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LETTER REGARDING THE TRANSMITTAL OF PROPOSED SAMPLING AND ANALYSIS  
PROGRAM FOR INTERIM OFFSHORE MONITORING FOR OPERABLE UNIT 4 (OU 4) NSY  
PORTSMOUTH ME  
7/21/1998  
BROWN & ROOT ENVIRONMENTAL



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C-49-07-8-130

July 21, 1998

Project Number 5003

Ms. Meghan Cassidy  
U.S. Environmental Protection Agency, Region I  
JFK Federal Building HBT  
Boston, MA 02203-2211

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

Reference: Contract No. N62472-90-D-1298  
Contract Task Order No. 201

Subject: Proposed Sampling and Analysis Program for Interim Offshore Monitoring for OU4 at  
Portsmouth Naval Shipyard, Kittery, ME

Dear Ms. Cassidy/Mr. McLeod:

On behalf of the Navy, Brown and Root Environmental is pleased to provide you with the framework for the proposed Sampling and Analysis Program for Interim Offshore Monitoring for OU4 at Portsmouth Naval Shipyard (PNS). The subject program will be the focus of the August 20, 1998 Offshore Technical Meeting at PNS. Please provide any comments by August 14, 1998, so the Navy can revise and prepare the necessary material for the meeting.

For the Community Restoration Advisory Board (RAB) members; if you have any comments or questions on these issues, they can be provided to the Navy at a RAB meeting, by calling the Public Affairs Office at (207) 438-1140 or by writing to:

Portsmouth Naval Shipyard  
Code 106.3R Bldg 44  
Attn Marty Raymond  
Portsmouth, NH 03804-5000

If additional information is required, please contact Ms. Marty Raymond at 207-438-2536 or Mr. Fred Evans at 610-595-0567, x159.

Sincerely,

Deborah J. Cohen, P.E.  
Project Manager

DJC/ko

Enclosure

cc:  
NOAA (K. Finkelstein)  
US Fish & Wildlife Service (K. Munney)  
ME Dept. of Marine Resources (D. Card)



Ms. Meghan Cassidy/Mr. Iver McLeod  
EPA Region I/Maine DEP  
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cc:

NH Fish & Game (J. Nelson)  
Ms. Juanita Bell  
Mr. Doug Bogen  
Mr. Jeff Clifford  
Ms. Michele Dionne  
Ms. Eileen Foley  
Ms. Mary Marshall  
Mr. Phil McCarthy  
Mr. Jack McKenna  
Mr. Guy Petty  
Mr. Onil Roy  
Mr. Peter Vandermark  
Ms. Carolyn Lepage  
NORTHDIV (Code 1823/FE, F. Evans)  
PNS (Code 106.3R, M. Raymond)  
COMSUBGRU TWO (R. Jones)  
PNS Code 100PAO w/o encl  
Brown and Root Environmental (L. Klink, B. Horne)  
SAIC (G. Tracey)

**PROPOSED SAMPLING AND ANALYSIS PROGRAM  
INTERIM OFFSHORE MONITORING FOR OU4  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE**

The following provides the framework for the proposed sampling and analysis program which will be detailed in the interim offshore monitoring plan for Operable Unit 4 (the offshore environment) at Portsmouth Naval Shipyard (PNS). The sampling program also includes sampling and analysis to meet PRG data needs.

**WHAT TO SAMPLE**

The focus of the monitoring program is to provide data to determine whether the concentrations of chemicals offshore PNS are at acceptable levels (i.e., meet remedial action objectives). Therefore, the evaluation of media to sample for the monitoring program included consideration of the preliminary Remedial Action Objectives (RAOs) identified for OU4. Preliminary RAOs for OU4 identified are as follows:

- Protect pelagic, epibenthic, eelgrass, and salt marsh communities from exposure to chemicals of concern at concentrations in the estuarine waters in the PNS offshore AOCs in excess of PRGs.
- Protect epibenthic, benthic, eelgrass, and salt marsh communities from exposure to chemicals of concern at concentrations in sediments in the PNS offshore AOCs in excess of PRGs.

Based on these RAOs, monitoring of estuarine waters (surface water) and sediment should provide data to determine whether the preliminary RAOs were being met. Based on the proposed PRG development approach (as presented in the May 21, 1998 technical meeting at PNS), water quality criteria (state and federal) will be used as interim PRGs for surface water. Also values calculated from threshold levels will be used as interim PRGs for sediment for the interim monitoring.

Surface water data, collected as part of Phase I and Phase II sampling rounds for the Estuarine Ecological Risk Assessment (EERA), showed concentrations below the water quality criteria (NCCOSC, 1997). This is consistent with the low magnitude of ecological risk from exposure to surface water identified for OU4. Therefore, preliminary RAOs for surface water are being met and monitoring of surface water is not included part of the interim monitoring.

In addition to monitoring of sediment to determine whether RAOs for sediment are being met, monitoring of mussels will be conducted as part of the program to provide data for locations where sediment is not present (e.g., the DRMO Storage Yard) and to provide data to confirm the comparability between sediment and mussel tissue results (where sediment is present). Mussel tissue concentrations will be converted to sediment-based concentrations using accumulation factors (biota-sediment accumulation factors [BSAF] for organics and bioaccumulation factors [BAFs] for inorganics). Table 1 provides a summary of the planned sampling and analysis for interim offshore monitoring at OU4.

For the development of interim PRGs, data needs include co-located data for porewater, bulk sediment/toxicity, and mussel and/or juvenile lobster. Sediment and mussel will be monitoring as part of the interim monitoring program. Additionally, sediment porewater and juvenile lobster will be sampled and analyzed as part of PRG data needs. One round of sampling is necessary to provide for the PRG data needs. Table 2 provides a summary of the planned sampling and analysis for PRG data needs.

Water exiting the onshore from seeps is currently being addressed as part of the onshore portion of PNS and therefore is not included as part of the interim offshore monitoring program.

## **WHAT TO ANALYZE**

Analysis for the interim offshore monitoring program is provided in Table 1 and includes chemistry, total organic carbon (TOC), and acid volatile sulfide (AVS): simultaneously extracted metal (SEM) concentrations for sediment samples and chemistry and lipid content for mussels. Analysis for chemistry includes chemicals of potential concern (COPCs) for OU4; including metals, polychlorinated biphenyls (PCBs), and total polyaromatic hydrocarbons (PAHs).

In addition to the analysis for sediment and mussels included in the interim offshore monitoring program, analysis for PRG data needs includes toxicity testing for sediment and porewater (amphipod and sea urchin testing), chemistry (COPCs) and dissolved organic carbon (DOC) for porewater and chemistry (COPCs) and lipid content for juvenile lobster.

## **WHERE TO SAMPLE**

Monitoring stations for the interim offshore monitoring program are described in Table 3. Locations are shown on Figure 1. The monitoring stations were located based on the location of stations sampled as

part of the EERA (Phase 1 and/or Phase 2), the location of seeps sampled from December 1996 to November 1997, and the location of the offshore AOCs and potential onshore sources (onshore IRP sites). The monitoring stations were selected to provide adequate monitoring of PNS as well as the AOCs. Except for at the DRMO Storage Yard, sediment and mussel samples are expected at all the monitoring stations.

Reference stations are also provided in Table 3. Station locations are shown on Figure 2. The reference locations were selected to provide data on regional concentrations in the Piscataqua River at locations with similar sediment type to PNS. Reference locations include up-estuary but downstream of several industrial inputs to the Piscataqua (RF-1), near up-estuary (RF-2), near an industrial input in close proximity to PNS (RF-3), and in a commercial fishing/suburban area (RF-4). These reference stations account for potential chemical concentrations related to industrial and commercial fishing/suburban activities present in the estuary that are not related to PNS. With the exception of RF-4, the reference locations are at locations previously sampled as part of the EERA. Note that a reference location for interim offshore monitoring was not located at any of the previous Spruce Creek EERA stations because these stations had sediment types different than those of PNS.

PRG data needs will be collected at interim monitoring stations based on the available media at the location. While sediment and mussel will be collected as part of the interim monitoring program and are expected at almost every station, juvenile lobster will be sampled for PRG data needs only. Juvenile lobster will be collected from every monitoring station where present. Sediment porewater will be collected at monitoring stations where sediment and mussel and/or sediment and juvenile lobsters are present.

## **WHEN TO SAMPLE**

For the first two years of interim monitoring, seasonal sampling will be conducted. Samples will be collected during the late winter (March/April) and in late summer (August/September). This is when AVS:SEM are generally the lowest and highest, respectively. After the initial two years, monitoring will be conducted annually. The time of year will be based on the trends observed in the seasonal sampling data (i.e., highest chemical concentration, lowest AVS:SEM). If no trend is observed, the sampling will be conducted in late summer.

Sampling for PRG data needs will be conducted during the first late winter monitoring round of the interim monitoring.

TABLE 1

SUMMARY OF PLANNED SAMPLING AND ANALYSIS FOR INTERIM OFFSHORE MONITORING  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Media	Analysis <sup>(1)</sup>	Rationale for Analysis	Notes for Sampling Stations (1)
Sediment	Chemistry (COPCs), TOC, AVS:SEM	<ul style="list-style-type: none"> <li>Collect for comparison with PRGs to determine whether RAOs are being met for the offshore. The data will be evaluated as provided in the decision tree to determine whether continued monitoring is necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Co-located sediment samples with mussel samples where possible.</li> <li>Locations will spatially account for areas around PNS which had actionable risks based on Estuarine Ecological Risk Assessment (EERA).</li> </ul>
Mussel	Chemistry (COPCs), Lipid Content	<ul style="list-style-type: none"> <li>Collect for comparison with PRGs for locations where sediment is not available. Tissue concentrations will be converted to sediment-based concentrations (based on AF values) for comparison to the sediment-based PRGs. The data will be evaluated as provided in the decision tree to determine whether continued monitoring is necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Collect in areas around PNS which had actionable risks based on EERA where sediment is not present.</li> </ul>
		<ul style="list-style-type: none"> <li>Collect to confirm the comparability between sediment and mussel tissue results where sediment data are available.</li> </ul>	<ul style="list-style-type: none"> <li>Co-locate with sediment samples where possible.</li> </ul>

AF: Accumulation Factor

AVS: Acid Volatile Sulfide

COPC: Chemicals of Potential Concern

PRG: Preliminary Remediation Goal

RAO: Remedial Action Objective

SEM: Simultaneously Extracted Metal

TOC: Total Organic Carbon

(1) See Table 3 for the rationale for selection of monitoring stations and Figures 1 and 2 for monitoring station and reference station locations.

TABLE 2

SUMMARY OF PLANNED SAMPLING AND ANALYSIS FOR PRG DATA NEEDS  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Medium (1)	Analysis (2)	Rationale for Analysis	Notes for Sample Locations (3)
Sediment	Chemistry (COPCs), TOC, AVS:SEM, Toxicity Testing	<ul style="list-style-type: none"> <li>Collect to provide additional co-located sediment and porewater chemistry and toxicity data for evaluation of site-specific toxicity/ bioavailability conditions.</li> <li>Collect to provide additional co-located sediment and tissue chemistry necessary for bioaccumulation factor modeling (e.g., BSAF).</li> </ul>	Sediment samples will be co-located with porewater and tissue samples. Only monitoring stations with both sediment and mussel and/or lobster will be used for PRG data needs.
Porewater	Chemistry (COPCs), DOC	<ul style="list-style-type: none"> <li>Collected to provide co-located sediment and porewater chemistry data for evaluation of site-specific toxicity/ bioavailability conditions.</li> </ul>	Co-locate with sediment samples.
Mussel	Chemistry (COPCs), Lipid Content	<ul style="list-style-type: none"> <li>Collect to provide co-located sediment and tissue chemistry for bioaccumulation factor modeling (e.g., BSAF).</li> </ul>	Co-locate with sediment samples.
Juvenile lobster	Chemistry (COPCs), Lipid Content	<ul style="list-style-type: none"> <li>Collect to provide co-located sediment and tissue chemistry for bioaccumulation factor modeling (e.g., BSAF).</li> </ul>	Co-locate with sediment samples.

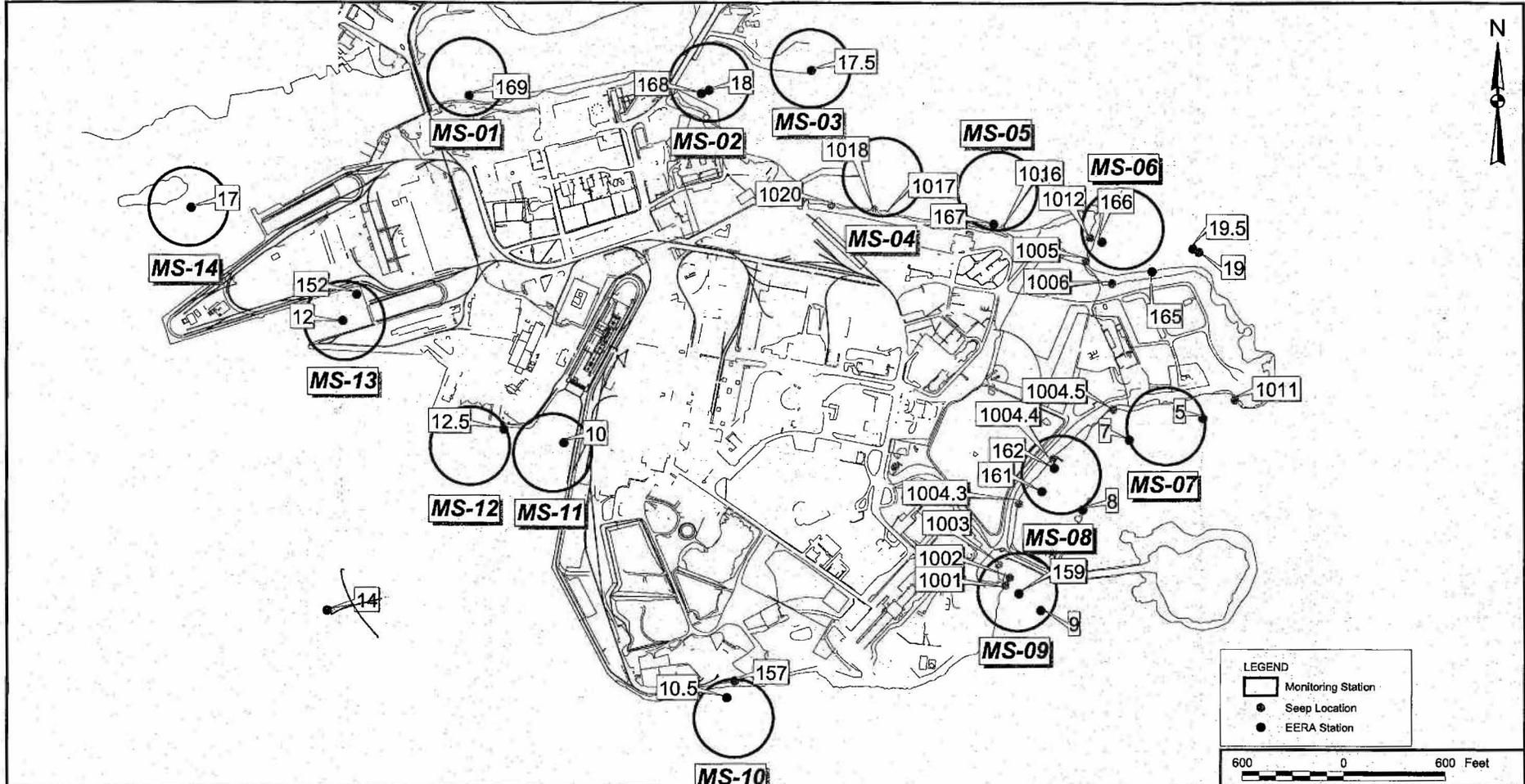
AVS: Acid Volatile Sulfide                      DOC: Dissolved Organic Carbon  
 BSAF: Biota-Sediment Accumulation Factor    SEM: Simultaneously Extracted Metals  
 COPC: Chemicals of Potential Concern        TOC: Total Organic Carbon

- 1 Sediment and mussel samples collected during the first late winter monitoring round will be used for PRG data needs. In addition, porewater and juvenile lobster samples will be collected during the same monitoring round to provide PRG data needs.
- 2 With the exception of toxicity testing, the analysis for interim monitoring and the PRG data needs are the same. Samples collected and analyzed for the interim monitoring will also be used for PRG data needs, as appropriate. Sea urchin and amphipod toxicity testing will be conducted for PRG data needs and not as part of the interim monitoring program.
- 3 Table 3 provides the list of monitoring stations to be used for interim offshore monitoring. Figure 1 shows the location of the monitoring stations. Note that reference stations will not be sampled for analysis required for PRG data needs only (i.e., toxicity testing).

TABLE 3

PROPOSED MONITORING STATIONS FOR INTERIM OFFSHORE MONITORING  
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Monitoring Station	Rationale
MS-1	Locate near station 169 to monitor the western portion of the Back Channel.
MS-2	Locate near stations 18 and 168 to monitor middle portion of the Back Channel.
MS-3	Locate near station 17.5 to monitor the shore of the Back Channel opposite PNS.
MS-4	Locate near seeps BC-1017 and BC-1018 to monitor the portion of the Back Channel potentially affected by the Topeka Pier site (Site 32).
MS-5	Locate near vicinity of station 167 and seep 1016 to monitor the eastern portion of the Back Channel.
MS-6	Locate near stations 19, 19.5, 166, and 165 and Jamaica Cove seep locations (1005, 1006, and 1012) to monitor Jamaica Cove.
MS-7	Locate near stations 5 and 7 to monitor the eastern portion of Clark Cove.
MS-8	Locate near stations 161 and 162 and Clark Cove seeps 1004.3 and 1004.4 to monitor western portion of Clark Cove.
MS-9	Locate near stations 159 and 9 to monitor the Sullivan Point AOC. Sullivan Point seeps are also located near this location.
MS-10	Locate near stations 157 and 10.5 to monitor the DRMO Storage Yard AOC.
MS-11	Locate near station 10 to monitor the eastern portion of the Dry Docks AOC, near Berth 6 and Site 27. Site 5 was also located in this area.
MS-12	Locate near station 12.5 to monitor mideastern portion of the Dry Docks AOC, near Site 10.
MS-13	Locate near stations 12 and 152 to monitor the midwestern portion of the Dry Docks AOC near Site 31. Site 5 was also located in this area.
MS-14	Locate near station 17 to monitor the western portion of the Dry Docks AOC and the western most portion of the Back Channel.
RF-1	Locate near station 25 to monitor up-estuary station with a depositional environment, fine-grained sediments, downstream of where Little Bay enters the Piscataqua River.
RF-2	Locate near station 16. An up-estuary station with a depositional environment, fine-grained sediments, upstream of PNS with influences from industrial and residential developments in the middle and lower Piscataqua River.
RF-3	Locate near stations 14, a fine-grained depositional environment. Station 14 is located near Portsmouth sewage discharge with possible PNS influence.
RF-4	Locate southeast of PNS in Sagamore Creek, south of Piscataqua River and draining into Little Harbor. Sagamore Creek is an area where there is commercial fishing with little or no industrial influence.

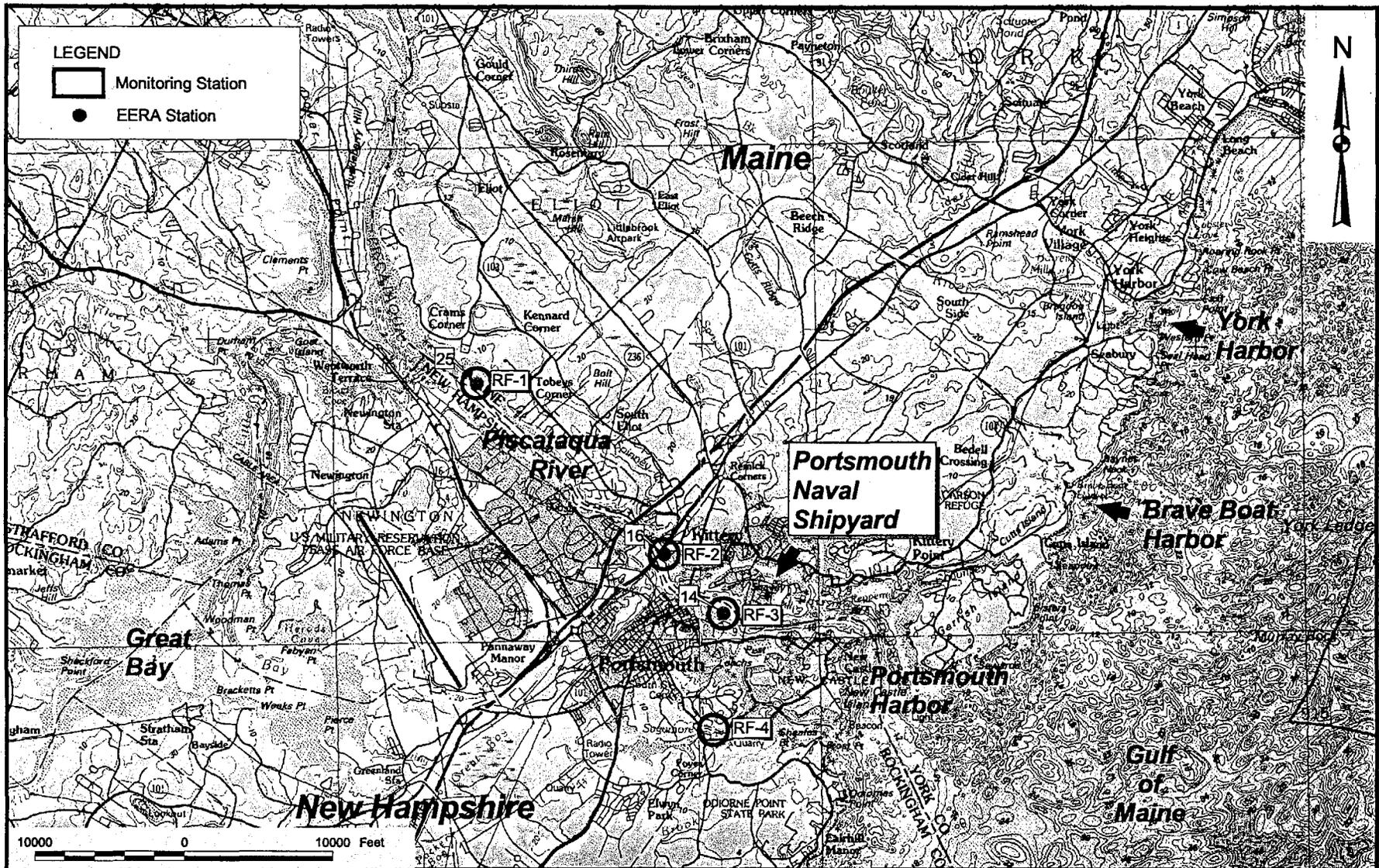


**LEGEND**

- Monitoring Station
- Seep Location
- EERA Station

600 0 600 Feet

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE	Brown & Root Environmental		CONTRACT NUMBER	OWNER NUMBER	
							D. PERRY	6-JUL-98			5003	0201	
							CHECKED BY	DATE			APPROVED BY	DATE	
							<i>DJC</i>	<i>7/14/98</i>			<i>[Signature]</i>	<i>5/17/98</i>	
							COST/SCHEDULE/AREA	INTERIM OFFSHORE MONITORING STATION LOCATIONS PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE				APPROVED BY	DATE
							SCALE					DRAWING NO.	REV
							AS NOTED					FIGURE 1	0



DRAWN BY D. PERRY	DATE 6 JUL 98
CHECKED BY DSC	DATE 7/17/98
COST/SCHEDULE/AREA	
SCALE AS NOTED	



Brown & Root Environmental

INTERIM OFFSHORE MONITORING REFERENCE LOCATIONS  
PORTSMOUTH NAVAL SHIPYARD  
KITTERY, MAINE

CONTRACT NUMBER 5003		OWNER No. 0201
APPROVED BY <i>[Signature]</i>	DATE 7/17/98	
APPROVED BY —	DATE —	
DRAWING No. FIGURE 2	REV 0	