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FINAL AMENDED SITE MANAGEMENT PLAN 2012 NSY PORTSMOUTH ME
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NSY PORTSMOUTH

Final

**FY12 Amended
Site Management Plan**

for

**Portsmouth Naval Shipyard
Kittery, Maine**



**Naval Facilities Engineering Command
Mid-Atlantic**

FEBRUARY 2012

FY12 REVISION 0

FINAL
AMENDED
SITE MANAGEMENT PLAN
FOR
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below ground surface
CDC	Child Development Center
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CHF	Contaminant Hazard Factor
CIA	Controlled Industrial Area
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
COPC	Chemical of potential concern
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EERA	Estuarine Ecological Risk Assessment
ESD	Explanation of Significant Difference
FCS	Final Confirmation Study
FFA	Federal Facility Agreement
FS	Feasibility Study
FY	Fiscal Year
HHRA	Human Health Risk Assessment
HRS	Hazard Ranking System
HSWA	Hazard and Solid Waste Amendments (of 1984)
IAG	Interagency Agreement
IAS	Initial Assessment Study
IM	Interim Measure
IRG	Interim Remediation Goal
IRP	Installation Restoration Program
JILF	Jamaica Island Landfill
LUCRD	Land Use Control Remedial Design
MB	Mercury Burial
MEDEP	Maine Department of Environmental Protection
mg/kg	Milligram per kilogram
MPF	Migration Pathway Factor
MPS	Media Protection Standard

MTADS	Multi-sensor Towed Array Detection System
NACIP	Navy Assessment and Control of Installation Pollutants
NAVFAC	Navy Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
OM&M	Operation, maintenance, and monitoring
OU	Operable Unit
PA	Preliminary Assessment
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PHERE	Public Health and Environmental Risk Evaluation
PNS	Portsmouth Naval Shipyard
PP	Proposed Plan
PRAP	Proposed Remedial Action Plan
PRG	Preliminary Remediation Goal
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RF	Receptor Factor
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SI	Site Investigation
SMP	Site Management Plan
SSA	Site Screening Area
SSI	Site Screening Investigation
SSP	Site Screening Process
SWMU	Solid Waste Management Unit
SVOC	Semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WW	World War

1.0 INTRODUCTION

This Site Management Plan (SMP) for Portsmouth Naval Shipyard (PNS) in Kittery, Maine was prepared by the United States Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic. The SMP serves as a management tool for planning, reviewing and setting priorities for all environmental investigative and remedial response activities to be conducted at the facility under the Navy Installation Restoration Program (IRP). Ultimately, the SMP serves as the schedule for implementation of the IRP at PNS. The SMP is updated annually to revise priorities and schedules of activities as additional information (including funding) becomes available. This version of the SMP presents the rationale for the sequence of future investigation and remediation activities and the estimated schedule for completion of these activities and updates the Fiscal Year (FY) 11 Amended SMP. The use of a SMP allows for annual adjustment in scheduled activities for reasons such as Federal budgetary constraints, changes in scope of investigation/remediation activities or other unanticipated events. These changes are governed by the Federal Facility Agreement (FFA) for PNS. The FFA establishes the roles and responsibilities of the Navy and United States Environmental Protection Agency (USEPA) and serves as an Interagency Agreement (IAG) for the completion of all necessary investigation and remedial actions at PNS.

The following section summarizes the location, mission, operations history, and environmental activities history at PNS.

1.1 FACILITY LOCATION AND MISSION

PNS is a military facility with restricted access on an island located in the Piscataqua River, as shown on Figure 1-1. PNS is referred to on National Oceanic and Atmospheric Administration (NOAA) nautical charts as Seavey Island, with the eastern tip given the name Jamaica Island. Clark's Island is to the east attached by a rock causeway to Seavey Island. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is located in Kittery, Maine, north of Portsmouth, New Hampshire, at the mouth of the Great Bay Estuary (commonly referred to as Portsmouth Harbor).

PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy. The long history of shipbuilding in Portsmouth Harbor dates back to 1690, when the first warship launched in North America, the Falkland, was built. PNS was established as a government facility in 1800, and it served as a repair and building facility for ships during the Civil War. The first government-built submarine was designed and constructed at PNS during World War (WW) I. A large number of submarines have been designed, constructed, and repaired at this facility since 1917. PNS continues to service submarines as its primary military focus.

Military activities are concentrated in the western portion of the facility in the Controlled Industrial Area (CIA) (the southern and southwestern portions of Dennett's Island). This area includes all of the dry docks and submarine berths and numerous buildings that house trade shops related to maintenance activities. Access to the area is tightly controlled and limited to individuals having appropriate clearances. The CIA is covered with buildings and asphalt to support military operations at PNS. Uses of other portions of PNS include administration offices, officers' residences, equipment storage, parking, and recreational facilities. Outside the CIA, areas are covered with asphalt, grass, and/or buildings depending on the use of the area. As part of the remedy for Operable Unit (OU) 3, wetlands were constructed north of OU3, adjacent to Jamaica Cove, and a parking lot and a recreational area were constructed on top of OU3.

Water for operations and drinking at the Shipyard are supplied by the Kittery Water District. Kittery's water supply originates from surface reservoirs located in the vicinity of York, Maine. Groundwater at PNS is not used for drinking, irrigation, industrial processes, fire fighting, or any other purposes.

A portion of PNS is on the National Register of Historic Places. The area between the two bridges connecting PNS to Kittery, Maine was placed on the Register by the National Park Service in 1977. Based on a Cultural Resources Survey of PNS (Louis Berger Group, Inc., April 2003), the boundary of the PNS Historic District was expanded and includes the majority of the CIA. Two other historic districts were also identified (Portsmouth Naval Hospital and Portsmouth Naval Prison Historic Districts).

1.2 REGULATORY HISTORY AND OVERVIEW OF ENVIRONMENTAL INVESTIGATIONS

The following is a description of the regulatory history and an overview of environmental investigation and remediation activities performed before September 30, 2011.

Prior to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) regulation at PNS, years of shipbuilding and submarine repair work at PNS resulted in hazardous substances being released into the soil, groundwater, surface water, and sediment on and around Seavey Island. As a result, investigation and remediation activities have been performed under the Department of Defense (DoD) IRP. The purpose of the IRP is to identify, investigate, assess, characterize, and clean up or control releases of hazardous substances; and to reduce potential risks to human health and the environment from past waste disposal operations and hazardous material spills at Navy activities. The IRP parallels CERCLA as discussed in Section 3.0. Investigations of hazardous substance releases at PNS began in 1983 when the Navy completed an Initial Assessment Study (IAS) (Weston, June 1983) that identified and assessed sites posing a potential threat to human health and the environment. The final phase of this study was completed in 1986 with the issuance of a Final Confirmation Study (FCS), (LEA, June 1986), which evaluated the sites identified in the IAS to confirm the presence of contamination.

USEPA became involved with PNS in 1985 when the agency requested information on PNS' hazardous wastes and conducted a visual site inspection under the authority of RCRA. Since 1988, Maine Department of Environmental Protection (MEDEP) has also provided oversight of investigation and remediation at PNS. In March 1989, USEPA issued a Corrective Action Permit under the RCRA Hazardous and Solid Waste Amendments (HSWA) of 1984 (USEPA, March 1989) that required PNS to investigate 13 Solid Waste Management Units (SWMUs) and take appropriate corrective action. Until the mid-1990s, investigations at the PNS were conducted under RCRA authority. RCRA provides "cradle to grave" tracking of hazardous substances, from generator to transporter for treatment, storage, or disposal. RCRA activities are conducted in four phases: the RCRA Facility Assessment (RFA); the RCRA Facility Investigation (RFI); the Corrective Measures Study (CMS); and the Corrective Measures Implementation (CMI) Plan. In 1993, the PNS sites were evaluated by USEPA under Superfund's Hazard Ranking System (HRS), used to determine the relative threats posed to the public health and environment by sites contaminated with hazardous substances (TRC Companies, May 1993). Under the HRS, a score is developed based on the potential for hazardous substances to spread from the site through air, surface water, and groundwater. Additional ranking factors include population, waste characterization, and potential damage to natural resources. Based on the HRS evaluation, PNS was proposed for inclusion on the USEPA's National Priorities List (NPL) in June 1993. Effective May 31, 1994, PNS was included on the NPL, and subsequent studies have been conducted under the authority of CERCLA, commonly known as Superfund. Consistent with the transition from RCRA to CERCLA, the SWMU terminology was replaced with "site." Ongoing work meets the intent of the HSWA Permit, but ongoing studies to develop and evaluate remedial activities are conducted as part of a Remedial Investigation (RI)/Feasibility Study (FS) (CERCLA terminology) and combine both RCRA and CERCLA criteria.

In 1994, the USEPA directed the onshore and offshore components of work required by the HSWA Permit be separated, because the onshore portion of the study was being delayed by the more complex offshore investigation. Therefore RFI/RI investigations for onshore and offshore areas were conducted separately. However, potential impacts from onshore sites to offshore areas were evaluated as part of the onshore studies, as discussed further in the site- or OU-specific discussions in Section 2.0.

The FFA for PNS was signed by USEPA and the Navy in September 1999, became effective February 2000, and supersedes the HSWA Permit. The State of Maine has elected not to be a party to the FFA at this time. However, the state is afforded a participatory role in the site remediation process by virtue of CERCLA. Among other things, the FFA outlines roles and responsibilities, establishes deadlines/schedules, outlines work to be performed, and provides a dispute resolution process for primary documents. The FFA ensures that CERCLA decisions will be consistent with RCRA and other federal and state hazardous waste statutes and regulations as appropriate for the sites at PNS. USEPA, MEDEP, and the Navy continue to work toward site cleanup at PNS under CERCLA. Refer to Section 3.0 of this report for a description of the RCRA and CERCLA processes.

During the initial investigations of PNS (as part of the RFA), 28 potential sites (referred to as SWMUs at that time) located onshore and offshore of PNS were identified. After the 28 potential sites were examined in greater depth, 15 were eliminated from further investigation, leaving 13 sites that required investigation and appropriate corrective action (Kearney & Baker/TSA, July 1986). These 13 sites, Sites 5, 6, 8, 9, 10, 11, 12, 13, 16, 21, 23, 26, and 27, were listed in the HSWA Permit. Subsequent to the HSWA, four (Sites 12, 13, 16, and 23) were identified as No Further Action (NFA) sites, and four (Sites 30, 31, 32, and 34) were newly identified. In addition, a portion of Site 6 was separated and given a separate number (Site 29). Therefore, the FFA included Sites 5, 6, 8, 9, 10, 11, 21, 26, 27, 29, 30, 31, 32, and 34 and offshore area. Subsequently, Sites 21, 26, and 27 and the Jamaica Island Landfill (JILF) Impact Area (within Site 8) have been removed from the IRP. The remaining IRP sites are under various stages of investigation/remediation as discussed further in Section 2.0. The locations of the IRP sites under investigation or remedial action are shown on Figure 1-2. A summary of the status of these IRP sites is provided in Table 1-1. A summary of the sites removed from the IRP is provided in Table 1-2.

NFA decision documents, prepared under CERCLA for seven former IRP sites and an impact area for one IRP site, provide information on the NFA sites. The NFA Decision Document for Site 12 - Boiler Blowdown Tank, Building 72, Site 13 - Rinse Water Tank, Building 76, Site 16 - Rinse Water Tank, Building 174, and Site 23 - Chemical Cleaning Facility Tank, Building 174 was signed in 1997 (Navy, July 1997). The NFA under CERCLA Decision Documents for Sites 26 and 27 were signed in 2001 (Navy, August 2001a and 2001b). The NFA Decision Documents for Site 21 and the JILF Impact Area were signed in 2008 (Navy, February 2008a and 2008b).

A list of important PNS historical events and documents related to environmental investigations and relevant dates is shown below. The identified events are illustrative, not comprehensive. Additional information on site- or OU-specific investigations is provided in the discussion related to the specific OU or site screening area.

Event/Document	Author/Date	Administrative Record (AR) Number
IAS completed	Weston, June 1983	N00102.AR.000002
USEPA involvement began	1985	NA
FCS completed	LEA, June 1986	N00102.AR.000012 N00102.AR.000013
RFA completed	Kearney & Baker/TSA, July 1986	N00102.AR.000014
MEDEP oversight began	1988	NA

Event/Document	Author/Date	Administrative Record (AR) Number
PNS Corrective Action Permit under the HSWA issued	USEPA, March 1989	N00102.AR.000019
RFI Report and Addendum to RFI Report and Onshore Ecological Risk Assessment completed	McLaren/Hart, April 1992, June 1993, and August 1992	N00102.AR.000117 to N00102.AR.000122, N00102.AR.000169, and N00102.AR.000125
Sampling to support offshore risk assessments conducted	1991 through 1993	NA
PNS placed on the NPL	May 31, 1994	NA
Onshore and offshore components of investigation separated	1994	NA
Public Health and Environmental Risk Evaluation (PHERE) and Offshore Human Health Risk Assessment completed	McLaren/Hart, March and May 1994	N00102.AR.000211 and N00102.AR.000229
RFI Data Gap Report and Air Monitoring Report completed	Halliburton NUS, November 1995 and B&R Environmental, June 1996	N00102.AR.000328 and N00102.SF.000356
Four rounds of groundwater and intertidal seep and sediment monitoring conducted	1996/1997	NA
NFA Decision Documents for Sites 12, 13, 16, and 23 signed	Navy, July 1997	N00102.AR.000447
FFA signed, supersedes the HSWA Permit	Navy, September 1999	N00102.AR.000726
Onshore/Offshore Contaminant Fate and Transport Modeling completed	TtNUS, December 1999	N00102.AR.000760
Interim Record of Decision (ROD) for OU4 signed, Interim Offshore Monitoring Plan completed, and monitoring started	Navy, May 1999, TtNUS, October 1999	N00102.AR.000676 and N00102.AR.000750
Estuarine Ecological Risk Assessment (EERA) for offshore Areas of Concern (AOCs) completed	NCCOSC, May 2000	N00102.AR.000838
Site investigations for Sites 10, 29, 30, 31, and 32 conducted	2000	NA
NFA Decision Documents for Sites 26 and 27 signed	Navy, August 2001	N00102.AR.001019 and N00102.AR.001020
ROD for OU3 signed	Navy, August 2001	N00102.AR.001018
Start of significant construction for OU3 remedy	June 2002	NA
Site investigation of Site 34 conducted	2003	NA
First Five-Year Review Report for PNS completed	TtNUS, June 2007	N00102.PF.001601
NFA Decision Documents for Site 21 and JILF Impact Area signed	Navy, February 2008	N00102.AR.001647 and N00102.AR.001648
ROD for OU1 signed	Navy, September 2010	N00102.AR.002495

1.3 SUMMARY OF ONSHORE AND OFFSHORE STUDIES

Initial investigations addressed PNS sites as one large study area in accordance with the remedial process outlined in the HSWA Permit. As the process progressed it became clear that certain sites and the offshore area would require more time than others to be adequately characterized in accordance with the HSWA Permit and CERCLA. In the 1990s, the onshore and offshore studies were conducted separated and subsequently the Navy reorganized the approach used to study the IRP sites such that PNS sites are investigated on individual or OU basis, in accordance with the FFA. The following summarizes the large-scale studies. The results of the studies were used to supplement additional investigation on a site- or OU-specific basis. Additional information on site- or OU-specific investigations is provided in the discussion related to the specific OU or site screening area in Section 2.0.

1.3.1 Onshore Studies

In accordance with the HSWA Permit requirements, the RFI was performed. The RFI consisted of several phases of investigations spanning from October 1989 to February 1992. The results of the RFI were then assembled into the RFI Report (McLaren/Hart, July 1992). The RFI "Approval with Conditions" was issued by the USEPA in March of 1993. The Addendum to the RFI Report (McLaren/Hart, June 1993) partially responded to the USEPA "Approval with Conditions;" however, many requirements of the "Approval with Conditions" called for additional field work to resolve data gaps. Subsequently, the RFI Data Gap field work was conducted during June/July of 1994. The results are presented in the RFI Data Gap Report (Halliburton NUS, November 1995) and are considered supplemental to the RFI Report. An onshore ecological risk assessment was conducted in conjunction with the fourth phase of the RFI (McLaren/Hart, August 1992) and the results were considered as part of the Draft Onshore FS Report (Halliburton NUS, March 1995).

Analytical data collected during the RFI for surface and subsurface soils, groundwater, surface water and ambient air were evaluated in accordance with the USEPA Superfund Risk Assessment Guidance. The results of this evaluation were summarized in the PHERE (McLaren/Hart, March 1994). These results were utilized in developing the Final Onshore Media Protection Standards (MPSs) Proposal (McLaren/Hart, April 1994). Final MPSs were then set by the USEPA. The final MPSs were essentially used as Preliminary Remediation Goals (PRGs) in the Draft Onshore FS Report (Halliburton NUS, March 1995). The 1995 Draft Onshore FS Report identified and recommended remedial alternatives for each SWMU; however, this document was never finalized. OU-specific FS documents were or are being prepared as discussed in section 2.0. The Applicable or Relevant and Appropriate Requirements (ARARs) Report (Halliburton NUS, September 1994) and Revised CMS Proposal (Halliburton NUS, July 1994) also were utilized in developing the Onshore FS. ARARs are legally applicable or relevant and appropriate requirements, standards, criteria or limitations as used by CERCLA and as defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The Ambient Air Quality Monitoring Report (McLaren/Hart, April 1992) was developed to support identification of SWMUs where contamination may have resulted in adverse impacts to air. Because of questions on previous sampling methods, techniques, and reporting methods, the Phase II Ambient Air Quality and Meteorological Monitoring Report (B&R Environmental, June 1996) was prepared as a confirmation air monitoring study.

The Groundwater Investigation and Monitoring Plan (B&R Environmental, November 1996) was developed to investigate facility groundwater. The purpose of this plan was to facilitate the implementation of a cost-effective, groundwater investigation and interim monitoring plan for sites of concern at PNS. The data were evaluated to determine the impact on the quality of groundwater in the aquifer and the impact on state waters. Four rounds of groundwater sampling were conducted from December 1996 to November 1997. Intertidal seep and sediment sampling was conducted concurrently with the groundwater sampling. The results of the groundwater monitoring are presented in the Groundwater Monitoring Summary Report (TtNUS, August 1999). The results of the intertidal seep and sediment sampling are presented in the Seep/Sediment Summary Report (TtNUS, August 2000).

Two phases of contaminant fate and transport modeling were conducted for several PNS sites to estimate the potential for chemicals in the soil and groundwater to migrate to the offshore and adversely impact surface water and sediment in offshore areas of PNS (TtNUS, December 1999). The 1996/1997 groundwater, seep, and sediment data were used as part of the contaminant fate and transport modeling.

1.3.2 Offshore Studies

The offshore portion of the RFI included an EERA and a Human Health Risk Assessment (HHRA) (McLaren/Hart, May 1994). The EERA and HHRA were both based on offshore sampling and analysis of surface water, sediments and biota conducted as part of the EERA. Intertidal seeps from PNS were also sampled and analyzed.

The overall purpose of the EERA was to assess the potential adverse environmental effects from past discharges of contaminants from PNS. Two functional phases of the EERA were developed to fulfill this objective. The Phase I EERA (Johnston et. al, December 1994), initiated in September 1991 and completed in May 1993, assessed the environmental quality in the Great Bay Estuary focusing on the lower Piscataqua River area in relation to PNS. Phase I included the collection and analysis of water (water column and seep), sediment (surface sediments and sediment cores), and biota (mussels, lobster, winter flounder, oysters, eelgrass and algae) samples. The objective of the Phase II EERA, the analysis phase initiated in July 1992 and completed in the summer of 1995, was to test hypotheses from Phase I and quantify the ecological risk from PNS. Phase II included the collection and analysis of additional water (water column and seeps), sediment (surface sediments and sediment cores) and biota (mussels, lobster, flounder and eelgrass)

samples. Phase I and Phase II data and conclusions were synthesized to develop the final EERA (NOCCOSC, May 2000).

Data collected during Phase I of the EERA were also used to develop the HHRA for Offshore Media (McLaren/Hart, May 1994). Data collected during Phase II were evaluated to assess human risks in the Phase I/Phase II Data Comparative Analysis Report (TtNUS, October 1998). The results of the Offshore HHRA Report were used to establish offshore MPSs, which were never finalized. The results of the offshore investigations were used as part of the preparation of the Interim ROD for OU4 (discussed further in Section 2.0).

1.4 OPERABLE UNIT DESIGNATION

In the 1990s, the Navy reorganized the approach used to study the IRP sites. Instead of addressing PNS sites as one large study area and cleanup action, the sites were organized into OUs that clustered them with other sites with similar kinds of contamination or combined them because of geographic proximity. Restructuring into OUs allows sites that are ready for cleanup to proceed without waiting for studies on other sites to be completed.

The sites identified in the HSWA Permit and the newly identified sites were grouped, based on similar characteristics or proximity, into OUs. As of the signing of the FFA, four sites were determined to require NFA (Sites 12, 13, 16, and 23) and therefore were not included in an OU. The sites listed in the FFA were grouped into five OUs (OU1 through OU5). Since the signing of the FFA, OU6 was identified in 2000 to address management of migration from the JILF. However, an Explanation of Significant Difference (ESD) for the OU3 ROD was signed in October 2005 to document that management of migration of groundwater from the JILF would be addressed under the OU3 remedy. Therefore, OU6 was recombined with OU3. Based on the results of Site Screening Investigations (SSIs), Sites 31, 32, and 34 were designated as OU8, OU7, and OU9, respectively. In 2001, the Decision Document for Site 27 was signed, which removed OU5 from the CERCLA program because Site 27 was the only site within OU5. In 2001, Site 26 was removed from OU4, and in 2008, Site 21 was removed from OU1. There is one study area at PNS, Site 30. Section 2.0 describes the OUs and study area at PNS.

1.5 REPORT ORGANIZATION

The SMP is organized as follows:

- Section 1.0 is this introduction.
- Section 2.0 describes the history and status of each site at PNS.

- Section 3.0 provides a description of the CERCLA remedial process and the RCRA Corrective Action Process and describes the similarities and differences between RCRA and CERCLA.
- Section 4.0 provides a description of the ranking procedure and a summary of ranking results.
- Section 5.0 presents the sequence of activities and target dates for primary/secondary documents along with a discussion of their development.
- Section 6.0 provides a list of documents prepared as part of the IRP for PNS prior to and after signing the FFS.
- Section 7.0 provides a list of references.

The Appendices are as follows:

- Appendix A presents the Defense Environmental Cleanup Program Fact Sheets related to the Relative Risk Site Evaluation (provided in Appendix E of the Relative Risk Site Evaluation Primer).
- Appendix B presents the PNS Relative Risk Site Evaluation Ranking Worksheets.
- Appendix C presents the current OU and site schedules.

The SMP is updated annually as specified in Section 12.0 of the FFA.

Table 1-1
Summary of IRP Sites Under Investigation
Portsmouth Naval Shipyard, Kittery, Maine

Site ID	Other ID ¹			Operable Unit ²	Site Name ²	Site Description	Current CERCLA	Comments/Notes
	IAS (1983)	RFI (1992)	FFA (1999)					
10	Not Identified	SWMU 10	SWMU 10	OU1	Former Battery Acid Tank No. 24	Past release of acidic discharges from piping and former underground storage tank associated with lead-acid battery recharging operations in Building 238 at the site resulted in soil contamination on site and sediment contamination off shore (in a portion of Dry Dock AOC). Tank and surrounding soil removal in 1986 as part of tank closure. Lead-contaminated soil remains at site.	RI/FS/PRAP/ROD/RA	OU1 RI Report finalized in July 2007, OU1 FS Report and PRAP were finalized in June 2010. The public comment period was held in June/July 2010. The OU1 ROD was signed in September 2010. Draft Remedial Action Work Plan submitted in January 2011. Resolving regulatory comments.
6	Not Identified	SWMU 6	SWMU 6	OU2	Defense Reutilization and Marketing Office (DRMO) Storage Yard including DRMO Impact Area (Quarters S, N, and 68)	Storage area for used materials that previously including lead and nickel-cadmium battery elements. 1983 open storage of batteries discontinued. 1993 portions of site capped or paved as part of interim corrective measures. 1999, 2005, 2006, and 2008 shoreline stabilization activities conducted for different portions of the shoreline. A removal action was conducted for the DRMO Impact Area	RI/FS/PRAP	OU2 Supplement RI Report finalized in March 2010. OU2 FS Report finalized in April 2011. Draft Final PRAP submitted in June 2011.
29	Not Identified	Part of SWMU 6	Teepee Incinerator	OU2	Former Teepee Incinerator Site	Area formerly used for open burning, waste disposal, and industrial incineration. 1998 separated from Site 6 and made into a new site. Shoreline stabilization activities at Site 6 in 2005, 2006, and 2008 included a portion of the Site 29 shoreline.	RI/FS/PRAP	OU2 Supplement RI Report finalized in March 2010. OU2 FS Report finalized in April 2011. Draft Final PRAP submitted in June 2011.
8	Site 1	SWMU 8	SWMU 8	OU3	Jamaica Island Landfill (JILF)	25-acre landfill. OU3 RA completed included capping 22 acres, and removal of 3 acres with wetlands created in removed area.	RI/FS/PRAP/ROD/RA	OU3 ROD (2001) - addressed soil and groundwater. OU3 ESDs (2003 and 2005) for excavation, consolidation, and wetlands construction and to include groundwater migration remedy into OU3. 5 Yr review 2007. OU3 post-remedial OM&M since 2006. OM&M Plan is being updated.
9	Sites 3 and 4	SWMU 9	SWMU 9	OU3	Former Mercury Burial Sites (MBI and MBII)	Concrete blocks and pipes containing mercury-contaminated wastes were buried within the JILF. Vaults removed in 1990s. No residual contamination from Site 9 found. Addressed by OU3 RA (see Site 8).	RI/FS/PRAP/ROD/RA	See Site 8.
11	Not Identified	SWMU 11	SWMU 11	OU3	Former Waste Oil Tanks Nos. 6 & 7	Storage of waste oils prior to offsite disposal. Tanks and soil removal in 1989. Within Site 8 boundary. Addressed by OU3 RA (see Site 8).	RI/FS/PRAP/ROD/RA	See Site 8.
5	Site 2	SWMU 5	SWMU 5	OU4	Former Industrial Waste Outfalls	Numerous discharge points in the dry dock area formerly used to discharge liquid industrial waste. Discharges were to the Dry Dock AOC portion of the offshore (see Offshore AOCs).	RI/FS	Offshore HHRA (1994) - surface water and sediment. OU4 Interim ROD (1999) - interim offshore monitoring for sediment. EERA (2000) - surface water and sediment. Interim offshore monitoring for OU4 since 1999. Draft OU4 FS submitted in July 2010. Regulatory review/resolving regulatory comments.
Offshore AOCs	Not Identified	Not Identified	Offshore Areas	OU4	Offshore Areas Potentially Impacted by PNS Onshore IRP Sites	Based on the EERA (2000), six AOCs were identified in the offshore area that could have been impacted by onshore IRP releases. These are the Back Channel, Jamaica Cove, Clark Cove, Sullivan Point, DRMO Storage Yard, and Dry Dock AOCs. The interim offshore monitoring plan (1999), as required by the Interim ROD(1999), identified 14 monitoring stations the cover the offshore AOCs.	RI/FS	Offshore HHRA (1994) - surface water and sediment. OU4 Interim ROD (1999) - interim offshore monitoring for sediment. EERA (2000) - surface water and sediment. Interim offshore monitoring for OU4 since 1999. Draft OU4 FS was submitted in July 2010. Regulatory review/resolving regulatory comments.
32	Not Identified	Not Identified	Topeka Pier Site (SSA)	OU7	Topeka Pier Site	17-acre area filled with soil, debris, and some waste material. 2006 shoreline stabilization removal action.	RI	Soil, groundwater, intertidal surface water, and sediment sampling conducted to support RI. Draft OU7 RI Report submitted in October 2010. Resolving regulatory comments.
31	Not Identified	Not Identified	West Timber Basin (SSA)	OU8	Former West Timber Basin	Portion of the filled area between Dry Docks 1 and 3. Site originally for storage and seasoning wood for ship production. Metal washing and pickling activities occurred at the site.	RI	Added as site based on 1998 SSI soil and groundwater sampling results. RI scheduled for 2012.
34	Not Identified	Not Identified	Oil Gasification Plant, Building 62 (SSA)	OU9	Former Oil Gasification Plant, Building 62	Site originally location of oil gasification plant. Site used for blacksmith shop and pesticide storage. Burning of coal as part of operations resulted in contaminated soil around the building. 2007 removal action conducted to remove majority of contaminated soil and stabilize a portion of the shoreline.	RI	Soil sampling conducted in 2009 and 2010 to support RI. Draft OU9 RI Report submitted in February 2011. Regulatory review.
30	Not Identified	Not Identified	Galvanizing Plant, Building 184 (SSA)	SSA	Former Galvanizing Plant, Building 184	Originally a galvanizing plant. 4-ft deep concrete tank vault within building contained pickling tanks and later used for metal parts assembly. The tank vault was filled in 1960s, and fill material has high acid content (i.e., low pH). Acid material apparently resulting in crystalline growth on wall adjacent to tank vault. 2006 and 2007 removal action to remove crystalline material and redirect storm water away from building.	Removal Action	EE/CA (Revision 2) prepared for removal of tank vault contents and tank vault and Action Memorandum (Revision 2) signed in December 2010. Draft Removal Action Work Plan submitted in April 2011. Regulatory review.

¹ Initial Assessment Study (IAS), June 1983, Administrative Record Number N00102.AR.000002; RCRA Facility Investigation (RFI) Report (draft), July 1992, Administrative Record Number N00102.AR.000117; Federal Facility Agreement (FFA), September 1999, Administrative Record Number N00102.AR.000726. Site designation in FFA as provided in Appendices B (List of Areas of Concern) and C (List of Site Screening Areas) of the FFA.

² Operable unit designation and Site Name are based on the Site Management Plan (SMP) provided in Appendix D of the FFA and subsequent annual amendment of the SMP.

Table 1-2
 Sites Removed from IRP
 Portsmouth Naval Shipyard, Kittery, Maine
 Page 1 of 2

Site ID	Other ID ¹			Operable Unit	Site Name	Site Description	Current CERCLA Status	Comments/Notes ²
	RFA (1986)	RFI (1992)	FFA (1999)					
1	SWMU 1	NA	NA	NA	Hazardous Waste Storage Facility	This unit was an active container storage area with a RCRA Permit. No additional action was required because it was a licensed RCRA facility with frequent inspections and no history of releases.	NFA	Eliminated from further investigation in the RFA.
2	SWMU 2	NA	NA	NA	Freon Recovery Operation	This unit was a still located in Building 174 and holding tank located outside of Building 174 that were used for reclaiming Freon solvent used in various operations. No additional action was required because the unit was certified closed in accordance with a State approved closure plan.	NFA	Eliminated from further investigation in the RFA.
3	SWMU 3	NA	NA	NA	Industrial Waste Treatment Plant	The treatment plant was located in Building 298. No additional action was required because there was no history of releases and the plant was in the process of obtaining a RCRA Permit.	NFA	Eliminated from further investigation in the RFA.
4	SWMU 4	NA	NA	NA	Interim Storage Facilities	This unit consisted of four temporary waste holding areas that were used before transfer of wastes to the Hazardous Waste Storage Facility (SWMU 1). No additional action was required because the unit was certified closed in accordance with a State approved closure plan.	NFA	Eliminated from further investigation in the RFA.
7	SWMU 7	NA	NA	NA	Interim Storage Areas	This unit consisted of four waste storage areas were used for the storage of drummed facility wastes. No additional action was required because the unit was certified closed in accordance with a State approved closure plan.	NFA	Eliminated from further investigation in the RFA.
12	SWMU 12	SWMU 12	NA	NA	Boiler Blowdown Tank, Bulding 72 (Tank No. 25)	This unit was a 3,800-gallon underground, steel tank for boiler blowdown. The tank was removed as part of the RFI. There were no releases from this unit, and subsequently no further action was required.	NFA	NFA Decision Document (AR No. N00102.AR.000447) signed July 1997.
13	SWMU 13	SWMU 13	NA	NA	Rinse Water Tank, Building 76 (Tank No. 27)	This unit was a 700-gallon underground, steel tank for rinse waters from Building 76. The tank was removed as part of the RFI. There were no releases from this unit, and subsequently no further action was required.	NFA	NFA Decision Document (AR No. N00102.AR.000447) signed July 1997.
14	SWMU 14	NA	NA	NA	Waste Oil Tank No. 31	This unit was a 750-gallon underground, steel tank that was used to hold used oil from Building 72.	NFA	Eliminated from further investigation in the RFA.
15	SWMU 15	NA	NA	NA	Oil/Water Separator No. 32	This unit was a 5,400-gallon fiberglass tank used for oily wastewaters from Building 72.	NFA	Eliminated from further investigation in the RFA.
16	SWMU 16	SWMU 16	NA	NA	Rinse Water Tank, Building 174 (Tank No. 34)	This unit was a 750-gallon underground, steel tank that was used to hold rinse waters from Building 174. The tank was removed as part of the RFI. There were no releases from this unit, and subsequently no further action was required.	NFA	NFA Decision Document (AR No. N00102.AR.000447) signed July 1997.
17	SWMU 17	NA	NA	NA	Floor Drain Tank No. 26	It was determined that this unit did not exist.	NFA	Eliminated from further investigation in the RFA.
18	SWMU 18	NA	NA	NA	Waste Lube Tank No. 35	This unit was a 4,500-gallon aboveground, steel tank used for used lubrication oil storage. No further action was required because it was a new tank (installed in 1982).	NFA	Eliminated from further investigation in the RFA.
19	SWMU 19	NA	NA	NA	Waste Oil Tank No. 37	This unit was a 500-gallon underground, steel tank that held used oil. No further action was required because it was a new tank (installed in 1985).	NFA	Eliminated from further investigation in the RFA.
20	SWMU 20	NA	NA	NA	Oil/Water Separator No. 38	This unit was a partially buried oil/water separator. No further action was required because it was a new unit (installed in 1985)	NFA	Eliminated from further investigation in the RFA.
21	SWMU 21	SWMU 21	SWMU 21	OU1	Acid/Alkaline Drain Tank No. 28	This unit was a 695-gallon underground tank that was used to store spent acid/alkaline cleaning solutions. The tank was removed as part of the RFI. Soil and groundwater sampling was conducted to confirm that a release from the tank did not result in unacceptable risks, and subsequently no further action was required.	NFA	NFA Decision Document (AR No. N00102.AR.001647) signed February 2008. NFA removed site from OU1.
22	SWMU 22	NA	NA	NA	Chemical Cleaning Facility Tank, Building 155	This unit was a 4,000 gallon aboveground tank for collecting spills and wastes from metal surface cleaning operations. No further action was required because there was low potential for release.	NFA	Eliminated from further investigation in the RFA.

Table 1-2
 Sites Removed from IRP
 Portsmouth Naval Shipyard, Kittery, Maine
 Page 2 of 2

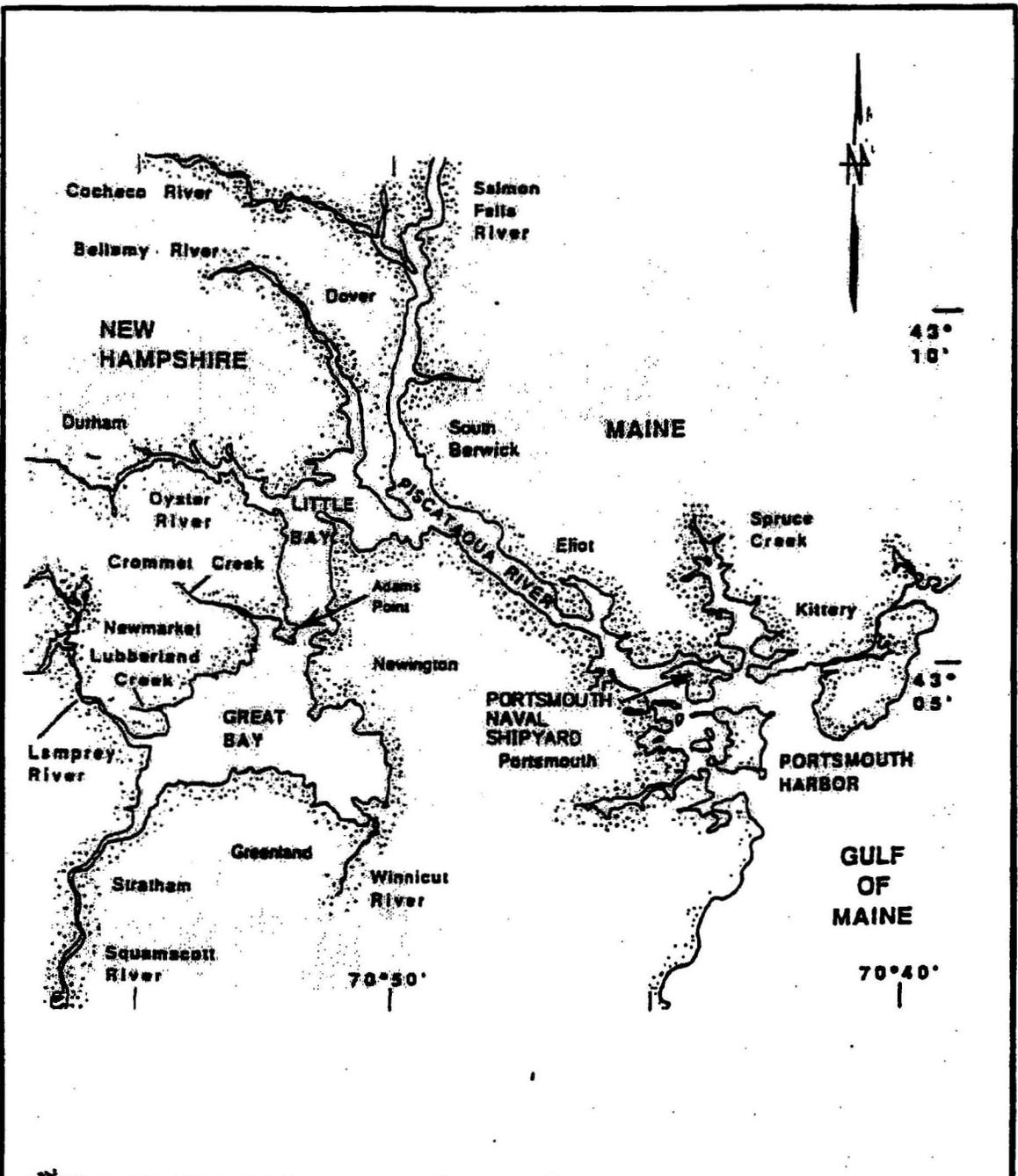
Site ID	Other ID ¹			Operable Unit	Site Name	Site Description	Current CERCLA Status	Comments/Notes ²
	RFA (1986)	RFI (1992)	FFA (1999)					
23	SWMU 23	SWMU 23	NA	NA	Chemical Cleaning Facility Tank, Building 174	This unit was a 2,270-gallon underground tank used to hold rinse waters from Building 174. The tank was removed as part of the RFI. There were no releases from this unit, and subsequently no further action was required.	NFA	NFA Decision Document (AR No. N00102.AR.000447) signed July 1997.
24	SWMU 24	NA	NA	NA	Asbestos Collection Dumpster	This unit was a central collection dumpster for asbestos waste that was located adjacent to the Hazardous Waste Storage Facility (SWMU 1). No further action was required because there was low potential for release.	NFA	Eliminated from further investigation in the RFA.
25	SWMU 25	NA	NA	NA	Burnable Dumpsters	This unit consisted of dumpsters to collect burnable wastes consisting mostly of paper. No further action was required because there was no evidence of a release of hazardous wastes or constituents.	NFA	Eliminated from further investigation in the RFA.
26	SWMU 26	SWMU 26	SWMU 26	OU4	Portable Oil Water Dumpsters	This unit consisted of dumpsters at the submarine berths used for oil/water wastes from cleanout of submarine bilges and various tanks. No further action was required for this unit because it consisted of portable tanks that were used for petroleum wastes only.	NFA	NFA Decision Document (AR No. N00102.AR.001019) signed August 2001. NFA under CERCLA removed site from OU4.
27	SWMU 27	SWMU 27	SWMU 27	OU5	Berth 6 Industrial Area/Fuel Oil Spill Area	A ruptured underground pipeline resulted in release of No. 6 fuel oil near Berth 6. The broken pipeline and surround contaminated soil was excavated. Other fuel oil lines that ran through Berth 6 that failed hydrostatic testing in 1981 were capped and abandoned in place. It was determined that petroleum product was the only contaminant of concern; therefore, no further action was required.	NFA	NFA Decision Document (AR No. N00102.AR.001020) signed August 2001. NFA under CERCLA removed site from OU5.
28	SWMU 28	NA	NA	NA	Silver Recovery System	Silver recovery operations for wastes with high silver content were conducted in several areas within buildings. Non-recoverable wastes were drummed and stored at the Hazardous Waste Storage Facility (SWMU 1). No further action was required because there was low potential for release.	NFA	Eliminated from further investigation in the RFA.
JILF Impact Area	NA	Portion of SWMU 8	JILF Impact Area	OU3	JILF Impact Area (Former CDC)	At the time the RFI for PNS was conducted, the Child Development Center (CDC) was located to the west of the JILF. Sampling in this area was conducted as part of the RFI to ensure that the children at the CDC were not being exposed to soil contaminated by wind dispersal of JILF contamination. When the CDC was moved to a different location, the area was referred to as the Former CDC. The building and playground equipment were removed and the area is currently used as an open-green space, with grass and trees covering the area. Sampling in the area indicated that it had not been impacted by the JILF and no further action was required.	NFA	NFA Decision Document (AR No. N00102.PF.001648) signed in February 2008. NFA removed area from OU3.

¹ RCRA Facility Assessment (RFA), July 1986, Administrative Record Number N00102.AR.000014 (including Addendum to RFA); RCRA Facility Investigation (RFI) Report (draft), July 1992, Administrative Record Number N00102.AR.000117; Federal Facility Agreement (FFA), September 1999, Administrative Record Number N00102.AR.000726. Site designation in FFA as provided in Appendix B (List of Areas of Concern) of the FFA.

² SWMUs removed in the RFA were not included in the 1989 HSWA Permit, Administrative Record Number N00102.AR.000019, and no further action was conducted at these SWMUs.

NA - Not applicable because site was not identified in document or not included in an operable unit.

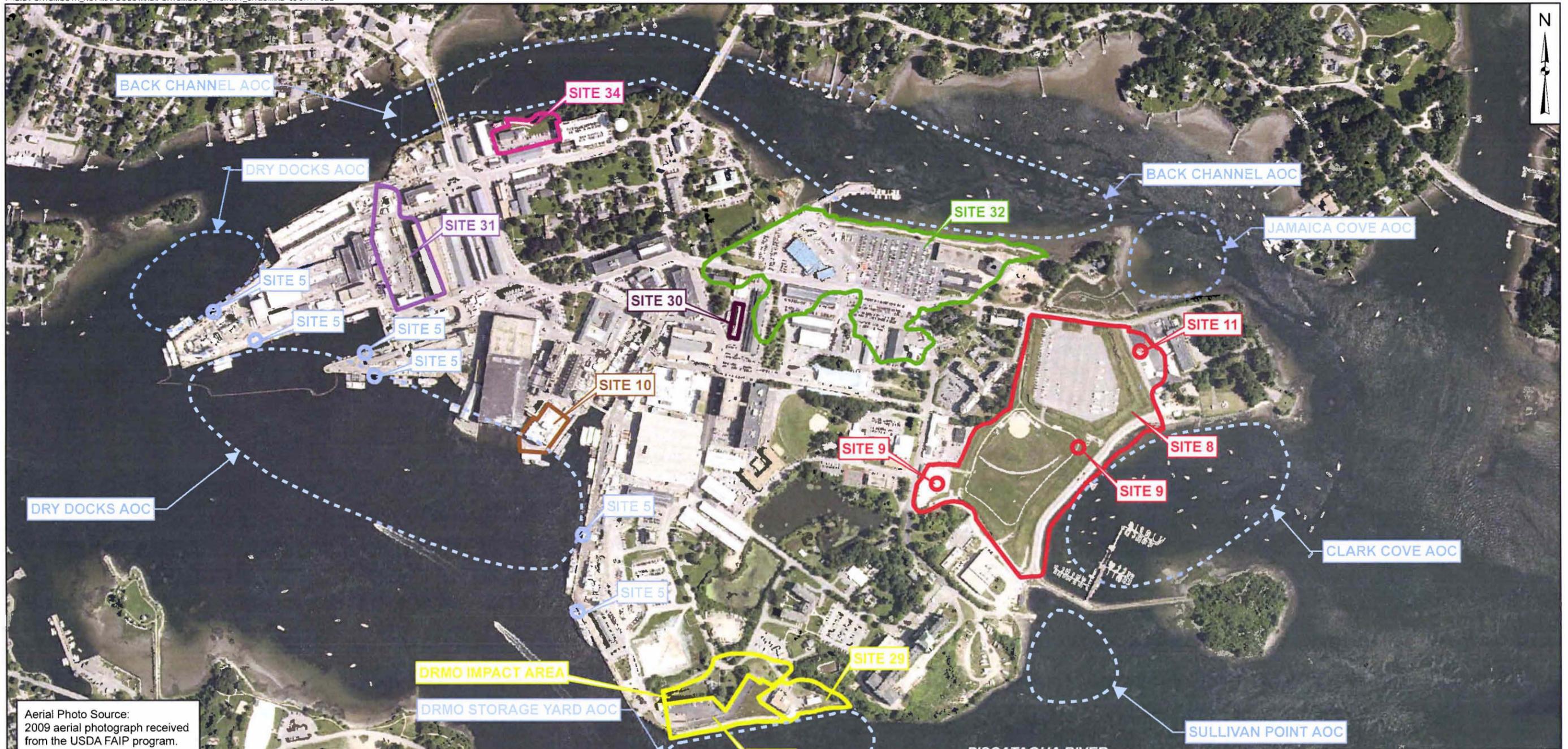
ACAD: R: 7/898/CUTPASTE/CUTPASTE1.dwg 02/16/99 HJP



REFERENCE: THE ECOLOGY OF THE GREAT BAY ESTUARY, NEW HAMPSHIRE AND MAINE:
 AN ESTUARINE PROFILE AND BIBLIOGRAPHY, EDITED BY FREDERICK T. SHORT,
 UNIVERSITY OF NEW HAMPSHIRE JACKSON ESTUARINE LABORATORY, OCTOBER 1992

DRAWN BY HJP	DATE 2/16/99	Tetra Tech NUS, Inc.	CONTRACT NO. 7090	OWNER NO. 0256
CHECKED BY DJC	DATE 6/13/01		APPROVED BY 	DATE
COST/SCHED-AREA 		GREAT BAY ESTUARY AND SITE LOCATION PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY 	DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 1-1	REV.

FORM 5885 10. T0008_AV.DWG - REV 0 - 1/22/98



Aerial Photo Source:
2009 aerial photograph received
from the USDA FAIP program.

- Operable Unit 1:** Site 10 - Former Battery Acid Tank No. 24
- Operable Unit 2:** Site 6 - Defense Reutilization and Marketing Office (DRMO) Storage Yard including DRMO Impact Area
Site 29 - Former Teepee Incinerator Site
- Operable Unit 3:** Site 8 - Jamaica Island Landfill (JILF)
Site 9 - Former Mercury Burial Site
Site 11 - Former Waste Oil Tanks Nos. 6 & 7
- Operable Unit 4:** Site 5 - Former Industrial Waste Outfalls
Offshore Areas potentially impacted by onshore IRP sites
(Six AOCs have been delineated)
- Operable Unit 7:** Site 32 - Topeka Pier Site
- Operable Unit 8:** Site 31 - West Timber Basin
- Operable Unit 9:** Site 34 - Former Oil Gasification Plant, Building 62
- Site Screening Area:** Site 30 - Galvanizing Plant, Building 184



DRAWN BY	DATE
T. WHEATON	09/03/10
CHECKED BY	DATE
D. COHEN	06/07/11
COST/SCHEDULE-AREA	
SCALE AS NOTED	

TETRA TECH

FACILITY SITE MAP
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

CONTRACT NUMBER 2103	OWNER NUMBER CTO WE14
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 1-2	REV 0

2.0 SITE DESCRIPTIONS

IRP sites that have potential or suspected contamination, or areas of known contamination that require further study through the CERCLA RI/FS process are referred to as AOCs in the FFA. IRP sites that require preliminary screening to determine whether they should become AOCs that require further study through the CERCLA RI/FS process are referred to as Site Screening Areas (SSAs) in the FFA. The evaluation process for SSAs is referred to in the FFA as the Site Screening Process (SSP) and provides procedures for determination and investigation of SSAs. The results of an SSI are used to determine whether an SSA requires further study in an RI/FS, further investigation, or no further action. SSAs that require further study as part of an RI/FS become AOCs. Based on proximity, some AOCs have been combined into OUs to more efficiently address the AOCs.

PNS IRP sites discussed in the SMP (referred to as SMP sites) are listed in Section 2.1 and shown on Figure 1-2. A summary of the history and current status of each site within the associated OU and of the SSA are provided in Sections 2.2 through 2.9.

2.1 SMP SITES

The following is a list of the sites discussed in the SMP, organized based on OU designation. Descriptions of the sites by OU are provided in Sections 2.2 through 2.9.

OU1

- Site 10 – Former Battery Acid Tank No. 24

OU2

- Site 6 – Defense Reutilization and Marketing Office (DRMO) Storage Yard including DRMO Impact Area (Quarters S, N, and 68)
- Site 29 – Former Teepee Incinerator Site

OU3

- Site 8 - JILF
- Site 9 – Former Mercury Burial Sites (MBI and MBII)
- Site 11 - Former Waste Oil Tank Nos. 6 and 7

OU4

- Site 5 – Former Industrial Waste Outfalls
- Offshore Areas Potentially Impacted by PNS Onshore IRP Sites

OU7

- Site 32 – Topeka Pier Site

OU8

- Site 31 – Former West Timber Basin

OU9

- Site 34 – Former Oil Gasification Plant, Building 62

SSA

- Site 30 – Former Galvanizing Plant, Building 184

2.2 OU1

OU1 consists of Site 10 – Former Battery Acid Tank No. 24. The FS, Proposed Remedial Action Plan (PRAP), and ROD for OU1 were completed in 2010, and the Remedial Action Work Plan and Land Use Control Remedial Design (LUCRD) are being prepared. The offshore area of Site 10 is part of the Dry Dock AOC investigated as part of the EERA and is retained in the Interim Offshore Monitoring Program with sampling at monitoring station MS-12 (see Figure 2-1). Sampling locations at MS-12 are in a depositional area west of Site 10 and south of Building 178 (TtNUS, November 2004a, February 2010, and November 2010). The offshore area is discussed as part of OU4 in Section 2.5.

Site 10 occupies a small peninsula located in the CIA near the southern shore of PNS (see Figure 1-2). Site 10 is currently and historically has been located within an industrial area. The site is located on fill material that was placed prior to the 1920s. Building 238, located within the boundary of Site 10, was built in 1955 and was used for battery recharging operations that previously resulted in releases of contaminated wastewater. Currently, the building consists mostly of office space; some minor battery recharging work is still performed, but the current process does not generate chemical waste. The area

surrounding Building 238 and spanning Site 10 is covered by asphalt. A loading dock is located on the southern and eastern side of the building. The site is bounded by the Piscataqua River on the east, south, and southwest. Buildings 303 and 179 are west and additional operational buildings are north of the site. The Site 10 shoreline along the Piscataqua River from the west to the southeast is bounded by a quay wall of granite blocks. Berths 4 and 5 are located south and east of Building 238, respectively. Barges are commonly docked at these berths. A crawl space with an earthen floor exists beneath a portion of Building 238 and the loading dock. The ground elevation of the earthen floor is approximately 5 to 6 feet below the ground elevation outside the building and loading dock.

Large lead-acid storage batteries were drained inside Building 238 as part of the lead-acid recharging operations, and until 1974, the acidic discharges drained directly to the offshore through an industrial waste outfall (Site 5) (TtNUS, June 2006a; Weston, June 1983). In 1974, the acidic discharges were directed into a lead-acid drain pipeline to an underground storage tank. The drain line exited the building in the crawl space and then dropped vertically into the earthen floor of the crawl space. The acidic discharge flowed through the drain line through the floor of the building to a steel underground storage tank (Battery Acid Tank No. 24) of 9,680-gallon capacity. Use of the piping and tank was discontinued in 1984 when a leak was discovered in the tank. Tank closure was conducted in 1986, when the tank and surrounding contaminated soil were removed (TtNUS, June 2006a). Testing of the soil during tank excavation indicated no exceedances of hazardous waste criteria. MEDEP did not require additional clean-up action at the time of the tank removal (TtNUS, March 2000).

A list of important Site 10 historical events and documents and relevant dates in site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
Filling of area was conducted and area apparently used for berthing and/or launching boats	Before 1826 to 1860s and 1900s to 1915	NA
Other industrial uses of area apparently began	1910s to 1920s	NA
Building 238 built and lead-acid battery recharging operations began within the building	1955	NA
Lead-battery acid wastes discharged directly to the river (through an industrial waste outfall that is part of Site 5)	1955 to 1974	NA
Lead-battery acid wastes discharged to underground storage tank (Battery Acid Tank No. 24) south of Building 238	1974 to 1984	NA
Leak in underground tank discovered and use of tank discontinued	1984	NA
Tank closure conducted with underground tank and surrounding contaminated soil removed	1986	NA

Event/Document	Author/Date	Administrative Record Number
RFI sampling conducted	1991	NA
Additional sampling of soil and groundwater to determine nature and extent of contamination	1998, 2001, and 2006	NA
OU1 RI Report finalized	TtNUS, July 2007	N00102.AR.001606
OU1 FS Report finalized	TtNUS, June 2010	N00102.AR.001754
OU1 PRAP finalized	Navy, June 2010	N00102.AR.001759
OU1 ROD signed	Navy, September 2010	N00102.AR.002495
Draft OU1 LUCRD submitted	December 2011	No Yet Assigned
Draft OU1 Remedial Action Work Plan submitted	January 2011	Not Yet Assigned

Soil and/or groundwater at Site 10 was investigated in 1991 as part of the RFI (McLaren/Hart, July 1992), in 1998 as part of the Site 10 Field Investigation (TtNUS, March 2000), in 2001 as part of the Site 10 Additional Investigation (TtNUS, March 2003a), and in 2006 as part of the Site 10 Data Gap Investigation (TtNUS, June 2006a). The investigations showed fill material at the site was rocky and ranged in thickness from 10 feet to 40 feet, and was generally thickest nearer to the shoreline). Gravel, bricks, and other building materials were also found in the fill material. Groundwater at the site is tidally influenced and is saline or brackish.

Based on evaluation of Site 10 data, it was determined that lead was the primary chemical of concern, and in addition to soil in the area of the tank leak, soil in the crawl space by the drain line had high concentrations of lead [greater than 10,000 milligram per kilogram (mg/kg)]. Groundwater concentrations did not indicate that groundwater was a medium of concern for human health exposure or for offshore impact. It was determined that additional information on the nature and extent of lead soil contamination and on lead concentrations in groundwater was necessary before preparing the RI Report. The Site 10 Data Gap Investigation Quality Assurance Project Plan (QAPP) was finalized in 2006 (TtNUS, June 2006a), and the investigation to provide this additional information was conducted in July and August 2006.

In the 2007 RI Report, Site 10 soil and groundwater data were evaluated, the nature and extent of contamination were defined, and risks associated with the site were determined (TtNUS, July 2007). Based on the distribution of lead concentrations in soil relative to site releases, the area of site-related impacts was identified. Mobilization of lead in soil to groundwater at the site is not significant (concentrations were less than action levels in site groundwater); therefore, the RI concluded that no unacceptable environmental impacts are expected to occur because of migration of groundwater from Site 10 to the offshore. Past release from site operations to the offshore area are being addressed as part of

MS-12 within OU4. As stated above, Site 10 currently and historically has been an industrial area and has no onshore ecological habitats; therefore, potential onshore ecological risks were not evaluated.

The HHRA showed that under current site conditions (all site soil covered by asphalt or within the crawl space of Building 238) and current and planned industrial site use, potentially unacceptable risks were estimated for construction workers exposed to soil within the crawl space under the building only. Risks associated with exposure to soil in the other area of the site (under asphalt outside the building) are acceptable for construction workers. Based on an evaluation of future conditions (assuming that soil is not covered by asphalt or building), potentially unacceptable risks were estimated for residential users exposed to soil anywhere at the site and for all other receptors (occupational workers and recreational users) only for exposure to soil within the crawl space of the building. Potential risks would also be unacceptable for antimony in soil under Building 238 for hypothetical future residential users. Exposure to saline/brackish groundwater at the site would not result in any unacceptable risks.

The selected remedy for OU1 includes excavation and off-yard disposal of contaminated soil with lead concentrations greater than acceptable levels for construction workers, recreational users, and occupational workers from around the drain lines within the crawl space under Building 238, implementation of LUCs to prevent future residential site use, and groundwater monitoring to confirm the lack of groundwater impacts from soil excavation (Navy, September 2010).

There have been no remedial actions under CERCLA at Site 10. The CERCLA path forward for OU1 is as follows:

- RA
- Long-term management (including LUCs)
- Five-year reviews

2.3 OU2

OU2 consists of Site 6 – DRMO Storage Yard, including the DRMO Impact Area, and Site 29 – Former Teepee Incinerator Site. The FS for OU2 was completed in April 2011, and the PRAP is being prepared. A removal action was conducted for the DRMO Impact Area.

OU2 is located in the south-central portion of PNS, as shown on Figure 1-2. Since the area was filled, Sites 6 and 29 within OU2 have been industrial and commercial areas. The DRMO Impact Area, included in OU2 because this area was thought to be impacted by particulate deposition from DRMO activities, has been a residential (military) area since before 1900.

The current DRMO area is the fenced area south of Quarters S and N and west of Building 298. The DRMO is responsible for the reuse, transfer, donation, sale, or disposal of excess and surplus DoD property in New England. DRMO operations are conducted in the paved portion of the fenced area; the area that was capped in 1993 is covered with grass and barricaded from use for any activities. The operations use temporary trailers and buildings; there are no permanent buildings located at the DRMO. Two buildings are located in the Site 29 area; Building 298 is used for office space, and Building 310 is the hose handling facility. There are no hazardous waste-related activities at OU2, and hazardous chemicals are not used as part of any of the current site operations.

OU2 is located along the Piscataqua River. The OU2 shoreline is steeply sloped and has shoreline erosion controls (riprap and a seawall) placed along portions of the shoreline in 1999, 2005, 2006, and 2008 to provide erosion protection. The OU2 shoreline is difficult and dangerous to access because of strong river currents and the steep embankment from the site to the river. There is a small intertidal sediment area adjacent to OU2 to the east. The offshore area of OU2 is part of the DRMO Storage Yard AOC investigated as part of the EERA and is retained in the Interim Offshore Monitoring Program with sampling at monitoring station MS-11 (see Figure 2-1). Sampling locations at MS-11 are in a depositional area east of OU2 (east of the seawall at Site 29) (TtNUS, November 2010). The offshore area is discussed as part of OU4 in Section 2.5.

After Site 6 and the majority of Site 29 were filled in the early 1900s, the area was used for DRMO operations (from approximately 1920). Over the time the area was used as a DRMO, materials reportedly stored at the DRMO included lead- and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap metal. The major hazardous materials of concern were the lead battery cells and plates that were stockpiled on uncovered pallets. Nickel-cadmium batteries were also stored in the same manner. Historically, DRMO operations primarily appear to have occurred in the current fenced area of the DRMO, but operations apparently also occurred in areas directly adjacent to the DRMO. Operations, such as open storage of batteries and other materials, that could cause contaminants to be leached or otherwise released by pathways such as infiltration or runoff were terminated in approximately 1983. In 1993, interim corrective measures conducted for a portion of the DRMO (McLaren/Hart, April 1993) included the capping and paving of sections of the area, installation of storm water controls, and installation of a new concrete curb.

The main activities that occurred in the Site 29 area are related to open burning, waste disposal, and industrial incineration. Filling of the remaining portion of OU2 may have begun in the 1920s. This area was apparently filled with paper, wood, rubbish, and ash and is referred to as the waste disposal area. The ash is reportedly from open burning of trash conducted in the waste disposal area from approximately 1918 until 1965, when the teepee incinerator was built. Ash from the teepee incinerator was also disposed of in the waste disposal area. Onsite disposal reportedly ended in 1975 when trash began being

taken off yard for disposal. Also, construction drawings of Building 298 from 1973 and of Building 310 from 1980 and Shipyard maps from the mid- to late 1970s support that disposal in the waste disposal area ended between 1975 and 1979 (between when Building 298 and Building 310 were constructed). Materials identified in soil borings located in the waste disposal area are generally consistent with the background information and include ash, cinders, wire, glass, wood, and metal pieces. Asbestos was also found during the excavation of the Building 310 foundation, which is located over the waste disposal area.

The teepee incinerator was built in 1965 and used to burn waste material until 1975. The teepee incinerator (Building 290) was used primarily for disposal of wood, paper, and rubbish, with occasional burning of cans of paint and solvents. Ash from the incinerator was deposited south of the incinerator until 1971 when the residue began to be landfilled in the JILF (at OU3, located approximately 1,000 feet northeast of OU2) and the Kittery municipal landfill. The incinerator was apparently demolished soon after operations ended in 1975.

Building 298 was built in 1975 and was used as an industrial waste treatment facility until the 1980s. Spill prevention and control methods were in place during operation of the facility, and there were no reported releases impacting soil or water outside the building. Clean closure under RCRA was documented in May 1997 and accepted by MEDEP in November 1997. The building is used as office space. In 2002, a utility trench was excavated to place new utilities to service the Building 298 offices. The excavated soil was disposed of by the Shipyard off yard, the trench was backfilled with clean fill material, and the trench is considered a clean area within the OU2 boundary. Building 310 was built around 1980 and is used as a hose handling facility.

A list of important OU2 historical events and documents and relevant dates in site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
OU2 area filled with material excavated from Henderson's Point	1902 to 1905	NA
DRMO activities began (stone crusher and scrap metal yard)	1920	NA
Additional filling and disposal at OU2 (in waste disposal area)	1920 to 1975/1979	NA
Seawall constructed	1940s	NA
Coal and coke storage facility located at Site 6 (Building 172)	1942 to 1957	NA
Sandblast grit (unused) storage located at Site 6 (Building 172)	1957 to 1960	NA
Teepee Incinerator (Building 290) operated	1965 to 1975	NA

Event/Document	Author/Date	Administrative Record Number
Building 298 used as industrial waste treatment facility	1975 to 1980s	NA
Hose handling facility located at Site 29 (Building 310)	1980 to present	NA
Pesticide handling conducted at Building 314	1982 to 1995	NA
Open storage of batteries at DRMO discontinued	1983	NA
Environmental sampling began at OU2 (as part of FCS)	1984	NA
RFI and RFI Data Gap investigation conducted at Site 6 (including what is now Site 29)	1989 to 1992 and 1995	NA
DRMO capped as an interim corrective measure	1993	NA
Clean closure under RCRA of industrial waste treatment facility (Building 298)	1997	NA
Portion of Site 6 separated into a new site (Site 29) and field investigation at Site 29 conducted	1998	NA
Emergency Removal Action (shoreline stabilization) at Site 6	1999	NA
Excavation for utility trench at Building 298 conducted	2002	NA
Draft FS prepared for OU2	2004	NA
Soil washing treatability study conducted	2005	NA
Emergency Removal Action (shoreline stabilization) conducted at Site 29/shoreline repairs completed	2005 and 2006/2008	NA
Additional Investigation at OU2 conducted	2007 to 2008	NA
Action Memorandum including Engineering Evaluation/Cost Analysis (EE/CA) for Removal Action for DRMO Impact Area	Navy, November 2009	N00102.AR.001351
OU2 Supplemental RI Report finalized	TtNUS, March 2010	N00102.AR.001743
Removal Action Work Plan for DRMO Impact Area finalized	Shaw, May 2010	N00102.AR.001746
Removal action conducted	2010	NA
OU2 Pre-Design Sampling and Analysis Plan finalized	TtNUS, November 2010	N00102.AR.002513
OU2 FS Report finalized	TtNUS, April 2011	Not Yet Assigned
OU2 Pre-Design Soil sampling conducted	April 2011	NA
Draft Final OU2 PRAP submitted	June 2011	Not Yet Assigned

Environmental sampling began at OU2 in 1984 as part of the FCS (LEA, June 1986). OU2 has been included in various investigations since then including the RFI (McLaren/Hart, July 1992), RFI Data Gap Investigation (Halliburton NUS, November 1995), groundwater monitoring (TtNUS, August 1999), Site 29 field investigation (TtNUS, March 2000), 1999 removal action at Site 6 (FWENC, June 2001), Building 298 utility trenching (TtNUS, November 2002), and OU2 soil washing treatability study (TtNUS, January 2006a). The investigations showed that Site 6 and much of Site 29 (in the area filled in the early 1900s as

part of Henderson's Point excavation) consists of angular rock fragments overlain by general fill material composed of sand and gravel with minor amount of wood and metal debris and cinders. In the remaining filled area of OU2, sand, gravel, and silt overlie waste fill that includes cinders, ash, plastic, glass, wire, and other waste materials. Fill thicknesses generally range from approximately 6 feet to 23 feet; however, the maximum fill thickness is approximately 40 feet (along the shoreline in the waste disposal area). The groundwater at OU2 is tidally influenced and is generally brackish or saline.

Sampling activities as part of the Additional Scrutiny Investigation for OU4 (discussed further in Section 2.5) included collecting samples of soil eroding along the top of the Site 29 shoreline (TtNUS, August 2005a). The data showed that the erosion was likely the cause of elevated metals (copper, lead, nickel) concentrations detected in offshore sediments (TtNUS, February 2006). Shoreline controls were placed in the eroding areas in November 2005 and June 2006 as part of emergency removal actions (TtEC, October 2005 and June 2008). Repairs to a portion of the shoreline controls were made in March 2008. As part of the June 2006 activities, surficial debris (including metal pieces and wires) was removed in the eastern portion of Site 29, and the area was covered with gravel.

Although a draft FS was prepared for OU2 in 2004 (TtNUS, November 2004b); additional investigation of soil and groundwater was conducted before finalizing the document to refine potential remedial options to address OU2 contamination. The QAPP for the additional investigation at OU2 (TtNUS, October 2007) was prepared, and field work was conducted from November 2007 to May 2008. The Supplemental RI Report, finalized in March 2010, included the results of the additional investigation, evaluation of nature and extent of contamination, and risks for OU2. Sites 6 and 29 data indicate that the main contaminants in soil are metals (particularly lead), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs), and the main contaminants in groundwater are metals. OU2 has little natural areas that would be a habitat for onshore ecological receptors. The HHRA indicated unacceptable risks for current and future potential receptors exposed to soil at Site 6 or Site 29 and soil in the backyards of Quarters S and N within the DRMO Impact Area; risks were acceptable for exposure to groundwater and soil in the remaining portion of the DRMO Impact Area. Uncertainty in the extent of contamination was identified for the area west of the DRMO that is being investigated as part of the Pre-Design Investigation. Contaminant fate and transport modeling and groundwater sampling conducted for OU2 indicated that migration of groundwater to the offshore was not anticipated to adversely impact the offshore. However, there could be a potential future risk for migration of highly contaminated soil from the capped area to the offshore area and there is a potential future risk to the offshore area from erosion if erosion controls fail in the future.

Based on the results of the Supplemental RI Report, the Navy planned a removal action for the DRMO Impact Area and revised the 2004 draft FS Report for OU2. The 2007 to 2008 additional investigation showed that DRMO contamination (lead and copper) was present in the backyards of Quarters S and N,

adjacent to the DRMO Storage Yard. The Navy prepared an EE/CA to evaluate removal of contaminated soil in the DRMO Impact Area to eliminate potential unacceptable risks. The removal action included excavation of contaminated soil, offsite disposal, and site restoration. The Action Memorandum was signed in November 2009, the Removal Action Work Plan was finalized in May 2010, and soil excavation was conducted in 2010. The soil excavation removed the potential unacceptable risks from OU2 contamination in the DRMO Impact Area. Site restoration activities were conducted in spring 2011, and a Construction Completion Report is being prepared.

The FS Report for OU2 was finalized in April 2011, and it identifies and evaluates potential remedial options to address contamination at Sites 6 and 29. Remedial options for the DRMO Impact Area were no longer included in the FS Report because the 2010 removal action addressed contamination in this area. The PRAP is being prepared with the Navy's recommended remedial alternatives for OU2.

There have been no remedial actions under CERCLA at OU2. The CERCLA path forward for OU2 is as follows:

- ROD
- RD/RA
- Five-year reviews as appropriate

2.4 OU3

OU3 consists of Site 8 - JILF, Site 9 - Former Mercury Burial Sites (MBI and MBII), and Site 11 - Former Waste Oil Tank Nos. 6 and 7. Post-remedial operation, maintenance, and monitoring (OM&M) is being conducted at OU3 (TtNUS, June 2006b). The offshore area of OU3 is part of the Jamaica Cove and Clark Cove AOCs investigated as part of the EERA and are retained in the Interim Offshore Monitoring Program with sampling at monitoring stations MS-5 through MS-9 (see Figure 2-1). Sampling locations are within the intertidal and subtidal areas of Jamaica and Clark Coves (TtNUS, November 2004a, February 2010, and November 2010). The offshore monitoring results are discussed as part of OU4 in Section 2.5.

OU3 is located in the eastern portion of PNS, as shown on Figure 1-2. The current OU3 area is approximately 22 acres and is used for parking, occupational uses, and recreational uses. Wetlands are located adjacent to the northern end of OU3, by Jamaica Cove. The hazardous waste storage facility (Building 357) is located to the northeast; although, the boundary of OU3 extends into a portion of the paved area west of the building. Clark Cove is east of the landfill, and the solid waste storage facility (Building 337) is located to the south. The Automotive Hobby Shop (Building 320) and hospital (H1) are located to the west. The current features reflect post-remedial construction conditions.

Site 8 is the landfill (JILF) and Sites 9 and 11 were located within the JILF boundary. The Navy used the JILF, which previously consisted of tidal mudflats, as a disposal area from 1945 to 1978 for general refuse, trash, construction rubble, dredged sediment, and various industrial wastes. The boundary of OU3 is defined by the boundary of the landfill. Prior to implementation of the OU3 remedy, the landfill was 25 acres; however, landfill material from 3 acres adjacent to Jamaica Cove was excavated as part of the remedy, and this area was removed from the landfill footprint. Mercury burial vaults (MBI and MBII) were placed in two locations within the landfill in the 1970s and then removed (intact) and disposed of off site in the 1990s/early 2000. There is no indication that mercury from the vaults has contaminated surrounding soil or groundwater. The waste oil tanks at Site 11 were used from 1943 to 1989 and were removed intact along with surrounding soil in 1989. Soil contamination remaining in the vicinity of Site 11 appeared to be landfill material (Site 8) mixed with petroleum that may have originated from spills during filling of the tanks formerly at Site 11. Therefore, the soil contamination remaining in the vicinity of Site 11 is considered Site 8 contamination.

A list of important OU3 historical events and documents and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
Use of underground storage tanks at Site 11 to store waste oil before offsite disposal began	1943	NA
Landfilling of tidal flats east of Seavey Island and west - southwest of Jamaica Island began	1945	NA
Poured concrete blocks and precast concrete pipes containing mercury-contaminated wastes buried in two locations (MBI and MBII) at the JILF	Between 1973 and 1975	NA
Dredged sediment from the Dry Dock area disposed of at the JILF, and landfilling of the area discontinued	1978	NA
IAS identifies the JILF and MBI and MBII as sites	1983	NA
Environmental investigations began at OU3 (as part of the FCS)	1984	NA
Use of tanks at Site 11 discontinued, and tanks and surrounding soil removed	1989	NA
RFI and RFI Data Gap investigations conducted	1989 to 1992 and 1994	NA
Pipe and blocks (three) removed from MBI and disposed of off site	1994 and 1997	NA
Geophysical survey of OU3 conducted	1998	NA
Blocks (eight) removed from MBII and disposed of off site	2000	NA
Revised OU3 Risk Assessment and FS for OU3 finalized	TtNUS, May and November 2000	N00102.AR.000835 and N00102.AR.000922

Event/Document	Author/Date	Administrative Record Number
Test pitting investigation conducted based on results of geophysical survey; 40 drums containing non-hazardous material located and removed	2000	NA
ROD for OU3 signed	Navy, August 2001	N00102.AR.001018
Phase I remedial design completed, evaluation of consolidation for MBII area and Jamaica Cove area conducted, and Phase II remedial design completed	US Army, June and November 2002	N00102.PF.001139, N00102.PF.001143, N00102.PF.001149, and N00102.PF.001195
Significant construction of remedy started	2002	NA
Changes to OU3 ROD documented in ESDs	Navy, September 2003 and October 2005	N00102.PF.001293 and N00102.PF.001493
Remedy construction completed	2004	NA
Remedial action construction report completed	TtEC, May 2006	N00102.PF.001561
Post-remedial OM&M plan finalized (without Land Use Control Remedial Design)	TtNUS, June 2006	N00102.PF.001566 and 001567
OU3 Rounds 1 and 2 post-remedial OM&M conducted	2006	NA
First Five-Year Review Report completed	TtNUS, June 2007	N00102.PF.001601
OU3 Rounds 3 and 4 post-remedial OM&M conducted	2007	NA
OU3 Rounds 5 and 6 post-remedial OM&M conducted	2008	NA
OU3 Rounds 7 and 8 post-remedial OM&M conducted	2009	NA
OU3 Rounds 1 through 4 evaluation report completed	TtNUS, July 2009	N00102.PF.000910
Draft post-remedial OM&M plan update (Revision 1) submitted	August 2009	Not Yet Assigned
Draft Final LUCRD submitted	March 2010	Not Yet Assigned
OU3 Round 9 post-remedial OM&M conducted	April to June 2010	NA
Final Rounds 1 through 9 evaluation report submitted	April 11	Not Yet Assigned
OU3 Round 10 post-remedial OM&M conducted	April 2011	NA

Environmental sampling began at OU3 in 1984 as part of the FCS (LEA, June 1986). OU3 has been included in various investigations including the RFI, RFI Data Gap investigation, groundwater monitoring and seep and sediment sampling in the intertidal area in 1996 and 1997, geophysical surveying, and test pitting. As discussed in the OU3 ROD (Navy, August 2001c), OU3 is characterized as containing a large volume of low-level hazardous materials from Site 8. Soil and groundwater data for Sites 8, 9, and 11 show similar chemical contamination throughout the area of the landfill. A variety of organic and inorganic constituents were detected in soil and groundwater and include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PCBs, pesticides, metals, and petroleum hydrocarbons. During test pitting at the JILF in February/March 2000, dioxin analysis of selected subsurface soil samples was conducted, and low levels of dioxins were detected. The contamination distribution is consistent with

the heterogeneous nature of the materials that were landfilled at the JILF (i.e., a range of concentrations of a variety of chemicals was detected in the JILF suggesting a heterogeneous mixture of waste materials).

The risk assessment for OU3 showed that remedial action was necessary, and the FS was prepared in 2000. The ROD for OU3 was signed in 2001, and the United States Army Corps of Engineers completed the remedial design for OU3 in 2002 (US Army, June 2002a, June 2002b, June 2002c, and November 2002). Tetra Tech EC, Inc., performed the remedial action for OU3 in 2002 through 2004 (TtEC, May 2006).

The selected remedy in the ROD for OU3 included installation of a hazardous waste landfill cover and implementation of institutional controls, erosion controls, and monitoring (Navy, August 2001c). In addition, a 2003 ESD for the ROD (Navy, September 2003) described the addition of excavation and consolidation of material within the limits of the JILF before placement of the hazardous waste landfill cover. Wetlands were constructed within the excavated area in 2003. Cap construction was completed in September 2004. A second ESD was issued in 2005 (Navy, October 2005) to recombine management of groundwater migration (formerly OU6, see Section 1.4) with the source control remedy (OU3). The OM&M program for OU3 was initiated in July 2006, and Rounds 1, 2, 3, and 4 sampling and inspection activities were conducted in July 2006, December 2006, April 2007, and November 2007 respectively. Based on the inspections, minor maintenance activities were conducted in 2006 and 2007. The Navy prepared the Rounds 1 through 4 Data Evaluation Report (TtNUS, July 2009), which provided recommendations for modification to the OM&M program after Round 5. Round 5 sampling and inspection activities were conducted in April and May 2008, Round 6 sampling and inspection activities were conducted in October 2008, Round 7 sampling and inspection activities were conducted in May 2009, and Round 8 sampling and inspection activities were conducted in October 2009. Round 9 sampling and landfill inspection activities were conducted in April 2010, and wetlands inspection conducted in June 2010. Maintenance activities, including repair of a culvert end and replacement of grass in a portion of the site, were conducted in May and June 2010. The Navy prepared the Rounds 1 to 9 Data Evaluation Report (TtNUS, April 2011), which provided recommendations for modification of the OM&M program after Round 9. The updated OM&M plan (draft, Revision 1, August 2009) provides modifications to the OM&M program. The updated OM&M plan has not been finalized because of the delay in resolving USEPA comments on the draft final LUCRD, which is an appendix of the plan. The draft OM&M plan (Revision 1) and draft final LUCRD are being implemented in the interim.

Based on the initiation of remedial activities at OU3 in June 2002, the first Five-Year Review Report for PNS was submitted in June 2007 (TtNUS). Five-year reviews of OU3 are required by statute because hazardous substances, pollutants, or contaminants remain on site at levels that do not allow for unlimited use and unrestricted exposure.

The CERCLA path forward for OU3 is as follows:

- Post-remedial OM&M field work and reporting (including sampling, landfill inspection, and LUC inspection).
- Update OM&M Plan.
- Five-year reviews.

2.5 OU4

OU4 consists of the areas offshore of PNS that potentially were affected by PNS onshore IRP sites and Site 5 – Former Industrial Waste Outfalls, a site that had offshore impacts but no onshore impacts. An interim remedy (monitoring) is being conducted for OU4 until the final remedy is implemented. The OU4 FS Report is under regulatory review. Onshore OUs with sites that have potential offshore impacts are OU1 (Section 2.2), OU2 (Section 2.3), OU3 (Section 2.4), OU7 (Section 2.6), OU8 (Section 2.7), and OU9 (Section 2.8). Additional information on the onshore sites is provided in these sections.

OU4 is the offshore area of the Piscataqua River and the Back Channel around PNS. OU4 includes Site 5 and six AOCs, as shown on Figure 1-2. As part of the Interim Offshore Monitoring Program, 14 interim offshore monitoring stations are located around PNS, in the offshore AOC areas, as shown on Figure 2-1.

Site 5 (Former Industrial Waste Outfalls) is a site that had offshore impacts but no onshore impacts. This site is located within the Dry Docks AOC, and any impacts that Site 5 may have had on the offshore are being addressed as part of the Dry Dock AOC. Site 5 consisted of numerous discharge points along the Piscataqua River in the berth area by the dry docks in the western end of PNS. The outfalls were used from approximately 1945 to 1975 to discharge liquid industrial wastes (primarily from acidic, alkaline, and metal-plating rinse baths) to the offshore before the sanitary and storm sewer systems were separated and offshore discharge of industrial wastes was discontinued. The wastewaters may have contained heavy metals (mercury, lead, cadmium, chromium, copper, and zinc), oils and grease, and PCBs. Lead sediment from decommissioned batteries (as part of operations at Site 10) was also reportedly included in the discharges to the river before 1975 (Weston, June 1983). Maintenance dredging is conducted periodically in the berth areas. Dredging activities occurred between January 2002 and April 2002, between Interim Offshore Monitoring Program Rounds 5 and 6 (TINUS, November 2004a).

The AOCs were identified in the EERA sampling as near-shore habitats adjacent to PNS that may have been affected by onshore IRP sites. A conceptual model developed as part of the EERA was used to identify six AOCs, Clark Cove, Sullivan Point, DRMO Storage Yard, Dry Docks, Back Channel, and Jamaica Cove.

A list of important OU4 historical events and documents and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
Outfalls in the Dry Dock area were used to discharge industrial wastes into the Piscataqua River	~1945 to 1975	NA
Sanitary and storm sewer systems separated; industrial discharge through outfalls discontinued	Completed by 1975	NA
Industrial waste outfalls first identified as a site and operations that previously discharged to the outfalls are identified (as part of the IAS)	1983	NA
Environmental sampling began including the offshore (as part of FCS)	1984	NA
Phase I and Phase II offshore sampling for offshore human health and ecological risk assessments conducted	1991 to 1993	NA
Final HHRA Report for Offshore Media completed	McLaren/Hart, May 1994	N00102.AR.000229
Interim ROD for OU4 signed, interim offshore monitoring plan completed, and first round of sampling conducted	Navy, May 1999 and TtNUS October 1999	N00102.AR.000676 and N00102.AR.000750
EERA document finalized	NCCOSC, May 2000	N00102.AR.000838
PRGs for OU4 developed	TtNUS, November 2001	N00102.PF.001062
Baseline evaluation of first four rounds of interim offshore monitoring data completed	TtNUS, July 2002	N00102.PF.001150
Evaluation of first seven rounds of interim offshore monitoring data completed, and stations requiring additional scrutiny and/or additional monitoring (as part of Rounds 8 and 9) identified	TtNUS, November 2004	N00102.PF.001416/ N00102.PF.001417
Work plan (QAPP) for additional scrutiny investigation completed and Round 8 and additional scrutiny investigations conducted	TtNUS, August 2005	N00102.PF.001484
Additional scrutiny investigation report and work plan for second phase of additional scrutiny completed	TtNUS, August and September 2007	N00102.PF.001612 and N00102.AR.001619
Phase II additional scrutiny investigation and Round 9 interim offshore monitoring conducted	November 2007 and April 2008	NA
Round 10 interim offshore monitoring conducted	December 2008	NA
Evaluation report for first 10 rounds finalized	TtNUS, February 2010	N00102.AR.001716
Draft FS Report submitted	July 2010	Not Yet Assigned
Interim Offshore Monitoring Plan updated (Revision 1)	TtNUS, November 2010	N00102.AR.002514
Round 11 interim offshore monitoring conducted	April 2011	NA

Various studies were conducted as part of the Phase I and Phase II EERA investigations. Phase I and Phase II data and conclusions were synthesized to assess potential risks to the estuarine environment in the vicinity of PNS. The risk determinations for surface water and sediment exposure for each AOC and the chemicals of potential concern (COPCs) for each AOC were identified. The ecological risks associated with exposure to surface water were determined to be acceptable, and the ecological risks associated with exposure to sediment were determined to be potentially unacceptable. Sediment COPCs included metals, PAHs, and PCBs.

The HHRA for Offshore Media (McLaren/Hart, May 1994) and the Phase I/Phase II Offshore Data Comparative Analysis (TtNUS, October 1998) provide the details on the assessment of human health risks for OU4. Based on the assessment and as provided in the Interim ROD for OU4, human health risks associated with exposure to sediment and surface water were acceptable, but risks associated with consumption of seafood exceeded regulatory guidelines. However, the HHRA could not differentiate whether the chemicals that cause the risk were from PNS sources or from other sources within the lower Piscataqua River. The Public Health Assessment for PNS prepared by the Agency for Toxic Substances and Disease Registry (ATSDR) in 2007 concluded that adults and children consuming fish or shellfish or wading in the surface water and sediment offshore of PNS are not likely to experience adverse health effects from the levels of chemicals in those media (November 2007).

An Interim ROD for OU4 was signed in May 1999 that requires the Navy to conduct interim offshore monitoring for OU4 (Navy, May 1999) until a final remedy is implemented for OU4. The Interim ROD specifies that monitoring will be conducted in accordance with a monitoring plan that specifies the sampling locations, analytical program, and frequency of sampling. The Interim Offshore Monitoring Plan, Revision 0, was finalized in October 1999 and updated (Revision 1) in November 2010. The following summarizes the monitoring program and modifications to the program based on data evaluation.

The monitoring program began in 1999 and initially included sediment, mussel, and juvenile lobster sampling and analysis (TtNUS, October 1999). The data from Rounds 1 and 2 were used to develop PRGs for OU4 (TtNUS, November 2001) that are being used as Interim Remediation Goals (IRGs) for making decisions as part of the Interim Offshore Monitoring Program. The data from Rounds 1 through 4 were evaluated to determine whether changes were needed to the Interim Offshore Monitoring Program (TtNUS, July 2002). The major changes to the program based on the Rounds 1 through 4 data were to discontinue select analyses (acid volatile sulfides and simultaneously extract metals) for sediment, discontinue juvenile lobster sampling, and conduct subsequent sampling (starting with Round 5) only during late summer. Data from Rounds 1 through 7 were evaluated to determine whether additional sampling (as part of Rounds 8 and 9) and/or additional scrutiny were needed for select monitoring stations (TtNUS, November 2004a). Based on the Rounds 1 through 7 data evaluation, recommendations also

were made to only sample sediment during Rounds 8 and 9 (no mussel sampling) and to discontinue alkylated PAH analysis of samples.

A QAPP for the additional scrutiny activities was prepared in 2005 (TtNUS August 2005a), sampling was conducted in 2005, and the data package was submitted in 2006 (TtNUS, February 2006). The report of the results for the first phase of the additional scrutiny investigation (TtNUS, August 2007) recommended additional investigation at two monitoring stations, and a QAPP for the second phase of additional scrutiny was prepared (TtNUS, September 2007). Phase II sampling was conducted in November 2007 and May 2008.

Round 8 sampling was conducted in 2005, and the data package was submitted in 2006 (TtNUS, January 2006b). Round 9 sampling was conducted in 2007, and Round 10 sampling was conducted in December 2008. The Navy prepared the Rounds 1 through 10 data evaluation report (TtNUS, February 2010), which provided recommendations for modifications to the Interim Offshore Monitoring Program. The Navy prepared an update (Revision 1) to the Interim Offshore Monitoring Plan (TtNUS, November 2010) for monitoring subsequent to Round 10. Based on the recommendations and Revision 1 of the Interim Offshore Monitoring Plan, monitoring is no longer required at several monitoring stations, as discussed below. Round 11 was completed in April 2011.

A description and current status of each monitoring station based on the results of the Rounds 1 through 10 data evaluation and in accordance with the 2010 Interim Offshore Monitoring Plan are as follows:

- **MS-01:** This monitoring station is located in the western portion of the Back Channel AOC, offshore of Site 34 (OU9) where a SSI was conducted in 2003 (TtNUS, August 2004) and an RI is being conducted (2009 and 2010). An additional scrutiny investigation was conducted at MS-01 to determine the likely sources of PAH contamination in sediment at this station. Rounds 8, 9, and 10 sampling were not required for MS-01. In 2007, a non-time-critical removal action was conducted for source material at Site 34, and additional sediment sampling at MS-01 was conducted in August 2009 to determine the extent of PAH contamination. Monitoring of sediment for PAHs was conducted at this station during Round 11.
- **MS-02 and MS-10:** These monitoring stations are located in the Back Channel and Sullivan Point AOCs, respectively, and are not located immediately offshore of any IRP sites. Additional scrutiny and Rounds 8, 9, and 10 sampling were not required for these monitoring stations. No additional offshore monitoring or actions are needed for these stations because chemical concentrations in sediment are less than IRGs, and the data do not indicate any impacts from known IRP sites. Therefore, in

accordance with the 2010 Interim Offshore Monitoring Plan, interim offshore monitoring was discontinued at these stations.

- **MS-03 and MS-04:** These monitoring stations are located in the eastern portion of the Back Channel AOC, offshore of Site 32 (OU7). Foundry slag associated with Site 32 has been identified in the intertidal areas of MS-03 and MS-04 and is likely the source of the elevated metals concentrations at these stations. In June 2006, a time-critical removal action was conducted to provide shoreline erosion controls where significant erosion of the shoreline was occurring. As part of the removal action, surficial debris (including slag) was removed from the shoreline, and shoreline controls were placed along the entire Site 32 shoreline in the mid- to high-tide area. Additional sampling was conducted in 2008 as part of Phase II RI field work for OU7 to determine the extent of copper and PAH contamination in sediment. Rounds 8, 9, and 10 sampling were not required for these monitoring stations. Monitoring of sediment for PAHs and copper was conducted at this station during Round 11.
- **MS-05, MS-06, MS-07, MS-08, and MS-09:** MS-05 and MS-06 are located in the Jamaica Cove AOC, and MS-07, MS-08, and MS-09 are located in the Clark Cove AOC. MS-05, MS-08, and MS-09 are immediately offshore of OU3, and MS-06 and MS-07 are in the offshore area adjacent to OU3. Remedial action conducted at OU3 included excavation of wastes from OU3 adjacent to Jamaica Cove (and subsequent wetlands construction in the excavated area), excavation of wastes from the offshore area within MS-08, and placement of shoreline controls along the entire OU3 shoreline. Because an increase in chemical concentrations was identified within MS-05 and MS-09 after OU3 remedial action construction, additional scrutiny was conducted to delineate the area of elevated chemical concentrations in these two stations. Additional sampling (during Rounds 8, 9, and 10) was conducted for MS-05, MS-08, and MS-09 to evaluate concentration trends post-remedial action. Although an initial increase in concentrations was observed at some locations, the sampling results indicated the increase was temporary. Chemical concentrations in sediment at MS-05, MS-08, and MS-09 during the recent sampling events were less than IRGs. MS-06 and MS-07 have not had exceedances of IRGs, indicating that sediment in the offshore area adjacent to OU3 has not been impacted by OU3. Monitoring of sediment for PAHs and metals at MS-05 and for PAHs, 4,4'-DDT, dioxins/furans, PCBs, and metals at MS-08 and MS-09 was conducted during Round 11. Sediment at MS-07 also was monitored during Round 11 as a reference station for MS-08 and MS-09. In accordance with the 2010 Interim Offshore Monitoring Plan, interim offshore monitoring was discontinued at MS-06.
- **MS-11:** This monitoring station is located in the DRMO Storage Yard AOC offshore of OU2. Erosion of metals-contaminated soil along a portion of the OU2 shoreline (by Site 6) was identified in 1999,

and a time-critical removal action was conducted to prevent further erosion of contaminants by placing shoreline erosion controls along a portion of the OU2 shoreline. Additional erosion was noted in areas of the OU2 shoreline where erosion controls were not in place, and a time-critical removal action was conducted in 2005 and 2006 to provide shoreline erosion controls along the remaining portion of the OU2 shoreline (at the Site 29 shoreline). In 2008, repairs were made to the shoreline controls placed in 2005. The entire OU2 shoreline now has some type of shoreline erosion controls. Sediment is present at only one location at MS-11 (on the eastern side of the monitoring station); the sediment concentrations at the other two locations (for comparison to IRGs) were estimated using mussel data from those locations. Additional scrutiny was conducted to confirm that elevated concentrations of metals (copper, lead, and nickel) in MS-11 sediment on the eastern side of the monitoring station were likely from erosion from OU2. Rounds 8, 9, and 10 sampling were not required for MS-11. Monitoring of sediment for copper, lead, and nickel was conducted at the location on the eastern side of this station during Round 11.

- **MS-12:** This station is located in the Dry Dock AOC offshore of Site 10 (OU1). One industrial waste outfall (Site 5) discharged into the offshore area of Site 10, apparently from Site 10 operations and other operations nearby. Lead-contaminated soil is present at Site 10 from a CERCLA release at the site; however, groundwater data from Site 10 do not indicate that lead in soil is leaching to groundwater at concentrations that would adversely impact the off shore. PAHs are not chemicals associated with the Site 10 source. Metals (including lead) and PAHs were reportedly included in discharges from Site 5; however, these discharges were discontinued by 1975. Therefore, there are no current IRP sources to MS-12. The elevated levels of lead and/or PAHs at MS-12 may be caused by a combination of sources that may or may not be related to PNS, including potential migration or transport from IRP sites, discharges from barges/boats, discharges from storm water outfalls located in the vicinity of the shipyard, and dock-side activities. Additional scrutiny was required for MS-12 to determine the extent and potential sources of contamination. Rounds 8, 9, and 10 sampling were not required for MS-12. Monitoring of sediment for PAHs and lead was conducted at this station during Round 11.
- **MS-13 and MS-14:** These stations are located in the Dry Dock AOC to monitor sediment potentially impacted by Site 31 (OU8). Industrial waste outfalls (Site 5) had discharge points in this area, but these discharges were discontinued by 1975. The area by MS-13 was dredged between January and April 2002 (between Rounds 5 and 6). Potential sources of PAHs detected in sediment at these stations that may or may not be related to PNS include potential migration or transport from IRP sites, discharges from barges/boats, discharges from storm water outfalls located in the vicinity of the shipyard, and dock-side activities. Round 8 sampling was required for these monitoring stations; additional scrutiny was not required. PAH concentrations in most samples were less than IRGs. No

additional monitoring or action are needed at these stations because of infrequent number of exceedances of IRGs over the eight rounds of sampling and because the data do not indicate any impacts from IRP sites. Therefore, in accordance with the 2010 Interim Offshore Monitoring Plan, interim offshore monitoring was discontinued at these stations.

The CERCLA path forward for OU4 is as follows:

- Interim offshore monitoring until a final remedy is implemented
- PRAP and ROD
- RD/RA as necessary
- Five-year reviews as appropriate

2.6 OU7

An RI is being prepared for OU7, which includes Site 32 – Topeka Pier Site.

Site 32 encompasses approximately 17 acres of filled land on the northern shore of PNS, along the Back Channel of the Piscataqua River, from just west of Building 162 to east of Building H29 and from the Back Channel south to Building 129, as shown on Figure 1-2. Current land use includes office parking (about 35 percent of the site area), equipment storage, vehicle and rail car maintenance, transducer repair, boat launch, temporary housing for Navy personnel (H23), and hospital (H1). The pier and offshore areas of OU7 are used for docking of boats. The offshore area of OU7 is part of the Back Channel AOC that was investigated as part of the EERA and is retained in the Interim Offshore Monitoring Program with sampling at monitoring stations MS-03 and MS-04. Sampling locations within each monitoring station are located in the intertidal and subtidal area along the OU7 shoreline (TtNUS, November 2004a, February 2010, November 2010). The offshore area is discussed as part of OU4 in Section 2.5.

Filling in the OU7 area began in 1900 when excavated material from the construction of Dry Dock No. 2 was used to connect Dennett's and Seavey Islands. A new pier, Topeka Pier, was constructed in the Back Channel of the Piscataqua River to dock the prison ship USS Topeka. Storing and milling of lumber in the area began by 1910, and a timber basin was established at the southeastern corner of the site. The area west of the timber basin was used to store coal, wood, and scrap iron. Building 98 was constructed to store combustibles including paints and oils. By the early 1920s, a sawmill (Building 129), a lumber storehouse with timber racks (Building 132), and an additional lumber storehouse (Building 149) were built west of the timber basin to accommodate the increased demand for lumber during WWI. Filling continued until 1945.

In 1994 and 1995, excavation work performed by the Shipyard along Goodrich Avenue and near Building H23 uncovered debris including large dry-cell batteries, graphite electrodes, brick, wood, metal pipe and

wire, glass, asbestos cloth, and crucibles used in foundry operations. Subsequently the area was identified as an SSA. Based on the SSI in 1998 (TtNUS, May 2000), Site 32 was recommended for an RI/FS and was subsequently identified as OU7.

A list of important OU7 historical events and documents and relevant dates in site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
Filling of area conducted	1900 to 1945	NA
Lumber storage began (in southeastern corner of Site 32)	1910	NA
Various buildings constructed related to lumber yard (to support WWI)	1920	NA
Many current buildings built (to support WWII)	1941 to 1945	NA
Wastes from buildings discharged to river; discontinued when sanitary sewer system installed	1940s to 1970s	A
Building 306 constructed as a transducer repair facility	1980	NA
Excavation work uncovered debris in area, and Site 32 identified as SSA	1994 to 1995	NA
SSI and geophysical survey conducted	1998	NA
SSI Report recommended RI	TtNUS, May 2000	N00102.AR.000812
Site 32 RI QAPP, Revision 0, completed	TtNUS, March 2003	N00102.AR.001239
Phase I RI field work conducted	2003	NA
Parking area repaved	2003/2004	NA
Emergency removal action (shoreline stabilization) conducted	June 2006	NA
Site 32 RI QAPP, Revision 1, completed	TtNUS, November 2008	N00102.AR.001690
Phase II RI field work conducted	2008	NA
Draft RI Report submitted	October 2010	Not Yet Assigned

Environmental sampling at OU7 included groundwater monitoring (at one well cluster) and seep and sediment sampling in the intertidal area in 1996 and 1997, an SSI in 1998 (TtNUS, May 2000), a Multi-Sensor Towed-Array Detection System (MTADS) geophysical survey in 1998 (Naval Research Laboratory, December 2001), Phase I of the RI in 2003 (TtNUS, January 2004 and June 2004), and Phase II of the RI in fall 2008.

Fill material reportedly included rock, earth, sediment (from excavation at Dry Dock No. 2), cinders, and other waste and scrap material that could not be destroyed by incineration. The site surface is mostly paved or covered by buildings, with some small areas of grass landscaping. Based on the various

investigations, depths to the bottom of fill ranged from 8.5 to 18 feet below ground surface (bgs) across the site. The fill generally consists of silt and silty clay with traces of fine-grained sand, rock fill, metal fragments and shavings, brick, wood, sandblast grit, pottery, glass, and coal and cinders. Fill is underlain by natural marine and glaciomarine silt and clay except in the southernmost borings where fill is underlain by glacial till. Groundwater was encountered at approximately 4 to 9 feet bgs and is tidally influenced and flows toward the Back Channel. The majority of groundwater at the site is saline or brackish.

The MTADS survey to identify magnetic and electromagnetic anomalies was conducted on the approximately one-fourth to one-third of the site that was accessible. The portions of the site not surveyed were inaccessible because of equipment, fenced laydown areas, railroad tracks, and other structures. Site features (e.g., utilities) appeared to be the source of the anomalies at all but one location. To rule out that the anomaly could be drums buried in the ground, a soil boring was installed as part of the Phase I RI within the area of this anomaly. Metals wastes were found in this boring at a depth of 4 to 8 feet bgs; no drums were found.

In April 2002, the Navy conducted a storm sewer video camera survey to determine the condition of the storm sewer system that flows through Site 32. The survey indicated that a majority of the sewers were in poor condition with debris, dislocated joints, etc. and that groundwater infiltration was occurring at several locations that could be accessed by the video camera. Most of the storm sewer outfalls in the Site 32 intertidal area are tidally influenced, and it is likely that the outfalls are points where groundwater from the site is being transported to the Back Channel. Therefore, the Navy considered the storm sewer outfalls as potential groundwater transport pathways in the RI for Site 32.

PAHs, PCBs, and metals are the main chemicals detected in soil at OU7, and metals are the main chemicals detected in groundwater. Only metals were detected in water discharging from the outfall and surface water samples; however, concentrations were less than risk-based screening levels. Based on the evaluation of data, the Navy recommended a second phase of sampling to collect additional groundwater data for metals, soil sampling to further investigate high chemical concentrations detected at two locations, and exploratory borings to define the extent of petroleum contamination at one location. The Site 32 RI QAPP was updated to include Phase II RI activities, which were conducted in 2008. An RI Report is being prepared to summarize investigative activities and present the evaluation of the nature and extent of contamination and site risks.

During Phase I RI sampling, the presence of foundry slag and copper and nickel concentrations in sediment in the intertidal area of Site 32 were further investigated. Slag mapping indicated that slag is generally in the mid- to high-tide portion of the intertidal area, and potentially impacted finer-grained sediment was found in the mid- to low-tide portion of the intertidal area. The sediment data showed that concentrations of copper and nickel in sampling grids located further away from the shoreline were less

than their respective ecological screening levels. Samples with exceedances of ecological screening levels were located in the mid-tide area and were bounded by samples with concentrations less than ecological screening levels to the east, west, and north. In June 2006, the Navy conducted an emergency removal action to address shoreline erosion along the shoreline north of Building 306. Based on the presence of debris including foundry slag, the Navy removed surface debris and placed shoreline controls along the entire length of the Site 32 shoreline (approximately 1,200 linear feet) (TtEC, June 2008), in the mid- to high-tide area. Phase II RI field work included sediment sampling to refine the extent of exceedances of ecological screening levels, and the data are being used to support the OU4 FS.

There have been no remedial actions under CERCLA at OU7. The CERCLA path forward for OU7 is as follows:

- FS, PRAP, and ROD
- RD/RA
- Five-year reviews as appropriate

2.7 OU8

An RI is being conducted for OU8, which includes Site 31 – West Timber Basin.

OU8 is a paved area located in the CIA, in the northeastern portion of PNS, as shown on Figure 1-2. OU8 is an industrial area and is surrounded by buildings or dry docks. The main site features were associated with the former plate yard, which was a fenced area with railroad spurs. Equipment and temporary facilities were within the fence of the former plate yard. Building 157, formerly the plate yard office, was vacant until demolition in 2006. Building 92 located east of the former plate yard is the Structural Shop.

The offshore area near OU8 is included in the Dry Dock AOC that was investigated as part of the EERA and was part of the Interim Offshore Monitoring Program with sampling at monitoring stations MS-13 and MS-14. Sampling locations at MS-13 were located adjacent to Dry Dock No. 1 to the east and at MS-14 were located east of Dry Dock No. 3 (TtNUS, November 2004a, February 2010, and November 2010). The offshore area is discussed as part of OU4 in Section 2.5.

During the early 1900s, wood for shipbuilding was stored and seasoned in the West Timber Basin (Site 31). In 1900, filling of the West Timber Basin was proposed to provide additional pier and working space to accommodate the increased docking and repair of battleships at PNS. Additionally, storage racks and pickling tanks were proposed for erection in the area for use in steel plate cleaning and recovering. By 1913, wet storage of wood had ceased at the West Timber Basin, and following approval of the proposal in 1916, the timber basin began to be filled. A metal washing plant (Building 110) for the recovery of

metals from the ash and skimmings of the brass foundries on the Shipyard was erected on the northern side of the site. Reportedly, some to all of the by-products from the plant were discarded into the timber basin. In addition, by-products from smelting and pigging (the process of pouring melted iron from a form into a mold) operations at the Shipyard were deposited into the timber basin. In 1917, a quay wall enclosed the basin, and between 1920 and 1940, the basin continued to be filled. The fill included rock, soil, cinders, and other waste and scrap material.

In 1940, Building 92 had been extended into the West Timber Basin, and a new plate yard was constructed near the quay wall. Also in 1940, the metal washing plant was razed along with Buildings 51 (acetylene plant and former pitch plant) and 83 (latrine). The Building 110 pickling tanks were removed, and train tracks traversed the area. The plate yard was active for 20 years (until 1960), serving as the primary steel storage yard and pickling location at the Shipyard. The pickling tanks for the plate yard were removed from the site at an unknown time. Filling of the area west of the timber basin was conducted from approximately 1940 to 1948.

A list of important OU8 historical events and documents and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
Wood storage and seasoning for shipbuilding conducted in West Timber Basin	Early 1900s to 1913	NA
Filling of West Timber Basin began	1916	NA
Quay wall installed to enclose the basin	1917	NA
Metal washing plant (Building 110) constructed	1920s	NA
Filling of basin continued	1920 to 1940	NA
Buildings 110, 51, and 83 razed, pickling tanks adjacent to Building 110 removed, and train tracks constructed	1940	NA
Building 92 extended over a portion of timber basin	1940	NA
Plate yard with pickling tanks and washing aprons active	1940 to 1960	NA
Pickling tanks removed after use of plate yard discontinued	Unknown (after 1960)	NA
SSI conducted	1998	NA
SSI Report finalized	TtNUS, May 2000	N00102.AR.00812
Removal of surface features and initial construction activities associated with expansion of Building 174	September to December 2006	NA

Environmental sampling at OU8 was conducted as part of the SSI in 1998 (TtNUS, May 2000) to determine the presence or absence of contamination and to determine whether further investigation under

CERCLA was needed for the site. Soil and groundwater sampling locations targeted areas where contamination would most likely be found.

The investigation showed that fill material consists mostly of sand, silt, and rock fragments, and trace amounts of brick and other debris were also found in subsurface fill material. The fill varies in thickness from 8.5 to 17.5 feet across the site, and a wedge of coal, cinders, and ash (approximately 8 feet thick, starting around 2 to 4 feet bgs) exists in the northern part of the site, tapering to the south to less than 1 foot thick. Groundwater at OU8 appears to be tidally influenced and ranges from saline/brackish along the perimeter of the site to fresh/mildly brackish further inland. The main chemicals detected in site soils were PAHs and metals. Low levels of PAHs detected intermittently throughout the site suggest that these levels may be attributable to ongoing industrial activities at the site. Consistent with the presence of waste-like materials in the subsurface, higher levels of PAHs and metals were detected in the subsurface. Although maximum concentrations of various metals in surface soil exceeded residential risk-based screening levels, the concentrations are generally similar to or less than facility background soil concentrations. For subsurface soil, three metals (arsenic, iron, and lead) had maximum concentrations exceeding industrial and residential risk-based screening levels. These three metals also had maximum concentrations in unfiltered groundwater exceeding drinking water criteria and/or risk-based screening levels (although no clear correlation was apparent between locations with soil metals exceedances and locations with groundwater metals exceedances) (TtNUS, May 2000).

Based on the results of the SSI, the site was recommended for further investigation as part of an RI. Soil (and fill material) at OU8 is covered by asphalt or buildings, the site is located in the CIA of PNS, and groundwater is not used for drinking. Therefore, site media do not pose an imminent concern.

There have been no remedial actions under CERCLA at OU8. The CERCLA path forward for OU8 is as follows:

- RI Work Plan

2.8 OU9

An RI Report is being prepared for OU9, which includes Site 34 – Former Oil Gasification Plant, Building 62. Based on site conditions, the Navy determined that, prior to an RI, a non-time-critical removal action was appropriate to address the majority of potential risk associated with ash at the site. The final Action Memorandum for the removal action (Navy, February 2006) was signed in February 2007, and the removal action was completed in 2007 (Shaw, July 2009). The RI Work Plan was finalized in July 2009. The offshore area of OU9 is part of the Back Channel AOC that was investigated as part of the EERA and is included in the Interim Offshore Monitoring Program with sampling at monitoring station MS-01. Sampling locations at MS-01 are in the intertidal area and subtidal area along the OU9 shoreline (TtNUS,

November 2004a, February 2010, and November 2010). Based on the results of the most recent investigation at MS-01 in November 2007, additional investigation of the extent of PAH-contaminated sediment at MS-01 was conducted as part of the OU9 RI. The sediment data are being used to support the OU4 FS. The offshore area is discussed as part of OU4 in Section 2.5.

OU9 is located in the central portion of PNS, as shown on Figure 1-2. The buildings at and in the vicinity of OU9 are used for industrial and commercial uses, and the paved areas surrounding the buildings are used for parking. Building 62 and its annex currently are used by the NAVFAC Mid--Atlantic Public Works Department as a mini-bulldozer shop and for storage. A parking garage is located east of the former locations of Buildings 63 and 188. OU9 is in a historic district at PNS, and buildings at and near the site (Buildings 40, 43, 60, and 62) are considered contributing elements to the National Registry District (Louis Berger Group, April 2003). There is a relatively flat grassy area with a picnic table north of former Building 63. In general, the land on the northern side of Building 62 Annex and northeast of Building 62 slopes gently north towards the roadway and then slopes steeply (i.e., forms ledges) to the water's edge at the shoreline of the site adjoining the Back Channel of the Piscataqua River. Access to the shoreline from the site is difficult because of the rapid changes in terrain at the ledges.

The Former Oil Gasification Plant, Building 62 (built in the late 1800s) and the more recent annex (built in the 1940s) are the most prominent features related to use of the site. Ash was generated from the combustion of coal as part of oil gasification (kerosene was converted to illuminating gas) from 1870s to early 1900 and as part of the blacksmith shop from 1915 to 1930. Ash, assumed to be from the combustion of coal (and potentially including ash from a building fire), was deposited primarily north of Building 62, resulting in an ash pile. Until the ash was removed in 2007, the pile was covered by vegetation including grass and small bushes and trees. Ash was also found under asphalt around Buildings 62, 62 Annex, and 63. After 1930, Building 62 and Annex were used by the Public Works Department. Pesticide storage activities were conducted in Building 62 in the 1960s until 1985 when a new pesticide control shop was built on the southern side of the Shipyard.

A list of important OU9 historical events and documents and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Document	Author/Date	Administrative Record Number
Ash was generated during coal (fuel) combustion as part of oil gasification process	1870s to early 1900s	NA
Ash was generated during coal (fuel) combustion as part of blacksmithing operation	1915 to 1930	NA
Building 62 reportedly gutted by fire	1919	NA

Event/Document	Author/Date	Administrative Record Number
Shipyards Public Works Department used Building 62 for storage	1930 to Present	NA
Pesticides stored at Building 62	1960s to 1985	NA
Site identified as SSA, and six drums of ash (less than 2 cubic yards) removed from pile north of Building 62	1998 and 1999	NA
SSI conducted and extent of ash investigated	TtNUS, August 2004 and September 2005	N00102.AR.001389 and N00102.AR.001495
EE/CA for Site 34 prepared and public comment period held	TtNUS, September 2005	N00102.AR.001495
Action memorandum for removal action signed	Navy, February 2007	N00102.AR.001532
Removal action design finalized	June 2007	N00102.AR.001604
Removal action conducted	2007	NA
Removal action construction report completed	Shaw, July 2008	N00102.AR.001670
RI Work Plan finalized	TtNUS, July 2009	N00102.AR.001744
RI sampling conducted	August 2009 and September 2010	NA
Draft OU9 RI Report submitted	February 2011	Not Yet Assigned

Previous environmental activities at OU9 included removal of six drums of ash (less than 2 cubic yards) from the ash pile in 1999, soil and sediment sampling in 1998 and 2003 (as part of the SSI), and an ash extent investigation in 2004. An EE/CA was completed in 2005 that recommended excavation and offsite disposal of the ash pile and ash exposed at shoreline ledge areas (TtNUS, September 2005), and a non-time-critical removal action to implement these recommendations was completed in 2007.

High concentrations of PAHs and metals are associated with the presence of ash in site samples, and a rapid decrease in concentrations occurs with depth. Concentrations of PAHs and metals are typically low in samples without ash. The visual presence of ash was used to define the approximate extent of contamination as part of the 2004 investigation. The human health risk screening conducted as part of the SSI indicated potentially unacceptable human health risks from exposure to ash material at the site based on PAH and metals concentrations exceeding residential and industrial risk screening levels. The depth to the bottom of the deepest ash layer was 5 feet bgs, and typically there were significant reductions in concentrations beneath the deepest ash layer. Based on data from temporary wells (installed and subsequently abandoned), no overburden groundwater is present at the site. The depth to bedrock varies from 5 to 12 feet bgs.

Based on the results of the SSI (TtNUS, August 2004), the site was recommended for an RI to assess the potential risks from site operations. The Navy recommended that a removal action be performed before

the RI because PAH and metals concentrations in the ash material were much greater than risk screening levels and would result in potentially unacceptable risks if the ash were uncovered. Because the majority of contamination at the site appeared to be associated with ash material, the 2007 ash removal action addressed the majority of unacceptable risks at the site. The RI evaluates residual site-related risks after removal of the ash.

There have been no remedial actions under CERCLA at OU9. The CERCLA path forward for OU9 is as follows:

- PRAP/ROD

2.9 SITE SCREENING AREA, SITE 30

Site 30 – Galvanizing Plant, Building 184, is a study area at PNS. This area is under investigation to determine whether further action as part of an RI/FS is needed. Based on site conditions, the Navy determined that a non-time-critical removal action is appropriate for Site 30 before determining whether an RI/FS is necessary. The Navy will conduct a removal action for the source area at Site 30.

Site 30 is located in the central portion of PNS, as shown on Figure 1-2. Building 184 was vacated in 2010 and will be remodeled for occupation by Autonomous Underwater Vehicle personnel. Prior to 2010, Building 184 was used for industrial purposes (welding school) and is a historically significant building (Louis Berger Group, April 2003). The surrounding buildings are commercial and industrial. Another IRP site at PNS (Site 32) is located approximately 200 feet north and northeast of Site 30.

Building 184 was constructed in 1943 as a galvanizing plant to accommodate the Shipyard's increased production schedule in support of the WWII effort. However, by the end of the war, the Shipyard's production requirements were reduced dramatically, and galvanizing was performed off yard by a private contractor. In 1946, Building 184 was converted from a galvanizing plant to the Shipyard's electrical testing laboratory. Sometime between 1954 and 1956, the building was converted into a clean room facility and used for cleaning and assembling metal parts. In the early 1960s, the building was converted into a welding school, and a flame-spray galvanizing system was installed in the building (Navy, January 2006). Until 2010, the building was used as a welding school. The welding school has been relocated, and Building 184 is not currently in use.

Little information is available about the specific types and quantities of chemicals used throughout the history of Building 184. However, chemicals used in industrial cleaning operations similar to these performed at the Shipyard include caustic solutions (sodium hydroxide, sodium carbonate, trisodium phosphate, and tetrasodium pyrophosphate), acid solutions (hydrochloric and sulfuric), and flux solutions (sodium silicate). These chemicals were most likely used when Building 184 was a galvanizing plant and

when the tanks in the acid pit were used as industrial cleaning tanks. For the metal parts assembly operations, the tanks were filled with various chemicals including large amounts of sulfuric acid, trisodium phosphate, alcohol, and acetone (Navy, January 2006).

As part of the original galvanizing operations, an acid pit was constructed in the floor of the central portion of Building 184, along the eastern wall. With the changes in usage of Building 184, the use of the acid pit also changed. The acid pit was filled and covered during use of the building as an electrical testing laboratory in which large shock-testing and vibration-testing machines were used. Molds and dies were stored in the area during this time. The conditions of the acid pit and tank at the time of covering are unknown. The acid pit was uncovered when the building was converted to a clean room facility, and the pickling tanks within the pit were used for metal parts assembly in the clean room. Use of the pit and tanks was discontinued again, and the pit was filled and covered, when the building was converted to a welding school. An office was constructed over the former acid pit area in the early to mid-1970s (Navy, January 2006).

The former acid pit, measuring approximately 52 feet long, 35 feet wide, and a maximum of 4 feet deep, was constructed as a concrete pit lined with acid-proof bricks set in acid-proof cement. The bottom of the acid pit was sloped to a drain at the center of the western side of the pit. The original drain appears to have been connected to the sanitary sewer system on the western side of the building, although detailed historical sewer drawings are not available (Navy, January 2006).

The acid pit originally contained pickling tanks used as part of galvanizing operations. The tanks, including a flux tank, water tank, acid tank, and caustic tank, were used to remove oxide scale from metal surfaces and to obtain a chemically clean surface in preparation for plating and galvanizing by immersion in a diluted acid bath. When the building was converted to a clean room, the pickling tanks within the pit were used as part of the metal parts assembly (Navy, January 2006).

The condition of the pit and tanks is unknown; however, test pitting activities conducted in 2001 indicated the presence of chemicals that are likely residuals from the cleaning operations. The chemicals within the former acid pit are believed to be the source of the crystalline substance observed along the base of the wall adjacent to the acid pit. Currently, the former acid pit is covered by a concrete floor slab, and the boundaries are clearly delineated by the slightly raised floor slab and by the joints between the original adjacent floor and the slab. A wood-framed office structure, welding training booths, and various pieces of equipment are located on the former acid pit area floor slab. Additionally, two floor drains and a clean-out plug are present within the concrete slab in the area of the former acid pit. A utility trough transects the entire width of the northern end of the former acid pit.

The crystalline substance along the edges of the former acid pit was first observed in 1973 and again in 1994 and 1996. The crystals had a low pH (around 1.0 or 2.0) and were composed of predominantly sulfate and metals. The material was not hazardous based on Toxicity Characteristic Leaching Procedure (TCLP) characteristics but may be hazardous based on the RCRA corrosivity criterion because of the caustic nature of the crystals (Navy, January 2006).

A list of important Site 30 historical events and documents and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event/Documents	Author/Date	Administrative Record Number
Building 184 constructed as galvanizing plant (acid proof pit used)	1943	NA
Building 184 converted to an electrical testing facility (pit covered)	1946	NA
Building 184 converted to clean room facility for cleaning metals parts (pit uncovered and used)	Between 1954 and 1956	NA
Building 184 used as welding school (pit covered with concrete floor)	Early 1960s to present	NA
Crystalline substance observed along edge of acid pit	1973	NA
Crystalline substance observed and analyzed	1994 and 1996 to 1997	NA
SSI conducted	1998	NA
SSI Report completed	TtNUS, May 2000	N00102.AR.000812
Test pit excavated within acid pit, and samples of fill material and crystalline substance analyzed	2001	NA
EE/CA for Site 30 finalized and public comment period held (Revision 1)	TtNUS, August 2005	N00102.AR.001485
Action memorandum for non-time-critical removal action signed	Navy, January 2006	N00102.AR.001522
Periodic removal of crystalline material by Shipyard	1997 to 2006	NA
Removal of crystalline material and covering of affected area	2006	NA
Regrading and repavement conducted to redirect storm water runoff away from Building 184	2007	NA
EE/CA (Revision 2) for tank vault removal finalized	November 2010	N00102.AR.002503
Action Memorandum (Revision 2) for tank vault removal finalized	December 2010	N00102.AR.002518
Draft Removal Action Work Plan submitted	April 2011	Not Yet Assigned

Environmental investigations at Site 30 were conducted in 1998 as part of the SSI (TtNUS, May 2000) and Test Pitting Investigation (TtNUS, May 2002). The SSI Report indicated that soil and groundwater sampled outside the building were not impacted by any potential environmental releases from the pit inside the building. However, the report recommended additional investigation activities at the former acid

pit within Building 184 to more accurately assess potential past environmental releases. A Test Pitting Investigation was conducted in 2001, during which water was observed in the pit, and the water coming in contact with crystalline materials within the pit is believed to be the cause of the crystalline growth along the outside edges of the pit. The investigation report stated that the pit water is not expected to be hydraulically connected to groundwater at the site, as indicated by the differences in elevations between pit water and groundwater in a monitoring well outside the building adjacent to the pit location. However, the source of the water is not known.

Based on regulatory concerns regarding the investigation of groundwater at Site 30, it was determined that more discussion among the Navy and regulators was needed to resolve the concerns. The Navy determined that a non-time-critical removal action for the former acid pit was warranted to abate potential exposure to nearby human populations and to mitigate the potential threat of a release to the environment of hazardous substances associated with the former acid pit within Building 184. An EE/CA (TtNUS, August 2005b) was finalized, and a removal action alternative that did not require relocation activities and excavation of pit materials within Building 184 was recommended. The action memorandum, dated January 2006, was signed in June 2006. Periodic scraping and appropriate disposal of the crystals and regrading of the area outside the building to eliminate stormwater ponding along the wall adjacent to the pit were conducted. In June 2006, the Navy removed crystals, cleaned the area, and placed a vinyl cover over the affected area within Building 184. As part of the Site 34 removal action, the Navy also regraded outside Building 184 to direct storm water away from the pit and area of crystal growth. Because the Shipyard relocated personnel from Building 184 to the Building 92, now access to Site 30 is possible; therefore, the Navy prepared an EE/CA in November 2010 for removal of the tank vault. The EE/CA provides evaluation of groundwater conditions at the site to resolve past regulatory concerns regarding the investigation of groundwater at Site 30 (TtNUS, October 2010).

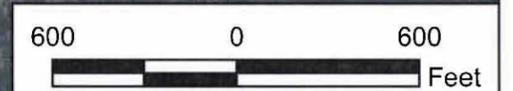


Aerial Photo Source:
2009 aerial photograph received
from the USDA FAIP program.

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CHECKED BY D. COHEN	DATE 06/07/11
COST/SCHEDULE-AREA	
SCALE AS NOTED	



OVERVIEW OF INTERIM OFFSHORE
MONITORING STATION LOCATIONS
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE



CONTRACT NUMBER 2103	OWNER NUMBER CTO WE14
APPROVED BY _____	DATE _____
APPROVED BY _____	DATE _____
FIGURE NO. FIGURE 2-1	REV 0

3.0 REGULATORY PROCESS ACTIVITIES

Beginning in 1980, investigations of PNS hazardous waste sites were conducted under the Department of Navy Assessment and Control of Installation Pollutants (NACIP) Program. Since 1986, investigations at PNS have been conducted under the DoD IRP. Funding to pay for such investigations are allocated for DoD sites.

This SMP is an attachment to the FFA. The FFA was developed to enable the Navy to meet the provisions of CERCLA, RCRA, and applicable state law. Among other things, an FFA outlines roles and responsibilities, establishes deadlines/schedules, and outlines work to be performed.

The IR Program parallels CERCLA, otherwise known as Superfund. Under the Superfund program, past disposal activities which may have resulted in the release of hazardous constituents to the environment would undergo several phases of environmental investigation that would ultimately determine the need for a remedy, and if necessary, the selection and implementation of the remedy for the site. The phases of investigation under CERCLA include the Preliminary Assessment (PA)/Site Inspection (SI), RI, FS, ROD, and Remedial Design (RD)/Remedial Action (RA). The process required by the FFA is analogous to CERCLA with one exception: the PA/SI is replaced by the SSP. Superfund also has provisions for Interim Measures (IM) that can be implemented if a site poses an immediate threat to the environment.

The RCRA established a national strategy for the management of ongoing solid and hazardous waste operations at active sites. PNS engages in the generation, treatment, storage and disposal of hazardous wastes, which requires the facility to be permitted under the jurisdiction of RCRA. The HSWA of RCRA were enacted in 1984 and broadened the authority of RCRA to include a multi-step corrective action process for releases of hazardous wastes to the environment.

The RFA is the first step of the RCRA corrective action process and is similar to a CERCLA PA/SI. The RCRA corrective action process closely resembles the CERCLA program (see Table 3-1), and consists of the RFA (release identification step), the RFI (release extent characterization), the CMS (selection of corrective measure), and CMI (implementation of corrective measures). The RCRA corrective action program also includes an IM step that may be conducted in cases when short-term actions are needed to respond to immediate threats.

Most environmental activities at PNS were initiated under RCRA in accordance with the HSWA permit. However, PNS was included on the NPL effective May 31, 1994 and is now governed by CERCLA as described in the FFA.

This section describes the CERCLA remedial process, the RCRA Corrective Action Process and describes the similarities and differences between RCRA and CERCLA.

3.1 CERCLA PROCESS ACTIVITIES

This section provides a description of the CERCLA remedial process.

3.1.1 Preliminary Assessment/Site Investigation (PA/SI) and Site Screening Process (SSP)

The initial study conducted under CERCLA at a site in response to a real or suspected hazardous substance release is the PA/SI. At Federal Facilities, the lead agency (the Navy in the case of PNS) collects the data for the PA/SI. The USEPA evaluates the PA/SI data. The PA/SI relies heavily on existing information, and is limited in scope. If the PA/SI identifies sites or study areas as potentially posing a threat to human health or the environment, an RI/FS is conducted.

The SSP as outlined in the FFA is an alternative to the PA/SI process. The SSP is the mechanism for evaluating whether identified SSAs should proceed with an RI/FS. SSAs refer to areas not previously identified that may pose a threat, or potential threat, to public health, welfare or the environment.

The SSP considers current CERCLA and RCRA guidance to determine if there have been releases of hazardous substances, pollutants, or contaminants, to the environment from the SSA. The SSP Report provides the basis as to whether a site should become an AOC subject to further study through CERCLA RI/FS process.

A generic Site Screening Workplan has been developed to facilitate studies during this phase.

3.1.2 Remedial Investigation/Feasibility Study (RI/FS)

The RI/FS is the next phase of the CERCLA remedial process and is required for all AOCs. The RI is intended to determine the nature and extent of contamination, potential migration pathways, toxicity and persistence of contaminants and potential (risk) for adverse impacts to human health or the environment. The FS is intended to develop remedial objectives, identify ARARs, develop and screen remedial alternatives, analyze remedial alternatives, and compare the alternatives against the CERCLA criteria (protection of human health and the environment, compliance with ARARS, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, long-term effectiveness, implementability, cost, state acceptance, community acceptance).

After completion of the RI/FS, a Proposed Plan (PP, also referred to as a Proposed Remedial Action Plan or PRAP) is completed which outlines the Navy's proposed remedial alternative. The PP is released to the public and a formal public comment period is held. Subsequently, a ROD that identifies the preferred remedial alternative(s) is issued. The State of Maine has the opportunity to concur on the ROD.

3.1.3 Removal Action

A removal action may be completed prior to or during the RI/FS to reduce the threat to human health or the environment by removing released hazardous substances or reducing potential exposure pathways. Emergency removal actions are taken when there is an imminent threat to human health or the environment. Time-critical removal actions are taken when a threat to public health or welfare of the environment exists and it is determined that less than six months exist before on-site removal activity must be initiated. Non-time-critical removal actions are those actions where a planning period of at least six months exists before on-site activities to reduce the threat to human health or the environment exists.

In order to select the best remedial alternative for non-time-critical removal actions an EE/CA is prepared. Unlike the FS, the EE/CA focuses only on the material to be removed and does not use the full CERCLA criteria. Both time-critical and non-time critical removal actions require that a public comment period be held in order that the public be afforded an opportunity to comment on the removal.

Subsequent to a removal action, the FS may conclude that no further action is required to reduce the threat to human health and the environment. In this case, a no action ROD would be issued and the CERCLA remedial process would be concluded.

3.1.4 Interim Remedial Action

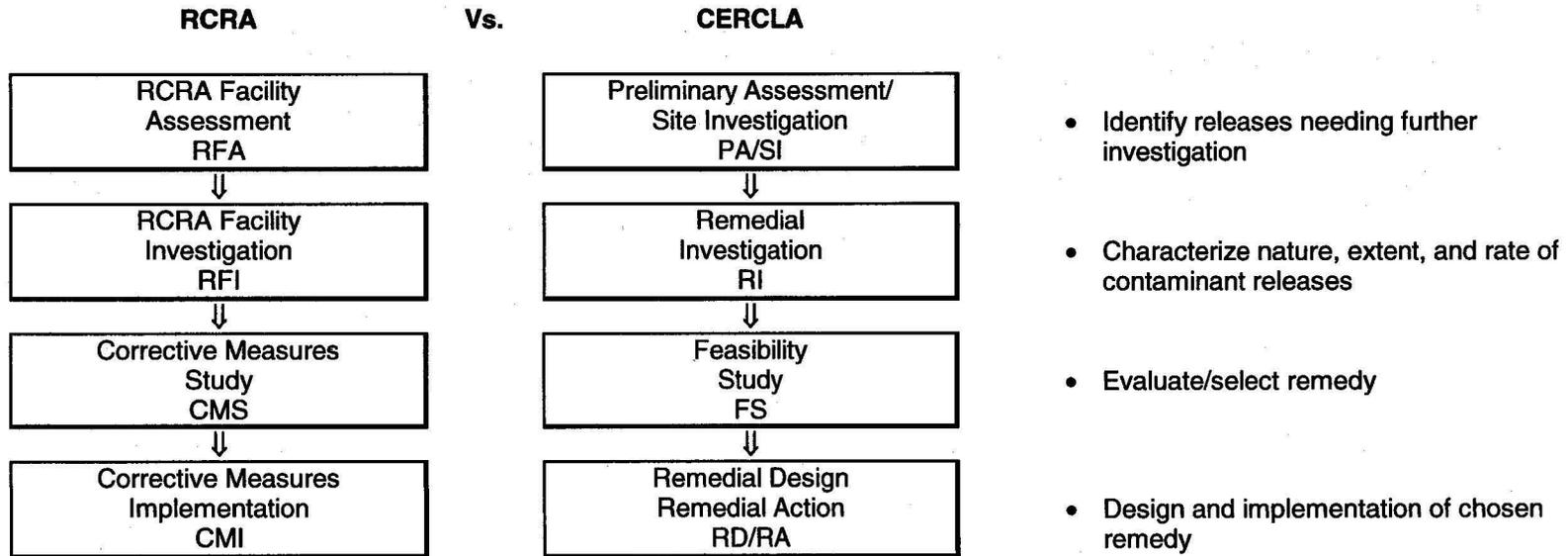
An interim remedial action may be completed prior to or during the RI/FS to reduce the threat to human health or the environment by removing released hazardous substances or reducing potential exposure pathways. In order to select the best remedial alternative for an interim remedial action, a focused FS may be prepared. An interim action must be consistent with the anticipated long-term remedial action. An interim ROD is issued and interim remedial design and remedial action activities are initiated.

3.1.5 Remedial Design/Remedial Action (RD/RA)

The ROD establishes the scope of the RA. The RD often proceeds in a stepped process and addresses detailed design issues not addressed during the FS. The RA involves implementation of the RD. The FFA establishes a process for developing an RD/RA schedule.

TABLE 3-1

**RCRA AND CERCLA CORRECTIVE ACTION PROCESSES
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**



*Interim measures may be performed at any point in the corrective action process.

4.0 SITE RANKING

This section provides a description of the relative risk ranking procedure and a summary of relative ranking results. Results of the risk ranking procedure are intended to assist in prioritizing site cleanups. Risk ranking of the site, provided in Appendix B, was conducted from 1995 to 1999, prior to the signing of the FFA. Sites that were determined to be NFA prior to the signing of the FFA were not included in the risk ranking.

4.1 RELATIVE RISK SITE EVALUATION FRAMEWORK

The DoD developed a Relative Risk Site Evaluation framework as a means of categorizing sites in the Defense Environmental Restoration Program (DERP) into High, Medium, and Low relative risk groups. The ranking of sites is not a substitute for a baseline risk assessment or health assessment nor a means of placing sites into a no further action category. The categorization of sites into relative risk groups is based on an evaluation of contaminants, pathways, and human and ecological receptors for groundwater, surface water and sediment, and surface soils. Although the air medium is not directly addressed by the Relative Risk Site Evaluation, the soil medium PRGs do include consideration for inhalation of airborne contaminants as a soil exposure pathway. The PRGs combine current USEPA toxicity values with "standard" exposure factors to estimate concentrations in environmental media (soil, sediment, air, surface water, and groundwater) that are protective of humans, including sensitive groups, over a lifetime. Each of these environmental media are evaluated using three factors:

- The Contaminant Hazard Factor (CHF)
- The Migration Pathway Factor (MPF)
- The Receptor Factor (RF)

The CHF is a combined measure of contaminant concentrations in a given environmental medium. CHF ratings are either "significant", "moderate", or "minimal" for each media. CHF rating is determined based on the ratio of the maximum concentration of a contaminant in each media (groundwater, surface water and sediment, surface soil) to a risk-based concentration standard for that contaminant (MPS or PRG). For media containing more than one contaminant, the ratios are added.

The MPF is a measure of the movement or potential movement of contamination away from the original source. MPF ratings are either "evident," "potential," or "confined" for each media. A rating of "evident" means that analytical data or observable evidence indicates that contamination in the media is moving away from the source, or contamination is present at, is moving towards, or has moved to a point of exposure. A rating of "potential" indicates the possibility for contamination to be present at or migrate to a

point of exposure; or information is not sufficient to make a determination of "evident" or "confined." A rating of "confined" indicates that the potential for contaminant migration from the source is limited or a low possibility for contamination to be present at or migrate to a point of exposure.

The RF is an indication of the potential for human or ecological contact with site contaminants. RF ratings are either "identified," "potential," or "limited" for each media. A rating of "identified" indicates that receptors have been identified that have access to contaminated media. A rating of "potential" indicates potential for receptors to have access to contaminated media. A rating of "limited" indicates that there is little or no potential for receptors to have access to contaminated media.

Sites lacking reliable concentration data will be designated as "not evaluated" and will then be deferred, programmed for additional data collection, a removal action if warranted, or another appropriate response action before they are evaluated.

Upon determination of the CHF, MPF, and RF a decision matrix is utilized to determine the category of relative risk for each media. Relative risk categories are High, Medium, and Low. The highest rating resulting from the evaluation of the three media becomes the relative risk category of the site. A site's rating may change based on new or additional information or as a result of remediation activities.

The results of the Relative Risk Site Evaluation are used, in conjunction with other risk management concerns, to assist in the sequencing of remedial work. Appendix A contains the Defense Environmental Cleanup Program Fact Sheets from the Relative Risk Site Evaluation Primer (available at https://www.denix.osd.mil/denix/Public/Library/Cleanup/CleanupOfc/Documents/Cleanup/rerisk_app_e.pdf). The fact sheets provide an explanation of the evaluation concept and answers to frequently asked questions related to the evaluation.

4.2 SUMMARY OF SITE RISK RANKING FOR PNS

A summary of relative risk ranking results is shown on Table 4-1. Complete relative risk ranking results are included as Appendix B.

TABLE 4-1

RELATIVE RISK RANKING RESULTS
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

OU No.	Site	Site Name	Rank
1	Site 10	Former Battery Acid Tank No. 24	High
	Site 21*	Former Acid/Alkaline Drain Tank (groundwater only)	Low
2	Site 6	DRMO Storage Yard and Impact Area	High
	Site 29	Former Teepee Incinerator Site	High
3**	Site 8*	JILF and Impact Area	High
	Site 9	Former Mercury Burial Sites (MBI and MBII)	Low
	Site 11	Former Waste Oil Tanks Nos. 6 & 7	High
4	Site 5	Former Industrial Waste Outfalls	High
	Site 26***	Portable Oil/Water Tanks	Low
	--	Offshore Areas (Offshore impacts from Sites 5, 6, 8, 9, 10, 26, 27)	High
5	Site 27***	Berth 6 Industrial Area	High
NA	Site 30	Former Galvanizing Plant, Building 184	High
8	Site 31	Former West Timber Basin	Low
7	Site 32	Topeka Pier Site	High
9	Site 34	Former Oil Gasification Plant, Building 62	High

* NFA was documented for Site 21 and the JILF Impact Area and these were removed from the associated OU.

** A remedial action was implemented for OU3.

*** NFA under CERCLA was documented for Sites 26 and 27 and these sites were removed from the associated OU.

NA Not applicable.

5.0 SCHEDULE

Schedules for OU1, OU2, OU3, OU4, OU7, OU8, OU9, and Site 30 are attached as Appendix C.

5.1 SCHEDULE DEVELOPMENT

The schedules were developed using the current status of activity for each site at PNS, anticipated activities and projected funding availability. Line item durations were developed using the FFA. The FFA provides durations for specific process activities. The FFA describes "deliverables" required during the cleanup process. These documents are separated into two categories; primary and secondary documents.

Primary documents are developed by the Navy and are initially provided as a draft. The Navy provides responses to comments received on draft documents and following resolution a draft final document is prepared. The draft and draft final documents are subject to review by the USEPA, MEDEP, and Restoration Advisory Board (RAB). If no comments are received on the draft final version, it becomes the final document. If comments are received, the necessary modifications will be made and the final Primary Document will be issued. Secondary documents, as listed in the FFA, also undergo review; however, a draft final version is not provided.

5.2 SCHEDULE DURATIONS

Section 10.0 of the FFA defines review, response and revision time frames for Primary and Secondary documents.

Section 12.0 of the FFA defines the schedule for updating the SMP.

6.0 DOCUMENTS

Documents for PNS IRP sites completed before the signature of the FFA and after signature of the FFA are provided in Sections 6.1 and 6.2, respectively.

6.1 DOCUMENTS COMPLETED BEFORE SIGNATURE OF FFA

The following documents were completed prior to the FFA being signed in September 1999:

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Initial Assessment Study	June 1983	N00102.AR.000002
Final Confirmation Study Report on Hazardous Waste Sites	May 1986	N00102.AR.000012/ N00102.AR.000013
RCRA Facility Assessment	July 1986	N00102.AR.000014
RCRA Facility Investigation (RFI) Proposal	August 1989	N00102.AR.000023
Addendum to RCRA Facility Investigation Proposal	February 1991	N00102.AR.000044
Interim Human Health Risk Assessment for Quarters S, N, and 68	April 1991	N00102.AR.000052
RCRA Facility Investigation Work Plan	August 1991	N00102.AR.000070
Work/Quality Assurance Project Plan for the Case Study for Estuarine Ecological Risk Assessment	September 1991	N00102.AR.000072
Interim Human Health Risk Assessment for the Day Care Center	October 1991	N00102.AR.000076
Revised Ambient Air Quality Monitoring Report (Section 11 of the RFI)	April 1992	N00102.AR.000117
Draft RCRA Facility Investigation Report	July 1992	N00102.AR.000117 to 000122
Onshore Ecological Risk Assessment	August 1992	N00102.AR.000125
Interim Corrective Measures at the Defense Reutilization and Marketing Office	April 1993	N00102.AR.000154
Final Hazard Ranking System Package	May 1993	N00102.SF.000162
Addendum to RCRA Facility Investigation Report	June 1993	N00102.AR.000169
Background Soil Sampling Work Plan	August 1993	N00102.AR.000180
Work/Quality Assurance Plan for Phase II of Estuarine Ecological Risk Assessment Case Study	February 1994	N00102.AR.000206
Public Health and Environmental Risk Evaluation Part A: Human Health Risk Assessment Report	March 1994	N00102.AR.000211
Final Media Protection Standards Proposal for Onshore Media (Chapter 1)	April 1994	N00102.AR.000216
Final Human Health Risk Assessment Report for Offshore Media	May 1994	N00102.AR.000229

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Media Protection Standards for Offshore Media: Sediment and Surface Water (Chapter 3)	June 1994	N00102.AR.000237
RFI Data Gap Work Plan	June 1994	N00102.AR.000234
Work Plan for Phase II Ambient Air Quality and Meteorological Monitoring Program	July 1994	N00102.SF.000238
Draft Revised Corrective Measures Study Proposal	July 1994	N00102.AR.000239
Draft Applicable or Relevant and Appropriate Requirements (ARARs) Report	September 1994	N00102.AR.000250
Estuarine Ecological Risk Assessment Phase I: Problem Formulation	December 1994	N00102.AR.000261
Draft Onshore Feasibility Study (FS) Report	March 1995	N00102.AR.000275
Draft Final Estuarine Ecological Risk Assessment (included in FFA, finalized May 2000)	July 1995	N00102.AR.000428
RCRA Facility Investigation (RFI) Data Gap Report	November 1995	N00102.AR.000328
Media Protection Standards for Offshore Media Based on Human Health Risks (Chapter 2)	April 1996	N00102.AR.000344
Phase II Ambient Air Quality and Meteorological Monitoring Report	June 1996	N00102.SF.000356
Community Relations Plan	October 1996	N00102.AR.000384
Consensus Document, No Further Action for Soils, SWMU 21	October 1996	N00102.AR.000383
Technical Memorandum on Seep Sampling	November 1996	N00102.AR.000396
Groundwater Investigation and Monitoring Plan (formerly titled Interim Groundwater Monitoring Plan)	November 1996	N00102.AR.000395
Onshore/Offshore Contaminant Fate and Transport Modeling Phase I Work Plan	December 1996	N00102.AR.000403
Draft Onshore/Offshore Contaminant Fate and Transport Modeling Phase I Report	February 1997	N00102.AR.000419
Technical Memorandum on Risk Evaluation of Surface Soils from Jamaica Island Landfill (JILF) Site	May 1997	N00102.AR.000432
Engineering Evaluation/Cost Analysis (EE/CA) for Mercury Burial Site I	June 1997	N00102.AR.000441
Decision Document, No Further Action, SWMUs 12, 13, 16, and 23	July 1997	N00102.AR.000447
Final Action Memorandum for Mercury Burial Site I	September 1997	N00102.AR.000471
MEDEP Evaluation of Heavy Metal Migration at Portsmouth Naval Shipyard with Geochemical Modeling	December 1997	N00102.AR.000508
Onshore/Offshore Contaminant Fate and Transport Modeling Phase I Report Addendum	December 1997	N00102.AR.000497
Work Plan, Teepee Incinerator (Site 29) and Building 238 (Site 10)	March 1998	N00102.AR.000532

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Site Screening Process Plan	March 1998	N00102.AR.000531
Site Screening Work Plan, Building 184 (Site 30), West Timber Basin (Site 31), and Topeka Pier (Site 32)	April 1998	N00102.AR.000546
Final Work Plan for MTADS Geophysical Mapping	September 1998	N00102.AR.000598
Onshore/Offshore Contaminant Fate and Transport Modeling Phase II Work Plan	August 1998	N00102.AR.000574
Phase I/Phase II Offshore Data Comparative Analysis Report	October 1998	N00102.AR.000606
Proposed Plan for Interim Action at OU4	October 1998	N00102.AR.000603
Interim Record of Decision for OU4	May 1999	N00102.AR.000676
Technical Memorandum Lead Contamination at DRMO Impact Area (finalized February 2000)	July 1999	N00102.AR.000699
Groundwater Monitoring Summary Report	August 1999	N00102.AR.000714
Proposal for Evaluation of Seep/Sediment Data	September 1999	N00102.AR.000884

6.2 DOCUMENTS COMPLETED AFTER SIGNATURE OF FFA

The following documents were completed from October 1999 (after the FFA was signed) to September 30, 2011:

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Interim Offshore Monitoring Plan for OU4	October 1999	N00102.AR.000750
Removal Action Work Plan for DRMO Shoreline Stabilization	October 1999	N00102.AR.000749
Onshore/Offshore Contaminant Fate and Transport Phase II Modeling Report	December 1999	N00102.AR.000760
Technical Memorandum for Recommended Human Health Risk Assessment Protocol for OU2	December 1999	N00102.AR.000924
Technical Memorandum, Lead Contamination at DRMO Impact Area	February 2000	N00102.AR.000795
Final Work Plan for Mercury Burial Vault II and Drum Investigation	February 2000	N00102.AR.000797
Field Investigation Report, Site 10 (Building 238) and Site 29 (Teepee Incinerator)	March 2000	N00102.AR.000811
Site Screening Report, Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier)	May 2000	N00102.AR.000812
Facility Background Development	May 2000	N00102.AR.000836
Revised OU3 Risk Assessment	May 2000	N00102.AR.000835
Final Estuarine Ecological Risk Assessment	May 2000	N00102.AR.000838

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Seep/Sediment Summary Report for Data Collected Between December 1996 and November 1997	August 2000	N00102.AR.000884
Test Pitting Investigation Report , Jamaica Island Landfill	October 2000	N00102.AR.000909
Revised OU2 Risk Assessment	November 2000	N00102.AR.000923/ N00102.AR.000924
Feasibility Study Report for OU3	November 2000	N00102.AR.000922
Proposed Remedial Action Plan for OU3	January 2001	N00102.AR.000945
Work Plan for Building 184 Subfloor Investigation	February 2001	N00102.AR.000968
Final Action Memorandum for Site 6, Defense reutilization and Marketing Office (DRMO) Shoreline Stabilization	June 2001	N00102.AR.000995
Final Drum Removal Report for Drum Investigation	June 2001	N00102.AR.000999
Final Closeout Report for Mercury Burial Vault Site I	June 2001	N00102.AR.001002
Final Removal Action Report for Mercury Burial Vault Site II	June 2001	N00102.AR.001003
OU3 Pre-design Investigation Quality Assurance Project Plan	August 2001	N00102.AR.001016
Record of Decision for OU3	August 2001	N00102.AR.001018
Decision Document for Site 26	August 2001	N00102.AR.001019
Decision Document for Site 27	August 2001	N00102.AR.001020
Site 10 Additional Investigation Quality Assurance Project Plan	October 2001	N00102.AR.001048
Preliminary Remediation Goals for OU4	November 2001	N00102.PF.001062
Final MTADS Geophysical Survey (of JILF and Topeka Pier)	December 2001	N00102.PF.001074
Test Pitting Investigation Report, Building 184, Site 30	May 2002	N00102.AR.001128
OU3 Phase I Remedial Design (specifications and plans)	June 2002	N00102.PF.001139
Technical Memorandum, OU3, Evaluation of MBII Waste Consolidation and Jamaica Cove Options	June 2002	N00102.PF.001143
Remedial Design Work Plan, Jamaica Island Landfill Phase I Waste Consolidation	June 2002	N00102.PF.001149
Baseline Interim Offshore Monitoring Report for OU4	July 2002	N00102.PF.001150
Phase II, OU3 Remedial Design Analysis Report (including drawings and specifications)	November 2002	N00102.PF.001195
Engineering Evaluation/Cost Analysis (EE/CA), Site 30 (Building 184)	December 2002	N00102.AR.001208
Final Remedial Design Work Plan for Jamaica Island Landfill Phase II Cap Construction	January 2003	N00102.PF.001226
Site 10 Additional Investigation Report	March 2003	N00102.AR.001243
Site 32 Remedial Investigation Quality Assurance Project Plan	March 2003	N00102.AR.001239
Site 34 Site Investigation Quality Assurance Project Plan	March 2003	N00102.AR.001238
Addendum to Site 32 Remedial Investigation Quality Assurance Project Plan	August 2003	N00102.AR.001252

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Explanation of Significant Difference for the Record of Decision for OU3	September 2003	N00102.PF.001293
Former CDC Area Investigation Report	April 2004	N00102.AR.001350
Technical Memorandum, Recommendation regarding Phase II of the Remedial Investigation for Site 32	June 2004	N00102.AR.001376
Site Screening Investigation Report for Site 34	August 2004	N00102.AR.001389
OU2 Soil Sampling and Treatability Study Work Plan	November 2004	N00102.AR.001414
Rounds 1 through 7 Interim Offshore Monitoring Report for OU4	November 2004	N00102.AR.001416/ N00102.AR.001417
Additional Scrutiny Quality Assurance Project Plan for OU4	August 2005	N00102.PF.001484
Engineering Evaluation/Cost Analysis (EE/CA) for Site 30 (Building 184) (Revision 1)	August 2005	N00102.AR.001485
Engineering Evaluation/Cost Analysis (EE/CA) for Site 34	September 2005	N00102.AR.001495
Explanation of Significant Difference for the Record of Decision for OU3	October 2005	N00102.PF.001493
Time Critical Removal Action Work Plan for DRMO (Site 29) Shoreline Stabilization	October 2005	N00102.AR.001506
OU2 Screening-Level Soil Washing Treatability Study Report	January 2006	N00102.AR.001524
Action Memorandum for Non-Time-Critical Removal Action for Site 30	January 2006	N00102.AR.001522
Action Memorandum for Non-Time-Critical Removal Action for Site 34	February 2006	N00102.AR.001532
Work Plan for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization	April 2006	N00102.AR.001553
OU3 Remedial Action Report (for the Jamaica Island Landfill Phase I Waste Consolidation and Phase II Cap Construction)	May 2006	N00102.PF.001561
Site 10 Data Gap Investigation Quality Assurance Project Plan	June 2006	N00102.AR.001564
Post-Remedial Operation, Maintenance and Monitoring Plan for OU3	June 2006	N00102.PF.001566/ N00102.PF.001567
Five-Year Review Report for Portsmouth Naval Shipyard	June 2007	N00102.PF.001601
Remedial Investigation Report for OU1	July 2007	N00102.AR.001606
Additional Scrutiny Report for OU4	August 2007	N00102.PF.001612
Phase II Additional Scrutiny Quality Assurance Project Plan	September 2007	N00102.AR.001619
OU2 Additional Investigation Quality Assurance Project Plan	October 2007	N00102.AR.001626
No Further Action Decision Document for Site 21 – Former Acid/Alkaline Drain Tank	February 2008	N00102.AR.001647
No Further Action Decision Document for the Jamaica Island Landfill Impact Area	February 2008	N00102.PF.001648

<u>Document</u>	<u>Date</u>	<u>Administrative Record Number</u>
Closeout Report for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization	June 2008	N00102.AR.001665
Closeout Report for Site 29 Removal Action Stabilization	July 2008	N00102.AR.001670
Contractor Closeout Report and As-built Drawings for Site 34 Shoreline Stabilization and Removal Action	July 2008	N00102.AR.001670
Site 32 Remedial Investigation Quality Assurance Project Plan, Revision 1	November 2008	N00102.AR.001690
Rounds 1 through 4 Data Evaluation Report for OU3 Post-Remedial Operation, Maintenance, and Monitoring Program	July 2009	N00102.PF.000910
Sampling and Analysis Plan for OU9 RI	July 2009	N00102.AR.001744
Action Memorandum for Non-Time-Critical Removal Action for OU2 DRMO Impact Area	November 2009	N00102.AR.001351
Rounds 1 through 10 Interim Offshore Monitoring Report for O4	February 2010	N00102.AR.001716
Supplemental Remedial Investigation Report for OU2	March 2010	N00102.AR.001743
Work Plan for Interim Removal Action for OU2 DRMO Impact Area	May 2010	N00102.AR.001746
Feasibility Study Report for OU1	June 2010	N00102.AR.001754
Proposed Remedial Action Plan for OU1	June 2010	N00102.AR.001759
Record of Decision for OU1	September 2010	N00102.AR.002495
Engineering Evaluation/Cost Analysis for Site 30, Revision 2	October 2010	N00102.AR.002503
Sampling and Analysis Plan for OU2 Pre Design Investigation	November 2010	N00102.AR.002513
Interim Offshore Monitoring Plan for OU4, Revision 1	November 2010	N00102.AR.002514
Action Memorandum for Non-Time Critical Removal Action for Site 30, Revision 2	December 2010	N00102.AR.002518
Feasibility Study Report for OU2	April 2011	Not Yet Assigned
Rounds 1 through 9 Data Evaluation Report for OU3 Post-Remedial Operation, Maintenance, and Monitoring Program	April 2011	Not Yet Assigned

7.0 REFERENCES

ATSDR (Agency for Toxic Substances and Disease Registry), November 2007. Public Health Assessment for Portsmouth Naval Shipyard, Kittery, Maine. EPA Facility ID ME7170022019.

B&R Environmental, June 1996. Phase II Ambient Air Quality and Meteorological Monitoring Report for Portsmouth Naval Shipyard, Kittery, Maine. Brown and Root Environmental, a Division of Halliburton NUS Corporation, Wayne, Pennsylvania.

B&R Environmental, November 1996. Groundwater Investigation and Monitoring Plan for Portsmouth Naval Shipyard, Kittery, Maine. Brown & Root Environmental, A Division of Halliburton NUS Corporation, Wayne, Pennsylvania.

FWENC (Foster Wheeler Environmental Corporation), June 2001. Final Action Memorandum for Site 6, Defense Reutilization and Marketing Office (DRMO) Shoreline Stabilization, Portsmouth Naval Shipyard. FWENC, Langhorne, Pennsylvania.

Halliburton NUS, July 1994. Draft Revised Corrective Measures Study Proposal for Portsmouth Naval Shipyard, Kittery, Maine. Halliburton NUS Corporation, Wayne, Pennsylvania.

Halliburton NUS, September 1994. Applicable or Relevant and Appropriate Requirements (ARARs) Report for Portsmouth Naval Shipyard, Kittery, Maine. Halliburton NUS Corporation, Wayne, Pennsylvania.

Halliburton NUS, March 1995. Draft Onshore Feasibility Study (FS) Report for Portsmouth Naval Shipyard, Kittery, Maine. Halliburton NUS Corporation, Wayne, Pennsylvania.

Halliburton NUS, November 1995. RCRA Facilities Investigation (RFI) Data Gap Report for Portsmouth Naval Shipyard, Kittery, Maine. Halliburton NUS Corporation, Wayne, Pennsylvania.

Johnston, R. K., W. R. Munns, Jr., F. T. Short, and H. A. Walker, December 1994. Estuarine Ecological Risk Assessment Phase I: Problem Formulation for Portsmouth Naval Shipyard, Kittery, Maine.

Kearney & Baker/TSA, July 1986. RCRA Facility Assessment, Portsmouth Naval Shipyard, A.T. Kearney, Inc., Alexandria, VA and Baker/TSA, Inc., Beaver, Pennsylvania.

LEA, June 1986. Final Confirmation Study Report on Hazardous Waste Sites at Portsmouth Naval Shipyard, Kittery, Maine. Loureiro Engineering Associates, Avon, Connecticut.

Louis Berger Group, April 2003. Cultural Resources Survey, Portsmouth Naval Shipyard, Kittery, Maine. Louis Berger Group, Inc., East Orange, New Jersey.

McLaren/Hart, April 1992. Revised Ambient Air Quality Monitoring Report. McLaren/Hart Environmental Engineering Corporation, Albany, New York. Included as Section 11 of the Draft RCRA Facility Investigation Report (McLaren/Hart, July 1992).

McLaren/Hart, July 1992. Draft RCRA Facility Investigation Report, Portsmouth Naval Shipyard, Kittery, Maine. McLaren/Hart Environmental Engineering Corporation, Albany, New York.

McLaren/Hart, August 1992. Onshore Ecological Risk Assessment for Portsmouth Naval Shipyard, Kittery, Maine. McLaren/Hart Environmental Engineering Corporation, Albany, New York.

McLaren/Hart, April 1993. Interim Corrective Measures at the Defense Reutilization and Marketing Office, Portsmouth Naval Shipyard, Kittery, Maine. McLaren/Hart Environmental Engineering Corporation, Lester, Pennsylvania.

McLaren/Hart, June 1993. Addendum to the RCRA Facility Investigation Report, Portsmouth Naval Shipyard, Kittery, Maine. McLaren/Hart Environmental Engineering Corporation, Albany, New York.

McLaren/Hart, March 1994. Public Health and Environmental Risk Evaluation Part A: Human Health Risk Assessment, Portsmouth Naval Shipyard, Kittery, Maine. McLaren/Hart Environmental Engineering Corporation, Albany, New York.

McLaren/Hart, April 1994. Final Media Protection Standards Proposal for Portsmouth Naval Shipyard, Kittery, Maine, Chapter 1: Onshore Media. McLaren/Hart Environmental Engineering Corporation, Albany, New York.

McLaren/Hart, May 1994. Final Human Health Risk Assessment Report for Offshore Media, Portsmouth Naval Shipyard. Addendum to Public Health and Environmental Risk Evaluation Part A (McLaren/Hart, March 1994). McLaren/Hart Environmental Engineering Corporation, Albany, New York.

Navy, July 1997. Decision Document, No Further Action, SWMUs 12, 13, 16, and 23, Portsmouth Naval Shipyard, Kittery, Maine.

Navy, May 1999. Interim Record of Decision for Operable Unit 4, Portsmouth Naval Shipyard, Kittery, Maine.

Navy, August 2001a. Decision Document for Site 26, Portsmouth Naval Shipyard, Kittery, Maine.

Navy, August 2001b. Decision Document for Site 27, Portsmouth Naval Shipyard, Kittery, Maine.

Navy, August 2001c. Record of Decision for Operable Unit 3, Portsmouth Naval Shipyard, Kittery, Maine.

Navy, September 2003. Explanation of Significant Difference for the Record of Decision for Operable Unit 3. Portsmouth Naval Shipyard, Kittery, Maine.

Navy, October 2005. Explanation of Significant Difference for the Record of Decision for Operable Unit 3. Portsmouth Naval Shipyard, Kittery, Maine. (Dated September 2005 and signed in October 2005.)

Navy, January 2006. Action Memorandum for Site 30, Portsmouth Naval Shipyard, Kittery, Maine. [Dated January and signed in June 2006.]

Navy, February 2006. Action Memorandum for Site 34, Portsmouth Naval Shipyard, Kittery, Maine. [Dated 2006 and signed in 2007.]

Navy, February 2008a. No Further Action Decision Document for Site 21 – Former Acid/Alkaline Drain Tank, Portsmouth Naval Shipyard, Kittery, Maine. [Dated February 2008 and signed in May 2008.]

Navy, February 2008b. No Further Action Decision Document for Jamaica Island Landfill Impact Area, Portsmouth Naval Shipyard, Kittery, Maine. [Dated February 2008 and signed in May 2008.]

Navy, November 2009. Action Memorandum Non-Time-Critical Removal Action for OU2 DRMO Impact Area, Portsmouth Naval Shipyard, Kittery, Maine. [EE/CA included as an attachment to Action Memorandum.]

Navy, September 2010. Record of Decision for Operable Unit 1. Portsmouth Naval Shipyard, Kittery, Maine.

Naval Research Laboratory, December 2001. MTADS Geophysical Survey of the Jamaica Island and Topoka Landfills at the Portsmouth Naval Shipyard, Kittery, Maine.

NCCOSC (Naval Command, Control, and Ocean Surveillance Center), May 2000. Final Estuarine Ecological Risk Assessment for Portsmouth Naval Shipyard, Kittery, Maine. NCCOSC, Narragansett, Rhode Island.

Shaw (Shaw Environmental, Inc.), July 2008. Contractor Closeout Report and As-built Drawings for Site 34 Shoreline Stabilization and Removal Action, Portsmouth Naval Shipyard, Kittery, Maine. Shaw, Norfolk, Virginia.

TRC Companies, May 1993. Final Hazard Ranking System Package for Portsmouth Naval Shipyard, Kittery, Maine (ME7170022019), Revision 2. TRC Companies, Inc., Lowell, Massachusetts.

TtEC (Tetra Tech EC, Inc.), October 2005. Time Critical Removal Action Work Plan for DRMO (Site 29) Shoreline Stabilization, Portsmouth Naval Shipyard, Kittery, Maine. Tetra Tech EC, Inc., Langhorne, Pennsylvania.

TtEC, May 2006. Final Remedial Action Report for Jamaica Island Landfill Phase I Waste Consolidation and Phase II Cap Construction. Tetra Tech EC., Inc., Langhorne, Pennsylvania.

TtEC, June 2008. Closeout Report for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization at Portsmouth Naval Shipyard, Kittery, Maine. TtEC, Langhorne, Pennsylvania.

TtNUS (Tetra Tech NUS, Inc.), October 1998. Phase I/Phase II Offshore Data Comparative Analysis Report for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, August 1999. Groundwater Monitoring Summary Report (December 1996 – November 1997) for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, October 1999. Interim Offshore Monitoring Plan for Operable Unit 4 for Portsmouth Naval Shipyard. TtNUS, King of Prussia, Pennsylvania.

TtNUS, December 1999. Onshore/Offshore Contaminant Fate and Transport Modeling Phase II Report for Portsmouth Naval Shipyard. TtNUS, King of Prussia, Pennsylvania. [Revision pages to July 1999 draft final version were provided in December 1999 to finalize the report.]

TtNUS, March 2000. Field Investigation Report, Site 10 (Building 238) and Site 29 (Teepee Incinerator), for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, May 2000. Site Screening Report, Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier), Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania. [Revision pages to March 2000 draft final version were provided in May 2000 to finalize the report.]

TtNUS, August 2000. Seep/Sediment Summary Report for Data Collected Between December 1996 and November 1997 for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, November 2000. Revised OU2 Risk Assessment, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, November 2001. Preliminary Remediation Goals for Operable Unit 4, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, July 2002. Baseline Interim Offshore Monitoring Report for Operable Unit 4, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, November 2002. Building 298 Trenching Closeout Report, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, March 2003a. Site 10 Additional Investigation Report for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, January 2004. Site 32 Phase I Remedial Investigation Data Package for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, PA.

TtNUS, April 2004. Former CDC Area Investigation Report for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, June 2004. Technical Memorandum, Recommendations regarding Phase II of the Remedial Investigation for Site 32, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, August 2004. Site Screening Investigation Report for Site 34 for Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania. (Includes Site 34 Site Investigation Data Package for Portsmouth Naval Shipyard, Kittery, Maine, TtNUS, King of Prussia, Pennsylvania, December 2003, as Appendix A.)

TtNUS, November 2004a. Rounds 1 through 7 Interim Offshore Monitoring Program Report, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania. [Letter dated January 13, 2005 indicates that November 2004 draft final (Rev 0) is the final document.]

TtNUS, November 2004b. Draft Feasibility Study for Operable Unit 2, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, August 2005a. Additional Scrutiny Quality Assurance Project Plan for Operable Unit 4 (OU4) at Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, August 2005b. Engineering Evaluation/Cost Analysis (EE/CA) for Site 30 (Building 184) (Revision 1), Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, September 2005. Engineering Evaluation/Cost Analysis (EE/CA) for Site 34, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, January 2006a. Operable Unit 2 Screening-Level Soil Washing Treatability Study Report, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, January 2006b. Round 8 Interim Offshore Monitoring Program Data Package, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, February 2006. Additional Scrutiny Investigation (for OU4) Data Package, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, June 2006a. Site 10 Data Gap Investigation Quality Assurance Project Plan, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, June 2006b. Post-Remedial Operation, Maintenance and Monitoring Plan for Operable Unit 3 (OU3), Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, June 2007. Five-Year Review Report, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, July 2007. Remedial Investigation Report for Operable Unit 1, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, August 2007. Additional Scrutiny Report for Operable Unit 4, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, September 2007. Phase II Additional Scrutiny Quality Assurance Project Plan, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, October 2007. Operable Unit 2 Additional Investigation Quality Assurance Project Plan, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, July 2009. Rounds 1 through 4 Data Evaluation Report for Operable Unit 3 Post-Remedial Operation, Maintenance, and Monitoring Program, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, February 2010. Rounds 1 through 10 Interim Offshore Monitoring Program Report for Operable Unit 4, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, October 2010. Engineering Evaluation/Cost Analysis for Site 30, Revision 2, Portsmouth Naval Shipyard, Kittery, Maine. TtNUS, King of Prussia, Pennsylvania.

TtNUS, November 2010. Final Interim Offshore Monitoring Plan (Revision 1) for Operable Unit 4 for Portsmouth Naval Shipyard. TtNUS, King of Prussia, Pennsylvania.

US Army (United States Army Corps of Engineers), June 2002a. Technical Memorandum. Evaluation of Jamaica Cove Options for OU3, Portsmouth Naval Shipyard, Kittery, Maine. US Army, Omaha and New England Districts, Omaha, Nebraska and Concord, Massachusetts.

US Army, June 2002b. Technical Memorandum. Evaluation of MBII Waste Consolidation for OU3, Portsmouth Naval Shipyard, Kittery, Maine. US Army, Omaha District, Omaha, Nebraska.

US Army, June 2002c. Operable Unit 3 Phase I Remedial Design Specifications and Plans for Portsmouth Naval Shipyard, Kittery Maine. US Army, Omaha District, Omaha, Nebraska.

US Army, November 2002. Phase II, Operable Unit 3 Remedial Design Analysis Report including drawings and specifications, Portsmouth Naval Shipyard, Kittery, Maine. US Army, Omaha District, Omaha, Nebraska.

USEPA (United States Environmental Protection Agency), March 1989, HSWA Permit for Portsmouth Naval Shipyard, Permit Under the Hazardous and Solid Waste Amendments of 1984. USEPA, March 10.

Weston, June 1983. Initial Assessment Study of Portsmouth Naval Shipyard. Naval Energy and Environmental Support Activity, NEESA 13-032, Port Hueneme.

APPENDIX A

DEFENSE ENVIRONMENTAL CLEANUP PROGRAM FACT SHEETS (From Appendix E of the Relative Risk Site Evaluation Primer)

- A.1 RELATIVE RISK SITE EVALUATION CONCEPT**
- A.2 RELATIVE RISK SITE EVALUATION QUESTIONS AND ANSWERS**

(See the Final FY09 PNS Amended SMP, April 2009 [Administrative Record No. N00102_001708] for Appendix A Fact Sheets on Relative Risk Site Evaluation)

APPENDIX A.1

RELATIVE RISK SITE EVALUATION CONCEPT

(See the Final FY09 PNS Amended SMP, April 2009 [Administrative Record No. N00102_001708] for Appendix A Fact Sheets on Relative Risk Site Evaluation)

APPENDIX A.2

RELATIVE RISK SITE EVALUATION QUESTIONS AND ANSWERS

(See the Final FY09 PNS Amended SMP, April 2009 [Administrative Record No. N00102_001708] for Appendix A Fact Sheets on Relative Risk Site Evaluation)

APPENDIX B

PNS RELATIVE RISK SITE EVALUTION RANKING WORKSHEETS

(See the Final FY09 PNS Amended SMP, April 2009 [Administrative Record No. N00102_001708] for Appendix B PNS Relative Risk Evaluation Ranking)

**PORTSMOUTH NAVAL SHIPYARD
INSTALLATION RESTORATION PROGRAM**

**RELATIVE RISK SITE EVALUTION
SITE RANKING**

(See the Final FY09 PNS Amended SMP, April 2009 [Administrative Record No. N00102_001708] for Appendix B PNS Relative Risk Evaluation Ranking)

APPENDIX C

SCHEDULES

- C.1 OU1 SCHEDULE (SITE 10)**
- C.2 OU2 SCHEDULE (SITES 6 and 29)**
- C.3 OU3 SCHEDULE (SITES 8, 9, and 11)**
- C.4 OU4 SCHEDULE (SITE 5 and OFFSHORE AOCs)**
- C.5 OU7 SCHEDULE (SITE 32)**
- C.6 OU8 SCHEDULE (SITE 31)**
- C.7 OU9 SCHEDULE (SITE 34)**
- C.8 SITE 30, FORMER GALVANIZING PLANT BUILDING 184,
SCHEDULE**

APPENDIX C.1
OU1 SCHEDULE (SITE 10)

APPENDIX C.2
OU2 SCHEDULE (SITES 6 and 29)

APPENDIX C.3
OU3 SCHEDULE (SITES 8, 9, and 11)

PORTSMOUTH NAVAL SHIPYARD
SITE MANAGEMENT PLAN SCHEDULE
OPERABLE UNIT (OU3)
(Sites 8, 9, and 11)

Task Name	Start	Finish	2011				2012				2013			
			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
OPERATION, MAINTENANCE AND MONITORING PLAN (OM&M Plan)	Thu 6/2/05	Wed 10/5/11	[Task bar spanning from Q1 2011 to Q4 2011]											
Prepare LUC RD (Appendix E of OM&M Plan)	Thu 6/2/05	Mon 8/8/11	[Task bar spanning from Q1 2011 to Q4 2011]											
<i>Receive Comments on Draft LUC RD</i>	<i>Thu 6/2/05</i>	<i>Thu 6/23/05</i>	[Task bar spanning from Q1 2011 to Q1 2011]											
Prepare Revised Draft LUC RD	Mon 4/13/09	Mon 4/13/09	[Task bar spanning from Q1 2011 to Q1 2011]											
<i>Submit Responses to Comments on Revised Draft LUC RD</i>	<i>Mon 4/13/09</i>	<i>Mon 4/13/09</i>	[Task bar spanning from Q1 2011 to Q1 2011]											
USEPA, MEDEP, & RAB Review Revised Draft LUC RD	Tue 4/14/09	Wed 7/15/09	[Task bar spanning from Q1 2011 to Q2 2011]											
<i>Receive Comments</i>	<i>Wed 7/15/09</i>	<i>Wed 7/15/09</i>	[Task bar spanning from Q2 2011 to Q2 2011]											
Comment Resolution	Thu 7/16/09	Fri 2/5/10	[Task bar spanning from Q2 2011 to Q4 2011]											
Prepare Draft Final LUC RD	Fri 2/5/10	Fri 3/5/10	[Task bar spanning from Q4 2011 to Q1 2012]											
<i>Submit Draft Final LUC RD</i>	<i>Mon 3/8/10</i>	<i>Mon 3/8/10</i>	[Task bar spanning from Q1 2012 to Q1 2012]											
USEPA, MEDEP, & RAB Review Draft Final LUC RD	Mon 3/8/10	Tue 11/16/10	[Task bar spanning from Q1 2012 to Q4 2012]											
<i>Navy Receives Approval, Comments, or Notice of Dispute</i>	<i>Tue 4/13/10</i>	<i>Tue 11/16/10</i>	[Task bar spanning from Q2 2012 to Q4 2012]											
Comment Resolution	Thu 5/20/10	Fri 7/8/11	[Task bar spanning from Q2 2012 to Q4 2012]											
Prepare Final LUC RD	Mon 7/11/11	Mon 8/8/11	[Task bar spanning from Q4 2012 to Q1 2013]											
<i>Submit Final LUC RD</i>	<i>Mon 8/8/11</i>	<i>Mon 8/8/11</i>	[Task bar spanning from Q1 2013 to Q1 2013]											
OM&M Plan Revision 1 (Primary Document)	Fri 6/5/09	Wed 10/5/11	[Task bar spanning from Q1 2011 to Q4 2011]											
Prepare OM&M Plan Revision 1	Fri 6/5/09	Tue 8/25/09	[Task bar spanning from Q1 2011 to Q2 2011]											
<i>Submit Draft Plan</i>	<i>Wed 8/26/09</i>	<i>Wed 8/26/09</i>	[Task bar spanning from Q2 2011 to Q2 2011]											
USEPA, MEDEP & RAB Review Draft Plan	Wed 8/26/09	Tue 11/10/09	[Task bar spanning from Q2 2011 to Q4 2011]											
<i>Receive Comments</i>	<i>Tue 11/10/09</i>	<i>Tue 11/10/09</i>	[Task bar spanning from Q4 2011 to Q4 2011]											
Comment Resolution (Delayed until LUCRD finalized)	Wed 11/11/09	Fri 7/8/11	[Task bar spanning from Q4 2011 to Q4 2012]											
Prepare Draft Final Plan	Fri 7/8/11	Fri 8/5/11	[Task bar spanning from Q4 2012 to Q1 2013]											
<i>Submit Draft Final Plan</i>	<i>Fri 8/5/11</i>	<i>Fri 8/5/11</i>	[Task bar spanning from Q1 2013 to Q1 2013]											
USEPA, MEDEP & RAB Review Draft Final Plan	Fri 8/5/11	Fri 9/2/11	[Task bar spanning from Q1 2013 to Q2 2013]											
<i>Receive Regulator Approval, Comments, or Notice of Dispute</i>	<i>Mon 9/5/11</i>	<i>Mon 9/5/11</i>	[Task bar spanning from Q2 2013 to Q2 2013]											
Comment Resolution	Mon 9/5/11	Mon 9/12/11	[Task bar spanning from Q2 2013 to Q2 2013]											
Prepare Final Plan	Mon 9/5/11	Tue 10/4/11	[Task bar spanning from Q2 2013 to Q3 2013]											
<i>Submit Final Plan</i>	<i>Wed 10/5/11</i>	<i>Wed 10/5/11</i>	[Task bar spanning from Q3 2013 to Q3 2013]											
FIVE-YEAR REVIEWS	Sat 6/23/12	Sat 6/23/12	[Task bar spanning from Q4 2012 to Q4 2012]											
Second Five-Year Review (due 5 years after First Five-Year Review)	Sat 6/23/12	Sat 6/23/12	[Task bar spanning from Q4 2012 to Q4 2012]											

PORTSMOUTH NAVAL SHIPYARD
SITE MANAGEMENT PLAN SCHEDULE
OPERABLE UNIT (OU3)
(Sites 8, 9, and 11)

Task Name	Start	Finish	2011				2012				2013			
			Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
OPERATION, MAINTENANCE AND MONITORING PLAN IMPLEMENTATION	Thu 4/8/10	Wed 9/28/11	[Gantt bar spanning from Thu 4/8/10 to Wed 9/28/11]											
Conduct Ninth Round	Thu 4/8/10	Tue 10/19/10	[Gantt bar spanning from Thu 4/8/10 to Tue 10/19/10]											
Five Year Evaluation - Rounds 1 through 9 Data Evaluation Report (Primary Document)	Thu 6/24/10	Fri 4/29/11	[Gantt bar spanning from Thu 6/24/10 to Fri 4/29/11]											
Prepare Draft Rounds 1 through 9 Report	Thu 6/24/10	Fri 10/29/10	[Gantt bar spanning from Thu 6/24/10 to Fri 10/29/10]											
Submit Draft Rounds 1 through 9 Report	Mon 11/1/10	Mon 11/1/10	[Gantt bar spanning from Mon 11/1/10 to Mon 11/1/10]											
USEPA, MEDEP & RAB Review Draft Report	Mon 11/1/10	Tue 1/25/11	[Gantt bar spanning from Mon 11/1/10 to Tue 1/25/11]											
Receive Comments	Wed 1/26/11	Wed 1/26/11	[Gantt bar spanning from Wed 1/26/11 to Wed 1/26/11]											
Comment Resolution	Wed 1/26/11	Thu 4/7/11	[Gantt bar spanning from Wed 1/26/11 to Thu 4/7/11]											
Receive Regulator Approval, Comments, or Notice of Dispute	Thu 4/7/11	Thu 4/7/11	[Gantt bar spanning from Thu 4/7/11 to Thu 4/7/11]											
Prepare Final Rounds 1 through 9 Report	Thu 4/7/11	Thu 4/28/11	[Gantt bar spanning from Thu 4/7/11 to Thu 4/28/11]											
Submit Final Rounds 1 through 9 Report	Fri 4/29/11	Fri 4/29/11	[Gantt bar spanning from Fri 4/29/11 to Fri 4/29/11]											
Conduct Tenth Round	Mon 4/18/11	Wed 9/28/11	[Gantt bar spanning from Mon 4/18/11 to Wed 9/28/11]											
Conduct groundwater and gas sampling	Mon 4/18/11	Fri 4/22/11	[Gantt bar spanning from Mon 4/18/11 to Fri 4/22/11]											
Conduct routine inspection, maintenance activities	Mon 4/18/11	Fri 4/22/11	[Gantt bar spanning from Mon 4/18/11 to Fri 4/22/11]											
Prepare and Submit Draft Data Package	Fri 4/22/11	Fri 7/29/11	[Gantt bar spanning from Fri 4/22/11 to Fri 7/29/11]											
USEPA, MEDEP & RAB Review Draft	Fri 7/29/11	Mon 8/29/11	[Gantt bar spanning from Fri 7/29/11 to Mon 8/29/11]											
Prepare and Submit Final Data Package	Tue 8/30/11	Wed 9/28/11	[Gantt bar spanning from Tue 8/30/11 to Wed 9/28/11]											

APPENDIX C.4
OU4 SCHEDULE (SITE 5 and OFFSHORE AOCs)

APPENDIX C.5
OU7 SCHEDULE (SITE 32)

APPENDIX C.6
OU8 SCHEDULE (SITE 31)

APPENDIX C.7
OU9 SCHEDULE (SITE 34)

PORTSMOUTH NAVAL SHIPYARD
SITE MANAGEMENT PLAN SCHEDULE
OPERABLE UNIT (OU) 9
(SITE 34)

Task Name	Start	Finish	2011				2012				2013		
			Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
REMEDIAL INVESTIGATION REPORT (RI REPORT)	Wed 9/22/10	Mon 12/26/11	[Gantt bar from 9/22/10 to 12/26/11]										
Prepare Draft RI Report	Wed 9/22/10	Mon 2/28/11	[Gantt bar from 9/22/10 to 2/28/11]										
Submit Draft RI Report	Mon 2/28/11	Mon 2/28/11	[Milestone diamond at 2/28/11]										
USEPA, MEDEP & RAB Review Draft RI Report	Mon 2/28/11	Fri 7/15/11	[Gantt bar from 2/28/11 to 7/15/11]										
Receive Regulator Comments on Draft RI Report	Fri 7/15/11	Fri 7/15/11	[Milestone diamond at 7/15/11]										
Comment Resolution	Fri 7/15/11	Wed 10/5/11	[Gantt bar from 7/15/11 to 10/5/11]										
Prepare Draft Final RI Report	Thu 9/29/11	Fri 10/28/11	[Gantt bar from 9/29/11 to 10/28/11]										
Submit Draft Final RI Report	Fri 10/28/11	Fri 10/28/11	[Milestone diamond at 10/28/11]										
USEPA, MEDEP & RAB Review Draft Final RI Report	Fri 10/28/11	Sat 11/26/11	[Gantt bar from 10/28/11 to 11/26/11]										
Receive Regulator Approval, Comments, or Notice of Dispute	Sun 11/27/11	Sun 11/27/11	[Milestone diamond at 11/27/11]										
Comment Resolution	Sun 11/27/11	Sat 12/3/11	[Gantt bar from 11/27/11 to 12/3/11]										
Prepare Final RI Report	Sun 11/27/11	Sun 12/25/11	[Gantt bar from 11/27/11 to 12/25/11]										
Submit Final RI Report	Mon 12/26/11	Mon 12/26/11	[Milestone diamond at 12/26/11]										
REMEDY IN PLACE	Tue 2/14/12	Tue 2/14/12	[Milestone diamond at 2/14/12]										

APPENDIX C.8

SITE 30, FORMER GALVANIZING PLANT BUILDING 184, SCHEDULE

