N00102.AR.001709
NSY PORTSMOUTH
5090.3a

FY09 Amended Site Management Plan

for

Portsmouth Naval Shipyard
Kittery, Maine

Naval Facilities Engineering Command Mid-Atlantic

APRIL 2009

TETRA TECH

PITT-04-9-032

April 20, 2009

Project Number 112G00904

Mr. Matthew Audet
Environmental Protection Agency
Region I (Mail Code: HBT)
1 Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, Maine 04333-0017

Reference: Contract No. N62467-04-D-0555 (CLEAN)
Contract Task Order No. 443

Subject: Final FY09 Amended Site Management Plan (SMP)
Portsmouth Naval Shipyard (PNS), Kittery, Maine

Dear Mr. Audet/Mr. McLeod:

On behalf of the U.S. Navy, Tetra Tech NUS, Inc. is pleased to provide to the U.S. Environmental Protection Agency Region I (USEPA) and to the Maine Department of Environmental Protection (MEDEP) 2 and 3 copies, respectively, of the revision pages (Revision 1) for the Final FY09 Amended SMP. A list of revisions is enclosed. No comment letters were received on the June 2008 draft document.

If you have any comments or questions, or if additional information is required, please contact Ms. Linda Cole at 757.444.0806.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs office at 207.438.1140 or by writing to:

Portsmouth Naval Shipyard
Code 106.3 Bldg. 44
Attn: John Gildersleeve
Portsmouth, NH 03804-5000

Sincerely,

Deborah J. Cohen, P.E.
Project Manager

DJC/clm
Enclosures:
(1) List of Revisions to finalize the Final FY09 Amended SMP
(2) Revision pages (Revision 1) for Final FY09 Amended SMP

Tetra Tech NUS, Inc.
661 Andersen Drive, Pittsburgh, PA 15220-2745
Tel 412.921.7090 Fax 412.921.4040 www.ttnus.com

TETRA TECH

Electronic Copy on CD
ME Dept. of Marine Resources (D. Nault)
Mr. Doug Bogen
Ms. Michele Dionne
Ms. Mary Marshall
Mr. Peter Britz
Ms. Diane McNabb
Mr. Alan Davis
NH Fish & Game (D. Grout)
Mr. Jon Carter
ATSDR (DOD-EJ/Carole Hossom)

Hard Copy
NAVFAC MIDLANT. (Code OPTE3-2/L. Cole)
(2 copies and 2 CDs)
PNS (Code 106.3, J. Gildersleeve) (2 copies and 1 CD)
Mr. Jack McKenna (1 copy)
Ms. Carolyn Lepage (1 copy)

Without Enclosure
Dr. Roger Wells
Mr. Onil Roy
PNS Code 100PAO (e-mail)
Y. Walker, NEHC
NOAA (K. Finkelstein)
U.S. Fish and Wildlife (K. Munney)

LIST OF REVISIONS TO FINALIZE THE FY09 AMENDED SITE MANAGEMENT PLAN PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

The cover, title page, table of contents, and acronym and abbreviations pages were updated to reflect Rev 1 and changes as necessary based on text and appendices changes. Revisions to Sections 2, 6, and 7 were made based on updates from June 2008 to September 2008. Revised sections are noted as Rev 1. Revisions to the schedules in Appendix C were made based on updates since June 2008 to April 10, 2009. Task lines in the schedules that have been revised are noted with asterisks. Appendix D was removed because no comments on the June 2008 draft FY09 Amended SMP required responses to comments.

The following updates to Appendix C schedules were made since June 2008:

Schedule	Task	Revision Description
Operable Unit 1	FS	The Feasibility Study (FS) Report schedule was updated to reflect receipt of United States Environmental Protection Agency (USEPA) technical comments on the draft document. In January 2009, USEPA requested that the Navy submit responses to USEPA and Maine Department of Environmental Protection (MEDEP) technical comments on the draft document and not to wait for receipt of USEPA legal comments. The Navy submitted the responses to technical comments on the draft FS Report on February 6, 2009. Follow-up comments, due March 9, 2009, are expected from the USEPA by April 13, 2009. The Navy estimated that USEPA legal comments would be provided by April 20, 2009. The schedule for the FS Report was updated based on the actual and anticipated dates.
	PRAP	The Proposed Remedial Action Plan (PRAP) schedule was updated to reflect submittal of the draft on December 8, 2008 and receipt of MEDEP comments on the draft on January 12, 2009. USEPA requested that the schedule for review and comment on the draft PRAP be extended until comments on the draft FS are resolved and the draft final FS was submitted. The schedule was revised to show that USEPA comments on the draft PRAP would be received after submittal of the draft final FS. Subsequent dates for the draft final PRAP, public comment period, Record of Decision (ROD), Remedial Design, and Remedial Action were updated accordingly.
	RIP	The Navy's current Remedy In Place (RIP) date was added to the schedule.

Schedule	Task	Revision Description
Operable Unit 2	Supplemental RI	Field work (including laboratory analysis, data validation, and data base update) was completed in July 2008, and the draft Supplemental Remedial Investigation (RI) Report was submitted on September 30, 2008. MEDEP and USEPA comments on the draft Supplemental RI were received December 1, 2008 and February 9, 2009, respectively. Responses to comments on the draft were submitted on April 1, 2009. The schedule was updated accordingly.
	FS	The revised draft FS Report was submitted on November 10, 2008. MEDEP and USEPA technical comments on the draft were received December 23, 2008 and March 4, 2009, respectively. The Navy estimated that USEPA legal comments would be provided by April 13, 2009. Based on discussion among the Navy, USEPA, and MEDEP, the responses to comments on the draft revised FS Report will be delayed to allow resolution of regulatory comments on the draft Supplemental RI Report (after receipt of regulatory comments on the draft final). The PRAP, ROD, Remedial Design, and Remedial Action schedules were updated accordingly.
	RIP	The Navy's current RIP date was added to the schedule.
Operable Unit 3	LUC Plan	The schedule for the Land Use Control (LUC) Remedial Design (RD) was updated to reflect submittal of the revised draft LUC RD on April 13, 2009. The schedule for subsequent dates for the LUC RD was revised accordingly.
	OM&M Implementation	The schedule for the Operation, Maintenance, and Monitoring (OM&M) Program was updated to reflect the actual submittal dates for the final data packages for Rounds 1, 2, and 3. The draft Rounds 1 through 4 Data Evaluation Report was submitted on October 15, 2008. MEDEP and USEPA comments on the draft were received December 13, 2008 and January 26, 2009, respectively. Responses to comments on the draft were submitted on March 13, 2009. The schedule was updated accordingly. The schedule for Round 5 was updated to reflect submittal of the data package on September 30, 2008. The schedule for Round 6 was updated to reflect sampling in October 2008 and submittal of the data package on January 26, 2009. The schedule for Round 7 was added. Sampling and inspection activities are anticipated for May 11 to May 14, 2009
Operable Unit 4	AS Phase II	The submittal date for the draft Additional Scrutiny Phase II Report was delayed to allow for discussion among the Navy, USEPA, and MEDEP on the next steps for OU4.
	Rounds 9 and 10	The Round 9 Data Package was submitted on September 22, 2008 and Round 10 sampling was conducted in December 2008. The dates were updated accordingly.
	RIP	The Navy's current RIP date was added to the schedule.

Schedule	Task	Revision Description
Operable Unit 7	Phase II RI	The Phase II Work Plan and Field Work schedules were updated to reflect actual completion dates.
	RIP	The Navy's current RIP date was added to the schedule.
Operable Unit 8	RI Work Plan	There were no changes in the schedule.
	RIP	The Navy's current RIP date was added to the schedule.
Operable Unit 9	Removal Action	The submittal of the final Removal Action Completion Report was updated based on submittal of the final report in September 2008.
	RI Workplan	The draft RI Work Plan was submitted on October 22, 2008. MEDEP and USEPA comments on the draft were received December 9, 2008 and February 9, 2009, respectively. Responses to comments on the draft were submitted on March 27, 2009. The schedule was updated accordingly.
	RIP	The Navy's current RIP date was added to the schedule.
Site 30	Removal Action	The schedule for the removal action for Site 30 had been delayed because of planned changes in use of Building 184 at Site 30. The changes are anticipated to be complete in FY09. A new schedule for the removal action will be determined for FY10.

FY09 REVISION 1

AMENDED
SITE MANAGEMENT PLAN
FOR
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

Prepared by:

Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

April 2009

TABLE OF CONTENTS

SECTION			PAGE NO.
1.0	INTRODUCTION		1-1
	1.1	FACILITY LOCATION AND MISSION	1-1
	1.2	REGULATORY HISTORY AND OVERVIEW OF ENVIRONMENTAL INVESTIGATIONS	1-2
	1.3	SUMMARY OF ONSHORE AND OFFSHORE STUDIES	1-5
	1.3.1	Onshore Studies	1-5
	1.3.2	Offshore Studies	1-7
	1.4	OPERABLE UNIT DESIGNATION	1-7
	1.5	REPORT ORGANIZATION	1-8
2.0	SITE DESCRIPTIONS		2-1
	2.1	SMP SITES	2-1
	2.2	OU1	2-2
	2.3	OU2	2-4
	2.4	OU3	2-8
	2.5	OU4	2-11
	2.6	OU7	2-15
	2.7	OU8	2-18
	2.8	OU9	2-20
	2.9	SITE SCREENING AREA, SITE 30	2-22
3.0	REGULATORY PROCESS ACTIVITIES		3-1
	3.1	CERCLA PROCESS ACTIVITIES	3-2
	3.1.1	Preliminary Assessment/Site Investigation (PA/SI) and Site Screening Process (SSP)	3-2
	3.1.2	Remedial Investigation/Feasibility Study (RI/FS)	3-2
	3.1.3	Removal Action	3-3
	3.1.4	Interim Remedial Action	3-3
	3.1.5	Remedial Design/Remedial Action (RD/RA)	3-3
4.0	SITE RANKING		4-1
	4.1	RELATIVE RISK SITE EVALUATION FRAMEWORK	4-1
	4.2	SUMMARY OF SITE RISK RANKING FOR PNS	4-2
5.0	SCHEDULE		5-1
	5.1	SCHEDULE DEVELOPMENT	5-1
	5.2	SCHEDULE DURATIONS	5-1
6.0	DOCUMENTS		6-1
	6.1	DOCUMENTS COMPLETED BEFORE SIGNATURE OF FFA	6-1
	6.2	DOCUMENTS COMPLETED AFTER SIGNATURE OF FFA	6-3
7.0	REFERENCES		7-1

TABLE OF CONTENTS (Continued)

APPENDICES

A DEFENSE ENVIRONMENTAL CLEANUP PROGRAM FACT SHEETS
B PNS RELATIVE RISK SITE EVALUATION RANKING WORKSHEETS
C SCHEDULES

TABLES

NUMBER PAGE NO.

3-1 RCRA and CERCLA Corrective Action Processes 3-4
4-1 Relative Risk Ranking Results 4-3

FIGURES

NUMBER PAGE NO.

1-1 Great Bay Estuary and Site Location 1-9
1-2 Facility Site Map 1-11
2-1 Overview of Interim Offshore Monitoring Station Locations 2-27

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
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
Navy	United States Department of the Navy
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 (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) 08 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, 2008.

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 the risk 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, May 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.

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 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	Date
IAS completed	1983
USEPA involvement began	1985
FCS completed	1986
RFA completed	1986
MEDEP oversight began	1988
PNS Corrective Action Permit under the HSWA issued	March 1989
RFI Report and Addendum to RFI Report and Onshore Ecological Risk Assessment completed	1992 and 1993
Sampling to support offshore risk assessments conducted	1991 through 1993
PNS placed on the NPL	May 31, 1994
Onshore and offshore components of investigation separated	1994
Public Health and Environmental Risk Evaluation (PHERE)	1994

Event	Date
and Offshore Human Health Risk Assessment completed	
RFI Data Gap Report and Air Monitoring Report completed	1995 and 1996
Four rounds of groundwater and intertidal seep and sediment monitoring conducted	1996/1997
NFA Decision Documents for Sites 12, 13, 16, and 23 signed	1997
FFA signed, supersedes the HSWA Permit	1999
Onshore/Offshore Contaminant Fate and Transport Modeling completed	1999
Interim Record of Decision (ROD) for OU4 signed, Interim Offshore Monitoring Plan completed, and monitoring started	1999
Estuarine Ecological Risk Assessment (EERA) for offshore Areas of Concern (AOCs) completed	2000
Site investigations for Sites 10, 29, 30, 31, and 32 conducted	2000
ROD for OU3 signed	2001
Start of significant construction for OU3 remedy	June 2002
Site investigation of Site 34 conducted	2003
First Five-Year Review Report for PNS completed	June 2007

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 Draft Onshore FS Report identifies and recommends remedial alternatives for each SWMU. 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, the only site within OU5, and therefore this OU is no longer part of the CERCLA program. 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:

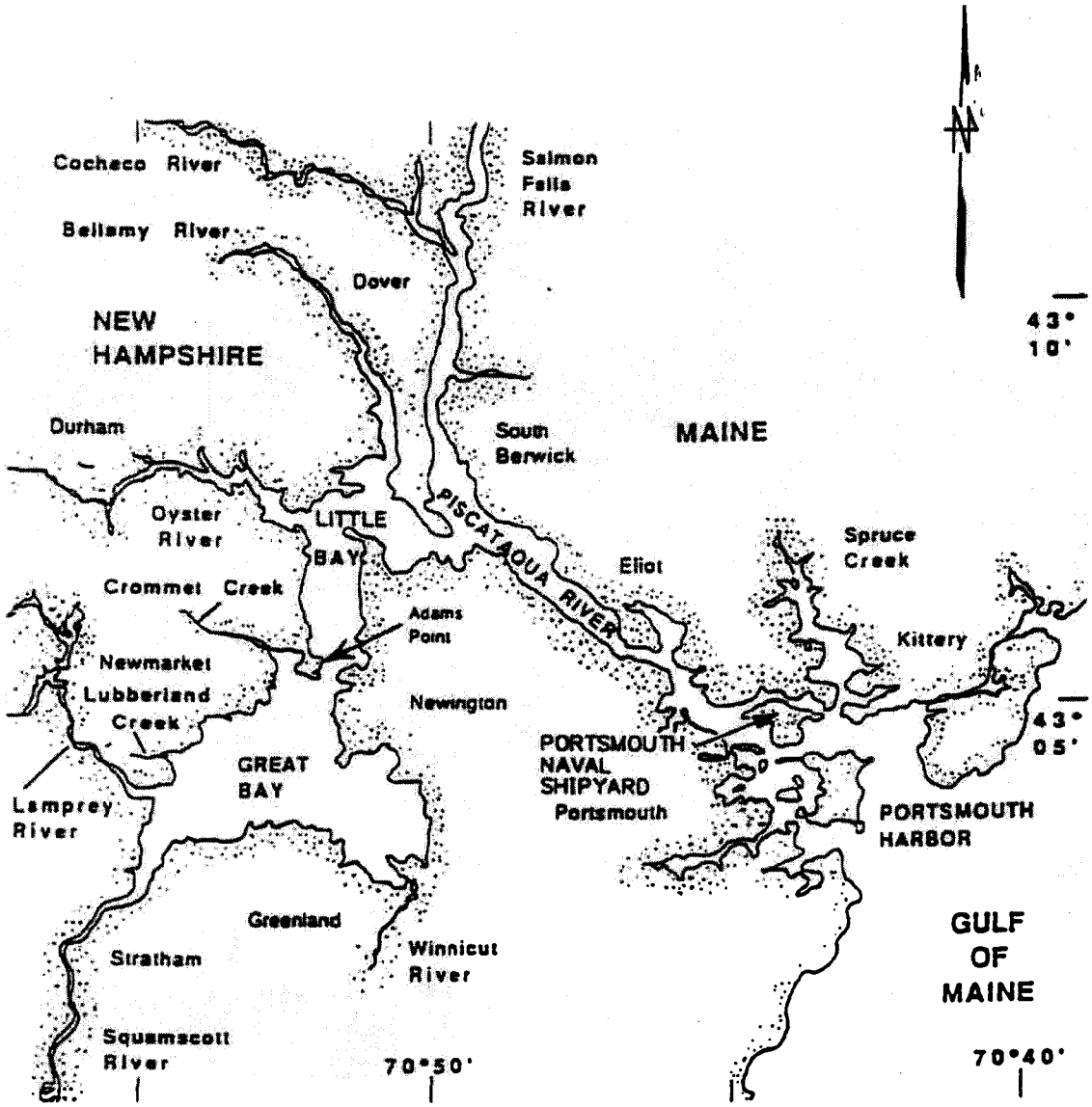
- Section 1.0 is this introduction.
- Section 2.0 describes the history and status of each site at PNS.
- Section 3.0 provides a description of the CERCLA remedial process and the RCRA Corrective Action Process and describes the similarities and differences between RCRA and CERCLA.
- Section 4.0 provides 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.
- Appendix D provides the responses to comments on the draft SMP.

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

ACAD:R:/7090/CUTPASTE/CUTPASTE1.dwg 02/16/99 HJP

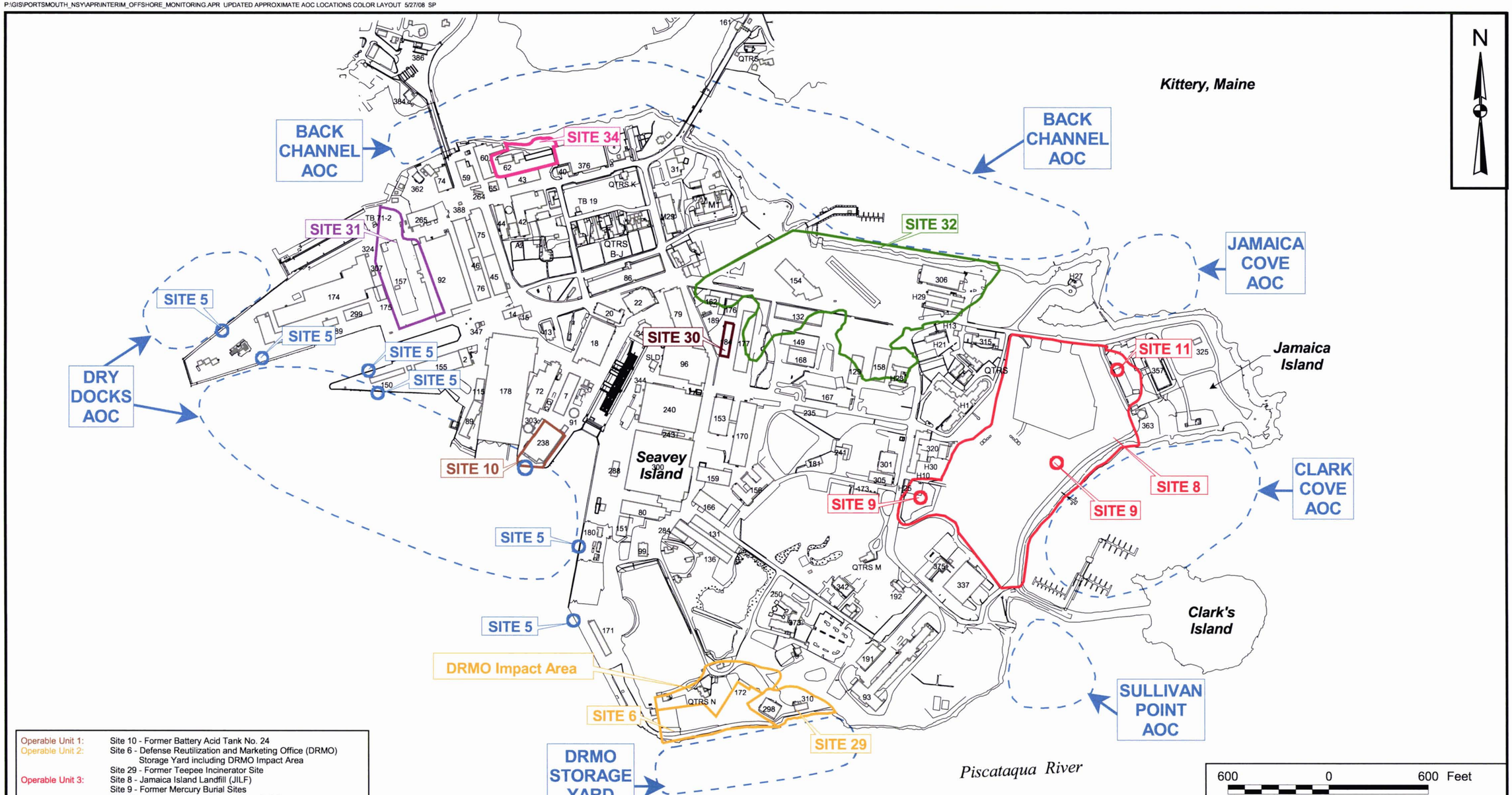


REFERENCE: THE ECOLOGY OF THE GREAT BAY ESTUARY, NEW HAMPSHIRE AND MAINE: AN ESTUARINE PROFILE AND BIBLIOGRAPHY, EDITED BY FREDERICK T. SHORT, UNIVERSITY OF NEW HAMPSHIRE JACKSON ESTUARINE LABORATORY, OCTOBER 1992

DRAWN BY HJP DATE 2/16/99	Tetra Tech NUS, Inc.	CONTRACT NO. 7090	OWNER NO. 0256
CHECKED BY DJC DATE 6/13/01	GREAT BAY ESTUARY AND SITE LOCATION PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE NOT TO SCALE		DRAWING NO. FIGURE 1-1	REV. 0

FORM CADD NO. TNNUS_AV.DWG - REV 0 - 1/22/98

P:\GIS\PORTSMOUTH_NSY\APR\INTERIM_OFFSHORE_MONITORING.APR UPDATED APPROXIMATE AOC LOCATIONS COLOR LAYOUT 5/27/08 SP



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 Sites
	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

Note: 2006 PNS Base Map

DRAWN BY S. PAXTON	DATE 7/20/07	Tetra Tech NUS, Inc.	CONTRACT NUMBER 0904	OWNER NUMBER CTO 443
CHECKED BY D. COHEN	DATE 5/27/07 updated 5/08	FACILITY SITE MAP PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY —	DATE —
COST/SCHEDULE-AREA			APPROVED BY —	DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 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, investigation, and schedule of SSAs. An SSI is used to determine whether an SSA requires further study in an RI/FS, further investigation, or no further action. SSAs that require further study in an RI/FS become AOCs. To most efficiently address the AOCs, AOCs have been combined where appropriate into OUs.

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 status for each site within the associated OU and the SSA are provided in Sections 2.2 through 2.9. Sites where NFA has been documented (see Section 1.0) are not discussed in this section.

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 on an OU-basis 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, & 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 Tanks Nos. 6 & 7

OU4

- Site 5 – Former Industrial Waste Outfalls
- Offshore Areas Potentially Impacted by PNS On-Shore 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. An FS is currently being prepared for OU1.

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 has historically been located within an industrial area. The site is located on fill material that was placed prior to the 1920s. Building 238, located on Site 10, was used for battery recharging operations that previously resulted in releases of hazardous materials. 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 are 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 and south. The southern portion of the western site boundary is formed by the Piscataqua River. 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.

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

Event	Date
Filling of area was conducted and area apparently used for berthing and/or launching boats	Before 1826 to 1860s and 1900s to 1915
Other industrial uses of area apparently began	1910s to 1920s
Building 238 built and lead-acid battery recharging operations began within the building	1955
Lead-battery acid wastes were discharged directly to the river (through an industrial waste outfall that is part of Site 5)	1955 to 1974
Lead-battery acid wastes discharged to underground storage tank (Battery Acid Tank No. 24) south of Building 238	1974 to 1984
Leak in underground tank discovered and use of tank discontinued	1984
Underground tank and surrounding contaminated soil removed	1986
RFI sampling conducted	1991
Additional sampling of soil and groundwater to determine nature and extent of contamination conducted at Site 10	1998, 2001, and 2006
OU1 RI Report finalized	July 2007
Draft OU1 FS Report submitted	April 2008

Building 238 was constructed in 1955. Lead-acid battery recharging operations were conducted within the building. Sulfuric acid used for the recharging was stored in large tanks inside Building 238. Large lead-acid storage batteries were drained inside Building 238, 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. A leak was discovered in the tank in 1984, and the tank and surrounding contaminated soil were removed in 1986 (TtNUS, June 2006a).

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 the fill material was rocky and ranged in thickness from

10 feet to 40 feet (particularly 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 the data for Site 10, it was determined that lead was the primary contaminant of concern, and in addition to soils in the area of the tank leak, soils 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 in soil in the areas with high concentrations of lead and on lead concentrations in groundwater were 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 was conducted in July and August 2006. The Navy finalized the RI Report (TtNUS, July 2007) and the Navy began preparation of the OU1 FS based on the results of the RI Report.

The offshore area of Site 10 is part of the Dry Dock AOC that was investigated as part of the EERA and is part of the more recent interim offshore 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). The offshore area is discussed as part of OU4 in Section 2.5.

2.3 OU2

OU2 consists of Site 6 – DRMO Storage Yard, including the DRMO Impact Area, and Site 29 – Former Teepee Incinerator Site. An RI/FS is currently being conducted for OU2.

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 the 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 the shoreline has shoreline erosion controls (riprap and a seawall). The shoreline controls that include riprap were placed along portions of the shoreline in 1999, 2005, 2006, and 2008 to provide shoreline protection along the OU2 shoreline. The OU2 shoreline is difficult and dangerous to access because of the strong river currents and the location at the base of a steep embankment. There is a small intertidal sediment area adjacent to OU2 to the east.

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

Event	Date
OU2 area filled with material excavated from Henderson's Point	1902 to 1905
DRMO activities began (stone crusher and scrap metal yard)	1920
Additional filling and disposal at OU2 (in waste disposal area)	1920 to 1975/1979
Seawall constructed	1940s
Coal and coke storage facility located at Site 6 (Building 172)	1942 to 1957
Sandblast grit (unused) storage located at Site 6 (Building 172)	1957 to 1960
Teepee Incinerator (Building 290) operated	1965 to 1975
Building 298 used as industrial waste treatment facility	1975 to 1980s
Hose handling facility located at Site 29 (Building 310)	1980 to present
Pesticide handling conducted at Building 314	1982 to 1995
Open storage of batteries at DRMO discontinued	1983
Environmental sampling began at OU2 (as part of FCS)	1984
RFI and RFI Data Gap investigation conducted at Site 6 (including what is now Site 29)	1989 to 1992 and 1995
DRMO capped as an interim corrective measure	1993
Clean closure under RCRA of industrial waste treatment facility (Building 298)	1997
Portion of Site 6 separated into a new site (Site 29) and field investigation at Site 29 conducted	1998
Emergency Removal Action (shoreline stabilization) at Site 6	1999
Excavation for utility trench at Building 298 conducted	2002
Draft FS prepared for OU2	2004
Soil washing treatability study conducted	2005
Emergency Removal Action (shoreline stabilization) conducted at Site 29/shoreline repairs completed	2005 and 2006/2008
Additional investigation at OU2 conducted	2007 to 2008
Draft Supplemental RI Report submitted	September 2008

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 have 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 was terminated in approximately 1983. In 1993, interim corrective measures were conducted for a portion of the DRMO (McLaren/Hart, April 1993) and 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 that was 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 in the waste disposal area. Onsite disposal reportedly ended in 1975 when trash was being taken off site 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; waste materials observed in the borings 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 ceased operations in 1975. The incinerator was apparently demolished soon after operations ended.

Building 298 was built in 1975 and was used as an industrial waste treatment facility until the 1980s. Industrial waste waters were treated in the facility and the treated effluent from the facility was discharged to the Shipyard's sanitary sewer system (and then the Kittery Municipal Treatment Plan). Sludge generated in the treatment process was disposed by a private contractor. Spill prevention and control methods were in place during operation of the facility and there were no releases that would affect soil or water outside the building. Clean closure under RCRA was documented in May 1997 and accepted by the

MEDEP in November 1997. The building is currently used as office space. In 2002, a utility trench was excavated to place new utilities to service the offices. The excavated soil was disposed as hazardous material, 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.

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 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 fill 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.

The 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 in groundwater are metals. OU2 has little natural areas that would be a habitat for onshore ecological receptors. The human health risk assessment (TtNUS, November 2000) indicated unacceptable risks for current and future potential receptors exposed to Site 6 or Site 29 soils; risks were acceptable for exposure to groundwater and soils in the DRMO Impact Area. Contaminant fate and transport modeling conducted for OU2 (TtNUS, December 1999) indicated that migration of groundwater to the offshore was not anticipated to impact the offshore. A draft FS was prepared for OU2 in 2004 (TtNUS, November 2004b) to identify and evaluate potential remedial options. Based on regulatory comments, the Navy determined that additional investigation to better define the extent of soil contamination at OU2 was necessary to refine potential remedial options in the FS. Additional groundwater data are also needed to address regulatory concerns regarding groundwater migration to the offshore. The Navy prepared a QAPP for the additional investigation at OU2 (including the area adjacent to the north of the DRMO fenceline) (TtNUS, October 2007), and field work was conducted from November 2007 to May 2008. The Navy is preparing a supplemental RI and revised draft FS based on the results of the additional investigation.

Sampling activities as part of the Additional Scrutiny Investigation for OU4 (discussed further in Section 2.5) included 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 the elevated metals (copper, lead, nickel) observed 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.

The offshore area of OU2 is part of the DRMO Storage Yard AOC that was investigated as part of the EERA and is part of the more recent interim offshore 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) and along the OU2 shoreline (mussel sampling locations) (TtNUS, November 2004a). The offshore area is discussed as part of OU4 in Section 2.5.

2.4 OU3

OU3 consists of Site 8 - JILF, Site 9 - Former Mercury Burial Sites (MBI and MBII), and Site 11 - Former Waste Oil Tanks Nos. 6 & 7. Post-remedial operation, maintenance, and monitoring (OM&M) is being conducted at OU3 (TtNUS, June 2006b).

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, and waste material extends under a portion of the paved area to the west of the building. Clark Cove is to the east of the landfill. The solid waste storage facility (Building 337) is located to the south. The Automotive Hobby Shop and hospital are located to the west. Waste material in the saturated zone extends under a portion of the paved area at the Automotive Hobby Shop. The current features reflect post-remedial construction conditions.

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

Event	Date
Use of underground storage tanks at Site 11 to store waste oil before offsite disposal began	1943
Landfilling of tidal flats east of Seavey Island and west - southwest of Jamaica Island began	1945
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
Dredged sediment from the Dry Dock area disposed at the JILF and landfilling of the area discontinued	1978
IAS identifies the JILF and MBI and MBII as sites	1983

Event	Date
Environmental investigations began at OU3 (as part of the FCS)	1984
Use of tanks at Site 11 discontinued and tanks and surrounding soil removed	1989
RFI and RFI Data Gap investigations conducted	1989 to 1992 and 1994
Pipe and blocks (three) removed from MBI and disposed off site	1994 and 1997
Geophysical survey of OU3 conducted	1998
Blocks (eight) removed from MBII and disposed off site	2000
Revised OU3 Risk Assessment and FS for OU3 prepared	2000
Test pitting investigation conducted based on results of geophysical survey; 40 drums containing non-hazardous material located and removed	2000
ROD for OU3 signed	2001
Phase I remedial design completed, evaluation of consolidation for MBII area and Jamaica Cove area conducted, and Phase II remedial design completed	2002
Significant construction of remedy started	2002
Changes to OU3 ROD documented in ESD documents	2003 and 2005
Remedy construction completed	2004
Remedial action construction report completed	2006
Post-remedial OM&M plan finalized without the Land Use Control Remedial Action Plan	2006
OU3 Rounds 1 and 2 post-remedial OM&M conducted	2006
First Five-Year Review Report completed	June 2007
OU3 Rounds 3 and 4 post-remedial OM&M conducted	2007
OU3 Round 5 post-remedial OM&M conducted	April to May 2008

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 the OU3 remedy, the landfill was 25 acres; however, landfill material from 3 acres adjacent to Jamaica Cove were 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 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. The tanks were removed intact along with surrounding soil in 1989. Soil contamination remaining in the vicinity of Site 11 appears to be landfill material mixed with petroleum materials that may have originated from spills during filling of the tanks formerly at Site 11.

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 survey, and test pitting investigation. Removal actions were also conducted to remove the vaults at MBI and MBII. As discussed in the OU3 ROD (Navy, August 2001c), OU3 is characterized as containing a large volume of low-level hazardous materials. There is no indication of residual contamination from Site 9 (mercury), and soil contamination remaining in the vicinity of Site 11 appears to be landfill material mixed with petroleum materials that may have originated from spills during filling of tanks formerly located at Site 11. 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 the 2000 test pitting at the JILF (in February/March), dioxin analysis of selected subsurface soil samples was conducted and low levels of dioxins were detected. The contamination distribution at the three sites 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 wastes in the landfill).

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. The United States Army Corps of Engineers performed 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 excavation and consolidation of material within the limits of the JILF, which was completed in 2002, and construction of the wetlands within the excavated area, which was completed 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) with the source control remedy (OU3). The OM&M program for OU3 was initiated in July 2006. 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 is preparing the Rounds 1 through 4 Data Evaluation Report. Round 5 sampling and inspection activities were conducted in April and May 2008, and Round 6 is planned for fall 2008.

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 review of OU3 is required by statute because hazardous substances, pollutants, or contaminants remain on site that do not allow for unlimited use and unrestricted exposure.

The offshore area of OU3 is part of the Jamaica Cove and Clark Cove AOCs that were investigated as part of the EERA and are part of the more recent interim offshore 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). The offshore monitoring results are discussed as part of OU4 in Section 2.5.

2.5 OU4

OU4 consists of the areas offshore of PNS that were potentially 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 before an FS is prepared. 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.

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

Event	Date
Outfalls in the Dry Dock area were used to discharge industrial wastes into the Piscataqua River	~1945 to 1975
Sanitary and storm sewer systems separated; industrial discharge through outfalls discontinued	Completed by 1975
Industrial waste outfalls first identified as a site and operations that previously discharged to the outfalls are identified (as part of the IAS)	1983
Environmental sampling began including the offshore (as part of FCS)	1984
Phase I and Phase II offshore sampling for the offshore human health and ecological risk assessments conducted	1991 to 1993
Final HHRA Report for Offshore Media completed	1994
Interim ROD for OU4 signed, interim offshore monitoring plan completed, and first round of sampling conducted	1999
EERA document finalized	2000
PRGs for OU4 developed	2001
Baseline evaluation of first four rounds of interim offshore monitoring data completed	2002
Evaluation of first seven rounds of interim offshore monitoring data completed, and stations requiring additional scrutiny and/or additional monitoring (as part of Rounds	2004

Event	Date
8 and 9) identified	
Work plan (QAPP) for the additional scrutiny investigation completed and Round 8 and additional scrutiny investigations conducted	2005
Additional scrutiny investigation report and work plan for second phase of additional scrutiny completed	2007
Phase II additional scrutiny investigation and Round 9 interim offshore monitoring conducted	November 2007 and April 2008

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. The most recent dredging occurred between January 2002 and April 2002, between Interim Offshore Monitoring Program Rounds 5 and 6 (TtNUS, November 2004a).

The AOCs were identified in the EERA sampling as nearshore habitats adjacent to PNS that may have been affected by onshore IRP sites. A conceptual model developed as part of the risk assessment was used to identify six AOCs, Clark Cove, Sullivan Point, DRMO Storage Yard, Dry Docks, Back Channel, and Jamaica Cove. 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 surface water were negligible to low, and the ecological risks associated with sediment were low to intermediate. 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 for exposure to sediment and surface were acceptable; risks for consumption of seafood exceeded regulatory guidelines. However, the human health risk assessment could not differentiate whether the chemicals that cause the risk were from PNS sources or from other sources within the lower Piscataqua River. Also, because risks are similar to or lower than other areas of the coastal waters of Maine, it would

not be feasible to address human health risk until an overall effort is made (by all contributors) to reduce contamination in the lower Piscataqua River (Navy, May 1999).

The Navy determined that interim monitoring was warranted for OU4 to provide current data on the offshore areas to determine whether onshore remedial actions, natural processes, and/or other sources have affected the chemical concentrations in OU4. Therefore, an Interim ROD for OU4 was signed in May 1999 that requires the Navy to conduct interim offshore monitoring for OU4 (Navy, May 1999).

The monitoring program initially included sediment, mussel, and juvenile lobster sampling and analysis (TtNUS, October 1999). The first round of interim offshore monitoring samples was collected in 1999. The data from Rounds 1 and 2 were used to develop PRGs for OU4 (TtNUS, November 2001). The PRGs 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 interim offshore monitoring 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) 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 were also made to only sample sediment during Rounds 8 and 9 (mussel samples will not be collected) and to discontinue alkylated PAH analysis of samples.

To address the additional scrutiny needs, a QAPP for the additional scrutiny activities was prepared in 2005 (TtNUS August 2005a), the 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 is planned for fall 2008.

A description and current status of each monitoring station are as follows:

- **MS-01**: This monitoring station is located in the Back Channel AOC, offshore of Site 34 (OU9) where a SSI was conducted in 2003 (TtNUS, August 2004). Additional scrutiny investigation was conducted at MS-01. Rounds 8 and 9 sampling were not required for MS-01. As discussed in Section 2.8, a

non-time-critical removal action was conducted for source material at Site 34, and additional sampling at MS-01 is planned as part of the OU9 RI.

- **MS-02 and MS-10**: These monitoring stations are located in the Back Channel and Sullivan Point AOCs, respectively. They are not located offshore of any known IRP sites. Additional scrutiny and Rounds 8 and 9 sampling were not required for these monitoring stations.

- **MS-03 and MS-04**: These monitoring stations are located in 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 metals at those stations. As discussed in Section 2.6, in June 2006, a time-critical removal action was conducted to provide shoreline erosion controls where significant erosion 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 scrutiny was recommended for these monitoring stations and activities for additional scrutiny will be identified and conducted as part of the Phase II RI field work for OU7. Rounds 8 and 9 sampling were not required for these monitoring stations.

- **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. Stations MS-05, MS-08, and MS-09 are offshore of OU3, and MS-06 and MS-07 are in the offshore area adjacent to OU3. As discussed in Section 2.4, remedial action was conducted at OU3, which 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. The construction activities apparently affected sediment concentrations in the offshore area within MS-05, MS-08, and MS-09. Additional scrutiny was recommended for these monitoring stations to determine the extent of sediment impact for MS-05 and MS-09 and to restart the trend line for all three stations (as part of Rounds 8 and 9 sampling). MS-06 and MS-07 do not appear to have been impacted by OU3.

- **MS-11**: This monitoring station is located in the DRMO Storage Yard AOC and is located offshore of OU2. As discussed in Section 2.3, 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 in the remaining portion of the OU2 shoreline (along portions of 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; the sediment concentrations at the other two locations (if sediment was present) are 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 are likely from erosion from OU2. Rounds 8 and 9 sampling were not required for MS-11.

- **MS-12**: This station is located in the Dry Dock AOC, offshore of Site 10 (OU1). As discussed in Section 2.2, there was one industrial waste outfall (Site 5) that discharged in the offshore area of Site 10 (apparently from Site 10 operations and other operations nearby). Lead-contaminated soil is present at Site 10 that is from a previous CERCLA release at the site; however, groundwater data from Site 10 do not indicate that the site is a current source to the offshore. 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 do not appear to be any 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, storm water outfalls located in the vicinity of the shipyard, and dock-side activities, to name a few. Additional scrutiny was required for MS-12 to determine the extent and potential sources of contamination. Rounds 8 and 9 sampling were not required for MS-12.

- **MS-13 and MS-14**: These stations are located in the Dry Dock AOC, to monitoring sediment potentially impacted by Site 31 (OU8). Industrial waste outfalls (Site 5) had discharge points in this area. 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 that may or may not be related to PNS include potential migration or transport from IRP sites, discharges from barges/boats, storm water outfalls located in the vicinity of the shipyard, and dock-side activities, to name a few. Rounds 8 and 9 sampling were required for these monitoring stations; additional scrutiny was not required.

2.6 OU7

OU7 contains Site 32 – Topeka Pier Site. An RI is currently being conducted for OU7.

Site 32 encompasses approximately 17 acres of filled land from just west of Building 162 to east of Building H29 and from the Back Channel south to Building 129 and is located on the northern shore of PNS as shown on Figure 1-2. The current land use includes office parking (about 35 percent of the site area), equipment storage, vehicle and rail car maintenance, transducer repair, boat launch, and temporary housing/Hospital Corps (Building H23, in the southeastern corner, is used to house transient Navy

personnel). OU7 is located along the Back Channel of the Piscataqua River. The pier and offshore areas are used for docking of boats.

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

Event	Date
Filling of area conducted	1900 to 1945
Lumber storage began (in southeastern corner of Site 32)	1910
Various buildings constructed related to lumber yard (to support WWI)	1920
Many of current buildings built (to support WWII)	1941 to 1945
Wastes from buildings discharged to river; discontinued when sanitary sewer system installed	1940s to 1970s
Building 306 constructed as a transducer repair facility	1980
Excavation work uncovered debris in area and Site 32 identified as site screening area	1994 to 1995
SSI and geophysical survey conducted	1998
Phase I of RI field work conducted	2003
Parking area repaved	2003/2004
Site 32 Phase I RI Data Package	January 2004
Emergency removal action (shoreline stabilization) conducted	June 2006

Filling 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 to the 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 along Goodrich Avenue and near Building H23 by the Shipyard 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 subsequently identified as OU7.

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), and Phase I of the RI in 2003 (TtNUS, January 2004 and June 2004). Phase II of the RI is planned for fall 2008.

Fill material 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. Groundwater is tidally influenced and flows toward the Back Channel. The majority of the 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 for all but one location. A soil boring was installed as part of the Phase I RI within the area of the 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. The storm sewers have outfalls in the Site 32 intertidal area. Most of these outfalls 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 considers the storm sewer outfalls as potential groundwater transport pathways in the RI for Site 32.

PAHs, PCBs, and metals are the main contaminants detected in soil at OU7; metals are the main contaminants detected in groundwater. Only metals were detected in outfall and surface water samples; however, the concentrations were less than risk-based screening levels. Based on the evaluation of Site 32 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 Navy is preparing a QAPP for the second phase of sampling.

During Phase I sampling, the presence of foundry slag and copper and nickel concentrations in sediment in the intertidal area of Site 32 were further investigated. The 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 that showed exceedances of ecological screening levels were located in the mid tide area and were bounded by samples 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. The Phase II RI field work will include sediment sampling to refine the extent of exceedances of ecological screening levels.

The offshore area of OU7 is part of the Back Channel AOC that was investigated as part of the EERA and is part of the more recent interim offshore 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). The offshore area is discussed as part of OU4 in Section 2.5.

2.7 OU8

OU8 contains Site 31 – West Timber Basin. An RI will be conducted for this site

OU8 is 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 removal in 2006. Building 92 located east of the former plate yard is the Structural Shop.

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

Event	Date
Wood storage and seasoning for shipbuilding conducted in the West Timber Basin	Early 1900s to 1913
Filling of the West Timber Basin began	1916
Quay wall installed to enclose the basin	1917
Metal washing plant (Building 110) constructed	1920s
Filling of basin continued	1920 to 1940

Buildings 110, 51, and 83 razed, pickling tanks adjacent to Building 110 removed, and train tracks constructed	1940
Building 92 extended over a portion of the timber basin	1940
Plate yard with pickling tanks and washing aprons active	1940 to 1960
Pickling tanks removed after use of plate yard discontinued	Unknown (after 1960)
Site screening investigation	1998
Removal of surface features and initial construction activities associated with expansion of Building 174	September to December 2006

During the early 1900s, wood for shipbuilding was stored and seasoned in the West Timber Basin. 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-product from the plant was 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. 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.

Environmental sampling at OU8 was conducted as part of the SSI in 1998 (TtNUS, May 2000). The investigation was conducted 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 be more likely to be found.

The investigation showed that fill material consists mostly of sand, silt, and rock fragments. Trace amounts of brick and other debris were also found in the subsurface fill material. The fill varies in thickness from 8.5 to 17.5 feet. 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.

The groundwater at OU8 appears to be tidally influenced and ranges from saline/brackish along the perimeter of the site to fresh/mildly brackish further in land. 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 appear to be 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 total groundwater (unfiltered) exceeding drinking water criteria and/or risk-based screening levels (although no clear correlation could be made as to those metals that exceed soil screening criteria and those that exceed groundwater criteria at individual sample locations) (TtNUS, May 2000).

Based on the results of the investigation, the site was recommended for further investigation as part of an RI. Soil (and fill material) at OU8 is covered by asphalt or buildings, OU8 is located in the CIA of PNS, and groundwater is not used for drinking. Therefore, site media do not pose an imminent concern. During preparation of schedules for the OUs at PNS, it was determined that OU8 had a lower priority than the other onshore Ous. Therefore, the start of the RI currently is planned for 2012.

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

2.8 OU9

OU9 contains Site 34 – Former Oil Gasification Plant, Building 62. An RI will be conducted for this site. Based on site conditions, the Navy determined that a non-time-critical removal action for the ash at the site to address the majority of potential risk is appropriate before conducting an RI for the site. The final action memorandum for the removal action (Navy, February 2006) was signed in February 2007, and the removal action was conducted in 2007. Preparation of the RI Work Plan began in 2008.

OU9 (Site 34) 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 are currently used by the Shipyard Public Works Department as a mini-bulldozer shop and for storage. A new parking garage is located east of the former

locations of Buildings 63 and 188. OU9 is in the 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.

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

Event	Date
Ash was generated during coal (fuel) combustion as part of the oil gasification process	1870s to early 1900s
Ash was generated during coal (fuel) combustion as part of the blacksmithing operation	1915 to 1930
Building 62 reportedly gutted by a fire	1919
Shipyard Public Works Department used Building 62 for storage	1930 to Present
Pesticides stored at Building 62	1960s to 1985
Site identified as site screening area and removal of six drums of ash (less than 2 cubic yards) from pile north of Building 62	1998 and 1999
Site screening investigation conducted and extent of ash investigated	2003 and 2004
Engineering Evaluation/Cost Analysis (EE/CA) for Site 34 prepared and public comment period held	2005
Design for removal action began	2006
Removal action conducted	2007

Building 62 (built in the late 1800s) and the more recent annex (built in the 1940s) are the most prominent features related to the use of the site. Ash was generated from the combustion of coal as part of the 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 the building fire) appears to have been deposited primarily north of Building 62, resulting in an ash pile. The pile is 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 Shipyard's Public Works Department. Pesticide storage activities were conducted in Building 62 in the 1960s and ended when a new pesticide control shop was built on the southern side of the Shipyard in 1985.

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 site screening

investigation), and an ash extent investigation in 2004. An EE/CA was completed in 2005 that recommended excavation and landfill disposal of the ash pile and ash exposed at 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 potential human health risks from exposure to ash material at the site because it contains PAHs and metals at 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 investigation (TtNUS, August 2004), the site was recommended for an RI to assess the potential risks from site operations. The Navy recommended a removal action be performed before the RI because the PAH and metals concentrations in the ash material are much greater than risk screening levels and would result in potentially unacceptable risks if the ash was uncovered. Because the majority of the contamination at the site appears to be associated with ash material, a removal action for the ash could address the majority of unacceptable risks at the site. The RI will address residual site-related risks after removal of the ash.

The offshore area of OU9 is part of the Back Channel AOC that was investigated as part of the EERA and is part of the more recent interim offshore 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). Based on the results of the most recent investigation at MS-01 in November 2007, investigation of the extent of PAH-contaminated sediment at MS-01 will be conducted as part of the OU9 RI. The offshore area is discussed as part of OU4 in Section 2.5.

2.9 SITE SCREENING AREA, SITE 30

Site 30 – Galvanizing Plant, Building 184, is a study area at PNS. This area is still 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 final action memorandum for the removal action (Navy, January 2006) was signed in June 2006.

Site 30 is located in the central portion of PNS as shown on Figure 1-2. Building 184 is used for industrial purposes (welding school), and 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.

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

Event	Date
Building 184 constructed as a galvanizing plant (acid proof pit used)	1943
Building 184 converted to an electrical testing facility (pit covered)	1946
Building 184 converted to clean room facility for cleaning metals parts (pit uncovered and used)	Between 1954 and 1956
Building 184 used as welding school (pit covered with concrete floor)	Early 1960s to present
Crystalline substance observed along edge of acid pit	1973
Crystalline substance observed and analyzed	1994 and 1996 to 1997
Site screening investigation conducted	1998
Test pit excavated within acid pit, and samples of fill material and crystalline substance analyzed	2001
EE/CA for Site 30 finalized and public comment period held	2005
Action memorandum for non-time-critical removal action signed	2006
Periodic removal of crystalline material by Shipyard	1997 to 2006
Removal of crystalline material and covering of affected area	2006
Regrading and repavement conducted outside Building 184 to redirect storm water runoff away from the building	2007

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. The building is still being used as a welding school (Navy, January 2006).

The specific types and quantities of chemicals used throughout the history of Building 184 are largely unknown. 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 as part of the electrical testing laboratory where large shock-testing and vibration-testing machines were used. Moulds and dies were stored in the area. The conditions of the acid pit and tank at the time of covering are unknown. The acid pit was then uncovered when the building was converted to a clean room facility. The pickling tanks within the pit were used for metal parts assembly in the clean room. Use of the pit and tanks was again discontinued when the building was converted to a welding school. The pit was filled and covered. 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, a water tank, an acid tank, and a 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 use 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. The former acid pit is currently covered by a concrete floor slab, and the boundaries are clearly delineated by a slightly raised floor slab and by the joints between the original adjacent floor and the slab placed over the former acid pit area. A wood-framed office structure, welding training booths, and various 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

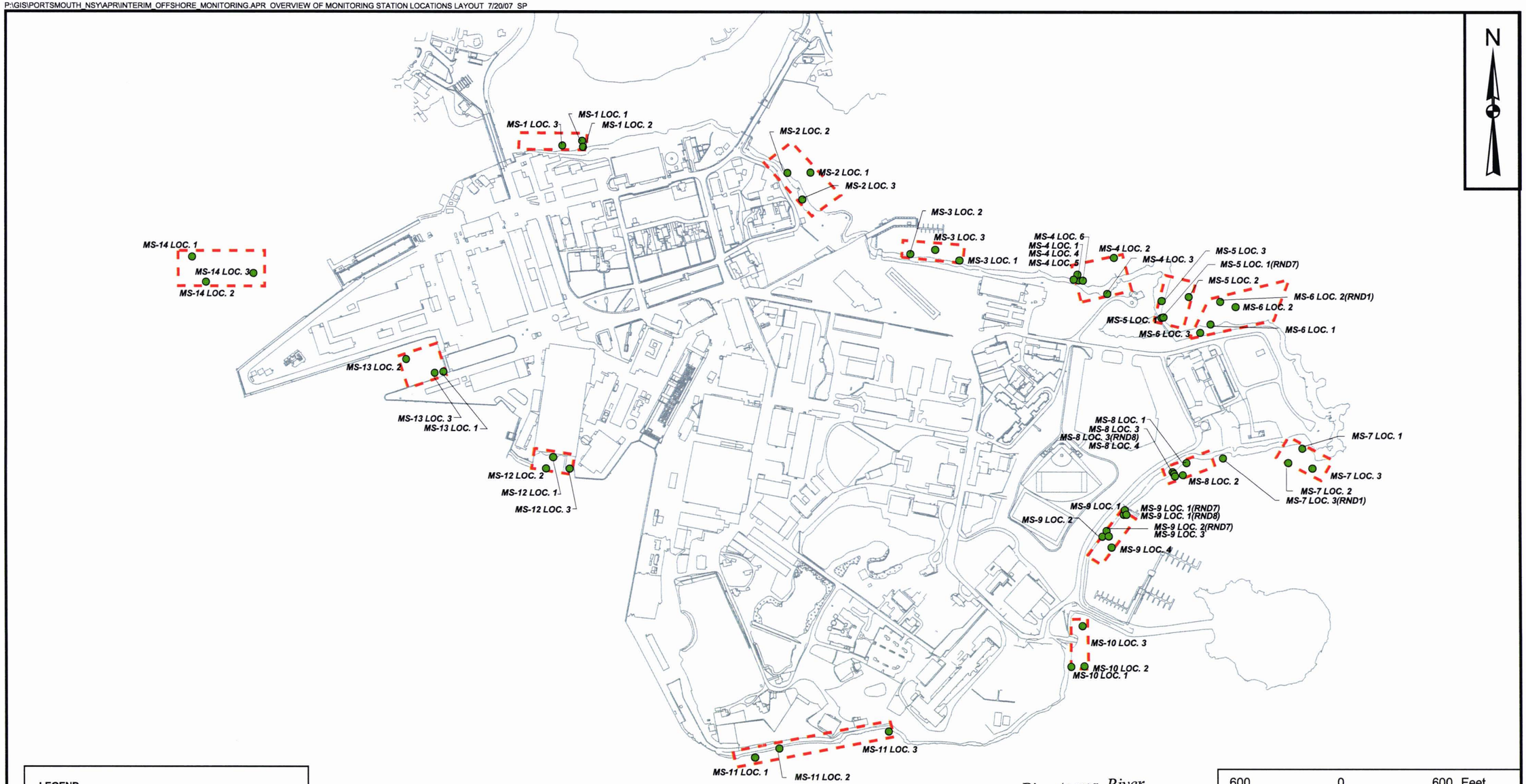
(TCLP) characteristics but may be hazardous based on the RCRA corrosivity criterion if brought in contact with water (Navy, January 2006).

Environmental investigations 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 that it might be necessary to perform 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 the Test Pitting Investigation, water was observed in the pit, and the water coming in contact with crystalline materials within the pit are 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 difference in elevations between the 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. Although it was determined that further work for Site 30 was a low priority compared to other IRP sites at PNS, 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 does 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, taking measures to minimize water entering the pit, and installation and operation of a pit dewatering system is planned until Building 184 operations are relocated and a permanent CERCLA remedy is determined.

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. The Navy is preparing to conduct additional measures to remove water from the pit in 2008.

P:\GIS\PORTSMOUTH_NSY\APR\INTERIM_OFFSHORE_MONITORING.APR OVERVIEW OF MONITORING STATION LOCATIONS LAYOUT 7/20/07 SP



LEGEND

- Sampling Location Within Monitoring Station (MS)
- Monitoring Station Location

Note: This figure shows all sample locations within each monitoring station collected as part of interim offshore monitoring.

DRAWN BY J. LAMEY	DATE 4/20/04	Tetra Tech NUS, Inc.	CONTRACT NUMBER 0904	OWNER NUMBER CTO 443
CHECKED BY D. COHEN	DATE 7/20/07	OVERVIEW OF INTERIM OFFSHORE MONITORING STATION LOCATIONS PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY —	DATE —
COST/SCHEDULE-AREA			APPROVED BY —	DATE —
SCALE AS NOTED			DRAWING 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

RCRA	Vs.	CERCLA	
RCRA Facility Assessment RFA		Preliminary Assessment/ Site Investigation PA/SI	• Identify releases needing further investigation
⇓		⇓	
RCRA Facility Investigation RFI		Remedial Investigation RI	• Characterize nature, extent, and rate of contaminant releases
⇓		⇓	
Corrective Measures Study CMS		Feasibility Study FS	• Evaluate/select remedy
⇓		⇓	
Corrective Measures Implementation CMI		Remedial Design Remedial Action RD/RA	• Design and implementation of chosen remedy

*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 conducting from 1995 to 1999, prior to the signing of the FFA. Site 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/relrisk_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:

Document	Date
Initial Assessment Study	June 1983
Final Confirmation Study Report on Hazardous Waste Sites	May 1986
RCRA Facility Assessment	July 1986
RCRA Facility Investigation (RFI) Proposal	August 1989
Addendum to RCRA Facility Investigation Proposal	February 1991
Interim Human Health Risk Assessment for Quarters S, N, and 68	April 1991
RCRA Facility Investigation Work Plan	August 1991
Work/Quality Assurance Project Plan for the Case Study for Estuarine Ecological Risk Assessment	September 1991
Interim Human Health Risk Assessment for the Day Care Center	October 1991
Revised Ambient Air Quality Monitoring Report (Section 11 of the RFI)	April 1992
Draft RCRA Facility Investigation Report	July 1992
Onshore Ecological Risk Assessment	August 1992
Interim Corrective Measures at the Defense Reutilization and Marketing Office	April 1993
Final Hazard Ranking System Package	May 1993
Addendum to RCRA Facility Investigation Report	June 1993
Background Soil Sampling Work Plan	August 1993
Work/Quality Assurance Plan for Phase II of Estuarine Ecological Risk Assessment Case Study	February 1994
Public Health and Environmental Risk Evaluation Part A: Human Health Risk Assessment Report	March 1994
Final Media Protection Standards Proposal for Onshore Media (Chapter 1)	April 1994
Final Human Health Risk Assessment Report for Offshore Media	May 1994
Media Protection Standards for Offshore Media: Sediment and Surface Water (Chapter 3)	June 1994
RFI Data Gap Work Plan	June 1994
Work Plan for Phase II Ambient Air Quality and Meteorological Monitoring Program	July 1994

Document	Date
Draft Revised Corrective Measures Study Proposal	July 1994
Draft Applicable or Relevant and Appropriate Requirements (ARARs) Report	September 1994
Estuarine Ecological Risk Assessment Phase I: Problem Formulation	December 1994
Draft Onshore Feasibility Study (FS) Report	March 1995
Draft Final Estuarine Ecological Risk Assessment (included in FFA, finalized May 2000)	July 1995
RCRA Facility Investigation (RFI) Data Gap Report	November 1995
Media Protection Standards for Offshore Media Based on Human Health Risks (Chapter 2)	April 1996
Phase II Ambient Air Quality and Meteorological Monitoring Report	June 1996
Community Relations Plan	October 1996
Consensus Document, No Further Action for Soils, SWMU 21	October 1996
Technical Memorandum on Seep Sampling	November 1996
Groundwater Investigation and Monitoring Plan (formerly titled Interim Groundwater Monitoring Plan)	November 1996
Onshore/Offshore Contaminant Fate and Transport Modeling Phase I Work Plan	December 1996
Draft Onshore/Offshore Contaminant Fate and Transport Modeling Phase I Report	February 1997
Technical Memorandum on Risk Evaluation of Surface Soils from Jamaica Island Landfill (JILF) Site	May 1997
Engineering Evaluation/Cost Analysis (EE/CA) for Mercury Burial Site I	June 1997
Decision Document, No Further Action, SWMUs 12, 13, 16, and 23	July 1997
Final Action Memorandum for Mercury Burial Site I	September 1997
MEDEP Evaluation of Heavy Metal Migration at Portsmouth Naval Shipyard with Geochemical Modeling	December 1997
Onshore/Offshore Contaminant Fate and Transport Modeling Phase I Report Addendum	December 1997
Work Plan, Teepee Incinerator (Site 29) and Building 238 (Site 10)	March 1998
Site Screening Process Plan	March 1998
Site Screening Work Plan, Building 184 (Site 30), West Timber Basin (Site 31), and Topeka Pier (Site 32)	April 1998
Final Work Plan for MTADS Geophysical Mapping	September 1998
Onshore/Offshore Contaminant Fate and Transport Modeling Phase II Work Plan	August 1998
Phase I/Phase II Offshore Data Comparative Analysis Report	October 1998
Proposed Plan for Interim Action at Operable Unit 4	October 1998
Interim Record of Decision for Operable Unit 4	May 1999

Document	Date
Technical Memorandum Lead Contamination at DRMO Impact Area (finalized February 2000)	July 1999
Groundwater Monitoring Summary Report	August 1999
Proposal for Evaluation of Seep/Sediment Data	September 1999

6.2 DOCUMENTS COMPLETED AFTER SIGNATURE OF FFA

The following documents were completed from October 1999 (after the FFA was signed) to September 30, 2008:

Document	Date
Interim Offshore Monitoring Plan for Operable Unit 4	October 1999
Removal Action Work Plan for DRMO Shoreline Stabilization	October 1999
Onshore/Offshore Contaminant Fate and Transport Phase II Modeling Report	December 1999
Technical Memorandum for Recommended Human Health Risk Assessment Protocol for OU2	December 1999
Technical Memorandum, Lead Contamination at DRMO Impact Area	February 2000
Final Work Plan for Mercury Burial Vault II and Drum Investigation	February 2000
Field Investigation Report, Site 10 (Building 238) and Site 29 (Teepee Incinerator)	March 2000
Site Screening Report, Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier)	May 2000
Facility Background Development	May 2000
Revised OU3 Risk Assessment	May 2000
Final Estuarine Ecological Risk Assessment	May 2000
Seep/Sediment Summary Report for Data Collected Between December 1996 and November 1997	August 2000
Test Pitting Investigation Report , Jamaica Island Landfill	October 2000
Revised OU2 Risk Assessment	November 2000
Feasibility Study Report for Operable Unit 3	November 2000
Proposed Remedial Action Plan for Operable Unit 3	January 2001
Work Plan for Building 184 Subfloor Investigation	February 2001
Final Action Memorandum for Site 6, Defense reutilization and Marketing Office (DRMO) Shoreline Stabilization	June 2001
Final Drum Removal Report for Drum Investigation	June 2001
Final Closeout Report for Mercury Burial Vault Site I	June 2001
Final Removal Action Report for Mercury Burial Vault Site II	June 2001

Document	Date
Operable Unit 3 Pre-design Investigation Quality Assurance Project Plan	August 2001
Record of Decision for Operable Unit 3	August 2001
Decision Document for Site 26	August 2001
Decision Document for Site 27	August 2001
Site 10 Additional Investigation Quality Assurance Project Plan	October 2001
Preliminary Remediation Goals for Operable Unit 4	November 2001
Final MTADS Geophysical Survey (of JILF and Topeka Pier)	December 2001
Test Pitting Investigation Report, Building 184, Site 30	May 2002
OU3 Phase I Remedial Design (specifications and plans)	June 2002
Technical Memorandum, OU3, Evaluation of MBII Waste Consolidation and Jamaica Cove Options	June 2002
Remedial Design Work Plan, Jamaica Island Landfill Phase I Waste Consolidation	June 2002
Baseline Interim Offshore Monitoring Report for Operable Unit 4	July 2002
Phase II, Operable Unit 3 Remedial Design Analysis Report (including drawings and specifications)	November 2002
Engineering Evaluation/Cost Analysis (EE/CA), Site 30 (Building 184)	December 2002
Final Remedial Design Work Plan for Jamaica Island Landfill Phase II Cap Construction	January 2003
Site 10 Additional Investigation Report	March 2003
Site 32 Remedial Investigation Quality Assurance Project Plan	March 2003
Site 34 Site Investigation Quality Assurance Project Plan	March 2003
Addendum to Site 32 Remedial Investigation Quality Assurance Project Plan	August 2003
Explanation of Significant Difference for the Record of Decision for OU3	September 2003
Former CDC Area Investigation Report	April 2004
Technical Memorandum, Recommendation regarding Phase II of the Remedial Investigation for Site 32	June 2004
Site Screening Investigation Report for Site 34	August 2004
OU2 Soil Sampling and Treatability Study Work Plan	November 2004
Rounds 1 through 7 Interim Offshore Monitoring Report for Operable Unit 4	November 2004
Additional Scrutiny Quality Assurance Project Plan for Operable Unit 4 (OU4)	August 2005
Engineering Evaluation/Cost Analysis (EE/CA) for Site 30 (Building 184) (Revision 1)	August 2005
Engineering Evaluation/Cost Analysis (EE/CA) for Site 34	September 2005
Explanation of Significant Difference for the Record of Decision for OU3	October 2005
Time Critical Removal Action Work Plan for DRMO (Site 29) Shoreline Stabilization	October 2005
OU2 Screening-Level Soil Washing Treatability Study Report	January 2006
Action Memorandum for Non-Time-Critical Removal Action for Site 30	January 2006

Document	Date
Action Memorandum for Non-Time-Critical Removal Action for Site 34	February 2006
Work Plan for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization	April 2006
OU3 Remedial Action Report (for the Jamaica Island Landfill Phase I Waste Consolidation and Phase II Cap Construction)	May 2006
Site 10 Data Gap Investigation Quality Assurance Project Plan	June 2006
Post-Remedial Operation, Maintenance and Monitoring Plan for OU3	June 2006
Five-Year Review Report for Portsmouth Naval Shipyard	June 2007
Remedial Investigation Report for Operable Unit 1	July 2007
Additional Scrutiny Report for Operable Unit 4	August 2007
Phase II Additional Scrutiny Quality Assurance Project Plan	September 2007
Operable Unit 2 Additional Investigation Quality Assurance Project Plan	October 2007
No Further Action Decision Document for Site 21 – Former Acid/Alkaline Drain Tank	February 2008
No Further Action Decision Document for the Jamaica Island Landfill Impact Area	February 2008
Closeout Report for Site 29 Removal of Waste Debris and Site 32 Shoreline Stabilization	June 2008
Closeout Report for Site 29 Removal Action Stabilization	July 2008

7.0 REFERENCES

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.]

Naval Research Laboratory, December 2001. MTADS Geophysical Survey of the Jamaica Island and Topeka 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.

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 Navel 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.

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.

U.S. 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 EVALUTION CONCEPT

A.2 RELATIVE RISK SITE EVALUATION QUESTIONS AND ANSWERS

APPENDIX A.1

RELATIVE RISK SITE EVALUTION CONCEPT

Office of the Deputy Under Secretary of Defense
(Environmental Security)

Defense Environmental Cleanup Program Fact Sheet

The Relative Risk Site Evaluation Concept

Introduction

The Department of Defense (DoD) considers environmental restoration as an integral part of its daily mission activities. At installations around the country, environmental restoration activities are underway to address contamination resulting from past DoD operations. Environmental analysis and cleanup activities address a wide variety of sites contaminated with fuels, solvents, chemicals, heavy metals, and common industrial materials.

Given the large number of sites to be addressed and limitations on money and people to work on these sites each year, DoD believes that a risk-based approach should be applied to work sequencing at active military installations, Base Realignment and Closure (BRAC) installations, and formerly used defense properties using relative risk as a key factor. The relative risk site evaluation framework described in this fact sheet provides a means of helping accomplish this objective.

The framework for evaluating site relative risk was published in September 1994, in the *Relative Risk Site Evaluation Primer (Interim Edition)* which contained instructions for performing relative risk site evaluations at sites across DoD. A revised edition of the Primer was issued in June 1996.

Definition of Relative Risk Site Evaluation

The relative risk site evaluation framework is a methodology used by all DoD Components to evaluate the relative risk posed by a site in relation to other sites. It is a tool used across all of DoD to group sites into high, medium, and low categories based on an evaluation of site information using three factors: the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF). Factors are based on a quantitative evaluation of contaminants and a qualitative evaluation of pathways and human and ecological receptors in the four media most likely to result in significant exposure—groundwater, surface water, sediment, and surface soils. A representation of this evaluation concept is presented in Figures 1 and 2. Figure 1 also depicts possible opportunities for stakeholder input into the technical evaluation.

The relative risk site evaluation framework is a qualitative and easy to understand methodology for evaluating the relative risks posed by sites and should not be equated with more formal risk assessments conducted to assess baseline risks posed by sites. It is a tool to assist in sequencing environmental restoration work (i.e., known requirements such as remedial investigation or cleanup actions) to be done by a DoD Component. It is designed to handle the broad range of sites that exist at DoD installations and the broad range of data available. The grouping of sites into high,

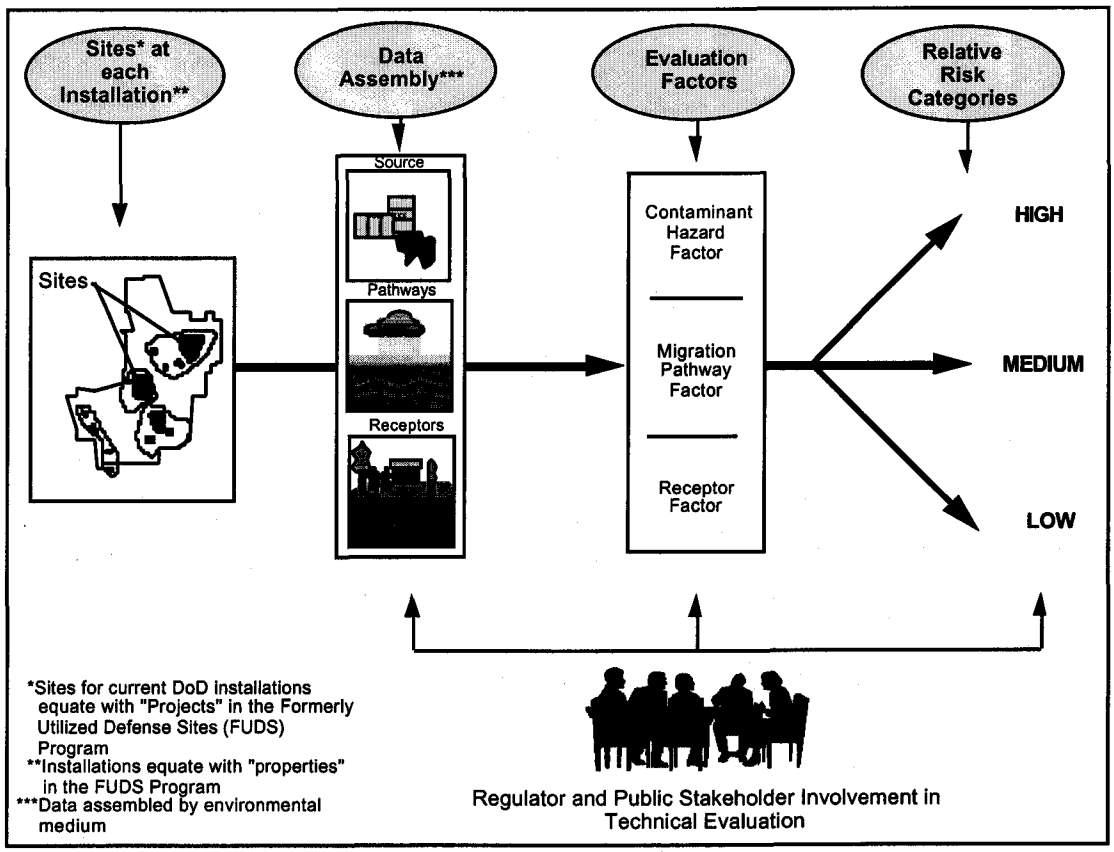


Figure 1. Relative Risk Site Evaluation Concept Summary

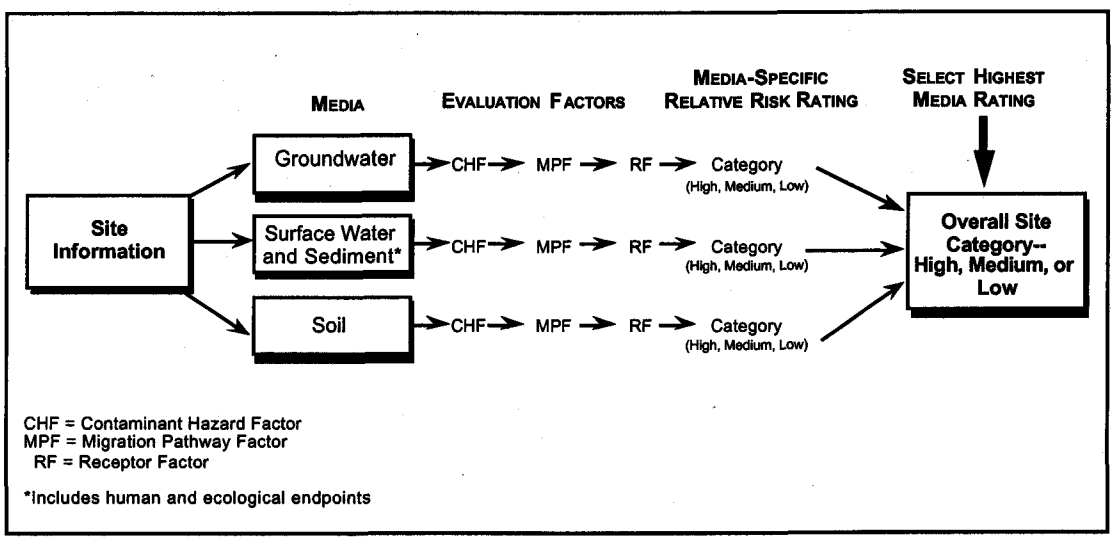


Figure 2. Flow Diagram of the Relative Risk Site Evaluation Framework

medium, or low relative risk categories **is not** a substitute for either a baseline risk assessment or health assessment; **it is not** a means of placing sites into a Response Complete/No Further Action category; and **it is not** a tool for justifying a particular type of action (e.g., the selection of a remedy).

Use of the relative risk site evaluation framework is restricted to environmental restoration sites and does not extend to unexploded ordnance (UXO) removal, building demolition/debris removal (BD/DR), potentially responsible party (PRP) activities, or compliance activities.

Relative Risk and Funding Decisions

Relative risk is not the sole factor in determining the sequence of environmental restoration work, but it is an important consideration in the priority setting process. It should be factored into all priority setting decisions, and should be discussed with regulators and public stakeholders in the environmental restoration process.

The actual funding priority for a site is identified after relative risk information is combined with other important risk management considerations (e.g., the statutory and regulatory status of a particular installation or site, public stakeholder concerns, program execution considerations, and economic factors). These additional risk management considerations can result in a decision to fund work at a site that is not classified as a high relative risk. DoD Components have each developed guidelines for combining relative risk and risk management considerations as part of their planning, programming, and budgeting process.

The relative risk site evaluation framework does not address the question of whether work is necessary at a site; it only provides information for use in helping to determine the general sequence in which sites will be addressed. At the DoD headquarters level, it also provides a framework for planning, programming, and budgeting requirements, a topic discussed below.

Requirements for Relative Risk Site Evaluations

Relative risk site evaluations are required for all sites at active military installations, BRAC installations, and formerly used defense properties that have future funding requirements that are not classified as (1) having "all remedies in place," (2) "response complete," (3) lacking sufficient information, or (4) abandoned ordnance. These four situations are discussed in the following four paragraphs.

Relative risk site evaluations are not required (NR) for sites classified as having all remedies in place (RIP) even though they may be in remedial action operation (RAO) or long-term monitoring (LTM). A RIP determination requires that remedial action construction is complete for a site.

Relative risk site evaluations are not required (NR) for sites classified as response complete (RC). Sites classified as RC are those where a DoD Component deems that no further action (NFA) is required with the possible exception of LTM. An RC determination requires that one of the following apply: (1) there is no evidence that contaminants were released at the site, (2) no contaminants were detected at the site other than at background concentrations, (3) contaminants attributable to the site are below action levels used for risk screening, (4) the results of a baseline risk assessment demonstrate that cumulative risks posed by the site are below established thresholds, or (5) removal and/or remedial action operations (RAOs) at a site have been implemented, completed, and are the final action for the site. Only LTM remains.

Relative risk site evaluations should be based on the information currently available on contaminants, migration pathways, and receptors. Sites lacking sufficient information for the conduct of a

relative risk site evaluation should be given a "Not Evaluated" designation and should then be programmed for additional study, a removal action if warranted, or other appropriate response action, including deferral, before they are evaluated.

Sites comprised solely of abandoned ordnance are not subject to the relative risk site evaluation described in this Primer. Such sites should be evaluated using a separate risk procedure, which is discussed in the management guidance cited above (Office of the Under Secretary of Defense [Environmental Security], 1994).

Implementation of the Relative Risk Site Evaluation Framework

DoD's goal is to conduct relative risk site evaluations at the field level with the involvement of the regulators and public stakeholders (see Figure 1). The technical evaluation of sites using the evaluation framework can serve as a basis for discussion and negotiation with regulators and public stakeholders. In particular, regulators and public stakeholders can help identify receptors, and can make judgments about the extent of contaminant migration in various environmental media at a site. Where they exist, Restoration Advisory Boards (RABs) are an excellent forum for obtaining public stakeholder input on these aspects of site relative risk. Other opportunities for public stakeholder involvement may also be appropriate. Regulators and public stakeholders should always be given the opportunity to participate in the development and review of relative risk site evaluation data before the data is used in planning and programming.

Management Uses of Relative Risk Information

DoD and DoD Components are using the relative risk site evaluation framework as a tool to help sequence work at sites and as a headquarters program management tool. As a program management tool, the framework is being used by DoD and DoD Components to periodically identify the distribution of sites in each of three relative risk categories—high, medium, and low. A series of discrete relative risk site evaluations provides headquarters program managers with a macro-level view of changes in relative risk distributions within DoD over time.

The relative risk site evaluation framework and resulting data also provide DoD with a basis for establishing goals and performance measures for the environmental restoration program. In this regard, DoD has established goals for all DoD Components to reduce relative risk at sites in Defense Environmental Restoration Account (DERA) and BRAC programs or to have remedial systems in place where necessary for these sites, within the context of legal agreements. DoD and DoD Components are tracking progress towards these relative risk reduction goals as one of several program measures of merit (MOMs) at the headquarters level. Another MOM tracks the number of sites where cleanup action has been taken and relative risk has been reduced in one or more media. Resultant information is used to provide the necessary feedback to develop and adjust program requirements and budget projections, as well as to assess whether established goals reflect fiscal reality.

For More Information

At the Installation, contact

At DoD Headquarters, contact the Office of the Deputy Under Secretary of Defense (Environmental Security - Cleanup) at 703/697-7475.

APPENDIX A.2

RELATIVE RISK SITE EVALUATION QUESTIONS AND ANSWERS

Office of the Deputy Under Secretary of Defense
(Environmental Security)

Defense Environmental Cleanup Program Fact Sheet

Relative Risk Site Evaluation Questions & Answers

Q.1 *How is relative risk information being used by the Department of Defense (DoD) and military services at the field and headquarters levels?*

A. Field activities within the DoD use relative risk information as one means of representing the status of their environmental restoration program to DoD, regulators, and local stakeholders. Information on site relative risk is used by each military installation or formerly used defense site, in conjunction with other risk management considerations, to help sequence work at sites in light of available resources within DoD.

Headquarters environmental restoration program offices within each military service collect relative risk information from each field activity to identify to Congress, regulators, and other stakeholders the distribution of sites in each of three relative risk categories– high, medium, and low. A series of discrete relative risk site evaluations provides headquarters program managers with a macro-level view of changes in relative risk distributions within DoD over time. In the event of budget cuts or recessions, Headquarters Program Offices will consider the relative risk of sites along with other risk management considerations in the resultant deferral of projects. In general, low relative risk sites will be deferred before medium relative risk sites, and medium relative risk sites will be deferred before high relative risk sites. At the installation or field level, specific work program adjustments will be made considering relative risk and other risk management concerns in the event that budget cuts or recessions occur.

Relative risk information will also be used to provide DoD with a basis for establishing goals and performance measures for the environmental restoration program. In this regard, DoD has established goals for all DoD Components to reduce relative risk at sites or to have remedial systems in place where necessary for these sites, within the context of legal agreements. Military services and DoD will track changes in relative risk towards these relative risk reduction goals as a measure of merit (MOM). Relative risk will not be used to set cleanup standards, nor will it be used as a basis for making remedial action decisions, remedy selection decisions, or no further action decisions.

Q.2 *How are other risk management considerations taken into account for priority setting?*

A. Relative risk is not the sole factor in determining the sequence of environmental restoration work, but it is an important consideration in the priority setting process. It should be

factored into all priority setting decisions, and should be discussed with regulators and public stakeholders in the environmental restoration process.

The actual funding priority for a site is identified after relative risk information is combined with other important risk management considerations (e.g., the statutory and regulatory status of a particular installation or site, public stakeholder concerns, program execution considerations, and economic factors). These additional risk management considerations can result in a decision to fund work at a site that is not classified as a high relative risk. Military services have each developed guidelines for combining relative risk and risk management considerations as part of their planning, programming, and budgeting process.

Q.3 *What is the role of the community in evaluating relative risk at sites?*

A. Community members of Restoration Advisory Boards and other members of the public participate in the technical evaluation of relative risk at a variety of levels depending on their desire for involvement. At some installations and formerly used defense sites, community members have received relative risk training and participate directly in the evaluation of relative risk factors for each environmental medium at a site. At other installations and formerly used defense sites, community members review and provide input into relative risk evaluations prepared by installation personnel. DoD intends to increase community input into relative risk evaluations at all installations and formerly used defense sites where there is sufficient interest. To increase community awareness of and access to guidance on performing relative risk site evaluations, DoD has placed the *Relative Risk Site Evaluation Primer* on the DoD Environmental Restoration Electronic Bulletin Board, a World Wide Web site at http://www.dtic.dla.mil/envirodod/envdocs.html.

Q.4 *What is the role of regulatory agencies in evaluating relative risk at sites?*

A. State and federal regulatory agency personnel are key participants in the relative risk evaluation process. Their involvement in this process largely depends on their degree of involvement in an environmental restoration program at a particular installation or formerly used defense site. At some installations or formerly used defense sites, regulatory agency personnel have received relative risk training and participate directly in the evaluation of relative risk factors for each environmental medium at a site. Discussions with regulatory agency personnel on relative risk at these training sessions and at project team meetings at installations have proven helpful in increasing regulatory acceptance of relative risk. DoD seeks to increase regulatory involvement in relative risk evaluations at all appropriate installations and formerly used defense sites.

Q.5 *How often will field activities need to conduct relative risk site evaluations?*

A. Relative risk at sites should be evaluated whenever important new information about a site becomes available. DoD will collect information on site relative risk from the military services on a semi-annual basis, once in the middle of the fiscal year and once at year end.

Q.6 *Will progress in the environmental restoration program be measured on the basis of Relative Risk?*

A. Yes, for the following reasons. Progress at sites in DERP has traditionally been measured by reporting on the response status of sites at the field and headquarters level (e.g., number of sites with responses complete). While these traditional measures of progress are still important measures, DoD planning guidance for Fiscal Years (FYs) 1998-2002 establishes goals for all military services to reduce relative risk at sites. The planning guidance specifically requires (1) military services to implement actions that lower relative risk for all high relative risk within specific time frames or have remedial systems in place where necessary for these sites, (2) implement actions that lower relative risk of all medium relative risk sites within a specific time frame or have remedial systems in place where necessary for those sites, and (3) implement actions that result in "response complete" for all relative risk sites within a set time frame.

Q.7 *Does relative risk site evaluation apply to sites at Base Realignment and Closure (BRAC) installations?*

A. Yes. DoD planning guidance requires that available restoration funds at BRAC installations be used to implement actions to lower relative risk for all high relative risk sites within specific time frames or have remedial systems in place where necessary for these sites.

Q.8 *What is the relationship between the Relative Risk Site Evaluation Framework and risk assessment?*

A. Relative risk evaluation and risk assessment share a common conceptual framework, but have significant differences in purpose and methodology. First and foremost, relative risk evaluation is not a substitute for a risk assessment. It is a screening-level evaluation of site information at a point in time based on three factors: the contaminant hazard factor (CHF), the migration hazard factor (MPF), and the receptor factor. In terms of hazard assessment, the relative risk framework uses maximum (worst-case) contaminant data, while risk assessment uses average and/or reasonable maximum concentrations of contaminants. For exposure assessment, the relative risk framework relies on a qualitative evaluation of fate and transport of contaminants away from a source, while risk assessment emphasizes quantitative predictions of contaminant fate and transport. In terms of toxicity assessment, both relative risk and risk assessment use similar data. The relative risk framework uses concentration standards *derived from* preliminary remediation goals that are calculated using the same toxicity data used in risk assessment. In terms of results, relative risk information is used at the field level to help sequence work at sites. Risk assessment results are typically used to determine whether or not additional response actions are warranted at a site.

Q.9 *Why were the Environmental Protection Agency (EPA) preliminary remediation goals (PRGs) multiplied by 100 for carcinogens?*

A. PRGs are concentrations of contaminants in a specific medium that have been estimated to (1) cause 1 excess cancer occurrence per 1,000,000 people over the course of a 70-year life-time or (2) cause non-cancer adverse effects (e.g., birth defects, neurological problems). These values have been calculated through the use of toxicity data found in EPA databases and by using conservative assumptions (e.g., a person will obtain all water for drinking and showering over a 30-year period

from the same source). The methods used by EPA for calculating "safe" doses for cancer-versus-noncancer effects differ dramatically. Noncancer effects have thresholds (levels of exposure that do not cause toxicity), while cancer effects are not assumed to have a threshold. The differing assumptions for noncancer and cancer effects mean that respective toxicities are handled differently when setting acceptable exposures. For cancer-inducing agents, mathematical formulas are used to determine acceptable exposure levels. For noncancer toxicants, a "reference dose" that is related to the threshold is used. Threshold doses are generally much higher than are doses that cause 1 in 1,000,000 cancer occurrences.

In Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-30, dated 22 April 1991, the *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, EPA states that action is generally not warranted if reasonable maximum contaminant exposures at a site are less than the reference dose or cause fewer than 1 in 10,000 excess cancer occurrences. This is consistent with the remedial action threshold for carcinogens defined in the Preamble to the National Oil and Hazardous Substances Pollution Contingency Plan (55 Federal Register 8716, March 8, 1990). This means that EPA has made the reference dose equivalent to 1 in 10,000 cancer occurrences for screening purposes. Because PRGs are reference doses and concentrations of contaminants that result in 1 in 1,000,000 cancer occurrences, the PRGs for cancer agents are 100 times smaller than the equivalence set by OSWER Directive 9355.0-30. Multiplying the cancer PRGs by 100 restores the equivalence for purposes of relative risk evaluation.

Q.10 *What is the relationship between Maximum Contaminant Levels (MCLs) and concentration standards in Appendix B-1?*

A. MCLs, established by EPA under the Safe Drinking Water Act, apply to water supplies used for human consumption. Under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), MCLs are often considered applicable or relevant and appropriate requirements for groundwater response actions. Some MCLs are risk-based, while others are technology-based. When compared to concentration standards in Appendix B-1, results are mixed. For noncancer toxicants, concentration standards in Appendix B-1 are generally equivalent to or lower than MCLs. For cancer-causing agents, concentration standards in Appendix B-1 (equivalent to 1 in 10,000 excess cancer occurrences) are in some cases above MCLs and in others below MCLs depending in part on whether the MCL is risk-based or technology-based.

Q.11 *Why is the threshold for the CHF rating of "significant" set at 100?*

A. The relative risk site evaluation framework is a programmatic tool used to categorize sites that have requirements for future work into three broad bands called "high," "medium," and "low." In order to place the CHF in the appropriate perspective, it is important to note that neither the intent nor the application of relative risk evaluation is to classify risk in an absolute sense that defines what remedial action is required. Decisions regarding future work are made

separately on the basis of a remedial investigation, baseline risk assessment, and evaluation of the acceptability of the calculated risk. As stated in response to Question 16, a low overall site rating is not equivalent to a no further action decision. Thus, the descriptors used in the relative risk evaluation process such as "significant," "moderate," and "minimal," as applied to the CHF ratios, and "high," "medium," or "low," as applied to the overall site rating, must be considered relative terms to be used only in the relative rating of the sites under consideration. If there is insufficient data to categorize a site, it is identified as "Not Evaluated."

The threshold values for the CHF descriptors were chosen as 2 and 100 such that when the site CHF was combined with the other site rating factors, an approximately equal distribution of sites among the three overall categories of "high," "medium," and "low" would result. This was determined by testing the framework with various values of CHF thresholds at thousands of DoD sites. Each of the three site-rating factors, which are based on the three elements of the conceptual site model used in a baseline risk assessment, are intended to have a balanced and appropriate impact on the final overall site rating. The balanced weighting of the three factors is illustrated (see Figure 7 in the Primer) by the fact that a "moderate" CHF will result in a "high" overall site rating if an "identified" receptor exists and the MPF is either "evident" or "potential." Even with a "potential" receptor, a "high" overall rating will result if an "evident" pathway exists for a site with a "moderate" CHF. (Also see Question 13.)

Q.12 *Does the Relative Risk Site Evaluation Framework consider wetlands as an ecological receptor?*

A. Wetlands, in the broad sense of the definition, are present at a large number of DoD sites. As a result, maximum resolution of sites on the basis of relative risk to human health and ecological receptors is obtained by considering wetlands as ecological receptors when they are part of sensitive environments such as critical habitats, marine sanctuaries, spawning areas, and other such environments listed in Table 2 of the Primer.

Q.13 *What is the rationale for the assignment of ratings to the 27 combinations of the three factors used in the Relative Risk Site Evaluation Framework?*

A. The bottom line answer is that for relative risk site evaluation to be a useful programmatic tool, it had to result in placing a significant distribution of the evaluated sites into each of the three broad categories of "high," medium," and "low." The thresholds for each category were established by evaluating data from all the services to ensure that there would be a distribution of sites into each category. The choices of categories for the 27 possible combinations of the three different site characterization factors (depicted in Figures 3 and 7 of the Primer) are based on a balanced consideration of the three factors as they describe the degree of completion of exposure of receptors to contaminants. The logic of the assigned categories is perhaps best understood by considering the combinations depicted in Figure 7 of the Primer in light of the exposure scenarios represented by each of the 27 possibilities.

With a significant CHF, which represents a concentration of contaminant that is two orders of magnitude above the concentration standard (see Appendix B of the Primer), any combination of evident or potential migration pathway with an identified or potential receptor is assigned to be in the high category. Any potential for exposure to contaminants at this high relative concentration will receive highest priority. Only if either the migration pathway is confined (no migration to a point of exposure) or the receptors are limited (little or no receptor access to site) is the site placed in a medium category. If both migration is unlikely and receptor access is unlikely, the site is assigned a low rating. In this case, the contaminant, though present at high concentrations, will not be exposed to receptors and can await cleanup while other sites with a more certain scenario for exposure are addressed.

Sites with a moderate CHF, where concentrations of contaminants exceed concentration standards by factors of 2 to 100, also receive high ratings if migration is evident and receptors are identified, if migration is evident and receptors are potential, or if migration is potential and receptors are identified. These situations all represent likely exposure scenarios to concentrations of contaminant that exceed the concentration standards by more than a factor of 2. If both the migration and the receptors are potential, exposure is less likely and a medium rating is assigned. If migration is evident, even if the receptor is judged to be limited, a medium rating is also assigned to allow for the existence of an unanticipated receptor. In the case of confined migration (no migration to a point of exposure), all receptor possibilities are assigned a low rating because exposure is unlikely. The combination of potential migration and limited receptors is also assigned a low rating.

With a low CHF, where measured concentrations are less than twice the concentration standard, only sites with both evident migration and identified receptors are assigned a high rating. A high probability of exposure, even to this relatively low concentration, received the highest priority. Evident migration with potential receptors or potential migration with identified receptors both receive a medium rating because of the likelihood of exposure, albeit to a relatively lower concentration of contaminant. All other possibilities with this relatively lower concentration of contaminant receive a low rating.

Q.14 *What happened to the Defense Priority Model (DPM)?*

A. In 9 November 1993, testifying before the Senate Committee on Energy and Natural Resources, Sherri Goodman, Deputy Under Secretary of Defense (Environmental Security) stated the following: "...concerns have been raised about the use of DPM for determining program priorities and DoD has decided not to use the model on a DoD-wide basis."

Q.15 *How does the Relative Risk Site Evaluation Framework relate to the Hazard Ranking System (HRS)?*

A. Both the HRS and evaluation framework are screening tools that can be used to evaluate relative risks at waste sites. The HRS is an EPA regulation (40 Code of Federal Regulations 300, Appendix A) used to place sites or aggregates of sites on the National Priorities List (NPL) if scores are above 28.5. Although the HRS has the capability to differentiate among the

relative risk of sites, it is more frequently applied to identify candidate installations for the NPL. The relative risk framework is a tool used to group sites in high, medium, and low relative risk categories to help sequence work at installations or former defense sites given the available resources. The HRS evaluates groundwater, surface water, soil, and air pathways and considers human and ecological receptors (called targets). Each pathway in the HRS is evaluated using three factor categories (likelihood of release, waste characteristics, and targets) each of which is subdivided into a number of factors tied to site-related information. The relative risk framework evaluates groundwater, surface water, and surface soils and considers human and ecological receptors. Both the HRS and relative risk use toxicity data from EPA databases for assessing contaminants; however, only the HRS takes waste quantity into account. The HRS assigns a single score to a site between 0 and 100 from a one-time ranking that becomes permanent. The relative risk framework assigns a site a high, medium, or low rating at a point in time, but allows for re-evaluation of a site when important new information becomes available. HRS ranking is detailed, time-intensive, and requires significant support documentation. In addition, HRS evaluations are typically not specific to sites when applied to military installations. HRS evaluations are based on an aggregation of sites across an installation. Relative risk evaluation is simpler and more transparent than HRS evaluation, is applied site by site, but is subject to more judgment.

Q.16 *Will "low" relative risk sites be addressed or will they be deferred indefinitely?*

A. A low relative risk site is not equivalent to a no further action site. Appropriate response actions will be programmed for all low relative risk sites as dictated by available resources and other risk management considerations.

Q.17 *Does the Relative Risk Site Evaluation Framework apply to ordnance and explosive wastes?*

A. The relative risk evaluation framework applies specifically to hazardous, petroleum, and radioactive waste sites in the environmental restoration program. A separate methodology has been developed for grouping ordnance and explosive waste sites into high, medium, and low categories. This methodology is based on safety concerns, and results are tracked separately from other sites.

Q.18 *When are relative risk site evaluations not performed?*

A. Relative risk site evaluations are not required at sites classified as (1) having "all remedies in place," (2) "response complete," (3) lacking sufficient information, or (4) abandoned ordnance. These four situations are discussed in section 1.4 of the Primer.

APPENDIX B

PNS RELATIVE RISK SITE EVALUTION RANKING WORKSHEETS

Site # - SITE NAME	RANK
Site 5 - Former Industrial Waste Outfalls	High
Site 6 – DRMO and Impact Area	High
Site 8 – JILF and Impact Area	High
Site 9 – Former Mercury Burial Sites (MBI and MBII)	Low
Site 10 – Former Battery Acid Tank No. 24	High
Site 11 – Former Waste Oil Tanks Nos. 6 & 7	High
Site 21 – Former Acid/Alkaline Drain Tank	Low
Site 26 - Portable Oil/Water Tanks	Low
Site 27 - Fuel Oil Spill Area (Berth 6 Industrial Area)	High
Site 29 – Former Teepee Incinerator Site	High
Site 30 – Former Galvanizing Plant, Building 184	High
Site 31 – Former West Timber Basin	Low
Site 32 - Topeka Pier Site	High
Site 34 – Former Oil Gasification Plant, Building 62	High

RELATIVE RISK SITE EVALUATION SUMMARY

Site	Media	RF	MPF	CHF	CHF	Media Rank
5	SEDH	I	E	3.4	Mod	High
	SEDEM	I	E	250	Sig	High
6	GW	I	E	23	Mod	High
	SWH	I	E	< 1	Min	High
	SWEM	I	E	< 1	Min	High
	SEDH	I	E	3.5	Mod	High
	SEDEM	I	E	260	Sig	High
	SOIL	P	P	670	Sig	High
8	GW	I	E	68	Mod	High
	SWH	I	E	< 1	Min	High
	SWEM	I	E	640	Sig	High
	SEDH	I	E	3.5	Mod	High
	SEDEM	I	E	150	Sig	High
	SOIL	I	E	7.0	Mod	High
9	GW	L	C	< 1	Min	Low
	SOIL	L	C	2.7	Mod	Low
10	GW	I	E	41	Mod	High
	SEDH	I	E	< 1	Min	High
	SEDEM	I	E	8.0	Mod	High
	SOIL	P	P	490	Sig	High
11	GW	I	E	8.5	Mod	High
	SOIL	I	P	14	Mod	High
21	SOIL	P	C	4.9	Mod	Low
26	SEDH	I	C	3.5	Mod	Low
	SEDEM	I	C	35	Mod	Low
27	GW	I	E	1100	Sig	High
	SOIL	P	E	2.2	Mod	High
29	GW	I	E	26	Mod	High
	SOIL	I	E	520	Sig	High
30	GW	P	P	1.8	Min	Low
	SOIL	I	P	10	Mod	High
31	GW	L	P	27	Mod	Low
	SOIL	P	C	41	Mod	Low

RELATIVE RISK SITE EVALUATION SUMMARY

Site	Media	RF	MPF	CHF	CHF	Media Rank
32	GW	P	P	70	Mod	Medium
	SWEM	I	E	24	Mod	High
	SEDEM	I	E	1200	Sig	High
	SOIL	P	P	36	Mod	Medium
34	SEDEM	I	E	330	Sig	High
	SEDH	I	E	3.1	Mod	High
	SOIL	I	E	41	Mod	High

LEGEND

Site = Solid Waste Management Unit

Media

SEDH = Sediment, Human
SEDEM = Sediment, Ecological Marine
GW = Groundwater
SWH = Surface Water, Human
SWEM = Surface Water, Ecological Marine

RF = Receptor Factor

I = Identified
P = Potential
L = Limited

MPF = Migration Potential Factor

E = Evident
P = Potential
C = Confined

CHF - Contaminant Hazard Factor

Sig = Significant (CHF > 100)
Mod = Moderate (CHF of 2 to 100)
Min = Minimal (CHF < 2)

PORTSMOUTH NAVAL SHIPYARD
INSTALLATION RESTORATION PROGRAM

RELATIVE RISK SITE EVALUTION
SITE RANKING

APP Covers FY09 SMP Rev. 0

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 9/9/96

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SEDH SEDEM

Site (Name/RMIS ID) / Project for FUDS: SWMU 00005

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: INDUSTRIAL DISCHARGE

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Several discharge points for storm and sanitary sewer water discharges to the Piscataqua River were located at the western end of the Shipyard. During 1945 to 1975 industrial wastes were discharged to the river. Materials disposed: Industrial wastes from plating and battery shops including: industrial wastewater (metals, oils, greases, PCBs, cyanide and phenols), solvents and heavy metals The use of these outfalls was terminated in 1975.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Surface water/sediment: Releases were to the Piscataqua River which is part of the Great Bay Estuary. Sediment and surface water has been impacted. In 1976, as part of a study for a proposed dredging project to deepen the berths, sediments in the areas of berths 6,11, & 13 were sampled and analyzed. The results indicated the presence of metals, oils, grease, PCBs, cyanide and phenols. The river as part of the estuary is a resource of tremendous value. Current use of the area includes commercial and recreational fishing, lobstering, clamming/oystering, and boating.

Brief Description of Receptors (Human and Ecological):
Human: Impacts on human health include ingestion of lobster, mussel and fin fish; demal contacts from surface water and sediments and surface water from swimming, wading and fishing. Ecological: There are five main habitats in the estuary: Eelgrass, mudflats (unvegetated), saltmarshes, channel, and shellfish (part of other habitats). Ecological receptor specifically include: lobster, shellfish, finfish, and other benthic fauna and flora.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Mercury and compounds (inorganic)	0.67	23.0	0.030
Polychlorinated biphenyls (PCBs)	0.35	20.0	0.020
Zinc	530.0	22,000.0	0.020
		Total:	3.380

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Studies of offshore media and biota indicate presence of contamination in the sediments.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Receptors include recreational and occupational contact with contaminated sediments and co - nsumption of seafood taken from the Piscataqua River.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00005 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
DDT	0.13		65.000
Chrysene	3.2	0.06	53.330
Pyrene	10.0	0.35	28.570
Phenanthrene	6.2	0.22	27.560
Fluoranthene	14.0	0.6	23.330
Benz[a]anthracene	3.6	0.23	15.650
Polychlorinated biphenyls (PCBs)	0.35	0.05	7.000
Chlordane, alpha-			6.000
Benzo[a]pyrene	2.2	0.4	5.500
DDE	0.01		5.000
		Total:	253.680

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100):

Minimal (If Total < 2):

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential:

Confined:

Brief Rationale for Selection: Offshore investigations have found contamination present in the media and biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential:

Limited:

Brief Rationale for Selection: Receptors include Piscataqua River biota from direct uptake and food chain ingestion.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00005 Sediment Marine Category: High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 5/16/95

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SWH SWEM SEDH SEDEM SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00006

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: STORAGE AREA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Approximately 2 acres of land which for more than 30 years has served as a temporary storage area for material prior to off-site disposal. Until 1983, there were few release controls at the storage yard. Ponding of precipitation in some areas and direct runoff to the Piscataqua River occurred during that era. Contamination occurred from open storage of batteries and other materials such as oil-laden tool and die scrap metals. In 1993 an interim corrective action was taken and a cap was installed on the unpaved sections of the yard. The cap consisted of a geocomposite clay liner, with geotextile above and below and topped with 12 inches of cursed stone choked with cement. Also a storm water catch basin with a trapped outlet was installed to trap floating contaminants such as oil and to discharge the storm water to the river. RMIS site type:

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The site is at the edge of the Piscataqua River and above the former elevation of the shoreline. Previous to the installation of the cap in 1993 surface storm water infiltrated with little resistance through the surface soils, the blocky rock material beneath and into the river. The tidal fluctuations of the river essentially represent the groundwater under the storage yard. Surface water/sediment: Contaminated surface water and suspended sediment has reached the river through runoff and direct discharge to the river as well as percolation through the surface soils and blocky rock material in the subsurface. Soil: Metal contaminated soil mantles the bedrock over an area approximately 780 feet long by 160 feet wide.

Brief Description of Receptors (Human and Ecological):
Human: The receptors to the contaminants which migrated to the river would be finfish, shell fish and other biota within the Piscataqua River, eventually reaching humans through consumption. In addition the potential exists for the ingestion and adsorption of contaminated surface soils. The installation of the interim cap in 1993 was designed to stop particles from: (a) becoming windborn, (b) percolating through the surface soils and into the rocky subsurface and (c) being carried into the river via runoff. Ecological: There are five main habitats in the estuary: Eelgrass, mudflats (unvegetated), saltmarshes, channel, and shellfish (part of other habitats). Ecological receptors include: lobster, shellfish, fin fish, and other benthic fauna and flora., etc.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	49.2	4.0	12.300
Dichloroethane, 1,2- (EDC)	73.0	12.0	6.080
Arsenic (cancer endpoint)	14.8	4.5	3.290
Mercury and compounds (inorganic)	4.5	11.0	0.410
Cadmium and compounds	4.5	18.0	0.250
Selenium	42.8	180.0	0.240
Acetone	48.0	610.0	0.080
Chromium (total)	14.95	180.0	0.080
Copper and compounds	112.0	1,400.0	0.080
Nickel and compounds	14.87	730.0	0.020
		Total:	22.860

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - 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

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of contamination.

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Groundwater flows into the Piscataqua River and contamination is available for uptake by plants and animals.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	255,000.0	400.0	637.500
Antimony and compounds	580.0	30.0	19.330
Aroclor-1254	7.5	0.97	7.730
Arsenic (cancer endpoint)	83.8	21.0	3.990
Benzo[a]pyrene	13.0	5.6	2.320
Nickel and compounds	2,670.0	1,500.0	1.780
Mercury and compounds (inorganic)	13.8	23.0	0.600
Cadmium and compounds	13.3	37.0	0.360
Benzo[b]fluoranthene	12.0	56.0	0.210
Benz[a]anthracene	7.7	56.0	0.140
		Total:	674.450

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

Potential - 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

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: Surface soil samples indicate presence of contamination. Interim cap covers unpaved portions of the site except adjacent to the shoreline.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: Occupational exposure to personnel working on site.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00006

Soil Category: High
(High, Medium, Low)

Surface Water Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Nickel and compounds	0.05	730.0	
Lead		4.0	
		Total:	

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): ____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could by due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: Studies of the Piscataqua River media and biota indicate contamination is present.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: ____

Limited: ____

Brief Rationale for Selection: Receptors include Piscataqua River plant and animal life and humans consuming seafood or contacting the surface water.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Surface Water Human Category:** High
(High, Medium, Low)

Surface Water Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Nickel and compounds	0.05	8.3	0.010
Lead		8.5	
		Total:	0.010

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Studies of the Piscataqua River media and biota indicate contamination is present.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Surface Water Marine Category:** High (High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (I) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Chromium (total)	211.0	3,000.0	0.070
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Mercury and compounds (inorganic)	0.67	23.0	0.030
Polychlorinated biphenyls (PCBs)	0.35	20.0	0.020
		Total:	3.450

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): ____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: Offshore investigations have found contaminated sediments and biota present.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: ____

Limited: ____

Brief Rationale for Selection: Recreational and occupational exposure.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00006 **Sediment Human Category:** High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
DDT	0.13		65.000
Chrysene	3.2	0.06	53.330
Pyrene	10.0	0.35	28.570
Phenanthrene	6.2	0.22	27.560
Fluoranthene	14.0	0.6	23.330
Benz[a]anthracene	3.6	0.23	15.650
Polychlorinated biphenyls (PCBs)	0.35	0.05	7.000
Chlordane, alpha-			6.000
Benzo[a]pyrene	2.2	0.4	5.500
DDE	0.01		5.000
		Total:	256.320

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100):

Minimal (If Total < 2):

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential:

Confined:

Brief Rationale for Selection: Offshore investigations have indicated contaminants present in the sediment and biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential:

Limited:

Brief Rationale for Selection: Biota present within the Piscataqua River.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00006

Sediment Marine Category: High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 10/11/97

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SWH SWEM SEDH SEDEM SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00008

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: LANDFILL

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
The JILF covers approximately 25 acres of filled land. Prior to landfilling activities tidal flats with tidal drainage channels separated Jamaica Island from Seavey Island. From 1945 to 1978 this area was filled with general refuse, trash, construction rubble and various industrial wastes. In 1978 a 2-acre foot thick clay cap and clay barrier wall were constructed around a portion of the landfill that accepted dredge spoils. The JILF is now covered with topsoil, pavement or rock and used as recreational, parking and equipment laydown areas, respectively. Groundwater at JILF varies from brackish to fresh and is not used as a source of drinking water. The groundwater at the JILF varies spatially and seasonally from fresh to brackish to seawater-like.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The groundwater of the island, specifically under JILF is impacted by the landfilled constituents. While the groundwater is not used or intended to be used for drinking water purposes and is separate from the mainland groundwater, there is communication of the groundwater with the estuarine river While no contamination exists which indicates the need for any prompt remedial action, seeps of groundwater are discharging contaminants to the Piscataqua River. Ongoing offshore studies will indicate the need for consideration of groundwater seeps. Soil: Possible occupational and recreational exposure if the surface soils are disturbed.

Brief Description of Receptors (Human and Ecological):
Human: Groundwater is not used on the Shipyard and there is no evidence to indicate that there is any additonal risk to human health from exposure to surface soils during recreational use of the area. Ecological: Groundwater seeps and contaminated sediments are making some impacts on the estuarine flora and fauna as some stress is thought to exist in mussels and eelgrass. Human and ecological receptors from past migration of contaminants include Piscataqua River biota and human consumption of seafood from the area.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Naphthalene	140.0	6.2	22.580
Aroclor-1254	13.0	0.73	17.810
Lead	49.2	4.0	12.300
Dichloroethane, 1,2- (EDC)	73.0	12.0	6.080
Arsenic (cancer endpoint)	14.8	4.5	3.290
Benz[a]anthracene	14.5	9.2	1.580
Benzo[b]fluoranthene	14.0	9.2	1.520
Chloroform	10.0	16.0	0.630
Ethylbenzene	530.0	1,300.0	0.410
Mercury and compounds (inorganic)	4.5	11.0	0.410
		Total:	67.910

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - 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

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of contamination.

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Groundwater flows into the Piscataqua River and contamination is available for uptake by biota.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Groundwater Category:** High (High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Copper and compounds	12,200.0	2,800.0	4.360
Lead	339.0	400.0	0.850
Arsenic (cancer endpoint)	14.2	21.0	0.680
Aroclor-1254	0.65	0.97	0.670
DDT	19.0	170.0	0.110
Cadmium and compounds	3.2	37.0	0.090
Benzo[a]pyrene	0.43	5.6	0.080
Zinc	1,250.0	22,000.0	0.060
Mercury and compounds (inorganic)	1.3	23.0	0.060
Benzo[b]fluoranthene	0.51	56.0	0.010
		Total:	6.970

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Surface soil samples indicate the presence of contamination. Exposure through contact, in - gestion or inhalation is possible.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Receptors include persons working or living on the shipyard.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00008 Soil Category: High
(High, Medium, Low)

Surface Water Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Nickel and compounds	0.05	730.0	
Lead		4.0	
		Total:	

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): ____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Confined - Information indicates a low potential for contamination to a potential point of exposure (could by due to the presence of geological structures or physical controls)

Potential - 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

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: Studies of the Piscataqua River media and biota indicate presence of contamination.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Limited - Little or no potential for receptors to have access to surface water

Potential - Potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: ____

Limited: ____

Brief Rationale for Selection: Receptors include Piscataqua River plant and animal life and humans consuming seafood or c - ontacting surface water and sediments.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00008 **Surface Water Human Category:** High (High, Medium, Low)

Surface Water Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Dieldrin	1.1		550.000
DDT	0.04		36.000
Mercury	0.7	0.03	28.000
Copper and compounds	30.8	2.9	10.620
Nickel and compounds	42.3	8.3	5.100
Zinc	413.0	86.0	4.800
Lead	36.5	8.5	4.290
Polychlorinated biphenyls	0.05	0.03	1.700
Mirex			0.250
Chromium VI and compounds	7.7	50.0	0.150
		Total:	641.460

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: Studies of the Piscataqua River media and biota indicate the presence of contamination.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Receptors include Piscataqua River biota exposed to surface water.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00008 Surface Water Marine Category: High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Chromium (total)	211.0	3,000.0	0.070
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Mercury and compounds (inorganic)	0.67	23.0	0.030
Zinc	530.0	22,000.0	0.020
		Total:	3.450

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Studies of the Piscataqua River media and biota indicate the presence of contamination.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Recreational and occupational exposure.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00008 Sediment Human Category: High (High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Chrysene	3.2	0.06	53.330
Pyrene	10.0	0.35	28.570
Fluoranthene	14.0	0.6	23.330
Benz[a]anthracene	3.6	0.23	15.650
Polychlorinated biphenyls (PCBs)	0.35	0.05	7.000
Benzo[a]pyrene	2.2	0.4	5.500
Mercury and compounds (inorganic)	0.67	0.15	4.470
Zinc	530.0	120.0	4.420
Lead	124.0	35.0	3.540
Nickel and compounds	91.2	30.0	3.040
		Total:	150.120

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100):

Minimal (If Total < 2):

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential:

Confined:

Brief Rationale for Selection: Studies of the Piscataqua River indicate the presence of contamination in the sediment and biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential:

Limited:

Brief Rationale for Selection: Receptors include Piscataqua River biota exposed to sediments.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00008

Sediment Marine Category: High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 10/16/97

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00009

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: SURFACE DISPOSAL AREA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
At 2 locations within the boundaries of SWMU 8, the Jamaica Island Landfill, mercury waste consisting of such materials as spent fluorescent bulbs, broken or discarded thermometers and thermostats, mercury switches, and mercury-contaminated rags, brooms, and dust pans used for cleanup of spills, was enclosed in steel drums and encased in large concrete blocks or pipes sealed at both ends with concrete. At the east location concrete blocks were found intact and therefore left in place and the concrete pipe was removed because the integrity of the concrete ends was questioned. At the west location no concrete blocks or pipes could be found despite three attempts. Sampling of excavated soil material and nearby monitoring wells at both locations indicated there have been no releases of mercury at either the west or east mercury burial sites.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The groundwater is common to the groundwater of SWMU 8, the Jamaica Island Landfill. If releases occurred to the groundwater the contaminants would be contained within the groundwater beneath the mercury burial site and host Jamaica Island Landfill with some discharge occurring through the saltwater freshwater interface boundary between the island and the Piscataqua River. Soil: At the east location the soils consist of brown to grey silty clay with debris consisting of reinforcing rods, roots, gravel and concrete. At the west location the soils are primarily spent sandblast grit with some sandy clay and significant debris consisting of steel rod, gravel and concrete. At both location the soil is underlain by former tidal flat highly organic clay soil deposits.

Brief Description of Receptors (Human and Ecological):
Human: Unless exploratory excavations are conducted there would be no human receptors to any potential contaminants contained within the concrete blocks or pipes. The soils are not contaminated from the disposed material and furthermore there would be no exposure unless excavation is conducted.
Ecological: Since there is no indication of any releases to the surrounding soil there is no potential for release to the surrounding ecology.
At the east location the blocks are above the ground water piezometric level. At the west location there is a potential that the unkown location of the disposed concrete blocks could be physically located below the groundwater and thereby have the means to release contaminants to the groundwater. However, there is no indication of any releases in the nearby monitoring wells.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Mercury and compounds (inorganic)		11.0	
		Total:	

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - 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

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Receptors include ocupational exposure if vaults are excavated and opened.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: _____

Limited: X

Brief Rationale for Selection: **Mercury contamination is not being detected outside the mercury burial vaults.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00009 **Groundwater Category:** Low
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	12.0	5.6	2.140
Benzo[b]fluoranthene	14.0	56.0	0.250
Benz[a]anthracene	14.0	56.0	0.250
Benzo[k]fluoranthene	10.0	560.0	0.020
Chrysene	12.0	5,600.0	
		Total:	2.660

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Receptors include occupational exposure if vaults are excavated and opened.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: _____

Limited: X

Brief Rationale for Selection: **Receptors include occupational exposure if excavation occurred.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00009 **Soil Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/19/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SEDH SEDEM SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00010

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: UNDERGROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
An underground 9680-gallon steel storage tank located outside of Bldg. 238 used for holding waste battery acid resulting from battery rebuilding operations. The unit and battery operations have been closed. In 1984 an approximate 2-inch diameter hole was discovered in the bottom of the tank. The volume of the tank would vary according to rise and fall of the tidal changes of the adjacent river. The tank was taken out of service in 1984 and removed in 1986. The area has subsequently been covered with asphalt paving. Materials disposed: Sulfuric battery acid contaminated with lead. Dates of operation: 1974-1984.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: The leaking storage tank was reportedly located below the groundwater table. The tank is located within 20 feet of the edge of the shoreline of the river and the area is likely in direct communication with the tidal action of the river, the contaminants would have had direct access to the estuarine river. Soil: Soils surrounding the area loamy clay mixed with rocky debris.

Brief Description of Receptors (Human and Ecological):
Contaminants released from the tank to the river would be exposed to the seafood chain which would include: shellfish, finfish, lobster and other benthic organisms. Humans could become exposed through seafood consumption or occupational exposure to soils or groundwater during excavation work.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Manganese	2,050.0	110.0	18.640
Lead	65.4	4.0	16.350
Iron	52,400.0	11,000.0	4.760
Chromium VI and compounds	79.3	180.0	0.440
Vanadium	101.0	260.0	0.390
Nickel and compounds	201.0	730.0	0.280
Barium and compounds	276.0	2,600.0	0.110
Mercury and compounds (inorganic)	0.29	11.0	0.030
Zinc	129.0	11,000.0	0.010
Thallium	86.6		
		Total:	41.000

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - 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

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Metal contamination is present in the soil, potential to leach into the groundwater exists -

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Groundwater reaching the Piscataqua River would be available for uptake by the plant and a - nimal life and humans consuming seafood.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00010 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	172,000.0	400.0	430.000
Antimony and compounds	1,580.0	30.0	52.670
Mercury and compounds (inorganic)	30.0	23.0	1.300
Iron	24,100.0	22,000.0	1.100
Arsenic (cancer)	23.1	21.0	1.100
Vanadium	109.0	520.0	0.210
Barium and compounds	887.0	5,200.0	0.170
Copper and compounds	486.0	2,800.0	0.170
Manganese and compounds	328.0	3,100.0	0.110
Cadmium and compounds	3.9	37.0	0.110
		Total:	487.120

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: Soil samples indicate the presence of contamination. Site is currently covered with asphalt pavement.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: Occupational exposure during work which could disturb the soils in the area.

Activity Name: KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00010

Soil Category: High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	124.0	400.0	0.310
Zinc	530.0	22,000.0	0.020
		Total:	0.330

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Studies of the Piscataqua River indicate the presence of contamination in the sediment and biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Receptors include seafood consumption and recreational or occupational exposure to sediments.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00010 Sediment Human Category: High (High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Zinc	530.0	120.0	4.420
Lead	124.0	35.0	3.540
		Total:	7.960

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Studies of the Piscataqua River indicate the presence of contaminants in the sediment and - biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Receptors include Piscataqua River biota.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00010 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 10/17/95

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00011

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: UNDERGROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Two 8,000-gallon underground steel tanks from railroad cars were buried side by side toward the eastern end of the Shipyard near SWMU 8, Jamaica Island Landfill. The tanks were used to temporarily store waste oils and solvents both potentially contaminated with various metals. In 1979 and again in 1986 the tanks were inspected for leaks and found to be sound. The inspection in 1979 was an actual exhumation and reburial and it was stated "no evidence of releases" at that time. The inspection in 1986 included a tightness test. The tanks were removed in 1989 and at that time the tanks appeared to be sound and neither showed signs of leakage or deterioration. Therefore, soil contamination is believed to have occurred by occasional spillage from over-filling.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Groundwater: When the tanks were removed in 1989 inspection of the excavated area revealed that the groundwater table was approximately 6 feet from the surface and at the "spring line" or half way up the diameter of the removed tanks. Soil: The excavated area exhibited soils indicative of loamy soil which had been previously tansported to provide proper support as fine-grained material to surround the buried tanks. The walls of the excavated material were representative of heterogeneous material at other locations of the landfill consisting of clayey, silty sand containing random rock, gravel, construction debris, wire and other steel debris. The soil had the appearance and smell of a high content of petroleum contamination.

Brief Description of Receptors (Human and Ecological):
Human: The area is covered with concrete and/or asphalt pavement. Ecological: As a potential contributor of contaminants to the groundwater in the area and because it is speculated at this time that the groundwater flow eventually reaches the back bay, SWMU 11 has the potential to contribute contaminants to the flora and fauna of the back bay and the Piscataqua River.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Benzo[a]pyrene	4.8	0.92	5.220
Aroclor-1254	1.3	0.73	1.780
Aroclor-1242	0.78		0.780
Benz[a]anthracene	4.8	9.2	0.520
Benzene	4.8	39.0	0.120
Dichlorodifluoromethane	25.0	390.0	0.060
Toluene	21.0	720.0	0.030
Dichloroethane, 1,1-	14.0	810.0	0.020
Xylene (mixed)	14.0	1,400.0	0.010
Methylphenol, 4-		180.0	
		Total:	8.540

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - 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

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Monitoring wells on-site and down gradient indicate contamination has migrated away from t - he site.**

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer)

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Groundwater flows toward the Piscataqua River and contamination would be available for upt - ake by plants and animals.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00011 **Groundwater Category:** High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Aroclor-1254	13.0	0.97	13.400
Lead	339.0	400.0	0.850
Benz[a]anthracene	10.0	56.0	0.180
		Total:	14.430

(1) Evaluate for human contaminants only .
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: Surface soils samples indicate contamination. Site is currently covered with pavement.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Receptors include occupational exposure to persons disturbing the soils.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SWMU 00011 Soil Category: High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 10/16/97

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00021

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: UNDERGROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
A 695 gallon steel underground storage tank located adjacent to building 75. This tank was in use from 1974 to 1991 and received waste water from air filter cleaning, deburring machines and acid/alkaline metal cleaning. Removed in 1991 the tank had large holes in both ends. The tank contents were analyzed and determined to be non-hazardous. Four soil samples were taken prior to backfilling.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Site is within an industrial area and currently covered with pavement.

Brief Description of Receptors (Human and Ecological):
Occupational exposure during work which could disrupt pavement.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	22.0	5.6	3.930
Benz[a]anthracene	34.0	56.0	0.610
Benzo[b]fluoranthene	18.0	56.0	0.320
Benzo[k]fluoranthene	43.0	560.0	0.080
Chrysene	34.0	5,600.0	0.010
		Total:	4.940

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Soil samples indicate the presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Occupational exposure during work which could disrupt pavement and soil.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00021 **Soil Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 3/30/98

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SEDH SEDEM

Site (Name/RMIS ID) / Project for FUDS: SWMU 00026

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: ABOVE GROUND STORAGE TANK

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Portable oil/water tanks were staged at the submarine berths since the 1960s to receive liquids pumped from the submarine bilges. Oil/water wastes containing acid and alkaline cleaning solutions are then pumped into rail cars for proper disposal. Occasional overflows in the past resulted in wastes flow into the adjacent Piscataqua River, pavement prevented wastes from infiltrating into the soil.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Wastes entering into the Piscataqua River would impact the plant and animal life and humans consuming seafood.

Brief Description of Receptors (Human and Ecological):
Plant and animal life within the Piscataqua River and humans consuming seafood caught from this area.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Arsenic (cancer endpoint)	28.7	21.0	1.370
Aluminum	77,900.0	75,000.0	1.040
Benzo[a]pyrene	2.2	5.6	0.390
Lead	124.0	400.0	0.310
Mercury and compounds (methyl)	0.67	5.5	0.120
Chromium (total)	211.0	3,000.0	0.070
Benz[a]anthracene	3.6	56.0	0.060
Nickel and compounds	91.2	1,500.0	0.060
Cadmium and compounds	2.0	37.0	0.050
Zinc	530.0	22,000.0	0.020
		Total:	**3.540**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

Potential - 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

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contaminants in the sediment and -** biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Limited - Little or no potential for receptors to have access to sediment

Potential - Potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Occupational and recreational exposure to sediments as well as consumption of seafood.**

Activity Name: KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00026 **Sediment Human Category:** Low
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	124.0	8.0	15.500
Nickel and compounds	91.2	8.0	11.400
Zinc	530.0	86.0	6.160
Phenanthrene	6.2	5.0	1.240
Fluoranthene	14.0	16.0	0.880
Cadmium and compounds	2.0	9.0	0.220
Aldrin	0.02	1.0	0.020
DDE	0.01	14.0	
Hexachlorobenzene	0.01		
Polychlorinated biphenyls (PCBs)	0.35		
		Total:	**35.420**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: **Studies of the Piscataqua River indicate the presence of contamanation in the sediment and -** biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Piscataqua River biota exposed to the sediment.**

Activity Name: KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00026 **Sediment Marine Category:** Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 4/14/95

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SWMU 00027

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): FS

RMIS Site Type: POL (PETROLEUM/LUBRICANTS) LINES

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Site was location of #6 oil pipeline from 1920s to 1978. In 1978 the pipeline ruptured and released oil into the soil. A section of the pipeline was removed in 1978 and the pieline was taken out of service. This site is adjacent to the Piscataqua River.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Area is covered with asphalt pavement and contains many utility lines. Groundwater from site flows into Piscataqua River.

Brief Description of Receptors (Human and Ecological):
Groundwater is not currently a source for drinking water. However it can reach the Piscataqua River and impact aquatic life.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L.	Standard ug/L.	Ratio (2)
Lead	4,500.0	4.0	1125.000
Dichloroethane, 1,2- (EDC)	24.0	12.0	2.000
Chromium (total)	139.0	180.0	0.770
Cadmium and compounds	11.0	18.0	0.610
Mercury and compounds (inorganic)	4.7	11.0	0.430
Trichloroethane, 1,1,2-	6.0	20.0	0.300
Beryllium and compounds	21.3	73.0	0.290
Cobalt	509.0	2,200.0	0.230
Nickel and compounds	27.0	730.0	0.040
		Total:	1129.670

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - 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

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of con - tamination.

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Contaminated groundwater could flow directly into the Piscataqua River and be available fo - r uptake by plant and animal life.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00027

Groundwater Category: High
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	632.5	400.0	1.580
Cadmium and compounds	5.9	37.0	0.160
Manganese and compounds	422.0	3,100.0	0.140
Copper and compounds	306.0	2,800.0	0.110
Zinc	1,510.0	22,000.0	0.070
Benzo[a]pyrene	0.23	5.6	0.040
Nickel and compounds	60.0	1,500.0	0.040
Mercury and compounds (inorganic)	0.51	23.0	0.020
Chromium (total)	66.4	3,000.0	0.020
Barium and compounds	93.8	5,200.0	0.020
		Total:	**2.230**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): ____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: **Soil samples indicate presence of contamination.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: ____

Potential: X

Limited: ____

Brief Rationale for Selection: **Receptors include occupational exposure from excavations or utility work in the area.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SWMU 00027 **Soil Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/19/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00029

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA RI/FS

RMIS Site Type: BURN AREA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Historical research shows site was previously used as a site for open pit and "teepee" incinerator burning of wastes. Ash and residues were removed and placed in SWMU 8. This area is on reclaimed land which aerial photographs indicate received Shipyard wastes. Filling occured while site was used for open burning of wastes.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Exposure can occur through contact with soils. Site covered with buildings and pavement, some grassy areas remain. Migration to the river is possible via groundwater or erosion of soils.

Brief Description of Receptors (Human and Ecological):
Occupational exposure to personnel working on or near the site during operations which disrupt the soil. Groundwater at site may also be impacted and migrating to the Piscataqua River.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	49.2	4.0	12.300
Dichloroethane, 1,2- (EDC)	73.0	12.0	6.080
Arsenic (cancer)	14.8	4.5	3.290
Copper and compounds	1,400.0	1,400.0	1.000
Manganese and compounds	1,670.0	1,700.0	0.980
Antimony and compounds	12.2	15.0	0.810
Mercury	4.5	11.0	0.410
Cadmium and compounds	4.5	18.0	0.250
Selenium	42.8	180.0	0.240
Iron	1,840.0	11,000.0	0.170
		Total:	25.930

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

Potential - 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

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Monitoring wells on-site and adjacent to the Piscataqua River indicate the presence of contamination.

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Groundwater flows into the Piscataqua River and contamination is available for uptake by plants and animals.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00029 **Groundwater Category:** High (High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	116,000.0	400.0	290.000
Antimony and compounds	5,720.0	30.0	190.670
Copper and compounds	47,800.0	2,800.0	17.070
Iron	258,000.0	22,000.0	11.730
2,3,7,8-TCDD (dioxin)			5.590
Arsenic (cancer)	38.0	21.0	1.810
Cadmium and compounds	51.0	37.0	1.380
Nickel and compounds	1,870.0	1,500.0	1.250
Manganese and compounds	3,180.0	3,100.0	1.030
Vanadium	250.0	520.0	0.480
		Total:	523.680

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

Potential - 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

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: Surface soils indicate contamination is present and have not been been isolated to minimiz - e exposure to workers.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: Workers in the area of the site may be exposed through inhalation or dermal contact.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SITE 00029

Soil Category: High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/18/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00030

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA PA

RMIS Site Type: PLATING SHOP

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Building 184 is currently used as a welding school for navy employees. Previously the site was used for galvanizing and metal cleaning. A yellow powderery efflorescence has appeared at the joint between the wall and the floor at the location where an acid dip tank was located. This substance has a very low pH (2.3) and cadmium, chromium, barium and lead were found in TCLP tests of this powder.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Primary pathway of concern is exposure to workers in building.

Brief Description of Receptors (Human and Ecological):
Occupational exposure.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	3.6	4.0	0.900
Manganese and compounds	1,100.0	1,700.0	0.650
Iron	2,120.0	11,000.0	0.190
Bis(2-ethylhexyl)phthalate (DEHP)	6.0	480.0	0.010
Phenol	0.9	22,000.0	
Butyl benzyl phthalate	0.9	7,300.0	
Zinc	11.0	11,000.0	
		Total:	1.750

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): X

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - 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

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: Potential for leaching to groundwater exists.

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: Water may eventually reach Piscataqua River.

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00030 **Groundwater Category:** Low
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	24.0	5.6	4.290
Dibenz[ah]anthracene	7.6	5.6	1.360
Iron	27,800.0	22,000.0	1.260
Lead	394.0	400.0	0.990
Arsenic (cancer)	15.7	21.0	0.750
Benzo[b]fluoranthene	24.0	56.0	0.430
Benz(a)anthracene	20.0	56.0	0.360
Aluminum	19,900.0	75,000.0	0.270
Indeno[1,2,3-cd]pyrene	14.0	56.0	0.250
Manganese and compounds	717.0	3,100.0	0.230
		Total:	10.480

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Direct occupational exposure to workers within Building 184 through inhalation or dermal c - ontact.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Direct occupational exposure to workers within Building 184.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00030 **Soil Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 2/19/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): GW SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00031

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA PA

RMIS Site Type: LANDFILL

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

Point of Contact (Name/Phone): Marty Raymond

National Priority List (Y/N): Yes **Site Rank:** Low

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Historical information indicates this site was used as a landfill during early part of this century. The site is currently covered by buildings and pavement. Direct exposure is unlikely except for excavation work.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
The site may impact the plant and animal life and humans consuming seafood in the vicinity of the site.

Brief Description of Receptors (Human and Ecological):
Human: Construction exposure to workers during excavation. Plant and animal life within the Piscataqua River and humans consuming seafood caught from this area.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Arsenic (cancer)	48.6	4.5	10.800
Lead	35.7	4.0	8.930
Manganese and compounds	9,730.0	1,700.0	5.720
Iron	9,930.0	11,000.0	0.900
Aluminum	4,950.0	37,000.0	0.130
Barium and compounds	279.0	2,600.0	0.110
Mercury and compounds (inorganic)	0.45	11.0	0.040
Selenium	4.3	180.0	0.020
Butyl benzyl phthalate	11.0	7,300.0	
Thallium	48.6		
		Total:	26.660

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - 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

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection:

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: _____

Limited: X

Brief Rationale for Selection:

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00031 **Groundwater Category:** Low
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	9,080.0	400.0	22.700
Iron	133,000.0	22,000.0	6.050
Mercury and compounds (inorganic)	109.0	23.0	4.740
Arsenic (cancer)	45.6	21.0	2.170
Benzo[a]pyrene	8.6	5.6	1.540
Copper and compounds	4,090.0	2,800.0	1.460
Manganese and compounds	1,150.0	3,100.0	0.370
Dibenz[ah]anthracene	1.6	5.6	0.290
Aluminum	22,100.0	75,000.0	0.290
Nickel and compounds	342.0	1,500.0	0.230
		Total:	40.820

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: _____

Confined: X

Brief Rationale for Selection: Soil excavations and historical evidence indicate the West Timber Bas was used as a landfi - ll.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: Receptor includes occupational exposure if excavation occured.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SITE 00031

Soil Category: Low
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Location (State): ~~NH~~ ME

Site (Name/RMIS ID) / Project for FUDS: SITE 00032

RMIS Site Type: LANDFILL

Point of Contact (Name/Phone): Marty Raymond

Date Entered (Day, Month, Year): 5/24/99

Media Evaluated (GW, SW, Sediment, Soil): GW SEDEM SOIL

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): CERCLA PA

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): Yes

National Priority List (Y/N): Yes **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Historical information this site had been used as a landfill and salvage area early in 1900s.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
Contact with soils and groundwater.

Brief Description of Receptors (Human and Ecological):
Occupational and residential exposure from Shipyard workers and family housing residents.

---

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt
A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the
(or RFA) phase that has not been entered into RMIS.

Ground Water

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Lead	195.0	4.0	48.750
Manganese	1,070.0	110.0	9.730
Arsenic (cancer)	41.2	4.5	9.160
Iron	17,000.0	11,000.0	1.550
Copper and compounds	496.0	1,400.0	0.350
Nickel and compounds	128.0	730.0	0.180
Aluminum	2,770.0	37,000.0	0.070
Barium and compounds	128.0	2,600.0	0.050
Zinc	532.0	11,000.0	0.050
Mercury and compounds (inorganic)	0.46	11.0	0.040
		Total:	69.930

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.

Potential - 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

Confined - Information indicates that the potential for contaminant migration from the source is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection:

RECEPTOR FACTOR (RF)

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The GW (cont. or not) is a current drinking water source or is equiv. to (Class I or IIA aquifer).

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for DW, irrigation or agriculture, but not presently used (Class IIB aquifer).

Limited - There is no potentially threatened water supply well downgradient of the source. The groundwater is not considered a potential source of DW or is of limited benificial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection:

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Groundwater Category:** Med
(High, Medium, Low)

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Copper and compounds	30,600.0	2,800.0	10.930
Iron	234,000.0	22,000.0	10.640
Lead	2,720.0	400.0	6.800
Arsenic (cancer)	25.8	21.0	1.230
Nickel and compounds	1,540.0	1,500.0	1.030
Benzo[a]pyrene	5.7	5.6	1.020
Mercury and compounds (inorganic)	16.3	23.0	0.710
Antimony and compounds	18.0	30.0	0.600
Manganese and compounds	1,580.0	3,100.0	0.510
Zinc	9,630.0	22,000.0	0.440
		Total:	**36.010**

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: _____

Potential: X

Confined: _____

Brief Rationale for Selection: **Exposure to contaminated soils.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: _____

Potential: X

Limited: _____

Brief Rationale for Selection: **Occupational and residential exposure to Shipyard workers and residents.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Soil Category:** Med
(High, Medium, Low)

Surface Water Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. ug/L	Standard ug/L	Ratio (2)
Copper and compounds	42.5	2.9	14.660
Nickel and compounds	41.85	8.3	5.040
Zinc	201.3	86.0	2.340
Lead	9.3	8.5	1.090
Polychlorinated biphenyls (PCBs)	0.01	0.03	0.350
Mirex			0.080
Heptachlor epoxide			
Anthracene			
Fluorene			
Manganese and compounds	40.0		
		Total:	23.560

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): ____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): ____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: ____

Confined: ____

Brief Rationale for Selection: Offshore investigations have found contamination present in the media and biota.

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to surface water

Potential - Potential for receptors to have access to surface water

Limited - Little or no potential for receptors to have access to surface water

(Place an "X" next to one below)

Identified: X

Potential: ____

Limited: ____

Brief Rationale for Selection: Receptors include Piscataqua River biota from direct uptake and food chain ingestion.

Activity Name KITTERY ME PORTSMOUTH NSY Site Name: SITE 00032 Surface Water Marine Category: High
(High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
DDD,4,4-	1.06		1060.000
DDT	0.06		31.870
Mercury	2.97	0.15	19.830
Chrysene	1.1	0.06	18.330
Pyrene	4.22	0.35	12.060
Lead	344.0	35.0	9.830
Anthracene	0.81	0.09	9.540
Copper and compounds	566.0	70.0	8.090
DDE,4,4-	0.02		7.800
Fluorene	0.26	0.04	7.490
		Total:	1217.960

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100): _____

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Offshore investigations have found contamination present in the media and biota.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors include Piscataqua River biota from direct uptake and food chain ingestion.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00032 **Sediment Marine Category:** High
(High, Medium, Low)

RELATIVE RISK EVALUATION WORKSHEET

SITE (1) BACKGROUND INFORMATION

Installation/Site Name for FUDS: KITTERY ME PORTSMOUTH NSY

Date Entered (Day, Month, Year): 5/24/99

Location (State): ~~NH~~ ME

Media Evaluated (GW, SW, Sediment, Soil): SEDH SEDEM SOIL

Site (Name/RMIS ID) / Project for FUDS: SITE 00034

Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage):

RMIS Site Type: OTHER

Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): No

Point of Contact (Name/Phone):

National Priority List (Y/N): No **Site Rank:** High

SITE SUMMARY

(Include only key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

Brief Site Description (Include site type, materials disposed of, dates of operation, and other relevant information):
Building 62 was the former Oil Gasification Plant and former Blacksmith Shop. The building has also been used as a pesticide storage area.

Brief Description of Pathways (Groundwater, Surface Water, Sediment, Soil):
The site is located adjacent to the shoreline.

Brief Description of Receptors (Human and Ecological):
Human: Occcupational and Construction exposures are likely at this time. Ecological: The site could effect the plant and animal life and humans consuming seafood.

(1) Use to record information on Sites and Areas of Concern (AOC) for Relative Risk Site Evaluation. The term Site is defined as a discrete area for which suspected contamination has been verified and requires furt A Site by definition has been, or will be, entered into RMIS. For the FUDS Program, "projects" equates to sites for current installations. An AOC is a discrete area of contamination, or suspected contamination in the (or RFA) phase that has not been entered into RMIS.

Soil

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Lead	5,450.0	400.0	13.630
Benzo[a]pyrene	51.0	5.6	9.110
Antimony and compounds	231.0	30.0	7.700
Dibenz[ah]anthracene	20.0	5.6	3.570
Iron	37,000.0	22,000.0	1.680
Benz(a)anthracene	85.0	56.0	1.520
Arsenic (cancer)	17.6	21.0	0.840
Benzo[b]fluoranthene	46.0	56.0	0.820
Indeno[1,2,3-cd]pyrene	38.0	56.0	0.680
Naphthalene	18.0	55.0	0.330
		Total:	41.180

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination is present at, is moving towards, or has moved to a point of exposure

Potential - 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

Confined - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Analytical data indicates soil contamination may be migrating offshore.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to contaminated soil

Potential - Potential for receptors to have access to contaminated soil

Limited - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors identified have access to sediment which contamination may have moved to.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00034 **Soil Category:** High
(High, Medium, Low)

Sediment Human

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Benzo[a]pyrene	5.6	5.6	1.000
Dibenz[ah]anthracene	2.5	5.6	0.450
Lead	181.0	400.0	0.450
Arsenic (cancer)	8.0	21.0	0.380
Benz(a)anthracene	9.2	56.0	0.160
Indeno[1,2,3-cd]pyrene	7.2	56.0	0.130
Benzo[b]fluoranthene	7.1	56.0	0.130
Anthracene	1,700.0	14,000.0	0.120
Chlordane, alpha- (2)	16.0	160.0	0.100
Aluminum	5,900.0	75,000.0	0.080
		Total:	3.120

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): _____

Moderate (If Total 2 - 100): X

Minimal (If Total < 2): _____

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential: _____

Confined: _____

Brief Rationale for Selection: **Analytical data indicates soil contamination may be migrating offshore.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential: _____

Limited: _____

Brief Rationale for Selection: **Receptors identified have access to sediment which contamination may have moved to.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00034 **Sediment Human Category:** High (High, Medium, Low)

Sediment Eco Marine

CONTAMINANT HAZARD FACTOR (1) (CHF)

Contaminant	Maximum Conc. mg/Kg	Standard mg/Kg	Ratio (2)
Chrysene	10.0	0.06	166.670
Benz(a)anthracene	9.2	0.23	40.000
Fluorene	1.1	0.04	31.430
Phenanthrene	6.4	0.22	28.440
Anthracene	1.7	0.09	20.000
Benzo[a]pyrene	5.6	0.4	14.000
Fluoranthene	5.2	0.6	8.670
DDD,4,4-	0.01		8.400
Lead	181.0	35.0	5.170
DDT	0.01		4.200
		Total:	331.450

(1) Evaluate for human contaminants only
(2) Ratio = Maximum Concentration/Standard
Note: Only top ten contaminants are displayed.

(Place an "X" next to one below)

Significant (If Total > 100): X

Moderate (If Total 2 - 100):

Minimal (If Total < 2):

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence indicates that contamination in the media is present at, is moving toward, or has moved to a point of exposure

Potential - 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

Confined - Information indicates a low potential for contamination to a potential point of exposure (could be due to the presence of geological structures or or physical controls)

(Place an "X" next to one below)

Evident: X

Potential:

Confined:

Brief Rationale for Selection: **Analytical data indicates soil contamination may be migrating offshore.**

RECEPTOR FACTOR (RF)

Identified - Receptors identified that have access to sediment

Potential - Potential for receptors to have access to sediment

Limited - Little or no potential for receptors to have access to sediment

(Place an "X" next to one below)

Identified: X

Potential:

Limited:

Brief Rationale for Selection: **Receptors identified have access to sediment which contamination may have moved to.**

Activity Name KITTERY ME PORTSMOUTH NSY **Site Name:** SITE 00034 **Sediment Marine Category:** High
(High, Medium, Low)

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

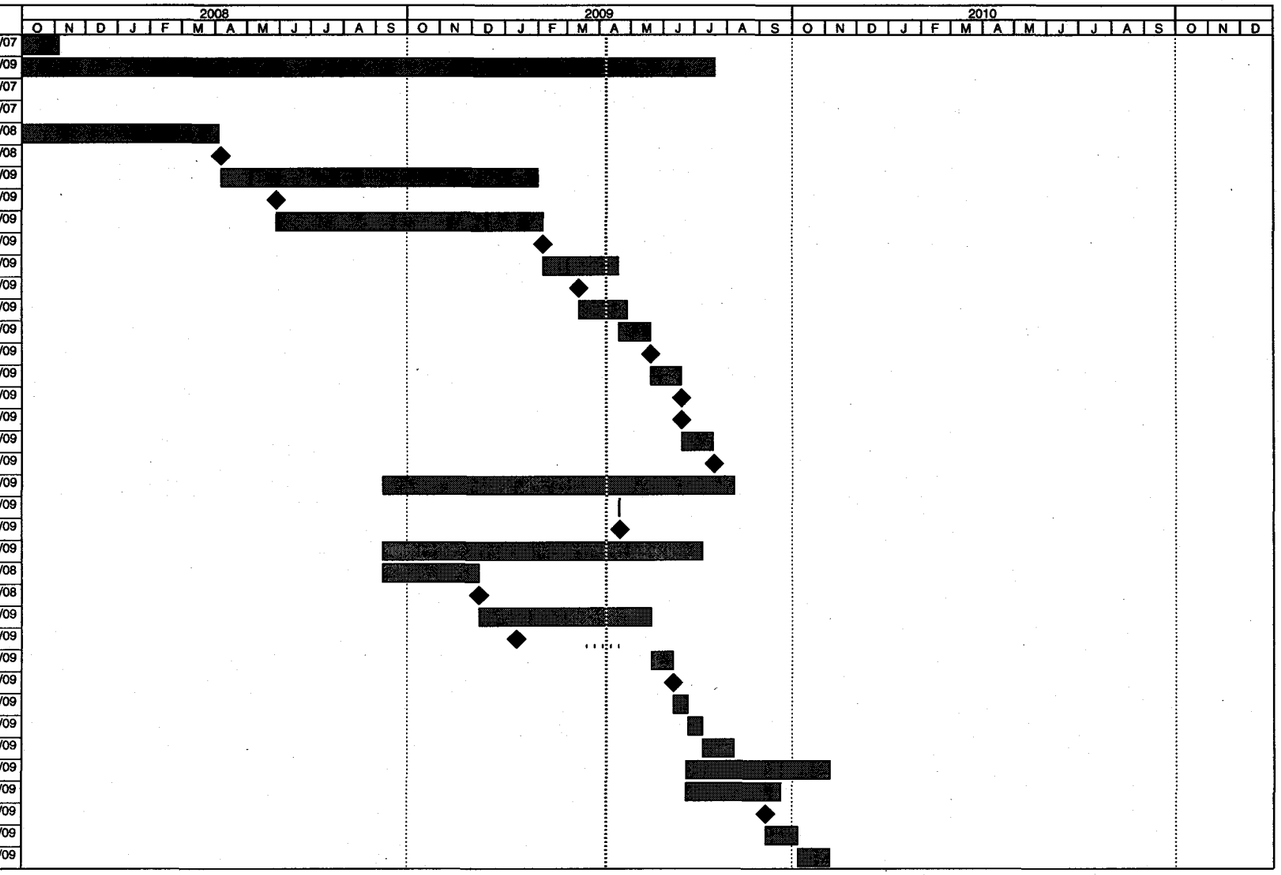
APPENDIX C.1

OU1 SCHEDULE (SITE 10)

Tue 4/7/09
1:37 PM

Portsmouth Naval Shipyard
Site Management Plan Schedules
OPERABLE UNIT 1 (OU1)
(Site 10)

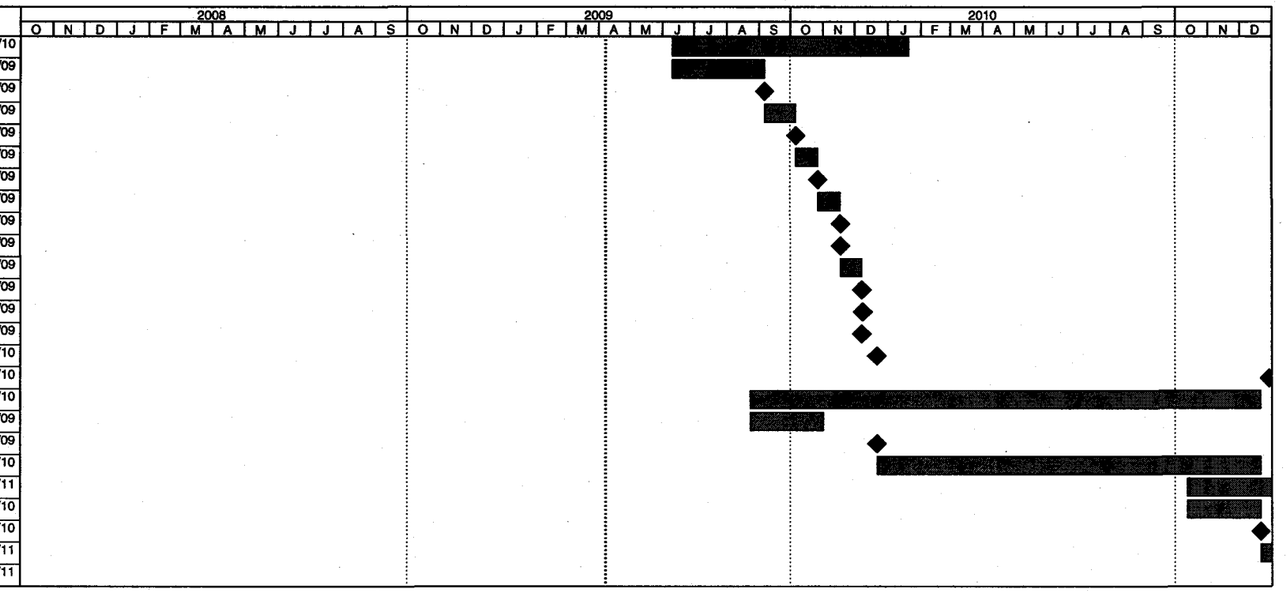
ID	Notes	Task Name	%	Dur	Start	Finish
150		REMEDIAL INVESTIGATION REPORT (Primary Document)	100%	1398 d	Thu 1/8/04	Mon 11/5/07
193		FEASIBILITY STUDY (Primary Document)	82%	929 d	Thu 1/4/07	Mon 7/20/09
194		FS, PRAP & ROD Contracting Action	100%	95 d	Thu 1/4/07	Sun 4/8/07
202		Award SOW for FS	100%	1 d	Mon 4/9/07	Mon 4/9/07
203		Prepare Draft FS Report	100%	236 d	Mon 8/13/07	Fri 4/4/08
209		USEPA & MEDEP Receives Draft FS Report	100%	1 d	Mon 4/7/08	Mon 4/7/08
210	*	USEPA, MEDEP & RAB Review Draft FS Report (without EPA legal)	100%	300 d	Mon 4/7/08	Sat 1/31/09
214	*	Navy Recieves Comments on Draft FS Report (without EPA legal)	100%	250 d	Thu 5/29/08	Mon 2/2/09
215	*	Prepare FS Report Response to Comments Letter (without EPA legal)	100%	253 d	Thu 5/29/08	Thu 2/5/09
220	*	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	100%	1 d	Fri 2/6/09	Fri 2/6/09
221	*	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	66%	73 d	Fri 2/6/09	Sun 4/19/09
226	*	Navy Receives Comments on FS Report Response to Comments Letter (including EPA legal)	50%	39 d	Fri 3/13/09	Mon 4/20/09
227	*	Navy and Regulator Comment Resolution	50%	46 d	Fri 3/13/09	Mon 4/27/09
228	*	Prepare Draft Final FS Report	0%	30 d	Mon 4/20/09	Tue 5/19/09
229	*	USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Wed 5/20/09	Wed 5/20/09
230	*	USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Wed 5/20/09	Thu 6/18/09
234	*	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Fri 6/19/09	Fri 6/19/09
235	*	Navy and Regulator Resolution or Notice of Dispute	0%	10 d	Fri 6/19/09	Sun 6/28/09
236	*	Prepare Final FS Report	0%	30 d	Fri 6/19/09	Sat 7/18/09
237	*	USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Mon 7/20/09	Mon 7/20/09
238	*	PROPOSED REMEDIAL ACTION PLAN (PRAP)	52%	334 d	Mon 9/8/08	Fri 8/7/09
239	*	Authorize Release of Funds for RD/RA Schedule	0%	1 d	Mon 4/20/09	Mon 4/20/09
240	*	Award RD/RA Schedule	0%	1 d	Tue 4/21/09	Tue 4/21/09
241	*	Prepare Proposed Remedial Action Plan	55%	304 d	Mon 9/8/08	Wed 7/8/09
242	*	Prepare Draft PRAP	100%	91 d	Mon 9/8/08	Sun 12/7/08
247	*	USEPA, MEDEP & RAB Receive Draft PRAP	100%	1 d	Mon 12/8/08	Mon 12/8/08
248	*	USEPA, MEDEP & RAB Review Draft PRAP	51%	164 d	Mon 12/8/08	Wed 5/20/09
252	*	Navy Receives Comments on Draft PRAP	50%	130 d	Mon 1/12/09	Thu 5/21/09
253	*	Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Thu 5/21/09	Wed 6/10/09
254	*	USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Thu 6/11/09	Thu 6/11/09
255	*	Navy and Regulator Comment Resolution	0%	14 d	Thu 6/11/09	Wed 6/24/09
256	*	Prepare for Public Comment Period	0%	14 d	Thu 6/25/09	Wed 7/8/09
257	*	Public Comment Period	0%	30 d	Thu 7/9/09	Fri 8/7/09
258	*	PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	136 d	Tue 6/23/09	Thu 11/5/09
259		Prepare RD/RA Schedule (Secondary)	0%	90 d	Tue 6/23/09	Sun 9/20/09
260		USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Mon 9/7/09	Mon 9/7/09
261		Regulatory and RAB Review	0%	30 d	Mon 9/7/09	Tue 10/6/09
262		Decision/Resolution Period	0%	30 d	Wed 10/7/09	Thu 11/5/09



Tue 4/7/09
1:37 PM

Portsmouth Naval Shipyard
Site Management Plan Schedules
OPERABLE UNIT 1 (OU1)
(Site 10)

ID	Notes	Task Name	%	Dur	Start	Finish
263	*	RECORD OF DECISION (ROD)	0%	224 d	Thu 6/11/09	Wed 1/20/10
264		Prepare Draft ROD (Primary Document)	0%	88 d	Thu 6/11/09	Sun 9/6/09
271		USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Mon 9/7/09	Mon 9/7/09
272		USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Mon 9/7/09	Tue 10/6/09
276		Navy Receives Comments on Draft ROD	0%	1 d	Wed 10/7/09	Wed 10/7/09
277		Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Wed 10/7/09	Tue 10/27/09
282		USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Wed 10/28/09	Wed 10/28/09
283		USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Wed 10/28/09	Tue 11/17/09
287		Navy Receives Comments on Draft Final ROD	0%	1 d	Wed 11/18/09	Wed 11/18/09
288		MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Wed 11/18/09	Wed 11/18/09
289		Prepare Final ROD	0%	20 d	Wed 11/18/09	Mon 12/7/09
290		Navy Signs Final ROD	0%	1 d	Tue 12/8/09	Tue 12/8/09
291		USEPA Receives Final ROD	0%	1 d	Wed 12/9/09	Wed 12/9/09
292		USEPA Signs Final ROD	0%	14 d	Tue 12/8/09	Mon 12/21/09
293		Navy Distributes Final Record of Decision	0%	30 d	Tue 12/22/09	Wed 1/20/10
294	*	REMEDY IN PLACE	0%	1 d	Thu 12/30/10	Thu 12/30/10
295	*	REMEDIAL DESIGN	0%	485 d	Mon 8/24/09	Tue 12/21/10
296		RD Contracting Action	0%	70 d	Mon 8/24/09	Sun 11/1/09
304		Award Remedial Design	0%	1 d	Tue 12/22/09	Tue 12/22/09
305		Design To Be Determined	0%	365 d	Tue 12/22/09	Tue 12/21/10
306	*	REMEDIAL ACTION	0%	191 d	Wed 10/13/10	Thu 4/21/11
307		RA Contracting Action	0%	70 d	Wed 10/13/10	Tue 12/21/10
315		Award Remedial Action	0%	1 d	Wed 12/22/10	Wed 12/22/10
316		Mobilization	0%	89 d	Wed 12/22/10	Sun 3/20/11
317		Start of Significant & Continuous Onsite Activity	0%	1 d	Thu 4/21/11	Thu 4/21/11



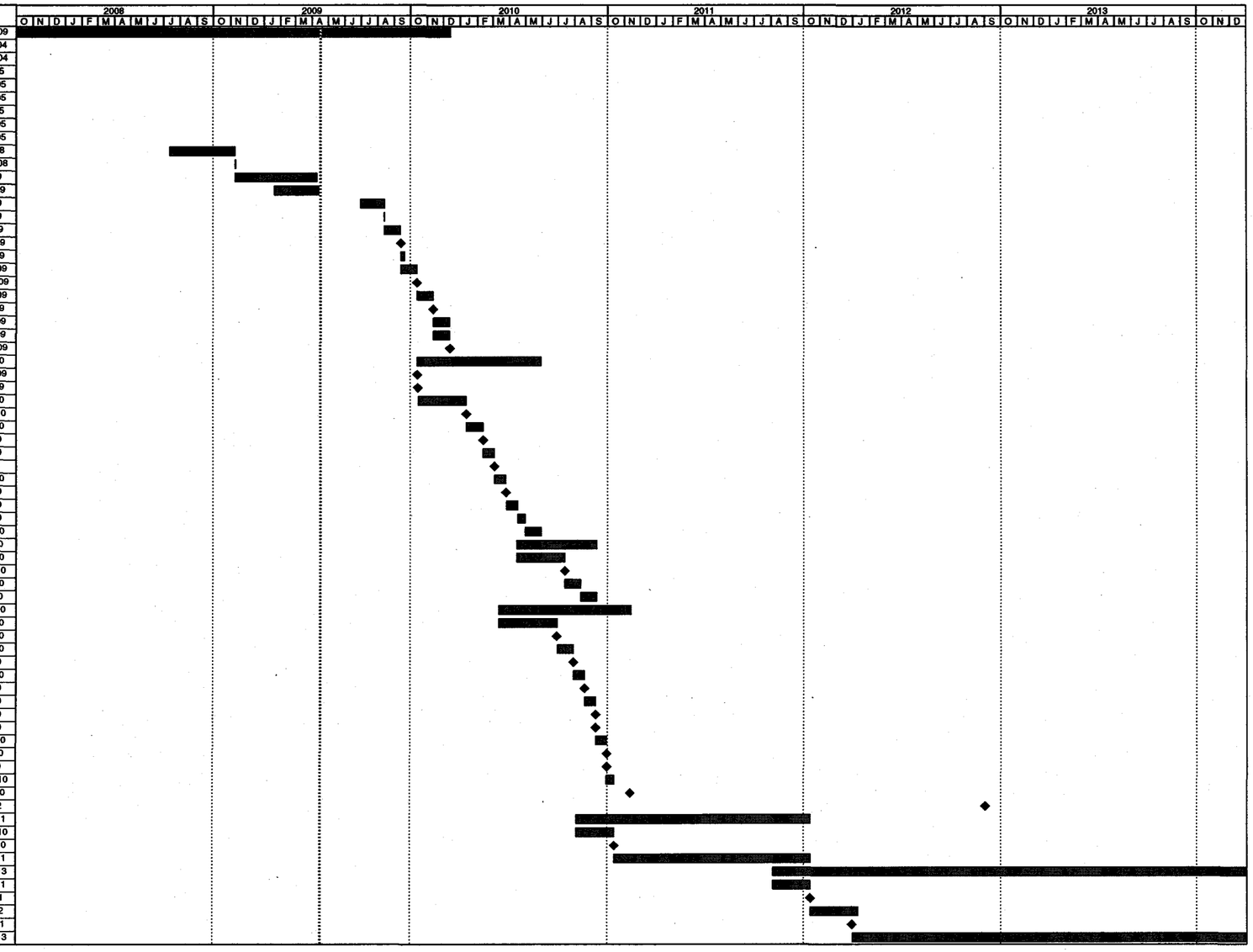
APPENDIX C.2

OU2 SCHEDULE (SITES 6 and 29)

Thu 4/16/09
2:25 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 2 (OU2)
(Sites 6 and 29)

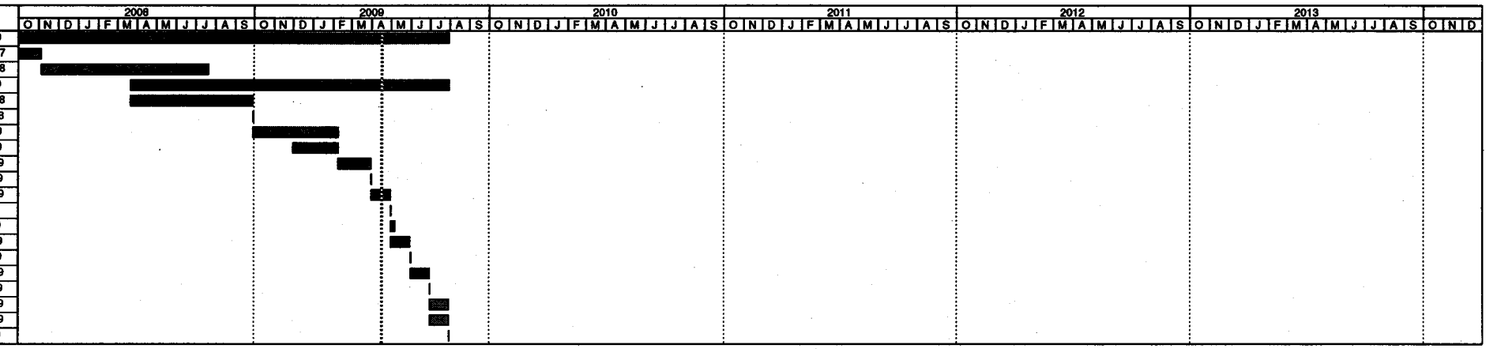
ID	Notes	Task Name	%	Dur	Start	Finish
117		FEASIBILITY STUDY (Primary Document)	79%	2481 d	Sat 3/1/03	Mon 12/14/09
118		Prepare Draft FS Report	100%	625 d	Sat 3/1/03	Sun 11/14/04
124		USEPA & MEDEP Receives Draft FS Report	100%	1 d	Mon 11/15/04	Mon 11/15/04
125		USEPA, MEDEP & RAB Review Draft FS Report	100%	135 d	Mon 11/15/04	Tue 3/29/05
129		Navy Receives Comments on Draft FS Report	100%	64 d	Wed 1/26/05	Wed 3/30/05
130		Prepare FS Report Response to Comments Letter	100%	113 d	Wed 3/30/05	Wed 7/20/05
138		USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	100%	1 d	Thu 7/21/05	Thu 7/21/05
139		USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	100%	112 d	Thu 7/21/05	Wed 11/9/05
140		Navy Receives follow-up comments on FS Report Response to Comments Letter	100%	21 d	Thu 10/20/05	Wed 11/9/05
141	*	Prepare Revised Draft FS Report	100%	119 d	Mon 7/14/08	Sun 11/9/08
142	*	USEPA & MEDEP Receives Revised Draft FS Report	100%	1 d	Mon 11/10/08	Mon 11/10/08
143	*	USEPA, MEDEP & RAB Review Revised Draft FS Report	90%	152 d	Mon 11/10/08	Fri 4/10/09
147	*	Navy Receives Comments on Revised Draft FS Report	0%	83 d	Wed 1/21/09	Mon 4/13/09
148	*	Prepare FS Report Response to Comments Letter	0%	45 d	Wed 7/1/09	Fri 8/14/09
149	*	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	0%	1 d	Fri 8/14/09	Fri 8/14/09
150	*	USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	0%	30 d	Fri 8/14/09	Sat 9/12/09
154	*	Navy Receives Comments on FS Report Response to Comments Letter	0%	1 d	Mon 9/14/09	Mon 9/14/09
155	*	Navy and Regulator Comment Resolution	0%	7 d	Mon 9/14/09	Sun 9/20/09
156	*	Prepare Draft Final FS Report	0%	30 d	Mon 9/14/09	Tue 10/13/09
157	*	USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Wed 10/14/09	Wed 10/14/09
158	*	USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Wed 10/14/09	Thu 11/12/09
162	*	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Fri 11/13/09	Fri 11/13/09
163	*	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Fri 11/13/09	Sat 12/12/09
164	*	Prepare Final FS Report	0%	30 d	Fri 11/13/09	Sat 12/12/09
165	*	USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Mon 12/14/09	Mon 12/14/09
166	*	PROPOSED REMEDIAL ACTION PLAN (PRAP)	0%	228 d	Thu 10/15/09	Sun 5/30/10
167		Authorize Release of Funds	0%	1 d	Thu 10/15/09	Thu 10/15/09
168		Award PRAP/ROD and RD/RA Schedule	0%	1 d	Fri 10/16/09	Fri 10/16/09
169		Prepare Draft PRAP	0%	88 d	Sat 10/17/09	Tue 1/12/10
174		USEPA, MEDEP & RAB Receive Draft PRAP	0%	1 d	Wed 1/13/10	Wed 1/13/10
175		USEPA, MEDEP & RAB Review Draft PRAP	0%	30 d	Wed 1/13/10	Thu 2/11/10
179		Navy Receives Comments on Draft PRAP	0%	1 d	Fri 2/12/10	Fri 2/12/10
180		Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Fri 2/12/10	Thu 3/4/10
181		USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Fri 3/5/10	Fri 3/5/10
182		USEPA, MEDEP & RAB Review Draft Final PRAP & Response to Comments Letter	0%	21 d	Fri 3/5/10	Thu 3/25/10
186		Navy Receives Comments on Draft Final PRAP	0%	1 d	Fri 3/26/10	Fri 3/26/10
187		Prepare Final PRAP	0%	21 d	Sat 3/27/10	Fri 4/16/10
188		Prepare for Public Comment Period	0%	14 d	Sat 4/17/10	Fri 4/30/10
189		Public Comment Period	0%	30 d	Sat 5/1/10	Sun 5/30/10
190	*	PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	150 d	Thu 4/15/10	Sat 9/11/10
191		Prepare RD/RA Schedule (Secondary)	0%	90 d	Thu 4/15/10	Tue 7/13/10
192		USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Wed 7/14/10	Wed 7/14/10
193		Regulatory and RAB Review	0%	30 d	Wed 7/14/10	Thu 8/12/10
194		Decision/Resolution Period	0%	30 d	Fri 8/13/10	Sat 9/11/10
195	*	RECORD OF DECISION (ROD)	0%	246 d	Sat 3/13/10	Sat 11/13/10
196		Prepare Draft ROD (Primary Document)	0%	109 d	Sat 3/13/10	Tue 6/29/10
204		USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Tue 6/29/10	Tue 6/29/10
205		USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Wed 6/30/10	Thu 7/29/10
209		Navy Receives Comments on Draft ROD	0%	1 d	Fri 7/30/10	Fri 7/30/10
210		Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Fri 7/30/10	Thu 8/19/10
215		USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Fri 8/20/10	Fri 8/20/10
216		USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Fri 8/20/10	Thu 9/9/10
220		Navy Receives Comments on Draft Final ROD	0%	1 d	Fri 9/10/10	Fri 9/10/10
221		MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Fri 9/10/10	Fri 9/10/10
222		Prepare Final ROD	0%	20 d	Fri 9/10/10	Wed 9/29/10
223		Navy Signs Final ROD	0%	1 d	Thu 9/30/10	Thu 9/30/10
224		USEPA Receives Final ROD	0%	1 d	Fri 10/1/10	Fri 10/1/10
225		USEPA Signs Final ROD	0%	14 d	Thu 9/30/10	Wed 10/13/10
226		Navy Distributes Final Record of Decision	0%	1 d	Sat 11/13/10	Sat 11/13/10
227	*	REMEDY IN PLACE	0%	1 d	Mon 9/3/12	Mon 9/3/12
228	*	REMEDIAL DESIGN	0%	435 d	Thu 8/5/10	Thu 10/13/11
229		RD Contracting Action	0%	70 d	Thu 8/5/10	Wed 10/13/10
237		Award Remedial Design	0%	1 d	Thu 10/14/10	Thu 10/14/10
238		Design To Be Determined	0%	365 d	Thu 10/14/10	Thu 10/13/11
239	*	REMEDIAL ACTION	0%	879 d	Fri 8/5/11	Mon 12/30/13
240		RA Contracting Action	0%	70 d	Fri 8/5/11	Thu 10/13/11
248		Award Remedial Action	0%	1 d	Fri 10/14/11	Fri 10/14/11
249		Mobilization	0%	89 d	Fri 10/14/11	Tue 1/10/12
250		Start of Significant & Continuous Onsite Activity	0%	1 d	Sat 12/31/11	Sat 12/31/11
251		Remedial Action Fieldwork	0%	730 d	Sun 1/1/12	Mon 12/30/13



Thu 4/16/09
2:26 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 2 (OU2)
(Sites 6 and 29)

ID	Notes	Task Name	%	Dur	Start	Finish
252		SUPPLEMENTAL RI (RI)	86%	1300 d	Mon 1/9/06	Fri 7/31/09
253		SUPPLEMENTAL RI QAPP (WORKPLAN)	100%	666 d	Mon 1/9/06	Mon 11/5/07
285	*	FIELDWORK (includes analysis, DV, Data Base Update)	100%	259 d	Tue 11/6/07	Mon 7/21/08
286	*	SUPPLEMENTAL RI REPORT (Primary Document)	67%	497 d	Sat 3/22/08	Fri 7/31/09
287	*	Prepare Draft Supplemental RI Report	100%	192 d	Sat 3/22/08	Mon 9/29/08
292	*	USEPA & MEDEP Receives Draft Supplemental RI Report	100%	1 d	Tue 9/30/08	Tue 9/30/08
293	*	USEPA, MEDEP & RAB Review Draft Supplemental RI Report	100%	133 d	Tue 9/30/08	Mon 2/9/09
297	*	Navy Recieves Comments on Draft Supplemental RI Report	100%	71 d	Mon 12/1/08	Mon 2/9/09
298	*	Prepare Supplemental RI Report Response to Comments Letter	100%	51 d	Mon 2/9/09	Tue 3/31/09
303	*	USEPA, MEDEP & RAB Receive Supplemental RI Report Response to Comments Letter	100%	1 d	Wed 4/1/09	Wed 4/1/09
304	*	USEPA, MEDEP & RAB Reviews Supplemental RI Report Response to Comments Letter	0%	30 d	Wed 4/1/09	Thu 4/30/09
308	*	Navy Receives Comments on Supplemental RI Report Response to Comments Letter	0%	1 d	Fri 5/1/09	Fri 5/1/09
309	*	Navy and Regulator Comment Resolution	0%	7 d	Fri 5/1/09	Thu 5/7/09
310	*	Prepare Draft Final Supplemental RI Report	0%	30 d	Fri 5/1/09	Sat 5/30/09
311	*	USEPA, MEDEP & RAB Receive Draft Final Supplemental RI Report	0%	1 d	Mon 6/1/09	Mon 6/1/09
312	*	USEPA, MEDEP & RAB Review Draft Final Supplemental RI Report	0%	30 d	Mon 6/1/09	Tue 6/30/09
316	*	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Wed 7/1/09	Wed 7/1/09
317	*	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Wed 7/1/09	Thu 7/30/09
318	*	Prepare Final Supplemental RI Report	0%	30 d	Wed 7/1/09	Thu 7/30/09
319	*	USEPA, MEDEP & RAB Receive Final Supplemental RI Report	0%	1 d	Fri 7/31/09	Fri 7/31/09



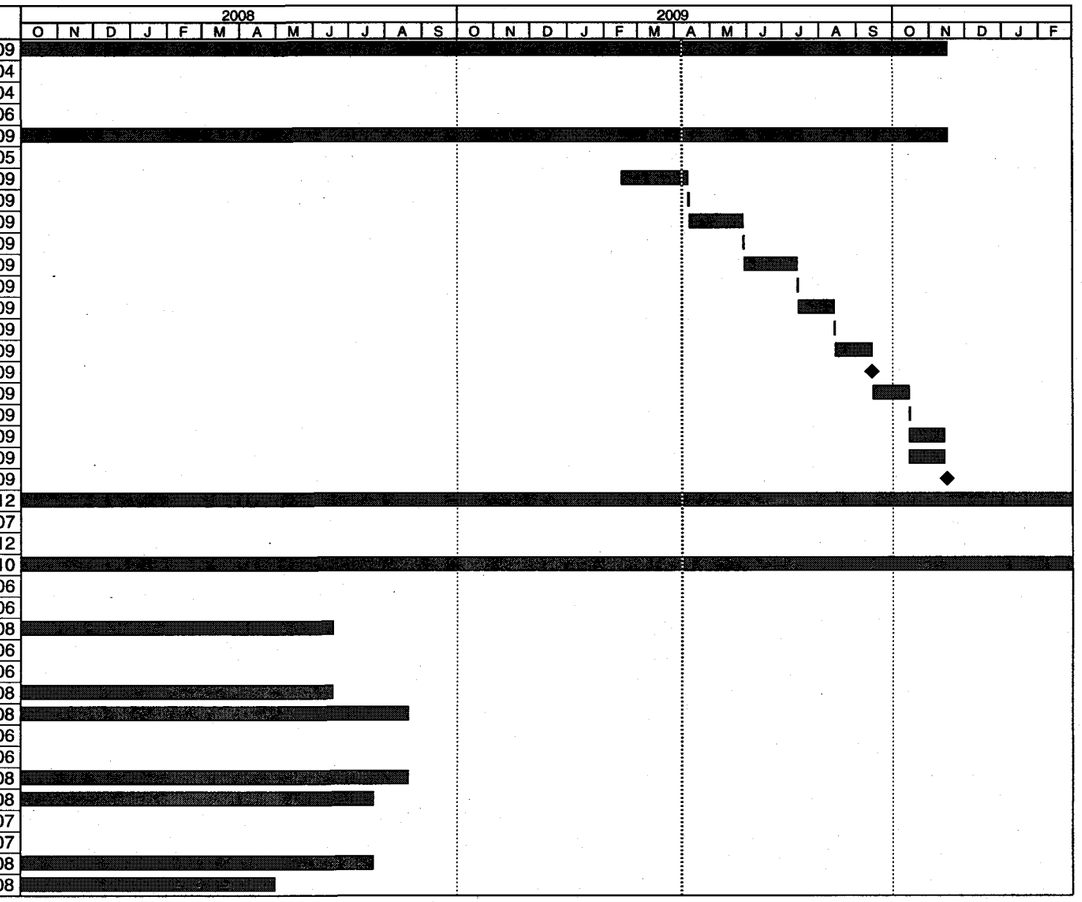
APPENDIX C.3

OU3 SCHEDULE (SITES 8, 9, and 11)

Tue 4/7/09
1:40 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 3 (OU3)
(Sites 8, 9, and 11)

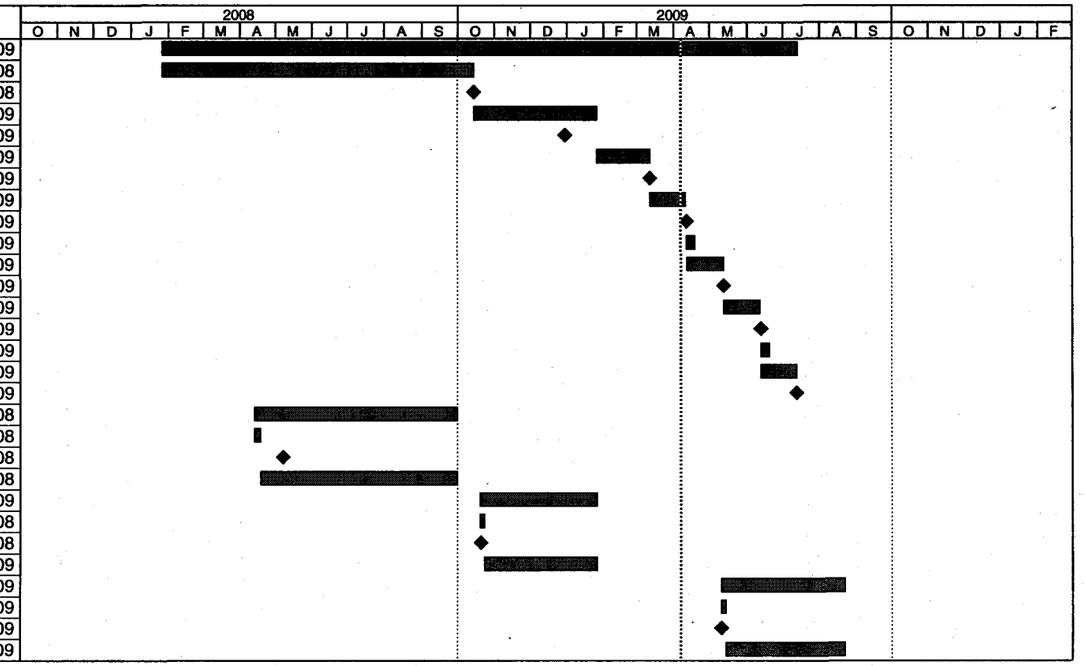
ID	Notes	Task Name	%	Dur	Start	Finish
410		OPERATION, MAINTENANCE AND MONITORING PLAN (OM&M Plan)	80%	2122 d	Mon 1/26/04	Mon 11/16/09
411		OM&M Plan Contracting Action	100%	25 d	Mon 1/26/04	Thu 2/19/04
412		Notice of Award, OM&M Plan	100%	1 d	Fri 2/20/04	Fri 2/20/04
413		Prepare OM&M Plan	100%	865 d	Fri 2/20/04	Mon 7/3/06
430		Prepare LUC (Appendix E of OM&M Plan)	23%	1629 d	Thu 6/2/05	Mon 11/16/09
431		Navy Receive Comments on draft LUC	100%	22 d	Thu 6/2/05	Thu 6/23/05
432	*	Prepare Revised Draft LUC	95%	56 d	Mon 2/16/09	Sun 4/12/09
433	*	USEPA, MEDEP, & RAB Receive Revised Draft LUC	0%	1 d	Mon 4/13/09	Mon 4/13/09
434	*	USEPA, MEDEP, & RAB Review Revised Draft LUC	0%	45 d	Tue 4/14/09	Thu 5/28/09
435	*	Navy Receives Comments on Revised Draft LUC	0%	1 d	Fri 5/29/09	Fri 5/29/09
436	*	Prepare Responses to Comments on Revised Draft LUC	0%	45 d	Sat 5/30/09	Mon 7/13/09
437	*	USEPA, MEDEP, & RAB Received Responses to Comments on Revised Draft LUC	0%	1 d	Tue 7/14/09	Tue 7/14/09
438	*	USEPA, MEDEP, & RAB Review Response to Comments on Revised Draft LUC	0%	30 d	Wed 7/15/09	Thu 8/13/09
439	*	Navy Receives Comments on Responses to Comments on Revised Draft LUC	0%	1 d	Fri 8/14/09	Fri 8/14/09
440	*	Prepare Responses to Comments and DF LUC	0%	30 d	Sat 8/15/09	Sun 9/13/09
441	*	USEPA, MEDEP, & RAB Receive Response to Comments and DF LUC	0%	1 d	Mon 9/14/09	Mon 9/14/09
442	*	USEPA, MEDEP, & RAB Reviews Response to Comments and DF LUC	0%	30 d	Tue 9/15/09	Wed 10/14/09
443	*	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Thu 10/15/09	Thu 10/15/09
444	*	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Thu 10/15/09	Fri 11/13/09
445	*	Prepare Final LUC	0%	30 d	Thu 10/15/09	Fri 11/13/09
446	*	USEPA, MEDEP & RAB Receive Final LUC	0%	1 d	Mon 11/16/09	Mon 11/16/09
447		FIVE-YEAR REVIEWS	99%	2180 d	Fri 7/7/06	Sun 6/24/12
448		First Five-Year Review	100%	354 d	Fri 7/7/06	Mon 6/25/07
472		Second Five-Year Review (due 5 years after First Five-Year Review)	0%	1 d	Sun 6/24/12	Sun 6/24/12
473		OPERATION, MAINTENANCE AND MONITORING PLAN IMPLEMENTATION	86%	1632 d?	Fri 2/10/06	Fri 7/30/10
474		Submit draft sampling SOPs	100%	1 d	Fri 2/10/06	Fri 2/10/06
475		Conduct Tidal Study	100%	5 d	Mon 3/27/06	Fri 3/31/06
476		Conduct First Round	100%	702 d	Mon 7/17/06	Tue 6/17/08
477		Conduct groundwater and gas sampling	100%	6 d	Mon 7/17/06	Sat 7/22/06
478		Conduct routine inspection	100%	6 d	Mon 7/17/06	Sat 7/22/06
479	*	Prepare and submit final data package	100%	696 d	Sun 7/23/06	Tue 6/17/08
485		Conduct Second Round	100%	619 d	Mon 12/11/06	Wed 8/20/08
486		Conduct groundwater and gas sampling	100%	5 d	Mon 12/11/06	Fri 12/15/06
487		Conduct routine inspection	100%	5 d	Mon 12/11/06	Fri 12/15/06
488	*	Prepare and submit final data package	100%	614 d	Sat 12/16/06	Wed 8/20/08
492		Conduct Third Round	100%	471 d	Mon 4/9/07	Tue 7/22/08
493		Conduct groundwater and gas sampling	100%	5 d	Mon 4/9/07	Fri 4/13/07
494		Conduct routine inspection	100%	5 d	Mon 5/28/07	Fri 6/1/07
495	*	Prepare and submit final data package	100%	466 d	Sat 4/14/07	Tue 7/22/08
499		Conduct Fourth Round	100%	280 d	Thu 7/26/07	Wed 4/30/08



Tue 4/7/09
1:40 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 3 (OU3)
(Sites 8, 9, and 11)

ID	Notes	Task Name	%	Dur	Start	Finish
507		Rounds 1 through 4 data evaluation report (Primary Document)	81%	534 d	Sun 1/27/08	Mon 7/13/09
508	*	Prepare Draft Rounds 1 through 4 Report	100%	262 d	Sun 1/27/08	Tue 10/14/08
509	*	USEPA, MEDEP & RAB Receives Draft Report	100%	1 d	Wed 10/15/08	Wed 10/15/08
510	*	USEPA, MEDEP & RAB Review Draft Report	100%	104 d	Wed 10/15/08	Mon 1/26/09
511	*	Navy Receives Comments on Draft Report	100%	27 d	Wed 12/31/08	Mon 1/26/09
512	*	Prepare Response to Comments Letter	100%	45 d	Tue 1/27/09	Thu 3/12/09
513	*	USEPA, MEDEP & RAB Receive Response to Comments Letter	100%	1 d	Fri 3/13/09	Fri 3/13/09
514		USEPA, MEDEP & RAB Reviews Response to Comments Letter	95%	30 d	Fri 3/13/09	Sat 4/11/09
515		Navy Receives Comments on Response to Comments Letter	0%	1 d	Mon 4/13/09	Mon 4/13/09
516		Navy and Regulator Comment Resolution	0%	7 d	Mon 4/13/09	Sun 4/19/09
517		Prepare Draft Final Rounds 1 through 4 Report	0%	30 d	Mon 4/13/09	Tue 5/12/09
518		USEPA, MEDEP & RAB Receive Draft Final Report	0%	1 d	Wed 5/13/09	Wed 5/13/09
519		USEPA, MEDEP & RAB Review Draft Final Report	0%	30 d	Wed 5/13/09	Thu 6/11/09
520		Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Sat 6/13/09	Sat 6/13/09
521		Navy and Regulator Resolution or Notice of Dispute	0%	7 d	Sat 6/13/09	Fri 6/19/09
522		Prepare Final Rounds 1 through 4 Report	0%	30 d	Sat 6/13/09	Sun 7/12/09
523		USEPA, MEDEP & RAB Receive Final Report	0%	1 d	Mon 7/13/09	Mon 7/13/09
524		Conduct Fifth Round	100%	170 d	Mon 4/14/08	Tue 9/30/08
525		Conduct groundwater and gas sampling	100%	5 d	Mon 4/14/08	Fri 4/18/08
526		Conduct routine inspection	100%	2 d	Thu 5/8/08	Fri 5/9/08
527	*	Prepare and submit data package	100%	165 d	Sat 4/19/08	Tue 9/30/08
531		Conduct Sixth Round	100%	99 d	Mon 10/20/08	Mon 1/26/09
532	*	Conduct groundwater and gas sampling	100%	4 d	Mon 10/20/08	Thu 10/23/08
533	*	Conduct routine inspection	100%	1 d	Tue 10/21/08	Tue 10/21/08
534	*	Prepare and submit data package	100%	95 d	Fri 10/24/08	Mon 1/26/09
538	*	Conduct Seventh Round	0%	104 d	Mon 5/11/09	Sat 8/22/09
539		Conduct groundwater and gas sampling	0%	4 d	Mon 5/11/09	Thu 5/14/09
540		Conduct routine inspection	0%	1 d	Mon 5/11/09	Mon 5/11/09
541		Prepare and submit data package	0%	100 d	Fri 5/15/09	Sat 8/22/09



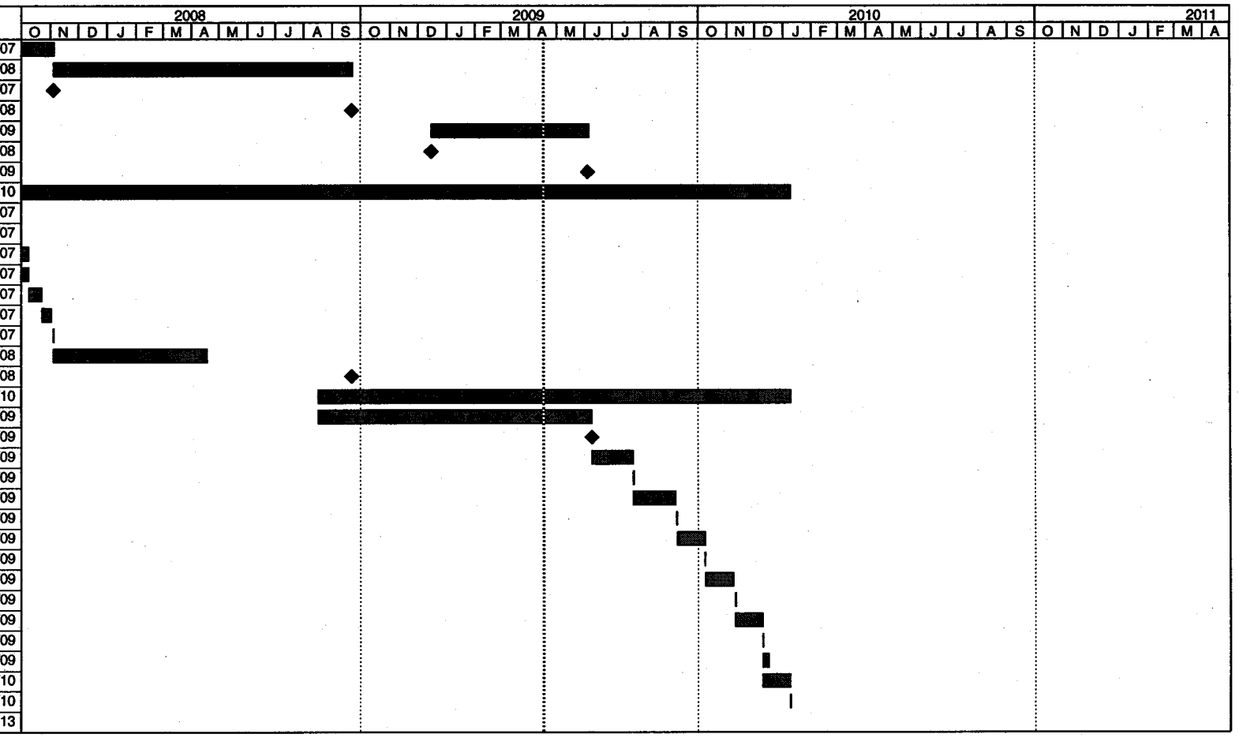
APPENDIX C.4

OU4 SCHEDULE (SITE 5 and OFFSHORE AOCs)

Thu 4/16/09
2:14 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 4 (OU4)
(Site 5 and Offshore AOCs)

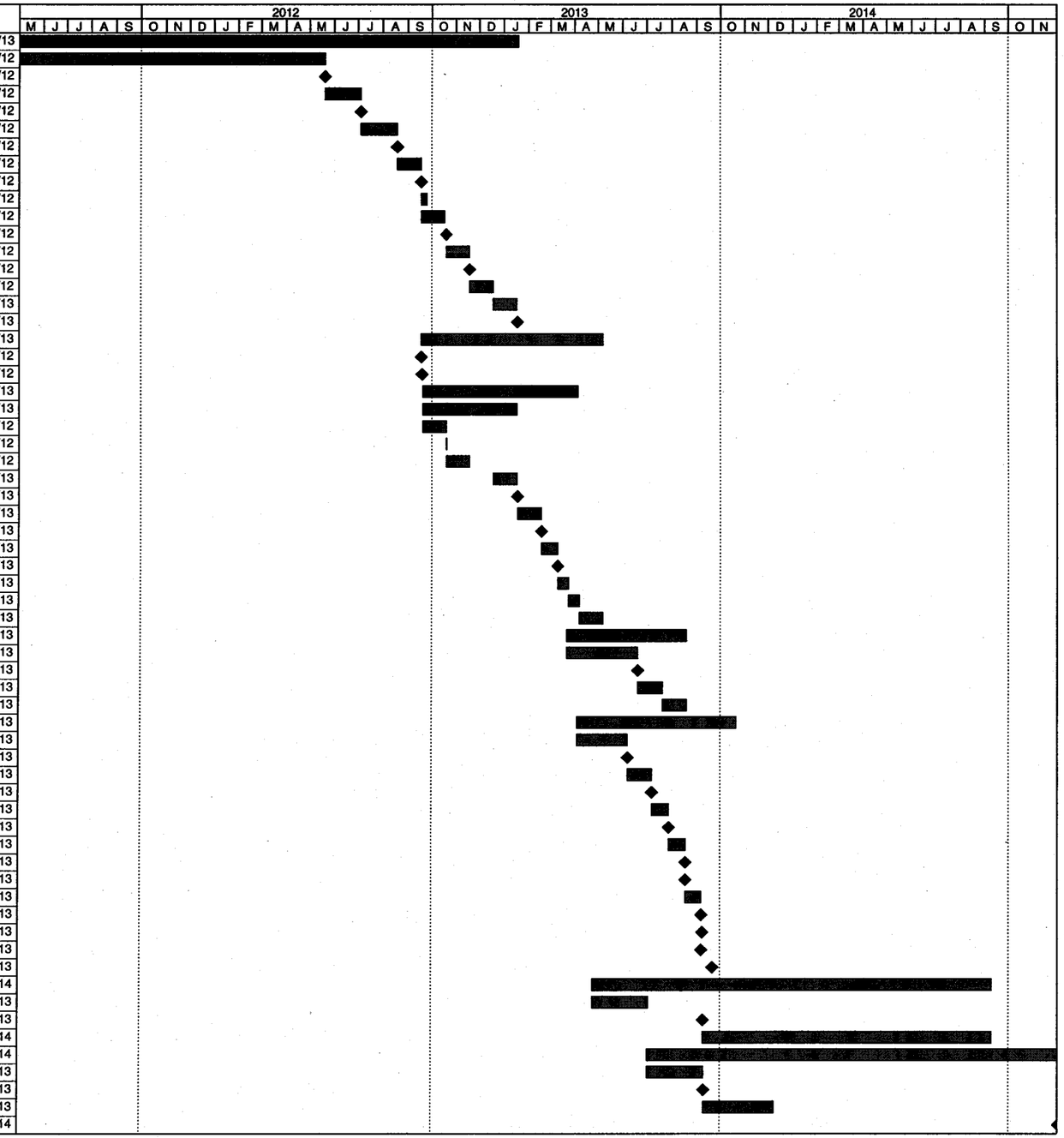
ID	Notes	Task Name	%	Dur	Start	Finish
175		ADDITIONAL SCRUTINY REPORT (AS Report)	100%	763 d	Tue 10/4/05	Mon 11/5/07
214		Round 9 Interim Monitoring Samping Event	100%	323 d	Mon 11/5/07	Mon 9/22/08
215		Start of Round 9 Sampling Event	100%	1 d	Mon 11/5/07	Mon 11/5/07
216	*	Submit Round 9 Data Package	100%	1 d	Mon 9/22/08	Mon 9/22/08
217		Round 10 Interim Monitoring Samping Event	0%	172 d	Tue 12/16/08	Fri 6/5/09
218	*	Start of Round 10 Sampling Event	0%	4 d	Tue 12/16/08	Fri 12/19/08
219	*	Submit Round 10 Data Package	0%	1 d	Fri 6/5/09	Fri 6/5/09
220		PHASE II ADDITIONAL SCRUTINY INVESTIGATION	30%	924 d	Sun 7/1/07	Sat 1/9/10
221		Prepare Draft Additional Scrutiny QAPP Addendum and HASP	100%	76 d	Sun 7/1/07	Fri 9/14/07
222		USEPA, MEDEP & RAB Receive Draft Additional Scrutiny QAPP Addendum and HASP	100%	1 d	Mon 9/17/07	Mon 9/17/07
223		USEPA, MEDEP & RAB Reviews Draft Additional Scrutiny QAPP Addendum and HASP	100%	25 d	Sat 9/15/07	Tue 10/9/07
224		Navy Receives Comments on Draft Additional Scrutiny QAPP Addendum	100%	8 d	Tue 10/2/07	Tue 10/9/07
225		Navy and Regulatory Comment Resolution	100%	14 d	Wed 10/10/07	Tue 10/23/07
226		Prepare Final Additional Scrutiny QAPP Addendum and HASP	100%	10 d	Wed 10/24/07	Fri 11/2/07
227		USEPA, MEDEP, & RAB Receive Final Additional Scrutiny QAPP Addendum and HASP	100%	1 d	Mon 11/5/07	Mon 11/5/07
228		Conduct Field Investigation	100%	166 d	Mon 11/5/07	Fri 4/18/08
229	*	Submit Phase II (and Round 9) Data Package	100%	1 d	Mon 9/22/08	Mon 9/22/08
230	Delayed	Additional Scrutiny Phase II Report	1%	511 d	Sun 8/17/08	Sat 1/9/10
231		Prepare Draft AS Phase II Report	2%	296 d	Sun 8/17/08	Mon 6/8/09
235		USEPA, MEDEP & RAB Receive Draft AS Phase II Report	0%	1 d	Tue 6/9/09	Tue 6/9/09
236		USEPA, MEDEP & RAB Review Draft AS Phase II Report	0%	45 d	Tue 6/9/09	Thu 7/23/09
240		Navy Receives Comments on Draft AS Phase II Report	0%	1 d	Fri 7/24/09	Fri 7/24/09
241		Prepare Response to Comments on Draft Report	0%	45 d	Fri 7/24/09	Sun 9/6/09
242		USEPA, MEDEP & RAB Receives Response to Comments on Draft Report	0%	1 d	Tue 9/8/09	Tue 9/8/09
243		USEPA, MEDEP & RAB Review Responses to Comments on Draft Report	0%	30 d	Wed 9/9/09	Thu 10/8/09
247		Navy Receives Follow-up Comments on Draft AS Report	0%	1 d	Thu 10/8/09	Thu 10/8/09
248		Prepare Response to Comments and Draft Final Report	0%	30 d	Fri 10/9/09	Sat 11/7/09
249		USEPA, MEDEP & RAB Receive Response to Comments and Draft Final Report	0%	1 d	Tue 11/10/09	Tue 11/10/09
250		USEPA, MEDEP & RAB Review Response to Comments and Draft Final Report	0%	30 d	Tue 11/10/09	Wed 12/9/09
254		Navy Receives Comments on Draft Final Report	0%	1 d	Thu 12/10/09	Thu 12/10/09
255		Navy and Regulatory Comment Resolution	0%	7 d	Thu 12/10/09	Wed 12/16/09
256		Prepare Final AS Phase II Report	0%	30 d	Thu 12/10/09	Fri 1/8/10
257		Submit Final AS Phase II Report	0%	1 d	Sat 1/9/10	Sat 1/9/10
258	*	REMEDY IN PLACE	0%	1 d	Mon 11/4/13	Mon 11/4/13



Thu 4/16/09
2:14 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT 4 (OU4)
(Site 5 and Offshore AOCs)

ID	Notes	Task Name	%	Dur	Start	Finish
326		OFFSHORE FEASIBILITY STUDY (FS)	0%	749 d	Sun 1/2/11	Sat 1/19/13
327		Prepare Draft FS Report	0%	505 d	Sun 1/2/11	Sun 5/20/12
333		USEPA & MEDEP Receives Draft FS Report	0%	1 d	Mon 5/21/12	Mon 5/21/12
334		USEPA, MEDEP & RAB Review Draft FS Report	0%	45 d	Mon 5/21/12	Wed 7/4/12
338		Navy Receives Comments on Draft FS Report	0%	1 d	Thu 7/5/12	Thu 7/5/12
339		Prepare FS Report Response to Comments Letter	0%	45 d	Thu 7/5/12	Sat 8/18/12
344		USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	0%	1 d	Sun 8/19/12	Sun 8/19/12
345		USEPA, MEDEP & RAB Reviews FS Report Response to Comments Letter	0%	30 d	Sun 8/19/12	Mon 9/17/12
349		Navy Receives Comments on FS Report Response to Comments Letter	0%	1 d	Tue 9/18/12	Tue 9/18/12
350		Navy and Regulator Comment Resolution	0%	7 d	Tue 9/18/12	Mon 9/24/12
351		Prepare Draft Final FS Report	0%	30 d	Tue 9/18/12	Wed 10/17/12
352		USEPA, MEDEP & RAB Receive Draft Final FS Report	0%	1 d	Sat 10/20/12	Sat 10/20/12
353		USEPA, MEDEP & RAB Review Draft Final FS Report	0%	30 d	Sat 10/20/12	Sun 11/18/12
357		Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Mon 11/19/12	Mon 11/19/12
358		Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Mon 11/19/12	Tue 12/18/12
359		Prepare Final FS Report	0%	30 d	Wed 12/19/12	Thu 1/17/13
360		USEPA, MEDEP & RAB Receive Final FS Report	0%	1 d	Sat 1/19/13	Sat 1/19/13
361		PROPOSED REMEDIAL ACTION PLAN (PRAP)	0%	232 d	Tue 9/18/12	Tue 5/7/13
362		Authorize Release of Funds	0%	1 d	Tue 9/18/12	Tue 9/18/12
363		Award PRAP/ROD and RD/RA Schedule	0%	1 d	Wed 9/19/12	Wed 9/19/12
364		Prepare Proposed Remedial Action Plan	0%	198 d	Thu 9/20/12	Fri 4/5/13
365		Prepare Draft PRAP	0%	120 d	Thu 9/20/12	Fri 1/18/13
366		Prepare Rough Draft PRAP	0%	30 d	Thu 9/20/12	Fri 10/19/12
367		Navy Receives Rough Draft PRAP	0%	1 d	Sat 10/20/12	Sat 10/20/12
368		Navy Reviews Rough Draft PRAP	0%	30 d	Sat 10/20/12	Sun 11/18/12
369		Prepare Draft PRAP	0%	30 d	Wed 12/19/12	Fri 1/18/13
370		USEPA, MEDEP & RAB Receive Draft PRAP	0%	1 d	Sat 1/19/13	Sat 1/19/13
371		USEPA, MEDEP & RAB Review Draft PRAP Schedule	0%	30 d	Sat 1/19/13	Sun 2/17/13
375		Navy Receives Comments on Draft PRAP	0%	1 d	Mon 2/18/13	Mon 2/18/13
376		Prepare Response to Comments Letter & Draft Final PRAP	0%	21 d	Mon 2/18/13	Sun 3/10/13
377		USEPA, MEDEP & RAB Receive Draft Final PRAP & Response to Comments Letter	0%	1 d	Mon 3/11/13	Mon 3/11/13
378		Navy and Regulator Comment Resolution	0%	14 d	Mon 3/11/13	Sun 3/24/13
379		Prepare for Public Comment Period	0%	14 d	Mon 3/25/13	Sun 4/7/13
380		Public Comment Period	0%	30 d	Mon 4/8/13	Tue 5/7/13
381		PREPARATION OF RD/RA SCHEDULE AND REMEDIAL DESIGN	0%	150 d	Sat 3/23/13	Mon 8/19/13
382		Prepare RD/RA Schedule (Secondary)	0%	90 d	Sat 3/23/13	Thu 6/20/13
383		USEPA, MEDEP & RAB Receive RD Schedule	0%	1 d	Fri 6/21/13	Fri 6/21/13
384		Regulatory and RAB Review	0%	30 d	Fri 6/21/13	Sat 7/20/13
385		Decision/Resolution Period	0%	30 d	Sun 7/21/13	Mon 8/19/13
386		RECORD OF DECISION (ROD)	0%	200 d	Fri 4/5/13	Mon 10/21/13
387		Prepare Draft ROD (Primary Document)	0%	64 d	Fri 4/5/13	Fri 6/7/13
392		USEPA, MEDEP & RAB Receives Draft ROD	0%	1 d	Sat 6/8/13	Sat 6/8/13
393		USEPA, MEDEP & RAB Review Draft ROD	0%	30 d	Sat 6/8/13	Sun 7/7/13
397		Navy Receives Comments on Draft ROD	0%	1 d	Mon 7/8/13	Mon 7/8/13
398		Prepare Response to Comments Letter & Draft Final ROD	0%	21 d	Mon 7/8/13	Sun 7/28/13
403		USEPA, MEDEP & RAB Receive Response to Comments & Draft Final ROD	0%	1 d	Mon 7/29/13	Mon 7/29/13
404		USEPA, MEDEP & RAB Review Draft Final ROD	0%	21 d	Mon 7/29/13	Sun 8/18/13
408		Navy Receives Comments on Draft Final ROD	0%	1 d	Mon 8/19/13	Mon 8/19/13
409		MEDEP Submits Letter of Concurrence/Non-Concurrence	0%	1 d	Mon 8/19/13	Mon 8/19/13
410		Prepare Final ROD	0%	20 d	Mon 8/19/13	Sat 9/7/13
411		Navy Signs Final ROD	0%	1 d	Sun 9/8/13	Sun 9/8/13
412		USEPA Receives Final ROD	0%	1 d	Mon 9/9/13	Mon 9/9/13
413		USEPA Signs Final ROD	0%	14 d	Sun 9/8/13	Sat 9/21/13
414		Navy Distributes Final Record of Decision	0%	30 d	Sun 9/22/13	Mon 10/21/13
415		REMEDIAL DESIGN	0%	503 d	Thu 4/25/13	Tue 9/9/14
416		RD Contracting Action	0%	70 d	Thu 4/25/13	Wed 7/3/13
424		Award Remedial Design	0%	1 d	Tue 9/10/13	Tue 9/10/13
425		Design To Be Determined	0%	365 d	Tue 9/10/13	Tue 9/9/14
426		REMEDIAL ACTION	0%	519 d	Wed 7/3/13	Wed 12/3/14
427		RA Contracting Action	0%	70 d	Wed 7/3/13	Tue 9/10/13
435		Award Remedial Action	0%	1 d	Wed 9/11/13	Wed 9/11/13
436		Mobilization	0%	89 d	Wed 9/11/13	Sun 12/8/13
437		Start of Significant & Continuous Onsite Activity	0%	1 d	Wed 12/3/14	Wed 12/3/14



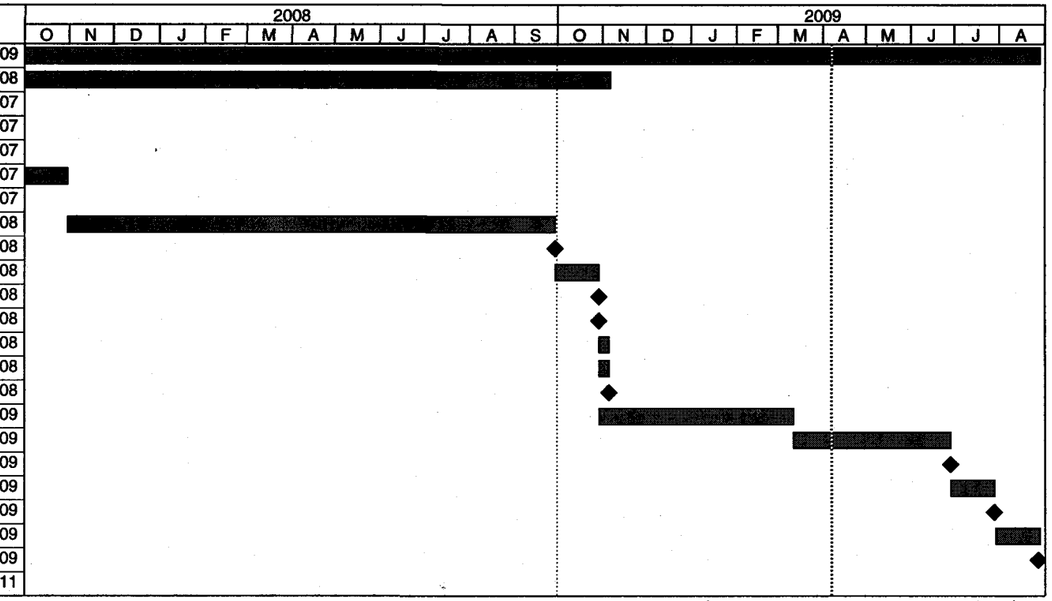
APPENDIX C.5

OU7 SCHEDULE (SITE 32)

Tue 4/7/09
1:41 PM

Portsmouth Naval Shipyard
Site Management Schedule
OPERABLE UNIT (OU) 7
(Site 32)

ID	Notes	Task Name	%	Dur	Start	Finish
66		PHASE II RI Work Plan and Field Work	85%	970 d	Tue 1/2/07	Fri 8/28/09
67		RI WORKPLAN	100%	675 d	Tue 1/2/07	Thu 11/6/08
68		Receive Funding for Phase II	100%	1 d	Tue 1/2/07	Tue 1/2/07
69		Prepare Draft RI QAPP	100%	180 d	Wed 1/3/07	Sun 7/1/07
74		USEPA, MEDEP & RAB Receives Draft RI Workplan	100%	1 d	Mon 7/2/07	Mon 7/2/07
75		USEPA, MEDEP & RAB Review Draft RI Workplan	100%	121 d	Mon 7/2/07	Tue 10/30/07
79		Navy Receives Comments on Draft RI Workplan	100%	65 d	Mon 8/27/07	Tue 10/30/07
80	*	Resolve Comments and Prepare RI Workplan RTC Letter and Draft Final	100%	335 d	Wed 10/31/07	Mon 9/29/08
84	*	USEPA, MEDEP Receive RI RTC and Draft Final	100%	1 d	Tue 9/30/08	Tue 9/30/08
85	*	USEPA, MEDEP & RAB Reviews RTC and Draft Final	100%	30 d	Tue 9/30/08	Wed 10/29/08
89	*	Navy Receives Comments on RTC and Draft Final	100%	1 d	Thu 10/30/08	Thu 10/30/08
90	*	Navy Receives Approval, Comments, or Notice of Dispute	100%	1 d	Thu 10/30/08	Thu 10/30/08
91	*	Navy and Regulator Resolution or Notice of Dispute	100%	7 d	Thu 10/30/08	Wed 11/5/08
92	*	Prepare Final RI Workplan	100%	7 d	Thu 10/30/08	Wed 11/5/08
93	*	USEPA, MEDEP & RAB Receive Final RI Workplan	100%	1 d	Thu 11/6/08	Thu 11/6/08
94	*	Perform Round II RI Field Work	100%	133 d	Thu 10/30/08	Wed 3/11/09
100	*	Prepare Data Package & Evaluation of Results	42%	109 d	Thu 3/12/09	Sun 6/28/09
107		USEPA, MEDEP & RAB Receives Draft Evaluation of Results and Final Phase II Data Package	0%	1 d	Mon 6/29/09	Mon 6/29/09
108		USEPA, MEDEP & RAB Review Draft Phase II Data Package & Evaluation of Results	0%	30 d	Mon 6/29/09	Tue 7/28/09
112		Navy Receives Comments on Draft Phase II Data Package & Evaluation of Results	0%	1 d	Wed 7/29/09	Wed 7/29/09
113		Prepare Response to Comments Letter	0%	30 d	Thu 7/30/09	Fri 8/28/09
114		USEPA, MEDEP & RAB Receive Response to Comments Letter	0%	1 d	Fri 8/28/09	Fri 8/28/09
115	*	REMEDY IN PLACE	0%	1 d	Fri 9/30/11	Fri 9/30/11

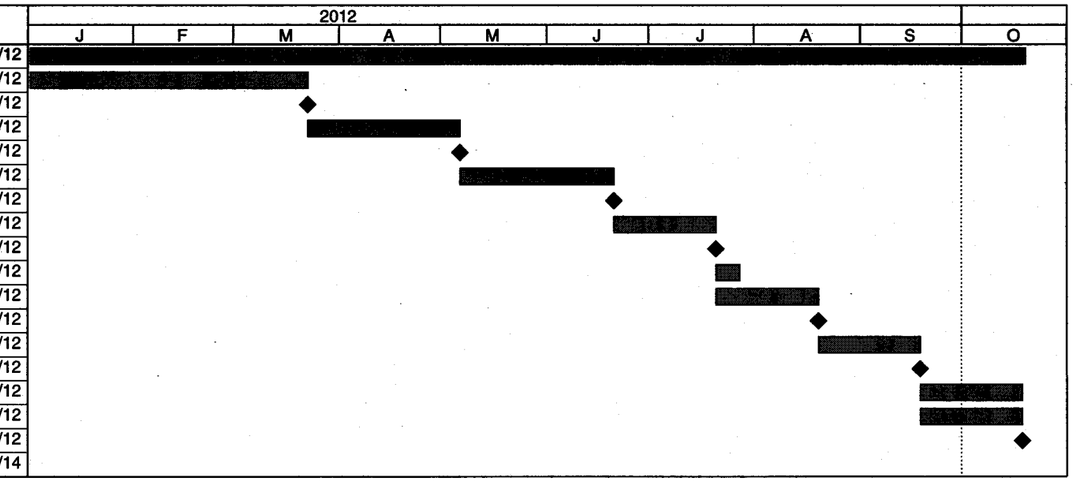


APPENDIX C.6
OU8 SCHEDULE (SITE 31)

Tue 4/7/09
3:10 PM

Portsmouth Naval Shipyard
Site Management Plan
OPERABLE UNIT 8 (OU8)
(Site 31)

ID	Notes	Task Name	%	Dur	Start	Finish
1		RI WORKPLAN	0%	292 d	Mon 1/2/12	Fri 10/19/12
2		Prepare Draft RI Workplan	0%	81 d	Mon 1/2/12	Thu 3/22/12
7		USEPA, MEDEP & RAB Receives Draft RI Workplan	0%	1 d	Fri 3/23/12	Fri 3/23/12
8		USEPA, MEDEP & RAB Review Draft RI Workplan	0%	45 d	Fri 3/23/12	Sun 5/6/12
12		Navy Receives Comments on Draft RI Workplan	0%	1 d	Mon 5/7/12	Mon 5/7/12
13		Prepare RI Workplan Response to Comments Letter	0%	45 d	Mon 5/7/12	Wed 6/20/12
18		USEPA, MEDEP Receive RI Workplan Response to Comments Letter	0%	1 d	Thu 6/21/12	Thu 6/21/12
19		USEPA, MEDEP & RAB Reviews RI Workplan Response to Comments Letter	0%	30 d	Thu 6/21/12	Fri 7/20/12
23		Navy Receives Comments on RI Workplan Response to Comments Letter	0%	1 d	Sat 7/21/12	Sat 7/21/12
24		Navy and Regulator Comment Resolution	0%	7 d	Sat 7/21/12	Fri 7/27/12
25		Prepare Draft Final RI Workplan	0%	30 d	Sat 7/21/12	Sun 8/19/12
26		USEPA, MEDEP & RAB Receive Draft Final RI Workplan	0%	1 d	Mon 8/20/12	Mon 8/20/12
27		USEPA, MEDEP & RAB Review Draft Final RI Workplan	0%	30 d	Mon 8/20/12	Tue 9/18/12
31		Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Wed 9/19/12	Wed 9/19/12
32		Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Wed 9/19/12	Thu 10/18/12
33		Prepare Final RI Workplan	0%	30 d	Wed 9/19/12	Thu 10/18/12
34		USEPA, MEDEP & RAB Receive Final RI Workplan	0%	1 d	Fri 10/19/12	Fri 10/19/12
35	*	REMEDY IN PLACE	0%	1 d	Mon 9/1/14	Mon 9/1/14

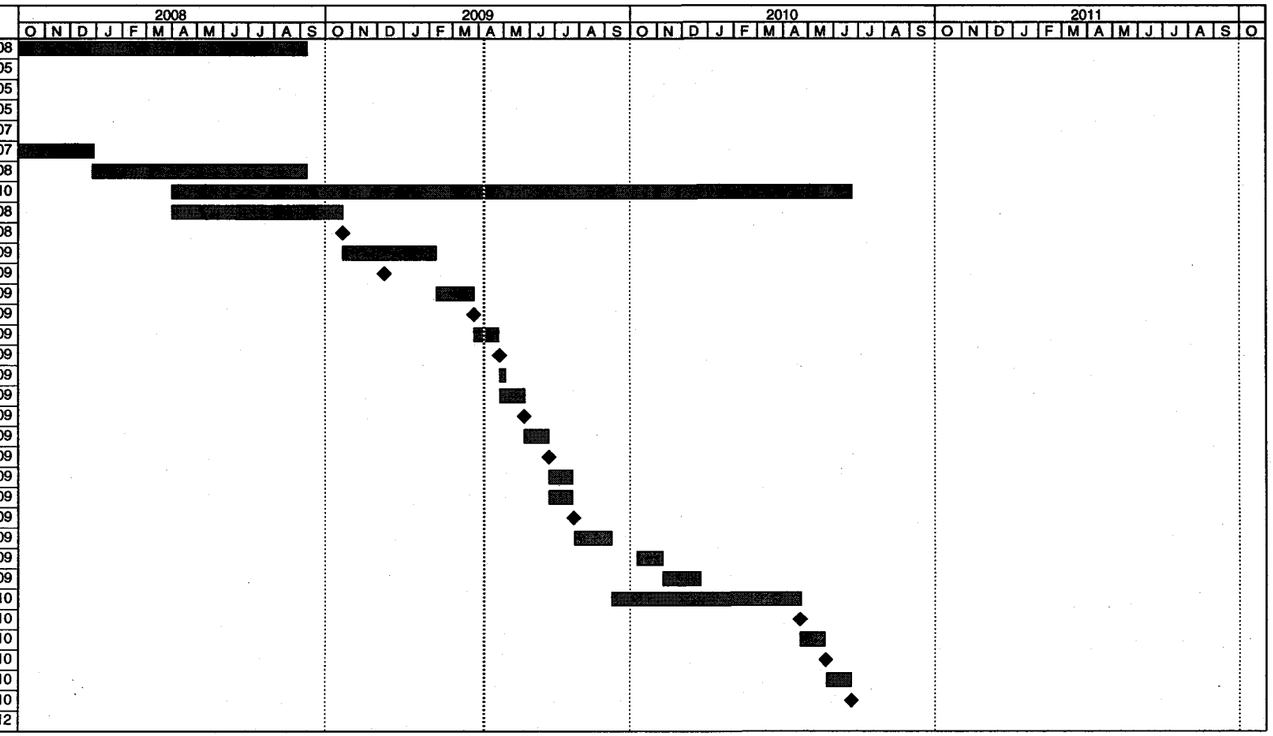


APPENDIX C.7
OU9 SCHEDULE (SITE 34)

Tue 4/7/09
1:42 PM

Portsmouth Naval Shipyard
Site Management Plan Schedule
OPERABLE UNIT (OU) 9
(Site 34)

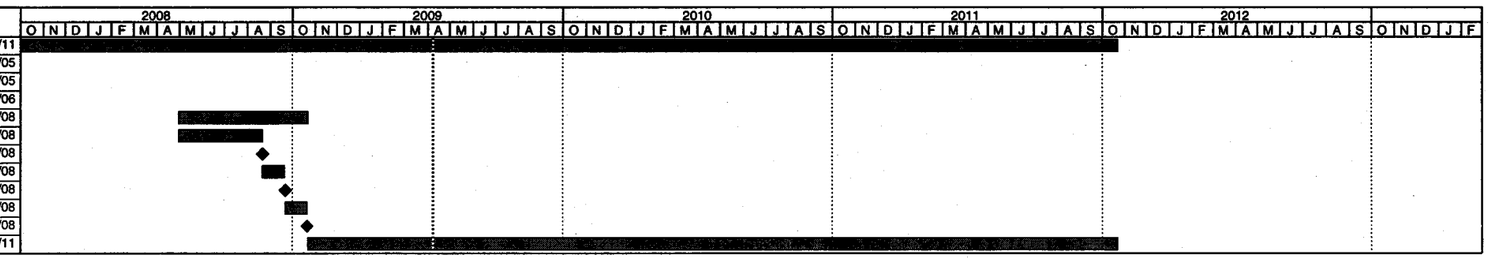
ID	Notes	Task Name	%	Dur	Start	Finish
84		SITE 34 REMOVAL ACTION (Secondary Document)	100%	1624 d	Wed 3/31/04	Tue 9/9/08
85		Engineering Evaluation/Cost Analysis (EE/CA)	100%	548 d	Wed 3/31/04	Thu 9/29/05
101		Prepare for Public Comment Period	100%	19 d	Fri 9/30/05	Tue 10/18/05
102		Public Comment Period	100%	30 d	Wed 10/19/05	Thu 11/17/05
103		Action Memorandum (AM)	100%	540 d	Fri 9/30/05	Fri 3/23/07
118		Design and Fieldwork	100%	850 d	Thu 9/1/05	Sat 12/29/07
119	*	Completion Report	100%	257 d	Fri 12/28/07	Tue 9/9/08
120		RI WORKPLAN (UFP-SAP and HASP)	42%	813 d	Wed 4/2/08	Wed 6/23/10
121	*	Prepare Draft RI Workplan	100%	203 d	Wed 4/2/08	Tue 10/21/08
133	*	USEPA, MEDEP & RAB Receives Draft RI Workplan	100%	1 d	Wed 10/22/08	Wed 10/22/08
134	*	USEPA, MEDEP & RAB Review Draft RI Workplan	100%	111 d	Wed 10/22/08	Mon 2/9/09
138	*	Navy Receives Comments on Draft RI Workplan	100%	62 d	Wed 12/10/08	Mon 2/9/09
139	*	Prepare RI Workplan Response to Comments Letter	100%	45 d	Tue 2/10/09	Thu 3/26/09
144	*	USEPA, MEDEP Receive RI Workplan Response to Comments Letter	100%	1 d	Fri 3/27/09	Fri 3/27/09
145	*	USEPA, MEDEP & RAB Reviews RI Workplan Response to Comments Letter	0%	30 d	Fri 3/27/09	Sat 4/25/09
149	*	Navy Receives Comments on RI Workplan Response to Comments Letter	0%	1 d	Mon 4/27/09	Mon 4/27/09
150	*	Navy and Regulator Comment Resolution	0%	7 d	Mon 4/27/09	Sun 5/3/09
151	*	Prepare Draft Final RI Workplan	0%	30 d	Mon 4/27/09	Tue 5/26/09
152	*	USEPA, MEDEP & RAB Receive Draft Final RI Workplan	0%	1 d	Tue 5/26/09	Tue 5/26/09
153	*	USEPA, MEDEP & RAB Review Draft Final RI Workplan	0%	30 d	Tue 5/26/09	Wed 6/24/09
157	*	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	Thu 6/25/09	Thu 6/25/09
158	*	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	Thu 6/25/09	Fri 7/24/09
159	*	Prepare Final RI Workplan	0%	30 d	Thu 6/25/09	Fri 7/24/09
160	*	USEPA, MEDEP & RAB Receive Final RI Workplan	0%	1 d	Sun 7/26/09	Sun 7/26/09
161	*	Field Work - mobilization and sampling	0%	45 d	Mon 7/27/09	Wed 9/9/09
162	*	Laboratory Analysis	0%	30 d	Sat 10/10/09	Sun 11/8/09
163	*	Data validation and Data base update	0%	45 d	Mon 11/9/09	Wed 12/23/09
164	*	Prepare Data Package & Evaluation of Results	0%	225 d	Thu 9/10/09	Thu 4/22/10
172	*	USEPA, MEDEP & RAB Receives Draft Evaluation of Results and Data Package	0%	1 d	Thu 4/22/10	Thu 4/22/10
173	*	USEPA, MEDEP & RAB Review Draft Evaluation of Results	0%	30 d	Thu 4/22/10	Fri 5/21/10
177	*	Navy Receives Comments on Draft Evaluation of Results	0%	1 d	Sun 5/23/10	Sun 5/23/10
178	*	Prepare Response to Comments Letter	0%	30 d	Mon 5/24/10	Tue 6/22/10
179	*	USEPA, MEDEP & RAB Receive Response to Comments Letter and Final Memo	0%	1 d	Wed 6/23/10	Wed 6/23/10
180	*	REMEDY IN PLACE	0%	1 d	Tue 2/14/12	Tue 2/14/12



APPENDIX C.8

SITE 30, FORMER GALVANIZING PLANT BUILDING 184, SCHEDULE

Tue 4/7/09
3:19 PM

Portsmouth Naval Shipyard
Site Management Plan Schedules
Site 30, Galvanizing Plant (Building 184)

ID	Notes	Task Name	%	Dur	Start	Finish
77		SITE 30 REMOVAL ACTION	36%	2799 d	Mon 2/23/04	Sat 10/22/11
78		Revised EE/CA (Secondary Document)	100%	555 d	Mon 2/23/04	Tue 8/30/05
91		Public Comment Period	100%	50 d	Wed 8/31/05	Wed 10/19/05
94		Revised Action Memorandum (Secondary Document)	100%	286 d	Wed 9/21/05	Mon 7/3/06
102	Delayed	Removal Action Work Plan (Secondary Document)	0%	175 d	Thu 5/1/08	Wed 10/22/08
103		Prepare Draft Site 30 Removal Action Work Plan	0%	113 d	Thu 5/1/08	Thu 8/21/08
110		USEPA, MEDEP & RAB Receive Draft Work Plan	0%	1 d	Fri 8/22/08	Fri 8/22/08
111		USEPA, MEDEP & RAB Review Draft Work Plan	0%	30 d	Fri 8/22/08	Sat 9/20/08
115		Navy Receives Comments on Draft Work Plan	0%	1 d	Mon 9/22/08	Mon 9/22/08
116		Prepare Final Work Plan	0%	30 d	Mon 9/22/08	Tue 10/21/08
117		USEPA, MEDEP & RAB Receive Final Work Plan	0%	1 d	Wed 10/22/08	Wed 10/22/08
118	Delayed	Perform Site 30 Removal Action	0%	1095 d	Thu 10/23/08	Sat 10/22/11