

# **FY02 Amended Site Management Plan**

for

## **Portsmouth Naval Shipyard Kittery, Maine**



**Engineering Field Activity North East  
Naval Facilities Engineering Command**

March 2002

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

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## ACRONYMS AND ABBREVIATIONS

<b>AOC</b>	<b>Area of Concern</b>
<b>ARAR</b>	<b>Applicable or Relevant and Appropriate Requirement</b>
<b>CDC</b>	<b>Child Development Center</b>
<b>CERCLA</b>	<b>Comprehensive Environmental Response, Compensation and Liability Act</b>
<b>CHF</b>	<b>Contaminant Hazard Factor</b>
<b>CIA</b>	<b>Controlled Industrial Area</b>
<b>CMI</b>	<b>Corrective Measures Implementation</b>
<b>CMS</b>	<b>Corrective Measures Study</b>
<b>DERP</b>	<b>Defense Environmental Restoration Program</b>
<b>DOD</b>	<b>Department of Defense</b>
<b>DRMO</b>	<b>Defense Reutilization and Marketing Office Storage Yard</b>
<b>EE/CA</b>	<b>Engineering Evaluation/Cost Analysis</b>
<b>EERA</b>	<b>Estuarine Ecological Risk Assessment</b>
<b>EFANE</b>	<b>Engineering Field Activity Northeast</b>
<b>FCS</b>	<b>Final Confirmation Study</b>
<b>FFA</b>	<b>Federal Facility Agreement</b>
<b>FS</b>	<b>Feasibility Study</b>
<b>GCL</b>	<b>Geocomposite Layer</b>
<b>HHRA</b>	<b>Human Health Risk Assessment</b>
<b>HRS</b>	<b>Hazard Ranking System</b>
<b>HSWA</b>	<b>Hazard and Solid Waste Amendments (of 1984)</b>
<b>IAG</b>	<b>Interagency Agreement</b>
<b>IAS</b>	<b>Initial Assessment Study</b>
<b>IM</b>	<b>Interim Measure</b>
<b>IR</b>	<b>Installation Restoration</b>
<b>JILF</b>	<b>Jamaica Island Landfill</b>
<b>MB</b>	<b>Mercury Burial</b>
<b>MEDEP</b>	<b>Maine Department of Environmental Protection</b>
<b>MEK</b>	<b>Methylethyl ketone</b>
<b>MILCON</b>	<b>Military Construction</b>
<b>MPF</b>	<b>Migration Pathway Factor</b>
<b>MPS</b>	<b>Media Protection Standard</b>
<b>MTADS</b>	<b>Multi-Sensored Towed Array Detection System</b>
<b>NACIP</b>	<b>Navy Assessment and Control of Installation Pollutants</b>
<b>Navy</b>	<b>U.S. Department of the Navy</b>

## ACRONYMS AND ABBREVIATIONS (CONT'D)

<b>NCCOSC</b>	<b>Naval Command Control and Ocean Surveillance Center</b>
<b>NCP</b>	<b>National Contingency Plan</b>
<b>NOAA</b>	<b>National Oceanic and Atmospheric Administration</b>
<b>NPL</b>	<b>National Priority List</b>
<b>NRL</b>	<b>Navy Research Laboratory</b>
<b>OU</b>	<b>Operable Unit</b>
<b>PA/SI</b>	<b>Preliminary Assessment/Site Investigation</b>
<b>PCBs</b>	<b>Polychlorinated Biphenyls</b>
<b>PHERE</b>	<b>Public Health and Environmental Risk Evaluation</b>
<b>PNS</b>	<b>Portsmouth Naval Shipyard</b>
<b>PP</b>	<b>Proposed Plan</b>
<b>PRAP</b>	<b>Proposed Remedial Action Plan</b>
<b>PRG</b>	<b>Preliminary Remediation Goal</b>
<b>RA</b>	<b>Remedial Action</b>
<b>RAB</b>	<b>Restoration Advisory Board</b>
<b>RCRA</b>	<b>Resource Conservation and Recovery Act</b>
<b>RD</b>	<b>Remedial Design</b>
<b>RF</b>	<b>Receptor Factor</b>
<b>RFA</b>	<b>RCRA Facility Assessment</b>
<b>RFI</b>	<b>RCRA Facility Investigation</b>
<b>RI</b>	<b>Remedial Investigation</b>
<b>ROD</b>	<b>Record of Decision</b>
<b>SMP</b>	<b>Site Management Plan</b>
<b>SSA</b>	<b>Site Screening Area</b>
<b>SSP</b>	<b>Site Screening Process</b>
<b>SWMU</b>	<b>Solid Waste Management Unit</b>
<b>TCE</b>	<b>Trichloroethene</b>
<b>USEPA</b>	<b>U.S. Environmental Protection Agency</b>
<b>UST</b>	<b>Underground Storage Tank</b>

## **1.0 INTRODUCTION**

This Site Management Plan (SMP) for Portsmouth Naval Shipyard (PNS) in Kittery, Maine was prepared by the U.S. Department of the Navy (Navy), Engineering Field Activity Northeast (EFANE), Naval Facilities Engineering Command. 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 within the Navy/Marine Corps Installation Restoration (IR) Program. Ultimately, the SMP serves as the schedule for implementation of the IR Program 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 FY01 Amended Site Management Plan. 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.

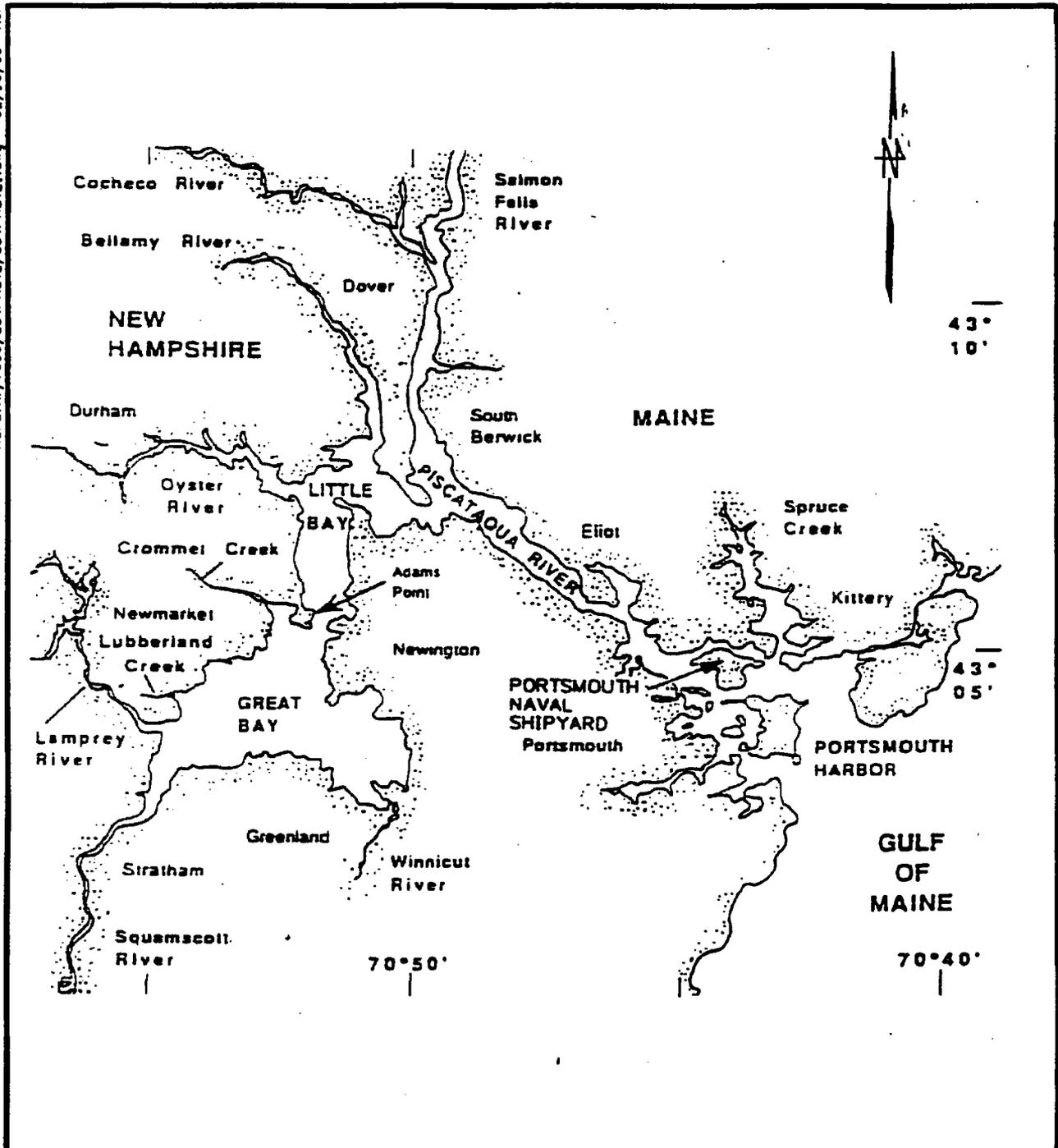
The following section summarizes the location, mission, operations history, and environmental activities history at PNS.

### **1.1 FACILITY LOCATION AND MISSION**

Situated within the town limits of Kittery, Maine, PNS is located on an island in the Piscataqua River, referred to on National Oceanic and Atmospheric Administration (NOAA) nautical charts as Seavey Island, with the eastern tip given the name Jamaica Island. Attached by a rock causeway is Clark's Island which is not industrialized. The Piscataqua River is a tidal estuary that forms the southern boundary between Maine and New Hampshire. PNS is located at the mouth of the Great Bay Estuary (commonly referred to as Portsmouth Harbor). The Great Bay Estuary and Site Location are shown on Figure 1-1. The Facility Map is included as Figure 1-2.

PNS is engaged in the conversion, overhaul, and repair of submarines for the Navy. PNS has a history dating back to 1800 when the facility was established. The first government-built submarine was designed and constructed at PNS during World War I. A large number of submarines have been designed, constructed, and repaired at this facility from 1917 to the present. PNS continues to service submarines as its primary military focus.

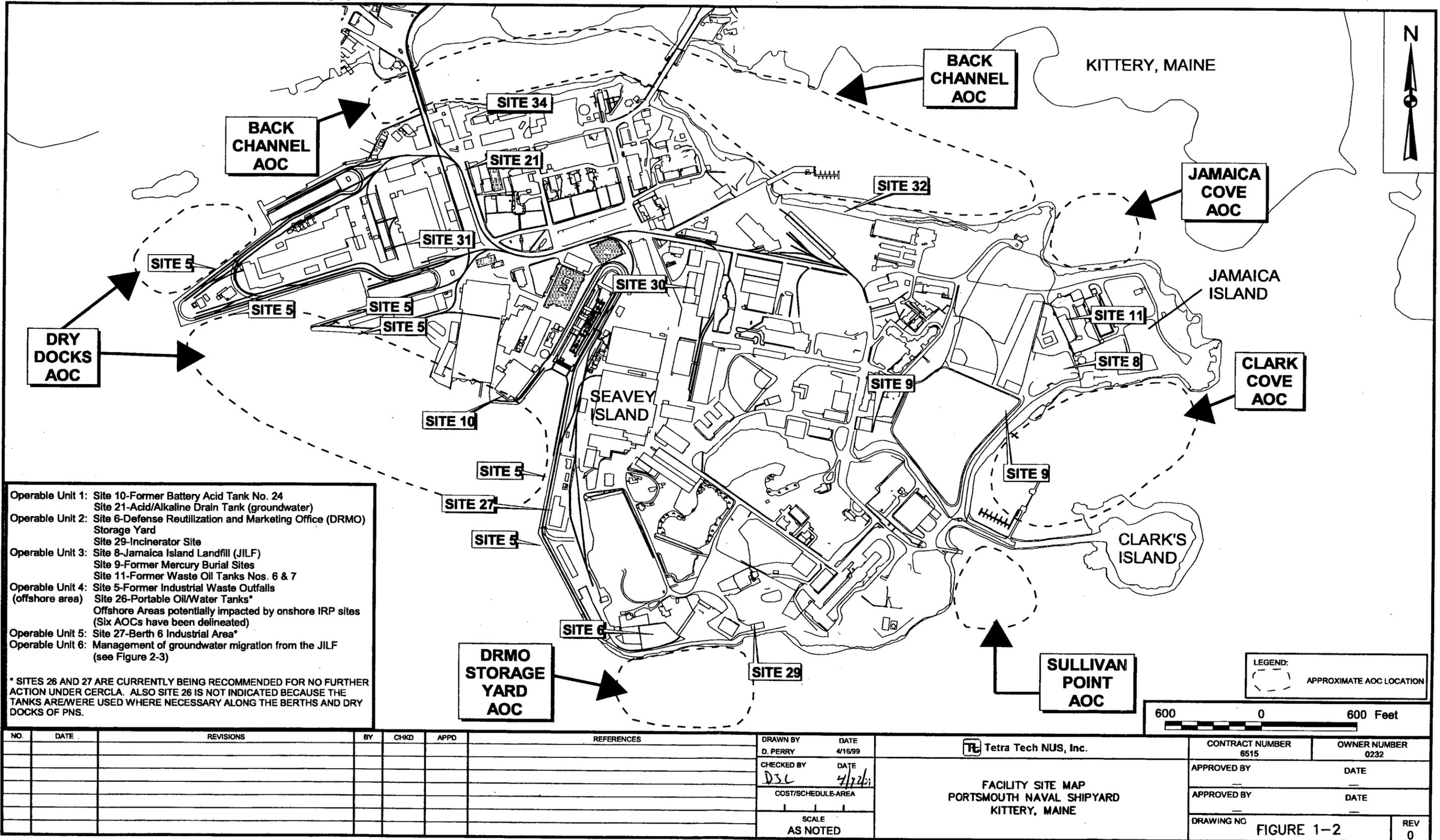
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REFERENCE: THE ECOLOGY OF THE GREAT BAY ESTUARY, NEW HAMPSHIRE AND MAINE: AN ESTUARINE PROFILE AND BIBLIOGRAPHY, EDITED BY FREDERICK T. SHORT, UNIVERSITY OF NEW HAMPSHIRE JACKSON ESTUARINE LABORATORY, OCTOBER 1992

DRAWN BY HJP	DATE 2/16/99	Tetra Tech NUS, Inc.	CONTRACT NO. 7090	OWNER NO. 0256
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COST/SCHED-AREA		GREAT BAY ESTUARY AND SITE LOCATION PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE		
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Operable Unit 1: Site 10-Former Battery Acid Tank No. 24  
 Site 21-Acid/Alkaline Drain Tank (groundwater)

Operable Unit 2: Site 6-Defense Reutilization and Marketing Office (DRMO) Storage Yard  
 Site 29-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 area)  
 Site 26-Portable Oil/Water Tanks\*  
 Offshore Areas potentially impacted by onshore IRP sites (Six AOCs have been delineated)

Operable Unit 5: Site 27-Berth 6 Industrial Area\*

Operable Unit 6: Management of groundwater migration from the JILF (see Figure 2-3)

\* SITES 26 AND 27 ARE CURRENTLY BEING RECOMMENDED FOR NO FURTHER ACTION UNDER CERCLA. ALSO SITE 26 IS NOT INDICATED BECAUSE THE TANKS ARE/WERE USED WHERE NECESSARY ALONG THE BERTHS AND DRY DOCKS OF PNS.

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY D. PERRY	DATE 4/16/99	Tetra Tech NUS, Inc.	CONTRACT NUMBER 6515	OWNER NUMBER 0232
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## 1.2 HISTORY OF HAZARDOUS WASTE DISPOSAL, ENVIRONMENTAL INVESTIGATION, AND REMEDIATION ACTIVITIES

The following is a description of the history of hazardous waste disposal, environmental investigation, and remediation activities performed prior to when the FFA was signed for PNS.

Years of shipbuilding and submarine repair work at PNS have resulted in hazardous substances being released into the soils, groundwater, surface water, and sediment on and around Seavey Island. As a result, investigation and remediation activities have been performed under the IR Program.

The purpose of the IR Program 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/Marine Corps activities. Investigations of hazardous substance releases at PNS began in 1983 when the Navy completed an Initial Assessment Study (IAS) (Weston, 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, 1986), which evaluated the sites identified in the IAS to confirm the presence of contamination.

The 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 the Resource Conservation and Recovery Act (RCRA). Since 1988, the Maine Department of Environmental Protection (MEDEP) has also provided oversight of investigation and remediation of PNS. 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 Facilities Investigation (RFI); the Corrective Measures Study (CMS); and the Corrective Measures Implementation (CMI) Plan. Until the mid-1990s, investigations at the PNS were conducted under RCRA authority. Effective May 31, 1994, PNS was included on the National Priority List (NPL). Subsequently, the studies have been conducted under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as Superfund.

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, 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 NPL in June 1993 and added to the NPL in May 1994. Since then, USEPA has coordinated the transition from RCRA to the CERCLA/Superfund process to ensure the uninterrupted and continued progress in the investigations. Ongoing work still meets the intent of the Hazard and Solid Waste Amendments (of 1984) (HSWA) Permit, but the ongoing onshore study to develop and evaluate remedial activities is entitled as a Feasibility Study (CERCLA terminology) and combines both RCRA and CERCLA criteria. Consistent with the transition from RCRA to CERCLA, the Solid Waste Management Unit (SWMU) terminology has since been replaced with "site". Refer to Section 3.0 of this report for a description of the RCRA and CERCLA processes. The USEPA, the MEDEP and the Navy will continue to work toward site cleanup under CERCLA. Among other things, the FFA establishes the roles and responsibilities for the USEPA and the Navy, sets deadlines, and establishes a mechanism for resolution of disputes. The FFA also provides for participation of the State in the process even though they have chosen not to be a party to the FFA.

The RFA (Kearney & Baker/TSA, 1986) identified 28 potential SWMUs located onshore and offshore of PNS. These are waste management sites that were known to exist or sites where known or potential releases of hazardous wastes or hazardous constituents occurred. After the 28 potential SWMUs were examined in greater depth, 15 were eliminated from further investigation, leaving 13 SWMUs. As a result of the RFA findings, in March 1989, the USEPA issued a Corrective Action Permit under the RCRA Hazardous and Solid Waste Amendments of 1984 (HSWA Permit) (USEPA, 1989) that required the PNS to investigate the 13 SWMUs (sites) and take appropriate corrective action. In 1994, the USEPA directed that 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.

### **1.2.1 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, 1992b). The RFI "Approval with Conditions" was issued by the USEPA in March of 1993. The Addendum to the RFI report (McLaren/Hart, 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. Results are

presented in the RFI Data Gap Report (Halliburton NUS, 1995c) and are considered supplemental to the RFI report.

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 a draft document titled Public Health and Environmental Risk Evaluation: Part A Human Health Risk Assessment (PHERE), (McLaren/Hart, 1994a). These results were utilized in developing the Final Media Protection Standards (MPSs) Proposal (McLaren/Hart, 1994b). Final MPSs were then set by the USEPA. The final MPSs were essentially used as Preliminary Remediation Goals (PRGs) in the Draft Onshore Feasibility Study (FS) Report (Halliburton NUS, 1995a). The Draft Onshore FS Report identifies and recommends remedial alternatives for each SWMU. The Applicable or Relevant and Appropriate Requirements (ARARs) Report (Halliburton NUS, 1994b) and Revised CMS Proposal (Halliburton NUS, 1994a) 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 Contingency Plan (NCP).

The Ambient Air Quality Monitoring Report (McLaren/Hart, 1992a) 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, 1996a) was prepared as a confirmation air monitoring study.

The Groundwater Investigation and Monitoring Plan (B&R Environmental, 1996b) was developed to address facility groundwater. The purpose of this plan is to facilitate the implementation of a cost-effective, groundwater investigation and interim monitoring plan for sites of concern at PNS. The data was evaluated to determine the impact on the quality of groundwater in the aquifer and the impact on surface water.

The Site Screening Work Plan for Building 184 (Site 30), West Timber Basin (Site 31), and Topeka Pier (Site 32) (B&R Environmental, 1998b) was developed to outline work necessary to determine whether these sites should become Areas of Concern (AOCs) that require further study through the CERCLA Remedial Investigation (RI)/FS process.

The Work Plan for Teepee Incinerator (Site 29) and Building 238 (Site 10) (B&R Environmental, 1998a) was to provide additional information to further characterize the sites to make remedial decisions. The purpose of this plan for Site 10 was to investigate additional areas based on new

information that indicates the pipes under Building 238 may have leaked, in addition to the underground storage tank (UST), which was removed in 1986. The purpose of this plan for Site 29 was to more fully characterize the area (formerly included as part of Site 6); including investigation for dioxins in the location where open burning occurred, and where the teepee incinerator was located.

### **1.2.2 Offshore Studies**

The offshore portion of the RFI included an Estuarine Ecological Risk Assessment (EERA) and a Human Health Risk Assessment (HHRA) (McLaren/Hart, 1994c). The Ecological and Human Health Risk Assessments were both based on offshore sampling and analysis of surface water, sediments and biota conducted as part of the EERA. 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, 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 the 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 the 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. The EERA (NCCOSC, 2000) has been finalized.

The data collected during Phase I of the Ecological Risk Assessment work was also used to develop the Human Health Risk Assessment for Offshore Media (McLaren/Hart, 1994c). The data collected from Phase II was evaluated to assess human risk in the Phase I/Phase II Data Comparative Analysis Report (TtNUS, 1998). The Offshore Human Health Risk Assessment Report is final, and the results have been used to establish human health surface water and sediment MPSs. The Offshore Human Health MPS Report is currently in the Draft stage (Halliburton NUS, 1995b).

Although they will not be finalized, both the Offshore Ecological and Human Health MPSs will be utilized in developing PRGs for surface water and sediment which take into consideration protection

of both ecological receptors and human health. Surface water and sediment PRGs will be used for the development and evaluation of offshore remedial objectives and alternatives in the Offshore FS.

The draft human health and draft ecological MPSs and the results of the groundwater monitoring have been used in the contaminant fate and transport modeling effort to evaluate the effects of groundwater contaminant migration on the offshore environment. This link between the onshore and offshore has been evaluated through the onshore/offshore contaminant fate and transport model.

An Interim Offshore Monitoring Plan has been prepared as required by the Interim Record of Decision (ROD) for Operable Unit 4. The monitoring program is designed to provide offshore monitoring in the interim period before completion of the offshore Feasibility Study and selection and implementation of the final remedy for the offshore.

### **1.2.3 Operable Units**

PNS has reorganized the approach it has used to study the sites. Instead of addressing the PNS sites as one large study and cleanup action, the sites were organized into five operable units (OUs) that clustered them with other sites with similar kinds of contamination or combined them because of geographic proximity. Restructuring into operable units allows sites that are ready for cleanup to proceed without waiting for studies on other sites to be completed. An additional OU (OU6) was identified in 2000 to address management of migration from the Jamaica Island Landfill (JILF). Section 2.3 discusses the six OUs.

## **1.3 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 IR Program for PNS.
- 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 Ranking Worksheets.
- Appendix C presents the Schedules.

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

## 2.0 SITE DESCRIPTIONS

This section presents the history and status of each site identified as needing further investigation at PNS prior to the signing of the FFA. A reference to the appropriate document(s) for status after the signing of the FFA is provided. This section also discusses the grouping of sites into OUs, including the OUs identified after the signing of the FFA.

To date, 13 sites and two site-impacted areas have been investigated at PNS, which were identified in the HSWA permit. Four other sites (Sites 30, 31, and 32, as well as Site 34, the Oil Gasification Plant) have been identified and investigated recently, which were not identified in the HSWA permit. These sites, as well as several areas offshore of PNS, have been identified as Areas of Concern (AOCs). AOCs are locations of potential or suspected contamination, or areas of known contamination that require further study through the CERCLA RI/FS process. To most efficiently address the AOCs, AOCs have been combined where appropriate into OUs. A description of the OUs is provided below:

Several sites not identified in the HSWA permit have also been included in the IR Program. Newly identified Site Screening Areas (SSAs) include Building 184 (Site 30), the West Timber Basin (Site 31), Topeka Pier (Site 32) and the Oil Gasification Plant (Site 34). SSAs are areas that require preliminary screening to determine whether they should become AOCs that require further study through the CERCLA RI/FS process. Site screening field investigations at Site 30, 31 and 32 have been completed and a report issued. Additional investigations are planned for sites 30, 31 and 32; the schedule for this work has not been established. A schedule for work to be performed at the Oil Gasification Plant has not been established at this time. Supplemental RI work has been performed at Site 29 and Site 10 during the summer of 1998.

Figure 1-2 presents the location of the AOCs and SSAs defined to date.

### 2.1 OPERABLE UNIT DESCRIPTIONS

The remedial process outlined in the HSWA Permit provided specific scopes and schedules for the RFI and CMS for all sites at PNS. As the process has progressed, it has become clear that certain sites and the offshore areas will require more time than others to be adequately characterized in accordance with the HSWA Permit and CERCLA. To expedite the process for those sites that have been adequately characterized and to group sites with similar characteristics, six OUs have been designated. This development is consistent with CERCLA.

The separation of PNS into OUs will permit the remedial process to progress at a faster pace, rather than waiting for complex issues to be resolved for more complex sites.

#### **OU1**

- Site 10 – Former Battery Acid Tank No. 24
- Site 21 – Acid/Alkaline Drain Tank (groundwater only)

#### **OU2**

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

#### **OU3**

- Site 8 - Jamaica Island Landfill (JILF) including JILF Impact Area, Former Child Development Center (CDC) Source Control
- Site 9 – Former Mercury Burial Sites (MBI and MBII)
- Site 11 - Former Waste Oil Tanks Nos. 6 & 7

#### **OU4**

- Site 5 - Industrial Waste Outfalls
- Site 26 - Portable Oil/Water Tanks
- Offshore Areas Potentially Impacted by PNS On-Shore Sites

#### **OU5**

- Site 27 - Berth 6 Industrial Area (formerly Fuel Oil Spill Area at Berth 6)

#### **OU6**

- JILF Management of Migration

## **2.2 SITE DESCRIPTIONS**

### **2.2.1 Site 10 – Former Battery Acid Tank No. 24**

This unit, used from 1974 to 1984, was an underground, 9680-gallon steel holding tank for waste lead battery acid from battery rebuilding operations. The unit was located outside of Building 238, within the Controlled Industrial Area (CIA). During an investigation of tank volume fluctuations in 1984, an approximate 2-inch hole was discovered at the bottom of the tank. The water level in the tank would rise and fall with the apparent tide. The period of potential release is not known. The tank was taken out of service in 1984 and removed in 1986. Soils were sampled at the time of tank removal. The area is currently covered by asphalt. Confirmation soil samples were taken from soil borings installed during the RFI investigation. IAS interview sheets found after the initial RFI and removal action were completed, indicated potential historical fill line leakage, necessitating expansion of the area of investigation. Additional investigation was performed in the summer of 1998, including surface soil sampling (at the Building 238 basement/crawl space area) and monitoring well installation.

The Field Investigation Report for Teepee Incinerator (Site 29) and Building 238 (Site 10) (TtNUS, March 2000) provides information related to Site 10 since the signing of the FFA

### **2.2.2 Site 21 – Acid/Alkaline Drain Tank**

This unit, used from 1974 to 1991, was a 695-gallon underground steel tank. The tank was located outside the Sheet Metal Shop, Building 75, in an industrial area just north of the CIA. The tank was located beneath the middle of a road and adjacent to railroad tracks. The tank held discharge from two clothes washing machines used to clean air filters. The prefilters were used to remove dirt, dust and debris from ships. Detergent used for cleaning was "Lestoil". Other wastes included rinse water from three deburring machines. Minor volumes of overflow wastes consisted of unspecified waste acid and alkaline metal surface-cleaning solutions, and solid residues. During the RFI the tank was excavated and removed by PNS in November 1991. Each end of the tank was found to have a hole approximately one by two feet. Stained fill and exposed bedrock was evident. Six inches of acid/alkaline/water solution and sludge were visible within the tank. During tank removal, some of the acid/alkaline/water (less than 10 gallons) solution spilled from the holes at the tank ends onto the fill material. Groundwater was not encountered during excavation. The excavation was backfilled with clean fill material and a mixture of fresh hot tar and excavated soil, and capped with four inches of hot asphalt. No further action for Site 21 soil was agreed upon among the Navy, USEPA and the MEDEP and formalized in a Consensus

Document (Navy, 1996). Additional groundwater investigation was conducted at Site 21 in conjunction with the investigation of the West Timber Basin Landfill (Site 31).

The Field Investigation Report for Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier) (TtNUS, May 2000) provides information related to Site 21 since the signing of the FFA.

### **2.2.3 Site 6 - Defense Reutilization and Marketing Office Storage Yard (DRMO)**

The DRMO, which has been in operation for more than 30 years, is approximately two acres and it serves as a temporary storage area for used materials prior to off-site recycling or disposal. Materials stored at the DRMO include lead and nickel-cadmium battery elements, motors, typewriters, paper products, and scrap metal. Most of the DRMO is situated on filled land. Until recently, there were no release controls at the DRMO. Previous visual inspection indicated ponding of precipitation in some areas and direct runoff to the Piscataqua River in other areas. Practices that resulted in obvious sources of contaminants, such as open storage of batteries, which could be leached or otherwise released by pathways such as infiltration or runoff, were terminated approximately in 1983. Currently within the fenced area of the DRMO, asphalt or an interim cap covers most of the surface.

The FCS was conducted at the DRMO in 1984. Surface and subsurface soil samples were collected within the DRMO and immediately west of the DRMO. Heavy metal contamination was noted; however, additional information was necessary to determine the nature and extent of contamination and to define the subsurface geology at the DRMO.

During 1989 to 1992, as part of the RFI, surface and subsurface soils, and groundwater samples were collected at the DRMO and in the vicinity. During the RFI Data Gap investigation of 1994, hydrogeology and tidal influences were further investigated.

In 1993, interim corrective measures were conducted at the DRMO which included capping and paving of sections of the DRMO, installation of storm water controls, and installation of a new concrete curb. The cap consists of 12 inches of compacted, crushed stone aggregate stabilized with portland cement, two layers of 16-ounce non-woven needle-punched geotextile, and a geocomposite clay liner (GCL). An area on the northwest side of the DRMO was paved with two inches of asphalt (McLaren/Hart, 1993).

During the RFI, surface soil sampling was conducted north of the DRMO in the vicinity of Quarters S, N, and 68 to assess the potential for possible wind dispersal of contaminants from the DRMO.

Also, the Site 29 Incinerator Site, which is located east of the DRMO Impact Area, is described in the following section.

In 1999, a removal action was performed at DRMO after erosion was identified along the shoreline. The slope was regraded and layers of stone and geotextile were placed to stabilize the slope.

The Revised OU2 Risk Assessment Report (TtNUS, November 2000a) and Final Action Memorandum for Site 6 Shoreline Stabilization (FWENC, June 2001) provide information related to Site 6 since the signing of the FFA.

#### **2.2.4 Site 29 – Teepee Incinerator Site**

Aerial photographs and historical records reveal that the land beneath and around the Industrial Waste Treatment Plant was originally used for open pit and incinerator burning. The area was also reportedly used for occasional disposal of waste paints. The ash and residue was removed after burning and placed in landfills. The fill was being deposited in the JILF (Site 8) by the 1950s. Site 29 previous limited investigation occurred in conjunction with Site 6. The 1986 RFA and HSWA permit did not identify Site 29 as a separate site. Additional investigation was performed in the summer of 1998, including dioxin sampling.

The Field Investigation Report for Teepee Incinerator (Site 29) and Building 238 (Site 10) (TtNUS, March 2000) and the Revised OU2 Risk Assessment Report (TtNUS, November 2000a) provide information related to Site 29 since the signing of the FFA

#### **2.2.5 Site 8 - Jamaica Island Landfill (JILF)**

The JILF covers an approximate area of 25 acres of filled land. Prior to landfilling activities, tidal flats separated Jamaica Island from Seavey Island. It has been reported that drainage channels existed within these tidal flats. From approximately 1945 to 1978 this area was filled with general refuse, trash, construction rubble, and various industrial wastes. The various industrial wastes received reportedly included incinerator ash; plating sludges containing chromium, lead and cadmium; asbestos insulation; volatile organic compounds including trichloroethene (TCE), methylene chloride, toluene and methyl ethyl ketone (MEK); acetylene and chlorine gas cylinders; contaminated dredge spoils containing chromium, lead, small amounts of oils containing polychlorinated biphenyls (PCBs), mercury and possibly phenols; waste paints and solvents; and spent sandblasting grit. Other items reported to have been used as fill at the JILF include reinforcing bars, chain-link fencing, and a small two-man submarine. The JILF is covered with

topsoil, pavement and gravel and is used for recreational activities, vehicle parking, and equipment storage. The recreational activities include a fitness area and a jogging track. Other uses of the landfill and adjacent area include equipment storage and hazardous waste storage facility.

In 1978, the PNS received approval to dredge over 100,000 cubic yards of sediment from Berths 6, 11 and 13, and to dispose of the material in a portion of the JILF. Cyanide, heavy metals, oil and grease, and low concentrations of PCBs were reported in dredge spoils samples. Approximately nine acres of the landfill were covered with dredge spoils from 1978 (Normandeau Associates, 1978).

At the time of disposal of the dredge spoils in 1978, a new dike was designed to contain the dredge spoils and to prevent post-construction seepage or runoff from the contaminated spoil into the adjacent Piscataqua River. A rock dike was placed by the area receiving the deepest spoils. The rest of the disposal site was enclosed with a granular fill dike. The dikes were to extend along the majority of the containment area. A 2-foot thick soil cover was placed on top of dredge spoils to minimize precipitation from penetrating the dredge spoils. A layer of topsoil was placed on top of the entire contained area and seeded to create an erosion resistant turf (Normandeau Associates, 1978).

During 1989 to 1992, as part of the RFI, surface and subsurface soils and groundwater samples were collected at the JILF. During the RFI Data Gap investigation of 1994, hydrogeology and tidal influences were further investigated. An advanced geophysical survey was conducted in 1998 at the JILF. The specific technology is called Multi-towed Array Detection System (MTADS), which is a magnetometer and pulsed induction electromagnetic system developed by the Navy Research Laboratory (NRL). Twenty-five test pits were dug in the JILF in areas outside of the running track area. A report on the findings of these test pits including sample results is under development.

At the time the RFI was conducted, the Child Development Center (CDC) was located to the west of the JILF. Sampling was conducted at the CDC to ensure that the children at the CDC were not being exposed to soil contaminated by wind dispersal of contamination from the JILF. Surface soil samples were collected within and around the fenced area at the CDC to evaluate the potential for surface soil contamination. The CDC has since been moved to a different location, and this area is now called the Former CDC. The building and playground equipment have been removed and the area is not currently used by children. The Navy has determined additional investigation is needed at the former CDC prior to determining a final remedial action. This

impact area will be addressed separately from the remainder of OU3. The schedule for this work has not yet been developed.

In October 2000, Site 8 was separated into two OUs, OU3 addresses the source control operable unit for Site 8, and OU6 addresses the management of migration operable unit for Site 8. The Feasibility Study for Operable Unit 3 (TtNUS, November 2000b) provides information related to Site 8 since the signing of the FFA; however, the report does not reflect the separation of Site 8 into two OUs. The Proposed Remedial Action Plan for OU3 (Navy, January 2001) provides information related to OU3 after the separation of Site 8 into two OUs.

#### **2.2.6 Site 9 – Former Mercury Burial Site I and Mercury Burial Site II (MBI and MBII)**

Poured concrete blocks and precast concrete pipes containing mercury contaminated wastes were reportedly buried between 1973 and 1975 at two locations within the boundaries of JILF. The two mercury burial sites are referenced as Mercury Burial Site I (MBI) and Mercury Burial Site II (MBII) and were reported to be placed under 8 to 10 feet of fill. Mercury contaminated wastes are reported to include fluorescent bulbs, thermometers, mercury switches and rags, brooms, and dust pans.

During the RFI, attempts were made to locate both burial sites. The original excavation locations were based on existing concrete plaques that marked the presumed location of the burial sites. Only burial site MBI was located in the field during the original RFI investigation. The poured concrete blocks and precast concrete pipes at MBI were excavated and inspected for integrity in 1991 during the RFI. All of the concrete appeared to be in reasonably good condition. Concrete blocks and the vertical section of concrete pipe were encountered at approximately 7.5 feet. Each poured concrete block was supported by a 1-foot thick concrete pad; the concrete sewer pipe was not supported. All the concrete appeared intact and was left in place and backfilled with original soil and fill material.

The reported location of MBII is in the western corner of the JILF, just south of the H25 Building parking lot. Information gathered by PNS personnel prior to the RFI Data Gap field investigation indicated that MBII may have been located south of the previous excavation or southeast of Building H25 just beyond or partially under its fenced in and paved parking lot (this was investigated as part of the RFI Data Gap Investigation). Additional excavations were conducted, however, poured concrete blocks and precast concrete pipes were not located during these excavation activities.

During 1989 to 1992, as part of the RFI, subsurface soils and groundwater samples were collected at the Mercury Burial sites. During the RFI Data Gap Investigation of 1994 the concrete pipe at MBI was excavated and disposed in an offsite landfill. The pipe was found to be plugged with concrete at both ends. Sampling results did not indicate an elevated concentration of mercury. Also during the RFI Data Gap investigation, another attempt, via test pit excavation, was made to locate MBII, with no success. The three remaining concrete blocks at MBI, and their contents were removed and properly disposed of, as a Removal Action in 1997. MBII was located in the Summer 2000. A total of eight blocks and their contents were removed and disposed of as a CERCLA Removal Action and disposed in accordance with Federal and state law.

The Feasibility Study for Operable Unit 3 (TtNUS, November 2000b) and the Proposed Remedial Action Plan for OU3 (Navy, January 2001) provide information related to Site 9 since the signing of the FFA

#### **2.2.7 Site 11 - Former Waste Oil Tanks Nos. 6 and 7**

Former Waste Oil Tanks Nos. 6 and 7 have been referred to as Waste Oil Tank Number 12 in the past. These were two 8,000-gallon underground steel tanks from railroad cars, in use from 1943 to 1989, and located at the northeastern end of the JILF. Waste oils from facility shops including cooling and cutting oils, motor oils, transmission oils, and hydraulic oils were stored in the tanks prior to off-site disposal. A Consent and Agreement Order has indicated that degreaser solvents were labeled as waste oils and may have been inadvertently stored in these tanks. Waste oils may also have contained various metals. In 1979 the tanks were excavated, inspected, and reburied because there was no evidence of releases at that time. In 1986, both tanks were tightness tested and found to be sound. These tanks were excavated and removed in 1989 according to state regulations and inspections. Upon removal, both tanks appeared sound and neither tank showed signs of leakage or deterioration. Soil contamination is believed to have occurred from spillage during filling.

Following tank removal, sampling was conducted by PNS and MEDEP. As a result of the elevated levels of lead and other contaminants, 332 tons of soil were excavated and disposed in an off-site RCRA permitted land disposal facility. Site 11 soils and groundwater were investigated in both the RFI and RFI Data Gap investigations.

In 1994 an investigation was conducted by C.T. Male Associates to determine the presence or absence of soil contamination in the area of the planned Hazardous Waste Transfer Facility. This investigation was part of the Military Construction (MILCON) project for the construction of the Transfer Facility. Information gathered is available for use by the IR Program. The report was

submitted to the State of Maine in accordance with permit conditions. Eight test pits were excavated and subsurface soil samples were collected at every two-foot interval; one sample from each test pit was selected for analysis, except for TP-1 where two samples were collected. Also, one field duplicate was collected. To support selection of the samples for analysis, field headspace screening of soil samples was conducted.

The Feasibility Study for Operable Unit 3 (TtNUS, November 2000b) and the Proposed Remedial Action Plan for OU3 (Navy, January 2001) provide information related to Site 11 since the signing of the FFA.

#### **2.2.8 Site 5 - Industrial Waste Outfalls**

The Industrial Waste Outfalls (Site 5) refer to several discharge points along the Piscataqua River at the western end of the site. The outfalls were used to discharge liquid industrial wastes prior to construction of the Industrial Waste Treatment Plant. The outfalls are believed to have been in operation from 1945 to 1975 and are located near Berths 6, 11 and 13. Wastes discharged include wastes from plating and battery shops contained in Buildings 79 and 238. The wastewaters may have contained heavy metals (mercury, lead, cadmium, chromium, copper and zinc), oil and grease, and PCBs.

#### **2.2.9 Site 26 - Portable Oil/Water Tanks**

Oil/water tanks at the submarine berths are used for the cleanout of submarine bilges and various tanks. Resulting oil wastes are pumped to railroad tank cars and properly disposed. Although the tanks continue to be used, operations have been modified and equipment improved to eliminate spillage and improve handling methods.

A No Further Action Decision Document is being prepared for review and comment to remove Site 26 from the CERCLA program.

#### **2.2.10 Offshore Areas**

Offshore areas refer generally to areas in the Piscataqua River and Great Bay Estuary that may have been affected by the release of hazardous waste or hazardous constituents from any site or study area located at PNS. Offshore areas have been the subject of significant investigative activities to date. The offshore studies are in the risk assessment/media protection standards development stage. An ecological risk assessment, in accordance with CERCLA procedures and recommendations, investigated the likelihood of adverse ecological effects as a result of

hazardous waste releases from the Shipyard. This data (Phase I) was also used to prepare a human health risk assessment to assess human health exposures from offshore media. An interim Record of Decision was prepared for offshore monitoring. The Interim Offshore Monitoring Plan (TtNUS, 1999) has been developed and offshore monitoring is being conducted in accordance with the plan.

#### **2.2.11 Site 27 - Berth 6 Industrial Area (formerly Fuel Oil Spill Area)**

In 1978, a ruptured underground pipeline near Berth 6 released No. 6 fuel oil (Bunker "C"). The pipeline was used from the early 1920s to 1978 to carry No. 6 fuel oil for fueling operations and it ran from Berth 6 to the pump house, Building 151, within the CIA. The pipeline ran parallel to and along Berth 6 and was buried approximately six feet below ground. A section of the pipeline was excavated and removed by a contractor. No additional information on the release is available. Reportedly, the broken pipeline and surrounding contaminated soil was excavated. The area is currently covered with asphalt.

There are various other underground distribution pipelines that run through Berth 6. In 1981, two lines, a No. 6 fuel oil line and a No. 2 fuel oil line, failed hydrostatic testing and were capped and abandoned in place. Reportedly, a portion of the abandoned lines were cut and removed during excavation near Building 151. At that time oil was still in the lines and partially filled the excavation. The condition of the other distribution pipelines is unknown.

The field investigation for the Fuel Oil Spill Area adjacent to Berth 6 was expanded by the Navy in the RFI to include the tank farm as a potential contributor of fuel oil contamination at Berth 6. The northernmost portion of the tank farm was located approximately 500 feet southeast of the fuel oil spill area. The Fuel Oil Spill Area was found to be unrelated to the Fuel Oil Tank Farm.

A No Further Action Decision Document is being prepared for review and comment to remove Site 27 from the CERCLA program.

### **2.3 SITE SCREENING AREAS**

Four sites have been identified by PNS as potentially contaminated that were not identified in the 1986 RFA and included in the HSWA permit. The SSAs, shown on Figure 1-2, are geographical areas that require preliminary screening to determine whether further study pursuant to the CERCLA RI/FS process will be required. SSAs may expand or contract in size as information becomes available indicating the extent of contamination and the geographical area needed to be

studied. The evaluation process is referred to in the FFA as the Site-Screening Process (SSP), and provides procedures for determination, investigation, and scheduling of SSAs. In addition to the following SSAs, the FFA provides for determination and investigation of future SSAs.

### **2.3.1 Site 30 - Galvanizing Plant Building 184**

Constructed in 1943 as a Galvanizing Plant, Building 184 was closed after World War II (WWII) and most equipment removed. Later the building was used by the Electrical Manufacturing Department for dye storage and test equipment. In the late 1950s the space was converted into an area for the cleaning of piping with the use of such chemicals as sulfuric acid. In the late 1960s the area was converted into the present day Welding School and Laboratory. The field investigation has been completed and a report issued. Additional investigation consisting of exploration under the floor of the building is planned for this site in the summer of 2000.

The Work Plan for Building 184 Subfloor Investigation (FWENC, February 2001) provides information on Site 30 since the signing of the FFA.

### **2.3.2 Site 31 - West Timber Basin Landfill**

This area was used for over 100 years for the storage and preservation of timber. As wooden shipbuilding and repair declined this area was no longer needed for this purpose. Another existing timber basin (at Site 32 - Topeka Pier site) constructed after the turn of the century, was sufficient to handle PNS requirements. The West Timber Basin was filled in prior to WWII. PNS plans indicate that the area was used for the disposal of general refuse. The field investigation has been completed and a report issued. Additional investigations will be conducted at this site, the schedule has yet to be determined for this work.

The Field Investigation Report for Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier) (TtNUS, May 2000) provides information related to Site 31 since the signing of the FFA.

### **2.3.3 Site 32 - Topeka Pier Site**

The area in the vicinity of Building 237, 154, 306, 129, 158 and H-23 was previously used as a salvage yard and portions are landfilled areas, including an east timber basin. The field investigation has been completed and a report issued. Additional investigation is planned for portions of the site, the schedule has not yet been developed.

The Field Investigation Report for Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier) (TtNUS, May 2000) provides information related to Site 32 since the signing of the FFA.

#### **2.3.4 Site 34 - Oil Gasification Plant, Building 62**

Constructed in the early 1870s, Building 62 served as the Shipyard Illuminating Gas Manufacturing Plant, for about 30 years. At the turn of the century, gas illumination on the Shipyard was replaced by electricity. Approximately 8,000 gallons of paraffin or gas oil was used per year as the source for illuminating gas. Early gas oil illumination advertisements indicate one gallon of oil would produce approximately 100 gallons of gas. Also, little waste product was produced compared to the more prevalent coal gasification process.

The building was subsequently used by Public Works for a variety of purposes, including a blacksmith shop. In 1999 a removal action was undertaken at this site. A schedule for additional work to be performed has not been established at this time.

Six drums of ash were removed in 1999 as a CERCLA Removal Action and disposed in accordance with Federal and state law.

### 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 Department of Defense (DOD) IR Program. 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.

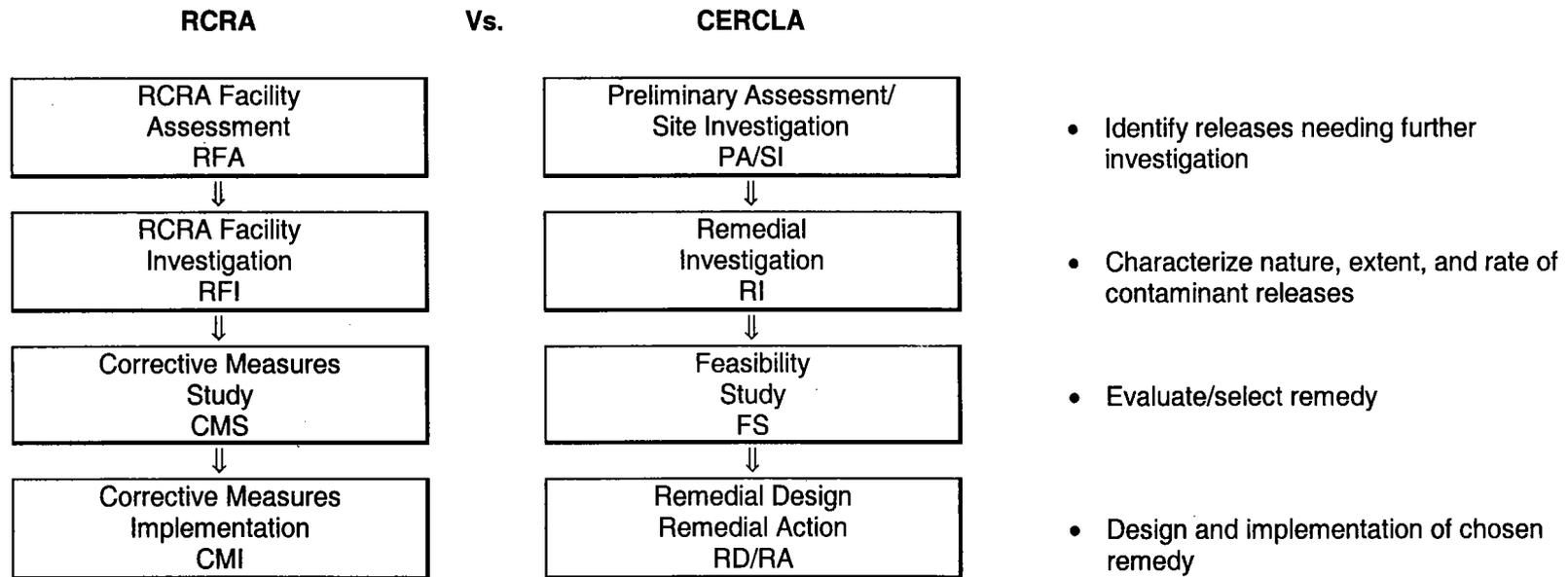
The IR Program parallels CERCLA, otherwise known as Superfund. Under the Superfund program, past disposal activities which may have resulted in the release of hazardous constituents to the environment would undergo several phases of environmental investigation that would ultimately determine the need 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/Site Inspection (PA/SI), RI, FS, ROD, and Remedial Design/Remedial Action (RD/RA). The process required by the FFA is analogous to CERCLA with one exception: the PA/SI is replaced by the Site Screening Process (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 Corrective Measures Study (CMS, selection of corrective measure), and Corrective Measures Implementation (CMI, implementation of corrective measures). The RCRA corrective action program also includes an Interim Measures (IM) step that may be conducted in cases when short-term actions are needed to respond to immediate threats.

**TABLE 3-1**

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



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

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, a Remedial Investigation/Feasibility Study 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 Engineering Evaluation/Cost Analysis (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 Actions**

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.

## 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.

### 4.1 RELATIVE RISK SITE EVALUATION FRAMEWORK

The Department of Defense has 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 of 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
- The Migration Pathway Factor
- The Receptor Factor

The Contaminant Hazard Factor (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 Remedial Goal). For media containing more than one contaminant, the ratios are added.

The Migration Pathway Factor (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 Receptor Factor (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 [www.dtic.mil/envirodod/envdocs.html](http://www.dtic.mil/envirodod/envdocs.html)). 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**  
**PNS, KITTERY, MAINE**

<b>Site/Site</b>	<b>Name</b>	<b>Rank</b>
Site 10	Battery Acid Tank No. 24	High
Site 21*	Acid/Alkaline Drain Tank	Low
Site 6	DRMO Storage Yard and Impact Area Quarters S, N, & 68	High
Site 29	Teepee Incinerator Site	High
Site 8	Jamaica Island Landfill (JILF)	High
Site 9	Mercury Burial Sites (MBI and MBII)	Low
Site 11	Former Waste Oil Tanks Nos. 6 & 7	High
Site 5	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
Site 27	Berth 6 Industrial Area	High
Site 30	Galvanizing Plant Building 184	High
Site 31	West Timber Basin Landfill	Low
Site 32	Topeka Pier Site	High
Site 34	Oil Gasification Plant, Building 62	High

\* Site 21 groundwater currently under investigation as part of Site 31

## **5.0 SCHEDULE**

Schedules for OU1, OU2, OU3, OU4, OU6, Site 26, Site 27 (OU5), Site 30, Site 31, Site 32, and Site 34 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 completed before the signature of the FFA and after signature of the FFA are provided in Sections 6.1 and 6.2, respectively.

### 6.1 DOCUMENTS COMPLETED BEFORE SIGNATURE OF FFA

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

<u>Document</u>	<u>Date</u>
Initial Assessment Study	June 1983
Final Confirmation Study Report on Hazardous Waste Sites	May 1986
RCRA Facility Assessment	July 1986
RCRA Facility Investigation 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 EERA	September 1991
Interim Human Health Assessment for the Day Care Center	October 1991
Revised Ambient Air Quality Monitoring Report	April 1992
Draft RCRA Facility Investigation Report for Onshore SWMUs (Remedial Investigation)	July 1992
On-Shore Ecological Risk Assessment of Portsmouth Naval Shipyard	August 1992
Interim Corrective Measures at the DRMO	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 EERA	February 1994
Public Health and Environmental Risk Evaluation Part A: Human Health Risk Assessment Report	March 1994
Final On-Shore Media Protection Standards Proposal	April 1994
Final Human Health Risk Assessment Report for Offshore Media for Portsmouth Naval Shipyard	May 1994
Chapter 3: Media Protection Standards for Off-Shore Media; Sediment and Surface Water	June 1994
RCRA Facility Investigation Data Gap Work Plan	June 1994
Phase II Ambient Air Quality and Meteorological Monitoring Program Work Plan	July 1994

Estuarine Ecological Risk Assessment Case Study for Portsmouth Naval Shipyard	December 1994
Phase II Ambient Air Quality and Meteorological Monitoring Report (included in FFA, finalized June 1996)	March 1995
Draft On-Shore Feasibility Study Report	March 1995
Draft Interim Ground Water Monitoring Plan (included in FFA, finalized November 1996)	May 1995
Chapter 2: Media Protection Standards for Off-Shore Media Based on Human Health Risks (included in FFA, finalized in April 1996)	June 1995
Draft Final Estuarine Ecological Risk Assessment (included in FFA, revised draft final dated April 1997, finalized May 2000)	July 1995
RCRA Facility Investigation Data Gap Report	November 1995
Chapter 2: Media Protection Standards for Off-Shore Media Based on Human Health Risks	April 1996
Phase II Ambient Air Quality and Meteorological Monitoring Report	June 1996
Community Relations Plan for Portsmouth Naval Shipyard	October 1996
Consensus Document, No Further Action for Soils, SWMU 21	October 1996
Technical Memorandum on Seep Sampling for Portsmouth Naval Shipyard	November 1996
Interim Groundwater Monitoring Plan	November 1996
On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Work Plan	December 1996
Draft On-Shore/Off-Shore Contaminant Fate and Transport Modeling Phase I Report	February 1997
Technical Memorandum on Risk Evaluation of Surface Soils from Jamaica Island Landfill Site	May 1997
Engineering Evaluation/Cost Analysis for MBI	June 1997
Decision Document, No Further Action, SWMUs 12, 13, 16, and 23	July 1997
MBI Action Memorandum	September 1997
MEDEP Evaluation of Heavy Metal Migration at Portsmouth Naval Shipyard with Geochemical Modeling	December 1997
On-Shore/Off-Shore 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 for PNS	March 1998
Work Plan – Site 30 (Building 184), Site 31 (West Timber Basin), and Site 32 (Topeka Pier)	April 1998
Work Plan for MTADS Geophysical Mapping at PNS	July 1998
Phase II On-Shore/Off-Shore Contaminant Fate and Transport Modeling Work Plan	August 1998
Phase I/Phase II Data Comparative Analysis Report	October 1998
Proposed Plan for Interim Action at OU4	October 1998

Interim Record of Decision for Operable Unit 4	May 1999
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 since the FFA was signed in September 1999 to June 2001:

<u>Document</u>	<u>Date</u>
Interim Offshore Monitoring Plan for Operable Unit 4	October 1999
On-Shore/Off-Shore Contaminant Fate and Transport Phase II Modeling Report	December 1999
Technical Memorandum OU2 Risk Assessment Protocol	December 1999
Technical Memorandum Lead Contamination at DRMO Impact Area	February 2000
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
Field Investigation 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
Estuarine Ecological Risk Assessment	May 2000
Seep/Sediment Summary Report	August 2000
Test Pitting Investigation Report	October 2000
Revised OU2 Risk Assessment	November 2000
Feasibility Study for OU3	November 2000
Proposed Remedial Action Plan for OU3	January 2001
Work Plan for Building 184 Subfloor Investigation	February 2001
Final Action Memorandum Site 6 Shoreline Stabilization	June 2001
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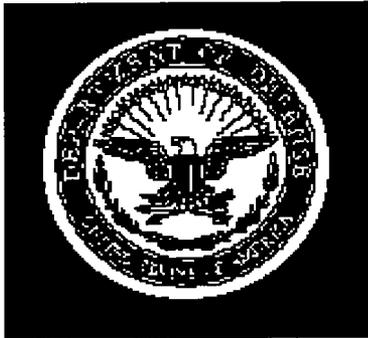
## **APPENDIX A**

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

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

**APPENDIX A.1**

**RELATIVE RISK SITE EVALUTION CONCEPT**



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

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## Defense Environmental Cleanup Program Fact Sheet

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### The Relative Risk Site Evaluation Concept

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#### 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,

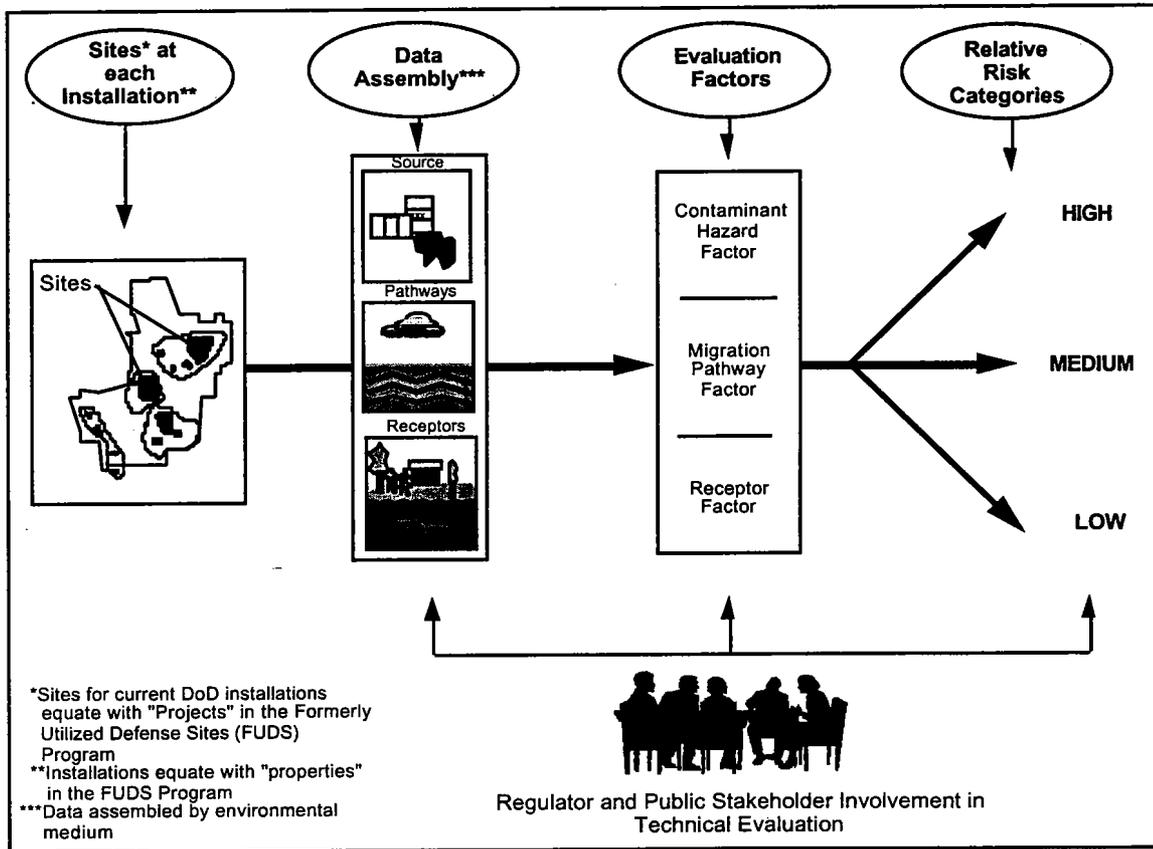


Figure 1. Relative Risk Site Evaluation Concept Summary

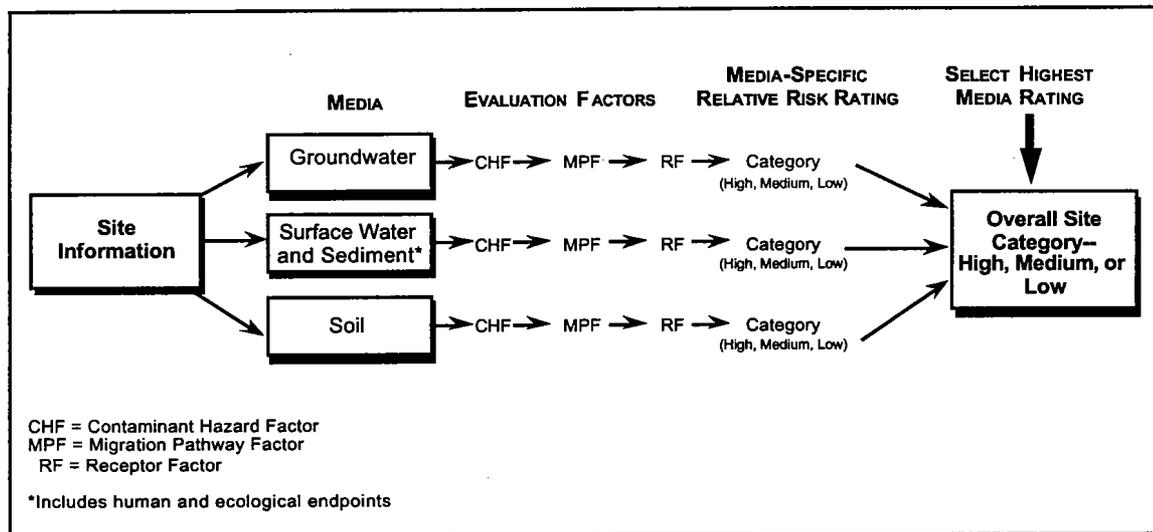


Figure 2. Flow Diagram of the Relative Risk Site Evaluation Framework

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**



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

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## Defense Environmental Cleanup Program Fact Sheet

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### Relative Risk Site Evaluation Questions & Answers

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**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 lifetime 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 EVALUATION RANKING WORKSHEETS**

**PORTSMOUTH NAVAL SHIPYARD  
INSTALLATION RESTORATION PROGRAM**

**RELATIVE RISK SITE EVALUATION  
SITE RANKING**

Site # - SITE NAME	RANK
Site 5 - Industrial Waste Outfalls	High
Site 6 - DRMO	High
Site 8 - JILF	High
Site 9 - Mercury Burial Vaults	Low
Site 10 - Battery Acid Tank	High
Site 11 - Waste Oil Tanks	High
Site 26 - Portable Oil/Water Tanks	Low
Site 27 - Fuel Oil Spill Area	High
Site 29 - Incinerator Site	High
Site 30 - Galvanizing Plant, Building 184	High
Site 31 - West Timber Basin Landfill	Low
Site 32 - Topeka Pier Site	High
Site 34 - Oil Gasification Plant	High

Site	Media	RF	MPF	CHF	CHF	Media Rank
5	SEDH	I	E	3	Mod	High
	SEDEM	I	E	210	Sig	High
6	GW	I	E	24	Mod	High
	SWH	I	E	0.001	Min	High
	SWEM	I	E	0.006	Min	High
	SEDH	I	E	3	Mod	High
	SEDEM	I	E	210	Sig	High
	SOIL	P	P	670	Sig	High
8	GW	I	E	48	Mod	High
	SWH	I	E	0.001	Min	High
	SWEM	I	E	0.006	Min	High
	SEDH	I	E	3	Mod	High
	SEDEM	I	E	210	Sig	High
	SOIL	I	E	6	Mod	High
9	SOIL	P	P	3	Mod	Medium
10	SEDH	I	E	3	Mod	High
	SEDEM	I	E	210	Sig	High
	SOIL	P	P	3	Mod	Medium
11	GW	I	E	8	Mod	High
	SOIL	I	P	3	Mod	High
21	SOIL	P	P	6	Mod	Medium
26	SEDH	I	C	3	Mod	Low
	SEDEM	I	C	35	Mod	Low
27	GW	I	E	1129	Sig	High
	SOIL	P	E	4	Mod	High
29	SOIL	I	E	8.9	Mod	High
30	SOIL	I	E	0.7	Min	High
31	SOIL	P	P	2.5	Mod	Med
32	SOIL	P	P	0.7	Min	Low
34	SOIL	I	E	Mod	41	High
	SEDH	I	E	Mod	3	High
	SEDEM	I	E	Sig	331	High

--- Negligible

**LEGEND**

Site = Solid Waste Management Unit

MPF = Migration Potential Factor

**Media**

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

E = Evident  
P = Potential  
C = Confined

CHF - Contaminant Hazard Factor

RF = Receptor Factor

I = Identified  
P = Potential  
L = Limited

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

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): 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; dermal 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.

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(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 further 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
<b>Total:</b>			<b>3.380</b>

(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 consumption 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
Benzo[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
<b>Total:</b>			<b>253.680</b>

(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:   KITTELY 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: <u>KITTERY ME PORTSMOUTH NSY</u>	Date Entered (Day, Month, Year): <u>5/16/95</u>
Location (State): <u>NH ME</u>	Media Evaluated (GW, SW, Sediment, Soil): <u>GW SWH SWEM SEDH SEDEM SOIL</u>
Site (Name/RMIS ID) / Project for FUDS: <u>SWMU 00006</u>	Phase of Exec. (SI, RI, FS, Remv, RD/RA, or equiv. RCRA Stage): <u>FS</u>
RMIS Site Type: <u>STORAGE AREA</u>	Agr. Status (Y/N, If yes, type of agreement e.g., FFA, Permit, Order): <u>Yes</u>
Point of Contact (Name/Phone): <u>Marty Raymond</u>	National Priority List (Y/N): <u>Yes</u> Site Rank: <u>High</u>

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 crushed 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 further 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
<b>Total:</b>			<b>22.860</b>

(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 beneficial use (III A, IIB 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
Benzo(a)anthracene	7.7	56.0	0.140
<b>Total:</b>			<b>674.450</b>

(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:* 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

**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 to personnel working on site.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00006

Soil 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
Polychlorinated biphenyls (PCBs)	0.35	20.0	0.020
<b>Total:</b>			<b>3.450</b>

(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 08006

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
Benzo[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
<b>Total:</b>			<b>256.320</b>

(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:       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): 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 additional 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 further 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
Benzo[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
<b>Total:</b>			<b>67.910</b>

(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)

(Place an "X" next to one below)

Evident:   X  

Potential: \_\_\_\_\_

Confined: \_\_\_\_\_

**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

*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 (conf. 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 beneficial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified:   X  

Potential: \_\_\_\_\_

Limited: \_\_\_\_\_

**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)

*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
<b>Total:</b>			<b>6.970</b>

(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

**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 -** 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

Potential: \_\_\_\_\_

Confined: \_\_\_\_\_

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

**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

(Place an "X" next to one below)

Identified:     X    

**Potential -** Potential for receptors to have access to contaminated soil

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 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
<b>Total:</b>			<b>641.460</b>

(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

**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)

**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

**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

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

(Place an "X" next to one below)

**Potential -** Potential for receptors to have access to surface water

**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
<b>Total:</b>			<b>3.450</b>

(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 < 3): \_\_\_\_\_

**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: SWMLJ 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
<b>Total:</b>			<b>150.120</b>

(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): 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 unknown 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 further 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.





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): 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 further 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		
<b>Total:</b>			<b>41.000</b>

(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)

(Place an "X" next to one below)

Evident:       X      

**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

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).

**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 beneficial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified:       X      

**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).

Potential: \_\_\_\_\_

Limited: \_\_\_\_\_

*Brief Rationale for Selection:* Groundwater reaching the Piscataqua River would be available for uptake by the plant and animal 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
<b>Total:</b>			<b>487.120</b>

(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

(Place an "X" next to one below)

Evident:           

**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

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

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

(Place an "X" next to one below)

Identified:           

**Potential -** Potential for receptors to have access to contaminated soil

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)





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): 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 transported 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.

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(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 further 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
Benzo[a]anthracene	4.8	9.2	0.520
Benzene	4.8	39.0	0.120
Dichlorodifluoromethane	25.0	390.0	0.064
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	
<b>Total:</b>			<b>8.540</b>

(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 down gradient indicate contamination has migrated away from the 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).

**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 beneficial use (IIIA, IIIB or perched 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 uptake by plants and animals.

Activity Name KITTERY ME PORTSMOUTH NSY

Site Name: SWMU 00011

Groundwater 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): 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 further 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.



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): 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.

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(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 further 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
<b>Total:</b>			<b>3.540</b>

(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 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:** 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		
<b>Total:</b>			<b>35.420</b>

(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)

(Place an "X" next to one below)

**Evident:** \_\_\_\_\_

**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

**Potential:** \_\_\_\_\_

**Confined:**   X  

**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

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

(Place an "X" next to one below)

**Identified:**   X  

**Potential -** Potential for receptors to have access to sediment

**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): 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 pipeline 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.

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(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 further 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 (XX)
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
		<b>Total:</b>	<b>1129.670</b>

(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)

(Place an "X" next to one below)

Evident:     X    

**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

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 beneficial use (III A, III B or perched aquifer).

(Place an "X" next to one below)

Identified:     X    

**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).

Potential:           

Limited:           

**Brief Rationale for Selection:** Contaminated groundwater could flow directly into the Piscataqua River and be available for 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
<b>Total:</b>			<b>2.230</b>

(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

**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: \_\_\_\_\_

**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

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

**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

(Place an "X" next to one below)

Identified: \_\_\_\_\_

Potential:   X  

Limited: \_\_\_\_\_

**Potential -** Potential for receptors to have access to contaminated soil

**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): 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 occurred 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.

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(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 further 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
<b>Total:</b>			<b>25.930</b>

(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)

(Place an "X" next to one below)

Evident:   X  

**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

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 beneficial 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: 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
<b>Total:</b>			<b>523.680</b>

(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:       X      

Potential:           

Confined:           

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

**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:** 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 (I) 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.

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(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 further 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	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
<b>Total:</b>			<b>10.480</b>

(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 contact.

**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.

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(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 further 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		
<b>Total:</b>			<b>26.660</b>

(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)

(Place an "X" next to one below)

Evident: \_\_\_\_\_

**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

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).

**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 beneficial use (IIIA, IIIB or perched aquifer).

(Place an "X" next to one below)

Identified: \_\_\_\_\_

**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).

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(a,h)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
<b>Total:</b>			<b>40.820</b>

(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 landfill - II.

**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 occurred.

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 Date Entered (Day, Month, Year): 5/24/99  
Location (State): ME Media Evaluated (GW, SW, Sediment, Soil): GW SEDEM SOIL  
Site (Name/RMIS ID) / Project for FUDS: SITE 00032 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: 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.

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(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 further 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
<b>Total:</b>			<b>69.930</b>

(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 beneficial 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
<b>Total:</b>			<b>36.010</b>

(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		
<b>Total:</b>			<b>23.560</b>

(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
<b>Total:</b>			<b>1217.960</b>

(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

**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 -** 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

**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

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

(Place an "X" next to one below)

**Identified:**       X      

**Potential -** Potential for receptors to have access to sediment

**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): 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: Occupational and Construction exposures are likely at this time. Ecological: The site could effect the plant and animal life and humans consuming seafood.

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(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 further 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
<b>Total:</b>			<b>41.180</b>

(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(a,h)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
<b>Total:</b>			<b>3.120</b>

(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
<b>Total:</b>			<b>331.450</b>

(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**

### **SUMMARY AND DETAILED SCHEDULES**

- C.1 OU1 SCHEDULE (SITES 10 & 21)**
- C.2 OU2 SCHEDULE (SITES 6 & 29)**
- C.3 OU3 SCHEDULE (SITES 8, 9, & 11 SOURCE CONTROL)**
- C.4 OU4 SCHEDULE (OFFSHORE)**
- C.5 OU6 SCHEDULE (SITE 8 MANAGEMENT OF MIGRATION)**
- C.6 SITE 26, PORTABLE OIL/WATER TANKS, SCHEDULE**
- C.7 SITE 27, BERTH 6 INDUSTRIAL AREA, (OU5) SCHEDULE**
- C.8 SITE 30, GALVANIZING PLANT BUILDING 184, SCHEDULE**
- C.9 SITE 31, WEST TIMBER BASIN LANDFILL, SCHEDULE**
- C.10 SITE 32, TOPEKA PIER SITE, SCHEDULE**
- C.11 SITE 34, OIL GASIFICATION PLANT, BUILDING 62, SCHEDULE**

**APPENDIX C.1**  
**OU1 SCHEDULE (SITES 10 & 21)**

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

ID	Task Name	%	Dur	Start	Finish	2001												2002												2003												2004											
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
43	SITE 10 ADDITIONAL INVESTIGATION	57%	854 d	9/18/00	1/19/03	[Gantt bar spanning from 9/18/00 to 1/19/03]																																															
44	Prepare Draft Site 10 Workplan	100%	141 d	9/18/00	2/5/01	[Gantt bar from 9/18/00 to 2/5/01]																																															
49	USEPA, MEDEP & RAB Receives Draft Site 10 Workplan	100%	1 d	2/6/01	2/6/01	[Milestone diamond at 2/6/01]																																															
50	USEPA, MEDEP & RAB Review Draft Site 10 Workplan	100%	45 d	2/6/01	3/22/01	[Gantt bar from 2/6/01 to 3/22/01]																																															
54	Navy Receives Comments on Draft Site 10 Workplan	100%	1 d	3/23/01	3/23/01	[Milestone diamond at 3/23/01]																																															
55	Prepare Site 10 Workplan Response to Comments Letter	100%	45 d	3/23/01	5/6/01	[Gantt bar from 3/23/01 to 5/6/01]																																															
60	USEPA, MEDEP Receive Site 10 Workplan Response to Comments Letter	100%	1 d	5/7/01	5/7/01	[Milestone diamond at 5/7/01]																																															
61	USEPA, MEDEP & RAB Reviews Site 10 Workplan Response to Comments Letter	100%	36 d	5/7/01	6/11/01	[Gantt bar from 5/7/01 to 6/11/01]																																															
65	Navy Receives Comments on Site 10 Workplan Response to Comments Letter	100%	1 d	6/12/01	6/12/01	[Milestone diamond at 6/12/01]																																															
66	Navy and Regulator Comment Resolution	100%	7 d	6/12/01	6/18/01	[Gantt bar from 6/12/01 to 6/18/01]																																															
67	Prepare Draft Final Site 10 Workplan	100%	100 d	6/6/01	9/13/01	[Gantt bar from 6/6/01 to 9/13/01]																																															
68	USEPA, MEDEP & RAB Receive Draft Final Site 10 Workplan	100%	1 d	9/17/01	9/17/01	[Milestone diamond at 9/17/01]																																															
69	USEPA, MEDEP & RAB Review Draft Final Site 10 Workplan	100%	23 d	9/17/01	10/9/01	[Gantt bar from 9/17/01 to 10/9/01]																																															
73	Navy Receives Approval, Comments, or Notice of Dispute	100%	1 d	10/9/01	10/9/01	[Milestone diamond at 10/9/01]																																															
74	Navy and Regulator Resolution or Notice of Dispute	100%	16 d	10/9/01	10/24/01	[Gantt bar from 10/9/01 to 10/24/01]																																															
75	Prepare Final Site 10 Workplan	100%	16 d	10/9/01	10/24/01	[Gantt bar from 10/9/01 to 10/24/01]																																															
76	USEPA, MEDEP & RAB Receive Final Site 10 Workplan	100%	1 d	10/25/01	10/25/01	[Milestone diamond at 10/25/01]																																															
77	Fieldwork	100%	120 d	10/26/01	2/22/02	[Gantt bar from 10/26/01 to 2/22/02]																																															
78	Prepare Draft Site 10 Field Investigation Report	5%	120 d	2/23/02	6/22/02	[Gantt bar from 2/23/02 to 6/22/02]																																															
83	USEPA, MEDEP & RAB Receives Draft Site 10 Field Investigation Report	0%	1 d	6/23/02	6/23/02	[Milestone diamond at 6/23/02]																																															
84	USEPA, MEDEP & RAB Review Draft Site 10 Field Investigation Report	0%	45 d	6/23/02	8/6/02	[Gantt bar from 6/23/02 to 8/6/02]																																															
88	Navy Receives Comments on Draft Site 10 Field Investigation Report	0%	1 d	8/7/02	8/7/02	[Milestone diamond at 8/7/02]																																															
89	Prepare Site 10 Field Investigation Report Response to Comments Letter	0%	45 d	8/7/02	9/20/02	[Gantt bar from 8/7/02 to 9/20/02]																																															
94	USEPA, MEDEP Receive Site 10 Field Investigation Report Response to Comments Letter	0%	1 d	9/21/02	9/21/02	[Milestone diamond at 9/21/02]																																															
95	USEPA, MEDEP & RAB Reviews Site 10 Field Investigation Report Response to Comments Letter	0%	30 d	9/21/02	10/20/02	[Gantt bar from 9/21/02 to 10/20/02]																																															
99	Navy Receives Comments on Site 10 Field Investigation Report Response to Comments Letter	0%	1 d	10/21/02	10/21/02	[Milestone diamond at 10/21/02]																																															
100	Navy and Regulator Comment Resolution	0%	7 d	10/21/02	10/27/02	[Gantt bar from 10/21/02 to 10/27/02]																																															
101	Prepare Draft Final Site 10 Field Investigation Report	0%	30 d	10/21/02	11/19/02	[Gantt bar from 10/21/02 to 11/19/02]																																															
102	USEPA, MEDEP & RAB Receive Draft Final Site 10 Field Investigation Report	0%	1 d	11/20/02	11/20/02	[Milestone diamond at 11/20/02]																																															
103	USEPA, MEDEP & RAB Review Draft Final Site 10 Field Investigation Report	0%	30 d	11/20/02	12/19/02	[Gantt bar from 11/20/02 to 12/19/02]																																															
107	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	12/20/02	12/20/02	[Milestone diamond at 12/20/02]																																															
108	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	12/20/02	1/18/03	[Gantt bar from 12/20/02 to 1/18/03]																																															
109	Prepare Final Site 10 Field Investigation Report	0%	30 d	12/20/02	1/18/03	[Gantt bar from 12/20/02 to 1/18/03]																																															
110	USEPA, MEDEP & RAB Receive Final Site 10 Field Investigation Report	0%	1 d	1/19/03	1/19/03	[Milestone diamond at 1/19/03]																																															
111																																																					
112	GROUNDWATER MODELING REPORT	0%	602 d	8/29/03	4/21/05	[Gantt bar spanning from 8/29/03 to 4/21/05]																																															
113	Prepare Modeling Work Plan	0%	90 d	8/29/03	11/26/03	[Gantt bar from 8/29/03 to 11/26/03]																																															
118	USEPA, MEDEP & RAB Receive Draft Modeling Work Plan	0%	1 d	11/27/03	11/27/03	[Milestone diamond at 11/27/03]																																															
119	USEPA, MEDEP & RAB Reviews Draft Modeling Work Plan	0%	45 d	11/27/03	1/10/04	[Gantt bar from 11/27/03 to 1/10/04]																																															
123	Navy Receives Comments on Draft Modeling Work Plan	0%	1 d	1/11/04	1/11/04	[Milestone diamond at 1/11/04]																																															
124	Prepare Modeling Work Plan Response to Comments Letter	0%	45 d	1/11/04	2/24/04	[Gantt bar from 1/11/04 to 2/24/04]																																															
125	USEPA, MEDEP & RAB Receive Modeling Work Plan Response to Comments Letter	0%	1 d	2/25/04	2/25/04	[Milestone diamond at 2/25/04]																																															
126	USEPA, MEDEP & RAB Reviews Modeling Work Plan Response to Comments Letter	0%	30 d	2/25/04	3/25/04	[Gantt bar from 2/25/04 to 3/25/04]																																															
130	Navy Receives Comments on Modeling Work Plan Response to Comments Letter	0%	1 d	3/26/04	3/26/04	[Milestone diamond at 3/26/04]																																															
131	Navy and Regulator Comment Resolution	0%	7 d	3/26/04	4/1/04	[Gantt bar from 3/26/04 to 4/1/04]																																															
132	Prepare Draft Final Modeling Work Plan	0%	30 d	3/26/04	4/24/04	[Gantt bar from 3/26/04 to 4/24/04]																																															
133	USEPA, MEDEP & RAB Receive Draft Final Modeling Work Plan	0%	1 d	4/25/04	4/25/04	[Milestone diamond at 4/25/04]																																															
134	USEPA, MEDEP & RAB Review Draft Final Modeling Work Plan	0%	30 d	4/25/04	5/24/04	[Gantt bar from 4/25/04 to 5/24/04]																																															
138	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	5/25/04	5/25/04	[Milestone diamond at 5/25/04]																																															
139	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	5/25/04	6/23/04	[Gantt bar from 5/25/04 to 6/23/04]																																															
140	Prepare Final Modeling Work Plan	0%	30 d	5/25/04	6/23/04	[Gantt bar from 5/25/04 to 6/23/04]																																															







**APPENDIX C.2**  
**OU2 SCHEDULE (SITES 6 & 29)**





**APPENDIX C.3**  
**OU3 SCHEDULE (SITES 8, 9, & 11 SOURCE CONTROL)**

Portsmouth Naval Shipyard  
Site Management Plan Schedule  
OPERABLE UNIT (OU) 3 SCHEDULE

ID	Task Name	%	Dur	Start	Finish	2001												2002												2003											
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
43	MTADS REPORT (Secondary Document)	99%	949 d	5/15/99	12/18/01	[Gantt bar from 5/15/99 to 12/18/01]																																			
44	USEPA, MEDEP & RAB Receive Draft MTADS Report	100%	1 d	5/15/99	5/15/99																																				
45	USEPA, MEDEP & RAB Review Draft MTADS Report	100%	46 d	5/16/99	6/30/99																																				
49	Prepare MTADS Report Response to Comments Letter	100%	132 d	7/1/99	11/9/99																																				
54	USEPA, MEDEP & RAB Receive MTADS Report Response to Comments Letter	100%	1 d	11/10/99	11/10/99																																				
55	USEPA, MEDEP & RAB Review MTADS Report Response to Comments Letter	100%	34 d	11/10/99	12/13/99																																				
59	Technical Meeting	100%	1 d	12/14/99	12/14/99																																				
60	Prepare Final MTADS Report	100%	734 d	12/15/99	12/17/01	[Gantt bar from 12/15/99 to 12/17/01]																																			
65	USEPA, MEDEP & RAB Receive Final MTADS Report	100%	1 d	12/18/01	12/18/01																																				
66																																									
67	TEST PITTING WORK PLAN AND REPORT (Secondary Document)	99%	824 d	7/23/98	10/23/00	[Gantt bar from 7/23/98 to 10/23/00]																																			
68	Test Pit Work Plan Contracting Action	100%	69 d	7/23/98	9/29/98																																				
76	Notice of Award, Test Pit Work Plan	100%	1 d	9/30/98	9/30/98																																				
77	Prepare Draft Testpitting Work Plan	100%	166 d	10/1/98	3/15/99																																				
78	USEPA, MEDEP & RAB Receive Draft Test Pit Work Plan	100%	1 d	3/16/99	3/16/99																																				
79	USEPA, MEDEP & RAB Review Draft Test Pit Work Plan	100%	73 d	3/16/99	5/27/99																																				
83	Navy Receives Comments on Draft Test Pit Work Plan	100%	1 d	5/28/99	5/28/99																																				
84	Prepare Draft Final Test Pit Work Plan	100%	204 d	5/28/99	12/17/99																																				
89	USEPA, MEDEP & RAB Receive Draft Final Test Pit Work Plan	100%	4 d	12/20/99	12/23/99																																				
90	USEPA, MEDEP & RAB Review Draft Final Test Pit Work Plan	100%	26 d	12/20/99	1/14/00																																				
94	Navy Receives Approval, Comments, or Notice of Dispute	100%	1 d	1/19/00	1/19/00																																				
95	Navy and Regulator Resolution or Notice of Dispute	100%	30 d	1/19/00	2/17/00																																				
96	Prepare Final Test Pit Work Plan	100%	30 d	1/26/00	2/24/00																																				
97	USEPA, MEDEP & RAB Receive Final Work Plan	100%	1 d	2/25/00	2/25/00																																				
98	Perform Test Pit Field Work	100%	34 d	2/4/00	3/8/00																																				
102	Prepare Draft Test Pit Report	100%	146 d	3/10/00	8/2/00																																				
108	USEPA, MEDEP & RAB Receive Draft Test Pit Report	100%	1 d	8/3/00	8/3/00																																				
109	USEPA, MEDEP & RAB Review Draft Test Pit Report	100%	50 d	8/3/00	9/21/00																																				
113	Navy Receives Comments on Draft Test Pit Report	100%	0 d	9/21/00	9/21/00																																				
114	Prepare Final Test Pit Report	100%	31 d	9/22/00	10/22/00	[Gantt bar from 9/22/00 to 10/22/00]																																			
115	USEPA, MEDEP & RAB Receive Final Test Pit Report	100%	1 d	10/23/00	10/23/00	◆																																			
116																																									
117	FEASIBILITY STUDY (FS)	99%	549 d	5/24/99	11/22/00	[Gantt bar from 5/24/99 to 11/22/00]																																			
118	Prepare Draft FS Report	100%	148 d	5/24/99	10/18/99																																				
123	USEPA & MEDEP Receives Draft FS Report	100%	1 d	10/19/99	10/19/99																																				
124	USEPA, MEDEP & RAB Review Draft FS Report	100%	78 d	10/19/99	1/4/00																																				
128	Navy Receives Comments on Draft FS Report	100%	1 d	1/4/00	1/4/00																																				
129	Prepare FS Report Response to Comments Letter	100%	45 d	1/4/00	2/17/00																																				
134	USEPA, MEDEP & RAB Receive FS Report Response to Comments Letter	100%	1 d	2/18/00	2/18/00																																				
135	USEPA, MEDEP & RAB Review FS Report Response to Comments Letter	100%	40 d	2/18/00	3/28/00																																				
139	Navy Receives Comments on FS Report Response to Comments Letter	100%	1 d	3/28/00	3/28/00																																				
140	Navy and Regulator Comment Resolution	100%	8 d	3/28/00	4/4/00																																				
141	Prepare Draft Final FS Report	100%	120 d	3/28/00	7/25/00																																				
142	USEPA, MEDEP & RAB Receive Draft Final FS Report	100%	1 d	7/26/00	7/26/00																																				
143	USEPA, MEDEP & RAB Review Draft Final FS Report	100%	48 d	7/26/00	9/11/00																																				
147	Navy Receives Approval, Comments, or Notice of Dispute	100%	1 d	9/12/00	9/12/00																																				
148	Navy and Regulator Resolution or Notice of Dispute	100%	71 d	9/12/00	11/21/00	[Gantt bar from 9/12/00 to 11/21/00]																																			
149	Prepare Final FS Report	100%	71 d	9/12/00	11/21/00	[Gantt bar from 9/12/00 to 11/21/00]																																			
150	USEPA, MEDEP & RAB Receive Final FS Report	100%	1 d	11/22/00	11/22/00	◆																																			
151																																									
152	PROPOSED REMEDIAL ACTION PLAN (PRAP)	99%	188 d	8/26/00	3/1/01	[Gantt bar from 8/26/00 to 3/1/01]																																			









**APPENDIX C.4**  
**OU4 SCHEDULE (OFFSHORE)**

Portsmouth Naval Shipyard  
Site Management Plan Schedule  
OPERABLE UNIT (OU) 4 SCHEDULE

ID	Task Name	%	Dur	Start	Finish	2001												2002												2003												2004											
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
63	PRELIMINARY REMEDIATION GOAL REPORT	100%	570 d	5/3/00	11/23/01	[Task bar spanning from May 2000 to November 2001]																																															
64	Prepare Draft Preliminary Remediation Goal (PRG) Report	100%	201 d	5/3/00	11/19/00	[Task bar from May 2000 to November 2000]																																															
65	USEPA, MEDEP & RAB Review Draft PRG Report	100%	66 d	11/20/00	1/24/01	[Task bar from November 2000 to January 2001]																																															
69	Prepare PRG Report Response to Comments Letter	100%	45 d	1/25/01	3/10/01	[Task bar from January 2001 to March 2001]																																															
70	USEPA, MEDEP & RAB Receive PRG Report Response to Comments Letter	100%	1 d	3/11/01	3/11/01	[Task diamond at March 2001]																																															
71	USEPA, MEDEP & RAB Reviews PRG Report Response to Comments Letter	100%	30 d	3/11/01	4/9/01	[Task bar from March 2001 to April 2001]																																															
75	Navy Receives Comments on PRG Report Response to Comments Letter	100%	1 d	4/10/01	4/10/01	[Task diamond at April 2001]																																															
76	Navy and Regulator Comment Resolution	100%	14 d	4/10/01	4/23/01	[Task bar from April 2001 to April 2001]																																															
77	Prepare Interim PRG Submittal	100%	30 d	4/11/01	5/10/01	[Task bar from April 2001 to May 2001]																																															
78	USEPA, MEDEP & RAB Receive Interim PRG Submittal	100%	1 d	5/11/01	5/11/01	[Task diamond at May 2001]																																															
79	USEPA, MEDEP & RAB Review Interim PRG Submittal	100%	30 d	5/11/01	6/9/01	[Task bar from May 2001 to June 2001]																																															
80	Navy Receives Comments on Interim PRG Submittal	100%	1 d	6/10/01	6/10/01	[Task diamond at June 2001]																																															
81	Prepare Draft Final PRG Report	100%	96 d	6/10/01	9/13/01	[Task bar from June 2001 to September 2001]																																															
82	USEPA, MEDEP & RAB Receive Draft Final PRG Report	100%	1 d	9/17/01	9/17/01	[Task diamond at September 2001]																																															
83	USEPA, MEDEP & RAB Review Draft Final PRG Report	100%	37 d	9/17/01	10/23/01	[Task bar from September 2001 to October 2001]																																															
87	Navy Receives Approval, Comments, or Notice of Dispute	100%	1 d	10/24/01	10/24/01	[Task diamond at October 2001]																																															
88	Navy and Regulator Resolution or Notice of Dispute	100%	29 d	10/24/01	11/21/01	[Task bar from October 2001 to November 2001]																																															
89	Prepare Final PRG Report	100%	29 d	10/24/01	11/21/01	[Task bar from October 2001 to November 2001]																																															
90	USEPA, MEDEP & RAB Receive Final PRG Report	100%	1 d	11/23/01	11/23/01	[Task diamond at November 2001]																																															
91																																																					
92	BASELINE INTERIM MONITORING REPORT (Baseline Report)	54%	457 d	5/5/01	8/4/02	[Task bar from May 2001 to August 2002]																																															
93	Start of Round 4 Sampling Event	100%	1 d	5/5/01	5/5/01	[Task diamond at May 2001]																																															
94	Prepare Draft Baseline Report	100%	240 d	5/6/01	12/31/01	[Task bar from May 2001 to December 2001]																																															
95	USEPA, MEDEP & RAB Receive Draft Baseline Report	100%	1 d	1/1/02	1/1/02	[Task diamond at January 2002]																																															
96	USEPA, MEDEP & RAB Review Draft Baseline Report	100%	51 d	1/1/02	2/20/02	[Task bar from January 2002 to February 2002]																																															
100	Prepare Baseline Report Response to Comments	13%	45 d	2/20/02	4/5/02	[Task bar from February 2002 to April 2002]																																															
101	USEPA, MEDEP & RAB Receive Baseline Report Response to Comments	0%	1 d	4/6/02	4/6/02	[Task diamond at April 2002]																																															
102	USEPA, MEDEP & RAB Reviews Baseline Report Response to Comments	0%	30 d	4/6/02	5/5/02	[Task bar from April 2002 to May 2002]																																															
106	Navy Receives Comments on Baseline Report Response to Comments	0%	1 d	5/6/02	5/6/02	[Task diamond at May 2002]																																															
107	Navy and Regulator Comment Resolution	0%	7 d	5/6/02	5/12/02	[Task bar from May 2002 to May 2002]																																															
108	Prepare Draft Final Baseline Report	0%	30 d	5/6/02	6/4/02	[Task bar from May 2002 to June 2002]																																															
109	USEPA, MEDEP & RAB Receive Draft Final Baseline Report	0%	1 d	6/5/02	6/5/02	[Task diamond at June 2002]																																															
110	USEPA, MEDEP & RAB Review Draft Final Baseline Report	0%	30 d	6/5/02	7/4/02	[Task bar from June 2002 to July 2002]																																															
114	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	7/5/02	7/5/02	[Task diamond at July 2002]																																															
115	Navy and Regulator Resolution or Notice of Dispute	0%	30 d	7/5/02	8/3/02	[Task bar from July 2002 to August 2002]																																															
116	Prepare Final Baseline Report	0%	30 d	7/5/02	8/3/02	[Task bar from July 2002 to August 2002]																																															
117	USEPA, MEDEP & RAB Receive Final Baseline Report	0%	1 d	8/4/02	8/4/02	[Task diamond at August 2002]																																															
118																																																					





**APPENDIX C.5**  
**OU6 SCHEDULE (SITE MANAGEMENT OF MIGRATION)**



**APPENDIX C.6**  
**SITE 26, PORTABLE OIL/WATER TANKS, SCHEDULE**

PORTSMOUTH NAVAL SHIPYARD  
SITE MANAGMENT PLAN SCHEDULES  
SITE 26 - NO FURTHER ACTION DECISION DOCUMENT

ID	Task Name	% Complete	Dur	Start	Finish	2001												2002												2003											
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
1	SITE 26 DECISION DOCUMENT (DD)	100%	394 d	8/29/00	9/26/01	[Task bar spanning from 8/29/00 to 9/26/01]																																			
2	USEPA & MEDEP Receives Draft Site 26 DD Report	100%	1 d	8/29/00	8/29/00	[Task bar at 8/29/00]																																			
3	USEPA, MEDEP & RAB Review Draft Site 26 DD Report	100%	56 d	8/29/00	10/23/00	[Task bar from 8/29/00 to 10/23/00]																																			
7	Navy Receives Comments on Draft Site 26 DD Report	100%	1 d	10/24/00	10/24/00	[Task bar at 10/24/00]																																			
8	Prepare Site 26 DD Report Response to Comments Letter	100%	40 d	10/14/00	11/22/00	[Task bar from 10/14/00 to 11/22/00]																																			
13	USEPA, MEDEP & RAB Receive Site 26 DD Report Response to Comments Letter	100%	1 d	11/23/00	11/23/00	[Task bar at 11/23/00]																																			
14	USEPA, MEDEP & RAB Reviews Site 26 DD Report Response to Comments Letter	100%	34 d	11/23/00	12/26/00	[Task bar from 11/23/00 to 12/26/00]																																			
18	Navy Receives Comments on Site 26 DD Report Response to Comments Letter	100%	1 d	12/27/00	12/27/00	[Task bar at 12/27/00]																																			
19	Navy and Regulator Comment Resolution	100%	7 d	12/27/00	1/2/01	[Task bar from 12/27/00 to 1/2/01]																																			
20	Prepare Draft Final Site 26 DD Report	100%	30 d	12/27/00	1/25/01	[Task bar from 12/27/00 to 1/25/01]																																			
21	USEPA, MEDEP & RAB Receive Draft Final Site 26 DD Report	100%	1 d	1/26/01	1/26/01	[Task bar at 1/26/01]																																			
22	Navy and Regulator Resolution or Notice of Dispute	100%	14 d	1/27/01	2/9/01	[Task bar from 1/27/01 to 2/9/01]																																			
23	Prepare for Public Comment Period	100%	14 d	2/10/01	2/23/01	[Task bar from 2/10/01 to 2/23/01]																																			
24	Public Comment Period	100%	30 d	3/8/01	4/6/01	[Task bar from 3/8/01 to 4/6/01]																																			
25	Prepare Draft Draft Responsiveness Summary	100%	30 d	4/7/01	5/6/01	[Task bar from 4/7/01 to 5/6/01]																																			
26	USEPA, MEDEP & RAB Receives Draft Responsiveness Summary	100%	1 d	5/7/01	5/7/01	[Task bar at 5/7/01]																																			
27	USEPA, MEDEP & RAB Review Draft Responsiveness Summary	100%	17 d	5/7/01	5/23/01	[Task bar from 5/7/01 to 5/23/01]																																			
31	Navy Receives Comments on Draft Responsiveness Summary	100%	1 d	5/24/01	5/24/01	[Task bar at 5/24/01]																																			
32	Prepare Responsiveness Summary & Final DD	100%	74 d	5/24/01	8/5/01	[Task bar from 5/24/01 to 8/5/01]																																			
37	USEPA, MEDEP & RAB Receive Responsiveness Summary & Final DD	100%	1 d	8/6/01	8/6/01	[Task bar at 8/6/01]																																			
38	Navy Signs Final DD	100%	14 d	8/7/01	8/20/01	[Task bar from 8/7/01 to 8/20/01]																																			
39	MEDEP Receives Final DD	100%	1 d	8/21/01	8/21/01	[Task bar at 8/21/01]																																			
40	MEDEP Signs Final DD	100%	7 d	8/22/01	8/28/01	[Task bar from 8/22/01 to 8/28/01]																																			
41	USEPA Receives Final DD	100%	1 d	8/29/01	8/29/01	[Task bar at 8/29/01]																																			
42	USEPA Signs Final DD	100%	1 d	8/30/01	8/30/01	[Task bar at 8/30/01]																																			
43	Navy Distributes Final Decision Document	100%	27 d	8/31/01	9/26/01	[Task bar from 8/31/01 to 9/26/01]																																			

**APPENDIX C.7**  
**SITE 27, BERTH 6 INDUSTRIAL AREA, (OU5) SCHEDULE**

PORTSMOUTH NAVAL SHIPYARD  
SITE MANAGMENT PLAN SCHEDULES  
SITE 27 - NO FURTHER ACTION DECISION DOCUMENT

ID	Task Name	% Complete	Dur	Start	Finish	2001												2002												2003											
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
1	SITE 27 DECISION DOCUMENT (DD)	100%	394 d	8/29/00	9/26/01	[Shaded bar]																																			
2	USEPA & MEDEP Receives Draft Site 27 DD Report	100%	1 d	8/29/00	8/29/00	[Shaded bar]																																			
3	USEPA, MEDEP & RAB Review Draft Site 27 DD Report	100%	56 d	8/29/00	10/23/00	[Shaded bar]																																			
7	Navy Receives Comments on Draft Site 27 DD Report	100%	1 d	10/24/00	10/24/00	[Diamond marker]																																			
8	Prepare Site 27 DD Report Response to Comments Letter	100%	40 d	10/14/00	11/22/00	[Shaded bar]																																			
13	USEPA, MEDEP & RAB Receive Site 27 DD Report Response to Comments Letter	100%	1 d	11/23/00	11/23/00	[Diamond marker]																																			
14	USEPA, MEDEP & RAB Reviews Site 27 DD Report Response to Comments Letter	100%	34 d	11/23/00	12/26/00	[Shaded bar]																																			
18	Navy Receives Comments on Site 27 DD Report Response to Comments Letter	100%	1 d	12/27/00	12/27/00	[Diamond marker]																																			
19	Navy and Regulator Comment Resolution	100%	7 d	12/27/00	1/2/01	[Vertical bar]																																			
20	Prepare Draft Final Site 27 DD Report	100%	30 d	12/27/00	1/25/01	[Shaded bar]																																			
21	USEPA, MEDEP & RAB Receive Draft Final Site 27 DD Report	100%	1 d	1/26/01	1/26/01	[Diamond marker]																																			
22	Navy and Regulator Resolution or Notice of Dispute	100%	14 d	1/27/01	2/9/01	[Shaded bar]																																			
23	Prepare for Public Comment Period	100%	14 d	2/10/01	2/23/01	[Shaded bar]																																			
24	Public Comment Period	100%	30 d	3/8/01	4/6/01	[Shaded bar]																																			
25	Prepare Draft Draft Responsiveness Summary	100%	30 d	4/7/01	5/6/01	[Shaded bar]																																			
26	USEPA, MEDEP & RAB Receives Draft Responsiveness Summary	100%	1 d	5/7/01	5/7/01	[Diamond marker]																																			
27	USEPA, MEDEP & RAB Review Draft Responsiveness Summary	100%	17 d	5/7/01	5/23/01	[Shaded bar]																																			
31	Navy Receives Comments on Draft Responsiveness Summary	100%	1 d	5/24/01	5/24/01	[Diamond marker]																																			
32	Prepare Responsiveness Summary & Final DD	100%	74 d	5/24/01	8/5/01	[Shaded bar]																																			
37	USEPA, MEDEP & RAB Receive Responsiveness Summary & Final DD	100%	1 d	8/6/01	8/6/01	[Diamond marker]																																			
38	Navy Signs Final DD	100%	14 d	8/7/01	8/20/01	[Shaded bar]																																			
39	MEDEP Receives Final DD	100%	1 d	8/21/01	8/21/01	[Diamond marker]																																			
40	MEDEP Signs Final DD	100%	7 d	8/22/01	8/28/01	[Vertical bar]																																			
41	USEPA Receives Final DD	100%	1 d	8/29/01	8/29/01	[Diamond marker]																																			
42	USEPA Signs Final DD	100%	1 d	8/30/01	8/30/01	[Vertical bar]																																			
43	Navy Distributes Final Decision Document	100%	27 d	8/31/01	9/26/01	[Shaded bar]																																			

**APPENDIX C.8**  
**SITE 30, GALVANIZING PLANT BUILDING 184, SCHEDULE**

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

ID	Task Name	%	Dur	Start	Finish	2001												2002												2003												2004											
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
1	SITE 30, BUILDING 184, WORKPLAN AND REPORT	83%	662 d	10/13/00	8/5/02	[Gantt bar spanning from 10/13/00 to 8/5/02]																																															
2	Submit RTC on Draft Site 30 Workplan	100%	1 d	10/13/00	10/13/00	◆																																															
3	EPA, MEDEP, & RAB Review RTC on Draft Site 30 Workplan	100%	31 d	10/13/00	11/12/00	■																																															
4	Navy Receives Comments on RTC	100%	1 d	11/13/00	11/13/00	◆																																															
5	Prepare DF Site 30 Workplan	100%	30 d	11/13/00	12/12/00	■																																															
6	EPA, MEDEP, & RAB Receive DF Site 30 Workplan	100%	1 d	12/13/00	12/13/00	◆																																															
7	EPA, MEDEP, & RAB Review DF Site 30 Workplan	100%	42 d	12/13/00	1/23/01	■																																															
8	Navy Receives Comments on DF Site 30 Workplan	100%	1 d	1/24/01	1/24/01	◆																																															
9	Prepare Final Site 30 Workplan	100%	30 d	1/24/01	2/22/01	■																																															
10	EPA, MEDEP, & RAB Receive Final Site 30 Workplan	100%	1 d	2/23/01	2/23/01	◆																																															
11	Perform Site 30 Field Work (Secondary Document)	100%	127 d	2/24/01	6/30/01	■																																															
12	Procurement and Preparation	100%	20 d	2/24/01	3/15/01	■																																															
13	Security and Mobilization	100%	14 d	3/16/01	3/29/01	■																																															
14	Perform Field Work	100%	4 d	3/30/01	4/2/01	■																																															
15	Receive Lab Analysis	100%	30 d	4/3/01	5/2/01	■																																															
16	Data Validation	100%	45 d	5/3/01	6/16/01	■																																															
17	Data Processing	100%	14 d	6/17/01	6/30/01	■																																															
18	Prepare Draft Site 30 Report	100%	90 d	7/1/01	9/28/01	■																																															
23	USEPA & MEDEP Receives Draft SSA Report	100%	1 d	10/1/01	10/1/01	◆																																															
24	USEPA, MEDEP & RAB Review Draft SSA Report	100%	50 d	10/1/01	11/19/01	■																																															
28	Navy Receives Comments on Draft SSA Report	100%	1 d	11/19/01	11/19/01	◆																																															
29	Prepare SSA Report Response to Comments Letter	100%	50 d	11/15/01	1/3/02	■																																															
30	USEPA, MEDEP Receive SSA Report Response to Comments Letter	100%	1 d	1/4/02	1/4/02	◆																																															
31	USEPA, MEDEP & RAB Reviews SSA Report Response to Comments Letter	100%	33 d	1/4/02	2/5/02	■																																															
35	Navy Receives Comments on SSA Report Response to Comments Letter	100%	1 d	2/5/02	2/5/02	◆																																															
36	Navy and Regulator Comment Resolution	100%	7 d	2/5/02	2/11/02	■																																															
37	Prepare Draft Final SSA Report	70%	30 d	2/5/02	3/6/02	■																																															
38	USEPA, MEDEP & RAB Receive Draft Final SSA Report	0%	1 d	3/7/02	3/7/02	◆																																															
39	USEPA, MEDEP & RAB Review Draft Final SSA Report	0%	30 d	3/7/02	4/5/02	■																																															
43	Navy Receives Notice of Dispute	0%	1 d	4/6/02	4/6/02	◆																																															
44	Navy and Regulator Resolution of Notice of Dispute	0%	7 d	4/6/02	4/12/02	■																																															
45	Prepare Final SSA Report	0%	30 d	4/6/02	5/5/02	■																																															
46	USEPA, MEDEP & RAB Receive Final SSA Report	0%	1 d	5/6/02	5/6/02	◆																																															
47																																																					
48	PROPOSE RI/FS SCHEDULE (IF REQUIRED)	0%	1 d	8/5/02	8/5/02	◆																																															

**APPENDIX C.9**  
**SITE 31, WEST TIMBER BASIN LANDFILL, SCHEDULE**

Portsmouth Naval Shipyard  
Proposed RI/FS Schedule  
Site 31, West Timber Basin

ID	Task Name	%	Dur	Start	Finish	2004												2005												2006												2007												2008																	
						O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
1	RI WORKPLAN	0%	292 d	10/1/03	7/18/04	[Gantt bar from 10/1/03 to 7/18/04]																																																																	
2	Prepare Draft RI Workplan	0%	81 d	10/1/03	12/20/03	[Gantt bar from 10/1/03 to 12/20/03]																																																																	
7	USEPA, MEDEP & RAB Receives Draft RI Workplan	0%	1 d	12/21/03	12/21/03	[Diamond marker at 12/21/03]																																																																	
8	USEPA, MEDEP & RAB Review Draft RI Workplan	0%	45 d	12/21/03	2/3/04	[Gantt bar from 12/21/03 to 2/3/04]																																																																	
12	Navy Receives Comments on Draft RI Workplan	0%	1 d	2/4/04	2/4/04	[Diamond marker at 2/4/04]																																																																	
13	Prepare RI Workplan Response to Comments Letter	0%	45 d	2/4/04	3/19/04	[Gantt bar from 2/4/04 to 3/19/04]																																																																	
18	USEPA, MEDEP Receive RI Workplan Response to Comments Letter	0%	1 d	3/20/04	3/20/04	[Diamond marker at 3/20/04]																																																																	
19	USEPA, MEDEP & RAB Reviews RI Workplan Response to Comments Letter	0%	30 d	3/20/04	4/18/04	[Gantt bar from 3/20/04 to 4/18/04]																																																																	
23	Navy Receives Comments on RI Workplan Response to Comments Letter	0%	1 d	4/19/04	4/19/04	[Diamond marker at 4/19/04]																																																																	
24	Navy and Regulator Comment Resolution	0%	7 d	4/19/04	4/25/04	[Gantt bar from 4/19/04 to 4/25/04]																																																																	
25	Prepare Draft Final RI Workplan	0%	30 d	4/19/04	5/18/04	[Gantt bar from 4/19/04 to 5/18/04]																																																																	
26	USEPA, MEDEP & RAB Receive Draft Final RI Workplan	0%	1 d	5/19/04	5/19/04	[Diamond marker at 5/19/04]																																																																	
27	USEPA, MEDEP & RAB Review Draft Final RI Workplan	0%	30 d	5/19/04	6/17/04	[Gantt bar from 5/19/04 to 6/17/04]																																																																	
31	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	6/18/04	6/18/04	[Diamond marker at 6/18/04]																																																																	
32	Navy and Regulator Resolution or Notice of Dispute	0%	7 d	6/18/04	6/24/04	[Gantt bar from 6/18/04 to 6/24/04]																																																																	
33	Prepare Final RI Workplan	0%	30 d	6/18/04	7/17/04	[Gantt bar from 6/18/04 to 7/17/04]																																																																	
34	USEPA, MEDEP & RAB Receive Final RI Workplan	0%	1 d	7/18/04	7/18/04	[Diamond marker at 7/18/04]																																																																	

**APPENDIX C.10**  
**SITE 32, TOPEKA PIER SITE, SCHEDULE**



**APPENDIX C.11**  
**SITE 34, OIL GASIFICATION PLANT, BUILDING 62, SCHEDULE**

2/26/02  
1:40 PM

Portsmouth Naval Shipyard  
Site Management Plan Schedule  
Site 34, Oil Gasification Plant (Building 62)

ID	Task Name	%	Dur	Start	Finish	2002												2003												2004											
						D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
1	SITE 34 WORKPLAN	0%	451 d	12/14/01	3/9/03	[Gantt bar spanning from Dec 2001 to Mar 2003]																																			
2	Prepare Preliminary Site 34 Data Quality Objectives (DQOs)	0%	98 d	12/14/01	3/21/02	[Gantt bar from Dec 2001 to Mar 2002]																																			
7	USEPA, MEDEP & RAB Receive Preliminary DQOs	0%	1 d	3/22/02	3/22/02	[Milestone diamond at Mar 22, 2002]																																			
8	USEPA, MEDEP & RAB Review Preliminary DQOs	0%	13 d	3/22/02	4/3/02	[Gantt bar from Mar 22 to Apr 3, 2002]																																			
12	Site 34 DQO Meeting	0%	1 d	4/4/02	4/4/02	[Milestone diamond at Apr 4, 2002]																																			
13	Prepare Draft DQOs/DQO Meeting Minutes	0%	20 d	4/5/02	4/24/02	[Gantt bar from Apr 5 to Apr 24, 2002]																																			
14	USEPA, MEDEP & RAB Receive Draft DQOs/Meeting Minutes	0%	1 d	4/25/02	4/25/02	[Milestone diamond at Apr 25, 2002]																																			
15	USEPA, MEDEP & RAB Review Draft DQOs/Meeting Minutes	0%	14 d	4/25/02	5/8/02	[Gantt bar from Apr 25 to May 8, 2002]																																			
19	Navy Receives Comments on draft DQOs/Meeting Minutes	0%	1 d	5/9/02	5/9/02	[Milestone diamond at May 9, 2002]																																			
20	Prepare Draft Site 34 QAPP	0%	143 d	4/5/02	8/25/02	[Gantt bar from Apr 5 to Aug 25, 2002]																																			
24	USEPA, MEDEP & RAB Receive Draft Site 34 QAPP	0%	1 d	8/26/02	8/26/02	[Milestone diamond at Aug 26, 2002]																																			
25	USEPA, MEDEP & RAB Review Draft Site 34 QAPP	0%	30 d	8/26/02	9/24/02	[Gantt bar from Aug 26 to Sep 24, 2002]																																			
29	Navy Receives Comments on Draft Site 34 QAPP	0%	1 d	9/25/02	9/25/02	[Milestone diamond at Sep 25, 2002]																																			
30	Prepare Site 34 QAPP Response to Comments	0%	45 d	9/25/02	11/8/02	[Gantt bar from Sep 25 to Nov 8, 2002]																																			
31	USEPA, MEDEP Receive Site 34 QAPP Response to Comments	0%	1 d	11/9/02	11/9/02	[Milestone diamond at Nov 9, 2002]																																			
32	USEPA, MEDEP & RAB Reviews Site 34 QAPP Response to Comments	0%	30 d	11/9/02	12/8/02	[Gantt bar from Nov 9 to Dec 8, 2002]																																			
36	Navy Receives Comments on Site 34 QAPP Response to Comments	0%	1 d	12/9/02	12/9/02	[Milestone diamond at Dec 9, 2002]																																			
37	Navy and Regulator Comment Resolution	0%	7 d	12/9/02	12/15/02	[Gantt bar from Dec 9 to Dec 15, 2002]																																			
38	Prepare Draft Final Site 34 Workplan	0%	30 d	12/9/02	1/7/03	[Gantt bar from Dec 9 to Jan 7, 2003]																																			
39	USEPA, MEDEP & RAB Receive Draft Final Site 34 Workplan	0%	1 d	1/8/03	1/8/03	[Milestone diamond at Jan 8, 2003]																																			
40	USEPA, MEDEP & RAB Review Draft Final Site 34 Workplan	0%	30 d	1/8/03	2/6/03	[Gantt bar from Jan 8 to Feb 6, 2003]																																			
44	Navy Receives Approval, Comments, or Notice of Dispute	0%	1 d	2/7/03	2/7/03	[Milestone diamond at Feb 7, 2003]																																			
45	Navy and Regulator Resolution or Notice of Dispute	0%	7 d	2/7/03	2/13/03	[Gantt bar from Feb 7 to Feb 13, 2003]																																			
46	Prepare Final Site 34 Workplan	0%	30 d	2/7/03	3/8/03	[Gantt bar from Feb 7 to Mar 8, 2003]																																			
47	USEPA, MEDEP & RAB Receive Final Site 34 Workplan	0%	1 d	3/9/03	3/9/03	[Milestone diamond at Mar 9, 2003]																																			
48																																									
49	SITE 34 FIELD WORK	0%	220 d	3/10/03	10/15/03	[Gantt bar spanning from Mar 2003 to Oct 2003]																																			
50	Procurement and Preparation	0%	21 d	3/10/03	3/30/03	[Gantt bar from Mar 10 to Mar 30, 2003]																																			
51	Security and Mobilization	0%	20 d	3/31/03	4/19/03	[Gantt bar from Mar 31 to Apr 19, 2003]																																			
52	Perform Field Work	0%	90 d	4/20/03	7/18/03	[Gantt bar from Apr 20 to Jul 18, 2003]																																			
53	Receive Lab Analysis	0%	30 d	7/19/03	8/17/03	[Gantt bar from Jul 19 to Aug 17, 2003]																																			
54	Data Validation	0%	45 d	8/18/03	10/1/03	[Gantt bar from Aug 18 to Oct 1, 2003]																																			
55	Data Processing	0%	14 d	10/2/03	10/15/03	[Gantt bar from Oct 2 to Oct 15, 2003]																																			
56																																									

