

**U.S. DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM**

**NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

LONG TERM MONITORING PLAN

SITE 9

**NEPTUNE DRIVE
DISPOSAL SITE**

JANUARY 1995

LONG TERM MONITORING PLAN
SITE 9: NEPTUNE DRIVE DISPOSAL SITE

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

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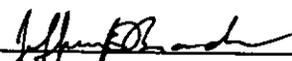
U.S. Department of the Navy
Northern Division
Naval Facilities Engineering Command
Contract: N62472-84-C-1013

Prepared by:

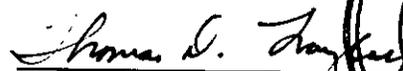
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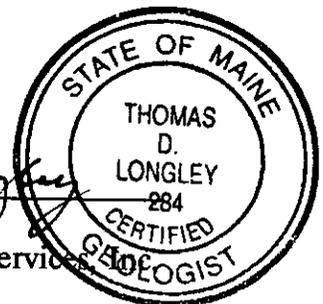
JANUARY 1995



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SITE 9
NEPTUNE DRIVE DISPOSAL SITE
LONG TERM MONITORING PLAN

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

REFERENCES

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1.0 INTRODUCTION

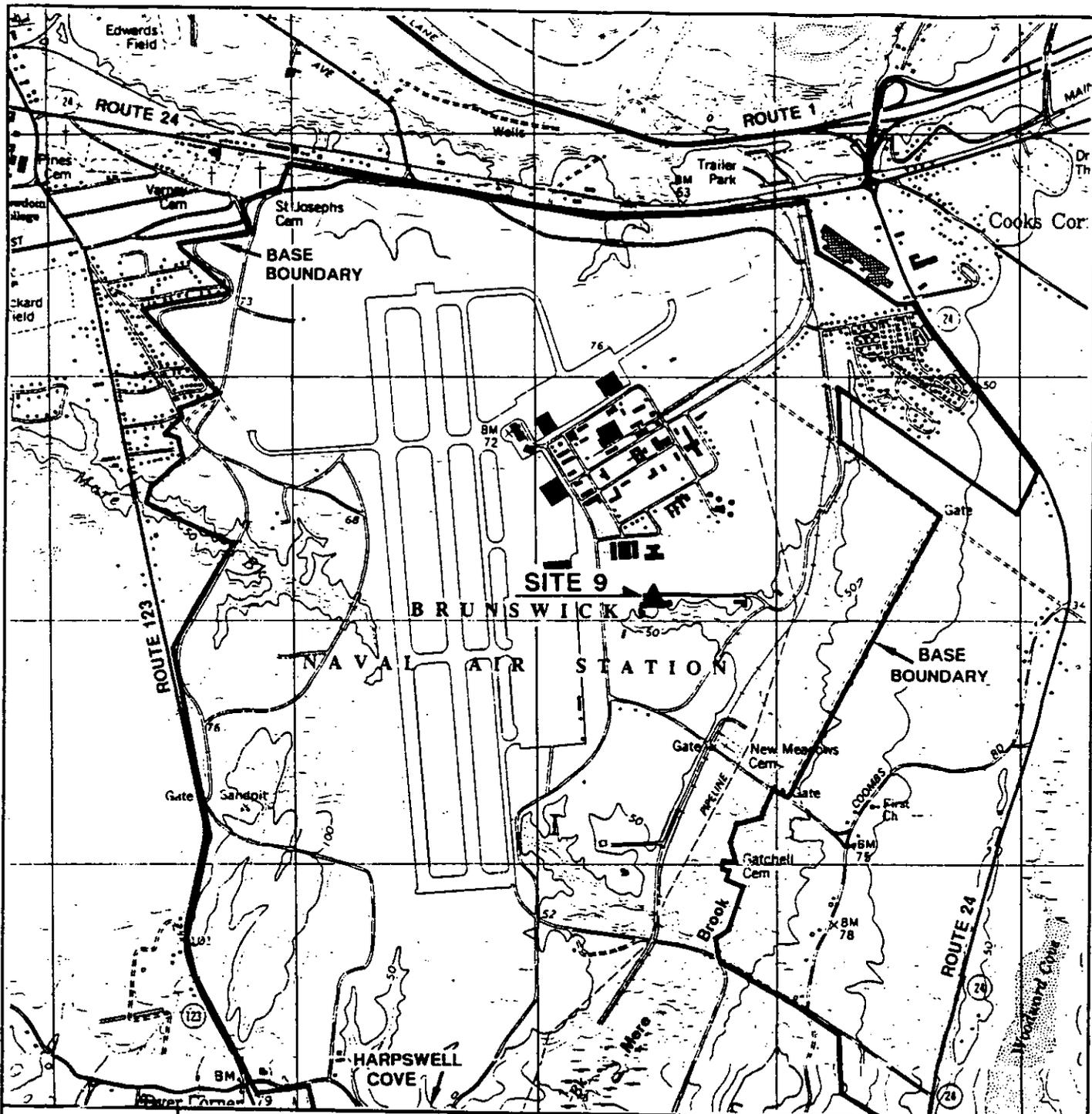
The Brunswick Naval Air Station (NAS Brunswick) is located south of the Androscoggin River between Brunswick and Bath, Maine (Figure 1-1). NAS Brunswick is an active base, owned and operated by the federal government through the Department of the Navy. This facility is currently participating in the Navy's Installation Restoration Program (IRP), which was designed to identify, evaluate, and remediate former disposal and spill sites at defense facilities. In 1987, the U.S. Environmental Protection Agency (USEPA) placed NAS Brunswick on the National Priorities List (NPL). Thirteen individual sites on base, including the Neptune Drive Disposal Site (Site 9), were identified in the Federal Facility Agreement. Site 9 is defined as an area north of Neptune Drive containing a former incinerator and an abandoned ash landfill/dump area, and an area south of Neptune Drive where disposal of hazardous materials allegedly occurred. This monitoring plan was developed to support the Navy's overall strategy for remediation at Site 9 at NAS Brunswick, as specified in the Proposed Plan and Interim Groundwater Record of Decision (ROD) for Site 9 (ABB-ES 1994a and 1994b).

1.1 PURPOSE AND SCOPE

The purpose of this Long Term Monitoring Plan (LTMP) is to identify the tasks to be performed to characterize the groundwater and surface water quality on-site and downgradient of Site 9 and identify contamination, if any, associated with past disposal activities at the site. In particular, this monitoring program is intended to better establish the presence/absence and concentrations of contaminants which have previously been sporadically observed during past sampling events. To date, no source area(s) responsible for these sporadic groundwater contaminants have been identified. The sporadic contaminant detections suggest that a significant, readily-identifiable source of groundwater contamination does not exist; however, only a few, irregularly-timed sampling events have been completed.

This LTMP dictates: (1) those criteria, including surface water, sediment, and groundwater sampling locations and frequencies, analytical parameters, laboratory methods, and reporting requirements to be followed to monitor the effectiveness of the remedial action (i.e., natural attenuation) and (2) those data assessments to be

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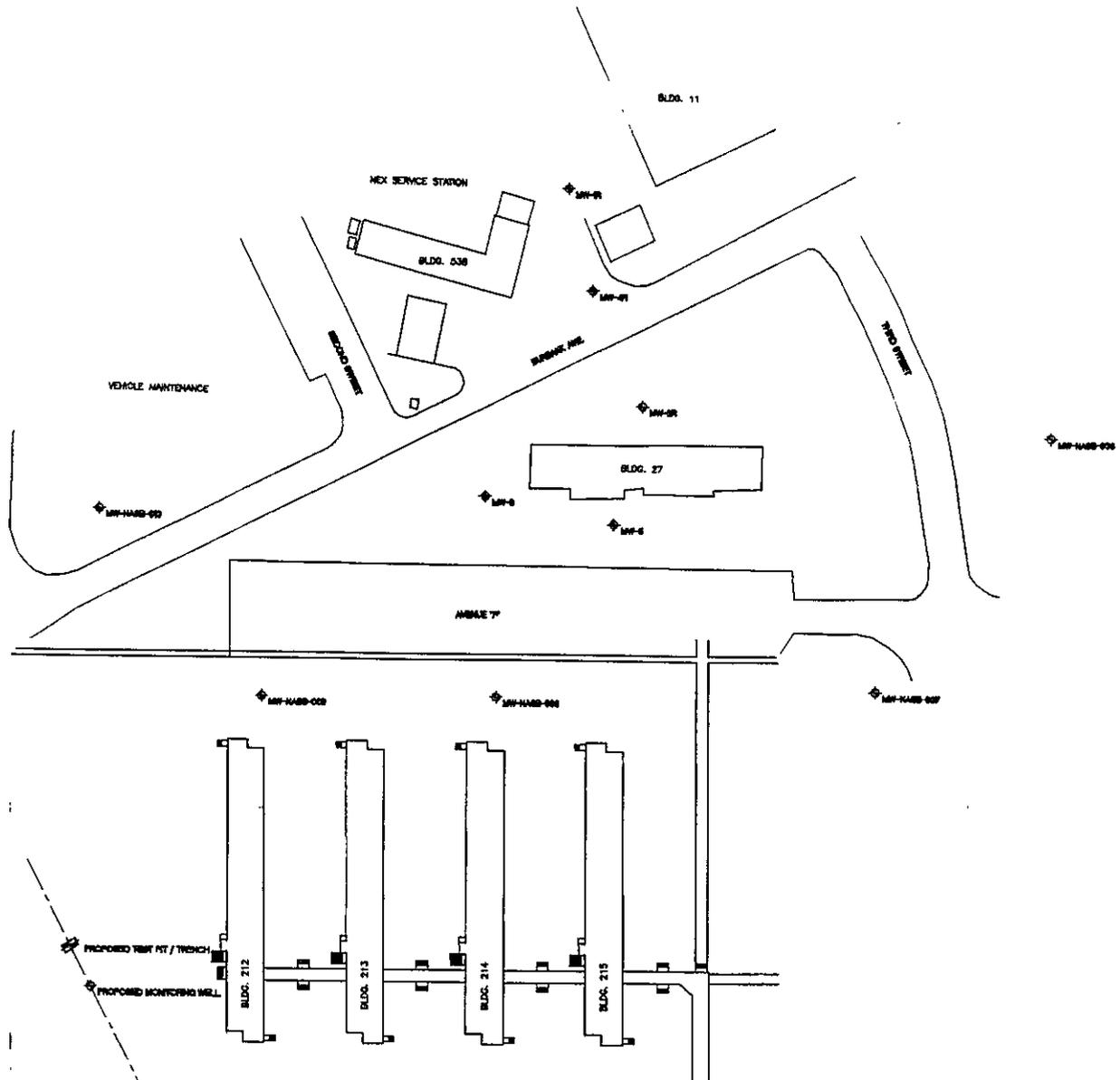
SOURCE: USGS QUADRANGLE, BRUNSWICK, AND ORRS ISLAND, ME, DATED 1980, 1978. 7.5 MINUTE SERIES.

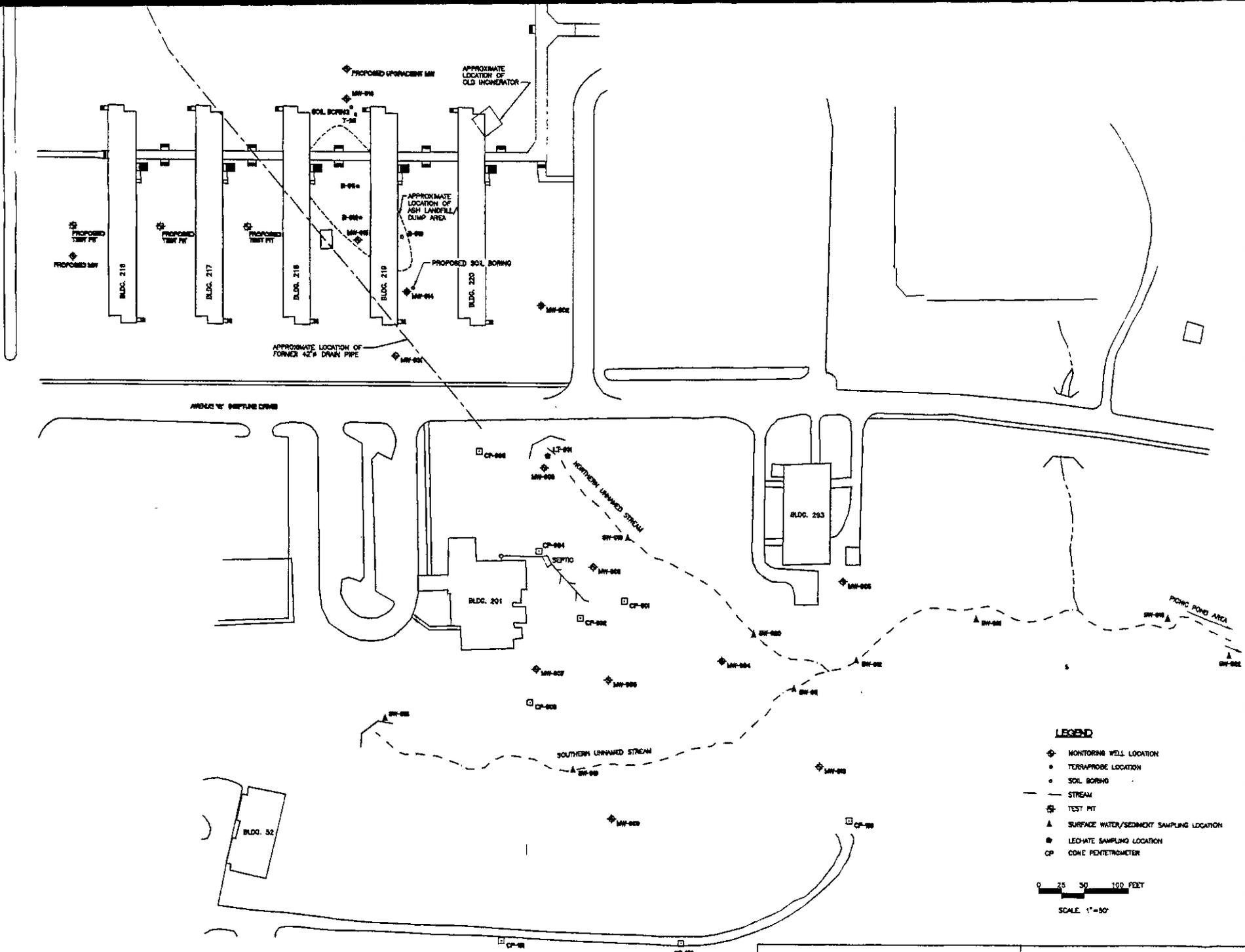


 ABB Environmental Services, Inc.	SITE LOCATION MAP SITE 9	
	LONG-TERM MONITORING PLAN	
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	JOB NO. 7131	FIGURE 1-1



S-I





- LEGEND**
- ◆ MONITORING WELL LOCATION
 - TERRAPROBE LOCATION
 - SOIL BORING
 - STREAM
 - ⊠ TEST PIT
 - ▲ SURFACE WATER/SEDIMENT SAMPLING LOCATION
 - ⊙ LEADATE SAMPLING LOCATION
 - CP CONE PENETROMETER

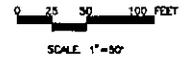


ABB ABB Environmental Services, Inc. INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	SITE LOCATION AND EXPLORATION MAP: SITE 9
	LONG-TERM MONITORING PLAN JOB NO. 7482-02 FIGURE 1-2

undertaken to evaluate the need for additional investigative and/or remedial actions at or in close proximity to this site.

The Interim Groundwater ROD for Site 9 embodies four fundamental concepts: (1) monitoring data collected to date do not definitively characterize the nature of site-related contamination; (2) additional, long term monitoring is needed to resolve the ambiguities noted above; (3) additional investigations to characterize soil quality in potential source areas are necessary; and (4) institutional controls are needed to prevent human ingestion of the groundwater because some of the historical analytical results indicate the presence of volatile organic compounds (VOCs) in groundwater in exceedance of maximum contaminant levels (MCLs).

The results of the monitoring program will be used in support of the Interim groundwater ROD and subsequent IRP activities at Site 9. If the analytical results indicate that contaminant levels do not exceed regulatory standards or concentrations associated with unacceptable risk, the monitoring program will be terminated at the five-year review. The decision to terminate the monitoring program will be made by the Navy, USEPA and Maine Department of Environmental Protection (MEDEP) with input from the Technical Review Committee, and be based on the results of additional investigations relevant to Site 9 and the five-year review. If, however, results of the additional investigations identify source areas or indicate that contamination exists at concentrations above regulatory standards or associated with unacceptable risks, additional actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) may be warranted. These actions might include remedial actions for the identified source areas, additional groundwater monitoring, additional investigations of soils and/or groundwater, modified institutional controls, or other actions consistent with CERCLA. Following the evaluation of the additional investigations, a final source control ROD will be prepared documenting any action to be taken. If sufficient information is present, this ROD may also cover any decision made on the groundwater operable unit. The final ROD may or may not continue to require institutional controls. On the other hand, if the analytical results are ambiguous as to the nature and extent of contamination in this area, then the monitoring program will be extended, and modified as necessary, to address those ambiguities.

This document is supported by sections of the LTMP developed for Building 95, Sites 1 and 3, and Eastern Plume; specifically the Quality Assurance Project Plan (QAPP) (Appendix A) and Health and Safety Plan (HASP) (Appendix B) (ABB-ES,

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1994c). This LTMP for Site 9 is organized as follows. Section 1.0 provides an overview of past site activities. Section 2.0 presents regulatory information used in developing the LTMP. Section 3.0 defines the actual plan to be followed.

1.2 SITE BACKGROUND

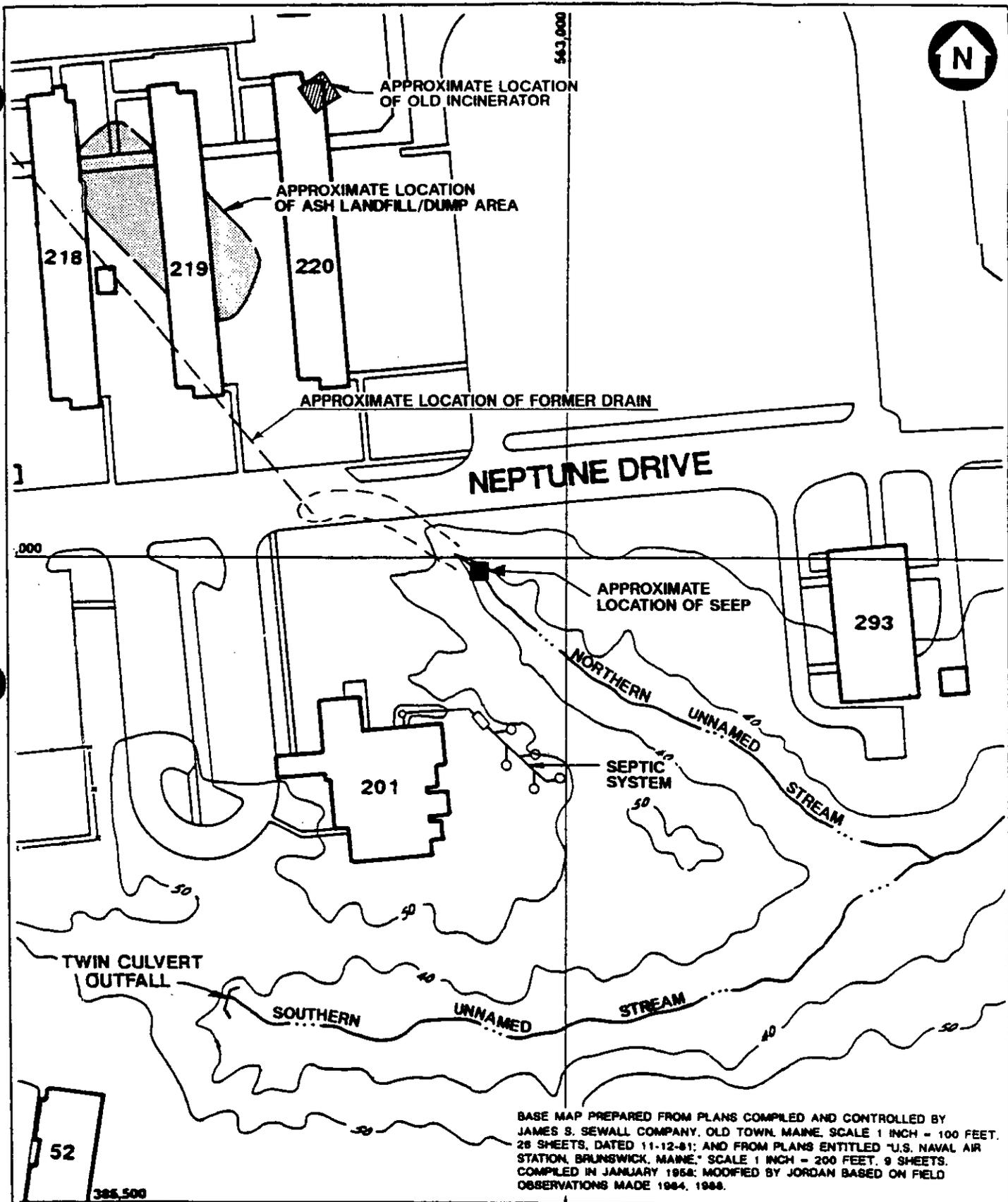
The Neptune Drive Disposal Site (Site 9) is located in the central portion of the NAS Brunswick (Figure 1-2). NAS Brunswick, located south of the Androscoggin River between Brunswick and Bath, Maine, is an active facility supporting the U.S. Department of the Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. Its primary mission is to operate and maintain P-3 Orion aircraft. NAS Brunswick first became active in the 1940s during World War II, and underwent major expansion in the 1950s.

Site 9 was identified as a potential hazardous waste site in the Initial Assessment Study (IAS) and was later included in the Pollution Abatement Confirmation Study (R.F. Weston Inc., 1983 and E.C. Jordan Co., 1985). Based on information gathered during those tasks, including review of aerial photographs and grading plans, Site 9 was defined as three areas of potential contamination: (1) the former location of an incinerator in the northeast corner of Building 220, and an inactive ash landfill/dump area in the current location of Buildings 218 and 219 (military barracks north of Neptune Drive); (2) a reported disposal area behind Building 201 (the dining facility south of Neptune Drive); and (3) the two streams bordering the recreational area east of Building 201, which had iron oxide staining characteristic of leachate. These areas are shown on Figure 1-3.

Former Incinerator and Ash Landfill/Dump Area

There is no precise information concerning the location of the incinerator and ash landfill/dump area or types of wastes handled or disposed of in these areas. The IAS identifies this area as the "first dump area used at the Air Station." The incinerator was apparently operated during a period commencing on or after April 1943, when the air station was commissioned, until the fall of 1946, when the air station was demobilized. Although the station was leased to various occupants from 1947 through 1951, including the University of Maine and Bowdoin College for classrooms and student housing, and various small commercial enterprises, it is unknown if the incinerator was used during this period. The air station was

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 <p>ABB Environmental Services Inc. ABEA BROWN BOYER</p>	<p>AREAS OF POTENTIAL CONTAMINATION: SITE 9</p>
	<p>INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE</p>

recommissioned in 1951, but it is unknown if the incinerator resumed operation. The incinerator could have been used as late as 1953, when the barracks that now occupy the location of the former incinerator were built. The IAS (R.F. Weston, Inc., 1983) states that during the period the incinerator was in operation, solid wastes were burned and the ash was placed in the dump. Wastes disposed of at this location reportedly included solvents which were burned on the ground, paint sludges, and possibly wastes from the Metal Shop.

Current land use at the former incinerator and inactive ash landfill/dump area is for military residences. The grading plans for the barracks (Buildings 212 through 220) constructed at this location show an oblong "dump area," approximately 125 by 75 feet, located around existing Building 219. These plans are shown on Sheet 4 of 90 titled "U.S. Naval Air Station, Brunswick, Maine, Barracks and Mess Facilities, General Layout, Section 4," Scale 1"=50', June 1952. The grading plans also show an old, 42-inch-diameter drain adjacent to the dump area. The drain ran from north of Orion Street, past the dump area, under Neptune Drive to the stream running between Buildings 201 and 293 (see Figure 1-3). The drain was reportedly removed during construction of the barracks.

Building 201

Historical information and aerial photographs indicate an area southeast of Building 201 as a potential source of contamination (see Figure 1-3). This area was reportedly used as a dumping area (R.F. Weston, Inc., 1983). Building 201 was formerly the Chief's Club and in 1993 was converted to the Galley. The main use of this building is as a cafeteria. The area behind Building 201 has been used as a picnic area. A barbecue pit is located southeast of the building.

Unnamed Streams

Two unnamed streams border the area around Building 201; one to the north; one to the south (see Figure 1-3). These streams receive runoff from the central portion of the base including the runways, parking lots, and paved roads. Seeps have been observed flowing into the northern unnamed stream.

1.3 SUMMARY OF INVESTIGATIONS AND REPORTS

The Navy conducted field activities and environmental sampling in 1988, as part of the RI for Site 9, to determine the geologic and hydrologic conditions and the distribution of contamination at this site. The focus of these investigations was on the area south of Neptune Drive including Building 201 and the two unnamed streams. The results of these investigations are presented in the Draft Final Remedial Investigation (RI) Report (E.C. Jordan Co., 1990). The Navy conducted additional investigations in 1990 at Site 9 including test pitting, and soil and groundwater sampling. Data from this program did not uncover evidence of a solvent burning or disposal area(s) near Building 201. The results of these investigations are presented in Section 7.0 of the Supplemental RI report (E.C. Jordan Co., 1991).

In 1991, plans were discovered by the NAS identifying the presence of a septic system east of Building 201. This septic system was installed in 1952 when Building 201 was built, and was used until 1972 when Building 201 was connected to the basewide sewer system (E.C. Jordan Co., 1991). The septic system, located upgradient of the most highly contaminated monitoring wells, was then speculated to be the primary source of groundwater contamination at Site 9, prompting further investigation of this area.

In January through March of 1993, the Navy conducted additional investigations to evaluate the Building 201 septic system as a potential source of contamination and to address data gaps identified by the USEPA and the MEDEP concerning the northern portion of Site 9. The results of these investigations are summarized in the Technical Memorandum (ABB-ES, 1994a). Results of sampling and analysis in 1993 indicate that the septic system and subsurface soils around the septic system are not acting as a current source of groundwater contamination. As such, remedial actions developed and presented in the Feasibility Study (FS) report for removing, containing, or treating the septic system or subsurface soils were no longer considered necessary (E.C. Jordan Co., 1992).

The Navy has proposed conducting additional field investigations to evaluate other potential source areas of groundwater contamination. Until these field investigations are completed, the final remedial action at this site can not be developed.

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The following section provides a summary of the groundwater investigations conducted at Site 9. A brief summary of the analytical results for soils (including ash and septic system soils), surface water, sediment, and leachate is included to support this LTMP. A more detailed description and summary of these results are presented in the Draft Final RI, Supplemental RI, and Technical Memorandum reports (E.C. Jordan Co., 1990; 1991 and ABB-ES, 1994d).

1.4 RESULTS OF GROUNDWATER INVESTIGATIONS AND ANALYTICAL DATA

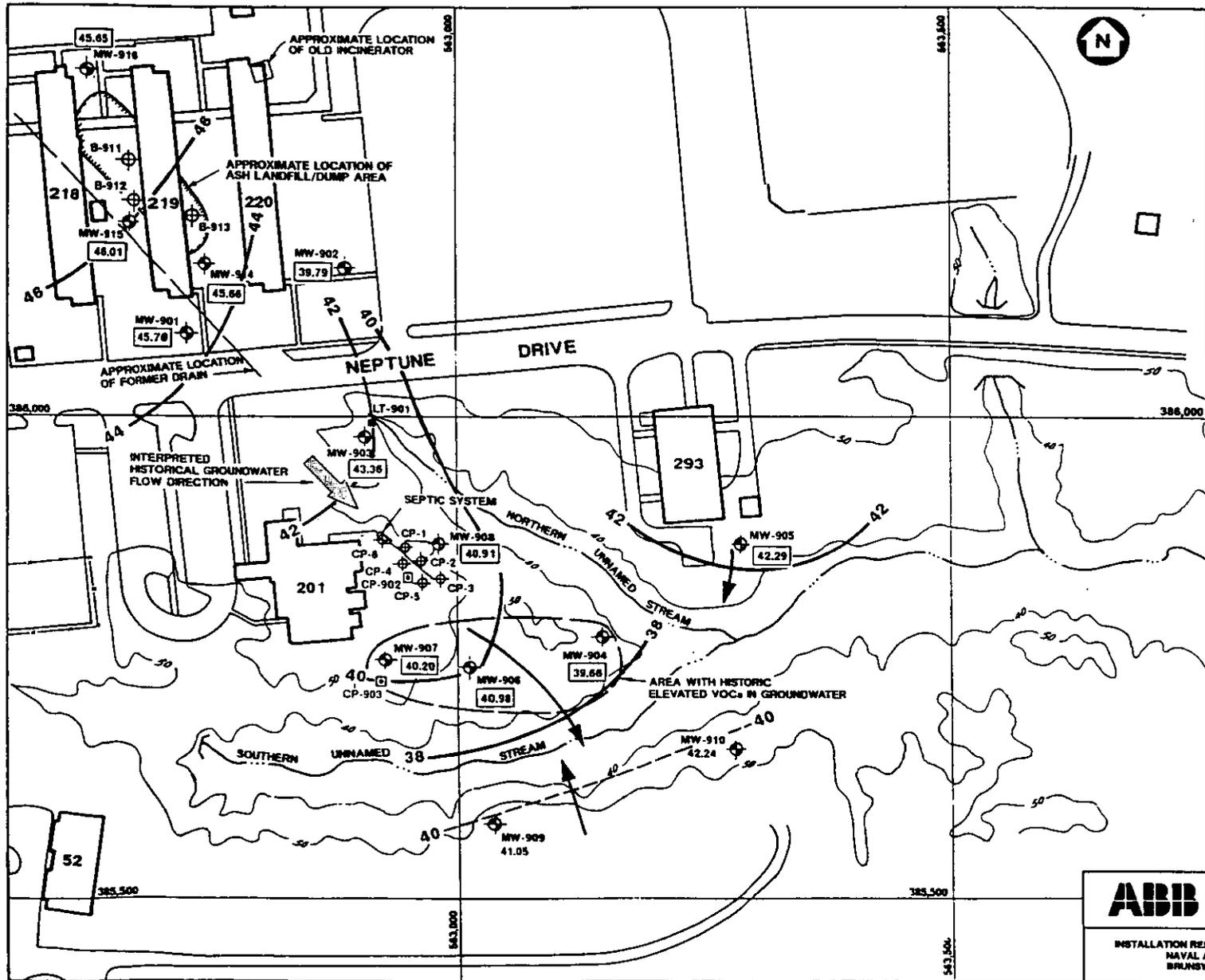
Groundwater investigations conducted in 1988 and 1990 were designed to assess the areal distribution of groundwater contamination, the potential impact of groundwater contamination on sediment and surface water quality, and the significance of chemicals detected in the groundwater at Site 9. Most of the investigations focused on the area south of Neptune Drive where six monitoring wells were installed around Building 201 (MW-903 through MW-908). Two monitoring wells also were installed north of Neptune Drive (MW-901 and MW-902) at locations considered to be downgradient of the former incinerator and ash landfill/dump area. The monitoring well locations are shown in Figure 1-4. Up to five groundwater samples were collected and analyzed for Target Compound List (TCL) compounds and Target Analyte List (TAL) inorganics from these wells during the RI field investigations.

Groundwater investigations conducted in 1993 were designed to evaluate groundwater quality south of the unnamed streams and north of Neptune Drive in the area of the former ash landfill/dump area. Two monitoring wells (MW-909 and MW-910) were installed south of the southern unnamed stream to evaluate groundwater flow beneath that stream and three monitoring wells (MW-914, MW-915, and MW-916) were installed north of Neptune Drive to better characterize groundwater quality in this portion of the site. One well (MW-916) was placed in an area upgradient and two wells (MW-914 and MW-915) were placed immediately downgradient of the ash disposal area (see Figure 1-4). One round of groundwater samples was collected from these wells and from four existing wells (MW-904, MW-906, MW-907, and MW-908) during the 1993 field investigation.

The groundwater results from the 1988, 1990, and 1993 investigations are presented in Table 1-1 and summarized below.

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LEGEND

- APPROXIMATE LOCATION OF CONE PENETROMETER BORINGS
- APPROXIMATE LOCATION OF MONITORING WELLS
- B-911 APPROXIMATE LOCATION OF SOIL BORINGS (CP-CESSPOOL BORINGS)
- CP-1
- LT-901 APPROXIMATE LOCATION OF LEACHATE SAMPLE
- GROUNDWATER ELEVATIONS MEASURED ON 8/19/93 (FT. MSL.)
- GROUNDWATER ELEVATIONS MEASURED ON 2/4/93. (FT. MSL.)
- 42 INTERPRETIVE WATER LEVEL CONTOUR LINE
- INTERPRETIVE GROUNDWATER FLOW DIRECTION
- INTERMITTENT STREAM
- TOPOGRAPHIC CONTOUR
- INTERPRETIVE GROUNDWATER FLOW DIRECTION (1992)

NOTE: VOCs HAVE BEEN DETECTED IN ONE SAMPLE EACH FROM CP-902 AND MW-908.



ABB Environmental Services, Inc.	GROUNDWATER CONTOURS AND MONITORING WELL LOCATIONS
	LONG TERM MONITORING PLAN
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	JOB NO. 7482-02 FIGURE I-4

TABLE 1-1
GROUNDWATER DATA

LONG TERM MONITORING PLAN: SITE 9
NAS BRUNSWICK

Sampling Date Sample Location	CRQL ($\mu\text{g/L}$)	1/89 MW-903	3/89 MW-903	1/90 MW-903	1/89 MW-904	3/89 MW-904	7/89 MW-904	4/91 MW-904	1/90 MW-904	2/93 MW-904	4/91 MW-906	1/90 MW-906	2/93 MW-906
Vinyl Chloride	10	ND	ND	ND	12	27	ND	NA	ND	8J	31	ND	ND
1,1-Dichloroethane	10	ND	ND	ND	12	12	6J	NA	5	ND	ND	36	ND
1,2-Dichloroethylene	10	ND	ND	ND	6	6	ND	NA	ND	1J	79	ND	4J
2-Butanone	-	ND	ND	110	ND	ND	68J	NA	ND	ND	ND	ND	ND
Aluminum	200	ND	ND	ND	ND	ND	1130	NA	ND	ND	ND	445J	ND
Calcium	5000	9700J	7140	6650	18000	21100	16800	NA	18400	18400	10700	12000	14100
Iron	100	3600J	3430	3700	ND	ND	1950	NA	ND	ND	115	ND	314J
Magnesium	5000	ND	ND	ND	5700	5960J	5610	NA	5730	5520	ND	ND	4310J
Manganese	15	240J	207	223	160	167	123	NA	155	ND	52.5	336	56.7
Mercury	0.2	ND	ND	ND	0.22J	0.23	ND	NA	ND	ND	ND	ND	ND
Sodium	5000	17000J	14000	17800	7500	5410	8040	NA	ND	6240	35100	36700	35400
Zinc	20	ND	ND	ND	ND	ND	25.3	NA	ND	8.8J	ND	ND	6.9J
Bicarbonate	-	NA	ND	NA	NA	ND	NA	43	NA	-	74	NA	-
Chloride	-	NA	NA	NA	NA	NA	NA	7.3	NA	-	29	NA	-
Sulfate	-	NA	NA	NA	NA	NA	NA	4.9	NA	-	8.8	NA	-

Notes:

All concentrations in $\mu\text{g/L}$ except bicarbonate, chloride, and sulfate which are in mg/L .

- $\mu\text{g/L}$ = micrograms per liter
- mg/L = milligrams per liter
- CP = cone penetrometer
- CRQL = Contract Required Detection Limit
- DUP = duplicate sample
- J = estimated concentration
- MW = monitoring well
- ND = not detected
- NA = not analyzed

TABLE 1-1
GROUNDWATER DATA

LONG TERM MONITORING PLAN: SITE 9
NAS BRUNSWICK

Sampling Date Sample Location	1/90 MW-907	4/91 MW-907	2/93 MW-907	1/90 MW-908	2/93 MW-908/DUP	4/91 CP-902	4/91 CP-903	2/93 MW-909	2/93 MW-910	2/93 MW-914	2/93 MW-915/DUP	2/93 MW-916	Background Concentration ¹ (µg/L)
Vinyl Chloride	18	NA	9J	ND	ND/2J	NA	NA	ND	ND	ND	10J/8J	ND	-
1,1-Dichloroethane	ND	NA	2J	ND	ND	20	20	ND	ND	ND	1J/1J	ND	-
1,2-Dichloroethylene	ND	NA	1J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
2-Butanone	ND	NA	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	-
Aluminum	ND	NA	ND	ND	ND	NA	NA	214J	ND	5510	1910/1830	ND	652
Calcium	26600	NA	40300	18200	24100/25700	NA	NA	2140J	4180J	33800	51300/51300	22000	18000
Iron	ND	NA	ND	ND	ND	NA	NA	360J	ND	30100J	12000J/12100J	220J	4430
Magnesium	5570	NA	5530	ND	3000J/2990J	NA	NA	775J	709J	3050J	4490J/4500J	2290J	8300
Manganese	2500	NA	6720	823	609/689	NA	NA	22.8	27.8	230	991/1010	14.7J	570
Mercury	ND	NA	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	0.11
Sodium	16100	NA	16200	10800	15100/16200	NA	NA	4030J	2550J	4100J	27900/27900	58800	52500
Zinc	ND	NA	13.8J	ND	ND/8.1J	NA	NA	10.4J	7.9J	ND	ND	ND	105
Bicarbonate	NA	100	-	NA	-	NA	NA	-	-	-	-	-	-
Chloride	NA	24	-	NA	-	NA	NA	-	-	-	-	-	-
Sulfate	NA	6.2	-	NA	-	NA	NA	-	-	-	-	-	-

Notes:

All concentrations in µg/L except bicarbonate, chloride, and sulfate which are in mg/L.

µg/L	=	micrograms per liter	J	=	estimated concentration
mg/L	=	milligrams per liter	MW	=	monitoring well
CP	=	cone penetrometer	ND	=	not detected
CRQL	=	Contract Required Detection Limit	NA	=	not analyzed
DUP	=	duplicate sample			

¹the following wells were used to determine background concentrations: MW-2118, MW-301, MW-312, MW-320, MW-403, MW-702, MW-703, MW-705, MW-801

TABLE 1-2
SURFACE WATER CONCENTRATIONS AND AMBIENT WATER QUALITY CRITERIA

LONG TERM MONITORING PLAN: SITE 9
NAS BRUNSWICK

COMPOUND	DETECTED CONCENTRATION RANGE (µg/L)	UPSTREAM CONCENTRATION (SW-915)	FRESH WATER AWQC		Picnic Area Pond (µg/L)
			CHRONIC (µg/L)	ACUTE (µg/L)	
Benzene	6-18	18	NA	5,300	ND
Toluene	12-22	12	NA	17,500	ND
Ethylbenzene	36	36	NA	32,000	ND
Xylene	34-74	74	NA	NA	ND
Naphthalene	26	26	620	2,300	ND
Methylnaphthalene	25	25	NA	NA	ND
Calcium	14,500 - 18,200	18,200	NA	NA	1,320
Iron	616 - 2,420	2,420	1,000	NA	1,920
Magnesium	300 - 1,300	1,300	NA	NA	1,140
Sodium	17,000 - 24,300	23,300	NA	NA	14,800
Zinc	40	40	110	120	30

Notes:

NA = Not Available
 ND = Not Detected
 µg/L = micrograms per liter
 AWQC = Ambient Water Quality Criteria

References:

Data presented in E.C. Jordan Co., 1990a and 1992.
 Chronic and acute AWQC from USEPA, 1991b.

1-13

1.4.1 Subsurface Geology and Groundwater Flow

Groundwater at Site 9 occurs in the overburden soil and varies in depth between 10 and 14 feet below ground surface (bgs). Overburden soil at Site 9 is a stratified formation consisting of a sand layer, a transition layer, and a clay layer overlying bedrock. The elevation of ground surface at the site is approximately 40 to 50 feet above mean sea level. The top of clay has been interpreted from boring logs to occur at a depth of about 20 feet bgs on the southern edge of the site.

Groundwater flow at the site is to the south and southeast. The calculated seepage velocities range from 26 feet per year throughout most of the site to 130 feet per year in the vicinity of the streams (E.C. Jordan Co., 1991). Data collected from MW-909 and MW-910 (south of the unnamed stream) indicate that the groundwater discharges to the two streams (see Figure 1-4). Ten-foot well screens were placed in sands just above a clay zone in these wells. Groundwater levels in these wells and the adjacent stream support the assumption that the stream is a discharge area for shallow groundwater.

1.4.2 Groundwater Analytical Results

VOCs were detected in five wells (MW-903, MW-904, MW-906, MW-907, and MW-908) south of Neptune Drive and two wells (MW-902 and MW-915) north of Neptune Drive. These data are presented in Table 1-1. Vinyl chloride was reported in three samples from MW-904 (12, 27, and 8J micrograms per liter [$\mu\text{g}/\text{L}$]), once in MW-906 (31 $\mu\text{g}/\text{L}$), twice in MW-907 (18 and 9J $\mu\text{g}/\text{L}$), once in MW-908's duplicate sample only (2J $\mu\text{g}/\text{L}$), and in MW-915 and its duplicate sample (8 $\mu\text{g}/\text{L}$ and 10 $\mu\text{g}/\text{L}$, respectively). The federal Maximum Contaminant Level (MCL) for vinyl chloride is 2 $\mu\text{g}/\text{L}$. The federal Maximum Contaminant Level Goal (MCLG) is zero, because this compound is classified as a carcinogen. The state Maximum Exposure Guideline (MEG) for vinyl chloride is 0.15 $\mu\text{g}/\text{L}$. Other VOCs detected in these wells include:

- 1,1-Dichloroethane (DCA) detected in MW-904 at concentrations ranging from 5 to 12 $\mu\text{g}/\text{L}$; in MW-906 at 36 $\mu\text{g}/\text{L}$; in MW-907 at 2J $\mu\text{g}/\text{L}$; in MW-915 at 1J $\mu\text{g}/\text{L}$ (in both the sample and its duplicate); and in two temporary sampling locations (CP-902 and CP-903) at 20 and 7 $\mu\text{g}/\text{L}$, respectively.

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- total 1,2-Dichloroethene (DCE) detected in MW-904 at concentrations ranging from 1J to 6 $\mu\text{g/L}$; in MW-906 at concentrations ranging from 4J to 79 $\mu\text{g/L}$, and in MW-907 at 1J $\mu\text{g/L}$.

The MEG for DCA is 5 $\mu\text{g/L}$, there is neither an MCL nor an MCLG for this compound. The MCL, MCLG, and MEG for DCE are all 70 $\mu\text{g/L}$. Only two detections of 2-butanone were measured, with no spatial or temporal pattern; these detections are considered to be a sampling or laboratory artifact and not indicative of site-related contamination.

Inorganic analytes detected in groundwater south of Neptune Drive were in the normal background range except for sodium, calcium, iron, magnesium, and mercury (E.C. Jordan Co., 1990). Mercury was detected in MW-904 in two sampling rounds in 1989 at concentrations of 0.22J and 0.23 $\mu\text{g/L}$. The MCL, MCLG, and MEG for mercury are all 2 $\mu\text{g/L}$. Mercury has not been detected in groundwater samples from Site 9 since 1989.

Only a few inorganic analytes were detected in MW-909 and MW-910 located south of the unnamed southern stream. Of these, aluminum, iron, and manganese exceeded their respective MCLs; however, these are secondary standards based on aesthetic qualities and not on protection of human health.

Elevated inorganic concentrations were detected in MW-914 and MW-915 located downgradient of the ash disposal area and included aluminum, barium, cadmium, calcium, chromium, iron, manganese, and potassium. Of these, cadmium and manganese were detected above their respective MCLs.

Semivolatile organic compounds (SVOCs) were detected in some wells but at low and estimated concentrations (i.e., below the Contract Required Quantitation Limit [CRQL]). Total polynuclear aromatic hydrocarbons (PAH) concentrations ranged from non-detect to 12J $\mu\text{g/L}$ in the wells sampled in 1993. The concentrations of PAHs downgradient of the ash disposal area (i.e., MW-914 and MW-915) ranged from non-detect to 4J $\mu\text{g/L}$. One SVOC [bis(2-ethylhexyl)phthalate at 12J $\mu\text{g/L}$ in MW-906] was observed. This detection may be site-related or a sampling or laboratory artifact.

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1.4.3 Surface and Subsurface Soils Analytical Results

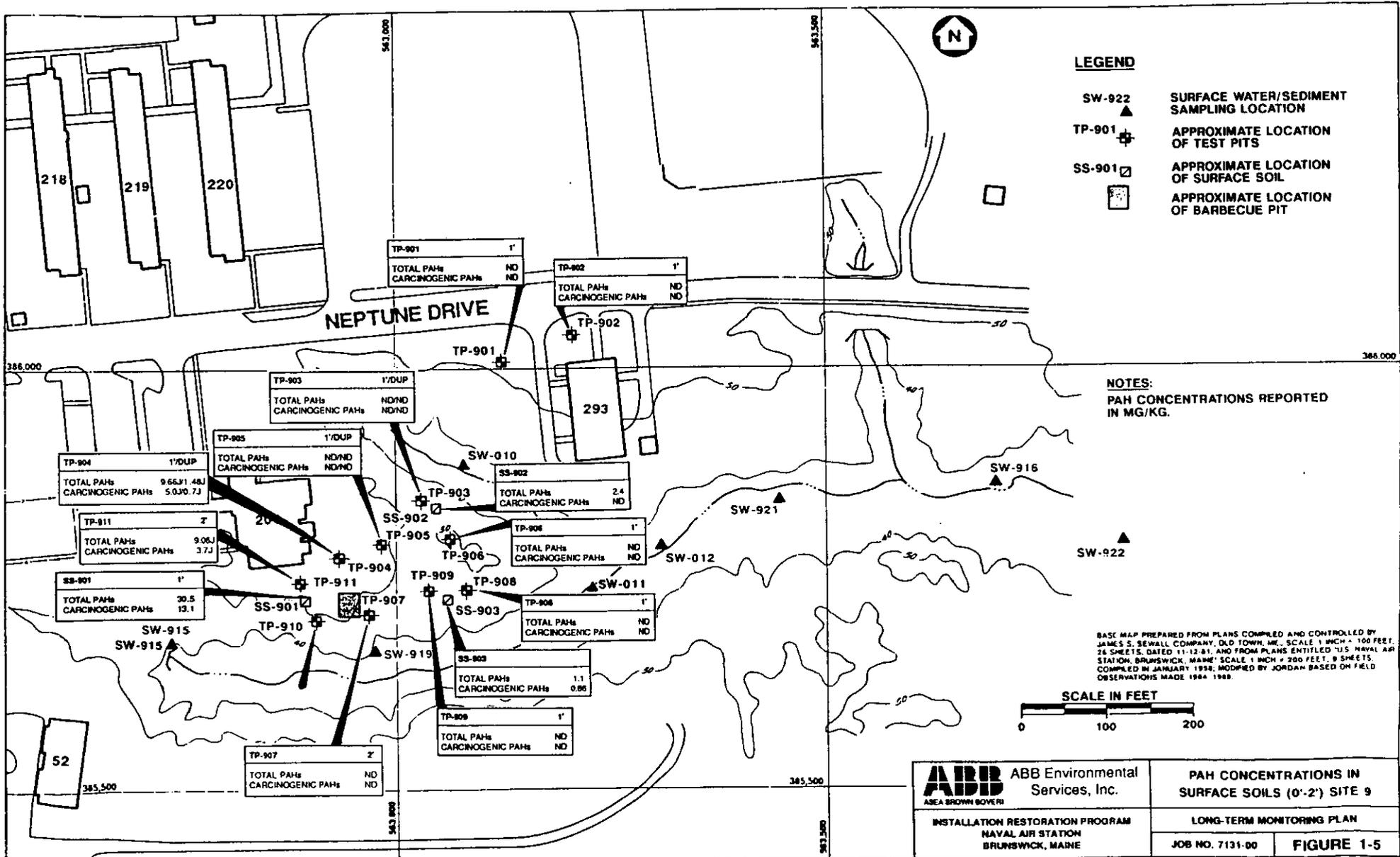
Soil sampling was conducted at Site 9 to evaluate the source of groundwater contamination. Potential source areas identified and investigated during 1988, 1990, and 1993 included the area behind Building 201, the septic system associated with Building 201, and the former ash landfill/dump area beneath Buildings 218 and 219.

Surface and subsurface soil samples were collected behind Building 201. The sampling locations and analytical data are presented in Figure 1-5. VOCs were not detected in these samples and inorganic analytes were detected at background concentrations. PAHs were detected in the surface soil and test pit samples. Detectable concentrations of PAHs were observed in two test pits (TP-904 and TP-911) at concentrations of 3.8 and 4.1 milligrams per kilogram (mg/kg), and two surface soil samples (SS-901 and SS-902) at concentrations of 13.1 and 0.81 mg/kg. The highest concentrations of PAHs (SS-901) were observed adjacent to the barbecue pit area, suggesting that these compounds are a result of residual charcoal or ash from the barbecue pit. Pesticides (dichlorodiphenyltrichloroethene [DDE] and dichlorodiphenyltrichloroethane [DDT]) were also detected in surface and shallow soil samples at concentrations consistent with the historic usage of DDT. The IAS indicated that DDT was applied basewide between 1955 and 1972. PAHs and pesticides were not detected in soils deeper than 2 feet bgs.

The septic system and ash landfill/dump area were investigated in 1993 to evaluate these areas as potential sources of groundwater contamination. Soil borings were drilled through the septic tank and four of the five cesspools, and samples collected from the organic-rich soils associated with this area. Five samples were collected for TCL VOC analysis and three samples for Toxicity Characteristic Leaching Procedure (TCLP) test. Chlorobenzene was the only site-related contaminant detected (16 $\mu\text{g}/\text{kg}$) in the subsurface soils around the septic system. No other VOCs, polychlorinated biphenyls (PCBs), or pesticides were detected above the CRQL. The TCLP results were all below regulatory limits.

Three soil borings (B-911, B-912, and B-913) were placed in the ash landfill/dump area, and samples collected for laboratory analysis (two from B-912 and one from B-913). These locations are shown on Figure 1-6. The borings were placed to depths between 17 and 18 feet bgs. Ash material was observed between 8 and 16 feet bgs, and the water table observed at approximately 9 feet bgs. Total PAHs detected in samples from these borings ranged from 3.8 to 33 mg/kg. The presence

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LEGEND

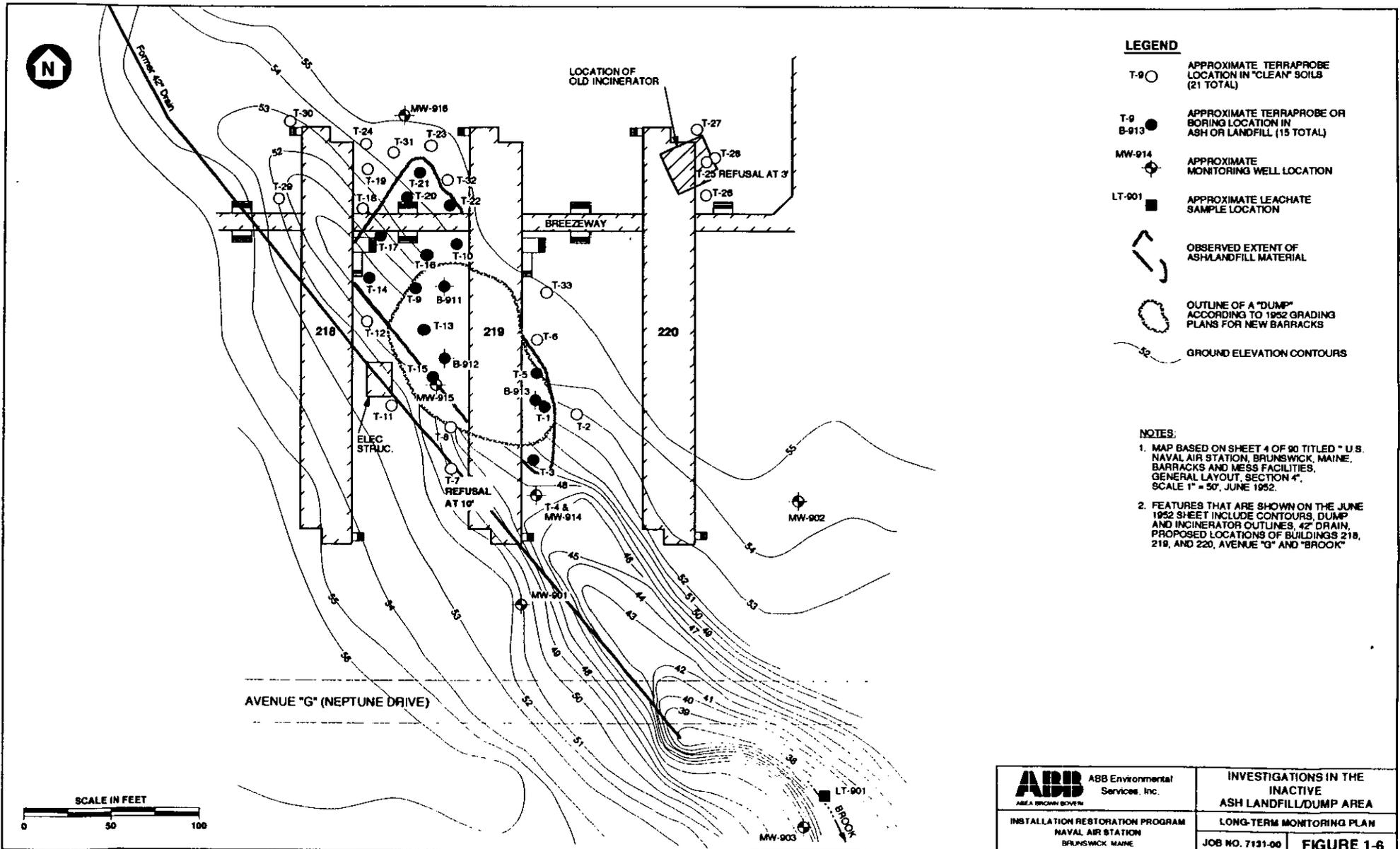
- SW-922 ▲ SURFACE WATER/SEDIMENT SAMPLING LOCATION
- TP-901 ⊕ APPROXIMATE LOCATION OF TEST PITS
- SS-901 □ APPROXIMATE LOCATION OF SURFACE SOIL
- APPROXIMATE LOCATION OF BARBECUE PIT

NOTES:
PAH CONCENTRATIONS REPORTED IN MG/KG.

BASIC MAP PREPARED FROM PLANS COMPILED AND CONTROLLED BY JAMES S. SEWALL COMPANY, OLD TOWN, ME. SCALE 1 INCH = 100 FEET. 26 SHEETS, DATED 11-12-81, AND FROM PLANS ENTITLED "U.S. NAVAL AIR STATION, BRUNSWICK, MAINE" SCALE 1 INCH = 200 FEET, 8 SHEETS, COMPILED IN JANUARY 1958, MODIFIED BY JORDAN BASED ON FIELD OBSERVATIONS MADE 1984-1988.



<p>ABB Environmental Services, Inc. ASEA BROWN BOVERI</p>	<p>PAH CONCENTRATIONS IN SURFACE SOILS (0'-2') SITE 9</p>	
	<p>LONG-TERM MONITORING PLAN</p>	
<p>INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE</p>	<p>JOB NO. 7131-00</p>	<p>FIGURE 1-5</p>



of PAHs is typical of the burned materials observed in the borings. Two VOCs (acetone and 2-butanone) were detected in the soil. Both VOCs are considered by the USEPA to be common laboratory contaminants and their presence may not indicate site contamination (USEPA, 1988). Other VOCs detected in these samples were at estimated concentrations up to 0.003J mg/kg, well below the CRQL. Low concentrations of pesticides were detected in these samples but at concentrations representing low-level background conditions consistent with concentrations observed at NAS Brunswick (E.C. Jordan Co., 1990). Inorganics detected in the samples above background concentrations include: barium, cadmium, chromium, copper, iron, lead, and zinc.

A TerraProbe investigation, consisting of 33 field sampling locations was conducted to identify the ash landfill/dump area. The area of investigation is shown on Figure 1-6. The ash landfill was discovered to extend on either side of Building 219 in an oblong trench oriented northwest to southeast. Ash was found from 6 to 16 feet bgs, with some ash below the water table (approximately 9 to 10 feet bgs).

1.4.4 Surface Water and Sediment Analytical Results

Surface water and sediment were sampled at 10 locations in the streams near Site 9 as well as downstream at the Picnic Area Pond (about 3,000 feet downstream of Site 9) during the RI field program. The sampling locations and analytical data for the 10 locations are presented in Figure 1-7. The fuel-related organic compounds, benzene (6 to 18 $\mu\text{g/L}$), toluene (12 to 22 $\mu\text{g/L}$), ethylbenzene (36 $\mu\text{g/L}$), xylenes (34 to 74 $\mu\text{g/L}$), naphthalene (26 $\mu\text{g/L}$), and methylnaphthalene (25 $\mu\text{g/L}$), were detected in surface water samples in the stream bordering the southern side of Site 9 (E.C. Jordan Co., 1990a). The maximum concentration of all compounds except toluene was detected in the upstream sample (i.e., SW-915), suggesting that non-point source runoff from parking lots, roadways and/or the runways, located upstream of this tributary, is the source of these contaminants (see Figure 1-7). The source of the toluene detected at SW-916 is not known. These compounds and their respective acute and chronic freshwater Ambient Water Quality Criteria (AWQC) are presented in Table 1-2. No VOC compounds were detected in excess of their respective AWQC.

Calcium, iron, magnesium, and sodium were detected in the streams bordering Site 9 at concentrations exceeding background levels of surface water samples collected in Mere Brook. In addition, iron concentrations exceed the chronic AWQC for this

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metal in both upstream (i.e., SW-915) and on-site sampling locations. Concentrations of inorganics in surface water at the Picnic Area Pond did not exceed federal AWQC. These concentrations are consistent with background values (E.C. Jordan Co., 1990a).

Site-related VOCs (i.e., vinyl chloride, DCE, and DCA) were not detected in sediment samples from the streams near Site 9; however, toluene was detected in two sediment samples from the Picnic Area Pond. Concentrations of inorganics in sediment samples were consistent with background concentrations in sand and clay soils (E.C. Jordan Co., 1990a). Lead was detected in all sediment samples collected near Site 9. The presence of lead is thought to be related to base operations, motor vehicle traffic, and aircraft exhaust. The highest concentrations were recorded at SD-901 and SD-915. Average lead concentrations in sediments below the confluence of the two unnamed streams is between 22 mg/kg and 32 mg/kg.

PAHs were detected in the majority of sediment samples collected in most sampling rounds from the streams in the Site 9 vicinity, at concentrations up to 383 mg/kg. The highest concentration was detected in sample SD-011. Dibenzofuran was also detected at SD-011 at a concentration of 5.1 mg/kg. Two other organic compounds, bis(2-ethylhexyl)phthalate (up to 1,900 micrograms per kilogram [$\mu\text{g}/\text{kg}$]) and butylbenzylphthalate (up to 1,000 $\mu\text{g}/\text{kg}$), were detected sporadically in sediment samples from the Site 9 streams. The highest concentrations were detected in the upstream sample at the culvert outfall (E.C. Jordan Co., 1990a).

Pesticides and PCBs were not detected in surface water or sediment samples.

1.4.5 Leachate Seeps and Sediments Analytical Results

One leachate seep was identified and sampled twice during the RI field program and once during the 1993 field investigation. The seep is located at the head of the northern stream and at the discharge of the historical drain (see Figures 1-4 and 1-7). Because the drain was located downgradient of the ash landfill/dump area, this structure may have acted as a preferential pathway for contaminant migration. Therefore, it is possible that the ash disposal area north of Neptune Drive is the source of contaminants detected in the leachate. Pesticides and PAHs were detected at low concentrations in both the leachate (LT-901) and sediment (SD-901) from this location. Toluene was detected in the leachate at a concentration of 1J $\mu\text{g}/\text{L}$, below its CRQL. Other organic compounds were not detected in the leachate, but two

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organic compounds, butylbenzylphthalate and 1,1-dichloroethane were each detected in only one of the three sampling rounds. Butylbenzyl-phthalate was detected at 820 $\mu\text{g}/\text{kg}$ and 1,1-dichloroethane was detected at 39 $\mu\text{g}/\text{kg}$ and 52 $\mu\text{g}/\text{kg}$ in the duplicate sample. Inorganic contaminants detected in leachate and sediment samples are shown in Figure 1-7.

1.5 SUMMARY

The results of the 1988, 1990, and 1993 field investigations at Site 9 indicate the presence of vinyl chloride and DCE in groundwater both south and north of Neptune Drive at concentrations in excess of their respective MCLs, MCLGs, and MEGs. DCA was detected in groundwater south of Neptune Drive at concentrations in excess of its respective MEG. The septic system, originally thought to be a potential source of VOC contamination south of Neptune Drive, was sampled to evaluate residual contamination. Sampling results indicate that the septic system is not a current source of groundwater contamination. The former ash landfill/dump area, north of Neptune Drive, was identified and soil and groundwater samples were collected for analysis. PAHs were detected in the ash material; however, these compounds were not detected in groundwater immediately downgradient from this area. Vinyl chloride was detected in one monitoring well downgradient from the disposal area but was not detected in ash or soil samples. Elevated concentrations of inorganics were detected in groundwater downgradient of the ash disposal area and the presence of these analytes may be due to past disposal activities in this area. Inorganics and PAHs were detected in leachate and/or sediment samples. The presence of these contaminants may be due to the ash or to other non-point source runoff from the roadways or parking lots.

2.0 REGULATORY FRAMEWORK

The selected interim remedial action specified in the Proposed Plan and Interim Groundwater ROD at Site 9 (ABB-ES, 1993c and 1993d) is long term monitoring of surface water, sediment, and groundwater, along with institutional controls to prevent human contact with groundwater in this area. Long term monitoring and institutional controls are consistent with CERCLA. Because the selected remedy (long term monitoring and institutional controls) leaves contaminants on-site and does not immediately allow for unlimited use and unrestricted access, a five-year Statutory Review is appropriate (OSWER Directive 9355.7-02). This LTMP will allow the Navy to collect data to conduct five-year reviews. However, because the selected remedy implicitly incorporates natural attenuation as part of the site remediation, and because natural attenuation will ultimately result in contaminant concentrations diminishing to levels below regulatory standards, the USEPA's interpretation of the statute is that the USEPA is not required to conduct a five-year review. Nevertheless, it is anticipated that the USEPA will conduct five-year statutory reviews of the remedy selected in the Interim Groundwater ROD. It is also anticipated that the monitoring program will continue until a five-year review suggests that no further action or another remedy should be selected.

At the time of development of this plan, no remedial actions have been conducted at this site. The Navy is proposing to conduct additional source investigations at the site. These activities will be described in a work plan which will be submitted for regulatory review and comment. The results of this monitoring program are intended to evaluate the effectiveness of natural attenuation and ensure that this action remains protective of human health and the environment. These data will also be used by the Navy to evaluate the need for additional source and/or groundwater remediation. Approval of this LTMP by USEPA and MEDEP is required prior to implementation.

3.0 MONITORING PLAN

The scope of the monitoring plan was developed on the basis of previous sampling results and the hydrogeological properties in this area of NAS Brunswick. To standardize common procedures, this plan was also designed to be consistent with the LTMP developed for Building 95, Sites 1 and 3, and Eastern Plume (ABB-ES, 1994c). Unless exceptions are specifically noted, the Site 9 LTMP shall be conducted in accordance with the LTMP for Building 95, Sites 1 and 3, and Eastern Plume Appendix A (QAPP) and Appendix B (HASP).

3.1 MONITORING LOCATIONS

A total of 19 surface water, sediment, groundwater, and leachate sampling locations have been included in this LTMP for sample collection. These locations are described in Table 3-1 and presented in Figure 3-1. A total of 11 of the 13 existing wells will be sampled to provide a comprehensive evaluation of groundwater quality in this area. One well is upgradient of the site, four are within the site boundaries, and six are downgradient of the site, including two on the opposite side of the southern unnamed stream (see Table 3-1 and Figure 3-1). Two existing monitoring wells (MW-902 and MW-905) are not included in this sampling and analysis program because historical data do not indicate contamination at these locations, and because groundwater elevation data indicate that these wells are not downgradient of the site. However, water level measurements will be obtained from all monitoring wells, including MW-902 and MW-905, during each sampling event.

Six surface water/sediment monitoring locations were selected, including five locations which previously exhibited VOC contamination or inorganics levels above background and one location about 200 feet downstream which has had concentrations similar to upgradient Mere Brook (e.g., background) concentrations in the past (see Table 3-1 and Figure 3-1). Lastly, a leachate sample from the location of the former drain will be collected whenever sufficient liquid is present to permit valid sample recovery.

TABLE 3-1
SITE 9 - NEPTUNE DRIVE DISPOSAL SITE
SAMPLING LOCATIONS, FREQUENCIES, AND ANALYTES

LONG TERM MONITORING PLAN
NAS BRUNSWICK

SAMPLE TYPE	IDENTIFIER	ANALYTES	FREQUENCY	LOCATION
Leachate	LT-901	TCL VOCs TAL Inorganics	Qtly ²	Seep at end of drain
Surface Water	SW-010	TCL VOCs	Qtly	Upstream location, Northern stream
	SW-011	TCL VOCs	Qtly	Southern stream
	SW-012	TCL VOCs	Qtly	Confluence of both streams
	SW-915	TCL VOCs	Qtly	Upstream location, Southern stream
	SW-916	TCL VOCs	Yearly	Downstream of confluence of both streams
	SW-919	TCL VOCs	Qtly	Southern stream downgradient of Building 201
	SW-922	TCL VOCs	Qtly	Approximately 200 feet downstream from SW-916
Sediment	SD-010	TCL SVOCs TCL VOCs	Qtly	Upstream location, Northern stream
	SD-011	TCL SVOCs TCL VOCs	Qtly	Southern stream
	SD-012	TCL SVOCs TCL VOCs	Qtly	Confluence of both streams
	SD-915	TCL SVOCs TCL VOCs	Qtly	Upstream location, Southern stream
	SD-916	TCL VOCs	Yearly	Downstream of the confluence of both streams
	SD-919	TCL SVOCs TCL VOCs	Qtly	Southern stream downgradient of Building 201
	SD-922	TCL VOCs	Qtly	Approximately 200 feet downstream from SD-916
	LT-901	TCL VOCs TAL Inorganics	Qtly	Seep at end of drain
Groundwater: North of Neptune Drive	MW-901	TCL VOCs	Qtly	Downgradient of ash

(continued)

TABLE 3-1
SITE 9 - NEPTUNE DRIVE DISPOSAL SITE
SAMPLING LOCATIONS, FREQUENCIES, AND ANALYTES

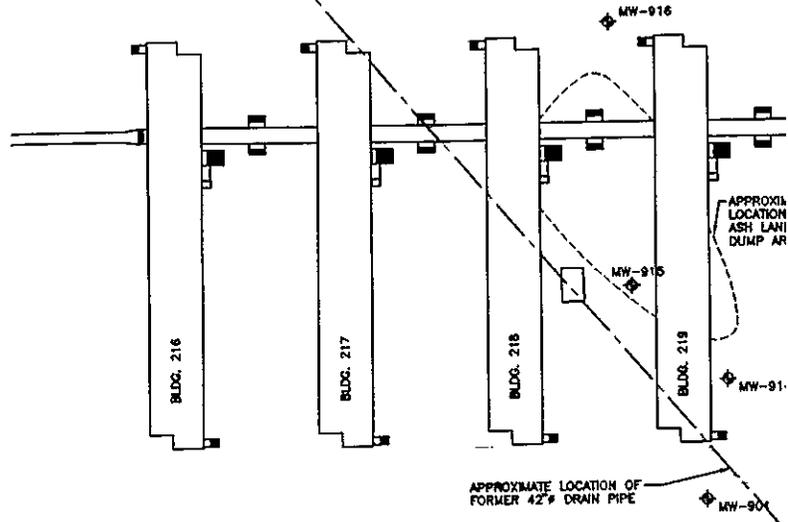
LONG TERM MONITORING PLAN
NAS BRUNSWICK

SAMPLE TYPE	IDENTIFIER	ANALYTES	FREQUENCY	LOCATION
	MW-914	TCL VOCs TAL Inorganics	Qtly	Immediately downgradient of ash
	MW-915	TCL VOCs TAL Inorganics	Qtly	Immediately downgradient of ash
	MW-916	TCL VOCs TAL Inorganics	Qtly	Upgradient of Site 9
Groundwater: South of Neptune Drive	MW-903	TCL VOCs TAL Inorganics	Qtly	Downgradient of ash; upgradient of septic system
	MW-904	TCL VOCs TAL Inorganics	Qtly	Downgradient of ash/septic system
	MW-906	TCL VOCs	Qtly	Downgradient of septic system
	MW-907	TCL VOCs	Qtly	Downgradient of Building 201
	MW-908	TCL VOCs	Qtly	Downgradient of ash
	MW-909	TCL VOCs	Yearly	Downgradient side of Southern stream
	MW-910	TCL VOCs	Yearly	Downgradient side of Southern stream

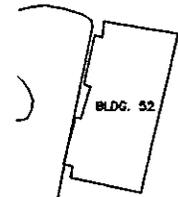
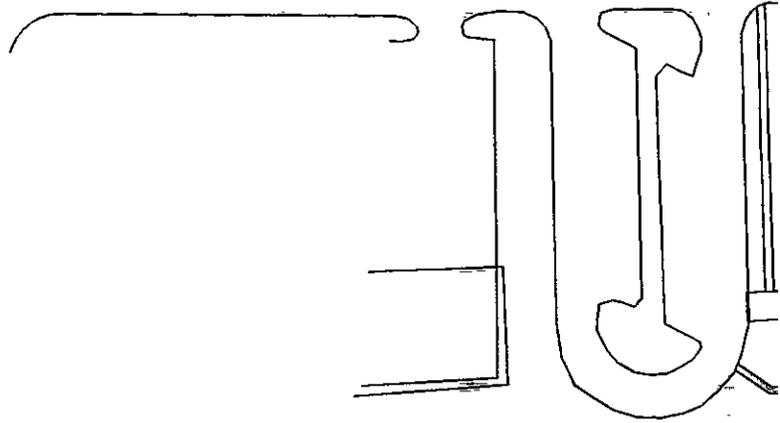
Notes:

Qtly = Quarterly

1. Sampling and analytical protocols as specified in the Long Term Monitoring Plan for Building 95, Sites 1 and 3, and Eastern Plume (ABB-ES, 1993b).
2. Will be sampled if sufficient flow is available.
3. Field parameters (i.e., pH, conductivity, temperature dissolved oxygen, turbidity, and water level measurements) will be recorded during each sampling event.
4. Water level measurements shall be obtained for all monitoring wells during each groundwater sampling event. (MW-901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 914, 915, 916).



AVENUE "C" (NEPTUNE DRIVE)



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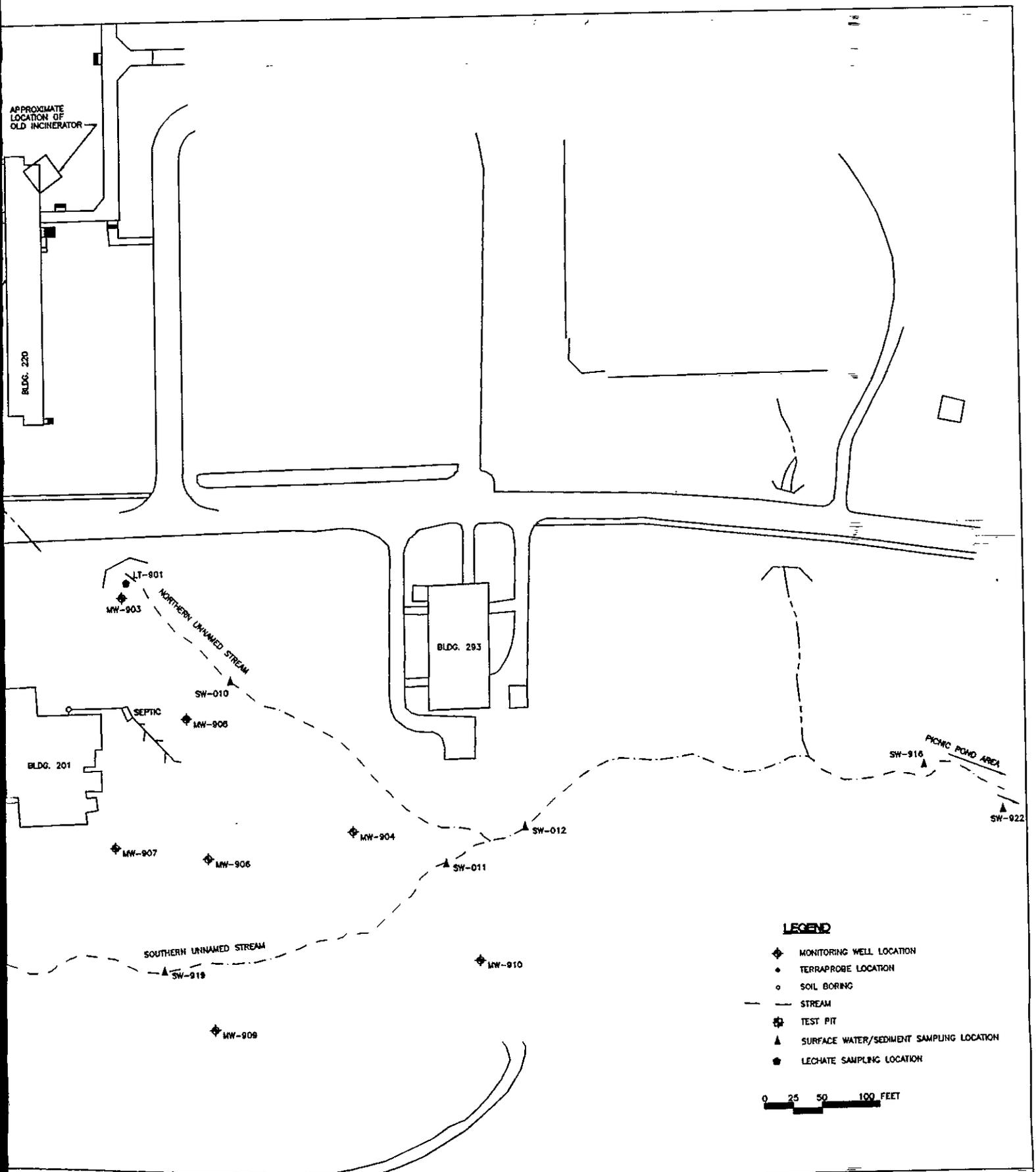


ABB ABB Environmental Services, Inc. INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	PROPOSED SAMPLING LOCATIONS	
	LONG-TERM MONITORING PLAN	
	JOB NO. 7131-00	FIGURE 3-1

3.2 SAMPLING FREQUENCY AND PROCEDURES

The majority of samples will be collected quarterly (Table 3-1). That is, samples will be collected during each calendar quarter, maintaining an interval of as close to three months between sampling events as possible. All samples will be collected on the same day. Two samples (from MW-909 and MW-910) will be collected annually, as no contamination has been detected in these wells and more frequent sampling is not needed. Water level measurements from 13 monitoring wells (see Note 4, Table 3-1) will be obtained and recorded during each sampling event.

Quarterly sampling was selected as the best overall frequency based on groundwater flow rates. Groundwater velocities are estimated to range from 26 feet per year across most of the site to 130 feet per year in the vicinity of the streams (E. C. Jordan Co., 1991). Therefore, groundwater travels approximately 7 to 35 feet in a quarter. Given this relatively short distance, quarterly sampling is frequent enough to provide adequate characterization of site conditions.

The sampling procedures, including collection of quality assurance samples (e.g. duplicates, matrix spike samples, equipment rinseates) and the stated Data Quality Objectives shall be as specified in the main document and in the QAPP (Appendix A) for the LTMP for Building 95, Sites 1 and 3, and Eastern Plume (ABB-ES, 1993b).

3.3 ANALYTICAL PARAMETERS

Samples will be analyzed for TCL VOCs and SVOCs and TAL Inorganics using USEPA Method SW-846 protocols (USEPA, 1986) (see Tables A-1 and A-2, Appendix A). These tables provide the analytical methods (Table A-1) and required detection limits (Table A-2) for the contaminants of concern at Site 9.

Should the laboratory be unable to meet the method detection limits during a regularly scheduled quarterly sampling event, resampling will not be conducted. An explanation of the problems encountered and recommendations for correcting the problem will be provided to USEPA and MEDEP in the monitoring report for that event. Corrective measures will be implemented by the Navy prior to the next scheduled sampling event. Should the problem repeat itself in the next event, the Navy will recommend a corrective action to the regulatory agencies, and the Navy

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will implement that action upon agreement with the USEPA and MEDEP. Conditions may exist which cannot be corrected, i.e., matrix interference. In those instances corrective measures may not be practicable.

3.4 VISUAL INSPECTION

Visual inspection of the monitoring well locations at the time of sampling will be performed to ensure proper integrity of the wells. Monitoring well labels will be checked, covers and grating inspected and the general condition of the well noted.

3.5 PROGRAM DURATION AND MODIFICATION

This monitoring program is assumed to continue for up to 30 years, subject to USEPA five-year reviews. If the results from any additional investigations relevant to Site 9 conclude that the monitoring program should be revised, then such changes will be made after that evaluation is conducted and appropriate reviews are performed and approvals are obtained. It is anticipated that a minimum of two years' data would be required before a reduction in the number of parameters would be proposed. Recommendations as to a change in the monitoring program will be based as a statistical evaluation of the data. This performance monitoring criteria is consistent with 40 CFR Part 264.96, Compliance Monitoring for Corrective Action. A reduction in the monitoring frequency at a particular monitoring location may be appropriate if all constituent concentrations are consistently below drinking water criteria.

3.6 DATA REDUCTION, VALIDATION, AND REPORTING

Data reduction, validation, and reporting shall be done in general compliance with the LTMP for Building 95, Sites 1 and 3, and Eastern Plume (ABB-ES, Section 8, Appendix A, 1993b). Analytical data shall be managed and statistically evaluated using the GRIT/STAT v. 4.2 Groundwater Information Tracking System with Statistical Analysis Capability (USEPA, 1992) or equivalent. Time charts, relating detected compounds over sequential sampling events, will be included for each sampling location. Of particular concern will be the presence or absence of VOCs

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at levels exceeding federal or state MCLs, or other concentrations considered to pose a health risk.

Quarterly monitoring data shall be reported to NAS Brunswick Technical Review Committee (TRC) members within 90 days of sample collection. The data evaluation to be conducted during five year reviews will be reported to TRC members within 120 days of the collection of the last sampling event.

Every five years, a five-year review will be performed for the site as required under CERCLA. The review will present a summary and evaluation of all site data collected prior to and during the five-year period. The data evaluation will provide a basis for continued sampling at the site and propose any refinements to the monitoring program. A quantitative risk assessment may also be performed during the five-year review to assist in evaluating groundwater quality and the need for additional remedial action.

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AWQC	Ambient Water Quality Criteria
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRQL	Contract Required Detection Limit
DCA	dichloroethane
DCE	dichloroethylene
DDE	dichlorodiphenyltrichloroethene
DDT	dichlorodiphenyltrichloroethane
FS	Feasibility Study
HASP	Health and Safety Plan
IAS	Initial Assessment Study
IRP	Installation Restoration Program
LTMP	Long-Term Monitoring Plan
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guideline
mg/kg	milligrams per kilogram
MSL	mean sea level
MW	monitoring well
NAS	Naval Air Station
NPL	National Priorities List
PAH	polynuclear aromatic hydrocarbon
QAPP	Quality Assurance Project Plan

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

RI	Remedial Investigation
ROD	Record of Decision
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
$\mu\text{g}/\text{kg}$	micrograms per kilogram
$\mu\text{g}/\text{L}$	micrograms per liter
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

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**ADDENDUM TO THE LONG TERM MONITORING QUALITY ASSURANCE
PROJECT PLAN**

ABB Environmental Services, Inc.

**TABLE A-1
ANALYTICAL METHODS**

**ADDENDUM TO THE LONG TERM MONITORING QUALITY ASSURANCE PROJECT PLAN: SITE 9
NAS BRUNSWICK**

ANALYTE	METHOD	REFERENCE ⁽¹⁾
TCL-VOCs	GC/MS	Method 8260
TCL-SVOCs	GC/MS	Method 8270
TAL-Elements	ICP/FAA/CVAA	Method 6010/7000

Notes:

⁽¹⁾ USEPA SW-846, Test Methods for Evaluating Solid Waste, 3rd Ed. as updated, November 1986, revised July 1992.

- CVAA = cold vapor atomic adsorption
- FAA = furnace atomic adsorption
- GC/ECD = gas chromatography/electron capture detector
- GC/MS = gas chromatography/mass spectrometry
- HPLC = high performance liquid chromatography
- ICP = inductively coupled plasma
- SVOC = semivolatile organic compound
- TAL = Target Analyte List
- TCL = Target Compound List
- VOC = volatile organic compound

TABLE A-2
REQUIRED DETECTION LIMITS FOR CONTAMINANTS OF CONCERN: SITE 9

ADDENDUM TO THE LONG TERM MONITORING QUALITY ASSURANCE PROJECT PLAN: SITE 9
NAS BRUNSWICK

ANALYTE	REQUIRED METHOD QUANTITATION LIMIT
Water	
1,1-dichloroethane	10 µg/L
1,2-dichloroethylene (cis and trans)	10 µg/L
ethylbenzene	10 µg/L
	5 µg/L
toluene	10 µg/L
vinyl chloride	2 µg/L ¹
xylene	10 µg/L
cadmium	5 µg/L
chromium	100 µg/L
manganese	15 µg/L
Sediment	
PAHs	330 µg/kg
arsenic	2 mg/kg
lead	0.6 mg/kg
chromium	2 mg/kg

Notes:

- mg/kg = milligrams per kilogram
- µg/L = micrograms per liter
- PAHs = polyaromatic hydrocarbon
- 1 = required method detection limit

**REGULATORY AND TRC COMMENTS ON
DRAFT DOCUMENT AND NAVY RESPONSES**

ABB Environmental Services, Inc.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

July 1, 1994

Mr. Fred Evans
Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Dear Mr. Evans:

The United States Environmental Protection Agency (EPA) has reviewed the document entitled Draft Long Term Monitoring Plan Site 9, Neptune Drive Disposal site, dated June 1994. The EPA's comments are found in Attachment 1 of this letter. Should you have any questions, please feel free to call me at (617) 223-5521.

Sincerely,

Robert Lim, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc. Nancy Beardsley/MEDEP
Jim Caruthers/NASB
Beth Walter/ABB-ES, Inc.
Susan Weddle/BACSE
Carolyn LePage/Gerber, Inc.
Sam Butcher/Harpswell Community Rep.
Rene Bernier/Topsham Community Rep.

B-1

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ATTACHMENT I

The following are the EPA's comments pertaining to the document entitled Draft Long Term Monitoring Plan (LTMP) for Site 9 dated June 1994.

General Comments

1. Similar to the overall organizational problem identified in the review of the draft Proposed Plan, Section 1.3 in this report needs to be revised to integrate data from 1993 investigations with the RI data. The EPA understands that this plan was developed prior to the changes made in the Proposed Plan, however comments on Section 1.3 are provided for consideration in revising the investigations summary.
2. There is a tendency to dismiss many of the analytes, particularly solvents, as "common laboratory contaminants." While some of the analytes mentioned are common laboratory contaminants, this argument depends on the concentration of the analyte being reported and whether it has been detected in the associated blanks. In many cases, no information on the analyte concentration has been provided, therefore, it cannot be determined whether the authors had a reasonable basis for attributing the analyte to contamination of the sample. Where an analyte has been dismissed, a complete description of the reason needs to be provided.
3. The federal Maximum Contaminant Level for vinyl chloride is 2 $\mu\text{g/L}$. As the EPA had commented in the LTMP for the Eastern Plume, the Navy must demonstrate that this requirement can be met using SW-846 Method 8260 by submitting a Method Detection Limit (MDL) study. Making site decisions are difficult if the detection levels for contaminant(s) of concern is above the regulatory limit and/or estimated. The EPA also understands that the Navy is undertaking additional efforts aimed at obtaining representative groundwater samples at Site 9.

Specific Comments

1. Page 1-9: A brief description of the current/recent use of Building 201 and the area behind it should be provided.
2. Page 1-15, Figure 1-5: There is no mention in the text of dibenzofuran reported at 5,100 ug/Kg in the sediment at SD-011.
3. Page 1-16, ¶ 2: Provide discussion on SW-916 where toluene was detected at a higher level than SW-915 (i.e., to what can this be attributable?).
4. Page 1-16, ¶ 2: Specify whether compounds identified for surface water samples exceeded acute or chronic AWQC.

5. Page 1-17, ¶ 1: Specify whether iron surface water sample exceeded acute or chronic AWQC.
6. Page 1-17, ¶ 1: AWQC should specify the freshwater chronic AWQC. In the case of iron, an AWQC limit is available for freshwater chronic (1.0 mg/L) as well as for water and fish ingestion (300 ug/L).
7. Page 1-17, ¶ 2: Comparison of concentrations of lead in sediments with background concentrations of lead in sand and clay soils is ineffectual. Delete last sentence since it does not add to the analysis.
8. Page 1-22: Include mercury in the list of contaminants detected above background range.
9. Page 1-32: The text should indicate that CRQLs for the TCL Pesticides/PCBs are frequently or consistently above the MCLs/MEGs.
10. Table 1-5: The shading used in the table needs to be defined.
11. Page 1-35, ¶ 1: a) The results for 1,1-DCA, toluene, and PAH, which are referenced as detected in SD-901, could not be found. The data or a reference to this data needs to be provided. In addition, reference Table 1-3 for inorganic sediment data.
 b) Toluene is not considered a common laboratory contaminant in CLP. The text should state that the result is below the CRQL.
 c) Road salt runoff would not appear to be a source for cyanide. An explanation needs to be provided if cyanide contamination is to be dismissed.
12. Page 1-35, ¶ 2: It seems that the first sentence of this paragraph is referring to investigations conducted in 1993. If so, please clarify because it implies that further investigations are recommended for South of Neptune Drive.
13. Page 1-37: It is unclear whether the VOC results are listed from the straight analysis of soil. Please clarify TCLP test results for VOCs.
14. Page 2-1: Page should be 2-2.
15. Table 3-1: DDT was detected in several sediment/seep samples. Freshwater chronic AWQC for DDT in surface water is extremely low (0.001 ug/L). Analysis of surface water for TCL pesticides at this level should be considered.
16. Table 3-1: The text should state whether TAL inorganics

analysis will include the analysis for cyanide.

17. Table 3-1: The addition of at least annual analysis of SW/SED-916 should be considered. One round of data indicates high levels of toluene, PAHs, and TOC at that location, which points toward a potential source in the vicinity. This may be non-point source runoff, but it does not appear to be fully evaluated.
18. Table 3-1: Sediment sampling at SD-901 should be considered. Sampling of SW/SD-920 should be considered due to the potential for the septic system to be a continuing source.
19. Table 3-1: Sampling of MW-902 to the north of Neptune Drive should be considered. The 2-butanone results may be attributable to the site and history of positive results in this location. Both MW-901 and MW-902 had positive results in September 1988 and results that were rejected in December 1988.
20. Table 3-1: Sampling for TAL inorganics should be considered for MW-903 if the results from this well will be compared to the upgradient (north) wells or used as background for septic system wells.
21. Page 3-4: The table only includes five SW/SED locations, not six, as stated in the text. A background location, as described in the text, should be collected.
22. Page 3-5: Consider including the versions of Tables 7-1 and 7-2 that are applicable.
23. Page 3-6: The example of turbidity as an intractable problem is poor. Several alternatives are possible if highly turbid samples present analytical problems.
24. The limits listed for inorganics in Table 7-2 (Long Term Monitoring QAPjP) should clearly state whether these are instrument detection limits or CRDLs. The table does not include sediment limits for VOCs, SVOCs, or pesticides.

RESPONSE TO USEPA COMMENTS DATED JULY 1, 1994

General Comments

1. Section 1.3 has been rewritten based on revisions to the text of the Final Proposed Plan.
2. Reference to "common laboratory contaminants" has been reevaluated and deleted or substantiated based on references or analytical data.
3. The Navy will provide a Method Detection Limit (MDL) study by the selected analytical laboratory that demonstrates the laboratory's ability to detect vinyl chloride at 2 ug/L. This study will be provided to the USEPA prior to initiating the LTMP at Site 9.

Specific Comments

1. A brief description of the current use of Building 201 has been added to the text.
2. Text has been added stating that dibenzofuran was detected at SD-11 at a concentrations of 5.1 mg/kg.
3. The source of toluene at monitoring location SW-916 (920 ug/L) is not known. This statement has been added to the text.
4. A table listing compounds detected in the surface water and their respective acute and chronic AWQC has been added to and the compounds detected in excess of their criteria have been identified in the text.
5. The iron concentrations detected in the surface water exceeded the chronic AWQC of 1,000 ug/L. This has been added to the text.
6. The term "freshwater" has been added to the text and to the table presenting the AWQCs. The AWQCs for water and fish ingestion were not used in the evaluation at Site 9 because the route of exposure (i.e. ingestion of water and fish) assumed in this criterion is not appropriate at this site. The unnamed streams are not used for potable purposes and do not support a fish population capable of producing enough fish to be consumed.
7. The sentence has been deleted from the text.
8. Mercury has been added as an inorganic analyte detected above background concentrations.
9. The text in Section 1.3 has been rewritten and this paragraph has been deleted.

10. The data in Table 1-5 has been combined with other tables. The groundwater data is now summarized in Table 1-1.

11a. PAHs and 1,1-DCA were detected in the sediment from SD-901 during the 1993 sampling event. Toluene was not detected in the sediment but was detected in the leachate. These data are presented in an appendix to the Technical Memorandum and summarized in Section 2.0 of the text.

11b. The reference to toluene has been changed to indicate that it was detected below its CRQL.

11c. Road salt has been identified as a possible source of cyanide contamination at NAS Brunswick. The Draft Final RI report (E.C. Jordan Co., August 1990; page 10-32) summarizes a report conducted in Maine (Olson and Ohno, 1989) documenting the use of sodium ferricyanide as a de-caking agent in road salt and linking it to cyanide contamination near salt storage piles. NAS Brunswick analyzed the salt used at the base and detected 2 to 3 mg/kg cyanide, consistent with the Olson and Ohno study.

12. The text in Section 1.3 has been rewritten and this issue has been clarified.

13. The VOC results stated in the text were for "straight soil analysis" ; results of the TCLP test have been added to the text.

14. The page numbering has been corrected.

15. DDT has been detected at Site 9 at concentrations consistent with historical usage of this pesticide during the 1960's and 1970's. The Navy does not consider the presence of DDT to be from the past disposal activities at Site 9. The USEPA supports this conclusion as stated in their comment number 53 to the Draft Proposed Plan: "The presence of DDT is from the historical routine application of this pesticide, not past disposal activities at Site 9." As such, the Navy does not consider DDT to be a site-related contaminant of concern and therefore, does not recommend that it be included in the list of surface water constituents to be sampled.

16. Cyanide is included in the Target Analyte List and therefore will be included in the analysis.

17. The Navy agrees to add SW/SD 916 to the LTMP. This location will be sampled annually for TCL VOCs.

18. The Navy agrees to add SD-901 to the LTMP. This location will be sampled quarterly for TCL VOCs and TAL inorganics.

The septic system and associated soils were sampled in Spring 1993. The analytical results indicate that this area of Site 9 is not a current source of groundwater

contamination. This conclusion has been presented in various documents and accepted by the regulatory agencies. Therefore, the Navy does not believe that sampling the surface water and sediment in the northern unnamed stream (i.e., SW/SD-920) is necessary. No change to the text has been made.

19. Analytical results from MW-902 indicate the presence of 2-butanone at 37J ug/l in September 1988 and below the detection limit in October 1989. The sampling result collected in December 1988 was rejected. The Navy will be sampling all wells associated with Site 9 as part of the additional source investigations at this site. If the analytical results show the presence of 2-butanone in this well, the Navy will consider adding MW-902 to the LTMP. If 2-butanone is not detected in this sample the Navy does not consider it necessary to include MW-902 in the LTMP.

20. The Navy agrees to include TAL inorganic analysis at MW-903.

21. The table has been changed to include SW/SD-922, located downstream of the site as the sixth sampling location. This location will be sampled quarterly for TCL VOCs.

22. The portions of Table 7-1 and 7-2 applicable to Site 9 have been included in Appendix A to this Long Term Monitoring Plan. Appendix A is titled "Addendum to the Long Term Monitoring Quality Assurance Project Plan".

23. The example of turbidity as an intractable problem has been replaced with "matrix interference". This paragraph identifies the process the Navy will follow should a problem arise in the sampling or analytical program. As stated in the text, any corrections to the plan will be submitted for regulatory input and approval. The purpose of the last two sentences was to identify that a situation may arise that can not be resolved by the Navy, USEPA or the MEDEP.

24. Table 7-2 has been revised to include limits for PAHs, arsenic, lead, and chromium in sediment and toluene, ethylbenzene, xylene, cadmium and manganese in water. The heading on Table 7-2 (now A-2) has been changed to "Required Detection Limits" because these are the detection limits the laboratory will be required to meet.



STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. MCKERNAN, JR.
GOVERNOR

DEBRAH J. RICHARD
ACTING COMMISSIONER

July 1, 1994

Mr. Fred Evans
Project Manager, Code 1821
Department of the Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, Penn. 19112-2090

RE: Draft Long Term Monitoring Plan, Site 9, Neptune Drive Disposal Site, dated June 1994, Brunswick Naval Air Station, Brunswick, Maine

Dear Fred:

The Department has received and reviewed the Site 9 Draft Long Term Monitoring Plan for NAS, Brunswick dated June 1994. The Department's comments are provided below.

1. Page 1-4, ¶ 2, second sentence: What determines if the monitoring program is terminated? Can a termination occur before the first 5-year review?.
2. Figure 1-2: Please include a smaller scale map in addition to Figure 1-2. The smaller scale map should show and label all buildings surrounding Site 9, specifically: all buildings east of the runway, all monitoring wells associated with the PX Gas Station, all areas north of Building 52, and west of sample point SW-922.
3. Page 1-7, ¶ 2, second sentence: The landfill contains material other than just ash. The LAS Study identified Site 9 as a former base landfill and a disposal area for metal wastes associated with the metal shop.
4. Page 1-7, ¶ 2, second sentence: If the two streams are contaminated because they have received leachate from the landfill or from another source at Site 9, the streams must be investigated and remediated as part of Site 9 under CERCLA.
5. Page 1-8, Title: Please change "Ash Landfill" to "Landfill".
6. Page 1-8: The LAS identifies the landfill as the "first dump area used at the Air Station." The LAS states, "For a while it was the main Air Station disposal area... At least some direct disposal of solid waste took place during the 1950's." Direct evidence collected to date confirms that un-incinerated solid waste exists in the landfill.

Serving Maine People & Protecting Their Environment

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7. Page 1-9, ¶ 1, last sentence: Please supply supporting information for the statement that, "the drain was reportedly removed and filled during construction of the barracks". The only information submitted to date is a figure showing the drain pipe with the words "to be removed" printed along the drainpipe.
8. Page 1-10, Section 1.3: The text should present all the data from previous investigations together. Separating the previous investigations is very confusing to the reader. All tables and figures must combine the information for all previous investigations.
9. Figure 1-3: Figure 1-3 shows work that was completed in 1993, but those investigations are not mentioned in the text on page 1-10.
10. Page 1-17, ¶ 1, sample location SW-915: The Navy should consider sample location SW-915 as an on-site sampling location. Seasonal groundwater directions are unknown. Groundwater from Site 9 may be discharging at SW-915.
11. Page 1-32, ¶ 2, fifth sentence: The Department does not accept MW-916 as a background location.
12. Page 3-1, ¶ 1: Additional language is necessary to indicate that all new monitoring wells installed as part of the additional investigative work for Site 9 will be sampled and analyzed as part of this plan. The number of wells, their approximate location, and frequency of monitoring must be indicated.
13. Page 3-1, ¶ 2: Please include a figure that shows all proposed sampling points. This figure should show the analytes to be sampled for and frequency of sampling for each location.
The monitoring plan must include sample locations MW-902, MW-905, SD-901, SD-920, and SW-920 for analyses. Data collected to date is inadequate to justify eliminating sampling points.
14. Page 3-4, ¶ 2: Previous discussions with the Navy included using specific down hole sampling procedures for VOC sampling. The LTMP does not mention any procedures for collection of groundwater. The text should include specific sampling procedures. Is there any flexibility that allows for amendments to the sample procedures based on performance evaluations and technology advances? The LTMP should provide specific performance requirements for the selected sampling procedures.
15. Page 3-5, ¶ 1: This should be a stand-alone report. The Data Quality Objectives should be included in this report. The final LTMP for Sites 1, 3, Building 95, and the Eastern Plume hasn't been accepted at this date.
16. Page 3-4, ¶ 2: The text should include a statement that the water level in every monitoring well will be measured and recorded during every sampling event.

17. Page 3-5, ¶ 2: Provide justification for the use of SW 846 protocols versus CLP procedures for characterizing groundwater chemistry at Site 9. The text should include a description of how the field parameters will be collected. All field parameters must be collected continuously during purging and after sampling is complete. Include how the field parameters will be reported and used by field personnel and in the performance evaluations.

18. Table 3-1, note 3: Include a figure identifying each monitoring point. The figure should show the frequency of measurement. Future reports must include a water table map.

19. Table 3-1, note 4: Note 4 should include water level measurements as a field parameter. Field personnel must record the water level during purging and sampling.

20. Page 3-6, ¶ 2, last two sentences: If conditions exist that cannot be corrected with the chosen purging and sampling techniques, alternative techniques must be chosen and implemented.

21. Page 3-8, ¶ 3: The final LTMP for Building 95, Sites 1 and 3, and the Eastern Plume has not been accepted by the Department. The LTMP for Site 9 should be a stand-alone report.

Section 3-6 must include a complete discussion of data reduction, validation, and reporting. The report should include a discussion about how GRIT/STAT will be used. Minimum data requirements for the specific statistical analyses must be presented. The text should include a discussion of how the Data Quality Objectives will be maintained during the sampling, analytical, and reduction stages. The specific statistical procedures must be presented to insure that the proposed sampling plan will meet the minimum requirements.

Section 3.6 must include a discussion of data validation. The report should discuss how the data will be reported. Figures must be included in the reports with complete data tables. All the data must be included on a computer diskette. The computer file must include all sample results. The database must use the most current EPA notation.

Please call me with any questions or comments.

Sincerely,

Nancy Beardsley

Nancy Beardsley
Project Manager, Federal Facilities Unit
Office of the Commissioner

pc: Robert Lim, USEPA
Jim Caruthers, NAS Brunswick
Carolyn Lepage, R.G. Gerber Inc.
Beth Walter, ABB ES
Rene Bernier, Topsham
Sam Butcher, Harpswell
Susan Weddle, Brunswick
Topsham Water District
Steven Mierzykowski, USFW
Mark Hyland, DEP
Marianne Hubert, DEP
Troy Smith, DEP

RESPONSE TO MEDEP'S COMMENTS DATED JULY 1, 1994

1. The monitoring program will be terminated when the Navy proposes termination, and it is approved by USEPA and MEDEP, or when a final ROD is prepared recommending No Further Action. Termination can occur before the first five year review if approved by USEPA and MEDEP.

The Navy views the Long Term Monitoring Plans for Building 95, Sites 1 and 3, Eastern Plume, and Site 9 as changeable documents. Based on this view, the Navy, with the approval of USEPA and MEDEP, may modify or discontinue the monitoring plan(s) at any time. However, the document will be reviewed a minimum of once every five years.

2. A smaller scale map/figure has been included that identifies the buildings in the area of Site 9 and the NEX Service Station.

3. The IAS identifies Site 9 as a "disposal area" and describes the "dump area" identified on the 1943 Air Station Map. The text has been revised to state "Ash Landfill/Dump Area" when describing the disposal area located north of Neptune Drive.

4. The NAS is currently monitoring the general surface water and sediment quality (including the two unnamed streams adjacent to Site 9) as part of their wastewater discharge license and specifically for PAHs to delineate the concentrations and distribution of contamination. Data collected as part of this program is submitted to the MEDEP annually. Analytical data collected as part of the IRP at Site 9 does not indicate the site as being the source of observed contamination. The contaminants of concern in the streams are fuel related VOCs and PAHs. The contaminants of concern at Site 9 are vinyl chloride, DCA and DCE. Because these streams receive runoff from the central portion of the NAS, it is likely that the contamination detected in the streams is the result of nonpoint source runoff from the runways, roadways and culvert/drainage system. If contamination in the unnamed streams is found to be associated with a CERCLA site, then these streams will be remediated under the CERCLA program.

5. Please see response to Comment No. 3. The text has been revised to state "Ash Landfill/Dump Area".

6. The first paragraph describing the "ash landfill/dump area" has been revised to include the statements made in the IAS and referenced to in this comment.

7. The statement that the "drain was reportedly removed" is based on the construction drawing that stated "to be removed". The Navy will be conducting additional investigations in the area of the drainpipe (proposed test pit and monitoring well) which will provide more reliable information as to the status of the drainpipe.

8. Section 1.3 has been rewritten based on comments received by the TRC on the Draft Proposed Plan. The revised Section 1.3 also incorporates comments received from the TRC on this document that were not addressed in the Proposed Plan.

9. This section has been rewritten. The field investigations are no longer discussed separately.

10. The Navy considers sampling location SW-915 to be upgradient/upstream from Site 9. However, the Navy will be collecting additional water level measurements from all wells associated with Site 9 as part of the additional source investigations. If the data indicate that SW-915 is downgradient of the site, the Navy will consider adding this sampling location to the LTMP.

11. The Navy understands the concerns regarding the proximity of MW-916 to the ash landfill/dump area. However, the analytical results from MW-916 are free of contamination and therefore do not appear to be impacted by previous disposal activities. The Navy considers this well to be representative of background conditions. The Navy will be conducting additional investigations at Site 9 and has agreed to place a monitoring well in the vicinity of the southeast corner of Building 215. Based on water level measurements and analytical data, this well may be considered more representative of background conditions and may replace MW-916 as the upgradient monitoring well in the monitoring program.

12. The Navy does not consider it possible to commit to including any of the proposed monitoring wells in the LTMP prior to sampling, analyzing and evaluating the data from these wells.

13. A figure identifying the proposed sampling locations has been included in the text. Table 3-1 identifies the analytes to be sampled for and frequency of sampling at each location.

The Navy agrees to add SD-901 to the LTMP. However, the Navy does not consider it necessary to include SW/SD 920 in the LTMP as explained in the response to USEPA comment number 18. The Navy agrees to consider adding MW-902 and MW-905 to the LTMP based on the analytical results of the groundwater sampling to be conducted as part of the additional source investigations at the site. Please see response to USEPA comment number 19.

14. The Navy is proposing to use point-source bailers to collect groundwater samples at Site 9. A discussion of the sampling technique has been added to the text. This discussion is also presented in the Draft Work Plan for Site 9 submitted to MEDEP on June 30, 1994.

The Navy considers the LTMP to be flexible and amended as necessary. However, any changes or amendments to the LTMP must be agreed to by the Navy, USEPA and MEDEP.

15. The Navy considers the Site 9 Long Term Monitoring Plan to be an Addendum to the Long Term Monitoring Plan for Building 95, Sites 1 and 3, and the Eastern Plume. It was the Navy's understanding the TRC agreed to issue the LTMP for Building 95, Sites 1 and 3, and Eastern Plume as Final at our last meeting (June 23, 1994).

16. Water level measurements will be collected at every monitoring well during each sampling event. This has been added to the text.

17. The SW-846 protocol will meet the data quality objectives and detection limits identified for this LTMP. A description of how the field parameters will be collected is identified in Section 4.0 of the QAPP.

18. A figure has been added to the text identifying the sampling locations. Table 3-1 provides a list of analytes to be sampled for and sampling frequency for these locations.

19. Notes 3 and 4 have been combined. Note 4 (now Note 3) includes water level measurements as a field parameter.

20. The purpose of this paragraph was to present the process the Navy will follow should a problem arise in the sampling or analytical program. As stated in the text, corrective actions will be taken by the Navy and if the problem persists additional corrective actions will be submitted for regulatory input and approval. The purpose of the last two sentences was to identify that a situation may arise that can not be resolved by the Navy, USEPA or the MEDEP. The example of turbidity as an intractable problem has been replaced with "matrix interference".

21. The Navy considers that the Long-Term Monitoring Plan for Sites 1, 3, Building 95 and the Eastern Plume has been accepted by the MEDEP. Comment responses on the Draft Final LTMP report were discussed at the June 23, 1994 TRC meeting and verbal approval for finalizing the report was given at that time.

The Navy does not consider it necessary to validate the majority of data collected as part of the LTMP. However, the validation process is presented in Section 8.0 of the QAPP for those data that may require validation (i.e., samples preceding the termination of the monitoring program).

The program QAPP identified DQOs, detection limits and methods the Navy will use to evaluate the suitability of the data. The LTMP will provide data suitable to statistical analysis. GRIT/STAT will be used to identify trends in the analytical data that can be used to evaluate any change in groundwater quality. The determination of the minimum data requirements for a particular well can only be made as data becomes available. Minimum data requirements may be on the order of 4 to 7 data points.

The data will be reported in text, table and figures that summarize the analytical results. All raw data, chain of custody and analytical request forms (ARFs) will be provided to MEDEP. Although it is not a requirement to include all data on a computer disk, the Navy is willing to provide the data in the format used to maintain its own database.

Geoscience and Environmental Management Professionals

**ROBERT G.
GERBER, INC.**

17 West Street • Freeport, Maine • 04032-1133

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June 29, 1994

File #965

Ms. Loukie Lofchie
Brunswick Area Citizens for a Safe Environment
P. O. Box 245
Brunswick, ME 04011

Subject: *Review of Draft Long Term Monitoring Plan: Site 9, Neptune Drive Disposal Site, Naval Air Station Brunswick, Brunswick, Maine, June 1994.*

Dear Ms. Lofchie:

As requested by the Brunswick Area Citizens for a Safe Environment (BACSE); Robert G. Gerber, Inc. (Gerber), has reviewed the *Draft Long Term Monitoring Plan: Site 9, Neptune Drive Disposal Site* for Naval Air Station Brunswick, Brunswick, Maine, dated June 1994. The document was prepared by ABB Environmental Services, Inc., (ABB-ES) for the U. S. Department of the Navy for the Naval Air Station Brunswick (NAS Brunswick) located in Brunswick, Maine. In the subject document, the Navy proposes sampling and reporting activities in support of their proposed interim remedial action to address groundwater contamination at the Neptune Drive Disposal Site.

Site 9, also known as the Neptune Drive Disposal Site, is located in the central portion of NAS Brunswick. The site initially included three areas of potential contamination: the location of a former incinerator and an associated ash disposal area; an area reportedly used for burning and disposal of solvents; and two streams exhibiting iron-staining characteristic of leachate. Results of earlier environmental investigations were reported in the August 1990 *Draft Final Remedial Investigation (RI)* and the April 1991 *Draft Final Supplemental RI* reports prepared by B. C. Jordan. The September 1993 *Draft Technical Memorandum for Site 9* presented a summary of investigations and analysis conducted through 1993, and recommendations for future activities at the site. Several of the issues we raised in our review of the September 1993 and earlier versions of the Technical Memorandum have been broached at subsequent meetings of the Technical Review Committee, and remain outstanding.

We recently reviewed the May 1994 *Draft Proposed Plan for Site 9* that presented the Navy's preferred alternative for an interim remedial action for groundwater at Site 9. The proposed interim action includes groundwater remediation by natural attenuation, implementation of institutional controls to prevent human exposure, and long-term monitoring of groundwater, surface water, and sediments to evaluate changes in environmental quality. We presented our comments on the draft proposed plan in our letter to you dated June 15, 1994.

L. Lofchie, Page 2 of 3, Draft Site 9 Long Term Monitoring Plan
June 29, 1994, File #965

The subject document addresses the environmental monitoring portion of the proposed remedial alternative. The purpose of the long term monitoring plan, as stated on page 1-3, is to "characterize the groundwater and surface water quality on-site and downgradient of Site 9 and identify contamination, if any, associated with past disposal activities at the site", as well as "better establish the presence/absence and concentrations of contaminants which have been sporadically observed during past sampling events". Our comments on the proposed monitoring plan are as follows:

1. Page 1-1. It is not clear where the former base landfill, described in Section 1.0 as being located north of Neptune Drive, is located. Figure 1-2 on page 1-6 shows the approximate locations of both the old incinerator and the ash disposal area (also described on page 1-1 as located north of Neptune Drive), but does not show the location of a former base landfill.
2. Page 1-4. There are four, not three, concepts enumerated in the first paragraph. The additional investigations described in the third concept should also characterize groundwater and possibly surface water quality in potential source areas.
3. Page 1-4. The second sentence in the second paragraph should reflect that the decision to terminate the monitoring program and proceed to a final ROD (Record of Decision) will be based on the five-year review of the program and the results of the additional investigations the Navy intends to conduct to identify potential sources at Site 9. The fourth sentence should be revised to indicate the five-year program and/or the results of the additional investigations the Navy intends to conduct at Site 9 may drive additional actions at the site.
4. Page 3-1. The Long Term Monitoring Plan for Site 9 should be a "freestanding" document in that it should include major components, such as the Quality Assurance Project Plan and the Health and Safety Plan, as appendices rather than reference an earlier document that applies to a completely different location.
5. Page 3-1. The description of monitoring locations in Section 3.1 should reference the total number of monitoring wells at Site 9 and include a justification for excluding wells. In addition, the description of several of the wells selected for monitoring as "within" the site boundaries, or upgradient and downgradient of the site, implies that the boundaries of Site 9 are well-defined and include all known sources. There is not sufficient data at this time to determine the areal extent of the site. The additional investigations the Navy intends to conduct should help define any potential sources as well as any environmental quality issues related to current or historical source areas.
6. Page 3-4. Where and when will the specific sampling methods and procedures be presented for review and approval by the appropriate entities. The issue of low-flow sampling has been

L. Lefebvre, Page 3 of 3, Draft Site 9 Long Term Monitoring Plan
June 29, 1994, File #965

discussed at several TRC (Technical Review Committee) meetings. What measures will be employed to minimize the volatilization of contaminants, vinyl chloride in particular, during sample collection.

7. Page 3-4. Will the quarterly sampling schedule coincide with typical seasonal high and low groundwater conditions. What is the anticipated date that sampling would begin.

8. Page 3-4. The quarterly sampling procedures should include collection of water level measurements from all existing monitoring wells at Site 9. The data analysis and review performed every five years should include evaluation of the water level measurements collected.

9. Page 3-6. The meaning of the next-to-last sentence on the page is unclear.

10. Page 3-7 & 3-8. Section 3.5 should be revised to reflect that the monitoring program duration and modification may be affected by the results of the additional source investigations the Navy intends to conduct at Site 9.

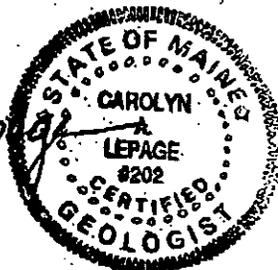
11. A glossary of abbreviations and acronyms similar to those included at the end of other NAS Brunswick documents prepared by ABB-ES would be helpful.

12. General Comment. There are a number of issues we raised in our comment letter dated June 15, 1994, concerning the May 1994 Draft Proposed Plan for Site 9 that remain unanswered at this time, such as how contaminants detected in stream sediments would be handled. Because of the extensive comments received from the various reviewers, the proposed plan is currently being revised and will be submitted to TRC participants for review and comment. Depending on the nature and extent of the revisions, we may have additional comments concerning the activities proposed for Site 9, including long term monitoring.

Please do not hesitate to give us a call if you have any questions on the comments above.

Sincerely,
Robert G. Gerber, Inc.

Carolyn A. Lepage
Carolyn A. Lepage, C.G.
Director of Operations



RESPONSE TO BACSE COMMENTS DATED JUNE 29, 1994

1. The text and figures have been changed to reflect the location and description of the ash landfill and "dump area". These areas are considered to be collocated based on information in the IAS and old construction drawings of the area. However, the Navy will be conducting additional investigations to determine the presence or absence of another disposal area north of Neptune Drive.
2. The text has been changed to read "four".
3. The text has been changed to include the statements made in the comment.
4. The LTMP for Site 9 is not considered to be a free standing document but rather an addendum to the LTMP prepared for Sites 1, 3, Building 95 and the Eastern Plume. As such, reference to the Appendices from this document are appropriate. Please see response to MEDEP comment number 15.
5. The comment is noted. The text in Section 3.1 has been modified to reference the sampling locations.
6. The Navy is proposing to use point-source bailers to collect groundwater samples at Site 9. A discussion of the sampling technique has been added to the text. This discussion is also presented in the Draft Work Plan for Site 9 submitted to the TRC on June 30, 1994. The QAPP describes the other specific sampling methods and procedures that will be used as part of this LTMP.
7. Quarterly sampling is anticipated to coincide with seasonal high and lows. Specific dates for the sampling at Site 9 can not be planned at this time.
8. Water level measurements will be collected at each well during every sampling event. These data will be incorporated into the five-year reviews.
9. The purpose of this paragraph was to present the process the Navy will follow should a problem arise in the sampling or analytical program. As stated in the text, corrective actions will be taken by the Navy and if the problem persists additional corrective actions will be submitted for regulatory input and approval. The purpose of the last two sentences was to identify that a situation may arise that can not be resolved by the Navy, USEPA or the MEDEP.
10. The text in Section 3.5 has been revised to discuss possible modifications to the LTMP based on the results of additional investigations conducted by the Navy.
11. A glossary of abbreviations and acronyms has been included in the text.

12. The Draft Proposed Plan was revised based on TRC comments and submitted on July 7, 1994. The Public Comment Period for the Proposed Plan began on July 12, 1994 and is scheduled to close on August 10, 1994. The Navy will provide responses to all written comments received in the Responsiveness Summary of the Record of Decision.

**REGULATORY AND TRC COMMENTS ON
DRAFT FINAL DOCUMENT AND NAVY RESPONSES**

ABB Environmental Services, Inc.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

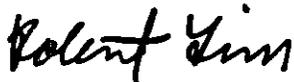
September 7, 1994

Mr. Fred Evans
Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Dear Fred:

The United States Environmental Protection Agency (EPA) has reviewed the document entitled **Draft Final Long Term Monitoring Plan Site 9, Neptune Drive Disposal Site**, dated August 1994. The EPA's comments are found in Attachment I of this letter. Should you have any questions, please feel free to call me at (617) 223-5521.

Sincerely,



Robert Lim, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc. Nancy Beardsley/MEDEP
Jim Caruthers/NASB
Beth Walter/ABB-ES, Inc. (w/ disk) i
Susan Weddle/BACSE
Carolyn LePage/Gerber, Inc.
Sam Butcher/Harpswell Community Rep.
Rene Bernier/Topsham Community Rep.



ATTACHMENT I

The following are the EPA's comments pertaining to the document entitled Draft Final Long Term Monitoring Plan (LTMP) for Site 9 dated August 1994.

General Comment:

1. The EPA is curious when the long term monitoring plan for Site 9 will be implemented. Although it may seem convenient to schedule implementation to coincide with the LTMP for the Eastern Plume, more than a quarter of a year will elapse before the completion of the groundwater treatment plant. The EPA feels that the Navy should consider beginning the LTMP for Site 9 as soon as possible and conduct a sampling event in the October-November time range.

Specific Comments:

1. Page 1-4, ¶ 2 (continued on Page 1-5): Although the EPA recognizes that predicting the likely outcomes of the LTMP and additional investigations is difficult, it seems that this paragraph succeeds in identifying the three possible outcomes at Site 9. They are: terminate the LTMP; continue the LTMP; or take action. This paragraph, however, implies that two separate RODs will be prepared in the future, one for groundwater and one for any source area(s). With respect to finalizing interim RODs, the EPA is flexible on the date which it is completed. For Site 9, rather than prepare two RODs, the EPA feels that the decision to prepare a final ROD for the groundwater operable unit can wait to adequately build a groundwater database or may tied to the ROD for the source area(s).

The EPA suggests revising this paragraph to:

~~It is expected that if~~ the analytical results indicate that contaminant levels do not exceed regulatory standards or concentrations associated with unacceptable risk, the monitoring program will be terminated at the five-year review and a final ROD prepared for the groundwater operable unit. The decision to terminate the monitoring program will be made by the Navy, USEPA, and Maine Department of the Environmental Protection (MEDEP) with input from the Technical Review Committee, and be based on the results of additional investigations relevant to Site 9 and the five-year review. ~~The final ROD may or may not continue to require institutional controls.~~ If, however, results of the additional investigations identify source areas or indicate that contamination exists at concentrations above regulatory standards or associated with unacceptable risks, additional actions under CERCLA may be warranted. These actions might

include remedial actions for the identified source areas, additional groundwater monitoring, additional investigations of soils and/or groundwater, modified institutional controls, or other actions consistent with CERCLA. Following the evaluation of the additional investigations, a final source control ROD will be prepared documenting any action to be taken. If sufficient information is present, this ROD may also cover any decision made on the groundwater operable unit. The final ROD may or may not continue to require institutional controls. On the other hand, if the analytical results are ambiguous as to the nature and extent of the contamination in this area, then the monitoring program will be extended, and modified as necessary, to address those ambiguities.

Regardless of the above predictions, some certainties are that activities at Site 9 will be closely monitored by the TRC and active discussion will need to continue.

2. Page 2-1, ¶ 1: Delete "(OSWER Directive 9355.7-02, Attachment I)" since there is no Attachment I.

Enclosed for your information is a recent supplemental OSWER directive on five-year reviews. Among the clarifications, the guidance recommends for streamlining purposes conducting a site-wide five-year review. In terms of timing, according to the guidance, the trigger date to which the five-year review is tied can be based on the more appropriate of three events. Either the contract award date(s), or remedial action start date(s), or the ROD signature date(s). With the many different dates at Brunswick, it seems that the most beneficial date would be a date late enough that would allow a significant amount of monitoring to be conducted since one of the purposes of the five-year review is to determine the success of the remedial action and to evaluate the monitoring data. At this time, the EPA does not have a suggested date and feels that discussion on the date for the sitewide Brunswick five-year review can be conducted later.

GENERAL COMMENTS:

1. The Navy plans to begin the implementation process for long term monitoring at Sites 1 and 3, Building 95, the Eastern Plume, and Site 9 once USEPA and MEDEP approvals of the Site 9 Long Term Monitoring Plan (LTMP) have been received. The implementation process will include funding the work and contracting the monitoring services.

SPECIFIC COMMENTS:

1. USEPA's suggested revisions have been incorporated into the Site 9 LTMP.
2. The reference to OSWER Directive 9355.7-02, Attachment I has been deleted.



STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. McKERNAN, JR.
GOVERNOR

DEBRAH J. RICHARD
ACTING COMMISSIONER

September 8, 1994

Mr. Fred Evans
Project Manager, Code 1821
Department of the Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, Penn. 19112-2090

RE: **Draft Final Long Term Monitoring Plan Site 9, dated August 1994, Brunswick Naval Air Station, Brunswick, Maine**

Dear Fred:

The Department has received and reviewed the Draft Final Long Term Monitoring Plan at Site 9 for NAS, Brunswick dated August 1994. The Department has also included some comments on the Navy's responses to our comments on the Draft LTMP. The Department's comments are provided below.

General Comments

1. I would like to schedule a meeting to discuss AWQC and how AWQC are applied in the State of Maine. The Department has commented on AWQC in many review comments over the past year, but our comments have not been adequately addressed. I want to get this issue resolved ASAP. I will ask Barry Mower from our Bureau of Water Quality to present the State's position on AWQC. Please let me know when it would be convenient to meet.

Specific Comments

2. Table 1-2: CWA Water Quality Criteria include criteria for the protection of human health and criteria for the protection of freshwater aquatic life. Why hasn't the human health criteria been included in this table?

3. Page 2-1: Natural attenuation will result in diminishing contaminant concentrations if you make the assumption that there is not an on-going source that is contributing to the contamination.

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PRESQUE ISLE, ME 04769
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4. Page 2-1: EPA should base its five year reviews on actual field conditions and not on the implicit assumption that natural attenuation will reduce contaminant concentrations. We don't know what, if any, the source areas are for Site 9, therefore, we can only assume that contaminant concentrations will decrease. It seems that the long term monitoring program hinges on five year reviews to determine the next plan of action at the site. I don't believe that five year reviews should be a discretionary requirement based on natural attenuation. I would like to see a further explanation from EPA or the Navy that explains EPA's interpretation of the Statutory Review in relation to Site 9 long term monitoring. Attachment I has not been included in this Report.

Comments on Navy response to Draft comments

Response 10: What is the basis for considering SW-915 as an upstream sampling point. The groundwater contours presented in past reports indicated that groundwater discharges in the area from Site 9.

Response 11: The Department does not accept MW-916 as a background well for reasons that have already been explained in detail. In the Navy's response to Department comments dated December 8, 1993, the Navy proposed to install and sample a new monitoring well in the vicinity of the southeast corner of Building 215, and perform a soil boring in the area of T-23 and MW-916. However, Figure 3-1 of the Draft Work Plan shows that a new upgradient monitoring well will be installed directly north of MW-916. Please clarify.

Response 12: At a minimum the Navy must include the additional wells as water level monitoring points, and evaluate after sampling whether these wells should be included in the LTMP.

Response 13: The Department's approach is to include all monitoring wells in the LTMP until sufficient data exists to justify the elimination of sampling points. USEPA comment number 19 does not discuss MW-905.

Please call with any questions or comments.

Sincerely,



Nancy Beardsley
Project Manager, Federal Facilities Unit
Office of the Commissioner

pc: Robert Lim, USEPA
Jim Caruthers, NAS Brunswick
Carolyn Lepage, R.G. Gerber Inc.
Beth Walter, ABB ES
Rene Bernier, Topsham
Sam Butcher, Harpswell
Susan Weddle, Brunswick
Topsham Water District
Steven Mierzykowski, USFW
Mark Hyland, MDEP
Troy Smith, MDEP
Marianne Hubert, MDEP

GENERAL COMMENTS:

1. The Navy recognizes Maine Department of Environmental Protection's position on Ambient Water Quality Criteria (AWQC). Future documents will compare surface water monitoring results to the State of Maine's AWQC for protection of human health and aquatic life.

SPECIFIC COMMENTS:

2. The Ambient Water Quality Criteria (AWQC) for aquatic life was presented in the table as a point of reference and to provide some perspective for the observed concentrations. The comparison was not used to determine the need for or extent of surface water remediation. Because groundwater at Site 9 is not presently used as a source of drinking water and because the LTMP is for groundwater monitoring, the AWQCs for human health were not used. However, future documents will compare surface water monitoring results to the State of Maine's AWQC for protection of human health and aquatic life.

3. Comment noted. At this time, no source of contamination has been identified.

4. Five year site reviews are intended to evaluate whether the response action remains protective of public health and the environment. The five year review document will present all data collected by the LTMP for the selected interim remedial action. USEPA, MEDEP, and the TRC (RAB) will receive and are encouraged to review the quarterly monitoring reports presenting the LTMP results. The Navy, USEPA, and MEDEP can propose changes to the LTMP at any time based on the results of the LTMP quarterly sampling and/or the results of the additional investigations at Site 9.

The reference to Attachment I has been deleted.

COMMENTS ON NAVY RESPONSE TO DRAFT COMMENTS:

Response 10: The Navy considers sampling location SW-915 to be upgradient/upstream from Site 9. However, the Navy will be collecting additional water level measurements from all wells associated with Site 9 as part of the additional source investigation and the LTMP. If these data indicate that SW-915 is downgradient of the site, the Navy will consider adding a new upgradient sampling location to the LTMP.

RESPONSES TO MEDEP COMMENTS DATED SEPTEMBER 8, 1994
PAGE 2 OF 2

Response 11: Comment noted. Figure 1-2 will be revised to indicate:

- a. The proposed upgradient monitoring well will be located in the vicinity of the southwest corner of Building 215. (Please note the Navy's 19 July 1994 letter to MEDEP erroneously stated the proposed monitoring well would be located southeast rather than southwest of building 215.)
- b. The proposed monitoring well west of building 212 has been relocated to be hydraulically upgradient of the proposed test pit/trench.

Response 12: The Navy agrees to measure water levels in all Site 9 monitoring wells during groundwater sampling events. The Navy has always agreed to consider adding wells to the LTMP based on the analytical results of future sampling events.

Response 13: Monitoring well MW-905 will not be sampled under the LTMP. It will be sampled as part of the additional investigations and if it is found to be contaminated, it will be added to the Site 9 LTMP.

ROBERT G.
GERBER, INC.

Geoscience and Environmental Management Professionals

17 West Street • Freeport, Maine • 04032-1133

207-865-6138 • (FAX) 207-865-1071

August 19, 1994
File #965

Ms. Loukie Lofchie
Brunswick Area Citizens for a Safe Environment
P. O. Box 245
Brunswick, ME 04011

Subject: *Review of Draft Final Long Term Monitoring Plan: Site 9, Neptune Drive Disposal Site, Naval Air Station Brunswick, Brunswick, Maine, August 1994.*

Dear Ms. Lofchie:

As requested by the Brunswick Area Citizens for a Safe Environment (BACSE), Robert G. Gerber, Inc. (Gerber), has reviewed the *Draft Final Long Term Monitoring Plan: Site 9, Neptune Drive Disposal Site* for Naval Air Station Brunswick, Brunswick, Maine, dated August 1994. The document was prepared by ABB Environmental Services, Inc., (ABB-ES) for the U. S. Department of the Navy for the Naval Air Station Brunswick (NAS Brunswick) located in Brunswick, Maine. In the subject document, the Navy proposes sampling and reporting activities in support of their proposed interim remedial action to address groundwater contamination at the Neptune Drive Disposal Site.

Site 9, also known as the Neptune Drive Disposal Site, is located in the central portion of NAS Brunswick. The site initially included three areas of potential contamination: the location of a former incinerator and an associated ash disposal area; an area reportedly used for burning and disposal of solvents; and two streams exhibiting iron-staining characteristic of leachate. Results of earlier environmental investigations were reported in the August 1990 *Draft Final Remedial Investigation (RI)* and the April 1991 *Draft Final Supplemental RI* reports prepared by E. C. Jordan. The September 1993 *Draft Technical Memorandum for Site 9* presented a summary of investigations and analysis conducted through 1993, and recommendations for future activities at the site. Several of the issues we raised in our review of the September 1993 and earlier versions of the Technical Memorandum have been broached at subsequent meetings of the Technical Review Committee, and remain outstanding.

We recently reviewed the July 1994 *Proposed Plan for Site 9* that presented the Navy's preferred alternative for an interim remedial action for groundwater at Site 9. The proposed interim action includes groundwater remediation by natural attenuation, implementation of institutional controls to prevent human exposure, and long-term monitoring of groundwater, surface water, and sediments to evaluate changes in environmental quality. We presented our comments on the *Proposed Plan* in our letter to you dated August 10, 1994.

L. Lefebvre, Page 2 of 3, Draft Final Site 9 Long Term Monitoring Plan
August 19, 1994. File #965

The subject document addresses the environmental monitoring portion of the proposed remedial alternative. The purpose of the long term monitoring plan, as stated on page 1-3, is to "characterize the groundwater and surface water quality on-site and downgradient of Site 9 and identify contamination, if any, associated with past disposal activities at the site", as well as "better establish the presence/absence and concentrations of contaminants which have been sporadically observed during past sampling events". We provided comments on the June 1994 version of the subject document in our letter to you dated June 29, 1994. Our comments on the current version of the proposed monitoring plan are as follows:

1. Page 1-5. We reiterate our comment from our June 29, 1994, letter concerning the incorporation by reference of significant sections of the *Long Term Monitoring Plan for Site 9*. We still feel that the document should be "freestanding" in that it should include major components, such as the Quality Assurance Project Plan and the Health and Safety Plan (HASP), as appendices rather than reference an earlier document that applies to a completely different location (that is, Sites 1 and 3, Building 95, and the Eastern Plume). It is our understanding, based on an earlier comment by Maine Department of Environmental Protection (DEP) staff, that the document referenced has not yet received agency approval. In addition, the HASP should be a site-specific document relating to the hazards presented to workers at Site 9 as these hazards, and the appropriate actions, are not necessarily the same as those at Sites 1 and 3, Building 95 and the Eastern Plume.
2. Page 1-11. In the June 1994 version of the subject document, the final sentence in the paragraph describing the unnamed streams mentions "leachate seeps and staining" having been observed in both streams. Why is the reference to leachate and staining, as well as the southern unnamed stream, not included in the corresponding sentence in the subject document.
3. Page 1-15. The "area with historic elevated VOCs in groundwater" drawn on Figure 1-4 does not reflect that volatile organic compounds (VOCs) have been detected in CP-902 and MW-908.
4. Page 1-18 - 1-21. The analytical results summarized in Section 1.4.2 do not present "estimated" results (denoted by a "J") consistently. For example, estimated concentrations of vinyl chloride were reported for MW-904, MW-907, and MW-908 in Table 1-1, but are not mentioned in the text on page 1-18. However, estimated concentrations of polynuclear aromatic hydrocarbons (PAHs) are mentioned in the paragraph at the top of page 1-21. The estimated values should be addressed in the text.
5. Page 1-19, 1-21, & 1-24. In several instances, compounds detected are attributed to sampling or laboratory artifacts or laboratory contamination. What do the applicable sampling or laboratory quality control and assurance measures indicate.
6. Page 1-20. What does "normal background range" mean. How is it defined.

**ROBERT G.
GERBER, INC.**

L. Lafchie, Page 3 of 3, Draft Final Site 9 Long Term Monitoring Plan
August 19, 1994, File #965

7. Page 1-24. How is "background" defined.
8. Page 1-26. Has it been determined that there is no groundwater input or contribution to samples collected at SW-915.
9. Page 1-26 - 1-30, 2-2. When and how will the contamination in surface water and sediments be evaluated for possible remediation. Levels of PAHs in sediments in particular remain a concern. While additional source investigations are mentioned elsewhere in the text (for example, on page 2-2), it is not clear if these proposed investigations will address surface water and sediment contamination.
10. Page 3-5 & 3-6. Water level measurements should be made at *all* wells at Site 9 during a sampling event even though water quality samples might not be collected from all wells. While the text and Table 3-1 indicate that MW-902 and MW-905 will not be included in the long term monitoring program, the response to DEP's comment #13 (see Appendix B in the subject document) indicates that the two wells will be sampled under another program and if contaminants are detected, they will be added to the long term monitoring program.
11. Page 3-7. How often will in situ parameters be monitored. What are the stabilization criteria.
12. General Comment. In our June 29, 1994, letter concerning the previous draft of the subject document, we noted there were a number of issues we raised concerning the May 1994 *Draft Proposed Plan for Site 9* that remained unanswered at the time, such as how contaminants detected in stream sediments would be handled. The *Proposed Plan* was revised in July 1994 and made available for public comment until August 10, 1994. The Navy will be providing written responses to all written comments submitted during the public comment period in the "Responsiveness Summary" of the *Record of Decision*. Depending on the nature and extent of the responses to comments, there may still be some concerns and issues remaining regarding the activities proposed for Site 9.

Please do not hesitate to give us a call if you have any questions on the comments above.

Sincerely,
Robert G. Gerber, Inc.

Carolyn A. Lepage
Carolyn A. Lepage, C.
Director of Operations

P:05.9965d.ag4



ROBERT G.
GERBER, INC.

1. The Navy has received agency approval of the "Final Long Term Monitoring Plan Building 95, Sites 1 and 3 and Eastern Plume", dated August 1994. In addition, the Navy considers the LTMP for Site 9 to be a stand alone plan identifying the specific tasks to be conducted as part of the long-term monitoring at the site. However, the Navy considers it necessary to have a consistent overall monitoring program at NAS Brunswick that can be applied to all IRP sites, as necessary. Therefore, the Navy has developed a QAPP, HASP, data quality objectives and sampling methodologies that can be applied to individual sampling plans. The LTMP for Building 95, Sites 1 and 3 and Eastern Plume was developed first, therefore, these sections are presented as appendices to that report. As such, the Site 9 LTMP references those appendices and any site specific modifications have been included as appendices to the Site 9 LTMP.

2. No leachate seeps have been observed in the southern unnamed stream. Therefore, the statement regarding an observed leachate seep in the southern unnamed stream has been removed.

3. Figure 1-4 has been revised to show that VOCs have been detected at CP-902 and MW-908. CP-902 was not a monitoring well and therefore not shown as a historic monitoring point. MW-908 has shown no consistent presence of VOC contamination. Figure 1-4 has been presented in previous documents which have been accepted by USEPA and MEDEP. The purpose of this figure is to show interpretive groundwater surface contours. The additional information provided by labeling the locations of past VOC detections was provided for reference only.

4. The text has been revised to include the estimated results.

5. Page 1-19. The statement that 2-butanone is considered to be a sampling or laboratory artifact is substantiated by the lack of spatial or temporal patterns to the detections, not the presence of 2-butanone in laboratory or sampling blanks. The two wells which detected 2-butanone will be sampled for VOCs during the LTMP. Therefore, the presence or absence of 2-butanone in groundwater will continue to be monitored.

Page 1-21. The statement that the single bis(2-ethylhexyl)phthalate detection, which was qualified as estimated (12J $\mu\text{g/L}$), "may be site-related or a sampling or laboratory artifact.", does not dismiss the detection or make a definitive statement regarding the validity of the detection.

Page 1-24. that statement that acetone and 2-butanone detections in soil samples "may not indicate site contamination (USEPA, 1988).", is substantiated by the USEPA reference. This statement does not dismiss the detections, it provides a valid consideration as to one possible source of the contaminants since their presence is not supported by spatial or temporal patterns of detection at the site.

6. "Normal background range" for NAS Brunswick groundwater was established in the referenced document Draft Final Remedial Investigation Report NAS Brunswick (E.C. Jordan Co., 1990) and has been accepted by USEPA and MEDEP. To aid in the interpretation of the text, the inorganic compounds in groundwater background concentrations were provided in Table 1-1. Please note that the reference has been corrected from 1990a to 1990.

7. See the response to comment 6. The reference to the Draft Remedial Investigation Report has been added to the text.

8. The Navy considers sampling location SW-915 to be upgradient/upstream from Site 9. However, the Navy will be collecting additional water level measurements from all wells associated with Site 9 as part of the additional source investigation and the LTMP. If these data indicate that SW-915 is downgradient of the site, the Navy will consider adding a new upgradient sampling location to the LTMP.

9. The schedule for the implementation of the additional source investigations has not yet been discussed with USEPA or MEDEP. These investigations will address surface water and sediment contamination at Site 9.

10. The Navy agrees that water level measurements will be obtained at all Site 9 monitoring wells during a groundwater sampling event. Monitoring wells MW-902 and MW-905 will not be sampled under the LTMP. They will be sampled as part of the additional investigations and if they are found to be contaminated, they will be added to the Site 9 LTMP.

11. The Section 4.6 of the Quality Assurance Project Plan has been revised to indicate that in situ parameters are considered stabilized if consecutive readings are within 10 percent of each other. In situ parameters are generally measured once per well purge volume.

12. The General Comment on the Proposed Plan for Site 9 (July 1994) is noted.