	3 J		14 J	2.7 J
PCB-183		2.8	3.1	2.2 U		2.1 U	4.8 J	2.2 U		1.5 U	2.2 U		3.1 J	2.5 J
PCB-184		2.5 J	2.2	2.2 U		2.1 U	2 U	2.4 U		1.5 U	2.2 U		2 U	1.7 U
PCB-187		3.1 J	1.9 J	2.2 R		3.6 J	5.8 J	2.5		1.5 U	2.2 U		3.6 J	1.7 U
PCB-195		2.2 U	1.8 U	2.2 U		2.1 U	2.4	2.4 U		1.5 U	2.2 U		2 U	1.7 U
PCB-206		7.8	15	4.4		3.9 J	9.4 J	2.4 U		5.8 J	3.8 R		6.2 J	12 J
PCB-209		14 J	18	7.5 J		3.1 J	2.7 R	2.4 U		6.7 J	5.6 J		2 U	12 J
PCB-28		6.7 J	1.8 U	15 J		14 J	25 J	9.5 J		1.7 J	16 J		13 J	1.7 U
PCB-44		6.8 J	1.8 U	6.6 J		7.5 J	22	2.7 R		1.7	9.9		9.1 J	1.7 U
PCB-49		2.2 U	1.8 U	2.7 R		3.8 R	5.6 R	2.4 U		1.5 U	7.2 J		4 R	1.7 U
PCB-52		19 J	6.6 J	16 J		17	35	2.7 R		4.9	15 J		19 J	3.6
PCB-66		2.2 U	1.8 U	14 J		2.1 U	26 J	2.4 U		1.5 U	9.2 J		9.3 R	1.7 U
PCB-8		6 J	1.8 U	4.8 J		3 J	7 J	4.1 J		1.5 U	2.7 J		3.7 R	3.5 J
PCB-87		19 J	17 J	7.2		6	45	5		4.6 J	5.4		17	13 J
TOTAL AROCLOR	82	75	0 U		0 U	170	1130		350	57		0 U	140	0 U
TOTAL DDT		118.5	13.7	12.7		22.4	50	7.8		7.6	4.5		32	71
TOTAL PCB CONGENERS		283.8	148	289		260.1	703.2	118		111.4	248.6		335	124.5
TOXAPHENE		760 U	320 U	290 U		72 U	720 U	400 U		54 U	230 U		700 U	610 U
TRANS-NONACHLOR		7.6 U	7.1	16		9.6 J	7.5 J	13		5 J	11		15	6.1 U
Inorganics (mg/kg)														
ARSENIC		9.5 J	8.4 J	12.1 J		13 J	9.9 J	16.4 J		5.1 J	15 J		12	7.9
CADMIUM		1.1 J	1.5 J	0.82 J		0.85 J	3.3 J	0.6 J		0.73 J	0.65 J		2.3 J	1.3 J
CHROMIUM		88.8 J	98.4 J	78.8 J		84.6 J	110 J	68.7 J		61.7 J	62.2 J		121 J	96.8 J
COPPER		182 J	142 J	260 J		519 J	197 J	205 J		62.1 J	106 J		203 J	207 J
LEAD		157 J	210 J	204 J		298 J	501 J	144 J		95.4 J	97.9 J		260 J	192 J
MERCURY		1.1 J	1.2 J	1.2 J		0.45 J	1.3 J	0.34 J		0.61 J	0.36 J		0.58 J	1.1 J
NICKEL		27.6 J	18.9 J	51.6 J		124 J	32.5 J	31.6 J		12.7 J	26.6 J		28 J	17.7 J
SELENIUM		5.1 U	4.8 U	5.5 U		6.8	5	5.3		2.4	4.7		5.2	3.7
ZINC		283 J	208 J	457 J		1130 J	601 J	261 J		221 J	212 J		418 J	324 J
Miscellaneous Parameters (lb/f3)														
BULK DENSITY	80.7	80.8	85.5		76.5	87.1	81.2		84.4	91.3		76.6	82.6	94.1
DRY BULK DENSITY	37.2	36.3	43.6		29.5	46.4	37		40	53.4		29.9	41	54.6
Miscellaneous Parameters (%)														
PERCENT GRAVEL	1.3	1.7	14.9		2.2	7.3	0		1.7	5.1		11.7	3.2	0
PERCENT MOISTURE	117	122	96		159	87.8	119		111	71.1		156	101	72.4
PERCENT SAND	23.9	26.6	7.8		14.7	35.5	27		34.9	53.8		10.4	34	37.8
PERCENT SILT/CLAY	74.8	71.7	77.3		83.1	57.2	73		63.4	41.1		77.9	62.8	62.2
SIEVE 1"			100											
SIEVE 1/2"	100		87			100				100		96	100	
SIEVE 1/4"			90									100		
SIEVE 3/8"	99	100	86		100	93			100	99		90	98	
SIEVE NO. 004	99	98	85		98	93	100		98	95		88	97	100
SIEVE NO. 010	97	97	83		96	90	97		96	88		86	96	100
SIEVE NO. 020	96	94	81		93	86	95		93	77		85	94	98
SIEVE NO. 040	95	93	79		92	78	92		84	66		84	89	95
SIEVE NO. 060	92	86	78		89	70	88		76	57		82	80	88
SIEVE NO. 100	84	78	78		86	62	82		69	48		80	71	76
SIEVE NO. 200	75	72	77		83	57	73		63	41		78	63	62
TOTAL ORGANIC CARBON		3.2	3.1	3		3.4	3.5	3.9		2.3	3.6		3.3	2.4
Miscellaneous Parameters (s.u.)														
PH	9	8.4	8.4		8.4	8.5	8.5		8	7.9		8.4	8.4	8.3

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-001 20081106 0 2 FT	TRP1-SD-001 20081106 2 4 FT	TRP1-SD-001 20081106 4 6 FT	TRP1-SD-001 20081106 0 1 FT	TRP1-SD-002 20081107 0 2 FT	TRP1-SD-002 20081107 2 4 FT	TRP1-SD-002 20081107 4 6 FT	TRP1-SD-002 20081107 0 1 FT	TRP1-SD-003 20081107 0 2 FT	TRP1-SD-003 20081107 2 4 FT	TRP1-SD-003 20081107 0 1 FT	TRP1-SD-004 20081107 0 2 FT	TRP1-SD-004 20081107 2 4 FT	TRP1-SD-004 20081107 4 6 FT
Miscellaneous Parameters (ppt)														
SALINITY	0.6	0.6	0.5 U		0.7	0.5	0.5		0.5	0.5 U		0.7	0.6	0.5 U
Petroleum Hydrocarbons (mg/kg)														
EXTRACTABLE PETROLEUM HYDROCARBONS		830	3000	3000		480	4700	240		530	260		1100	7300
TCLP Inorganics (µg/l)														
ARSENIC	12.6	12	16.4		17.8	15.8	10.7		14.3	12.8		16.3	9.5 J	11.4
BARIUM	151	248	186		179	129	414		189	168		64.9	308	267
CADMIUM	0.14 U	0.14 U	3.1		0.14 U	0.14 U	0.14 U		0.14 U	2.7		0.14 U	0.14 U	1.3 U
CHROMIUM	20.5	15.7	12.7		3.4	6.4	18.6		3.3	5		1.3 J	7.1	5.9
LEAD	3.3 J	6.2 J	397 J		8.4 J	3.4 J	14.6 J		20.1 J	484 J		2.2 UJ	11	351
MERCURY	0.02 U	0.031 U	0.022 U		0.016 U	0.016 U	0.016 U		0.044 U	0.016 U		0.016 U	0.016 U	0.022 U
SELENIUM	23.4 U	36.6 U	16.5 U		26.3 U	27.5 U	28.8 U		23.8 U	15.6 U		24.3 U	26.3 U	14.1 U
SILVER	0.59 U	0.59 U	0.59 U		0.59 U	0.59 U	0.59 U		0.59 U	0.59 U		0.59 U	0.59 U	0.59 U

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-004 20081107 0 1 FT	TRP1-SD-005 20081107 0 2 FT	TRP1-SD-005 20081107 2 4 FT	TRP1-SD-005 20081107 4 6 FT	TRP1-SD-005 20081107 0 1 FT	TRP1-SD-006 20081107 0 2 FT	TRP1-SD-006 20081107 2 3 FT	TRP1-SD-006 20081107 0 1 FT	TRP1-SD-007 20081106 0 2 FT	TRP1-SD-007 20081106 2 4 FT	TRP1-SD-007 20081106 4 6 FT	TRP1-SD-007 20081106 0 1 FT	TRP1-SD-008 20081105 0 2 FT	TRP1-SD-008 20081105 2 4 FT
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	12		26	200	11		200	36		7.2 U	110	22		220
2-METHYLNAPHTHALENE	15		45	270	19		140	51		20	51	60		78
ACENAPHTHENE	100		140	620	110		1500	290		30	2100	490		4900
ACENAPHTHYLENE	180		340	560	170		250	120		170	230	760		490
ANTHRACENE	390		1300	3000	620		1400	260		330	2300	3100		2700
BENZO(A)ANTHRACENE	1700		4700	8700	1700		3100	660		960	3800	12000		5100
BENZO(A)PYRENE	1100		2300	4400	1200		1200	470		980	2700	5300		2700
BENZO(B)FLUORANTHENE	1800		4100	6200	1700		2200	700		1400	3700	7800		3900
BENZO(G,H,I)PERYLENE	450		970	1800	460		400	250		480	1400	1900		1100
BENZO(K)FLUORANTHENE	600		1400	3300	570		630	340		650	2200	4100		2100
CHRYSENE	1700		4400	8300	1900		3300	790		1200	4700	13000		6100
DIBENZO(A,H)ANTHRACENE	130		280	450	150		140	76		170	640	710 J		450 J
FLUORANTHENE	3100		16000	23000	4100		15000	2600		1500	14000	52000		21000
FLUORENE	85		300	450	140		1400	180		59	1500	800		2300
HEXACHLOROBENZENE	8.9 U		7 U	6.8 U	8.2 U		7.5 U	8.7 U		7.2 U	6.4 U	9.2 U		8.7 U
HIGH MOLECULAR WEIGHT PAHS	11330		38680	63850	12050		31340	6596		7610	37840	119010		51350
INDENO(1,2,3-CD)PYRENE	420		1000	1800	450		390	230		470	1300	2000		1100
LOW MOLECULAR WEIGHT PAHS	1214		3845	9800	1710		10600	1781		1061	13040	7661		15188
NAPHTHALENE	24		320	2700	21		210	120		22	59	51		120
PHENANTHRENE	420		1400	2200	630		5700	760		430	6800	2400		4600
PYRENE	3600		11000	19000	3000		8600	2000		2800	12000	36000		16000
Pesticides/PCBs (µg/kg)														
4,4'-DDD	1.8 U		6.9 U	6.7 U	1.6 U		7.4 U	1.7 U		4.8 U	18 J	6.5 UJ		1.8 U
4,4'-DDE	3.6 J		6.9 U	10 J	1.6 U		7.4 U	1.2 J		12	27 J	19		3 J
4,4'-DDT	2.8 R		6.9 U	20	1.6 U		7.4 U	1.7 UJ		22 J	36 J	59 J		12 J
ALDRIN	0.91 U		3.6 U	3.5 U	0.89 J		3.8 U	0.88 U		2.5 U	5.9	3.4 U		1
ALPHA-CHLORDANE	0.91 U		3.6 U	3.5 U	0.84 U		3.8 U	0.88 U		2.5 U	2.5 U	3.4 U		0.91 U
AROCLOR-1016		67 U	70 U	68 U		89 U	75 U		79 U	71 U	64 U		71 U	86 U
AROCLOR-1221		67 U	70 U	68 U		89 U	75 U		79 U	71 U	64 U		71 U	86 U
AROCLOR-1232		67 U	70 U	68 U		89 U	75 U		79 U	71 U	64 U		71 U	86 U
AROCLOR-1242		67 U	70 U	68 U		89 U	75 U		79 U	71 U	64 U		71 U	86 U
AROCLOR-1248		67 U	70 U	68 U		89 U	75 U		79 U	71 U	64 U		71 U	86 U
AROCLOR-1254		67 U	72	530		89 U	75 U		100	420	370		420	260
AROCLOR-1260		67 U	70 U	68 U		89 U	75 U		79 U	71 U	64 U		71 U	86 U
CIS-NONACHLOR	1.7 R		3.6 U	10 J	0.84 UJ		5.2 R	1.2 R		5 R	25 J	6.3 J		7.5 J
DIELDRIN	1.8 U		6.9 U	6.7 U	1.6 U		7.4 U	1.7 U		4.8 U	20 J	13 J		1.8 U
ENDOSULFAN I	0.91 U		3.6 U	3.5 U	0.84 U		3.8 U	0.88 U		2.5 U	2.5 U	3.4 U		0.91 U
ENDOSULFAN II	1.8 U		6.9 U	6.7 U	1.6 U		7.4 U	1.7 U		4.8 U	4.9 U	6.5 U		1.8 U
ENDRIN	1.8 U		6.9 U	6.7 U	1.6 U		7.4 U	1.7 U		4.8 U	4.9 U	6.5 U		1.8 U
GAMMA-BHC (LINDANE)	0.91 U		3.6 U	3.5 U	1.6 J		3.8 U	1.2 J		2.5 U	5.6 R	3.4 U		0.91 U
GAMMA-CHLORDANE	2.1 J		3.6 U	4.5 J	0.84 U		3.8 U	0.88 U		6.9 R	2.5 U	6.6 R		3.4
HEPTACHLOR	0.91 U		3.6 U	3.5 U	0.84 U		3.8 U	0.88 U		2.5 U	7.9	3.4 U		0.91 U
HEPTACHLOR EPOXIDE	0.91 U		3.6 U	3.5 U	0.84 U		3.8 U	0.88 U		9.8 J	4.2 R	17 J		5.3 J
METHOXYCHLOR	9.7 R		36 U	35 U	9.5 J		38 U	8.8 U		25 UJ	25 UJ	34 UJ		9.1 U
OXYCHLORDANE	0.34 R		31 J	41 J	13 J		21	12 J		9.6 R	2.5 U	3.4 U		4.6 R
PCB-101	2.6 U		8.9 J	2 U	3.3 R		4.2 R	7.6 J		24 J	47	8.1		100 J
PCB-105	2.6 U		2.1 U	2 U	2.5 U		2.3 U	2.6 J		6.9 J	17 J	4.5 J		39 J
PCB-118	8.3 J		5.8 J	4.9 J	5.8 J		5 J	8.3 J		15 J	75 J	18 J		140 J
PCB-128	2.6 U		2.1 U	2 U	2.5 U		2.3 U	2.5 U		2.6 J	5.4 J	2.5 U		13 J
PCB-138	2.6 U		6	2 U	3.8		5.6	5.3 J		17 J	39 J	10		79 J
PCB-153	2.6 U		6	2 U	3.3 J		3.6 J	6.3 J		16 J	33 J	7.5 J		63 J
PCB-170	2.6 U		2.1 U	2 U	2.5 U		2.3 U	3.6 J		2.4 J	11 J	4.8		10 J

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-004 20081107 01 FT	TRP1-SD-005 20081107 02 FT	TRP1-SD-005 20081107 24 FT	TRP1-SD-005 20081107 46 FT	TRP1-SD-005 20081107 01 FT	TRP1-SD-006 20081107 02 FT	TRP1-SD-006 20081107 23 FT	TRP1-SD-006 20081107 01 FT	TRP1-SD-007 20081106 02 FT	TRP1-SD-007 20081106 24 FT	TRP1-SD-007 20081106 46 FT	TRP1-SD-007 20081106 01 FT	TRP1-SD-008 20081105 02 FT	TRP1-SD-008 20081105 24 FT
Pesticides/PCBs (µg/kg) Continued														
PCB-18	2.6 U		9.5 R	2 U	6.9		3	31		3.9 J	11	15 J		23 R
PCB-180	2.6 U		4.9 J	2 U	2.5 U		2.3 J	2.8 J		4.6 J	13 J	4.4 J		14 J
PCB-183	2.6 U		2.1 U	2 U	2.5 U		2.3 U	2.5 U		1.7 U	2.1 J	2.5 U		2.7 U
PCB-184	2.6 UJ		2.1 U	2 UJ	2.5 U		2.3 U	2.5 U		1.7 U	1.8 U	2.5 U		2.7 U
PCB-187	2.6 UJ		2.1 U	2 UJ	2.5 U		2.3 U	2.5 U		1.7 UJ	3.5 J	2.5 UJ		3.4 R
PCB-195	2.6 U		2.1 U	2 U	2.5 U		2.3 U	2.5 U		1.7 U	1.9 J	2.5 U		2.7 U
PCB-206	2.6 UJ		2.7	2 UJ	2.7		2.3 U	3 J		1.8 J	5 J	2.5 U		2.7 U
PCB-209	2.6 UJ		2.1 U	2 UJ	2.5 U		2.3 U	2.5 U		1.7 U	1.8 U	45 J		2.7 U
PCB-28	2.6 UJ		14 J	2 UJ	2.5 U		4.1 R	23 J		10 J	17 J	3.3 R		17 J
PCB-44	2.6 U		9.6 J	2 U	3.9 J		2.3 U	8.7 J		9.2	19	6.1 J		34
PCB-49	21 J		2.1 U	3.2 J	2.5 U		4.6 R	3.5 R		3.5 R	4.8 R	2.5 U		2.7 U
PCB-52	2.6 UJ		13 J	2 UJ	2.5 U		2.3 U	9.9 J		18 J	34	7.1 J		79
PCB-66	2.6 U		2.1 U	2 U	2.5 U		3 R	4.8 R		1.7 U	1.8 U	2.5 U		2.7 U
PCB-8	2.6 U		9.5 J	2 U	5.9 J		2.3 U	3.9 R		2.3	5.6 J	2.7 R		14 R
PCB-87	4.5 J		2.1 U	4.1 J	3.2 J		3.9 J	5.9		9.8 J	50	4.4 J		52
TOTAL AROCLOR		0 U	72	530		0 U	0 U		100	420	370		420	260
TOTAL DDT	4.5		10.35 U	33.35	2.4 U		11.1 U	2.9		36.4	81	81.25		15.9
TOTAL PCB CONGENERS	60.8		175.5	43.8	89.6		62	234.2		274.2	678.4	273.5		1186.8
TOXAPHENE	91 U		360 U	350 U	84 U		380 U	88 U		250 U	250 U	340 U		91 U
TRANS-NONACHLOR	13 J		19	21	10 J		13	7.4 J		19	2.5 U	24		8.8 J
Inorganics (mg/kg)														
ARSENIC	13.8 J		10.2	8.7	8.3		12.8 J	12.9 J		18.4 J	23.3 J	15.6 J		13.4 J
CADMIUM	0.65 J		0.47 J	1.3 J	0.38 J		1 J	0.48 J		1.1 J	3 J	0.54 J		0.83 J
CHROMIUM	71 J		42.6 J	113 J	40.1 J		60.4 J	62.7 J		167 J	142 J	76.3 J		130 J
COPPER	130 J		78.7 J	201 J	64.9 J		463 J	80.6 J		1600 J	8620 J	791 J		1010 J
LEAD	119 J		62.1 J	253 J	79.8 J		80.8 J	88.4 J		1170 J	661 J	192 J		690 J
MERCURY	0.46 J		0.33 J	12.7 J	0.25 J		0.48 J	0.33 J		0.97 J	2.3 J	0.37 J		0.64 J
NICKEL	27.5 J		18.9 J	51.3 J	16.4 J		28.7 J	25.8 J		482	188	40.3		278
SELENIUM	6.5		1.5	3.5	1.8		4.5 U	5.9 U		14.6	9.8	7.6		8.6
ZINC	230 J		111 J	669 J	108 J		341 J	156 J		4660 J	2640 J	410 J		2470 J
Miscellaneous Parameters (lb/f3)														
BULK DENSITY		87.4	82.6	90.3		76.6	79		87.2	96.7	87		89.2	85.4
DRY BULK DENSITY		38.3	41	46.9		28.2	34.3		37.2	53	45		42.2	33.5
Miscellaneous Parameters (%)														
PERCENT GRAVEL		10.4	10.6	8.5		0	21.2		5.6	3.2	0		0.4	1
PERCENT MOISTURE		128	101	92.6		172	131		134	82.5	93.2		111	155
PERCENT SAND		28.2	19.1	33.4		32.2	18.5		23.8	40.9	28.1		38.3	28.4
PERCENT SILT/CLAY		61.4	70.3	58.1		67.8	60.3		70.6	55.9	71.9		61.3	70.6
SIEVE 1"														
SIEVE 1/2"		97	100	100			92		100					100
SIEVE 1/4"		100					100							
SIEVE 3/8"		94	96	95			83		99	100			100	100
SIEVE NO. 004		90	89	91		100	79		94	97	100		100	99
SIEVE NO. 010		84	84	88		99	73		91	94	97		98	97
SIEVE NO. 020		79	80	82		99	68		87	86	91		95	94
SIEVE NO. 040		74	78	75		97	66		84	75	86		87	88
SIEVE NO. 060		68	76	69		94	64		80	67	82		77	82
SIEVE NO. 100		64	73	63		83	62		75	61	77		68	76
SIEVE NO. 200		61	70	58		68	60		71	56	72		61	71
TOTAL ORGANIC CARBON	3.9		3.6	3.1	3.8		3.7	4		3.4	4.1	4.4		3.2
Miscellaneous Parameters (s.u.)														
PH		8.4	8.4	8.4		8.4	8.5		7.9	8.4	8.4		8	8.4

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-004 20081107 0 1 FT	TRP1-SD-005 20081107 0 2 FT	TRP1-SD-005 20081107 2 4 FT	TRP1-SD-005 20081107 4 6 FT	TRP1-SD-005 20081107 0 1 FT	TRP1-SD-006 20081107 0 2 FT	TRP1-SD-006 20081107 2 3 FT	TRP1-SD-006 20081107 0 1 FT	TRP1-SD-007 20081106 0 2 FT	TRP1-SD-007 20081106 2 4 FT	TRP1-SD-007 20081106 4 6 FT	TRP1-SD-007 20081106 0 1 FT	TRP1-SD-008 20081105 0 2 FT	TRP1-SD-008 20081105 2 4 FT
Miscellaneous Parameters (ppt)														
SALINITY		0.6	0.5	0.5		0.8	0.7		0.7	0.6	0.5		0.5	0.9
Petroleum Hydrocarbons (mg/kg)														
EXTRACTABLE PETROLEUM HYDROCARBONS	290		240 J	1000	280		160	200		270	2300	760		520
TCLP Inorganics (µg/l)														
ARSENIC		18.2	19.3	8.2 J		14.5	25		31.2	25.4	5.3 U		5.3 U	5.3 U
BARIUM		110	144	209		105	131		66.6	87.5	431		160	137
CADMIUM		0.14 U	0.14 U	0.14 U		0.14 U	0.14 U		0.14 U	0.14 U	0.14 U		0.14 U	0.14 U
CHROMIUM		1.6 J	1.1 U	1.7 J		5.6	1.1 J		1.6	1.4	8.8		8	6.3
LEAD		5.7	2.2 U	2.2 U		2.2 UJ	3.6 J		2.2 U	2.2 U	2.2 U		2.2 U	2.2 U
MERCURY		0.016 U	0.016 U	0.016 U		0.016 U	0.038 U		0.016 U	0.035	0.016 U		0.016 U	0.016 U
SELENIUM		22 U	21.5 U	25.3 U		28.5 U	29.7 U		17.3 U	25.6 U	23.1 U		16.3 U	14.4 U
SILVER		0.59 U	0.59 U	1.6 U		0.59 U	0.59 U		0.59 U	0.59 U	0.59 U		0.59 U	0.59 U

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-008 20081105 4 6 FT		TRP1-SD-008 20081105 0 1 FT		TRP1-SD-009 20081105 0 2 FT		TRP1-SD-009 20081105 2 4 FT		TRP1-SD-009 20081105 4 6 FT		TRP1-SD-009 20081105 0 1 FT		TRP1-SD-010 20081105 0 2 FT		TRP1-SD-010 20081105 2 4 FT		TRP1-SD-010 20081105 4 6 FT		TRP1-SD-010 20081105 0 1 FT	
PAHs (µg/kg)																				
1-METHYLNAPHTHALENE	31		11	U			12		19		7.5	U			7.7		40		6.9	U
2-METHYLNAPHTHALENE	35		31				21		32		16				19		49		21	
ACENAPHTHENE	250		150				600		290		32				82		220		31	
ACENAPHTHYLENE	260		440				150		180		150				140		120		180	
ANTHRACENE	620		1200				660		750		480				840		770		410	
BENZO(A)ANTHRACENE	2000		3300				2100		1700		1600				1600		2100		950	
BENZO(A)PYRENE	1700		2400				1100		1200		1100				1200		1600		930	
BENZO(B)FLUORANTHENE	2300		3400				1600		1700		1700				1600		2200		1400	
BENZO(G,H,I)PERYLENE	690		1100				380		630		480				540		800		500	
BENZO(K)FLUORANTHENE	560		1700				600		810		880				860		1100		490	
CHRYSENE	2400		4100				2100		2000		1800				1700		2400		1300	
DIBENZO(A,H)ANTHRACENE	280		370				150		180		160				190		240		180	
FLUORANTHENE	4500		7800				6400		4900		1800				5300		7000		1800	
FLUORENE	200		240				280		340		77				170		320		71	
HEXACHLOROBENZENE	7.6	U	11	U			9.4	U	8	U	7.5	U			5.4	U	6	U	6.9	U
HIGH MOLECULAR WEIGHT PAHS	15580		24070				16050		13880		9660				14690		19240		8360	
INDENO(1,2,3-CD)PYRENE	680		1000				390		560		480				530		730		480	
LOW MOLECULAR WEIGHT PAHS	2559		3295				2385		3833		1296				4070		3909		1399	
NAPHTHALENE	94		34				24		41		21				19		130		16	
PHENANTHRENE	1100		1200				650		2200		520				2800		2300		670	
PYRENE	4700		6100				4200		3900		3200				4700		5900		3200	
Pesticides/PCBs (µg/kg)																				
4,4'-DDD	7.7	J	2.1	U			3.4	UJ	3	U	8.2	UJ			2	U	6.2	U	8.5	UJ
4,4'-DDE	6.6	U	2.1	U			3.4	U	3	U	8.4	J			5	R	35	R	8.5	U
4,4'-DDT	21	J	2.1	UJ			3.4	UJ	3	UJ	27	J			9.3	J	33	J	12	R
ALDRIN	3.4	U	1.1	U			1.8	U	1.6		4.2	U			1	U	3.2	U	4.4	U
ALPHA-CHLORDANE	3.4	U	1.1	U			1.8	U	1.6	U	4.2	U			1	U	3.2	U	4.4	U
AROCLOR-1016	76	U			94	U	94	U	80	U			72	U	54	U	61	U		
AROCLOR-1221	76	U			94	U	94	U	80	U			72	U	54	U	61	U		
AROCLOR-1232	76	U			94	U	94	U	80	U			72	U	54	U	61	U		
AROCLOR-1242	76	U			94	U	94	U	80	U			72	U	54	U	61	U		
AROCLOR-1248	76	U			94	U	94	U	80	U			72	U	54	U	61	U		
AROCLOR-1254	890				210		94	U	91				190		300		390	R		
AROCLOR-1260	76	U			94	U	94	U	80	U			72	U	54	U	61	U		
CIS-NONACHLOR	8.9	J	2.2	J			1.8	U	1.6	UJ	14	R			6.8	R	3.2	U	11	J
DIELDRIN	6.6	U	2.1	U			3.4	U	3	U	8.8	J			2	U	17	R	8.5	U
ENDOSULFAN I	3.4	U	1.1	U			1.8	U	1.6	U	4.2	U			1	U	3.2	U	4.4	U
ENDOSULFAN II	6.6	U	2.1	U			3.4	U	3	U	8.2	U			2	U	6.2	U	8.5	U
ENDRIN	6.6	U	2.1	U			3.4	U	3	U	8.2	U			2	U	6.2	U	8.5	U
GAMMA-BHC (LINDANE)	3.4	U	1.1	U			3.2		1.7	J	4.2	U			1	U	3.2	U	4.4	U
GAMMA-CHLORDANE	3.4	U	1.8	J			6.4	J	1.6	U	5.8	R			3.6	R	11	R	4.4	U
HEPTACHLOR	3.4	U	1.1	U			1.8	U	1.6	U	4.2	U			1	U	3.2	U	4.4	U
HEPTACHLOR EPOXIDE	9.7	J	1.1	U			1.8	U	1.8		4.2	U			3.7	J	13		4.4	U
METHOXYCHLOR	34	UJ	11	U			18	UJ	16	UJ	42	UJ			10	U	32	U	44	UJ
OXYCHLORDANE	11	J	1.1	U			1.8	U	1.6	U	11	R			1	U	5.6	R	4.4	U
PCB-101	43	J	9.1	J			10	J	41		38				31		82		9.2	J
PCB-105	12	J	3	U			3.3	J	18	J	11	J			9.5	J	21	J	2.8	
PCB-118	57	J	19	J			17	J	76	J	48	J			47	J	93	J	15	J
PCB-128	3.8	J	3	U			2.5	U	8.3	J	3.7	J			2.9	J	6.8	J	2.5	U
PCB-138	28	J	8.2				8.8	J	47	J	26	J			20	J	47	J	12	
PCB-153	28		7.7				8.6		38		25				19		40	J	5.5	
PCB-170	4.1	J	3	U			2.7	R	7.4	J	3.9	J			5.1	J	13	J	2.5	U

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-008 20081105 4 6 FT		TRP1-SD-008 20081105 0 1 FT		TRP1-SD-009 20081105 0 2 FT	TRP1-SD-009 20081105 2 4 FT		TRP1-SD-009 20081105 4 6 FT		TRP1-SD-009 20081105 0 1 FT		TRP1-SD-010 20081105 0 2 FT	TRP1-SD-010 20081105 2 4 FT		TRP1-SD-010 20081105 4 6 FT		TRP1-SD-010 20081105 0 1 FT	
Pesticides/PCBs (µg/kg) Continued																		
PCB-18	8.2		7.2			13	J	6.4		9.3			5.2		12		3.5	
PCB-180	8.6		3.6	J		3.8	J	9.1	J	7	J		5.5	J	12	J	2.5	J
PCB-183	2.5	U	3	U		2.5	U	2.2	U	2.5	U		1.5	U	1.9	U	2.5	U
PCB-184	2.5	U	3	U		2.5	U	2.2	U	2.5	U		1.5	U	1.9	U	2.5	U
PCB-187	2.7	R	3	UJ		2.5	UJ	2.2	UJ	2.5	UJ		1.8	R	3.6	R	2.5	UJ
PCB-195	2.5	U	3	U		2.5	U	2.2	U	2.5	U		1.5	U	1.9	U	2.5	U
PCB-206	3.5	J	4.7	J		3.2	J	2.7	J	3.8	J		2.2		6.3		2.5	U
PCB-209	2.5	U	3	U		2.5	U	2.2	U	2.5	U		1.5	U	2.4	R	2.5	U
PCB-28	18		3.6	R		18		17		18			8.3		18		3.1	R
PCB-44	13		7.7	J		18		9.2	J	14			8.1		20		13	J
PCB-49	9.4	J	8.4			6.6	R	5.6	J	7.4	J		5.3	J	11	J	7.7	J
PCB-52	30	J	5.8	R		15	J	23	J	27			19		46		5.2	R
PCB-66	2.5	U	13			7.2	J	2.2	U	2.5	U		1.5	U	2.9	R	13	
PCB-8	8.6	J	3	U		4.9	J	4.6	J	2.5	U		4.5	J	6.7	J	2.8	R
PCB-87	25	J	3.2	J		3.1	J	23		16			17		61	J	5.2	J
TOTAL AROCLOR	890				210	0	U	91				190	300		0	U		
TOTAL DDT	32		3.15	U		5.1	U	4.5	U	39.5			10.3		36.1		8.5	
TOTAL PCB CONGENERS	539.1		181.4			271.6		624.2		481.9			379.1		849.5		168	
TOXAPHENE	340	U	110	U		180	U	160	U	420	U		100	U	320	U	440	U
TRANS-NONACHLOR	22	J	7.8			6.4		1.6	U	8.6			2.6	R	25		17	J
Inorganics (mg/kg)																		
ARSENIC	12.9	J	15.4	J		15.8	J	12.3	J	10.3	J		12	J	14.5	J	12.4	J
CADMIUM	0.89	J	0.45	J		0.7	J	1.2	J	1	J		1.5	J	1.9	J	0.47	J
CHROMIUM	93.7	J	66.9	J		82.9	J	95.5	J	84.3	J		101	J	88.9	J	56.8	J
COPPER	576	J	226	J		181	J	255	J	190	J		670	J	625	J	201	J
LEAD	416	J	148	J		139	J	228	J	228	J		665	J	327	J	163	J
MERCURY	0.89	J	0.57	J		0.52	J	0.72	J	0.6	J		1.6	J	4.3	J	0.47	J
NICKEL	127		28.4			38.8		57.1		41.5			146		67.9		30.9	
SELENIUM	7.9		6.9			6.3		6.1		4.7			5.6		6		4.3	
ZINC	1200	J	257	J		249	J	433	J	387	J		1860	J	975	J	356	J
Miscellaneous Parameters (lb/f3)																		
BULK DENSITY	87.3				81.4	81.7		86.7				101	113		95.2			
DRY BULK DENSITY	37.1				29.2	29.4		36.6				59.8	74.1		49.3			
Miscellaneous Parameters (%)																		
PERCENT GRAVEL	6.9				0.8	1.1		3.9				46.5	29.7		6			
PERCENT MOISTURE	135				179	178		137				69.5	52.9		93.2			
PERCENT SAND	26.6				6.2	5.1		16				29.3	39.2		40.7			
PERCENT SILT/CLAY	66.5				93	93.8		80.1				24.2	31.1		53.3			
SIEVE 1"	100																	
SIEVE 1/2"	93					100		96				81	85		100			
SIEVE 1/4"	93							100				100	100					
SIEVE 3/8"	93				100	99		96				71	75		100			
SIEVE NO. 004	93				99	99		96				53	70		94			
SIEVE NO. 010	92				98	98		95				48	62		92			
SIEVE NO. 020	91				97	98		94				42	56		87			
SIEVE NO. 040	86				96	97		93				37	45		78			
SIEVE NO. 060	80				96	97		90				33	40		70			
SIEVE NO. 100	73				95	96		85				29	36		61			
SIEVE NO. 200	67				93	94		80				24	31		53			
TOTAL ORGANIC CARBON	3.6		4.5			3.5		3.7		3.5			2.5		3.3		4.3	
Miscellaneous Parameters (s.u.)																		
PH	8.2				8.1	7.7		8.2				7.7	8		8.3			

TABLE 1

SUMMARY OF OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNETICUT

PARAMETER	TRP1-SD-008 20081105 4 6 FT		TRP1-SD-008 20081105 0 1 FT		TRP1-SD-009 20081105 0 2 FT		TRP1-SD-009 20081105 2 4 FT		TRP1-SD-009 20081105 4 6 FT		TRP1-SD-009 20081105 0 1 FT		TRP1-SD-010 20081105 0 2 FT		TRP1-SD-010 20081105 2 4 FT		TRP1-SD-010 20081105 4 6 FT		TRP1-SD-010 20081105 0 1 FT	
Miscellaneous Parameters (ppt)																				
SALINITY	0.8				0.8		0.8		0.6				0.5		0.5	U	0.5			
Petroleum Hydrocarbons (mg/kg)																				
EXTRACTABLE PETROLEUM HYDROCARBONS	460		280				220		480		250				400		1100		160	
TCLP Inorganics (µg/l)																				
ARSENIC	6	J			5.3	U	8.1	J	20.4				15.2		9.3	J	5.3	U		
BARIUM	134				103		138		184				84.9		232		541			
CADMIUM	0.14	U			0.14	U	0.14	U	0.14	U			0.14	U	0.14	U	0.14	U		
CHROMIUM	12.8				6.2		9.7		11.6				7.5		9.1		14.7			
LEAD	2.2	U			2.2	U	2.3	J	2.2	U			6.7		3.1	J	2.2	U		
MERCURY	0.016	U			0.016	U	0.18		0.016	U			0.016	U	0.016	U	0.016	U		
SELENIUM	32.4	U			16.2	U	27.7	U	29.9	U			31.7	U	28	U	25.7	U		
SILVER	0.59	U			3.6	U	0.59	U	0.59	U			0.59	U	0.59	U	3.8	U		

J Estimated value
R Rejected
U Nondetect at indicated analytical detection limit
UJ Estimated nondetect at the estimated analytical detection limit

TABLE 2

FREQUENCY OF DETECTION INFORMATION FOR OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Sample with Maximum Detection	Minimum Nondetect	Maximum Nondetect	Average of Detected Concentrations	Overall Average
PAHs (µg/kg)								
1-METHYLNAPHTHALENE	23/28	7.7	220	TRP1-SD-008A-0204	6.9	11	62.38	51.94
2-METHYLNAPHTHALENE	28/28	15	270	TRP1-SD-005A-0406	---	---	53.32	53.32
ACENAPHTHENE	28/28	20	4900	TRP1-SD-008A-0204	---	---	508.46	508.46
ACENAPHTHYLENE	28/28	120	760	TRP1-SD-007B-0001	---	---	266.79	266.79
ANTHRACENE	28/28	150	3100	TRP1-SD-007B-0001	---	---	1032.86	1032.86
BENZO(A)ANTHRACENE	28/28	350	12000	TRP1-SD-007B-0001	---	---	2707.86	2707.86
BENZO(A)PYRENE	28/28	390	5300	TRP1-SD-007B-0001	---	---	1700.36	1700.36
BENZO(B)FLUORANTHENE	28/28	520	7800	TRP1-SD-007B-0001	---	---	2504.29	2504.29
BENZO(G,H,I)PERYLENE	28/28	230	1900	TRP1-SD-007B-0001	---	---	717.50	717.50
BENZO(K)FLUORANTHENE	28/28	290	4100	TRP1-SD-007B-0001	---	---	1206.79	1206.79
CHRYSENE	28/28	430	13000	TRP1-SD-007B-0001	---	---	3086.43	3086.43
DIBENZO(A,H)ANTHRACENE	28/28	68	710 J	TRP1-SD-007B-0001	---	---	240.39	240.39
FLUORANTHENE	28/28	600	52000	TRP1-SD-007B-0001	---	---	8217.86	8217.86
FLUORENE	28/28	45	2300	TRP1-SD-008A-0204	---	---	417.54	417.54
HIGH MOLECULAR WEIGHT PAHS	28/28	3238	119010	TRP1-SD-007B-0001	---	---	22824.32	22824.32
INDENO(1,2,3-CD)PYRENE	28/28	200	2000	TRP1-SD-007B-0001	---	---	698.93	698.93
LOW MOLECULAR WEIGHT PAHS	28/28	600	15188	TRP1-SD-008A-0204	---	---	4124.21	4124.21
NAPHTHALENE	28/28	16	2700	TRP1-SD-005A-0406	---	---	170.96	170.96
PHENANTHRENE	28/28	210	6800	TRP1-SD-007A-0406	---	---	1674.29	1674.29
PYRENE	28/28	1400	36000	TRP1-SD-007B-0001	---	---	6871.43	6871.43
Pesticides/PCBs (µg/kg)								
4,4'-DDD	5/28	3.6 J	65 J	TRP1-SD-004A-0406	1.6	15	19.62	6.00
4,4'-DDE	13/26	1.2 J	39	TRP1-SD-001A-0204	1.6	14	11.87	7.54
4,4'-DDT	14/22	7 J	72 J	TRP1-SD-001A-0204	1.6	7.4	27.02	17.93
ALDRIN	5/28	0.49 J	5.9	TRP1-SD-007A-0406	0.72	7.6	1.98	1.76
ALPHA-CHLORDANE	1/28	1.1 J	1.1 J	TRP1-SD-002A-0204	0.54	7.6	1.10	1.55
AROCLOR-1254	19/27	57 J	890	TRP1-SD-008A-0406	59	94	280.89	209.13
AROCLOR-1260	2/28	160 J	360	TRP1-SD-002A-0406	52	94	260.00	52.52
CIS-NONACHLOR	9/16	2.2 J	55 J	TRP1-SD-001A-0204	0.84	6.1	14.53	8.81
DIELDRIN	5/27	1.9 J	20 J	TRP1-SD-007A-0406	1.6	15	10.16	4.43
ENDOSULFAN I	1/28	9.2 J	9.2 J	TRP1-SD-001A-0204	0.54	7.2	9.20	1.71
GAMMA-BHC (LINDANE)	6/26	0.61 J	3.2	TRP1-SD-009A-0204	0.91	7.6	1.87	1.84
GAMMA-CHLORDANE	7/23	1.8 J	6.4 J	TRP1-SD-009A-0204	0.54	7.6	3.50	2.35
HEPTACHLOR	1/28	7.9	7.9	TRP1-SD-007A-0406	0.54	7.6	7.90	1.76
HEPTACHLOR EPOXIDE	11/27	0.69 J	27 J	TRP1-SD-001A-0204	0.84	7	9.58	4.84
METHOXYCHLOR	2/27	7 J	9.5 J	TRP1-SD-005B-0001	7.2	76	8.25	15.95
OXYCHLORDANE	11/22	11 J	41 J	TRP1-SD-005A-0406	0.72	7.6	22.45	11.89
PCB-101	22/24	5.6	100 J	TRP1-SD-008A-0204	2	2.6	27.62	25.42
PCB-105	21/28	2.1 J	39 J	TRP1-SD-008A-0204	2	3	9.58	7.49
PCB-118	28/28	3.8 J	140 J	TRP1-SD-008A-0204	---	---	27.71	27.71
PCB-128	8/26	2.6 J	13 J	TRP1-SD-008A-0204	1.5	3	5.81	2.57
PCB-138	26/28	3.8	79 J	TRP1-SD-008A-0204	2	2.6	19.07	17.79
PCB-153	26/28	3.3 J	63 J	TRP1-SD-008A-0204	2	2.6	17.24	16.09
PCB-170	13/22	2.4 J	13 J	TRP1-SD-010A-0406	2	3	6.76	4.49
PCB-18	21/26	3	31	TRP1-SD-006B-0001	1.5	2.6	8.97	7.43
PCB-180	24/27	2.3 J	21 J	TRP1-SD-002A-0406	2	2.6	6.96	6.32
PCB-183	6/28	2.1 J	4.8 J	TRP1-SD-002A-0406	1.5	3	3.07	1.54
PCB-184	2/28	2.2	2.5 J	TRP1-SD-001A-0204	1.5	3	2.35	1.19
PCB-187	7/23	1.9 J	5.8 J	TRP1-SD-002A-0406	1.5	3	3.43	1.83
PCB-195	2/28	1.9 J	2.4	TRP1-SD-002A-0406	1.5	3	2.15	1.18
PCB-206	20/27	1.8 J	15	TRP1-SD-001A-0406	2	2.7	5.31	4.24
PCB-209	8/26	3.1 J	45 J	TRP1-SD-007B-0001	1.5	3	13.99	5.10
PCB-28	19/24	1.7 J	25 J	TRP1-SD-002A-0406	1.7	2.6	14.69	11.85
PCB-44	22/27	1.7	34	TRP1-SD-008A-0204	1.7	2.6	11.69	9.71
PCB-49	10/19	3.2 J	21 J	TRP1-SD-004B-0001	1.5	2.7	8.62	5.05
PCB-52	21/25	3.6	79	TRP1-SD-008A-0204	2	2.6	21.77	18.47
PCB-66	6/24	7.2 J	26 J	TRP1-SD-002A-0406	1.5	2.7	13.73	4.23
PCB-8	16/23	2.3	9.5 J	TRP1-SD-005A-0204	1.5	3	5.23	3.98
PCB-87	27/28	3.1 J	61 J	TRP1-SD-010A-0406	2.1	2.1	15.94	15.41
TOTAL AROCLOR	19/28	57	1130	TRP1-SD-002A-0406	0	0	308.26	209.18
TOTAL DDT	22/28	2.9	118.5	TRP1-SD-001A-0204	2.4	11.1	32.81	26.44
TOTAL PCB CONGENERS	28/28	43.8	1186.8	TRP1-SD-008A-0204	---	---	328.40	328.40
TRANS-NONACHLOR	23/27	5 J	25	TRP1-SD-010A-0406	1.6	7.6	13.31	11.67
Inorganics (mg/kg)								
ARSENIC	28/28	5.1 J	23.3 J	TRP1-SD-007A-0406	---	---	12.58	12.58
CADMIUM	28/28	0.38 J	3.3 J	TRP1-SD-002A-0406	---	---	1.11	1.11
CHROMIUM	28/28	40.1 J	167 J	TRP1-SD-007A-0204	---	---	87.36	87.36
COPPER	28/28	62.1 J	8620 J	TRP1-SD-007A-0406	---	---	644.51	644.51
LEAD	28/28	62.1 J	1170 J	TRP1-SD-007A-0204	---	---	281.05	281.05
MERCURY	28/28	0.25 J	12.7 J	TRP1-SD-005A-0406	---	---	1.31	1.31
NICKEL	28/28	12.7 J	482	TRP1-SD-007A-0204	---	---	73.78	73.78
SELENIUM	23/28	1.5	14.6	TRP1-SD-007A-0204	4.5	5.9	5.86	5.28
ZINC	28/28	108 J	4660 J	TRP1-SD-007A-0204	---	---	772.39	772.39
Miscellaneous Parameters (lb/ft^3)								
BULK DENSITY	28/28	76.5	113	TRP1-SD-010A-0204	---	---	86.73	86.73
DRY BULK DENSITY	28/28	28.2	74.1	TRP1-SD-010A-0204	---	---	41.57	41.57
Miscellaneous Parameters (%)								
GRAVEL	28/28	0	46.5	TRP1-SD-010A-0002	---	---	7.32	7.32
SAND	28/28	5.1	53.8	TRP1-SD-003A-0204	---	---	27.16	27.16
SILT/CLAY	28/28	24.2	93.8	TRP1-SD-009A-0204	---	---	65.53	65.53
MOISTURE	28/28	52.9	179	TRP1-SD-009A-0002	---	---	116.33	116.33
SIEVE 1"	2/2	100	100	TRP1-SD-001A-0406	---	---	---	---
	2/2	100	100	TRP1-SD-008A-0406	---	---	---	---
SIEVE 1/2"	18/18	81	100	TRP1-SD-003A-0204	---	---	---	---
	18/18	81	100	TRP1-SD-009A-0204	---	---	---	---
	18/18	81	100	TRP1-SD-007A-0002	---	---	---	---
	18/18	81	100	TRP1-SD-010A-0406	---	---	---	---
	18/18	81	100	TRP1-SD-004A-0204	---	---	---	---
	18/18	81	100	TRP1-SD-001A-0002	---	---	---	---
	18/18	81	100	TRP1-SD-008A-0204	---	---	---	---
	18/18	81	100	TRP1-SD-002A-0204	---	---	---	---
	18/18	81	100	TRP1-SD-005A-0406	---	---	---	---
	18/18	81	100	TRP1-SD-005A-0204	---	---	---	---

TABLE 2

FREQUENCY OF DETECTION INFORMATION FOR OUTER PIER 1 2008 INVESTIGATION DATA
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Sample with Maximum Detection	Minimum Nondetect	Maximum Nondetect	Average of Detected Concentrations	Overall Average
Miscellaneous Parameters (%) Continued								
SIEVE 1/4"	8/8	90	100	TRP1-SD-010A-0002	---	---	---	---
	8/8	90	100	TRP1-SD-006A-0203	---	---	---	---
	8/8	90	100	TRP1-SD-005A-0002	---	---	---	---
	8/8	90	100	TRP1-SD-010A-0204	---	---	---	---
	8/8	90	100	TRP1-SD-004A-0002	---	---	---	---
	8/8	90	100	TRP1-SD-009A-0406	---	---	---	---
SIEVE 3/8"	24/24	71	100	TRP1-SD-010A-0406	---	---	---	---
	24/24	71	100	TRP1-SD-008A-0204	---	---	---	---
	24/24	71	100	TRP1-SD-009A-0002	---	---	---	---
	24/24	71	100	TRP1-SD-003A-0002	---	---	---	---
	24/24	71	100	TRP1-SD-001A-0204	---	---	---	---
	24/24	71	100	TRP1-SD-007A-0204	---	---	---	---
	24/24	71	100	TRP1-SD-008A-0002	---	---	---	---
	24/24	71	100	TRP1-SD-002A-0002	---	---	---	---
SIEVE NO. 004	28/28	53	100	TRP1-SD-006A-0002	---	---	---	---
	28/28	53	100	TRP1-SD-002A-0406	---	---	---	---
	28/28	53	100	TRP1-SD-004A-0406	---	---	---	---
	28/28	53	100	TRP1-SD-007A-0406	---	---	---	---
	28/28	53	100	TRP1-SD-008A-0002	---	---	---	---
SIEVE NO. 010	28/28	48	100	TRP1-SD-004A-0406	---	---	---	---
SIEVE NO. 020	28/28	42	99	TRP1-SD-006A-0002	---	---	---	---
SIEVE NO. 040	28/28	37	97	TRP1-SD-006A-0002	---	---	---	---
	28/28	37	97	TRP1-SD-009A-0204	---	---	---	---
SIEVE NO. 060	28/28	33	97	TRP1-SD-009A-0204	---	---	---	---
SIEVE NO. 100	28/28	29	96	TRP1-SD-009A-0204	---	---	---	---
SIEVE NO. 200	28/28	24	94	TRP1-SD-009A-0204	---	---	---	---
TOTAL ORGANIC CARBON	28/28	2.3	4.5	TRP1-SD-008B-0001	---	---	3.49	3.49
Miscellaneous Parameters (s.u.)								
PH	28/28	7.7	9	TRP1-SD-001A-0002	---	---	8.27	8.27
Miscellaneous Parameters (ppt)								
SALINITY	24/28	0.5	0.9	TRP1-SD-008A-0204	0.5	0.5	0.63	0.57
Petroleum Hydrocarbons (mg/kg)								
EXTRACTABLE TPH	28/28	160	7300	TRP1-SD-004A-0406	---	---	1100.36	1100.36
TCLP Inorganics (µg/L)								
ARSENIC	23/28	6 J	31.2	TRP1-SD-007A-0002	5.3	5.3	15.23	12.99
BARIUM	28/28	64.9	541	TRP1-SD-010A-0406	---	---	189.35	189.35
CADMIUM	2/28	2.7	3.1	TRP1-SD-001A-0406	0.14	1.3	2.90	0.29
CHROMIUM	27/28	1.1 J	20.5	TRP1-SD-001A-0002	1.1	1.1	7.69	7.43
LEAD	15/28	2.3 J	484 J	TRP1-SD-003A-0204	2.2	2.2	88.03	47.67
MERCURY	2/28	0.035	0.18	TRP1-SD-009A-0204	0.016	0.044	0.11	0.02

J Estimated

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	ERM	INNER PIER 1 SBP-1 0 - 0.5 ft SBP-1-GRAB 19991028	INNER PIER 1 SBP-2 0 - 0.5 ft SBP-2-GRAB 19991028	INNER PIER 1 SBP-3 0 - 0.5 ft SBP-3-GRAB 19991028	INNER PIER 1 SBP-4 0 - 0.5 ft SBP-4-GRAB 19991028	INNER PIER 1 SBP-4 0.75 - 1.0 ft SBP-4-CORE 19991028	OUTER PIER 1 SBP-5 0 - 0.5 ft SBP-5-GRAB 19991028	OUTER PIER 1 SBP-6 0 - 0.5 ft SBP-6-GRAB 19991028	OUTER PIER 1 SBP-7 0 - 0.5 ft SBP-7-GRAB 19991028
Low Molecular Weight PAHs (ug/kg)									
2-METHYLNAPHTHALENE		310 U	14	60 U	8	38 U	10	10	69 U
ACENAPHTHENE		4000	64	630	36	74	17	16	300
ACENAPHTHYLENE		380	140	330	49	80	81	55	79
ANTHRACENE		22000	780	3700	290	2500	250	180	1300
FLUORENE		6100	120	860	43	120	29	24	230
NAPHTHALENE		310 U	29	93	13	38 U	38	21	69 U
PHENANTHRENE		65000	1300	13000	1100	2900	370	360	5700
LOW MOLECULAR WEIGHT PAHS	3160	97790	2447	18643	1539	5712	795	666	7678
High Molecular Weight PAHs (ug/kg)									
BENZO(A)ANTHRACENE		22000	1500	6200	910	3000	630	430	6300
BENZO(A)PYRENE		13000	1200	3900	940	2600	610	390	5300
CHRYSENE		24000	1800	8500	1300	4900	730	850	8200
DIBENZO(A,H)ANTHRACENE		1600	180	580	150	400	89	58	1000
FLUORANTHENE		68000	3600	18000	2200	6900	1200	990	12000
PYRENE		56000	2300	15000	2100	7000	810	790	9400
HIGH MOLECULAR WEIGHT PAHS	9600	184600	10580	52180	7600	24800	4069	3508	42200
Pesticides/PCBs (ug/kg)									
4,4'-DDD		16 U	2.2 U	2.4 U	8.1	15 U	1.5 U	1.5 U	17
4,4'-DDE		16 U	2.2 U	2.4 U	0.90 U	15 U	1.5 U	1.5 U	1.4 U
4,4'-DDT		16 U	2.2 U	2.4 U	0.90 U	15 U	1.5 U	1.5 U	1.4 U
TOTAL DDT	46.1	24	3.3	3.6	9	22.5	2.25	2.25	18.4
PCB-8		16 U	2.2 U	2.4 U	1 U	15 U	1.5 U	1.5 U	1.4 U
PCB-18		16 U	2.2 U	2.4 U	1 U	15 U	1.5 U	1.5 U	1.4 U
PCB-28		16 U	2.2 U	2.4 U	0.99 U	15 U	1.5 U	1.5 U	1.4 U
PCB-44		230	2.2 U	2.4 U	2.6 U	15 U	1.5 U	1.5 U	1.4 U
PCB-52		340	5.2	6.9	3.2 U	33	1.5 U	1.5 U	1.4 U
PCB-66		310	2.2 U	9.3	3 U	20	1.5 U	1.5 U	1.4 U
PCB-101		470	23	86	16	130	6.6	2.2	18
PCB-105		410	4.8	24	4.8	50	2.1	1.5 U	1.4 U
PCB-118		603	13	41	7.6 U	92	1.5 U	1.5 U	1.4 U
PCB-128		220	2.8	6	0.90 U	26	1.5 U	1.5 U	1.4 U
PCB-138		590	18	52	6.8	120	2.3	1.5 U	1.4 U
PCB-153		560	10	39	7.9	73	3.5	1.5 U	11
PCB-170		84	2.2 U	32	2.1	15 U	1.6	1.5 U	1.4 U
PCB-180		150	2.2 U	5.2	0.90 U	15 U	1.5 U	1.5 U	1.4 U
PCB-187		58	2.2 U	2.4 U	0.90 U	15	1.5 U	1.5 U	1.4 U
PCB-195		16 U	2.2 U	2.4 U	0.90 U	15 U	1.5 U	1.5 U	1.4 U
PCB-206		16 U	2.2 U	2.4 U	0.90 U	15 U	1.5 U	1.5 U	1.4 U
PCB-209		16 U	8	59	16	15 U	6	5	42
TOTAL PCB CONGENERS	180	8146	191.6	737.6	131.09	1253	62.2	38.4	163
ALPHA-CHLORDANE	6	16 U	2.2 U	2.4 U	0.90 U	15 U	1.5 U	1.5 U	1.4 U
Inorganics (mg/kg)									
ARSENIC	70	16	16	19	14	13	12	13	8.3
CADMIUM	9.6	0.94	0.88	0.64	0.34	0.39	0.5	0.42	0.91
CHROMIUM	370	130	71	100	58	64	61	58	39
COPPER	270	980	430	870	300	570	120	79	140
LEAD	218	620	290	350	330	350	110	86	100
NICKEL	51.6	130	53	89	56	120	25	22	14
SELENIUM	1.4	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	410	1900	690	970	1200	1900	220	160	250

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	INNER PIER 1 P1-48 0 - 0.17 ft CAB-53 20030617	OUTER PIER 1 P1-50 0 - 0.17 ft CAB-56 20030617	OUTER PIER 1 P1-53 0 - 0.17 ft CAB-59 20030617	OUTER PIER 1 P1-55 0 - 0.17 ft CAB-61 20030617	INNER PIER 1 P1-C2 0 - 2.0 ft DAD-28-0002 20041011	INNER PIER 1 P1-C2 2.0 - 4.0 ft DAD-28-0204 20041011	INNER PIER 1 P1-C2 4.0 - 5.0 ft DAD-28-0405 20041011	OUTER PIER 1 P1-C3 0 - 2.58 ft DAD-29 -0003 20041011	OUTER PIER 1 P1-C4 0 - 2.0 ft DAD-30-0002 20041011
Low Molecular Weight PAHs (ug/kg)									
2-METHYLNAPHTHALENE	106.03	61.97	38.23	34.64	52.19	26.55	19.18	52.41	30.61
ACENAPHTHENE	2616.45	220.72	29.04	22.79	121.15	64.73	213.17	44	54.02
ACENAPHTHYLENE	64.48	64.12	27.7	21.73	74.97	40.63	16.01	175.19	92.39
ANTHRACENE	9578.41 D	952.08	334.34	239.39	1116	942.73	601.02	522.33	380.23
FLUORENE	4166.58	355.3	67.58	48.49	192.65	123.57	83.74	105.31	86.29
NAPHTHALENE	124.23	101.48	63.81	55.34	92.79	63.33	61.61	90.5	60.26
PHENANTHRENE	41362.46 D	3258.73	596.82	400.77	2317.82	1786.14	993.49	737.51	822.69
LOW MOLECULAR WEIGHT PAHS	58018.64	5014.4	1157.52	823.15	3967.57	3047.68	1988.22	1727.25	1526.49
High Molecular Weight PAHs (ug/kg)									
BENZO(A)ANTHRACENE	26359.94 D	4769.39	1270.48	742.9	3865.98	2659.19	1101.7	2238.4	1167.16
BENZO(A)PYRENE	17068.78 D	3420.77	1195.76	722.2	4329.69	2644.52	657.17	1864.69	1510.91
CHRYSENE	24955.11 D	5702.15	1735.59	1025.88	4350.83	3141.59	1147.05	2585.02	1635.16
DIBENZO(A,H)ANTHRACENE	2232.49 D	473.32	198.53	117.51	636.02	656.51	94.26	271.4	233.45
FLUORANTHENE	79548.58 D	8369.87	2169.83	1592.9	7427.24	4827.17	2618.69	2864.06	2422.82
PYRENE	61819.33 D	10927.01	1918.82	1314.09	13809.73	9497.79	2623.55	5269.8	4123.02
HIGH MOLECULAR WEIGHT PAHS	211984.23	33662.51	8489.01	5515.48	34419.49	23426.77	8242.42	15093.37	11092.52
Pesticides/PCBs (ug/kg)									
4,4'-DDD	78.16 D	8.39	4.91	3.33	118.8	5.04	1.08	7.49	72.23
4,4'-DDE	2.58	4.56	4.08	3.01	14.21 J	3.99	0.07 U	6.46	17.96
4,4'-DDT	3.53	59.65 D	3.7	0.98	3.72 J	0.19	0.06 U	1.83	31.41
TOTAL DDT	84.27	72.6	12.69	7.32	136.73	9.22	1.145	15.78	121.6
PCB-8	5.7	0.94 U	0.88 U	0.82 U	5.01 NJ	0.11 U	0.09 U	0.50 UJ	15.52 U
PCB-18	16.62	2.38	1.49	1.23	10.9 J	1.55	0.24	1.88	11 U
PCB-28	16.14	3.79	3.68	3.82	13.52 J	2.27	0.07 U	5.23	11.62 U
PCB-44	547.5 D	7.63	3.35	2.74	71.09	16.37	5.61	6.94	20.68
PCB-52	1206.27 D	11.14	3.15	2.56	157.97	35.99	23.43	9.7	16.81
PCB-66	245.52 D	4.86	4.14	3.83	37.53	6.61	2.29	9.18	20.54
PCB-101	2096.07 D	16.81	4.42	2.77	301.58	52.16	26.53	16.08	33.7
PCB-105	718.93 D	7.39	2.87	2.63	99.52	12.28	7.85	5.08	10.36 U
PCB-118	1591.08 D	14.41	4.83	3.41	244.42	44.71	21.23	11.65	21.11
PCB-128	0.37 U	0.57 U	0.53 U	0.50 U	53.2	7.02	4.67	3.35	9.37 U
PCB-138	1378.02 D	13.01	4.67	3.45	277.25	44.25	20.44	12.25	24.8
PCB-153	1364.96 D	15.17	6.02	4.28	268.18	44.33	21.78	14.19	29.57
PCB-170	138.25 D	3.2	1.87	1.33	11.31 J	3.32	1.88	2.15	13.04 U
PCB-180	176.34 D	3.76	3.28	2.67	44.77	5.47	2.92	4.33	12.92 U
PCB-187	78.91 D	2.52	2.16	1.66	9.32 J	2.89	1.6	3.4	11.29 U
PCB-195	6.97	2.74	1.61	1.3	NA	NA	NA	NA	NA
PCB-206	4.62	6.2	2.04	2.11	1.67 J	0.81	0.95	1.63	13.05 U
PCB-209	3.21	16.03	3.13	3.16	1.08 J	0.82	0.46	2.65	13.44 U
TOTAL PCB CONGENERS	19190.59	263.59	106.83	87.22	3218.64	563.81	285.92	221.88	458.03
ALPHA-CHLORDANE	3.78 D	0.89	1.2	0.54 J	14.54 J	0.9	0.06 U	1.81	21.2
Inorganics (mg/kg)									
ARSENIC	15.5	15.2	14.4	14.6	8.66	6.08	6.23	11.6	7.22
CADMIUM	1.13	0.733	0.413	0.436	1.82	0.401	0.020 U	0.734	0.746
CHROMIUM	250 B	98.9 B	94.7 B	93.5 B	112	62	68.4	101	73.8
COPPER	1630	136	84	74	624	503	231 J	203	261
LEAD	1130	140	94	88	399 J	230 J	415 J	165 J	157 J
NICKEL	316	31.6	28.6	30.4	93.2 J	28.12 J	53.2	42.27 J	30.70 J
SELENIUM	2.23	0.969	0.827	0.868	1.03	0.252	0.444	0.828	0.541
ZINC	3180 B	300 B	167 B	149 B	1744 J	573 J	2300	368 J	706 J

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 P1-C5 2.0 - 4.0 ft DAD-31-0204 20041011	OUTER PIER 1 P1-C5 4.0 - 6.0 ft DAD-31-0406 20041011	INNER PIER 1 P1 0 - 1.0 ft DAD-20 20041012	INNER PIER 1 P1-C1 0 - 1.0 ft DAD-27 20041012	OUTER PIER 1 P2 0 - 1.0 ft DAD-21 20041012	OUTER PIER 1 P3 0 - 1.0 ft DAD-22 20041012	OUTER PIER 1 P4 0 - 1.0 ft DAD-23 20041012	OUTER PIER 1 P4R 0 - 1.0 ft DAD-23-D 20041012	OUTER PIER 1 P5 0 - 1.0 ft DAD-25 20041012
Low Molecular Weight PAHs (ug/kg)									
2-METHYLNAPHTHALENE	86.52	83.48	1122.56	40.17	49.47	46.58	41.23	51.96	46.47
ACENAPHTHENE	111.71	127.88	19264.51	396.85	39.46	33.72	40.27	49.76	45.12
ACENAPHTHYLENE	151.18	83.75	199.99	106.04	210.73	171.51	175.84	232.75	96
ANTHRACENE	447.88	474.39	106693.76	5628.99	3194.92	685.4	806	1143.91 J	561.83
FLUORENE	201.38	224.3	30848.56	740.55	216.3	101.04	110.99	126.51	122.98
NAPHTHALENE	129.53	136.18	2397.65	79.33	72.91	72.96	81.95	65.35	77.62
PHENANTHRENE	985.24	877.34	305756.05	10987.62	1264.24	883.87	852.09	953.66 J	1218.22
LOW MOLECULAR WEIGHT PAHS	2113.44	2007.32	466283.08	17979.55	5048.03	1995.08	2108.37	2623.9	2168.24
High Molecular Weight PAHs (ug/kg)									
BENZO(A)ANTHRACENE	1325.63	908.78	143323.46	17586.11	4037.05	2013.88	2810.79	2888.87 J	2004.52
BENZO(A)PYRENE	1374.96	828.52	88770.69	13934.4	2957.26	2069.45	2472.81	2665.4 J	1243.82
CHRYSENE	1692.79	1047.95	136491.42	17333.41	5542.68	3113.26	4328.2	4166.44 J	2080.32
DIBENZO(A,H)ANTHRACENE	216.24	137.37	11119.14	1849.28	459.88	301.32	376.36	363.71	160.14
FLUORANTHENE	3997.81	2604.65	499501.99	41012.43	5468.48	2965.52	4095.51	5039.17 J	4301.28
PYRENE	3534.56	2652.9	375349.34	35029.09	6238.28	3273.45	4287.16 J	3848.12 J	3961.3
HIGH MOLECULAR WEIGHT PAHS	12141.99	8180.17	1254556.04	126744.72	24703.63	13736.88	18370.83	18971.71	13751.38
Pesticides/PCBs (ug/kg)									
4,4'-DDD	12.16	19.69	2.79 J	59.15	3.09	5.74	2.58 J	2.83	7.96
4,4'-DDE	11.04	13.05	10.21 J	0.11 U	3.98	5.83	3.69 J	4.41	4.14
4,4'-DDT	3.46	1.02	0.09 U	0.74 J	2.16	7.34	1.67 J	2.78	2.22
TOTAL DDT	26.66	33.76	13.045	59.945	9.23	18.91	7.94	10.02	14.32
PCB-8	7.04 NJ	2.5 NJ	0.13 U	2.12 NJ	0.23 U	0.49 U	0.21 U	0.58 U	0.67 NJ
PCB-18	10.81	10.89	0.09 U	2.96 J	0.95	0.35 U	1.16 J	1.14	1.62
PCB-28	18.93	18.86	7.72 J	4.49 J	2.96	2.95	3.45 J	3.22	2.83
PCB-44	17.16	17.67	334.21	119.58	3.58	3.84	4.13 J	3.64	5.21
PCB-52	22.02	23.21	772.95	285.58	3.98	4.29	5.12 J	2.88	9.29
PCB-66	23.61	20.97	163.84	60.06	5.88	5.3	5.65 J	5.71	4.46
PCB-101	31.94	24.13	1197.92	443.53	7.84	6.77	8.04 J	5.29	16.02
PCB-105	9.78	8.64	359.91	157.22	4.52	2.42	4.61 J	1.44	3.85
PCB-118	21.94	18.68	950.37	381.95	4.75	6.02	5.21 J	3.51	9.75
PCB-128	8.81	5.09	164.16	75.03	1.98	2.69	1.81 J	2.01	2.87
PCB-138	23.54	18	778.77	353.52	4.94	6.62	5.19 J	3.78	10.37
PCB-153	28.01	22.4	848.93	341.84	5.69	7.93	6.13 J	4.75	13.27
PCB-170	5.46	3.43	5.29 J	10.54 J	1	1.27	1.07 J	1.09	1.8
PCB-180	11.02	7.87	0.11 U	52.62	2.12	2.77	2.07 J	1.94	3.72
PCB-187	8.07	5.17	2.39 J	7.48 J	2.05	2.84	1.86 J	2.37	2.39
PCB-195	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-206	4.33	3.87	0.11 U	0.58 J	0.59	0.86	0.87 J	0.85	1.74
PCB-209	4.02	3.78	0.11 U	0.58 J	0.89	2.47	1.5 J	2.18	2.37
TOTAL PCB CONGENERS	514.98	432.32	11175.47	4601.36	109.67	120.92	117.95	94.18	186.46
ALPHA-CHLORDANE	4.45	2.5	4.61 J	2.16 J	0.66	1	0.71 J	0.83	1.11
Inorganics (mg/kg)									
ARSENIC	12.9	10.3	15.6	20.2	12.7	12.5	13.1	14.8	15.3
CADMIUM	1.88	1.84	0.020 U	0.598	0.6	0.501	0.563	0.532	0.41
CHROMIUM	123	111	406	254	92	78.9	89.6	84.6	88.6
COPPER	180	142	2590 J	2019 J	120	102	136 J	82.9	76.5
LEAD	165 J	147 J	2834 J	2435 J	111	90.8	123 J	83.8	78.9
NICKEL	56.0 J	35.60 J	1048	294	27.12	25.11	28.95	25.46	26.48
SELENIUM	0.885	0.794	3.2	1.82	0.624 J	0.630 J	0.722	0.727 J	0.805 J
ZINC	405 J	281 J	13740	3742	262	207	261	199	183

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 P6 0 - 1.0 ft DAD-26 20041012	OUTER PIER 1 TRP1-SD-001 0 - 1.0 ft TRP1-SD-001B-0001 20081106	OUTER PIER 1 TRP1-SD-001 2.0 - 4.0 ft TRP1-SD-001A-0204 20081106	OUTER PIER 1 TRP1-SD-001 4.0 - 6.0 ft TRP1-SD-001A-0406 20081106	OUTER PIER 1 TRP1-SD-002 0 - 1.0 ft TRP1-SD-002B-0001 20081107	OUTER PIER 1 TRP1-SD-002 2.0 - 4.0 ft TRP1-SD-002A-0204 20081107	OUTER PIER 1 TRP1-SD-002 4.0 - 6.0 ft TRP1-SD-002A-0406 20081107	OUTER PIER 1 TRP1-SD-003 0 - 1.0 ft TRP1-SD-003B-0001 20081107
Low Molecular Weight PAHs (ug/kg)								
2-METHYLNAPHTHALENE	29.22 J	28	49	50	20	58	150	23
ACENAPHTHENE	66.65	40	92	77	31	110	660	32
ACENAPHTHYLENE	161.48 J	290	340	180	220	560	360	220
ANTHRACENE	788.56 J	780	960	590	380	1900	1500	430
FLUORENE	148.73	110	220	130	76	310	600 J	78
NAPHTHALENE	40.42 J	49	85	71	30	80	250	36
PHENANTHRENE	1929.12	450	890	470	330	1700	1900	450
LOW MOLECULAR WEIGHT PAHS	3164.18	1747	2636	1568	1087	4718	5420	1269
High Molecular Weight PAHs (ug/kg)								
BENZO(A)ANTHRACENE	3292.41 J	2900	2100	1400	1200	4500	2400	1000
BENZO(A)PYRENE	1954.41 J	1900	1600	1100	1400	3100	1900	1300
CHRYSENE	3797.91	3800	2700	1700	1600	6100	3000	1500
DIBENZO(A,H)ANTHRACENE	220.56 J	220	230	140	160	370	220	170
FLUORANTHENE	7992.24	1400	4200	3800	1700	8900	8500	1700
PYRENE	6207.26 J	6000	5100	2800	2800	9400	6400	2600
HIGH MOLECULAR WEIGHT PAHS	23464.79	16220	15930	10940	8860	32370	22420	8270
Pesticides/PCBs (ug/kg)								
4,4'-DDD	1.49 J	5.7 U	15 U	6.2 U	7.8 U	3.6 J	14 U	4.5 U
4,4'-DDE	3.02 J	5.7 U	39	7.5	7.8 U	5.8 J	14 J	4.5 U
4,4'-DDT	0.14 U	7 J	72 J	6.2 U	12 R	13 J	29 J	7.2 R
TOTAL DDT	4.58	12.7	118.5	13.7	7.8	22.4	50	4.5
PCB-8	0.19 U	4.8 J	6 J	1.8 U	4.1 J	3 J	7 J	2.7 J
PCB-18	0.14 U	7.3 J	3.2 J	1.8 U	4.4 J	6.8	18 J	5.6 J
PCB-28	2.7 J	15 J	6.7 J	1.8 U	9.5 J	14 J	25 J	16 J
PCB-44	3.21 J	6.6 J	6.8 J	1.8 U	2.7 R	7.5 J	22	9.9
PCB-52	3.11 J	16 J	19 J	6.6 J	2.7 R	17	35	15 J
PCB-66	3.34 J	14 J	2.2 U	1.8 U	2.4 U	2.1 U	26 J	9.2 J
PCB-101	3.96 J	16	12 J	3.3 R	6.2 J	17	48	16
PCB-105	1.43 J	4.1 J	7.9 J	3.2 J	2.4 U	5 J	16 J	4.1 J
PCB-118	2.78 J	13 J	13 J	6.3 J	8.6 J	12 J	30 J	9.9 J
PCB-128	2.02 J	2.2 U	2.2 U	1.8 U	2.4 U	2.1 U	4.7 R	2.2 U
PCB-138	3.02 J	13 J	12 J	7.3 J	6.5 J	13 J	38 J	12 J
PCB-153	3.75 J	13 J	14	9.4 J	6.1 J	13	36	12
PCB-170	1.14 J	2.2 U	5.6 J	3.5 R	2.4 U	3 R	12 J	3.7 R
PCB-180	1.8 J	6.5 J	7.5 J	3.3 R	2.7 J	8	21 J	3 J
PCB-187	2.42 J	2.2 R	3.1 J	1.9 J	2.5	3.6 J	5.8 J	2.2 U
PCB-195	NA	2.2 U	2.2 U	1.8 U	2.4 U	2.1 U	2.4	2.2 U
PCB-206	0.54 J	4.4	7.8	15	2.4 U	3.9 J	9.4 J	3.8 R
PCB-209	1.17 J	7.5 J	14 J	18	2.4 U	3.1 J	2.7 R	5.6 J
TOTAL PCB CONGENERS	75.11	289	283.8	148	118	260.1	703.2	248.6
ALPHA-CHLORDANE	0.96 J	2.9 U	7.6 U	3.2 U	4 U	1.1 J	7.2 U	2.3 U
Inorganics (mg/kg)								
ARSENIC	14.1	12.10 J	9.50 J	8.40 J	16.40 J	13.00 J	9.90 J	15.00 J
CADMIUM	0.439	0.820 J	1.10 J	1.50 J	0.600 J	0.850 J	3.30 J	0.650 J
CHROMIUM	76.7	78.8 J	88.8 J	98.4 J	68.7 J	84.6 J	110 J	62.2 J
COPPER	95.2 J	260 J	182 J	142 J	205 J	519 J	197 J	106 J
LEAD	295 J	204 J	157 J	210 J	144 J	298 J	501 J	97.9 J
NICKEL	26.03	51.6 J	27.60 J	18.90 J	31.60 J	124 J	32.50 J	26.60 J
SELENIUM	0.833	5.50 U	5.10 U	4.80 U	5.3	6.8	5	4.7
ZINC	218	457 J	283 J	208 J	261 J	1130 J	601 J	212 J

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 TRP1-SD-003 2.0 - 4.0 ft TRP1-SD-003A-0204 20081107	OUTER PIER 1 TRP1-SD-004 0 - 1.0 ft TRP1-SD-004B-0001 20081107	OUTER PIER 1 TRP1-SD-004 2.0 - 4.0 ft TRP1-SD-004A-0204 20081107	OUTER PIER 1 TRP1-SD-004 4.0 - 6.0 ft TRP1-SD-004A-0406 20081107	OUTER PIER 1 TRP1-SD-005 0 - 1.0 ft TRP1-SD-005B-0001 20081107	OUTER PIER 1 TRP1-SD-005 2.0 - 4.0 ft TRP1-SD-005A-0204 20081107	OUTER PIER 1 TRP1-SD-005 4.0 - 6.0 ft TRP1-SD-005A-0406 20081107
Low Molecular Weight PAHs (ug/kg)							
2-METHYLNAPHTHALENE	24	15	53	65	19	45	270
ACENAPHTHENE	20	100	790	450	110	140	620
ACENAPHTHYLENE	120	180	150	140	170	340	560
ANTHRACENE	150	390	480	620	620	1300	3000
FLUORENE	45	85	690	520 J	140	300	450
NAPHTHALENE	31	24	55	74	21	320	2700
PHENANTHRENE	210	420	1700	2000	630	1400	2200
LOW MOLECULAR WEIGHT PAHS	600	1214	3918	3869	1710	3845	9800
High Molecular Weight PAHs (ug/kg)							
BENZO(A)ANTHRACENE	350	1700	1100	1100	1700	4700	8700
BENZO(A)PYRENE	390	1100	620	720	1200	2300	4400
CHRYSENE	430	1700	1200	1200	1900	4400	8300
DIBENZO(A,H)ANTHRACENE	68	130	110	97	150	280	450
FLUORANTHENE	600	3100	3400	4100	4100	16000	23000
PYRENE	1400	3600	3200	2800	3000	11000	19000
HIGH MOLECULAR WEIGHT PAHS	3238	11330	9630	10017	12050	38680	63850
Pesticides/PCBs (ug/kg)							
4,4'-DDD	3.8 J	1.8 U	14 UJ	65 J	1.6 U	6.9 U	6.7 U
4,4'-DDE	3.8 J	3.6 J	14 UJ	12 U	1.6 U	6.9 U	10 J
4,4'-DDT	5.8 R	2.8 R	18 J	32 R	1.6 U	6.9 U	20
TOTAL DDT	7.6	4.5	32	71	2.4	10.35	33.35
PCB-8	1.5 U	2.6 U	3.7 R	3.5 J	5.9 J	9.5 J	2 U
PCB-18	1.5 U	2.6 U	7.4 J	1.7 U	6.9	9.5 R	2 U
PCB-28	1.7 J	2.6 UJ	13 J	1.7 U	2.5 U	14 J	2 UJ
PCB-44	1.7	2.6 U	9.1 J	1.7 U	3.9 J	9.6 J	2 U
PCB-52	4.9	2.6 UJ	19 J	3.6	2.5 U	13 J	2 UJ
PCB-66	1.5 U	2.6 U	9.3 R	1.7 U	2.5 U	2.1 U	2 U
PCB-101	5.6	2.6 U	28	2.8 R	3.3 R	8.9 J	2 U
PCB-105	2.1 J	2.6 U	8.2 J	3 J	2.5 U	2.1 U	2 U
PCB-118	3.8 J	8.3 J	16 J	5.2 J	5.8 J	5.8 J	4.9 J
PCB-128	1.5 U	2.6 U	2.3 R	1.7 U	2.5 U	2.1 U	2 U
PCB-138	5.2 J	2.6 U	20 J	6.2 J	3.8	6	2 U
PCB-153	5.2 J	2.6 U	21 J	8.1 J	3.3 J	6	2 U
PCB-170	5 J	2.6 U	5.6 R	2.6 R	2.5 U	2.1 U	2 U
PCB-180	3.5 J	2.6 U	14 J	2.7 J	2.5 U	4.9 J	2 U
PCB-187	1.5 U	2.6 UJ	3.6 J	1.7 U	2.5 U	2.1 U	2 UJ
PCB-195	1.5 U	2.6 U	2 U	1.7 U	2.5 U	2.1 U	2 U
PCB-206	5.8 J	2.6 UJ	6.2 J	12 J	2.7	2.7	2 UJ
PCB-209	6.7 J	2.6 UJ	2 U	12 J	2.5 U	2.1 U	2 UJ
TOTAL PCB CONGENERS	111.4	60.8	335	124.5	89.6	175.5	43.8
ALPHA-CHLORDANE	0.54 U	0.91 U	7 U	6.1 U	0.84 U	3.6 U	3.5 U
Inorganics (mg/kg)							
ARSENIC	5.10 J	13.80 J	12	7.9	8.3	10.2	8.7
CADMIUM	0.730 J	0.650 J	2.30 J	1.30 J	0.380 J	0.470 J	1.30 J
CHROMIUM	61.7 J	71.0 J	121 J	96.8 J	40.10 J	42.60 J	113 J
COPPER	62.1 J	130 J	203 J	207 J	64.9 J	78.7 J	201 J
LEAD	95.4 J	119 J	260 J	192 J	79.8 J	62.1 J	253 J
NICKEL	12.70 J	27.50 J	28.00 J	17.70 J	16.40 J	18.90 J	51.3 J
SELENIUM	2.4	6.5	5.2	3.7	1.8	1.5	3.5
ZINC	221 J	230 J	418 J	324 J	108 J	111 J	669 J

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 TRP1-SD-006 0 - 1.0 ft TRP1-SD-006B-0001 20081107	OUTER PIER 1 TRP1-SD-006 2.0 - 3.0 ft TRP1-SD-006A-0203 20081107	OUTER PIER 1 TRP1-SD-007 0 - 1.0 ft TRP1-SD-007B-0001 20081106	OUTER PIER 1 TRP1-SD-007 2.0 - 4.0 ft TRP1-SD-007A-0204 20081106	OUTER PIER 1 TRP1-SD-007 4.0 - 6.0 ft TRP1-SD-007A-0406 20081106	OUTER PIER 1 TRP1-SD-008 0 - 1.0 ft TRP1-SD-008B-0001 20081105	OUTER PIER 1 TRP1-SD-008 2.0 - 4.0 ft TRP1-SD-008A-0204 20081105
Low Molecular Weight PAHs (ug/kg)							
2-METHYLNAPHTHALENE	51	140	60	20	51	31	78
ACENAPHTHENE	290	1500	490	30	2100	150	4900
ACENAPHTHYLENE	120	250	760	170	230	440	490
ANTHRACENE	260	1400	3100	330	2300	1200	2700
FLUORENE	180	1400	800	59	1500	240	2300
NAPHTHALENE	120	210	51	22	59	34	120
PHENANTHRENE	760	5700	2400	430	6800	1200	4600
LOW MOLECULAR WEIGHT PAHS	1781	10600	7661	1061	13040	3295	15188
High Molecular Weight PAHs (ug/kg)							
BENZO(A)ANTHRACENE	660	3100	12000	960	3800	3300	5100
BENZO(A)PYRENE	470	1200	5300	980	2700	2400	2700
CHRYSENE	790	3300	13000	1200	4700	4100	6100
DIBENZO(A,H)ANTHRACENE	76	140	710 J	170	640	370	450 J
FLUORANTHENE	2600	15000	52000	1500	14000	7800	21000
PYRENE	2000	8600	36000	2800	12000	6100	16000
HIGH MOLECULAR WEIGHT PAHS	6596	31340	119010	7610	37840	24070	51350
Pesticides/PCBs (ug/kg)							
4,4'-DDD	1.7 U	7.4 U	6.5 UJ	4.8 U	18 J	2.1 U	1.8 U
4,4'-DDE	1.2 J	7.4 U	19	12	27 J	2.1 U	3 J
4,4'-DDT	1.7 UJ	7.4 U	59 J	22 J	36 J	2.1 UJ	12 J
TOTAL DDT	2.9	11.1	81.25	36.4	81	3.15	15.9
PCB-8	3.9 R	2.3 U	2.7 R	2.3	5.6 J	3 U	14 R
PCB-18	31	3	15 J	3.9 J	11	7.2	23 R
PCB-28	23 J	4.1 R	3.3 R	10 J	17 J	3.6 R	17 J
PCB-44	8.7 J	2.3 U	6.1 J	9.2	19	7.7 J	34
PCB-52	9.9 J	2.3 U	7.1 J	18 J	34	5.8 R	79
PCB-66	4.8 R	3 R	2.5 U	1.7 U	1.8 U	13	2.7 U
PCB-101	7.6 J	4.2 R	8.1	24 J	47	9.1 J	100 J
PCB-105	2.6 J	2.3 U	4.5 J	6.9 J	17 J	3 U	39 J
PCB-118	8.3 J	5 J	18 J	15 J	75 J	19 J	140 J
PCB-128	2.5 U	2.3 U	2.5 U	2.6 J	5.4 J	3 U	13 J
PCB-138	5.3 J	5.6	10	17 J	39 J	8.2	79 J
PCB-153	6.3 J	3.6 J	7.5 J	16 J	33 J	7.7	63 J
PCB-170	3.6 J	2.3 U	4.8	2.4 J	11 J	3 U	10 J
PCB-180	2.8 J	2.3 J	4.4 J	4.6 J	13 J	3.6 J	14 J
PCB-187	2.5 U	2.3 U	2.5 UJ	1.7 UJ	3.5 J	3 UJ	3.4 R
PCB-195	2.5 U	2.3 U	2.5 U	1.7 U	1.9 J	3 U	2.7 U
PCB-206	3 J	2.3 U	2.5 U	1.8 J	5 J	4.7 J	2.7 U
PCB-209	2.5 U	2.3 U	45 J	1.7 U	1.8 U	3 U	2.7 U
TOTAL PCB CONGENERS	234.2	62	273.5	274.2	678.4	181.4	1186.8
ALPHA-CHLORDANE	0.88 U	3.8 U	3.4 U	2.5 U	2.5 U	1.1 U	0.91 U
Inorganics (mg/kg)							
ARSENIC	12.90 J	12.80 J	15.60 J	18.40 J	23.30 J	15.40 J	13.40 J
CADMIUM	0.480 J	1.00 J	0.540 J	1.10 J	3.00 J	0.450 J	0.830 J
CHROMIUM	62.7 J	60.4 J	76.3 J	167 J	142 J	66.9 J	130 J
COPPER	80.6 J	463 J	791 J	1600 J	8620 J	226 J	1010 J
LEAD	88.4 J	80.8 J	192 J	1170 J	661 J	148 J	690 J
NICKEL	25.80 J	28.70 J	40.3	482	188	28.4	278
SELENIUM	5.90 U	4.50 U	7.6	14.6	9.8	6.9	8.6
ZINC	156 J	341 J	410 J	4660 J	2640 J	257 J	2470 J

TABLE 3

COMPREHENSIVE SEDIMENT ANALYTICAL DATA SET
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 TRP1-SD-008 4.0 - 6.0 ft TRP1-SD-008A-0406 20081105	OUTER PIER 1 TRP1-SD-009 0 - 1.0 ft TRP1-SD-009B-0001 20081105	OUTER PIER 1 TRP1-SD-009 2.0 - 4.0 ft TRP1-SD-009A-0204 20081105	OUTER PIER 1 TRP1-SD-009 4.0 - 6.0 ft TRP1-SD-009A-0406 20081105	OUTER PIER 1 TRP1-SD-010 0 - 1.0 ft TRP1-SD-010B-0001 20081105	OUTER PIER 1 TRP1-SD-010 2.0 - 4.0 ft TRP1-SD-010A-0204 20081105	OUTER PIER 1 TRP1-SD-010 4.0 - 6.0 ft TRP1-SD-010A-0406 20081105
Low Molecular Weight PAHs (ug/kg)							
2-METHYLNAPHTHALENE	35	16	21	32	21	19	49
ACENAPHTHENE	250	32	600	290	31	82	220
ACENAPHTHYLENE	260	150	150	180	180	140	120
ANTHRACENE	620	480	660	750	410	840	770
FLUORENE	200	77	280	340	71	170	320
NAPHTHALENE	94	21	24	41	16	19	130
PHENANTHRENE	1100	520	650	2200	670	2800	2300
LOW MOLECULAR WEIGHT PAHS	2559	1296	2385	3833	1399	4070	3909
High Molecular Weight PAHs (ug/kg)							
BENZO(A)ANTHRACENE	2000	1600	2100	1700	950	1600	2100
BENZO(A)PYRENE	1700	1100	1100	1200	930	1200	1600
CHRYSENE	2400	1800	2100	2000	1300	1700	2400
DIBENZO(A,H)ANTHRACENE	280	160	150	180	180	190	240
FLUORANTHENE	4500	1800	6400	4900	1800	5300	7000
PYRENE	4700	3200	4200	3900	3200	4700	5900
HIGH MOLECULAR WEIGHT PAHS	15580	9660	16050	13880	8360	14690	19240
Pesticides/PCBs (ug/kg)							
4,4'-DDD	7.7 J	8.2 UJ	3.4 UJ	3 U	8.5 UJ	2 U	6.2 U
4,4'-DDE	6.6 U	8.4 J	3.4 U	3 U	8.5 U	5 R	35 R
4,4'-DDT	21 J	27 J	3.4 UJ	3 UJ	12 R	9.3 J	33 J
TOTAL DDT	32	39.5	5.1	4.5	8.5	10.3	36.1
PCB-8	8.6 J	2.5 U	4.9 J	4.6 J	2.8 R	4.5 J	6.7 J
PCB-18	8.2	9.3	13 J	6.4	3.5	5.2	12
PCB-28	18	18	18	17	3.1 R	8.3	18
PCB-44	13	14	18	9.2 J	13 J	8.1	20
PCB-52	30 J	27	15 J	23 J	5.2 R	19	46
PCB-66	2.5 U	2.5 U	7.2 J	2.2 U	13	1.5 U	2.9 R
PCB-101	43 J	38	10 J	41	9.2 J	31	82
PCB-105	12 J	11 J	3.3 J	18 J	2.8	9.5 J	21 J
PCB-118	57 J	48 J	17 J	76 J	15 J	47 J	93 J
PCB-128	3.8 J	3.7 J	2.5 U	8.3 J	2.5 U	2.9 J	6.8 J
PCB-138	28 J	26 J	8.8 J	47 J	12	20 J	47 J
PCB-153	28	25	8.6	38	5.5	19	40 J
PCB-170	4.1 J	3.9 J	2.7 R	7.4 J	2.5 U	5.1 J	13 J
PCB-180	8.6	7 J	3.8 J	9.1 J	2.5 J	5.5 J	12 J
PCB-187	2.7 R	2.5 UJ	2.5 UJ	2.2 UJ	2.5 UJ	1.8 R	3.6 R
PCB-195	2.5 U	2.5 U	2.5 U	2.2 U	2.5 U	1.5 U	1.9 U
PCB-206	3.5 J	3.8 J	3.2 J	2.7 J	2.5 U	2.2	6.3
PCB-209	2.5 U	2.5 U	2.5 U	2.2 U	2.5 U	1.5 U	2.4 R
TOTAL PCB CONGENERS	539.1	481.9	271.6	624.2	168	379.1	849.5
ALPHA-CHLORDANE	3.4 U	4.2 U	1.8 U	1.6 U	4.4 U	1 U	3.2 U
Inorganics (mg/kg)							
ARSENIC	12.90 J	10.30 J	15.80 J	12.30 J	12.40 J	12.00 J	14.50 J
CADMIUM	0.890 J	1.00 J	0.700 J	1.20 J	0.470 J	1.50 J	1.90 J
CHROMIUM	93.7 J	84.3 J	82.9 J	95.5 J	56.8 J	101 J	88.9 J
COPPER	576 J	190 J	181 J	255 J	201 J	670 J	625 J
LEAD	416 J	228 J	139 J	228 J	163 J	665 J	327 J
NICKEL	127	41.5	38.8	57.1	30.9	146	67.9
SELENIUM	7.9	4.7	6.3	6.1	4.3	5.6	6
ZINC	1200 J	387 J	249 J	433 J	356 J	1860 J	975 J

B Blank contamination
J Estimated value
NA Not analyzed
U Undetected at indicated analytical detection limit

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	**ERM**	INNER PIER 1 **SBP-1 SBP-1-GRAB 19991028**		INNER PIER 1 **SBP-2 SBP-2-GRAB 19991028**		INNER PIER 1 **SBP-3 SBP-3-GRAB 19991028**		INNER PIER 1 **SBP-4 SBP-4-CORE 19991028**	
		RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	70	16	0.229	16	0.229	19	0.271	13	0.186
CADMIUM (mg/kg)	9.6	0.94	0.098	0.88	0.092	0.64	0.067	0.39	0.041
CHROMIUM (mg/kg)	370	130	0.351	71	0.192	100	0.270	64	0.173
COPPER (mg/kg)	270	980	3.630	430	1.593	870	3.222	570	2.111
LEAD (mg/kg)	218	620	2.844	290	1.330	350	1.606	350	1.606
NICKEL (mg/kg)	51.6	130	2.519	53	1.027	89	1.725	120	2.326
SELENIUM (mg/kg)	1.4	NA	NA	NA	NA	NA	NA	NA	NA
ZINC (mg/kg)	410	1900	4.634	690	1.683	970	2.366	1900	4.634
TOTAL PCB CONGENERS (µg/kg)	180	8146	45.256	191.6	1.064	737.6	4.098	1253	6.961
ALPHA-CHLORDANE (µg/kg)	6	16 U	1.333	2.2 U	0.183	2.4 U	0.200	15 U	1.250
TOTAL DDT (µg/kg)	46.1	24	0.521	3.3	0.072	3.6	0.078	22.5	0.488
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	9600	184600	19.229	10580	1.102	52180	5.435	24800	2.583
LOW MOLECULAR WEIGHT PAHs (µg/kg)	3160	97790	30.946	2447	0.774	18643	5.900	5712	1.808
Total ERM-Q			9.299		0.778		2.103		2.014

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	INNER PIER 1 **SBP-4 SBP-4-GRAB 19991028**		OUTER PIER 1 **SBP-5 SBP-5-GRAB 19991028**		OUTER PIER 1 **SBP-6 SBP-6-GRAB 19991028**		OUTER PIER 1 **SBP-7 SBP-7-GRAB 19991028**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	14	0.200	12	0.171	13	0.186	8.3	0.119
CADMIUM (mg/kg)	0.34	0.035	0.5	0.052	0.42	0.044	0.91	0.095
CHROMIUM (mg/kg)	58	0.157	61	0.165	58	0.157	39	0.105
COPPER (mg/kg)	300	1.111	120	0.444	79	0.293	140	0.519
LEAD (mg/kg)	330	1.514	110	0.505	86	0.394	100	0.459
NICKEL (mg/kg)	56	1.085	25	0.484	22	0.426	14	0.271
SELENIUM (mg/kg)	NA	NA	NA	NA	NA	NA	NA	NA
ZINC (mg/kg)	1200	2.927	220	0.537	160	0.390	250	0.610
TOTAL PCB CONGENERS (µg/kg)	131.09	0.728	62.2	0.346	38.4	0.213	163	0.906
ALPHA-CHLORDANE (µg/kg)	0.90 U	0.075	1.5 U	0.125	1.5 U	0.125	1.4 U	0.117
TOTAL DDT (µg/kg)	9	0.195	2.25	0.049	2.25	0.049	18.4	0.399
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	7600	0.792	4069	0.424	3508	0.365	42200	4.396
LOW MOLECULAR WEIGHT PAHs (µg/kg)	1539	0.487	795	0.252	666	0.211	7678	2.430
Total ERM-Q		0.776		0.296		0.238		0.869

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	INNER PIER 1 **P1-48 CAB-53 20030617**		OUTER PIER 1 **P1-50 CAB-56 20030617**		OUTER PIER 1 **P1-53 CAB-59 20030617**		OUTER PIER 1 **P1-55 CAB-61 20030617**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	15.5	0.221	15.2	0.217	14.4	0.206	14.6	0.209
CADMIUM (mg/kg)	1.13	0.118	0.733	0.076	0.413	0.043	0.436	0.045
CHROMIUM (mg/kg)	250 B	0.676	98.9 B	0.267	94.7 B	0.256	93.5 B	0.253
COPPER (mg/kg)	1630	6.037	136	0.504	84	0.311	74	0.274
LEAD (mg/kg)	1130	5.183	140	0.642	94	0.431	88	0.404
NICKEL (mg/kg)	316	6.124	31.6	0.612	28.6	0.554	30.4	0.589
SELENIUM (mg/kg)	2.23	1.593	0.969	0.692	0.827	0.591	0.868	0.620
ZINC (mg/kg)	3180 B	7.756	300 B	0.732	167 B	0.407	149 B	0.363
TOTAL PCB CONGENERS (µg/kg)	19190.59	106.614	263.59	1.464	106.83	0.594	87.22	0.485
ALPHA-CHLORDANE (µg/kg)	3.78 D	0.630	0.89	0.148	1.2	0.200	0.54 J	0.090
TOTAL DDT (µg/kg)	84.27	1.828	72.6	1.575	12.69	0.275	7.32	0.159
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	211984.23	22.082	33662.51	3.507	8489.01	0.884	5515.48	0.575
LOW MOLECULAR WEIGHT PAHs (µg/kg)	58018.64	18.360	5014.4	1.587	1157.52	0.366	823.15	0.260
Total ERM-Q		13.633		0.925		0.394		0.333

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	INNER PIER 1 **P1-C2 DAD-28-0002 20041011**		INNER PIER 1 **P1-C2 DAD-28-0204 20041011**		INNER PIER 1 **P1-C2 DAD-28-0405 20041011**		OUTER PIER 1 **P1-C3 DAD-29 -0003 20041011**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	8.66	0.124	6.08	0.087	6.23	0.089	11.6	0.166
CADMIUM (mg/kg)	1.82	0.190	0.401	0.042	0.020 U	0.001	0.734	0.076
CHROMIUM (mg/kg)	112	0.303	62	0.168	68.4	0.185	101	0.273
COPPER (mg/kg)	624	2.311	503	1.863	231 J	0.856	203	0.752
LEAD (mg/kg)	399 J	1.830	230 J	1.055	415 J	1.904	165 J	0.757
NICKEL (mg/kg)	93.2 J	1.806	28.12 J	0.545	53.2	1.031	42.27 J	0.819
SELENIUM (mg/kg)	1.03	0.736	0.252	0.180	0.444	0.317	0.828	0.591
ZINC (mg/kg)	1744 J	4.254	573 J	1.398	2300	5.610	368 J	0.898
TOTAL PCB CONGENERS (µg/kg)	3216.64	17.881	561.81	3.132	283.92	1.588	219.88	1.233
ALPHA-CHLORDANE (µg/kg)	14.54 J	2.423	0.9	0.150	0.06 U	0.005	1.81	0.302
TOTAL DDT (µg/kg)	136.73	2.966	9.22	0.200	1.145	0.025	15.78	0.342
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	34419.49	3.585	23426.77	2.440	8242.42	0.859	15093.37	1.572
LOW MOLECULAR WEIGHT PAHs (µg/kg)	3967.57	1.256	3047.68	0.964	1988.22	0.629	1727.25	0.547
Total ERM-Q		3.050		0.939		1.007		0.640

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **P1-C4 DAD-30-0002 20041011**		OUTER PIER 1 **P1-C5 DAD-31-0204 20041011**		OUTER PIER 1 **P1-C5 DAD-31-0406 20041011**		INNER PIER 1 **P1 DAD-20 20041012**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	7.22	0.103	12.9	0.184	10.3	0.147	15.6	0.223
CADMIUM (mg/kg)	0.746	0.078	1.88	0.196	1.84	0.192	0.020 U	0.001
CHROMIUM (mg/kg)	73.8	0.199	123	0.332	111	0.300	406	1.097
COPPER (mg/kg)	261	0.967	180	0.667	142	0.526	2590 J	9.593
LEAD (mg/kg)	157 J	0.720	165 J	0.757	147 J	0.674	2834 J	13.000
NICKEL (mg/kg)	30.70 J	0.595	56.0 J	1.085	35.60 J	0.690	1048	20.310
SELENIUM (mg/kg)	0.541	0.386	0.885	0.632	0.794	0.567	3.2	2.286
ZINC (mg/kg)	706 J	1.722	405 J	0.988	281 J	0.685	13740	33.512
TOTAL PCB CONGENERS (µg/kg)	456.03	2.545	512.98	2.861	430.32	2.402	11173.47	62.086
ALPHA-CHLORDANE (µg/kg)	21.2	3.533	4.45	0.742	2.5	0.417	4.61 J	0.768
TOTAL DDT (µg/kg)	121.6	2.638	26.66	0.578	33.76	0.732	13.045	0.283
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	11092.52	1.155	12141.99	1.265	8180.17	0.852	1254556.04	130.683
LOW MOLECULAR WEIGHT PAHs (µg/kg)	1526.49	0.483	2113.44	0.669	2007.32	0.635	466283.08	147.558
Total ERM-Q		1.163		0.842		0.678		32.415

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	INNER PIER 1 **P1-C1 DAD-27 20041012**		OUTER PIER 1 **P2 DAD-21 20041012**		OUTER PIER 1 **P3 DAD-22 20041012**		OUTER PIER 1 **P4 DAD-23 20041012**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	20.2	0.289	12.7	0.181	12.5	0.179	13.1	0.187
CADMIUM (mg/kg)	0.598	0.062	0.6	0.063	0.501	0.052	0.563	0.059
CHROMIUM (mg/kg)	254	0.686	92	0.249	78.9	0.213	89.6	0.242
COPPER (mg/kg)	2019 J	7.478	120	0.444	102	0.378	136 J	0.504
LEAD (mg/kg)	2435 J	11.170	111	0.509	90.8	0.417	123 J	0.564
NICKEL (mg/kg)	294	5.698	27.12	0.526	25.11	0.487	28.95	0.561
SELENIUM (mg/kg)	1.82	1.300	0.624 J	0.446	0.630 J	0.450	0.722	0.516
ZINC (mg/kg)	3742	9.127	262	0.639	207	0.505	261	0.637
TOTAL PCB CONGENERS (µg/kg)	4599.36	25.563	107.67	0.609	118.92	0.672	115.95	0.655
ALPHA-CHLORDANE (µg/kg)	2.16 J	0.360	0.66	0.110	1	0.167	0.71 J	0.118
TOTAL DDT (µg/kg)	59.945	1.300	9.23	0.200	18.91	0.410	7.94	0.172
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	126744.72	13.203	24703.63	2.573	13736.88	1.431	18370.83	1.914
LOW MOLECULAR WEIGHT PAHs (µg/kg)	17979.55	5.690	5048.03	1.597	1995.08	0.631	2108.37	0.667
Total ERM-Q		6.301		0.626		0.460		0.522

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **P4R** **DAD-23-D** **20041012**		OUTER PIER 1 **P5** **DAD-25** **20041012**		OUTER PIER 1 **P6** **DAD-26** **20041012**		OUTER PIER 1 **TRP1-SD-001** **TRP1-SD-001B-0001** **20081106**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	14.8	0.211	15.3	0.219	14.1	0.201	12.10 J	0.173
CADMIUM (mg/kg)	0.532	0.055	0.41	0.043	0.439	0.046	0.820 J	0.085
CHROMIUM (mg/kg)	84.6	0.229	88.6	0.239	76.7	0.207	78.8 J	0.213
COPPER (mg/kg)	82.9	0.307	76.5	0.283	95.2 J	0.353	260 J	0.963
LEAD (mg/kg)	83.8	0.384	78.9	0.362	295 J	1.353	204 J	0.936
NICKEL (mg/kg)	25.46	0.493	26.48	0.513	26.03	0.504	51.6 J	1.000
SELENIUM (mg/kg)	0.727 J	0.519	0.805 J	0.575	0.833	0.595	5.50 U	1.964
ZINC (mg/kg)	199	0.485	183	0.446	218	0.532	457 J	1.115
TOTAL PCB CONGENERS (µg/kg)	92.18	0.523	184.46	1.036	73.11	0.417	289	1.606
ALPHA-CHLORDANE (µg/kg)	0.83	0.138	1.11	0.185	0.96 J	0.160	2.9 U	0.242
TOTAL DDT (µg/kg)	10.02	0.217	14.32	0.311	4.58	0.099	12.7	0.275
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	18971.71	1.976	13751.38	1.432	23464.79	2.444	16220	1.690
LOW MOLECULAR WEIGHT PAHs (µg/kg)	2623.9	0.830	2168.24	0.686	3164.18	1.001	1747	0.553
Total ERM-Q		0.489		0.486		0.608		0.832

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-001 TRP1-SD-001A-0204 20081106**		OUTER PIER 1 **TRP1-SD-001 TRP1-SD-001A-0406 20081106**		OUTER PIER 1 **TRP1-SD-002 TRP1-SD-002B-0001 20081107**		OUTER PIER 1 **TRP1-SD-002 TRP1-SD-002A-0204 20081107**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	9.50 J	0.136	8.40 J	0.120	16.40 J	0.234	13.00 J	0.186
CADMIUM (mg/kg)	1.10 J	0.115	1.50 J	0.156	0.600 J	0.063	0.850 J	0.089
CHROMIUM (mg/kg)	88.8 J	0.240	98.4 J	0.266	68.7 J	0.186	84.6 J	0.229
COPPER (mg/kg)	182 J	0.674	142 J	0.526	205 J	0.759	519 J	1.922
LEAD (mg/kg)	157 J	0.720	210 J	0.963	144 J	0.661	298 J	1.367
NICKEL (mg/kg)	27.60 J	0.535	18.90 J	0.366	31.60 J	0.612	124 J	2.403
SELENIUM (mg/kg)	5.10 U	1.821	4.80 U	1.714	5.3	3.786	6.8	4.857
ZINC (mg/kg)	283 J	0.690	208 J	0.507	261 J	0.637	1130 J	2.756
TOTAL PCB CONGENERS (µg/kg)	283.8	1.577	148	0.822	118	0.656	260.1	1.445
ALPHA-CHLORDANE (µg/kg)	7.6 U	0.633	3.2 U	0.267	4 U	0.333	1.1 J	0.183
TOTAL DDT (µg/kg)	118.5	2.570	13.7	0.297	7.8	0.169	22.4	0.486
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	15930	1.659	10940	1.140	8860	0.923	32370	3.372
LOW MOLECULAR WEIGHT PAHs (µg/kg)	2636	0.834	1568	0.496	1087	0.344	4718	1.493
Total ERM-Q		0.939		0.588		0.720		1.599

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-002 TRP1-SD-002A-0406 20081107**		OUTER PIER 1 **TRP1-SD-003 TRP1-SD-003B-0001 20081107**		OUTER PIER 1 **TRP1-SD-003 TRP1-SD-003A-0204 20081107**		OUTER PIER 1 **TRP1-SD-004 TRP1-SD-004B-0001 20081107**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	9.90 J	0.141	15.00 J	0.214	5.10 J	0.073	13.80 J	0.197
CADMIUM (mg/kg)	3.30 J	0.344	0.650 J	0.068	0.730 J	0.076	0.650 J	0.068
CHROMIUM (mg/kg)	110 J	0.297	62.2 J	0.168	61.7 J	0.167	71.0 J	0.192
COPPER (mg/kg)	197 J	0.730	106 J	0.393	62.1 J	0.230	130 J	0.481
LEAD (mg/kg)	501 J	2.298	97.9 J	0.449	95.4 J	0.438	119 J	0.546
NICKEL (mg/kg)	32.50 J	0.630	26.60 J	0.516	12.70 J	0.246	27.50 J	0.533
SELENIUM (mg/kg)	5	3.571	4.7	3.357	2.4	1.714	6.5	4.643
ZINC (mg/kg)	601 J	1.466	212 J	0.517	221 J	0.539	230 J	0.561
TOTAL PCB CONGENERS (µg/kg)	703.2	3.907	248.6	1.381	111.4	0.619	60.8	0.338
ALPHA-CHLORDANE (µg/kg)	7.2 U	0.600	2.3 U	0.192	0.54 U	0.045	0.91 U	0.076
TOTAL DDT (µg/kg)	50	1.085	4.5	0.098	7.6	0.165	4.5	0.098
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	22420	2.335	8270	0.861	3238	0.337	11330	1.180
LOW MOLECULAR WEIGHT PAHs (µg/kg)	5420	1.715	1269	0.402	600	0.190	1214	0.384
Total ERM-Q		1.471		0.663		0.372		0.715

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-004 TRP1-SD-004A-0204 20081107**		OUTER PIER 1 **TRP1-SD-004 TRP1-SD-004A-0406 20081107**		OUTER PIER 1 **TRP1-SD-005 TRP1-SD-005B-0001 20081107**		OUTER PIER 1 **TRP1-SD-005 TRP1-SD-005A-0204 20081107**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	12	0.171	7.9	0.113	8.3	0.119	10.2	0.146
CADMIUM (mg/kg)	2.30 J	0.240	1.30 J	0.135	0.380 J	0.040	0.470 J	0.049
CHROMIUM (mg/kg)	121 J	0.327	96.8 J	0.262	40.10 J	0.108	42.60 J	0.115
COPPER (mg/kg)	203 J	0.752	207 J	0.767	64.9 J	0.240	78.7 J	0.291
LEAD (mg/kg)	260 J	1.193	192 J	0.881	79.8 J	0.366	62.1 J	0.285
NICKEL (mg/kg)	28.00 J	0.543	17.70 J	0.343	16.40 J	0.318	18.90 J	0.366
SELENIUM (mg/kg)	5.2	3.714	3.7	2.643	1.8	1.286	1.5	1.071
ZINC (mg/kg)	418 J	1.020	324 J	0.790	108 J	0.263	111 J	0.271
TOTAL PCB CONGENERS (µg/kg)	335	1.861	124.5	0.692	89.6	0.498	175.5	0.975
ALPHA-CHLORDANE (µg/kg)	7 U	0.583	6.1 U	0.508	0.84 U	0.070	3.6 U	0.300
TOTAL DDT (µg/kg)	32	0.694	71	1.540	2.4	0.052	10.35	0.225
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	9630	1.003	10017	1.043	12050	1.255	38680	4.029
LOW MOLECULAR WEIGHT PAHs (µg/kg)	3918	1.240	3869	1.224	1710	0.541	3845	1.217
Total ERM-Q		1.026		0.842		0.397		0.718

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-005 TRP1-SD-005A-0406 20081107**		OUTER PIER 1 **TRP1-SD-006 TRP1-SD-006B-0001 20081107**		OUTER PIER 1 **TRP1-SD-006 TRP1-SD-006A-0203 20081107**		OUTER PIER 1 **TRP1-SD-007 TRP1-SD-007B-0001 20081106**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	8.7	0.124	12.90 J	0.184	12.80 J	0.183	15.60 J	0.223
CADMIUM (mg/kg)	1.30 J	0.135	0.480 J	0.050	1.00 J	0.104	0.540 J	0.056
CHROMIUM (mg/kg)	113 J	0.305	62.7 J	0.169	60.4 J	0.163	76.3 J	0.206
COPPER (mg/kg)	201 J	0.744	80.6 J	0.299	463 J	1.715	791 J	2.930
LEAD (mg/kg)	253 J	1.161	88.4 J	0.406	80.8 J	0.371	192 J	0.881
NICKEL (mg/kg)	51.3 J	0.994	25.80 J	0.500	28.70 J	0.556	40.3	0.781
SELENIUM (mg/kg)	3.5	2.500	5.90 U	2.107	4.50 U	1.607	7.6	5.429
ZINC (mg/kg)	669 J	1.632	156 J	0.380	341 J	0.832	410 J	1.000
TOTAL PCB CONGENERS (µg/kg)	43.8	0.243	234.2	1.301	62	0.344	273.5	1.519
ALPHA-CHLORDANE (µg/kg)	3.5 U	0.292	0.88 U	0.073	3.8 U	0.317	3.4 U	0.283
TOTAL DDT (µg/kg)	33.35	0.723	2.9	0.063	11.1	0.241	81.25	1.762
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	63850	6.651	6596	0.687	31340	3.265	119010	12.397
LOW MOLECULAR WEIGHT PAHs (µg/kg)	9800	3.101	1781	0.564	10600	3.354	7661	2.424
Total ERM-Q		1.431		0.522		1.004		2.299

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-007 TRP1-SD-007A-0204 20081106**		OUTER PIER 1 **TRP1-SD-007 TRP1-SD-007A-0406 20081106**		OUTER PIER 1 **TRP1-SD-008 TRP1-SD-008B-0001 20081105**		OUTER PIER 1 **TRP1-SD-008 TRP1-SD-008A-0204 20081105**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	18.40 J	0.263	23.30 J	0.333	15.40 J	0.220	13.40 J	0.191
CADMIUM (mg/kg)	1.10 J	0.115	3.00 J	0.313	0.450 J	0.047	0.830 J	0.086
CHROMIUM (mg/kg)	167 J	0.451	142 J	0.384	66.9 J	0.181	130 J	0.351
COPPER (mg/kg)	1600 J	5.926	8620 J	31.926	226 J	0.837	1010 J	3.741
LEAD (mg/kg)	1170 J	5.367	661 J	3.032	148 J	0.679	690 J	3.165
NICKEL (mg/kg)	482	9.341	188	3.643	28.4	0.550	278	5.388
SELENIUM (mg/kg)	14.6	10.429	9.8	7.000	6.9	4.929	8.6	6.143
ZINC (mg/kg)	4660 J	11.366	2640 J	6.439	257 J	0.627	2470 J	6.024
TOTAL PCB CONGENERS (µg/kg)	274.2	1.523	678.4	3.769	181.4	1.008	1186.8	6.593
ALPHA-CHLORDANE (µg/kg)	2.5 U	0.208	2.5 U	0.208	1.1 U	0.092	0.91 U	0.076
TOTAL DDT (µg/kg)	36.4	0.790	81	1.757	3.15	0.068	15.9	0.345
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	7610	0.793	37840	3.942	24070	2.507	51350	5.349
LOW MOLECULAR WEIGHT PAHs (µg/kg)	1061	0.336	13040	4.127	3295	1.043	15188	4.806
Total ERM-Q		3.608		5.144		0.984		3.251

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-008 TRP1-SD-008A-0406 20081105**		OUTER PIER 1 **TRP1-SD-009 TRP1-SD-009B-0001 20081105**		OUTER PIER 1 **TRP1-SD-009 TRP1-SD-009A-0204 20081105**		OUTER PIER 1 **TRP1-SD-009 TRP1-SD-009A-0406 20081105**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	12.90 J	0.184	10.30 J	0.147	15.80 J	0.226	12.30 J	0.176
CADMIUM (mg/kg)	0.890 J	0.093	1.00 J	0.104	0.700 J	0.073	1.20 J	0.125
CHROMIUM (mg/kg)	93.7 J	0.253	84.3 J	0.228	82.9 J	0.224	95.5 J	0.258
COPPER (mg/kg)	576 J	2.133	190 J	0.704	181 J	0.670	255 J	0.944
LEAD (mg/kg)	416 J	1.908	228 J	1.046	139 J	0.638	228 J	1.046
NICKEL (mg/kg)	127	2.461	41.5	0.804	38.8	0.752	57.1	1.107
SELENIUM (mg/kg)	7.9	5.643	4.7	3.357	6.3	4.500	6.1	4.357
ZINC (mg/kg)	1200 J	2.927	387 J	0.944	249 J	0.607	433 J	1.056
TOTAL PCB CONGENERS (µg/kg)	539.1	2.995	481.9	2.677	271.6	1.509	624.2	3.468
ALPHA-CHLORDANE (µg/kg)	3.4 U	0.283	4.2 U	0.350	1.8 U	0.150	1.6 U	0.133
TOTAL DDT (µg/kg)	32	0.694	39.5	0.857	5.1	0.111	4.5	0.098
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	15580	1.623	9660	1.006	16050	1.672	13880	1.446
LOW MOLECULAR WEIGHT PAHs (µg/kg)	2559	0.810	1296	0.410	2385	0.755	3833	1.213
Total ERM-Q		1.693		0.972		0.914		1.187

TABLE 4

ERM-Q CALCULATIONS
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

PARAMETER	OUTER PIER 1 **TRP1-SD-010 TRP1-SD-010B-0001 20081105**		OUTER PIER 1 **TRP1-SD-010 TRP1-SD-010A-0204 20081105**		OUTER PIER 1 **TRP1-SD-010 TRP1-SD-010A-0406 20081105**	
	RESULT	ERM_RATIO	**RESULT**	ERM_RATIO	**RESULT**	ERM_RATIO
ARSENIC (mg/kg)	12.40 J	0.177	12.00 J	0.171	14.50 J	0.207
CADMIUM (mg/kg)	0.470 J	0.049	1.50 J	0.156	1.90 J	0.198
CHROMIUM (mg/kg)	56.8 J	0.154	101 J	0.273	88.9 J	0.240
COPPER (mg/kg)	201 J	0.744	670 J	2.481	625 J	2.315
LEAD (mg/kg)	163 J	0.748	665 J	3.050	327 J	1.500
NICKEL (mg/kg)	30.9	0.599	146	2.829	67.9	1.316
SELENIUM (mg/kg)	4.3	3.071	5.6	4.000	6	4.286
ZINC (mg/kg)	356 J	0.868	1860 J	4.537	975 J	2.378
TOTAL PCB CONGENERS (µg/kg)	168	0.933	379.1	2.106	849.5	4.719
ALPHA-CHLORDANE (µg/kg)	4.4 U	0.367	1 U	0.083	3.2 U	0.267
TOTAL DDT (µg/kg)	8.5	0.184	10.3	0.223	36.1	0.783
HIGH MOLECULAR WEIGHT PAHs (µg/kg)	8360	0.871	14690	1.530	19240	2.004
LOW MOLECULAR WEIGHT PAHs (µg/kg)	1399	0.443	4070	1.288	3909	1.237
Total ERM-Q		0.708		1.748		1.650

J Estimated value
NA Not analyzed
U Undetected at indicated analytical detection limit

TABLE 5

CHEMICAL-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation of Compliance with ARAR
FEDERAL				
Cancer Slope Factors (CSFs)	United States Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) and others	To Be Considered (TBC)	These are guidance values used in the human health risk assessment to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	These standards are used to determine that there are no unacceptable carcinogenic risks from direct exposure to contaminated sediment. Alternatives IP-3 and OP-4 will meet these standards because potential risk from adult exposure to contaminated sediment will be addressed through dredging and off-site disposal of contaminated sediment.
Reference Doses (RfDs)	EPA IRIS and others	TBC	These are guidance values used in the human health risk assessment to evaluate the potential non-carcinogenic hazard caused by exposure to contaminants.	These standards are be used to determine that there are no unacceptable non-carcinogenic risks from direct exposure to contaminated sediment. Alternatives IP-3 and OP-4 will meet these standards because potential risk from adult exposure to contaminated sediment will be addressed through dredging and off-site disposal of contaminated sediment.

TABLE 5

CHEMICAL-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation of Alternative Compliance with ARAR
FEDERAL (continued)				
Guidelines for Carcinogen Risk Assessment	EPA/630/P-03/001F (March 2005)	TBC	These guidelines are used to perform human health risk assessments.	Alternatives IP-3 and OP-4 will meet these standards because potential risk from adult exposure to contaminated sediment would be addressed through dredging and off-site disposal of contaminated sediment.
Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens	EPA/630/R-03/003F (March 2005)	TBC	These guidelines are used to perform human health risk assessments.	Alternatives IP-3 and OP-4 will meet these standards because potential risk from child exposure to contaminated sediment would be addressed through dredging and off-site disposal of contaminated sediment.
Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposure to Lead in Soil		TBC	EPA guidance for evaluating human health risks posed by lead in sediment.	Alternatives IP-3 and OP-4 will meet this standard because potential risk from adult exposure to lead in contaminated sediment would be addressed through dredging and off-site disposal.

TABLE 5

CHEMICAL-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation of Alternative Compliance with ARAR
STATE OF CONNECTICUT				
None				

TABLE 6

LOCATION-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation of Compliance with ARAR
FEDERAL				
Clean Water Act, Section 404	33 United States Code (USC) 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available.	Dredging operations under Alternatives IP-3 and OP-4, including sediment dewatering, will be conducted in a manner that will minimize discharges to wetlands or navigable waters. Resource agencies have indicated that mitigation would not be required for altering aquatic habitat.
Rivers and Harbors Act, Section 10	33 USC 403; 33 CFR Parts 320-323	Applicable	Sets forth criteria for obstructions or alterations of navigable waters.	The dredging and dewatering components of Alternatives IP-3 and OP-4 will meet the substantive environmental requirements of these standards.
Fish and Wildlife Coordination Act	16 USC Part 661 *et seq.*,	Applicable	Protects fish and wildlife when actions at the site would result in the control or structural modification of a natural stream, body of water, wetlands, floodplain, or flood-prone areas. The statute requires federal agencies to take into account the effects of remedial actions and prevent loss or damage to resources.	The dredging and dewatering components of Alternatives IP-3 and OP-4 will be conducted to minimize impacts to fish and wildlife in the Thames River. Federal and state resource agencies will be consulted to prevent, mitigate, or compensate for loss of fish and wildlife.
Coastal Zone Management Act	16 USC Parts 1451 *et seq*.	Applicable	Requires that any actions must be conducted in a manner consistent with state-approved management programs.	The dredging and dewatering components of Alternatives IP-3 and OP-4 will be conducted so as to comply with the substantive requirements of this act.
STATE OF CONNECTICUT				
Connecticut Coastal Management Act	Connecticut General Statutes (CGS) §22a-444	Applicable	Requires that any actions must be conducted in a manner consistent with state-approved management programs.	The dredging and dewatering components of Alternatives IP-3 and OP-4 will be conducted so as to comply with the substantive requirements of this act.

TABLE 6

LOCATION-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation of **Compliance with ARAR**
STATE OF CONNECTICUT (continued)				
Dredging and erection of structures and placement of fill in tidal, coastal, or navigable waters	CGS §22a-359	Applicable	This statute regulates dredging and the erection of structures and the placement of fill, and work incidental thereto, in the tidal, coastal or navigable waters of the state waterward of the high tide line. Work within the regulated zone must be conducted in due regard for indigenous aquatic life, fish and wildlife, the prevention or alleviation of shore erosion and coastal flooding, use and development of adjoining uplands, improvement of coastal and inland navigation for all vessels, including small craft for recreational purposes, use and development of adjacent lands and properties and interests of the state including pollution control, water quality, recreational use of public water and management of coastal resources, with proper regard for the rights and interests of all persons concerned.	The dredging and dewatering components of Alternatives IP-3 and OP-4 will be conducted so as to comply with the substantive requirements of this act.
Tidal Wetlands and Watercourses	Regulations of Connecticut State Agencies (RCSA) §22a-30-1 through 17	Applicable	These rules regulate all activities within or affecting tidal wetlands and watercourses.	The dredging and dewatering components of Alternatives IP-3 and OP-4 will be conducted so as to prevent erosion, sedimentation, and other disturbance to tidal wetlands and watercourses.
Flood Management Regulations	RCSA 25-68h-1 through 25-68h-3	Relevant and Appropriate	These regulations address activities by state agencies in floodplains to minimize flood risk and prevent flood hazards.	Alternatives IP-3 and OP-4 will comply with this standard. Any shoreline activities within the 100-year coastal flood hazard zone will comply with the substantive provisions of these regulations.
Connecticut Endangered Species Act	CGS §26-303 through 314	Applicable	Remedial actions may not jeopardize the continued existence of state-listed endangered or threatened species, or adversely modify or destroy their critical habitat.	The dredging and dewatering components of Alternatives OP-3 and IP-4 will be conducted so as to minimize disturbance to aquatic habitats in the Thames River that may be used by the state-threatened Atlantic Sturgeon.

TABLE 7

ACTION-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis	Evaluation of Compliance with ARAR
FEDERAL				
Clean Water Act (CWA), Section 304; National Recommended Water Quality Criteria (NRWQC)	33 United States Code (USC) 1314; 40 Code of Federal Regulations (CFR) 122.44	Relevant and Appropriate	Guidelines establish NRWQC for the protection of human health and/or the aquatic organisms.	Alternatives IP-3 and OP-4 will comply. Water quality monitoring would ensure that these criteria are not exceeded during dredging and dewatering operations.
CWA, Section 402, National Pollution Discharge Elimination System (NPDES)	33 USC 1342; 40 CFR 122 through 125	Not Applicable (off-site disposal)	These standards govern the discharge of water into surface waters.	Dewatering operations would meet these standards through passive treatment before dewatering fluid is discharged back to the Thames River.
CWA; General Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR § 403	Potentially Applicable (off-site disposal)	Standards for direct discharge of dewatering fluid or any other discharge into a Publicly Owned Treatment Works (POTW).	Alternatives IP-3 and OP-4 will comply with these standards if off-site disposal of dewatering fluid involves discharge to a POTW.
Toxic Substance Control Act (TSCA), PCB Remediation Waste Risk-Based Standards	15 U.S.C. § 2601 *et seq.*; 40 CFR 761.61(c)	Applicable	Risk-based standards for the sampling, cleanup, or disposal of PCB remediation waste.	Alternatives IP-3 and OP-4 will comply because sediment exceeding the unrestricted use risk-based standard of 1 mg/kg will be excavated/dredged and disposed off site.
Clean Air Act (CAA), National Emissions Standards for Hazardous Air Pollutants (NESHAPs)	42 U.S.C. §12(b)(1); 40 CFR Part 61	Applicable	The regulations establish emissions standards for 189 hazardous air pollutants. Standards set for dust control and other release sources.	Alternatives IP-3 and OP-4 will comply. If removal activities, including excavation/dredging or processing of contaminated sediment, generate regulated air pollutants, measures will be implemented to meet these standards.

TABLE 7

ACTION-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis	Evaluation of Compliance with ARAR
FEDERAL (continued)				
United States Environmental Protection Agency (EPA) Contaminated Sediment Remediation Guidance for Hazardous Waste Sites	EPA-540-R-05-012; OSWER 9355.0-85 December 2005	TBC	Guidance on the remediation of contaminated sediments, including capping and dredging.	Alternatives IP-3 and OP-4 would comply. Dredging alternatives would be designed and implemented utilizing this guidance.
STATE OF CONNECTICUT				
Hazardous Waste Management: Generator and Handler Requirements, Listing and Identification	Regulations of Connecticut State Agencies (RCSA) § 22a-449(c) 100-101	Applicable	Connecticut is delegated to administer the federal Resource Conservation and Recovery Act (RCRA) statute through its state regulations. These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference	Alternatives IP-3 and OP-4 would comply. Hazardous waste determinations would be performed on all contaminated sediment excavated/dredged to determine that the levels of regulated constituents do not exceed applicable limits. Any contaminated sediment that exceeds hazardous waste standards would be managed in accordance with requirements of these regulations. Also, wastes produced from dewatering process would be tested to determine whether they exceed applicable limits.
Hazardous Waste Management: Generator Standards	RCSA § 22a-449(c)-102	Applicable	This section establishes standards for various classes of generators. The standards of 40 CFR 262 are incorporated by reference.	Alternatives IP-3 and OP-4 would comply. Any hazardous waste generated as a result of either excavation/dredging or dewatering operations would be handled and disposed of in compliance with these standards.
Hazardous Waste Management: TSDF Standards;	RCSA § 22a-449 (c) 104	Relevant and Appropriate	This section establishes standards for the treatment, storage, and disposal of hazardous waste. The standards of 40 CFR 264 are incorporated by reference, in particular 40 CFR Subpart G (Closure/Post Closure), Subpart I (Containers), Subpart J (Tank Systems), Subpart L (Waste Piles), Subpart N (Landfills).	Alternatives IP-3 and OP-4 would comply. Any hazardous waste that is treated or temporarily stored on site would be managed in accordance with the requirements of this section, particularly if waste piles, containers, or tanks are used to manage sediment or dewatering fluid exceeding hazardous waste thresholds.
Hazardous Waste Management Facility Siting	RSCA § 22a-116-B-1	Applicable	Any siting of a facility that manages or treats hazardous waste will meet these standards.	Alternatives IP-3 and OP-4 would comply. Any sediment management and/or dewatering facility that manages material that exceeds hazardous waste thresholds would comply with these siting standards.
Solid Waste Management	RSCA §22a-209 -1 through	Applicable to solid waste managed on-site	Management and siting requirements for the disposal of solid waste.	Alternatives IP-3 and OP-4 would comply. All material that does not exceed hazardous waste thresholds would be managed on site as solid waste and disposed off site in an appropriate

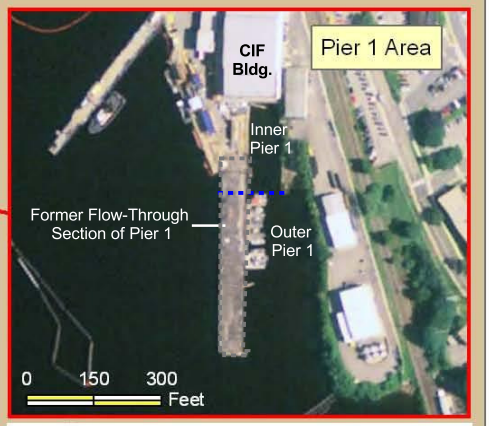
TABLE 7

ACTION-SPECIFIC ARARs AND TBCs
INNER AND OUTER PIER 1
NSB-NLON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis	Evaluation of Compliance with ARAR
				licensed solid waste facility.
STATE OF CONNECTICUT (continued)				
Water Pollution Control	RCSA §22a-430-1 through 8	Not Applicable (off-site disposal)	These rules regulate water discharge to surface water.	Dewatering operations would meet these standards through passive treatment before dewatering fluid is discharged back to the Thames River.
Air Pollution Control	RCSA §22a-174 1-20	Applicable	These regulations require permits to construct and operate specified types of emission sources and contain emission standards that must be. Pollutant abatement controls may be required. Specific standards pertain to fugitive dust (18b).	Alternatives IP-3 and OP-4 would comply. If removal activities, including excavation/dredging or processing of contaminated sediment, generates regulated air pollutants, measures would be implemented to meet these standards.
Connecticut Guidelines for Soil Erosion and Sediment Control	Connecticut Council on Soil and Water Conservation	TBC	Technical and administrative guidance for development, adoption, and implementation of erosion and sediment control program.	Alternatives IP-3 and OP-4 would comply. Excavation/dredging operations would include an appropriate erosion and sedimentation control program that would comply with this guidance.

ATTACHMENT 2

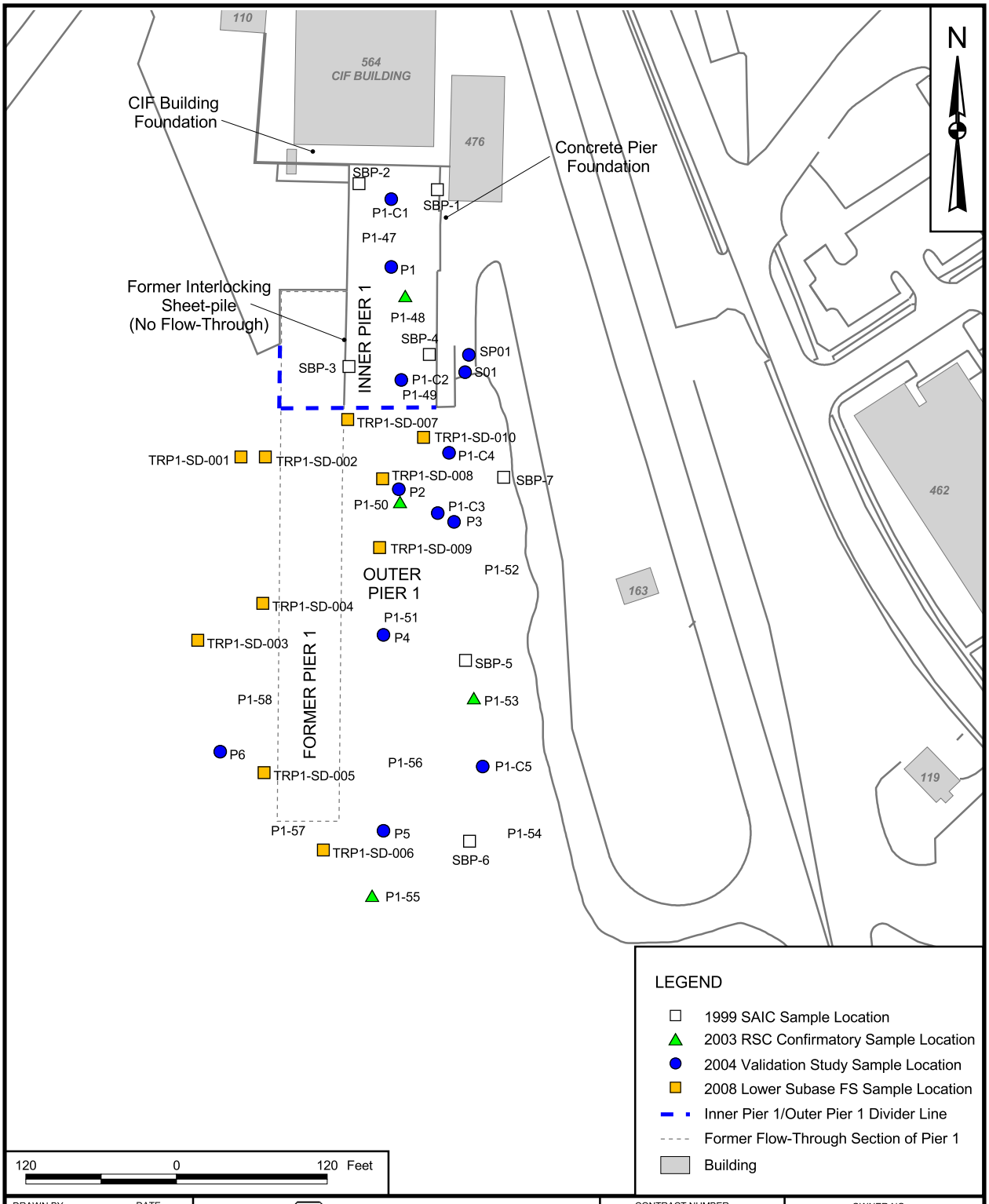
FIGURES



Notes:
1. This figure was orignially published by Battelle as Figure 1-1 in the the following document: "Battelle, 2008. Final Engineering Evaluation/Cost Analysis for Pier 1 Inner Area, Naval Submarine Base New London, Groton, Connecticut. Prepared for NAVFAC MIDLANT OPNEEV, Norfolk, Virginia. March."

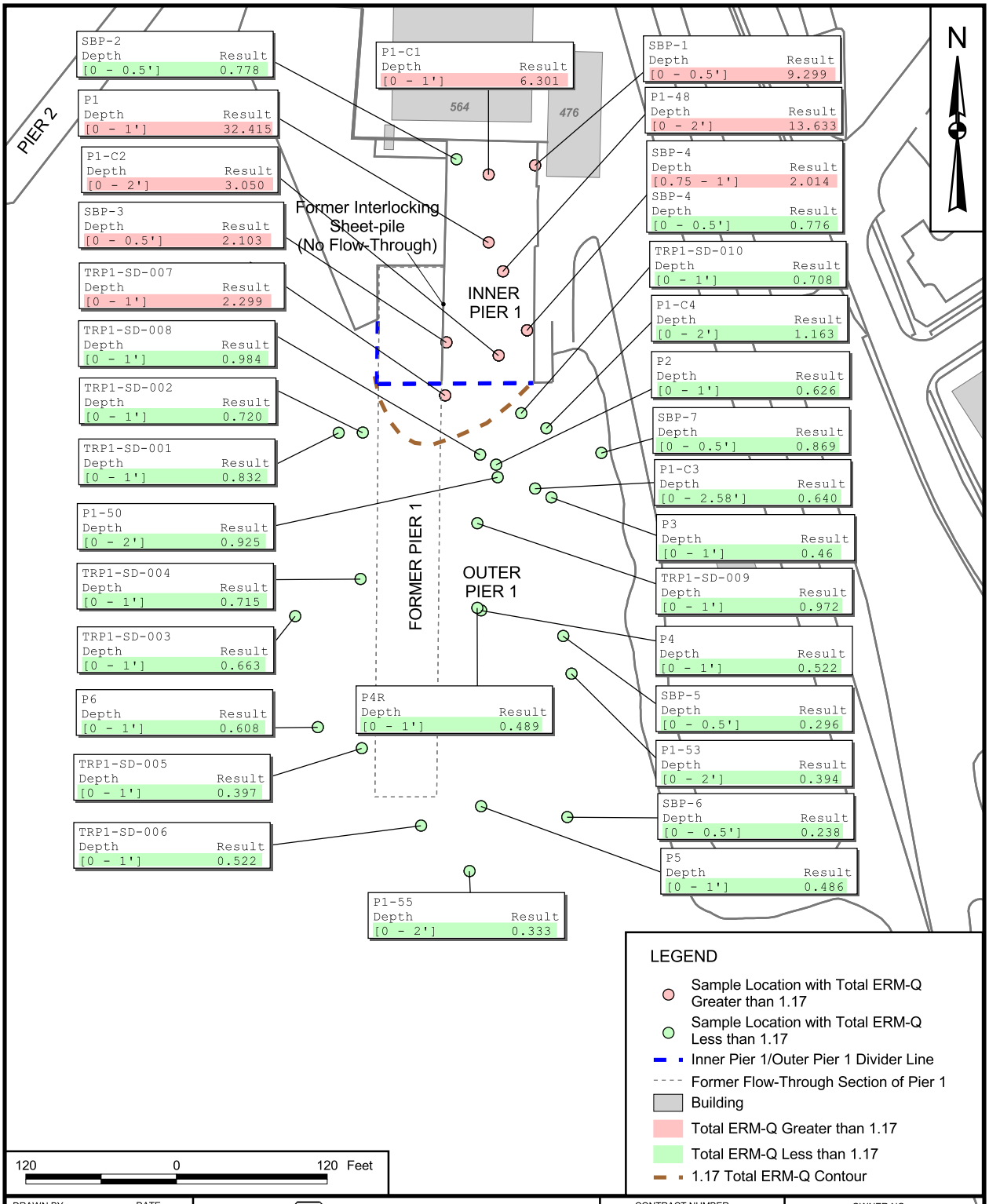
2. Pier 1 was demolished in August 2009.

DRAWN BY S. STROZ — DATE 07/27/09	Tetra Tech NUS, Inc.	CONTRACT NUMBER WE24	OWNER NO. 2195
CHECKED BY C. RICH — DATE 11/09/09	LOCATION OF NSB-NLON AND PIER 1 INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY C. RICH	DATE 11/09/09
COST/SCHEDULE-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 1	REV 0



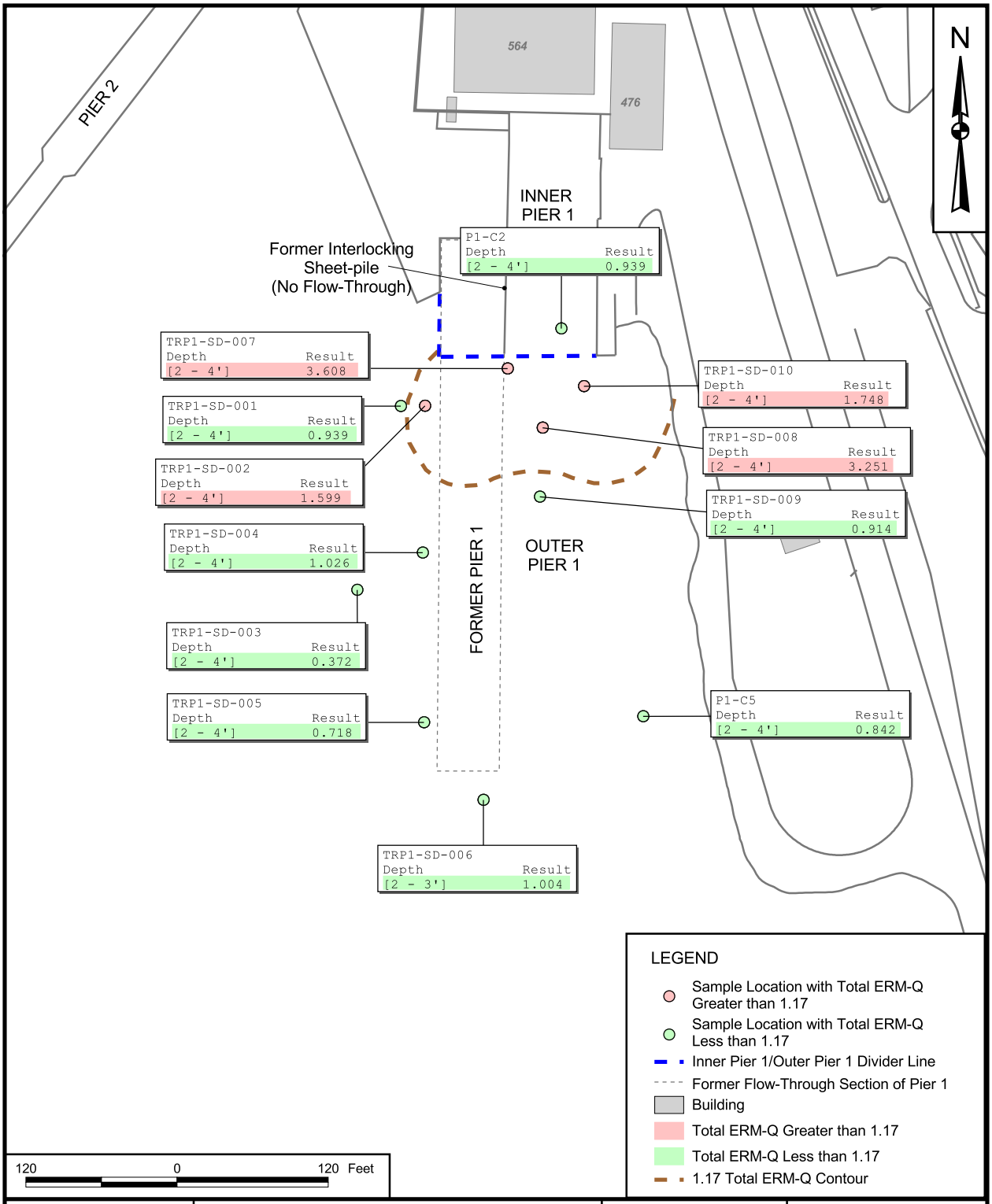
DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	07/08/09		WE24	2195
CHECKED BY	DATE	HISTORICAL SAMPLING LOCATIONS IN THE PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 2	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR PIER 1 SAMPLE LOCATIONS LAYOUT 11/09/09 SS



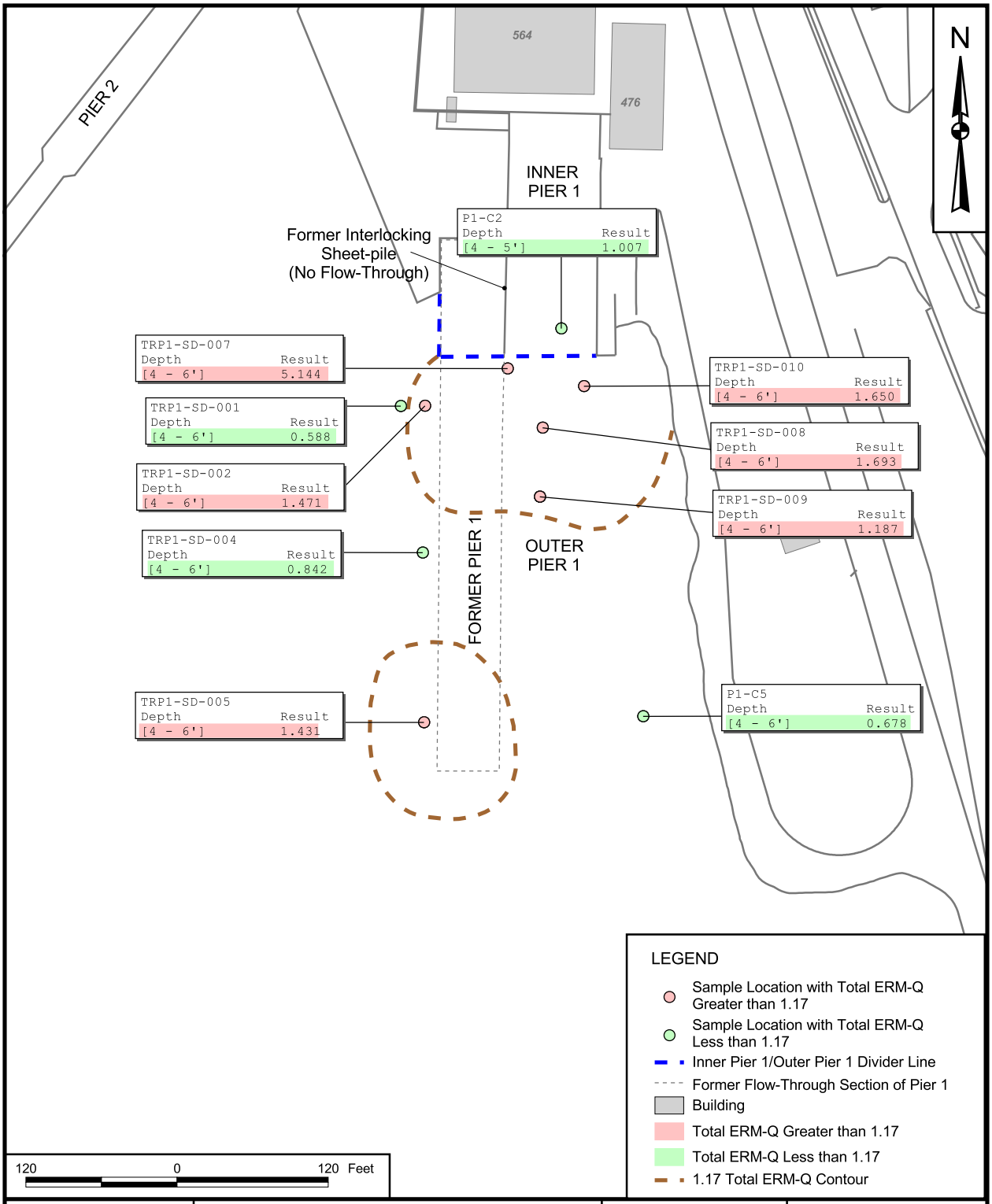
DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	04/22/09		WE24	2195
CHECKED BY	DATE	TOTAL ERM-Qs, 0-2 FEET DEPTH, PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 3	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR REV2 PIER 1 TOTAL ERM-QS 0-2 FOOT DEPTH LAYOUT 11/09/09 SS



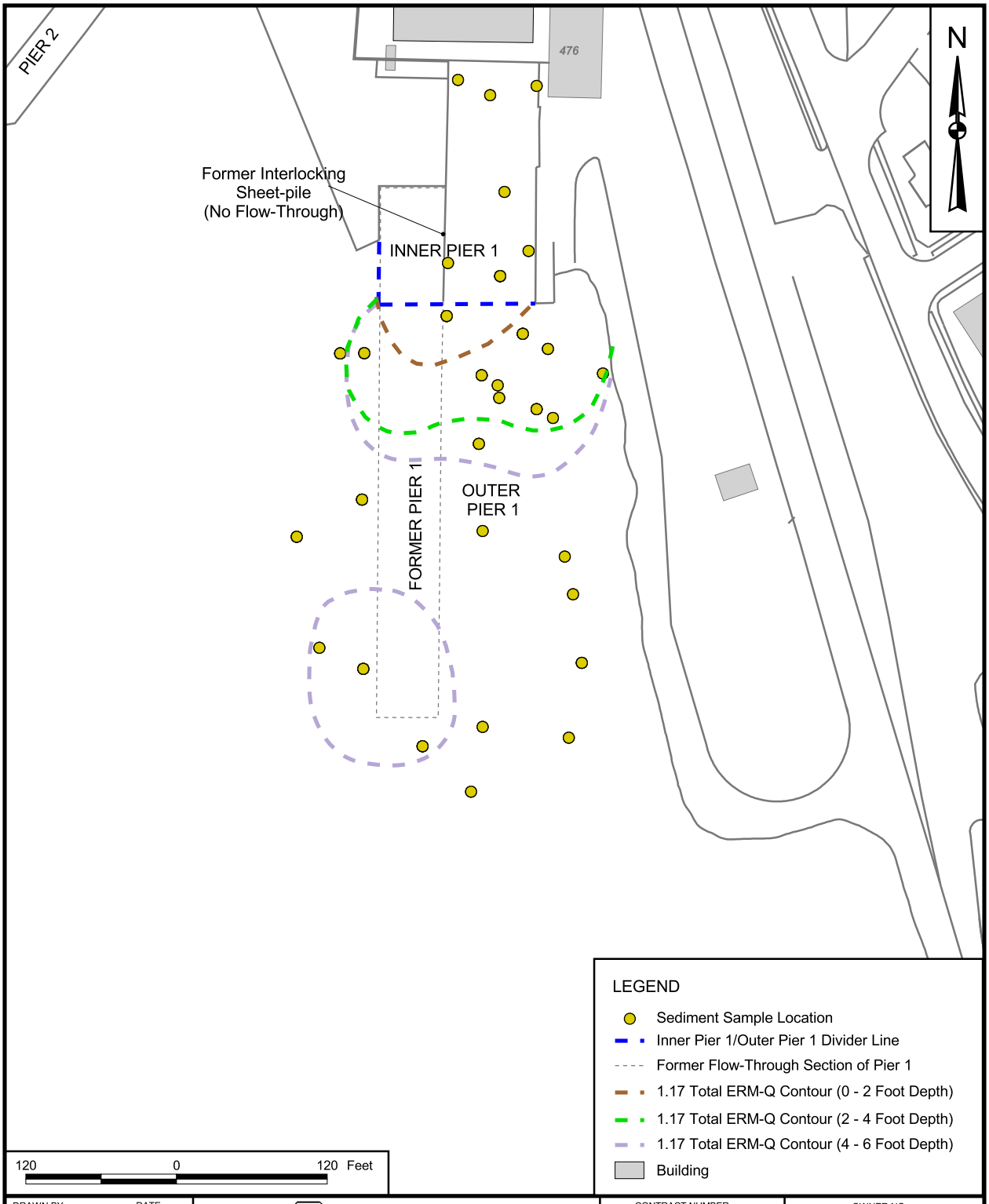
DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	04/22/09		WE24	2195
CHECKED BY	DATE	TOTAL ERM-Qs, 2-4 FEET DEPTH, PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 4	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR REV PIER 1 TOTAL ERM-QS 2 -4 FOOT DEPTH LAYOUT 11/09/09 SS



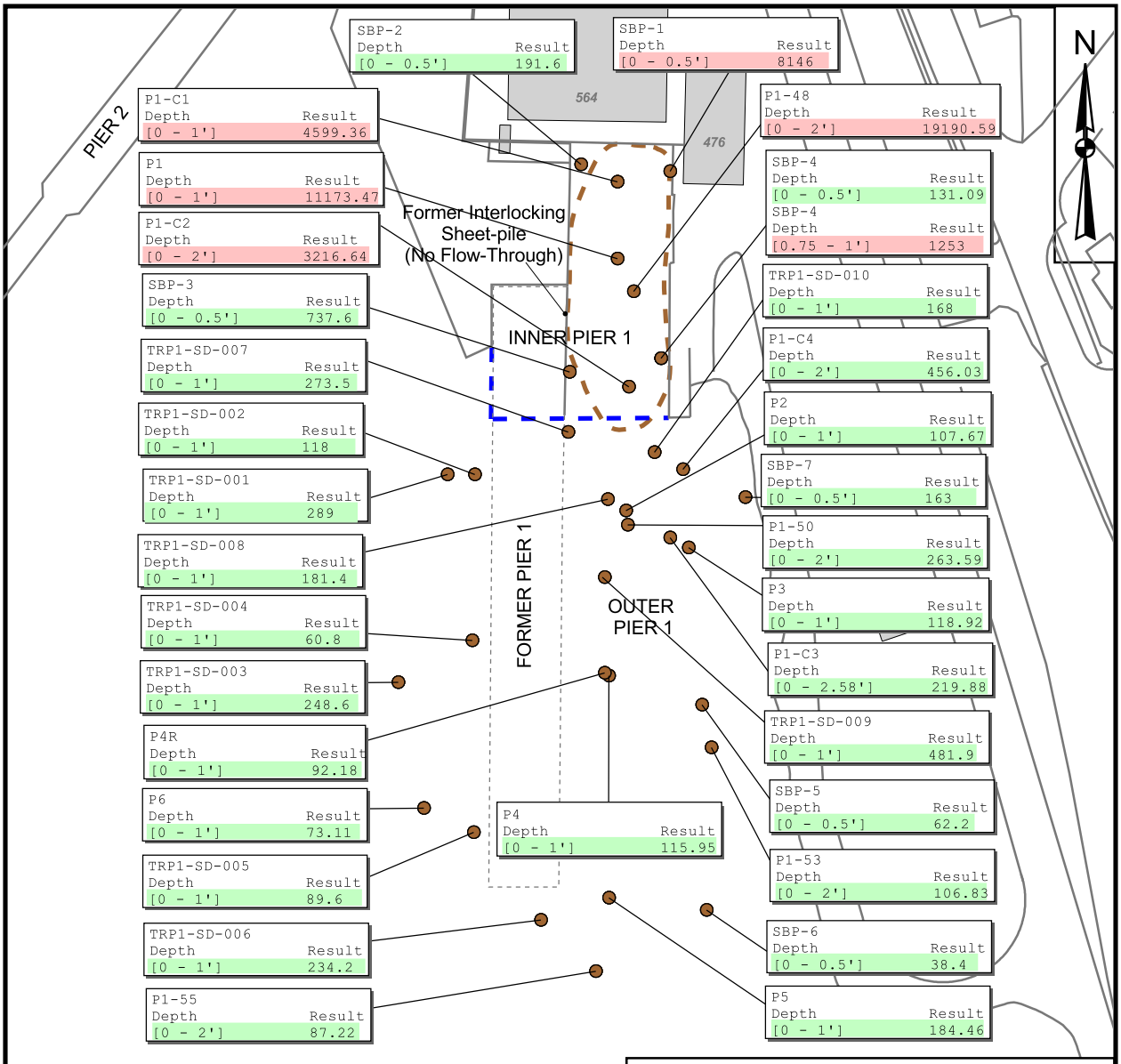
DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	04/22/09		WE24	2195
CHECKED BY	DATE	TOTAL ERM-Qs, 4-6 FEET DEPTH, PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 5	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR REV PIER 1 4 TO 6 TOTAL ERM-QS TAG LAYOUT 11/10/09 SS



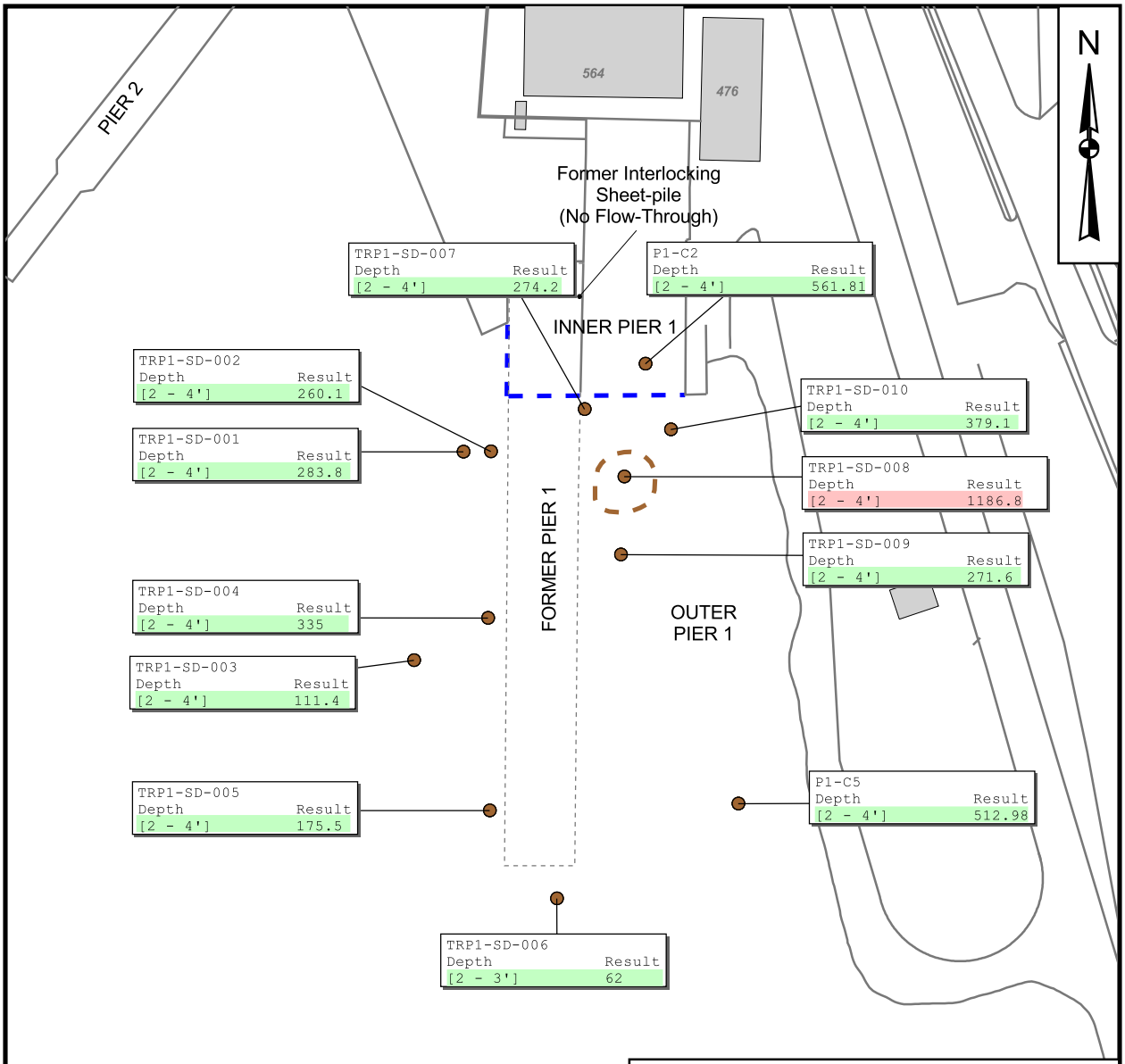
DRAWN BY S. STROZ	DATE 02/04/09	Tetra Tech NUS, Inc.	CONTRACT NUMBER WE24 / OWNER NO. 2195
CHECKED BY C. RICH	DATE 11/09/09	TOTAL ERM-Qs PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB - NLON, GROTON, CONNECTICUT	APPROVED BY C. RICH / DATE 11/09/09
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 6 / REV 0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR PIER 1 COMBINED ISOCONTOURS FOR ERM-QS LAYOUT 11/04/09 SS



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	04/21/09		WE24	2195
CHECKED BY	DATE	TOTAL PCB CONGENERS, 0-2 FEET DEPTH, PIER 1 AREA INNER AND OUTER PIER ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 7	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR PIER 1 PCB CONGENERS 0-2 FOOT DEPTH LAYOUT 11/10/09 SS



LEGEND

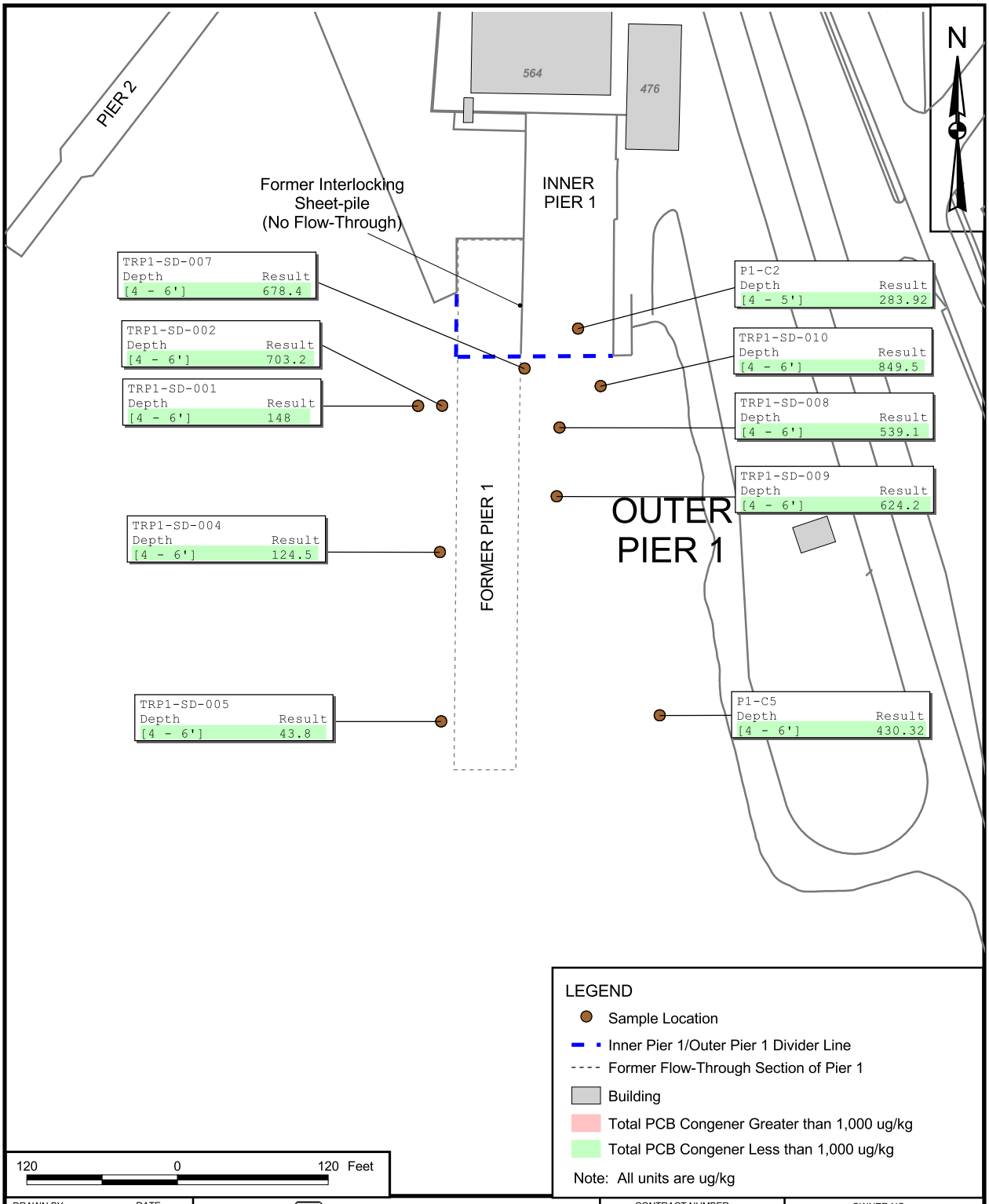
- Sample Location
- Inner Pier 1/Outer Pier 1 Divider Line
- Former Flow-Through Section of Pier 1
- 1,000 ug/kg Total PCB Contour
- Building
- Total PCB Congener Greater than 1,000 ug/kg
- Total PCB Congener Less than 1,000 ug/kg

Note: All units are ug/kg

120 0 120 Feet

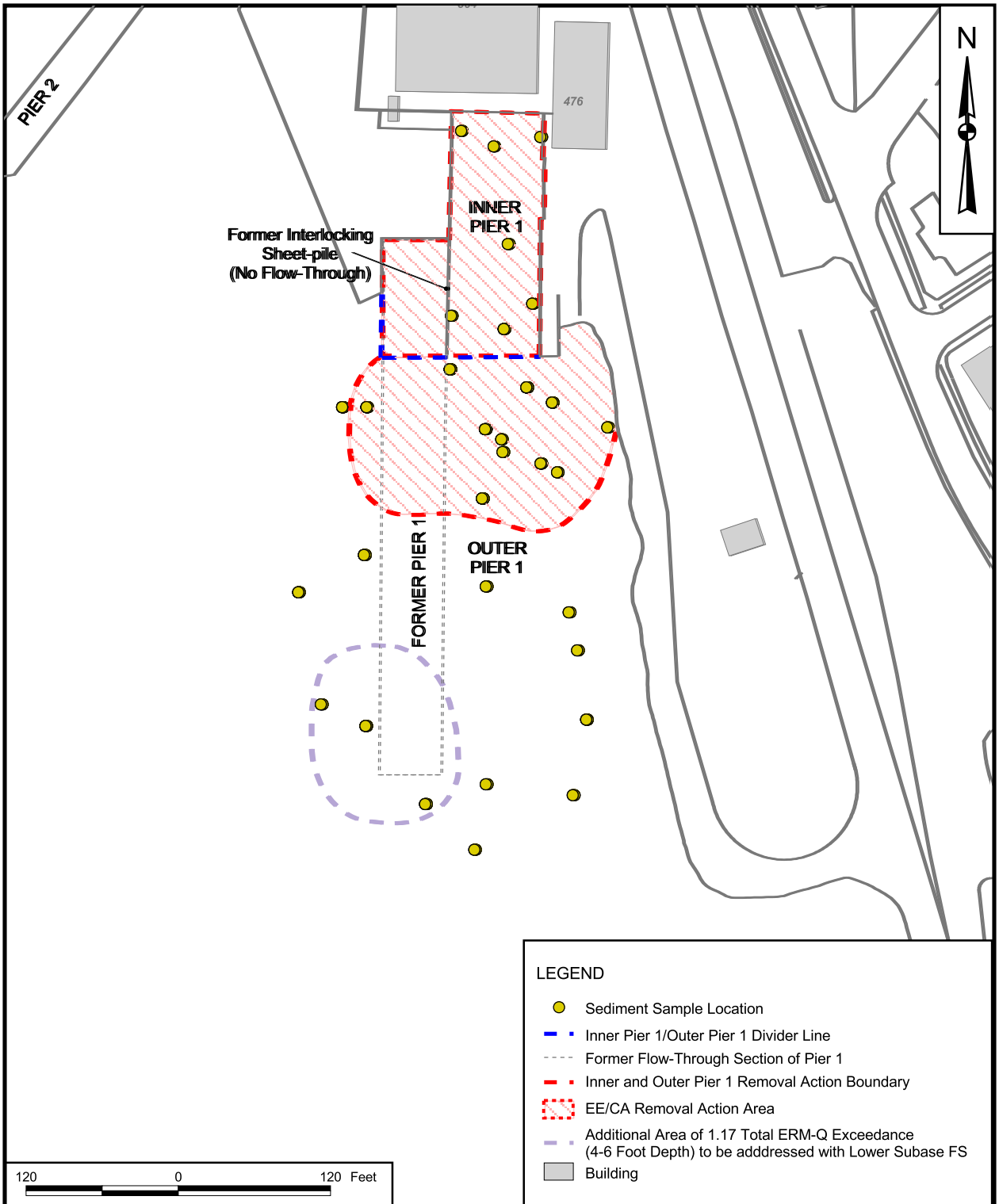
DRAWN BY S. STROZ	DATE 04/21/09	Tetra Tech NUS, Inc.	CONTRACT NUMBER WE24 / OWNER NO. 2195
CHECKED BY C. RICH	DATE 11/09/09	TOTAL PCB CONGENERS, 2-4 FEET DEPTH, PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY C. RICH / DATE 11/09/09
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 8 / REV 0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR PIER 1 PCB CONGENERS 2-4 FOOT DEPTH LAYOUT 11/10/09 SS



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	04/21/09		WE24	2195
CHECKED BY	DATE	TOTAL PCB CONGENERS, 4-6 FEET DEPTH, PIER 1 AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 9	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR PIER 1 PCB CONGENERS 4-6 FOOT DEPTH LAYOUT 11/09/09 SS



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
S. STROZ	07/07/09		WE24	2195
CHECKED BY	DATE	BOUNDARY BETWEEN INNER AND OUTER PIER 1 AND REMOVAL ACTION AREA INNER AND OUTER PIER 1 ACTION MEMORANDUM NSB-NLON, GROTON, CONNECTICUT	APPROVED BY	DATE
C. RICH	11/09/09		C. RICH	11/09/09
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE			DRAWING NO.	REV
AS NOTED			FIGURE 10	0

P:\GIS\NLON\SUBASE FEASIBILITY STUDY.APR PIER BOUNDARY AND REMOVAL ACTION AREA LAYOUT 11/10/09 SS

ATTACHMENT 3

PUBLIC NOTICE

Ad Number: d00219832 / PO# OK per Corey Ric
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Publication Date: 10/17/2009
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Health debate swirls around bottom-feeder pedicure

CASEY SEILER
cseiler@timesunion.com

The problem with fish pedicures, health officials say, is that the carp carry some of their previous meal when they move on to the next. Potential exists for carp to become a tiny school of Typhoid Marys with gills but no teeth, passing on foot contagion.

Can a nation truly be free when its citizens can't pay someone to let a small school of carp nibble on their toes?

OK, it's not a question that we hear debated that often in the so-called mainstream media, where most of the attention goes to marginal matters like the public option and military policy in Afghanistan. But while the people remain distracted, the state legislature is preparing to move forward with a bill that would deny every New Yorker of their God-given right to a fish pedicure.

For those who don't read cosmetology trade journals: A fish pedicure involves the use of small carp called garra rufa. Placed in a warm footbath, the toothless fish will absolutely go to town "chewing" off the dead skin found on the average human foot. It's the pedicure sensation that's sweeping the — well, several nations in Asia and Eastern Europe. It has, however, been banned in more than a dozen U.S. states.

Hefty penalties proposed

New York might be joining them. Introduced by state Sen. Jeff Klein, bill No. 6205 would prohibit "the use of live fish in any manner in any pedicure procedure." A first offense would result in a fine of up to $250; a subsequent violation would be classified as a Class B misdemeanor. (Klein, a Bronx Democrat, did not return a call for comment.)

The bill currently lacks a sponsor in the assembly — a chamber, it's worth noting, with a much more liberal attitude toward the use of fish in cosmetic procedures.

The problem with fish pedicures, health officials say, is that while the fish tank and the footbath can be sanitized, the carp themselves will invariably carry around some of their previous meal when they move on to the next. The potential exists for the carp to become, in effect, a tiny school of Typhoid Marys with gills but no teeth, passing foot contagion from one customer to the next.

"Oh, see — that's gross," said Ania Bickham, the proprietor of Ania Hair Studio & Spa in Albany, which offers the traditional non-carp pedicures.

A different sensation

Bickham hasn't heard of any capital region businesses offering the procedure, although one of her customers told her about having it done. It was, the customer said, not unpleasant — once you got over the sensation of tiny fish chewing on your extremities.

The regulatory problem is simple: The fish are tools, and tools need to be cleaned after each use. In a Wall Street Journal article from this spring, Lynda Elliott of the New Hampshire Board of Barbering, Cosmetology and Esthetics put it this way: "There's no way to sanitize them unless you bake them for 20 minutes at 350 degrees."

By which point the fish wouldn't be able to service the next customer. Although they might not taste too bad with some lemon and a sprig of rosemary.

As the bill makes its way through the legislature, I hope Klein's fellow lawmakers will address some of the glaring deficiencies in his bill, which is at once too narrow and far too broad. Klein's language would bar the use of live fish from pedicures while remaining silent on the question of their use in manicures, or other cosmetic practices that I'd rather not get into.

Also, the prohibition on the use of fish seems to tacitly condone the use of other live animals — field mice, raccoons, maybe even badgers — in the removal of dead skin from our feet.

Are fish pedicures gross? Perhaps. Unsanitary? Probably. But life is a series of risks. At bottom, the decision to get a fish pedicure or not shouldn't be made by the state. It should be reserved for each individual to make on his or her own — perhaps in consultation with the family esthetician.

Editor's note: The writer is with the Times Union in Albany.

Don't let community banks take hit for sins of large retail and investment institutions

By JIM CRONIN

Politicians are responding to the ills of our banking system in a way that might appease voters and, thereby, garner votes, with little regard for the impact on community banks and, ultimately, their constituents.

As we all struggle to recover from the financial crisis thrust upon us by a host of perpetrators — mortgage brokers, large retail and investment banks and Wall Street — further enabled by regulators, Congress and the executive branch of government, I would like to sound an alarm and ask for your help.

To begin with, we need to separate community banks from the pack. They did not play any part in the creation of this mess. They nevertheless are quickly becoming one of the most affected victims and, by extension, I fear so too will the communities they serve.

The public needs to know that the losses experienced by the FDIC will all be directly paid for by the banking industry, not by the American taxpayer. Acknowledging that, we must also recognize that increased premiums will be paid by community banks that had nothing to do with the failures. For example, Dime's FDIC premium went from about $250,000 in 2008 to just under $1 million this year. That's a 300 percent jump. And there will be more increases in 2011.

Although taxpayers won't directly pay for the increased premiums, they might indirectly in the form of possible lower interest rates on deposit accounts or increased fees.

As difficult as those increases are for a community bank to fund, I fear they pale in comparison to the potential harm that might come from the various proposals being circulated in Washington from the Obama administration, Sen. Christopher Dodd and Rep. Barney Frank.

Typical Washingtonian solutions

These folks are rushing to correct the ills of our banking system with typical Washingtonian solutions that are not all well thought out or formed with minimal understanding of the consequences to, again, the community banking system.

Politicians are trying to read the reaction of the American voter to this crisis, painting all banks with the same broad brush. They are responding in a way that might appease voters and, thereby, garner votes, with little regard for the impact on community banks and, ultimately, their constituents.

One idea is to create a new "super" regulator called the Consumer Financial Protection Agency. Under this proposal, there would be one regulator to ensure that all banks comply with consumer-related statutes and regulations. The idea is to create an independent body, separate from existing regulators.

Whole new, costly bureaucracy

Sounds reasonable, but totally unnecessary. The problem is there would be minimal connection between the concerns the existing regulators rightfully have in assessing the safety and soundness of an institution and compliance with consumer regulations. Such an organization would have too much power and could exercise it with a lack of understanding of the interconnectivity of compliance laws and regulations versus safety and soundness concerns. And it would create a whole new bureaucracy that would be very costly and mostly paid for by the banking industry, hence another burdensome and unnecessary cost to community banks.

Another suggestion is to create a new regulator, the National Bank Supervisor, to replace the Office of Thrift Supervision and the Comptroller of the Currency. Concurrent with the formation of this new regulator is a proposal to eliminate the federal thrift charter. That would mean existing federal mutual institutions would either have to convert to stock ownership and become a national bank or seek to become a state chartered institution.

Why the concern? There are 296 federally chartered, mutual thrift institutions in the country. Most of them used to be called savings and loans with a few former savings banks included in the mix. The Obama administration has concluded that thrifts, with their focus on residential lending, are a product of a past generation and that "thrifts were more vulnerable to the housing downturn that the United States has been experiencing since 2007."

They have effectively concluded that their number is so small that they should legislate them out of existence as they are currently structured.

In addition to the thrifts, there are 215 mutual savings banks nationwide, mostly in the Northeast, 17 of which are in Connecticut. Dime is one of them. If this proposal passes, it doesn't take a lot of imagination to conclude some bureaucrat in Washington, in the not too distant future, will question the need for mutual savings banks. From that, there could be further legislative action to force mutual savings banks to convert to a state-chartered stock institution or a national bank, legislating us out of existence.

From a public policy standpoint, small to mid-size thrifts and mutual savings banks would no longer be a concern of big government.

The frightening part of this irrational thinking is that community institutions didn't create this problem. Large national or regional banks and Wall Street did. Sure, one of the main culprits was Washington Mutual that had a thrift charter, but there is no connection to what it did and a mutual community bank other than, coincidentally, its charter.

Let's slow it all down

What needs to happen? The Senate and House banking committees need to slow down the process. Take time to evaluate all of the ramifications of the current proposals, both short- and long-term. Listen to constituents — community banks and their customers.

Those who see the value that a mutual bank like Dime provides to our community should let Sen. Dodd, Sen. Joseph Lieberman and Rep. Joe Courtney hear their concerns. Write or e-mail them. A sample letter is on www.dime-bank.com.

Don't hesitate. This process is moving full-speed ahead. Let Washington hear your voice now.

Jim Cronin is president of Dime Bank.

Letters To The Day

Bloody fish photo a waste of space

I was disgusted to see the very large photo of two men beaming with the bloody shark they had killed. ("Catch of the day," Oct. 10.)

What on earth did the shark do to deserve becoming a trophy and having its photo in our paper?

The space would have served a much better purpose by having several more photos run of animals in our shelters needing new homes and loving caretakers.

JoAnn Torigoe
East Lyme

Defeating ash fill protects Franklin

On behalf of "residents of the last green valley," we would like to extend our sincere gratitude to everyone who supported the effort to protect one of our last, vast, pristine parcels of land in Franklin.

This land had been slated to be used as a toxic ash landfill. Now, because of the efforts of our citizens, legislators, state officials, town officials, media and others — including the Toxics Action Center for their guidance and perseverance — this land will continue to support a diverse population of wildlife and provide a large supply of drinking water for future use.

Our environment is precious to us all and is everyone's responsibility to protect.

Anthony Fratianni
Franklin

Forget trees, put focus on sidewalks

I don't care that Selectman Bill Peace plants trees; sorry if that offends anyone. We have many trees in Old Saybrook. We don't need more. Bill Peace says we should re-elect him because he's been "pursuing environmental issues, such as planting trees, and adding sidewalks."

Our trees are photosynthesizing just fine. And, Mr. Peace doesn't even maintain those trees. Remember, he redeployed public works' employees from cleaning storm drains and pruning trees to working on the "Kate."

No, we don't need more trees. Let's pour sidewalks, instead. I want Mr. Peace to provide residents with a sidewalk on the Old Boston Post Road of the same consistent color and smooth, flat surface as the sidewalk along First Selectman Mike Pace's home.

Mr. Peace and Mr. Pace aren't the architects, principals or providers of good education for students. Loving parents, concerned educators and great kids get the credit.

Mr. Peace and Mr. Pace are responsible for making certain the sidewalks our children walk or bicycle on to and from school are safe. In more than 10 years they have not done anything about the weary and the wretched Old Boston Post Road sidewalk.

Sidewalks, not trees.

Mary Hansen
Old Saybrook

ECSO an awesome part of community

I had the privilege to attend the opening of the Eastern Connecticut Symphony Orchestra for the season on Sept. 26. I could have closed my eyes and thought that the Chicago Symphony was in front of me. Their sound was in a word, awesome.

The new director Toshiyuki Shimada seemed to be a perfect fit for this talented orchestra. While leading he seemed to also highlight their talents. I have followed the evolution of this fine orchestra since before Paul Phillips. I thought that the symphony reached its zenith under Mr. Phillips, but they played on an even higher level here. It was hard for me to believe that this orchestra was local. What they do for the community cannot be overstated. The concert rose to a crescendo with "Rhapsody in Blue."

Although the pianist was a virtuoso, the orchestra stayed with him perfectly, to provide an incredible experience.

Edward Stoltz
New London

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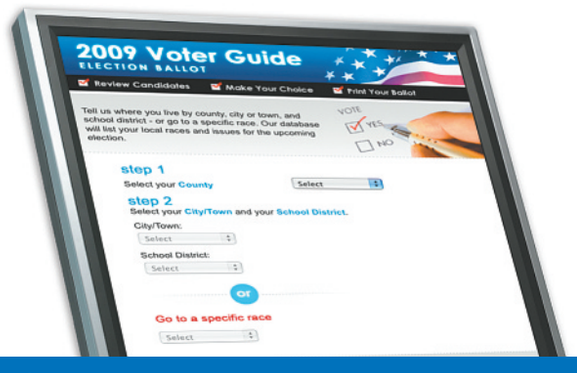
THE DAY'S
2009 Voter Guide
See Every Race and Every Candidate on the Ballot in Your Town
Since 1881, The Day has been informing voters about the choices they face in upcoming elections. This year, we're publishing an online Voter Guide to help you prepare for Election Day.



✓ See all the races in your town
✓ Read biographies of each of the candidates
✓ Print out a ballot to take with you to the voting booth
The 2009 Voter Guide will be online Saturday, Oct. 17, through Election Day, Tuesday, Nov. 3.
Find it at:
theday.com
www.theday.com/election2009/votersguide
d220947

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PUBLIC NOTICE

The Department of the Navy, Naval Submarine Base - New London (NSB-NLON), in conjunction with the United States Environmental Protection Agency and the Connecticut Department of Environmental Protection announce the availability of the final Engineering Evaluation/Cost Analysis (EE/CA) for Inner and Outer Pier 1 at NSB-NLON, Groton, Connecticut and invite the public to review and comment on it. The EE/CA was prepared under the Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund), which authorizes Federal action to respond to the releases of hazardous substances into the environment, to develop and evaluate alternatives for a non-time-critical removal action (NTCRA) to address contamination in the sediment at Inner and Outer Pier 1, which is the focus of the EE/CA. The public comment period for this EE/CA begins October 17, 2009 and ends November 16, 2009.

The Pier 1 area was formerly used to pull ships and submarines out of the water for sandblasting, paint scraping, and maintenance. Several environmental field investigations were performed to characterize the sediment and the results identified elevated concentrations of several chemicals including polychlorinated biphenyls, polycyclic aromatic hydrocarbons, pesticides, and metals. While there are no current human health risks, these contaminants could harm the environment. Approximately 2,700 cubic yards of contaminated sediment at Inner Pier 1 and 6,700 cubic yards of contaminated sediment at Outer Pier 1 will be removed.

Six alternatives were evaluated for Inner Pier 1 sediment and five alternatives were evaluated for Outer Pier 1 sediment as part of the EE/CA. The technologies evaluated, that can achieve a timely cleanup, included dredging and capping. Based on the results of this evaluation, dredging, dewatering, and off-site disposal is the Navy's preferred method for addressing the contaminated sediment at both Inner and Outer Pier 1. The Navy considered the effectiveness, implementability, and cost of all of the alternatives.

Community input is integral to the removal action selection process. The public is encouraged to review the EE/CA for Inner and Outer Pier 1 at the following Information Repositories during normal hours of operation:

Groton Public Library
52 Newton Road
Groton, CT 06340
(860) 441-6750

Bill Library
718 Colonel Ledyard Highway
Ledyard, CT 06339
(860) 464-9912

The public can provide either oral or written comments on the EE/CA for Inner and Outer Pier 1. Comments should be submitted to either of the following Navy contacts listed below. Oral comments should be provided within the public comment period and written comments must be postmarked no later than November 16, 2009.

Mr. Richard Conant
Environmental Restoration Program Manager
NAVFAC MIDLANT PWD New London
Environmental Division Box 400
Building 439, Tautog Avenue, Room 104
Groton, CT 06349-5400
Tel: (860) 694-5649
Email: richard.conant@navy.mil

Mr. Jim Gravette
Remedial Project Manager
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ATTACHMENT 4

COST ESTIMATES

NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
INNER PIER 1 SEDIMENT
ALTERNATIVE IP-3: WATER-BASED DREDGING TO BEDROCK, DEWATERING, and OFF-SITE DISPOSAL of SEDIMENT and DEWATERING FLUID
Capital Cost

			Unit Cost				Extended Cost				
Item	Quantity	Unit	Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	Subtotal
1 PROJECT PLANNING											
1.2 Prepare Documents & Plans including Permits	300	hr			$37.50		$0	$0	$11,250	$0	$11,250
2 MOBILIZATION AND DEMOBILIZATION											
2.1 Site Support Facilities (trailers, phone, electric, etc.)	1	ls		$1,000.00		$3,500.00	$0	$1,000	$0	$3,500	$4,500
2.2 Barge Mobilization	2	ea				$2,500.00	$0	$0	$0	$5,000	$5,000
2.3 Equipment Mobilization/Demobilization	4	ea			$170.00	$522.00	$0	$0	$680	$2,088	$2,768
2.4 Long-Reach Equipment Mobilization/Demobilization	1	ea			$300.00	$975.00	$0	$0	$300	$975	$1,275
2.5 Utility Connection/Disconnection (phone/electric	1	ls	$1,250.00				$1,250	$0	$0	$0	$1,250
3 FIELD SUPPORT											
3.1 Office Trailer	2	mo				$375.00	$0	$0	$0	$750	$750
3.2 Field Office Equipment, Utilities, & Support	2	mo		$470.00			$0	$940	$0	$0	$940
3.3 Storage Trailer	2	mo				$99.00	$0	$0	$0	$198	$198
3.4 Site Superintendent	30	day		$169.00	$384.64		$0	$5,070	$11,539	$0	$16,609
3.5 Site Health & Safety	25	day		$169.00	$307.68		$0	$4,225	$7,692	$0	$11,917
3.6 Site QA/QC	25	day		$169.00	$307.68		$0	$4,225	$7,692	$0	$11,917
3.7 Bathymetric Survey (pre & post removal)	2	ea	$5,000.00				$10,000	$0	$0	$0	$10,000
3.8 Turbidity Survey (1 week)	1	ls		$1,045.00	$1,540.00	$2,040.00	$0	$1,045	$1,540	$2,040	$4,625
4 DREDGING, AND DEWATERING											
4.1 Excavator on Barge, long-reach	25	day			$466.96	$4,437.40	$0	$0	$11,674	$110,935	$122,609
4.2 Spoil Barge, 90' by 30', 2 each	50	day				$748.40	$0	$0	$0	$37,420	$37,420
4.3 Tugboat, 2 each	50	day			$340.48	$663.40	$0	$0	$17,024	$33,170	$50,194
4.4 Barge Barriers, fabric, membrane, etc.	2	ea		$4,875.00			$0	$9,750	$0	$0	$9,750
4.5 Trash Pumps, 2 each	50	day				$117.00	$0	$0	$0	$5,850	$5,850
4.6 Turbidity Curtain	170	ft		$39.90			$0	$6,783	$0	$0	$6,783
4.7 Turbidity Monitoring Buoy	2	ea				$4,080.00	$0	$0	$0	$8,160	$8,160
4.8 Dewatering Effluent Tank, 5,000 gal, 2 each	4	mo				$781.00	$0	$0	$0	$3,124	$3,124
4.9 Transfer Pump, 2 each	50	day				$66.40	$0	$0	$0	$3,320	$3,320
4.10 Dredgeman/Laborers, 6 each	150	day			$309.86		$0	$0	$46,479	$0	$46,479
4.11 Fly Ash	264	tons		$40.00			$0	$10,560	$0	$0	$10,560
4.12 Front-End Loader	25	day			$430.24	$854.40	$0	$0	$10,756	$21,360	$32,116
4.13 Excavator	25	day			$466.96	$2,635.00	$0	$0	$11,674	$65,875	$77,549
4.14 Sampling Dewatered Sediment	12	ea	$1,290.00	$25.00	$50.00	$55.00	$15,480	$300	$600	$660	$17,040
4.15 Sampling Dewatering Fluid	5	ea	$645.00	$25.00	$50.00	$55.00	$3,225	$125	$250	$275	$3,875
5 TRANSPORTATION AND DISPOSAL											
5.1 Hazardous Sediment	295	tons	$350.00				$103,250	$0	$0	$0	$103,250
5.2 Non-Hazardous Sediment	3,225	tons	$40.00				$129,000	$0	$0	$0	$129,000
5.3 Disposal of Dewatering Fluid	27,650	gal	$0.15				$4,148	$0	$0	$0	$4,148
5.4 Transportation of Dewatering Fluid ($500/5,000 gal)	6	trip	$500.00				$3,000	$0	$0	$0	$3,000
6 POST CONSTRUCTION COST											
6.1 Contractor Completion Report	80	hr			$37.50		$0	$0	$3,000	$0	$3,000
6.2 Remedial Action Closeout Report	140	hr			$37.50		$0	$0	$5,250	$0	$5,250
Subtotal							$269,353	$44,023	$147,400	$304,700	$765,476
Overhead on Labor Cost @ 30%									$44,220		$44,220
G & A on Cost @ 10%							$26,935	$4,402	$14,740	$30,470	$76,548
Tax on Materials and Equipment Cost @ 6%								$2,641		$18,282	$20,923
Total Direct Cost							$296,288	$51,067	$206,360	$353,452	$907,167
* Indirects on Total Direct Cost @ 30%			(excluding transportation and disposal cost)								$200,331
Profit on Total Direct Cost @ 10%											$90,717
Total Field Cost											$1,198,214

NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
INNER PIER 1 SEDIMENT
ALTERNATIVE IP-3: WATER-BASED DREDGING TO BEDROCK, DEWATERING, and OFF-SITE DISPOSAL of SEDIMENT and DEWATERING FLUID
Capital Cost

Item	Quantity	Unit	Unit Cost				Extended Cost				Subtotal
			Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	
Contingency on Total Field Costs @ 20%											$239,643
Engineering on Total Field Cost @ 5%											$59,911
TOTAL CAPITAL COST											**$1,497,768**

* Cost: Includes Erosion Control, Data Process, Bond Premium Insurance, Security, Testing & Analysis, Maintenance, Timekeeper, Photos, Pollution Insurance (if required), Normal Trash Disposal, and Site Clean up.

NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
OUTER PIER 1 SEDIMENT
ALTERNATIVE OP-4: DREDGING TO MEET PRGs, DEWATERING, and OFF-SITE DISPOSAL of SEDIMENT and DEWATERING FLUID
Capital Cost

				Unit Cost				Extended Cost				
Item	Quantity	Unit	Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	Subtotal
1 PROJECT PLANNING											
1.2 Prepare Documents & Plans including Permits	300	hr			$37.50		$0	$0	$11,250	$0	$11,250
2 MOBILIZATION AND DEMOBILIZATION											
2.1 Site Support Facilities (trailers, phone, electric, etc.)	1	ls		$1,000.00		$3,500.00	$0	$1,000	$0	$3,500	$4,500
2.2 Barge Mobilization	3	ea				$2,500.00	$0	$0	$0	$7,500	$7,500
2.3 Equipment Mobilization/Demobilization	4	ea			$170.00	$522.00	$0	$0	$680	$2,088	$2,768
2.4 Long-Reach Equipment Mobilization/Demobilization	1	ea			$300.00	$975.00	$0	$0	$300	$975	$1,275
2.5 Utility Connection/Disconnection (phone/electric)	1	ls	$1,250.00				$1,250	$0	$0	$0	$1,250
3 FIELD SUPPORT											
3.1 Office Trailer	2	mo				$375.00	$0	$0	$0	$750	$750
3.2 Field Office Equipment, Utilities, & Support	2	mo		$470.00			$0	$940	$0	$0	$940
3.3 Storage Trailer	2	mo				$99.00	$0	$0	$0	$198	$198
3.4 Site Superintendent	40	day		$169.00	$384.64		$0	$6,760	$15,386	$0	$22,146
3.5 Site Health & Safety	35	day		$169.00	$307.68		$0	$5,915	$10,769	$0	$16,684
3.6 Site QA/QC	35	day		$169.00	$307.68		$0	$5,915	$10,769	$0	$16,684
3.7 Bathymetric Survey (pre & post removal)	2	ea	$5,000.00				$10,000	$0	$0	$0	$10,000
3.8 Turbidity Survey (1 week)	1	ls		$1,045.00	$1,540.00	$2,040.00	$0	$1,045	$1,540	$2,040	$4,625
4 DREDGING, AND DEWATERING											
4.1 Excavator on Barge, long-reach	35	day			$466.96	$4,437.40	$0	$0	$16,344	$155,309	$171,653
4.2 Spoil Barge, 90' by 30', 3 each	105	day				$748.40	$0	$0	$0	$78,582	$78,582
4.3 Tugboat, 3 each	105	day			$340.48	$663.40	$0	$0	$35,750	$69,657	$105,407
4.4 Barge Barriers, fabric, membrane, etc.	3	ea		$4,875.00			$0	$14,625	$0	$0	$14,625
4.5 Trash Pumps, 3 each	105	day				$117.00	$0	$0	$0	$12,285	$12,285
4.6 Turbidity Curtain	800	ft		$39.90			$0	$31,920	$0	$0	$31,920
4.7 Turbidity Monitoring Buoy	2	ea				$4,080.00	$0	$0	$0	$8,160	$8,160
4.8 Dewatering Effluent Tank, 5,000 gal, 3 each	3	mo				$781.00	$0	$0	$0	$2,343	$2,343
4.9 Transfer Pumps, 2 each	105	day				$66.40	$0	$0	$0	$6,972	$6,972
4.10 Dredgeman/Laborers, 6 each	210	day			$309.86		$0	$0	$65,071	$0	$65,071
4.11 Verification Sampling	6	ea	$645.00	$25.00	$50.00	$55.00	$3,870	$150	$300	$330	$4,650
4.12 Fly Ash	646	tons		$40.00			$0	$25,840	$0	$0	$25,840
4.13 Front-End Loader	40	day			$430.24	$854.40	$0	$0	$17,210	$34,176	$51,386
4.14 Excavator	40	day			$466.96	$2,635.00	$0	$0	$18,678	$105,400	$124,078
4.15 Sampling Dewatered Sediment	34	ea	$1,290.00	$25.00	$50.00	$55.00	$43,860	$850	$1,700	$1,870	$48,280
4.16 Sampling Dewatering Fluid	28	ea	$645.00	$25.00	$50.00	$55.00	$18,060	$700	$1,400	$1,540	$21,700
5 TRANSPORTATION AND DISPOSAL											
5.1 Non-Hazardous Sediment	8,600	tons	$40.00				$344,000	$0	$0	$0	$344,000
5.2 Disposal of Dewatering Fluid	136,000	gal	$0.15				$20,400	$0	$0	$0	$20,400
5.3 Transportation of Dewatering Fluid ($500/5,000 gal)	28	trip	$500.00				$14,000	$0	$0	$0	$14,000
6 POST CONSTRUCTION COST											
6.1 Contractor Completion Report	80	hr			$37.50		$0	$0	$3,000	$0	$3,000
6.2 Remedial Action Closeout Report	140	hr			$37.50		$0	$0	$5,250	$0	$5,250
Subtotal							$455,440	$95,660	$215,396	$493,675	$1,260,171
Overhead on Labor Cost @ 30%									$64,619		$64,619
G & A on Cost @ 10%							$45,544	$9,566	$21,540	$49,368	$126,017
Tax on Materials and Equipment Cost @ 6%								$5,740		$29,621	$35,360
Total Direct Cost							$500,984	$110,966	$301,554	$572,663	$1,486,167
* Indirects on Total Direct Cost @ 30%			(excluding transportation and disposal cost)								$332,330
Profit on Total Direct Cost @ 10%											$148,617
Total Field Cost											$1,967,113

NAVAL SUBMARINE BASE NEW LONDON
GROTON, CONNECTICUT
OUTER PIER 1 SEDIMENT
ALTERNATIVE OP-4: DREDGING TO MEET PRGs, DEWATERING, and OFF-SITE DISPOSAL of SEDIMENT and DEWATERING FLUID
Capital Cost

Item	Quantity	Unit	Unit Cost Subcontract	Unit Cost Material	Unit Cost Labor	Unit Cost Equipment	Extended Cost Subcontract	Extended Cost Material	Extended Cost Labor	Extended Cost Equipment	Subtotal
Contingency on Total Field Costs @ 20%											$393,423
Engineering on Total Field Cost @ 5%											$98,356
TOTAL CAPITAL COST											**$2,458,892**

* Cost: Includes Erosion Control, Data Process, Bond Premium Insurance, Security, Testing & Analysis, Maintenance, Timekeeper, Photos, Pollution Insurance (if required), Normal Trash Disposal, and Site Clean up.