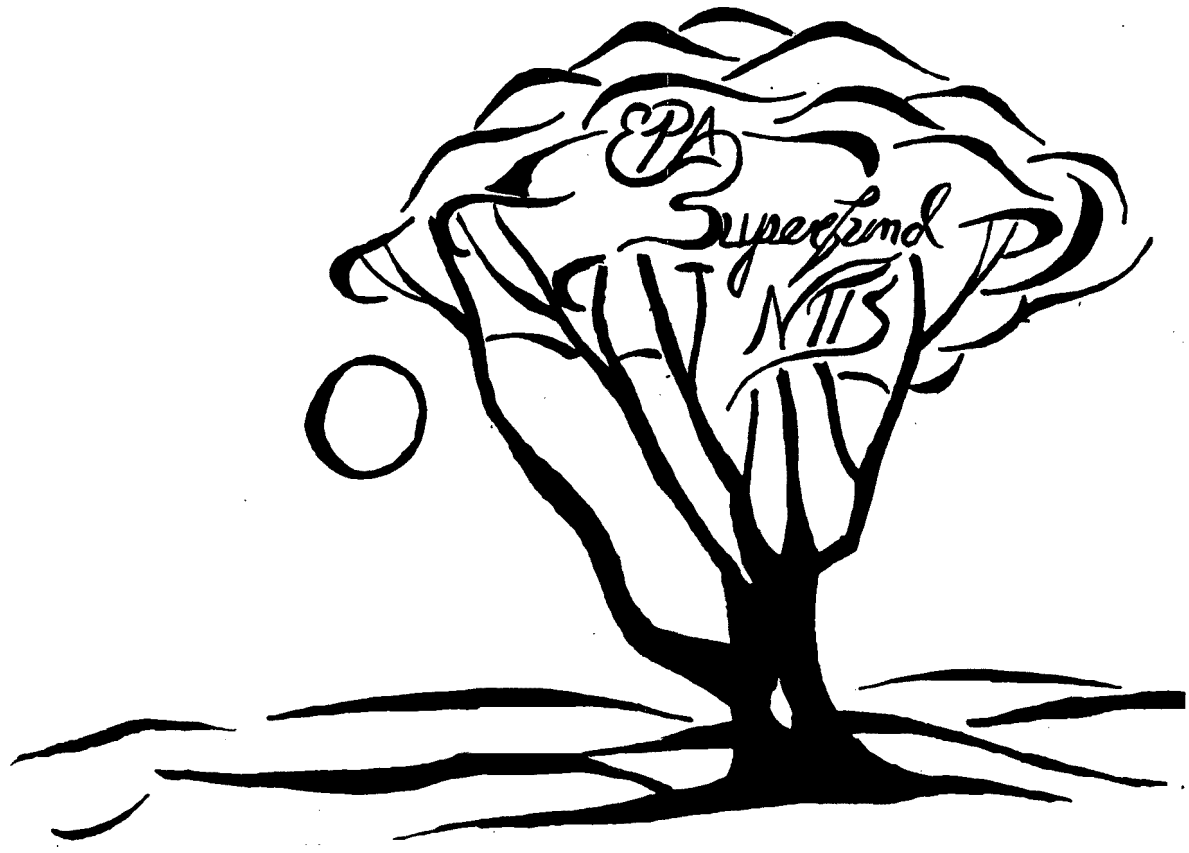
PB94-963715
EPA/ROD/R01-94/089
November 1994

EPA Superfund Record of Decision:

Brunswick Naval Air Station, Groundwater Operable Unit Site 9, Brunswick, ME, 9/30/94



INTERIM RECORD OF DECISION
FOR THE GROUNDWATER OPERABLE UNIT
AT SITE 9
NAVAL AIR STATION, BRUNSWICK
BRUNSWICK, MAINE

SEPTEMBER 1994

NAVAL AIR STATION BRUNSWICK
INTERIM RECORD OF DECISION

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DECLARATION

SITE NAME AND LOCATION

Naval Air Station (NAS) Brunswick
Neptune Drive Disposal Site: Site 9
Brunswick, Maine

STATEMENT OF BASIS AND PURPOSE

This Interim Record of Decision (ROD) document presents the selected interim remedial action of groundwater remediation through natural attenuation, institutional controls, and long-term monitoring of the groundwater operable unit at the Neptune Drive Disposal Site: Site 9 at NAS Brunswick in Brunswick, Maine. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. Through this document, the Navy plans to monitor natural attenuation and prevent exposure to contaminated groundwater which is a potential threat to human health, welfare, or the environment at Site 9, while conducting additional source investigations. This decision is based on information contained in the Administrative Record for the site. Copies of this Administrative Record are located at the Public Works Office at NAS Brunswick, and at the Curtis Memorial Library, 23 Pleasant Street, in Brunswick, Maine.

The State of Maine Department of Environmental Protection (MEDEP) and the U.S. Environmental Protection Agency (USEPA) concur with the selected interim remedy.

A final remedy and subsequent ROD for the site including both groundwater and source operable units will be developed after conducting additional investigations.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from Site 9, if not addressed by implementing the interim response action selected in this ROD, may present an endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The interim remedial action consists of groundwater remediation through natural attenuation, long-term environmental monitoring, institutional controls to prevent exposure to contaminated groundwater, and five-year site reviews. Environmental monitoring of groundwater, surface water, sediment, and leachate seep will be conducted to measure the changes in contaminant concentrations due to natural attenuation. Monitoring results will be submitted to the regulatory agencies as part of the five-year reviews.

By implementing this interim ROD, any threats posed by groundwater at Site 9 are addressed by preventing endangerment to public health, welfare, or the environment. The potential threat to human health is not immediate because groundwater at this site is not currently used as a drinking water supply.

STATUTORY DETERMINATIONS

The selected interim remedial action meets the mandates of CERCLA Section 121. It protects human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the interim remedial action, and is cost-effective. This interim remedy will control risks posed by the site, and will be consistent with a final remedy for the site. Because this action does not constitute the final action at Site 9, the statutory preference for remedies that employ treatment to reduce toxicity, mobility, or volume as a principal element will be addressed in the final response action. Because this remedy may result in hazardous substances being present in groundwater above health-based cleanup concentrations, institutional controls will be necessary and a review will be conducted by the Navy, the USEPA, and the MEDEP within five years to ensure that the interim remedy continues to provide adequate protection of human health and the environment. This review will be conducted at least every five years as long as hazardous substances are present in groundwater above health-based cleanup concentrations or until the ROD for the final site remedy is signed and supersedes this Interim ROD.

The foregoing represents the selection of an interim remedial action by the Department of the Navy and the U.S. Environmental Protection Agency, New England Regional Office, with concurrence of the Maine Department of Environmental Protection.

By: _____ Date: 13 Sep 94
D.J. Nelson

Title: Captain, U.S. Navy
Commanding Officer
Naval Air Station
Brunswick, Maine

The foregoing represents the selection of an interim remedial action by the Department of the Navy, and the U.S. Environmental Protection Agency, Region I, with concurrence of the Maine Department of Environmental Protection.

By: _____ Date: 9/30/94
John P. DeVillars

Title: Regional Administrator, USEPA
U.S. Environmental Protection Agency
Region I

DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

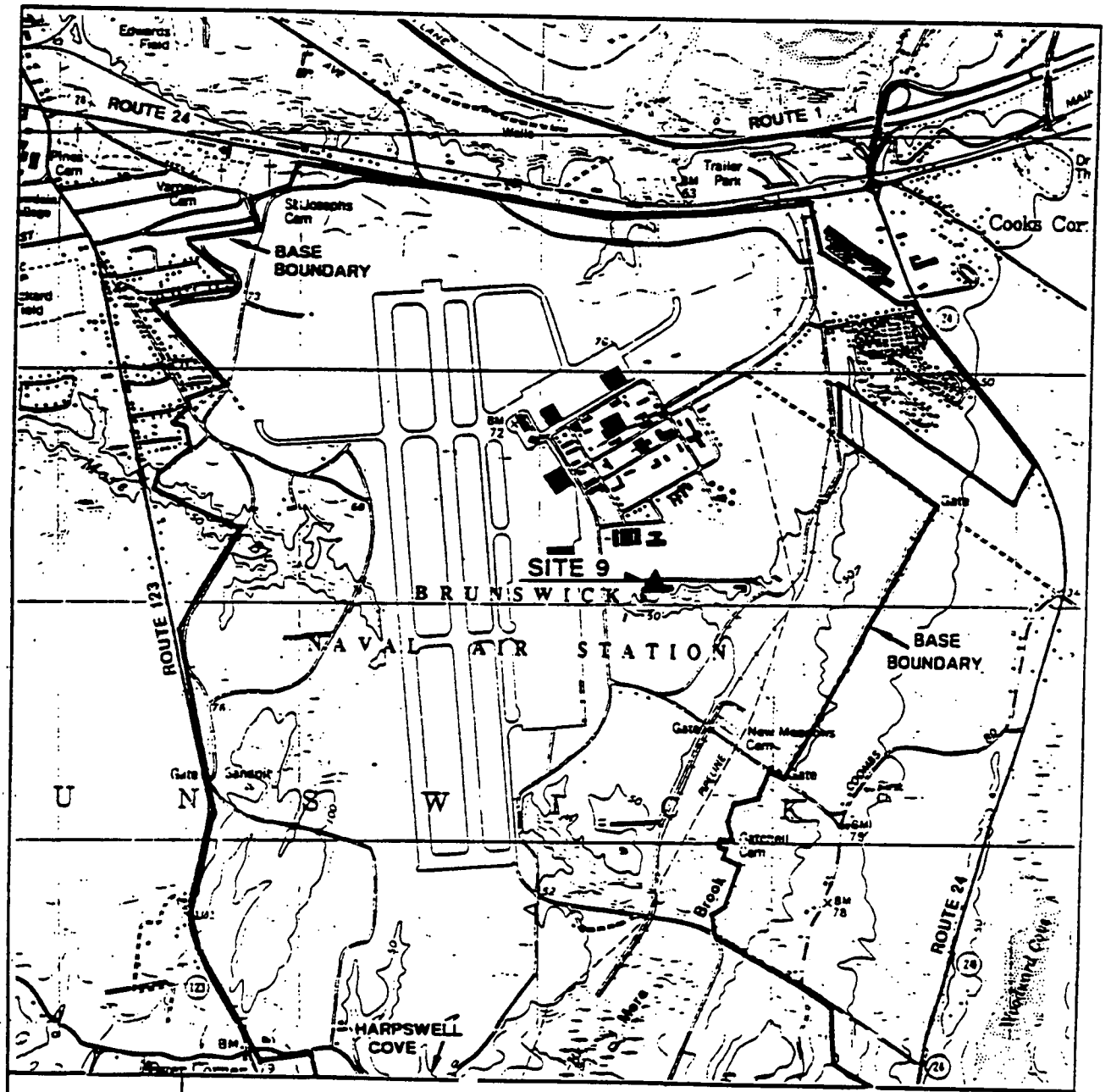
The U.S. Naval Air Station (NAS) Brunswick is located in Brunswick, Maine. In 1987, NAS Brunswick was placed on the National Priorities List (NPL). There are currently 13 areas (Sites) within NAS Brunswick under investigation. This Interim Record of Decision (ROD) relates to the groundwater operable unit that is part of the contamination at Site 9.

NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route 1 and between Routes 24 and 123 (Figure 1). Undisturbed topography at NAS Brunswick is characterized by low, undulating hills with deeply incised brooks; ground surface elevations range from mean sea level (MSL) in lowland drainage areas and the Harpswell Cove estuary, to over 110 feet MSL west and southeast of the southern end of the runways. Topography in the developed areas of the base has been modified by construction, with ground surface elevations generally ranging from 50 to 75 feet above MSL.

NAS Brunswick is located on 3,094 acres. The operations area (138 acres) lies east of the two parallel runways and consists of numerous office buildings, a steam plant, fuel farm, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick aircraft. Forested areas (approximately 48 percent), grasslands (approximately 28 percent), and paved areas (approximately 12 percent) comprise most of the base property. Paved areas are mostly flight ramps and runways. The remaining 12 percent of the base includes the operations area (approximately 5 percent) and miscellaneous shrub land, marsh, and open water. The southern edge of the base borders the estuary of Harpswell Cove.

Property uses surrounding NAS Brunswick are primarily suburban and rural residential, with some commercial and light industrial uses along Routes 1, 24, and 123. An elementary school, a college, and a hospital are located within 1 mile of the western base boundary.

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 (PAC) 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


ROUTE 24
ROUTE 1
BASE BOUNDARY
SITE 9
BRUNSWICK
NAVAL AIR STATION
ROUTE 123
BASE BOUNDARY
HARPSWELL COVE
Cooks Cor
Trailer Park
St Josephs Cem
Edwards Field
New Meadows Cem
Brook
ROUTE 24
MAINE
QUADRANGLE LOCATION
N
SOURCE: USGS QUADRANGLE, BRUNSWICK, AND ORRS ISLAND, ME. DATED 1980, 1978. 7.5 MINUTE SERIES.
SCALE IN FEET
0
2,000
4,000
ABB Environmental Services Inc.
SITE LOCATION MAP SITE 9
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION
BRUNSWICK, MAINE
INTERIM RECORD OF DECISION
JOB NO. 7124-03
FIGURE 1

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 behind Building 201.

These areas are described in the following paragraphs and shown in Figure 2.

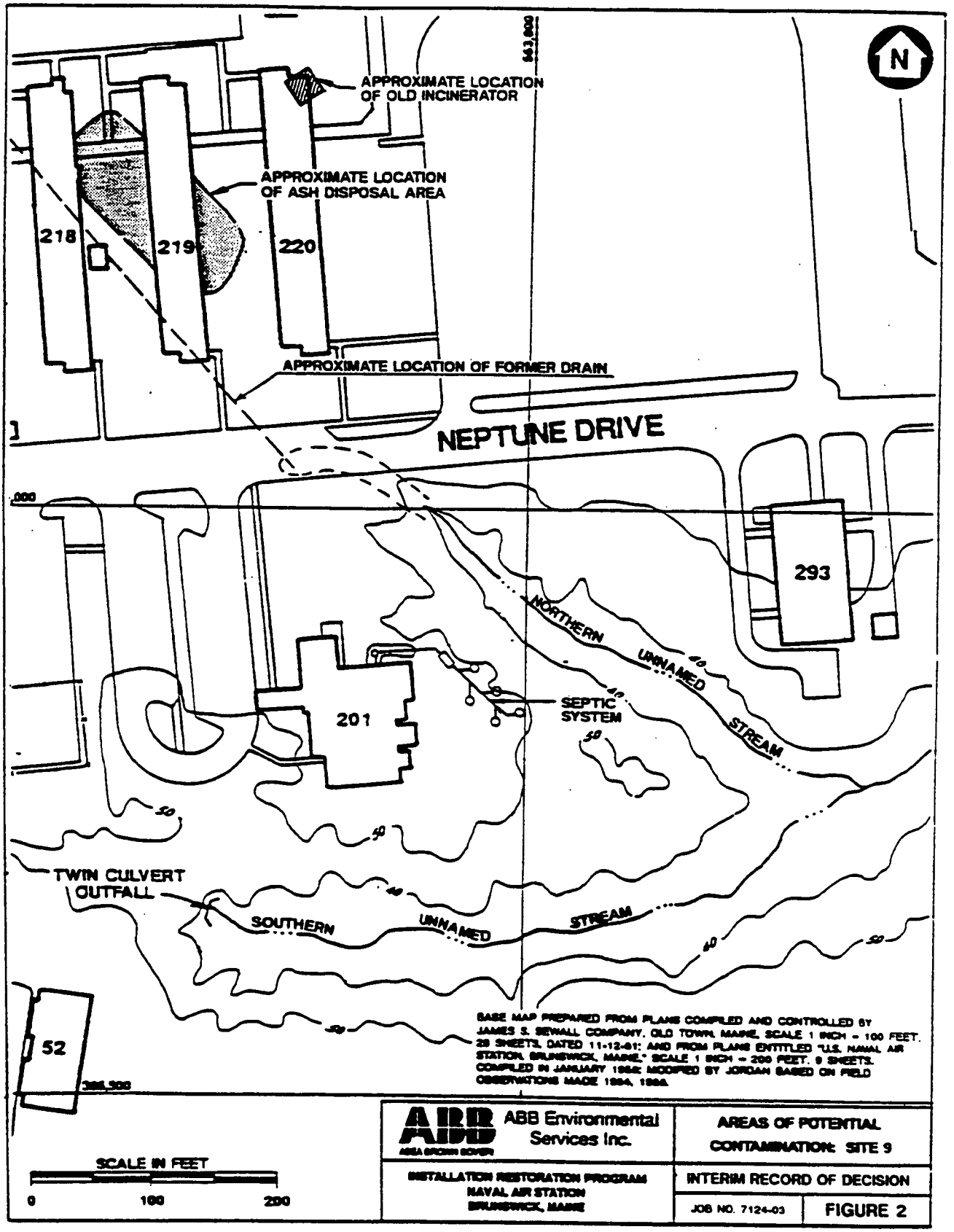
Former Incinerator and Ash Landfill/Dump Area

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 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 plan 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. 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 unnamed stream running between Buildings 201 and 293. The drain may represent a potential preferential pathway for contaminant migration. 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. 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


APPROXIMATE LOCATION OF OLD INCINERATOR
APPROXIMATE LOCATION OF ASH DISPOSAL AREA
218
219
220
APPROXIMATE LOCATION OF FORMER DRAIN
NEPTUNE DRIVE
293
NORTHERN UNNAMED STREAM
SEPTIC SYSTEM
201
TWIN CULVERT OUTFALL
SOUTHERN UNNAMED STREAM
52
BASE MAP PREPARED FROM PLANS COMPILED AND CONTROLLED BY JAMES S. SEWALL COMPANY, OLD TOWN, MAINE, SCALE 1 INCH = 100 FEET, 29 SHEETS, DATED 11-12-81; AND FROM PLANS ENTITLED "U.S. NAVAL AIR STATION, BRUNSWICK, MAINE," SCALE 1 INCH = 200 FEET, 9 SHEETS, COMPILED IN JANUARY 1984; MODIFIED BY JORDAN BASED ON FIELD OBSERVATIONS MADE 1984, 1986.
SCALE IN FEET
0
100
200
ABB Environmental Services Inc.
AREAS OF POTENTIAL CONTAMINATION: SITE 9
INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION
BRUNSWICK, MAINE
INTERIM RECORD OF DECISION
JOB NO. 7124-03
FIGURE 2

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. These streams receive runoff from the central portion of the base including the runways, parking lots, and paved roads. These streams flow and discharge to the Picnic Pond located approximately 3,000 feet downstream of Site 9. Seeps have been observed flowing into the northern unnamed stream.

Groundwater associated with the site is not used for potable or any other purposes. The base is connected to a public water supply administered by the Brunswick-Topsham Water District.

A more complete description of the site can be found in Section 10.0 of the Draft Final Remedial Investigation (RI) Report (E.C. Jordan Co., 1990a); Section 6.0 of the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991); and the Technical Memorandum for Site 9 (ABB-ES, 1994a).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. LAND USE AND RESPONSE HISTORY

NAS Brunswick is an active facility supporting the U.S. Navy's antisubmarine warfare operations in the Atlantic Ocean and Mediterranean Sea. The base's 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 is located in the central portion of the base. Based on historical information, including aerial photographs and grading plans, Site 9 was originally defined as three areas of potential contamination: (1) the former location of an incinerator in the northeastern corner of the current site 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 behind Building 201 (R.F. Weston, Inc., 1983). These areas are described in Section I and shown on Figure 2.

As part of the RI for Site 9, the Navy conducted field activities and environmental sampling in 1988 and 1990 to determine the geologic and hydrologic conditions and

the distribution of contamination at this site. The results of the RI are presented in Section 11.0 of the Draft Final RI Report (E.C. Jordan Co., 1990a) and Section 7.0 of the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991). Additional investigations were conducted by the Navy in 1993 to better evaluate the septic system as a source of groundwater contamination and former incinerator and ash landfill/dump area. The results of these investigations are summarized in the Technical Memorandum. These documents are part of the Administrative Record and are also available for review at the Curtis Memorial Library in Brunswick, Maine.

B. ENFORCEMENT HISTORY

The enforcement history at Site 9 and the NAS is summarized as follows:

- In 1983, an IAS was completed detailing historical hazardous material usage and waste disposal practices at NAS Brunswick. Ten sites were identified and ranked according to potential hazard.

- In 1984, a PAC Study was conducted, which recommended further investigation of seven of the 10 hazardous waste sites originally identified (i.e., Sites 1 through 4 and 7 through 9).

- In 1987, NAS Brunswick was placed on the U.S. Environmental Protection Agency's (USEPA) NPL.

- The RI/Feasibility Study (FS) process was initiated in 1987 for the seven sites identified in the PAC.

- In February 1988, the first Technical Review Committee (TRC) meeting was held. The TRC is comprised of representatives from the Navy, regulatory agencies, surrounding communities and concerned citizens. TRC meetings have been held quarterly since that initial meeting.

- Four sites were added to the RI/FS program in 1989 (i.e., Sites 11, 12, 13, and 14), as well as the two additional sites originally identified in the IAS (i.e., Sites 5 a..d 6). Site 10, originally identified in the IAS, was no longer under the jurisdiction of NAS Brunswick and is not included in the Installation Restoration Program (IRP).

- In 1990, the Navy entered into a Federal Facility Agreement (FFA) with the USEPA and the Maine Department of Environmental

Protection (MEDEP) regarding the cleanup of environmental contamination at NAS Brunswick. The FFA sets forth the roles and responsibilities of each agency, contains deadlines for the investigation and cleanup of hazardous waste sites, and establishes a mechanism to resolve disputes among the agencies.

- In August 1990, the Navy completed the Draft Final RI and Phase I FS reports (E.C. Jordan Co., 1990a and 1990b). The Draft Final RI Report described field sampling investigations, geology and hydrogeology, and presented contamination and risk assessments. The Draft Final Phase I FS identified remedial action objectives, and developed and screened remedial alternatives for the nine original sites studied in the Draft Final RI. The Navy prepared Focused Feasibility Study (FFS) Reports for Sites 1 and 3 and Site 8 in 1991 and 1992, respectively (E.C. Jordan Co., 1991a and 1992a). The Navy submitted a Draft Final Supplemental RI Report for the Eastern Plume and Sites 5, 6, 8, 9, 12, and 14, an FFS Report for Sites 5, 6, and 12, and an FS for Sites 2, 4, 7, 9, 11, and 13 in August and July of 1991, and March 1992, respectively (E.C. Jordan Co., 1991, 1991b, and 1992). A Technical Memorandum summarizing additional field investigations of the septic system and former ash landfill/dump area at Site 9 was prepared in May 1994 (ABB-ES, 1994a). RODs have been signed for Sites 1 and 3, Sites 5 and 6, and Site 8. An Interim ROD has been signed for the Eastern Plume.

- Currently, the Navy is studying 13 sites under the IRP.

Because the Navy is committed to providing a timely response to environmental contamination at NAS Brunswick, a strategy was developed to expedite the RI/FS process. This strategy involves identifying the sites for which enough information is available to proceed to the ROD. Separate timetables have been established for completing the Final FS reports and RODs for these sites.

The Navy has identified the groundwater at Site 9 as a distinct area of contamination and believes the remedial process can be initiated. An FS for Site 9 was submitted to the regulatory agencies for review (E.C. Jordan Co., 1992). A Technical Memorandum was prepared in May 1994 describing the results of additional field investigations of the septic system and former ash landfill/dump area at Site 9 (ABB-ES, 1994a). This document concludes that, to date, no distinct source area of groundwater contamination could be identified at Site 9 (ABB-ES, 1994a). Therefore, the Navy recommended groundwater remediation through natural attenuation. The Navy proposes that long-term monitoring of groundwater, surface

water, sediment and leachate be initiated through this ROD, while additional source investigations of Site 9 continues. A Proposed Plan, detailing the Navy's preferred alternative, was issued in July 1994 and a Public Hearing was held on July 14, 1994, to discuss and accept oral comments on the preferred alternative under consideration for Site 9. Responses to comments received during the public comment period are presented in Appendix A, the Responsiveness Summary.

III. COMMUNITY PARTICIPATION

Throughout the site's investigative and remediation history, the community has been active and involved. Community members and other interested parties have been informed of site activities through informational meetings, fact sheets, press releases, public meetings, and TRC meetings.

In August 1987, the Navy established an information repository for public review of site-related documents at the Curtis Memorial Library in Brunswick. In 1992, the Navy placed the RI, Supplemental RI, and FS reports for Site 9 in the Information Repository and Administrative Record. In 1994, the Navy placed the Technical Memorandum in the Information Repository and Administrative Record. A Public Hearing was held in July 1994. The Administrative Record for Site 9 is available for public review at NAS Brunswick in the Public Works office or at the Curtis Memorial Library. A notice and brief analysis of the Proposed Plan were published in the local newspaper, *The Times Record*.

The TRC has been an important vehicle for community participation. The TRC was established in early 1988 and comprises the Navy, USEPA, MEDEP, and various community representatives. The community members of the TRC include representatives from Brunswick, Harpswell, and Topsham, as well as the Brunswick Area Citizens for a Safe Environment. The TRC also has representatives from the Brunswick-Topsham Water District. The TRC has met on a quarterly basis to review the technical aspects of the program and provide community input.

In September 1988, the Navy released a Community Relations Plan outlining a program to address public concerns and keep citizens informed about and involved in remedial activities. On August 16, 1990, the Navy held an informational meeting to discuss the results of the RI, including field investigations at Site 9.

On July 14, 1994, the Navy held an informational meeting and public hearing to discuss the results of the RI, FS, and Technical Memorandum, and the Navy's preferred alternatives as presented in the Proposed Plan for Site 9. During this meeting, the Navy, its consultants, and regulatory representatives were available to answer questions from the public, and accept formal comments. During the public

comment period from July 12 to August 10, 1994, the Navy accepted comments on the preferred alternative presented in the Proposed Plan for Site 9. These comments and the Navy's responses to them are included in Appendix A, Responsiveness Summary, of this Interim ROD.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The selected interim remedy for Site 9 at NAS Brunswick was developed to address the groundwater operable unit while additional source investigations are conducted. The interim remedial action is not intended to be a final remedy, but is considered consistent with the final remedy that will be chosen. The final ROD will be based on the results of long-term monitoring and additional source investigations relevant to Site 9. Additional interim remedial action(s) may be proposed if data collected before the final ROD warrants such action(s).

V. SUMMARY OF SITE CHARACTERISTICS

The nature and distribution of contamination at Site 9 is summarized by field program and medium in the following paragraphs. A complete discussion of the site characteristics can be found in Section 10.0 of the Draft Final RI Report on pages 10-14 through 10-36 (E.C. Jordan Co., 1990a), and the Technical Memorandum (ABB-ES, 1994a). Summary tables of groundwater contaminants and their concentrations appear in Appendix Q-1 of the Draft Final RI Report and Appendix B of this document.

A. RESULTS OF THE 1988 AND 1990 REMEDIAL INVESTIGATIONS

The RI fieldwork conducted in 1988 and 1990 was designed to assess the areal distribution of soil contamination at the site, monitor groundwater downgradient of Site 9, assess the significance of chemicals detected in the groundwater, and determine the impact of this site on surface water and sediment quality. Most of the RI fieldwork focused on the area south of Neptune Drive and included a soil gas survey; test pits; soil borings; installation of monitoring wells; sampling of soils, groundwater, surface water, sediment, and a leachate seep; and in situ aquifer permeability tests. Sampling locations are presented in Figure 3.

Groundwater Flow and Subsurface Geology

Groundwater flow at the site is to the south and southeast, discharging to the two streams. 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).

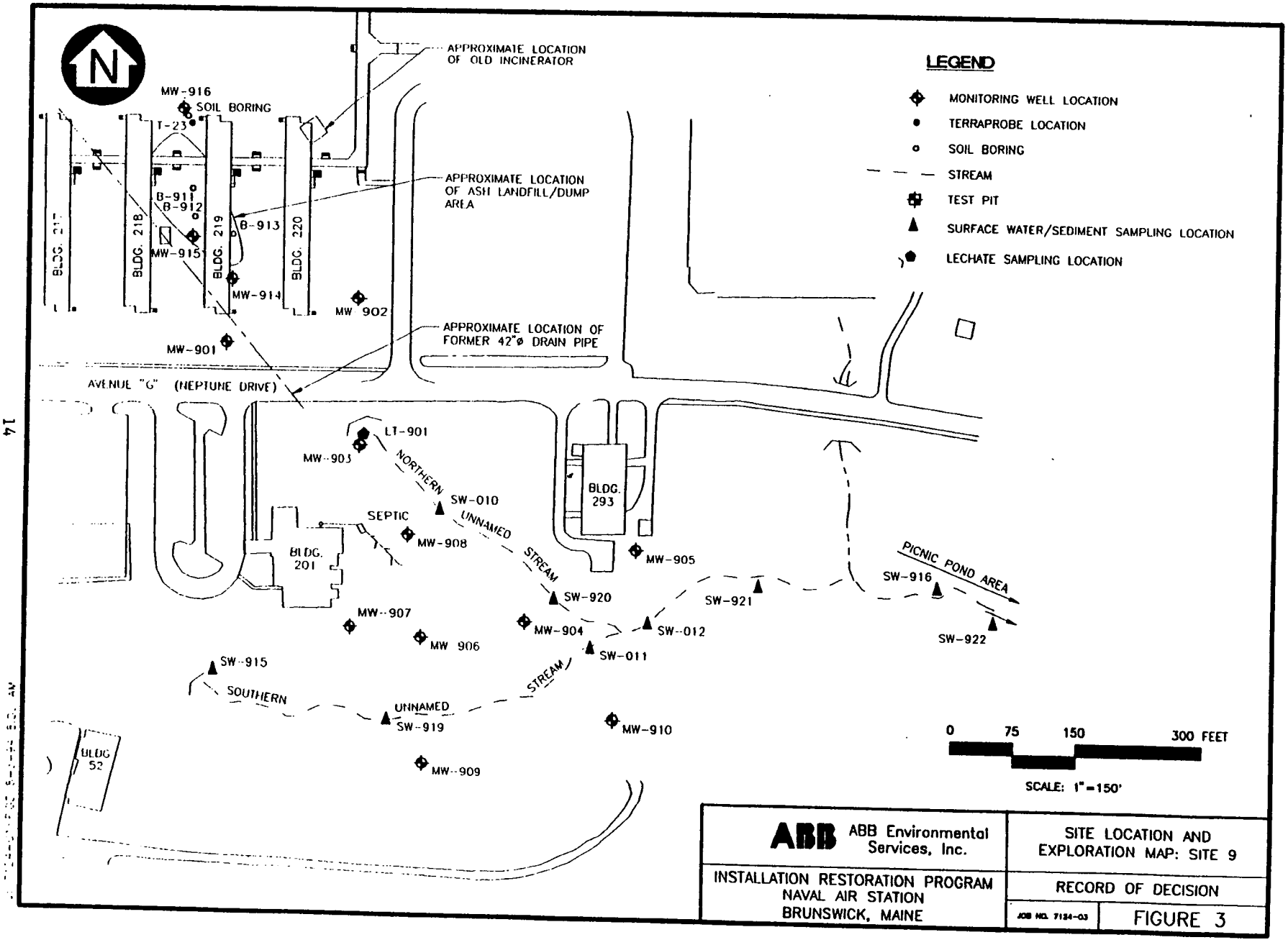

N
APPROXIMATE LOCATION OF OLD INCINERATOR
MW-916
SOIL BORING
T-23
APPROXIMATE LOCATION OF ASH LANDFILL/DUMP AREA
B-911
B-912
B-913
MW-915
MW-914
MW-902
MW-901
APPROXIMATE LOCATION OF FORMER 42"ø DRAIN PIPE
BLDG. 217
BLDG. 218
BLDG. 219
BLDG. 220
AVENUE "G" (NEPTUNE DRIVE)
LT-901
MW-903
NORTHERN
SW-010
UNNAMED
STREAM
SEPTIC
MW-908
BLDG. 201
BLDG. 293
MW-905
PICNIC POND AREA
SW-916
SW-921
SW-920
MW-907
MW-904
SW-012
MW-906
SW-011
SW-922
SW-915
SOUTHERN
STREAM
UNNAMED
SW-919
MW-910
BLDG 52
MW-909
LEGEND
MONITORING WELL LOCATION
TERRAPROBE LOCATION
SOIL BORING
STREAM
TEST PIT
SURFACE WATER/SEDIMENT SAMPLING LOCATION
LECHATE SAMPLING LOCATION
0
75
150
300 FEET
SCALE: 1"=150'
ABB Environmental Services, Inc.
SITE LOCATION AND EXPLORATION MAP: SITE 9
INSTALLATION RESTORATION PROGRAM
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FIGURE 3

Groundwater at Site 9 occurs in the overburden soil and varies in elevation 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 MSL. 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.

Surface and Subsurface Soils

A soil gas survey was conducted to help identify potential areas of volatile organic compound (VOC) contamination. The survey included areas both north of Neptune Drive (two points between Buildings 218, 219, and 220, south of the ash landfill/dump area), and south of Neptune Drive (18 points between Buildings 201 and 293). Two of 20 soil gas points detected low concentrations of VOCs. These points were located near Building 293, east of the site, and do not indicate a source of VOC contamination at Site 9. In subsequent subsurface soil sampling, one VOC, dichloroethene (DCE), was detected at 6 micrograms per kilogram (μg/kg) at a depth of 14 feet in one soil boring (i.e., MW-904) (E.C. Jordan Co., 1990a). No contaminants were detected in subsurface soil samples collected north of Neptune Drive.

Polynuclear aromatic hydrocarbons (PAHs) were detected in several surface soil and test pit soil samples south of Neptune Drive at concentrations up to 30.5 milligrams per kilogram (mg/kg). The location of the highest concentrations of PAHs near the barbecue pit suggests that PAHs may be the result of charcoal or ash disposal or deposits. The low levels of PAHs throughout Site 9 may also be attributable to base operations, including motor vehicle traffic and aircraft exhaust. Low levels (i.e., less than 0.50 mg/kg) of pesticides were detected in four test pit samples and three surface soil samples (E.C. Jordan Co., 1992). These pesticides are believed to be residues from basewide use of dichlorodiphenyltrichloroethane (DDT) in the 1960s and early 1970s.

Leachate Seeps and Sediments

One leachate seep was identified at Site 9 and sampled twice during the RI field program and again in 1993. The seep is located at the head of the northern stream and at the discharge of the historical drain. It is possible that the ash disposal area is the source of contaminants in the leachate. Pesticides were detected at low levels in both the leachate and sediment from this location. Other organic compounds were not detected in the leachate, but two organic compounds, butylbenzylphthalate, and 1,1-dichloroethane (DCA) were each detected in the sediment in one of the three sampling rounds at 820 μg/kg and 39 μg/kg (52 μg/kg in the duplicate sample),

respectively. Inorganic contaminants detected in leachate and sediment samples include arsenic, lead, aluminum, manganese, and zinc.

Surface Water and Sediments

Sixteen surface water and sediment locations in the streams near Site 9 as well as downstream at the Picnic Area Pond (about 3,000 feet downstream of Site 9) were sampled four times during the RI field program. The fuel-related organic compounds benzene (6 to 18 micrograms per liter [μg/L]), toluene (12 to 22 μg/L), ethylbenzene (36 μg/L), xylenes (34 to 74 μg/L), naphthalene (26 μg/L), and methylnaphthalene (25 μg/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 nonpoint source runoff from parking lots, roadways and/or the runways, located upstream of the site, is the source of these contaminants. The source of toluene detected at SW-916 is not known. None of these compounds were detected above their respective freshwater Ambient Water Quality Criteria (AWQC). AWQC are contaminant concentrations in surface water that are considered protective of aquatic organisms.

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 exceeded the chronic AWQC for this metal in both upstream and on-site sampling locations. Concentrations of inorganics in surface water at the Picnic Area Pond did not exceed AWQCs. These concentrations were consistent with background values (E.C. Jordan Co., 1990a).

Site-related VOCs 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).

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 at 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 μg/kg) and butylbenzylphthalate (up to 1,000 μg/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 polychlorinated biphenyls (PCBs) were not detected in surface water or sediment.

Groundwater

Up to five groundwater samples were collected from the wells at Site 9 during the RI and analyzed for Target Compounds List (TCL) VOCs, Semi Volatile Organic Compounds (SVOCs), Pesticides, and Target Analyte List (TAL) inorganics. VOCs were detected in three wells (i.e., MW-904, MW-906, and MW-907). These data are summarized in Table B-1 of Appendix B. Groundwater upgradient of the septic system and south of Neptune Drive did not contain VOCs. Vinyl chloride was detected twice in MW-904 (12 to 27 μg/L), once in MW-906 (31 μg/L), and once in MW-907 (18 μg/L). The federal Maximum Contaminant Level (MCL) for vinyl chloride is 2 μg/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 μg/L. DCA was detected in four of five sampling rounds in MW-904 at concentrations ranging from 5 to 12 μg/L. DCA was detected in MW-906 at 36 μg/L in only one sampling round. DCA was also detected in two groundwater samples (i.e., CP-902 and CP-903) collected in 1991 downgradient of the septic system at 20 and 7 μg/L, respectively. There is neither an MCL nor an MCLG for DCA, but the MEG is 5 μg/L. DCE was detected in MW-904 in two sampling rounds at 6 μg/L, and in MW-906 at 79 μg/L. The MCL, MCLG, and MEG for 1,2-DCE are all 70 μg/L.

SVOCs were detected at some wells but at estimated concentration (i.e., below the contact required quantification limit [CRQL]). Inorganics detected in Site 9 groundwater were in the normal background range, except for sodium, calcium, iron, and magnesium (E.C. Jordan Co., 1990a). Mercury was detected in MW-904 in two sampling rounds in 1989, but has not been detected at the site since. Mercury concentrations were 0.22 and 0.23 μg/L, below its MCL, MCLG, and MEG of 2 μg/L.

B. Results of 1993 Investigations

In 1991, additional historical information was discovered, identifying the presence of a septic system east of Building 201. The 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) It was speculated that the septic system, located upgradient of the monitoring wells with the highest contaminant levels, was 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 south at Neptune Drive and to further evaluate the former incinerator and ash landfill/dump area north of Neptune Drive. The investigations included the installation of soil borings, additional groundwater monitoring wells, completion of a TerraProbe survey, and collection and analysis of groundwater, surface water, and leachate samples.

South of Neptune Drive - Septic System Investigation

In January 1993, borings were drilled through the septic tank and four of the five cesspools to determine if the septic system was the source of VOC contamination in groundwater east of Building 201. VOCs, if present, would likely be attached to the organic-rich soils within the septic tank and cesspools. Organic sediment in the septic tank and the organic layers in the cesspools were visually identified and five samples were collected and analyzed for contamination. Chlorobenzene was the only site-related contaminant detected in the subsurface soils around the septic system at a concentration of 16 μg/kg. No VOCs, PCBs or pesticides were detected above the CRQL. While the septic system cannot be ruled out as being a past source of VOC contamination detected in this area, results of these samples indicate that the septic system is not a current source of contamination.

Two monitoring wells were installed south of the southern unnamed stream (MW-909 and MW-910), and groundwater samples were collected from these new and from the four existing wells (MW-904, MW-906, MW-907, and MW-908) behind Building 201. Samples were sent for analysis for TCL VOCs, SVOCs, pesticides, PCBs, and TAL inorganics. No VOCs were detected above the CRQL. However, vinyl chloride (non-detect to 9J μg/L), DCA (non-detect to 2J μg/L), and toluene (non-detect to 1J μg/L), were observed in one or more samples and one SVOC (bis-2-ethylhexyl)phthalate at 12J μg/L in MW-906) was observed in the 1993 sampling event.

Only a few inorganics were observed in samples from MW-909 and MW-910 above background concentrations. Of these, only aluminum, iron, and manganese exceeded their respective MCLs, but these are secondary standards based on aesthetic qualities and not on protection of human health. A summary of these data are presented in Tables B-2 and B-3 of Appendix B.

The groundwater sample results also indicate that contaminants are not migrating beneath the southern unnamed stream. These data support the assumption that contaminated groundwater discharges directly to the unnamed streams. To evaluate whether or not the former drain acts as a conduit for any contaminants that may be site-related, a leachate surface water and a sediment sample were collected on the south side of Neptune Drive at location LT-901. These samples were analyzed for

the same analytes as those tested for in the groundwater samples. Detections of DCA, PAHs, and pesticides were noted in the sediment sample.

North of Neptune Drive - Former Incinerator and Disposal Area

A TerraProbe investigation consisting of 33 locations, and three monitoring wells were installed during the 1993 field investigation north of Neptune Drive. Results of these activities identified the distribution of ash in the former landfill/dump area. The ash extends on either side of Building 219. Ash, found from 6 to 16 feet below ground surface (bgs), was sampled and found to contain PAHs at concentrations from 3.8 to 33 mg/kg. The presence of PAHs is typical with burned materials observed in the borings.

Three monitoring wells were installed during this field investigation consisting of one upgradient well (MW-916), and two wells downgradient of the ash landfill/dump area (MW-914 and MW-915) and one groundwater sample from each well was collected for chemical analysis.

Groundwater samples collected immediately downgradient of the ash disposal area did not contain PAHs at concentrations that could be quantified. Sporadic low concentrations of DCA, DCE, and vinyl chloride were detected in the two downgradient monitoring wells. Except for vinyl chloride, all compounds were detected below their respective MCLs. Vinyl chloride was detected only in one monitoring well at a maximum concentration of 10J μg/L, which is above its MCL of 2 μg/L. Elevated inorganic concentrations were detected in the downgradient wells. However, only two analytes, cadmium and manganese, were detected above their respective MCLs. A summary of these data are presented in Tables B-2 and B-3 of Appendix B.

The groundwater sampling results from the downgradient monitoring wells do not indicate a significant source of VOC contamination that continuously impacts groundwater quality. Overall groundwater quality in the two downgradient wells indicate that, although the ash is below the water table, organic compounds are not leaching from the ash or migrating through groundwater flow at concentrations of concern to human health or the environment.

C. SUMMARY

The results of the 1988, 1990, and 1993 field investigations at Site 9 indicate the presence of vinyl chloride and DCE in groundwater at concentrations in excess of their MCLs and vinyl chloride, DCE and DCA in excess of their MEGs. The septic system, originally thought to be the source of VOC contamination south of Neptune

Drive, was sampled to evaluate residual contamination. Sampling results indicate that the septic system is not currently a source of groundwater contamination. The former ash landfill/dump area, north of Neptune Drive, was identified and characterized. 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 landfill/dump 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.

The Navy recommended an interim remedial action for the groundwater operable unit at Site 9 because no definitive source area was found. Despite the inability to determine the source of groundwater contamination, the previous investigations have concluded that: the former incinerator and ash landfill/dump area and the septic system are not current sources of VOC contamination. The interim remedial action consists of long-term monitoring of groundwater, surface water, sediment and leachate at Site 9 to evaluate groundwater remediation by natural attenuation both north and south of Neptune Drive. The Navy is proposing additional source investigations at Site 9. The final Proposed Plan and ROD for Site 9 will incorporate the results of additional and address any other remedial actions that may be necessary to remediate the remainder of Site 9.

VI. SUMMARY OF SITE RISKS

A baseline risk assessment was conducted to estimate the potential risks to human health and the environment from exposure to groundwater, surface water, sediment, leachate, and soil contaminants associated with Site 9. The human health risk assessment followed a four-step process: (1) contaminant identification, which identified those hazardous substances that, given the specifics of the site, were of significant concern; (2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and established the extent of possible exposure; (3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and (4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and noncarcinogenic risks. The results of the baseline risk assessment for Site 9 are summarized in Appendix Q of the Draft Final RI Report (E.C. Jordan Co., 1990a). However, because this section is to support the interim groundwater ROD, only the risks associated with groundwater exposure are

summarized in this section. A summary of site risks will be presented in the final ROD for this site.

The groundwater contaminants of concern (COC) identified in the Site 9 human health risk assessment constitute a representative subset of all the contaminants identified during the RI. The COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment. The COCs are summarized in Tables Q-7 and Q-14 in Appendix Q of the Draft Final RI Report (E.C. Jordan Co., 1990a). A summary of the health effects of each COC is presented in Appendix Q, pages Q-122 through Q-151 of the Draft Final RI Report (E.C. Jordan Co., 1990a).

The potential risks associated with exposure to groundwater contaminants south of Neptune Drive were qualitatively evaluated in the Draft Final RI report (E.C. Jordan Co., 1990a) based on a comparison of contaminant concentrations to MCLs, MCLGs, MEGs, or health-based criteria. Quantitative risk estimates were developed as part of the Technical Memorandum (ABB-ES, 1994a) to evaluate risks associated with potential future use of groundwater from the portion of Site 9 north of Neptune Drive not previously evaluated. A summary of the groundwater contaminants of concern, analytical data and regulatory standards and criteria are presented in Table 1.

VOCs were the contaminants detected most frequently at Site 9. VOCs were detected in three wells (MW-904, 906 and 907) located south of Neptune Drive and one well (MW-915) located north of Neptune Drive. Vinyl chloride was detected at concentrations ranging from non-detect to 31 μg/L south of Neptune Drive and from non-detect to 10J μg/L north of Neptune Drive. The federal MCL for vinyl chloride is 2 μg/L. The federal MCLG is zero because this compound is classified as a carcinogen. The MEG for vinyl chloride is 0.15 μg/L. In addition to vinyl chloride, DCA and DCE were detected in groundwater at concentrations in excess of either the MCL, MCLG, or MEG.

Inorganics detected in groundwater at Site 9 were in the normal background range, except for sodium, calcium, iron, mercury and magnesium (south of Neptune Drive) and sodium, calcium, aluminum, chromium iron, and manganese (north of Neptune Drive). Aluminum, iron, and manganese concentrations exceeded their respective MCLs. However, the MCLs for these inorganics are based on aesthetic qualities and not on protection of human health.

Quantitative risk estimates for ingestion of groundwater were developed as part of the Technical Memorandum based on analytical data collected in 1993. The risk estimates were based on a residential exposure and assumed that a 70-kilogram adult

TABLE 1

GROUNDWATER CONTAMINANTS AND REGULATORY CRITERIA

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

COMPOUND	CONCENTRATION RANGE (µG/L)	FEDERAL MCL (µG/L)	FEDERAL MCLG (µG/L)	MAINE MEG (µG/L)
Vinyl Chloride	ND - 31	2	0	0.15
1,1-Dichloroethane	ND - 36	--	--	5
1,2-Dichloroethylene	ND - 79	70	70	70
2-Butanone	ND - 110	--	--	--
Toluene	ND - 1J	1,000	1,000	2,000
PAHs (total)	ND - 12J	--	--	--
Mercury	ND - 0.23	2	2	2

Notes:

MCL = Maximum Contaminant Level; (USEPA, 1992)
MCLG = Maximum Contaminant Level Goal; (USEPA, 1992)
MEG = Maximum Exposure Guideline; (MEDOH, 1990)
ND = Not Detected
J = Estimated Concentration

drinks 2 liters of water per day for 30 years. This scenario is considered to be conservative because groundwater beneath the site is not currently used for potable purposes. The quantitative risk estimates are presented in Appendix C of the Technical Memorandum (ABB-ES, 1994a) and summarized in the following paragraphs.

Excess lifetime cancer risks were estimated for the groundwater exposure pathway by multiplying the exposure level by the chemical-specific cancer slope factor (CSF). CSFs have been developed by USEPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risks posed by potentially carcinogenic compounds. That is, the true risk is unlikely to be greater than the predicted risk. The resulting risk estimates are expressed in scientific notation as a probability (e.g., $1x10^{-6}$ for 1/1,000,000) and indicate (using this example) that an individual is not likely to have more than a one-in-a-million chance of developing cancer over 70 years as a result of site-related exposure to the compound at the stated concentration. Current USEPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The Hazard Index (HI) was also calculated for the groundwater exposure pathway as USEPA's measure of the potential for noncarcinogenic health effects. The HI is the sum of Hazard Quotients (HQs), which are calculated for each chemical by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects. RfDs have been developed by USEPA to protect sensitive individuals during the course of a lifetime, and they reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help confirm that adverse health effects will not occur. The HQ is often expressed as a single value (e.g., 0.3) indicating the ratio of the stated exposure as defined to the RfD value (in this example, the exposure as characterized is approximately one-third of an acceptable exposure level for the given compound). The HQ is only considered additive for compounds that have the same or similar toxic endpoints. Risk estimates developed as part of this baseline risk assessment were evaluated using the USEPA criteria and target risk range to identify the need for remedial actions at this site.

The significance of risk estimates was evaluated by comparing risks to established target levels. USEPA has established target levels for the evaluation of carcinogenic risks and noncarcinogenic hazards at hazardous waste sites. USEPA's guidelines state that the total incremental carcinogenic risk for an individual resulting from multiple-pathway exposures at a Superfund site should not exceed a range of 10^{-6} to 10^{-4}. The State of Maine has established a guideline of $1x10^{-5}$ incremental carcinogenic risk as a target risk level for remediation at hazardous waste sites. The

risk characterizations in this report refer to the USEPA's target risk range; and carcinogenic risk estimates as being "below the target range" when risks are less than 10^{-6}; "within the target range" when risks are between 10^{-6} and 10^{-4}; and "above the target range" when risks are greater than 10^{-4}. The USEPA's and State of Maine's target hazard level for noncarcinogenic effects is an HI of 1.0.

Incremental cancer risks and HIs for the groundwater scenarios evaluated at Site 9 are summarized in Table 2. The HI is calculated to be 6.0 and 3.0 based on exposure to the maximum and average contaminant concentrations, respectively. Both HIs exceed the USEPA target level of 1.0, but are below the USEPA Region I values of concern for HI of 10 (USEPA, 1989). The elevated HI is due almost entirely to the presence of manganese. The incremental carcinogenic risk is estimated to be $2x10^{-4}$ for the maximum and $1x10^{-4}$ for the average exposure conditions. The cancer risk is attributable to the presence of vinyl chloride. The estimated incremental cancer risks are at or slightly exceed the USEPA target risk range and exceed the MEDEP's risk guideline.

Environmental receptors are not considered to be at risk from exposure to groundwater contaminants. Groundwater at Site 9 discharges to the tributaries bordering the site. The ecological risks associated with exposure to surface water and sediments were calculated and are presented in Appendix Q to the Draft Final RI (E.C. Jordan Co., 1990a). Exposure to contaminants (i.e., DDT and PAHs) from sources other than Site 9 groundwater may be associated with potential risks to aquatic organisms. These risk estimates will be used to determine the need for additional remedial actions in the stream sediments and surface water at Site 9 and will be presented in the final ROD or source operable unit ROD for this site.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, might present an endangerment to public health, welfare, or the environment. The objective of the selected interim remedial action is to reduce contaminant concentrations in groundwater at Site 9 through natural attenuation.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

Under its legal authorities, the lead agency's (i.e., Navy's) primary responsibility at NPL and similar sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) establishes several other statutory requirements and preferences, including a requirement that

TABLE 2
SUMMARY OF RISK ESTIMATES: INGESTION OF GROUNDWATER[1]

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

COMPOUND	MAXIMUM CONCENTRATION (µg/L)	AVERAGE CONCENTRATION (µg/L)	AVERAGE SCENARIO		MAXIMUM SCENARIO	
			HAZARD INDEX (UNITLESS)	INCREMENTAL CARCINOGENIC RISK (UNITLESS)	HAZARD INDEX (UNITLESS)	INCREMENTAL CARCINOGENIC RISK (UNITLESS)
Vinyl Chloride	10	6	0.00027	$1.3x10^{-4}$	0.00027	$2.2x10^{-4}$
1,1-Dichloroethane	1	1	0.00068	NA	0.00068	NA
Naphthalene	1	1	0.00046	NA	0.00046	NA
Acenaphthalene	1	1	0.00068	NA	0.00068	NA
Phenanthrene	1	1	0.0027	NA	0.0027	NA
Bis(2-ethylhexyl)phthalate	2	2	–	$3.3x10^{-7}$	–	$3.3x10^{-7}$
Aluminum	5,510	2,493	0.094	NA	0.17	NA
Barium	443	239	0.21	NA	0.35	NA
Cadmium	6.4	3.8	0.035	NA	0.054	NA
Chromium	9.9	6.4	2.3	NA	5.5	NA
Manganese	1,010	415	0.024	NA	0.024	NA
Vanadium	6.2	6.2	–	NA	–	NA
		Summary	4	$1x10^{-4}$	6	$2x10^{-4}$

Notes:

– Not calculated; no quantitative toxicity information available.
NA Not applicable: compound not considered to be carcinogenic.
1 This scenario is based on 70 kilogram adult ingesting 2 liters of water per day for 30 years.

the Navy's remedial action, when complete, complies with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that the Navy select a remedial action that is cost-effective and that uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances is a principal element over remedies not involving such treatment. Remedial alternatives were developed to be consistent with these congressional mandates.

Based on preliminary information relating to the types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were established to aid in the development and screening of alternatives. These remedial action objectives were established to mitigate existing and future potential threats to public health and the environment, to comply with state requirements, and address community concerns, and include:

- reducing VOC contamination in groundwater to concentrations considered protective of human health
- evaluate groundwater quality and measure contaminant concentrations in the groundwater, surface water, sediment, and leachate through long-term environmental monitoring
- conduct additional source investigations of possible source areas of contamination both north and south of Neptune Drive

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives was developed for the site.

Remedial action alternatives for NAS Brunswick were developed to (1) adequately protect public health and the environment; (2) attain chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs) that can be implemented in a manner consistent with location- and action-specific ARARs; (3) use permanent treatment technologies to the maximum extent practicable; (4) be capable of achieving a remedy in a cost-effective manner, considering short- and long-term costs; and (5) permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances, to the maximum extent practicable.

The Navy's selection of the interim remedial action was the result of a comprehensive evaluation of different alternatives and the regulatory review process. The Draft Final FS for the site was conducted to identify remedial technologies and develop alternatives that could address contamination at the site. The FS report was prepared prior to the results of the 1993 field investigations summarized in the Technical Memorandum (ABB-ES, 1994a). The FS report describes and evaluates five alternatives: an alternative that offers no action; an alternative that offers minimal action but includes institutional controls and long-term monitoring; an alternative that includes a low-permeability cover over an area of concern to minimize rainwater infiltration through a source area; an alternative to remove the source of contamination and dispose of it at an off-site landfill; and an alternative to remove and dispose of the source of subsurface soils that includes extraction/ treatment of groundwater.

The No Action Alternative described in the Phase 1 FS report was renamed Minimal Action in the FS report because it included institutional controls and environmental monitoring. A true No Action Alternative was developed for the FS that included no remedial actions at the site. The No Action Alternative was included to comply with the NCP and to use as a baseline to measure the effectiveness of the alternatives.

VIII. DESCRIPTION OF ALTERNATIVES

Source control and groundwater remedial alternatives for Site 9 were developed and presented in the FS report (E.C. Jordan Co., 1992). However, these alternatives were developed based on the assumption that the septic system and leachfield associated with Building 201 were the sources of groundwater contamination. Sampling results collected and analyzed in 1993 indicate that the septic system and subsurface soils around the septic system are not acting as a current source of contamination (ABB-ES, 1994a). Therefore, remedial actions for removing, containing, or treating the septic system or subsurface soils are not necessary at this time.

The Navy will be conducting additional field investigations in the vicinity of Site 9 to evaluate other potential source areas of groundwater contamination. Until these field investigations are completed, no source control alternatives will be developed. Therefore, this interim remedial action addresses only groundwater contamination. Other alternatives (i.e., a no action alternative and alternatives that include a source control component) will be developed and evaluated after the completion of the additional field investigations at Site 9. Therefore, this section summarizes only the No-Action and Minimal Action Alternatives developed for detailed analysis and described in Section 8.0 of the FS (E.C. Jordan Co., 1992).

ALTERNATIVE 9-A: NO ACTION

The No Action Alternative does not include any remedial actions and provides a baseline for comparing alternatives. In the No Action Alternative, the site would remain undisturbed. Because no remedial actions would be implemented, long-term human health risks for the site would essentially be the same as those identified in the baseline risk assessment.

Estimated Time for Design and Construction: Not applicable
Estimated Time of Operation: Not Applicable
Estimated Capital Cost: None
Estimated Operations and Maintenance Costs (net present worth): None
Estimated Total Cost (net present worth): None

ALTERNATIVE 9-B: GROUNDWATER REMEDIATION THROUGH NATURAL ATTENUATION, INSTITUTIONAL CONTROLS AND LONG-TERM MONITORING

The preferred alternative for the interim remedial action at Site 9 is remediation through natural attenuation, and long-term monitoring of the groundwater operable unit to measure expected decreases of contaminant concentrations over time. In addition, institutional controls will be implemented to limit exposure to groundwater during the time required to reduce contaminant concentrations in groundwater. Because the source has not been characterized, the site groundwater has been set as an operable unit, and a long-term monitoring plan is being prepared. The Navy proposes to initiate additional source investigations to develop the final remedial action at this site.

The preferred alternative is the same as the Minimal Action Alternative described in the FS, except it includes monitoring of the leachate seep at the former drain outlet location when sufficient liquid is present to collect a sample (E.C. Jordan Co., 1992). The preferred alternative also includes groundwater, surface water, and sediment monitoring to measure the decrease in contaminant concentrations by natural attenuation. The time to achieve groundwater clean-up concentrations under this alternative was estimated based on USEPA-approved groundwater models and groundwater flow velocities at the site. Groundwater at Site 9 moves at an estimated 26 feet to 130 feet per year; therefore, a water particle will move through the site (i.e., from Neptune Drive to the southern unnamed stream) in approximately 0.70 years. The groundwater models indicate that it may require three to 22 pore volume flushes to remediate the aquifer. Under natural flow conditions, groundwater clean-up concentrations would be achieved over a period of two to 15 years, the amount of time it would take for the groundwater to discharge to the streams (E.C.

Jordan Co., 1992). Under an active groundwater remediation scenario (i.e., groundwater pumping and treatment), clean-up concentrations would be achieved in approximately three years. This scenario includes pumping contaminated groundwater from two extraction wells to a treatment plant. The treatment process would include pretreatment of the water for metal removal and enhanced chemical oxidation of the organic compounds in the groundwater using ultraviolet light. The treatment process would be designed to meet MCLs for vinyl chloride and 1,2-DCE. Once treated, the water would be discharged to the sewer, one of the streams or reinjected into the aquifer. The time to achieve clean-up concentrations is estimated to be three years with a total cost (net present worth) of 1,300,000

The natural attenuation alternative includes the following components:

- groundwater remediation through natural attenuation,
- long-term monitoring of groundwater, surface water, sediment, and leachate,
- institutional controls, and
- five-year reviews

The Navy will also be conducting additional source investigations concurrent with implementing this alternative.

Components of this interim remedial alternative are described in the following paragraphs.

Institutional Controls. The preferred alternative requires institutional controls (i.e., deed and land use restrictions) to prevent human consumption of contaminated groundwater until monitoring results determine that controls are no longer necessary. These controls would be implemented to restrict future use of site groundwater for drinking water. The legal implications of instituting land-use restrictions would be coordinated with appropriate Navy officials and state and local governments. If NAS Brunswick ever closes, these restrictions would be placed on future development.

Environmental Monitoring. Groundwater and surface water quality would be monitored as a measure of the long-term effectiveness of remediation by natural attenuation. Monitoring groundwater would track contaminant concentrations and groundwater movement. Surface water and sediment monitoring would also track contaminant concentration to evaluate the impact, if any, of groundwater discharge to the streams. The Navy will prepare a Long-Term Monitoring Plan detailing the sampling locations, frequency of sampling events, and contaminants to be analyzed. This plan would be submitted for regulatory agency review, comment, and approval. Environmental monitoring would occur until groundwater clean-up concentrations are

achieved. For cost-estimating purposes, the monitoring was assumed to occur for up to 30 years, although the clean-up concentrations are expected to be achieved within 15 years. The costs for monitoring the groundwater have been included to assess the progress of natural attenuation for up to 30 years.

Five-year Site Review. Under CERCLA 121c, a five-year site review is required for any site where contaminants remain on the site at concentrations that do not allow for unlimited exposure or land use. The five-year review is expected to focus on evaluating whether the remedial alternative continues to provide adequate protection of human health and the environment, and would focus on the data collected as part of the long-term monitoring program. The five-year site review could recommend additional remedial actions at the site or that no further action is necessary. The five-year review would be conducted in cooperation with the MEDEP and USEPA.

The cost estimate for this interim remedial alternative is based on conducting quarterly groundwater sampling at 13 locations; surface water and sediment sampling at five locations; and leachate sampling at one location for a period of five years. After five years, the sampling frequency is assumed to occur bi-annually for 10 additional years and annually for up to 30 years. All samples will be analyzed for VOCs and selected samples analyzed for SVOCs and inorganics. The cost estimate also includes costs associated with conducting five-year reviews. The actual costs of this interim remedial alternative will be determined based on the final Long-Term Monitoring Plan and agency input during the five year reviews.

Estimated Time for Design and Construction: Not applicable
Estimated Time of Operation: 30 years of monitoring
Estimated Capital Costs: $0
Estimated Operations and Maintenance Costs (net present worth): $434,000
Estimated Total Cost (net present worth): $434,000

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, the Navy is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP lists nine evaluation criteria to be used in assessing individual remedial alternatives.

A detailed analysis was performed on the alternatives using the nine evaluation criteria to select a site remedy. The following is a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria. These criteria and their definitions are as follows:

Threshold Criteria

The two threshold criteria described below must be met for the alternatives to be eligible for selection in accordance with the NCP.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed by each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with ARARs** describes how the alternative complies with chemical-, location-, and action-specific ARARs, or other criteria, advisories, and guidance.

Primary Balancing Criteria

The following five criteria are used to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

3. **Long-term effectiveness and permanence** evaluates the effectiveness of alternatives in protecting human health and the environment after response objectives have been met, in terms of the magnitude of residual risk and the adequacy and reliability of controls.

4. **Reduction of toxicity, mobility, or volume through treatment** evaluates the treatment technologies by the degree of expected reduction in toxicity, mobility, or volume of hazardous material. This criterion also evaluates the irreversibility of the treatment process and the type and quantity of residuals remaining after treatment.

5. **Short-term effectiveness** addresses the period needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the remedial action objectives are achieved.

6. **Implementability** assesses the ability to construct and operate the technology; the reliability of the technology; the ease of undertaking additional remedial actions; and the ability to

monitor the effectiveness of the remedy. Administrative feasibility is addressed in terms of the ability to obtain approvals from other agencies. This criterion also evaluates the availability of required resources, such as equipment, facilities, specialists, and capacity.

7. **Cost** evaluates the capital and operation and maintenance costs of each alternative, and provides an estimate of the total present-worth cost of each alternative.

Modifying Criteria

The modifying criteria are used in the final evaluation of remedial alternatives generally after public comment on the RI/FS and Proposed Plan has been received.

8. **State acceptance** addresses whether, based on its review of the RI/FS and Proposed Plan, the state concurs with, opposes, or has no comment on the alternative the Navy proposed for the remedial action.

9. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and FS report and requires a determination of which components of the alternatives interested persons in the community support, have reservations about, or oppose.

The state acceptance criterion has been addressed by incorporating comments received from the state on the Proposed Plan. The final acceptance by the state will be evaluated after the state has had an opportunity to review comments received during the public comment period. The state is a party to the FFA and has had the opportunity to review and comment on all documents relating to Site 9. Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of the alternatives against the nine criteria, was conducted. The comparative analysis for the original alternatives can be found in Table 8-11 of the FS (E.C. Jordan Co., 1992). A description of the preferred alternative can be found in the Proposed Plan (ABB-ES, 1994b). The section below presents the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analysis.

Overall Protection of Human Health and the Environment

Overall Protection of Human Health and the Environment addresses how an alternative as a whole will protect human health and the environment. This includes an assessment of how human health and environmental risks are properly eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

The interim remedial action developed for Site 9 will provide protection of human health and the environment. Protection of human health is provided by reducing exposure to site contaminants through institutional controls. Protection to the environment would be provided, over time, as natural attenuation reduces contaminant concentrations discharging to the unnamed streams. Clean-up concentrations would be achieved over two to 15 years, the amount of time required for the groundwater to discharge to the streams.

Compliance with Applicable or Relevant and Appropriate Requirements

Compliance with ARARs addresses whether or not a remedy complies with all state and federal environmental and public health laws and requirements that apply or are relevant and appropriate to the conditions and clean-up options at a specific site. If an ARAR cannot be met, the reasons must be clearly stated and a waiver may be required. When comparing interim remedies, it is appropriate to analyze compliance with only those laws and regulations that are applicable or relevant and appropriate to the limited scope of the interim action.

The interim remedial alternative will attain ARARs that apply to the limited scope of the interim action. Because the remedy selected is an interim action that includes no remedial action, the location- and action-specific ARARs do not apply. The selected remedy would meet the following chemical-specific federal and state ARARs: Safe Drinking Water Act MCLs and non-zero MCLGs; and Maine Drinking Water Rules.

Long-term Effectiveness and Permanence

Long-term Effectiveness and Permanence refers to the ability of an alternative to maintain reliable protection of human health and the environment over time once clean-up goals have been met.

Site 9 risks associated with the groundwater operable unit stem largely from potential exposure to groundwater as drinking water. Because there is no current use of groundwater, there is no immediate threat to human health at Site 9.

The interim remedial action depends solely on institutional controls and land use restrictions to reduce risks, while natural attenuation will provide the long-term effectiveness. Effective enforcement of institutional controls will be needed to assume proper protection of human health under this alternative.

Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of Toxicity, Mobility, or Volume through Treatment are three principal measures of the overall performance of an alternative. The 1986 Superfund amendments emphasize that, whenever possible, USEPA should select a remedy that uses a treatment process to permanently reduce the level of toxicity of contaminants at the site, the spread of contaminants away from the source of contamination (i.e., mobility), and the volume or amount of contamination at the site.

The interim remedial alternative relies on institutional controls and natural flushing of the aquifer to achieve risk reduction. There is no treatment component to this alternative. Therefore, this alternative does not meet this criterion. An active groundwater remediation scenario (i.e., groundwater pumping and treatment) would achieve a significant and permanent reduction of toxicity, mobility, and volume of VOCs in groundwater.

Short-term Effectiveness

Short-term Effectiveness refers to the likelihood of adverse effects on human health or the environment that may result during the construction and implementation of an alternative until clean-up goals have been achieved.

There will be no impacts to the community, workers, or environment above those that currently exist at Site 9 as a result of implementing the interim remedial alternative.

Impacts to workers conducting long-term monitoring will be controlled by the use of appropriate personal protective clothing and equipment during remedial activities. All site work would be conducted in accordance with Occupational Safety and Health Administration (OSHA) regulations.

Implementability

Implementability refers to the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the alternative.

The interim remedial action is implementable. Long-term monitoring has been successfully demonstrated at other Superfund sites. An active groundwater remediation scenario would be easily implemented. Groundwater treatment methods are well developed and demonstrated, although UV/oxidation has not been used extensively. There should be little difficulty constructing extraction wells and the treatment plant and obtaining the clean-up concentrations. Additional remedial actions, if necessary, would not be hindered by this remediation scenario.

Cost

Cost includes the capital (up-front) cost of implementing an alternative as well as the cost of operating and maintaining the alternative over the long term, and net present worth of both capital and operation and maintenance costs.

The capital, operation and maintenance, and total cost for the interim remedial action alternative is provided as part of the Description of Alternatives in Section VIII. The estimated total cost (net present worth) is $434,000. The costs are based on sampling 13 monitoring well locations, five surface water and sediment locations and one leachate seep. Quarterly sampling is assumed for the first five years, with bi-annual sampling through 15 years and annual sampling up to 30 years. The major cost component in this alternative is long-term environmental monitoring.

The estimated total costs (net present worth) for an active groundwater remediation scenario is $1,300,000. These costs include the capital costs for installing the extraction wells and building the treatment plant, operation and maintenance costs associated with the treatment plant and annual monitoring costs for a period of five years.

State Acceptance

As a party to the FFA, the State of Maine has provided comments and recommendations on the RI reports, FS, Technical Memorandum and Proposed Plan. The Navy has taken the State's comments into account. The State has documented its concurrence with the remedial action as stated in Section XIII of this ROD. A copy of the state's letter of concurrence is presented in Appendix C of this ROD.

Community Acceptance

Community Acceptance addresses whether the public concurs with the Navy's Proposed Plan. Community acceptance of the Proposed plan was evaluated based on comments received at the public hearing and during the public comment period.

This is documented in the Responsive Summary presented in Appendix B of this ROD.

X. THE SELECTED REMEDY

The selected remedy for the Interim ROD at Site 9 is Alternative 9B. This alternative consists of groundwater remediation through natural attenuation, long-term environmental monitoring of groundwater, surface water, sediment and leachate, institutional controls and five-year reviews.

This action does not address the source of contamination, and a final remedy for the site will be presented after additional source investigations are conducted. In addition, the need for remedial action in sediments and surface waters in the streams will be evaluated and addressed in the final ROD for Site 9 or in a separate operable unit ROD.

A. CLEANUP CONCENTRATIONS

Cleanup concentrations have been established for the COCs identified in the risk evaluation. Cleanup concentrations have been set equivalent to the appropriate ARARs (e.g., MCLs) if available. In the absence of a chemical-specific ARAR, or other suitable criteria to be considered, a concentration corresponding to a 10^{-6} excess cancer risk level for carcinogenic effects of an HQ of 1.0 for noncarcinogenic effects was used to set cleanup concentrations. Periodic assessment of the protection afforded by remedial actions will be made as the remedy is being implemented and until a final remedy is chosen to replace this interim action.

Table 3 summarizes the cleanup concentrations derived based on carcinogenic and noncarcinogenic effects for the COCs identified in the groundwater. These cleanup concentrations are consistent with ARARs for groundwater.

B. DESCRIPTION OF REMEDIAL COMPONENTS

This interim remedial action consists of:

- groundwater remediation through natural attenuation,
- long-term monitoring of groundwater, surface water, sediment, and leachate,
- institutional controls, and
- five-year reviews.

TABLE 3
TARGET CLEANUP CONCENTRATIONS

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

CONTAMINANT	MAXIMUM CONCENTRATION (µg/L)	MCL (µg/L)	MEG (µg/L)	TARGET CLEANUP CONCENTRATION (µg/L)
DCE	79	70	70	70
DCA	36	N/A	5	5
Vinyl Chloride	31	2	0.15	2

Notes:

MCL = Maximum Contaminant Level (Federal Safe Drinking Water Act)
MEG = Maximum Exposure Guideline (State of Maine Drinking Water Rules)
N/A = Not Available
µg/L = micrograms per liter
DCA = dichloroethane
DCE = dichloroethylene

Natural Attenuation

Based on previous investigations, the Navy does not believe there to be a continuing source of groundwater contamination at Site 9. Therefore, the time to achieve groundwater cleanup concentrations by natural attenuation was estimated based on USEPA-approved groundwater models and groundwater flow velocities at the site. Groundwater at Site 9 moves at an estimated 26 to 130 feet per year; therefore, a water particle will move through the site (i.e., from Neptune Drive to the southern unnamed stream) in approximately 0.70 years. The groundwater models indicate that it may require three to 22 pore volume flushes to remediate the aquifer. Under natural flow conditions, groundwater cleanup concentrations would be achieved over a period of two to 15 years, the amount of time it would take for the groundwater to discharge to the streams. Active remediation (i.e., pumping and treatment) of the groundwater was not warranted because of site specific conditions (i.e., sporadic detections or contaminants).

Environmental Monitoring

Groundwater and surface water quality would be monitored as a measure of the long-term effectiveness of remediation by natural attenuation. Monitoring groundwater would track contaminant concentrations and groundwater movement. Surface water, sediment, and leachate monitoring would also track contaminant concentrations to evaluate the impact, if any, of groundwater discharge to the streams. The Navy will prepare a Long-Term Monitoring Plan detailing the sampling locations, frequency of sampling events, and contaminants to be analyzed. This plan will be submitted for agency review and comment. Environmental monitoring would occur until groundwater cleanup concentrations are achieved. For cost-estimating purposes, the monitoring is assumed to occur for a period of 30 years.

Institutional Controls

The selected alternative requires institutional controls to prevent human contact with contaminated groundwater until monitoring results determine that controls are no longer necessary. These controls would be implemented to restrict future use of site groundwater for drinking water. The legal implications of instituting land-use restrictions would be coordinated with appropriate Navy officials and state and local governments. If NAS Brunswick closes, these restrictions would be placed on future development.

Five-year Reviews

Under CERCLA 121c, a five-year site review is required for any site where contaminants remain on the site at concentrations that do not allow for unlimited exposure of land use. The five-year review is expected to focus on evaluating whether the remedial alternative continues to provide adequate protection of human health and the environment, and would focus on the data collected as part of the long-term monitoring program. The five-year site review would be conducted in cooperation with the MEDEP and USEPA.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at NAS Brunswick Site 9 is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective. However, the selected remedy does not satisfy the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element. The selected remedy is an interim action which will be consistent with the final remedy that will be selected for Site 9.

A. THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at Site 9 will permanently reduce the risks posed to human health and the environment by eliminating, reducing, and controlling exposures to human and environmental receptors through natural attenuation. Human health risks will be reduced through the use of institutional controls during the time required to achieve cleanup objectives (estimated to be between two and 15 years). The implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts.

B. THE SELECTED REMEDY ATTAINS ARARS

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to the limited scope of the interim action. Generally, ARARs for the selected interim remedial action are a subset of those found in Tables 2-1, 2-2 and 2-4 of Section 2.0 of the FS (E.C. Jordan Co., 1992). However, because the FS considered permanent remedial alternatives and the remedy selected is an interim action that includes no remedial action, the location- and action-specific ARARs outlined in the FS do not apply. Appendix D presents tabular summaries of the chemical-specific ARARs that apply to the remedy including the regulatory

citation and a brief summary of the regulatory requirement and the action to be taken to attain the ARAR.

The selected remedy would meet the following federal and state ARARs:

Chemical-specific ARARs

- Safe Drinking Water Act (SDWA) - MCLs and non-zero MCLGs
- Maine Drinking Water Rules

The following chemical-specific policies, criteria, and guidelines were also considered:

- Maine Department of Human Services Rule 10-144A, CMR Chapter 233 -MEGs
- USEPA RfDs
- USEPA Human Health Assessment Group CSFs

Location-specific ARARs

No remedial actions are included in this interim action; therefore, location-specific ARARs are not triggered.

Action-specific ARARs

No remedial actions are included as part of this interim action; therefore, location- or action-specific ARARs are not triggered.

Federal and State Drinking Water Regulations. The chemical-specific ARARs identified for Site 9 were applied to the RI/FS process to determine the need for groundwater remediation. The drinking water standards, MCLs, and other guidance and criteria to be considered (TBCs) were used to evaluate potential risk to human health from the ingestion of groundwater. In the evaluation of potential risk, the groundwater in the aquifer underlying the site is classified by the state as GW-A, a drinking water source. The quality and safety of drinking water sources is regulated by the SDWA and Maine Drinking Water Rules. MCLs are enforceable standards under the SDWA that represent the maximum level of contaminants that is acceptable for users of public drinking water supplies. MCLs are relevant and appropriate because, while the groundwater on- and off-site is not currently used as

a drinking water source, the groundwater underlying NAS Brunswick potentially could be used as a drinking water source in the future.

In the case of DCA, because no MCL or other ARAR exists, it is appropriate to consider the Maine MEG in setting a cleanup level. Use of the MEG of 5 μg/L will reduce the risks to levels which are within USEPA's acceptable risk range of 10^{-4} and 10^{-6}. MEGs are developed by the State of Maine based on federal standards, health advisories and environmental toxicology methods.

C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

The selected remedy is cost-effective by affording overall effectiveness proportional to its costs. The Navy evaluated the overall effectiveness of the interim action by assessing the relevant three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. The relationship of the overall effectiveness of the selected remedial alternative was established as being proportional to its costs. The costs associated with this interim remedial alternative include:

Estimated Capital Cost: $0
Estimated Operation and Maintenance Cost (net present worth): $434,000
Estimated Total Cost (net present worth): $434,000

The No Action Alternative has no associated costs.

The preferred alternative is protective of human health and the environment, meets ARARs and response objectives, and is considered to be effective and permanent in its reduction of contaminant concentrations.

D. THE SELECTED REMEDY USES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The Navy identified those alternatives that attain ARARs and that are protective of human health and the environment. The Navy also identified which alternative uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of factors among alternatives in terms of: (1) long-term effectiveness and permanence, (2) reduction of toxicity, mobility, or volume through treatment, (3) short-term effectiveness, (4) implementability, and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and

volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives because it is implementable and provides long-term effectiveness. The selected remedy, however, does not satisfy the statutory preference for treatment because active groundwater treatment is not considered to be cost-effective or feasible at this time. The interim remedial action provides the best balance of trade-offs among these criteria prior to determination of a final remedy.

E. THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

This remedy does not meet the statutory preference for treatment. Active groundwater treatment was not considered to be cost-effective at this time, based on time required to achieve response objectives.

This interim ROD will be followed by a final ROD that will determine what further action, if any, will be necessary for a complete remedy at the site that will meet the preference for treatment which will permanently and significantly reduce toxicity, mobility, or volume of hazardous substances.

XII. DOCUMENTATION OF SIGNIFICANT CHANGES

The Navy presented a Proposed Plan for remediation of the groundwater operable unit at Site 9 in July 1994. The preferred alternative included long-term monitoring of groundwater which will be remediated by natural attenuation. Institutional controls will also be implemented. No significant changes have been made to the alternative described in the Proposed Plan and presented to the public.

XIII. STATE ROLE

As a party to the FFA, MEDEP has reviewed the various alternatives and has indicated its support for the selected interim remedy. MEDEP concurs with the selected interim remedy for NAS Brunswick Site 9. A copy of the letter of concurrence is presented in Appendix C of this Interim ROD.

ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
CRQL	contract required quantification limit
CSF	cancer slope factor
COC	contaminant of concern
DCA	dichloroethane
DCE	dichloroethene
DDT	dichlorodiphenyltrichloroethane
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
FS	Feasibility Study
HI	Hazard Index
HQ	Hazard Quotient
IAS	Initial Assessment Study
IRP	Installation Restoration Program
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guideline
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSL	mean sea level
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration

PAC	Pollution Abatement Confirmation Study
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
RfD	reference dose
RI	Remedial Investigation
ROD	Record of Decision
SDWA	Safe Drinking Water Act
SVOC	semivolatile organic compound
TAL	target analyte list
TBCs	other guidance and criteria to be considered
TCL	target compound list
TRC	Technical Review Committee
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

ABB-ES, 1994a. "Technical Memorandum: Site 9: Neptune Drive Disposal Site"; Portland, Maine; May.

ABB Environmental Services, Inc. (ABB-ES), 1994b. "Proposed Plan for Site 9, the Neptune Drive Disposal Site NAS Brunswick"; Portland, Maine; July.

E.C. Jordan Co., 1985. "Pollution Abatement Confirmation Study NAS Brunswick"; Portland, Maine; July.

E.C. Jordan Co., 1990a. "Draft Final Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1990b. "Draft Final Phase I Feasibility Study Development and Screening of Alternatives NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1991. "Draft Final Supplemental Remedial Investigation Report NAS Brunswick"; Portland, Maine; August.

E.C. Jordan Co., 1991a. "Focused Feasibility Study for Sites 1 and 3 NAS Brunswick"; Portland, Maine; October.

E.C. Jordan Co., 1991b. "Focused Feasibility Study for Sites 5, 6, and 12 NAS Brunswick"; Portland, Maine; July.

E.C. Jordan Co., 1992. "Feasibility Study Sites 2, 4, 7, 9, 11 and 13 NAS Brunswick"; Portland, Maine; March.

E.C. Jordan Co., 1992a. "Feasibility Study for Site 8 NAS Brunswick"; Portland, Maine; March.

R.F. Weston Inc., 1983. "Initial Assessment Study of Naval Air Station, Brunswick, Maine"; Westchester, Pennsylvania; June.

U.S. Environmental Protection Agency (USEPA), 1989. "Risk Assessment Guidance: Region I"; Boston, Massachusetts; February.

RESPONSIVENESS SUMMARY

SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

During the public comment period, written comments were received from special interest groups. At the public meeting on July 14, 1994, several questions and comments were also raised. The following is a list of all comments and questions and the Navy's response.

1. Comment (written): **Page 1-1**. It would be helpful to have an idea of when the interim remedial action will begin, when the Navy anticipates conducting the additional source investigations, and approximately when the final remedial action will be selected. This comment relates to BACSE's concerns, as stated at the July 14, 1994 public hearing on the subject document, that the additional source investigations, as well as the evaluation and possible remediation of contaminated stream sediments be conducted in a timely fashion.

   Response: The interim remedial action for Site 9 of long-term monitoring is scheduled to begin in Fiscal Year 1995 (FY95). The fiscal year begins on October 1, 1994. Additional source investigations are also scheduled for FY95. Based on the results of the additional source investigations, the Navy will either begin the final remedial action for Site 9 or collect additional information to fill potential data gaps. Without knowing the results of the additional source investigations, the Navy cannot commit to a date for the final remedial action at this site. However, the Navy is committed to proceeding in a timely fashion and all schedules for future work will be prepared and submitted to the Technical Review Committee (TRC) for review and comment.

2. Comment (written): **Page 3-4**. Why is the old drain mentioned at the end of the Former Incinerator and Ash Landfill section of concern.

   Response: The old drain is mentioned in this section because it represents a potential preferential pathway for contaminant migration. Contaminants associated with the ash landfill may have leached from the disposal area and migrated through the subsurface soils along the location of the old drain. As part of the additional source investigations, the Navy has proposed sampling the soils from this area and placing a monitoring well to better evaluate this potential contaminant pathway.

SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

(Continued)

3. Comment (written): **Page 4-1**. It should be clarified that the Proposed Plan referred to in the final sentence in Section 4.0 is not the subject document, but rather a future plan related to the additional source investigations, and that the risks to be addressed will include the risks associated with PAHs (polynuclear aromatic hydrocarbons) detected in stream sediments.

   Response: The Proposed Plan referred to in the final sentence of Section 4.0 is the Proposed Plan for the final remediation of Site 9 and **not** the subject document. The "final" Proposed Plan will provide a summary of site risks from exposure to all media including the risks associated with exposure to PAH contamination in stream sediments. These risk estimates will be used to determine the need for additional remedial actions at Site 9 and be summarized in the final Record of Decision (ROD) or operable unit ROD to be prepared for this site.

4. Comment (written): **Page 4-5**. Why is there no risk estimate for 1,2-Dichloroethylene (DCE) in Table 4-2. What are the risk estimates for DCE.

   Response: The risk estimates presented in Table 4-2 were based on analytical data collected in 1993 from the wells (MW-914, MW-915 and MW-916) north of Neptune Drive. 1,2-Dichloroethylene (DCE) was not detected in these wells and therefore, a quantitative risk estimate could not be developed. The quantitative risk estimates in the Proposed Plan are a summary of the risk evaluation presented in the Technical Memorandum (May 1994).

5. Comment (written): **Page 6-1**: The estimate of time (0.70 years) for a water particle to travel through Site 9 does not appear to be correct if groundwater moves at an estimated rate of 26 to 130 feet per year. For example, monitoring well MW-916 is situated almost 500 feet upgradient of the nearest identified groundwater discharge location, the northern unnamed stream (see Figure 3-3, for example). At the estimated rates, groundwater in the vicinity of MW-916 might be expected to discharge to the northern unnamed stream in approximately 3.8 to 19.2 years.

   Response: The estimated time of 0.70 years for a water particle to travel through Site 9 is based on the distance from the area of contaminated

groundwater (i.e., MW-904, MW-906 and MW-908) to the stream. This distance is approximately 90 feet. Assuming a seepage velocity of 130 feet per year, a water particle would require 0.70 years to discharge to the unnamed stream.

6. Comment (written): **Page 6-2**. It is not clear how the results of the additional source investigations will be evaluated in conjunction with the long-term monitoring results. How does the reevaluation of the interim remedial action mentioned in the last sentence on Page 1-1 figure into the long-term monitoring plan.

Response: The results of the additional source investigations will be used to support the final ROD for Site 9. For example, if these investigations indicate a source of groundwater contamination, a final ROD or an operable unit ROD focusing on source remediation may be appropriate. If the investigations do not identify a source of groundwater contamination, the interim remedial action of long-term monitoring may be appropriate as the final action. This determination cannot be made until the results of the source investigations become available for review and evaluation.

The data collected as part of the long-term monitoring program will be evaluated at a minimum of every five years. However, the Navy has indicated that these data will be evaluated more frequently and will be used, as appropriate, to evaluate the effectiveness of the selected interim remedial alternative. If the data collected as part of the long-term monitoring program does not support groundwater remediation through natural attenuation (i.e., decreases in groundwater contaminant concentrations), then additional remedial actions may be necessary. The TRC will be involved in the review and evaluation of the data.

7. Comment (written): **Page 6-3**. Was the cost estimate based on conducting 15 or 30 years of annual monitoring once 5 years of quarterly monitoring and 10 years of biannual monitoring are completed. If the estimated time of operation is 30 years, it would appear that 15 years of annual monitoring is appropriate for the cost estimate.

Response: The cost estimate is based on conducting quarterly sampling for years 0 through 5, biannual sampling for years 6 through 15, and annual sampling for years 16 through 30.

8. Comment (verbal): The citizens group is concerned that additional investigations be conducted in a timely fashion.

Response: The interim remedial action of long-term monitoring and additional source investigations at Site 9 are both scheduled to be conducted during the fiscal year 1995 which begins on October 1, 1994. The Navy considers this to be a timely response to community and regulatory concerns.

9. Comment (verbal): The citizens group is concerned that the sediments in the stream be addressed in a timely fashion.

Response: The Naval Air Station has conducted sediment sampling for PAH contamination in the unnamed tributary adjacent to Site 9. These data will be used in conjunction with existing data and data collected as part of the long-term monitoring program to evaluate potential clean-up alternatives for the stream sediments, as necessary. The remedial alternatives for the stream sediments will be presented in a Proposed Plan and documented in either an operable unit or final ROD for Site 9. The public will have the same opportunity to comment on these alternatives that it has had to comment on the Interim Remedial Alternative presented in this ROD.

10. Comment (verbal): How did the Navy determine that it would take 2 to 15 years to clean up the groundwater?

Response: The range of time estimated for contaminants in the groundwater at Site 9 to decease to drinking water concentrations is based on three variables; (1) the measured groundwater velocities at the site, (2) the distance between the contaminated source area and the discharge location, and (3) the fraction of organic carbon (f_{oc}) which largely determines the retardation factor which then is used to determine the number of pore volumes of groundwater that must flush through the area.

It was estimated to require 0.70 years for a water particle to travel through Site 9, from the area of contaminated groundwater identified in MW-904, MW-906, and MW-908 to the discharge location at the southern unnamed stream. The distance between the monitoring wells and the stream is approximately 90 feet. Using the measured groundwater velocity of 130 feet per year, a water particle would require 0.70 years to discharge to the unnamed stream.

The time required to achieve cleanup concentrations is based on the calculation of 22 pore volumes through the area of contamination. Because the plume contains contaminants that adsorb onto the soil, the plume travels slower than groundwater. The retardation factor assumed in this estimate was based on a range of f_{oc} of 0.01 to 0.001. This range results in the 2- to 15-year estimate presented in the Interim ROD.

11. Comment (verbal): Is it correct that the model used is based on static conditions and not on trends?

    Response: Yes, that is correct.

12. Comment (verbal): Where do the two unnamed streams empty into?

    Response: The two unnamed streams discharge into the lower portion of Mere Brook which discharges into Harpswell Cove.

13. Comment (verbal): Do we know how much contaminants are flowing through those streams every year?

    Response: No. However, the Navy and NAS do monitor the surface water in these streams. The long-term monitoring program described in this ROD will provide additional data that will allow the Navy to estimate the amount of contamination that is discharging from the Site 9 area into the two unnamed streams.

14. Comment (verbal): Are there 8 other sites that are discharging into streams and into Mere Brook?

Response: There are a total of 13 sites that are being studied as part of the Installation Restoration Program (IRP). Of these 9 sites are within the Mere Brook drainage area, as well as several non-IRP sites.

15. Comment (verbal): The best and hopeful plan that you have coming out of this monitoring will show a decrease in these contaminants over the years. Do you hope they just go away? Is that what we're looking for?

Response: Yes. The Navy's remedial action at Site 9 is groundwater remediation through natural attenuation. Allowing natural processes such as degradation to reduce contaminant concentrations in groundwater. Over time, the Navy expects to see a decrease in groundwater contamination. This will be measured through the implementation of the long-term monitoring program.

16. Comment (verbal): The report said something about chromium, was that an error?

Response: No. Chromium was detected in groundwater in two monitoring wells north of Neptune Drive at estimated concentrations of 9.9J μg/L (MW-914) and 4.3J μg/L (MW-915 duplicate sample). Chromium was not detected in the MW-915 sample. The chromium concentration is considered to be estimated because it was detected below the contract required detection limit for the laboratory performing the analysis. Background concentrations of chromium is estimated to be 6.3 μg/L.

17. Comment (verbal): The reason I asked is that chromium has the highest risk estimate (hazard index) as presented in Table 4-2 of the Proposed Plan. Could you just talk about that for a minute?

Response: The risk estimates presented in Table 4-2 of the Proposed Plan are based on the assumption that an individual drinks 2 liters of water per day for 300 days per year over a 30-year exposure duration. All the water is obtained from the area beneath Site 9. The hazard index is the ratio of the exposure dose the individual receives divided by an "acceptable" dose (i.e., concentration of the contaminant that is expected to be without adverse effects). If the hazard index is greater than 1, then the assumed exposure

dose could result in adverse health effects. However, this is not a certainty because of the numerous assumptions and uncertainties made in calculating the ratio (i.e., the assumption that someone drinks the water and that the toxicity data generally conducted on small mammals reflects the risks to humans).

The hazard index for chromium is the highest of all the compounds detected in the groundwater. This indicates, that relative to all other contaminants, chromium could potentially cause the greatest risk if water at Site 9 was used for drinking purposes. Based on these results, chromium should be identified as a contaminant of concern at Site 9. It should be noted that chromium was not detected at Site 9 at concentrations in excess of its Drinking Water Standard of 100 μg/L.

The long-term monitoring program includes the sampling of groundwater and analysis of chromium (among other contaminants). As such, additional data will become available as to the distribution of chromium contamination at Site 9.

GROUNDWATER DATA SUMMARY TABLES

TABLE B-1
SUMMARY OF GROUNDWATER ORGANIC AND INORGANIC ANALYSIS (1989 - 1991)

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

SAMPLING ROUND REPORT DATE SAMPLE LOCATION	1 1/89 MW-904	1 1/89 MW-903	2 3/89 MW-904	2 3/89 MW-903	3 7/89 MW-904	4 1/90 MW-904	4 1/90 MW-903	4 1/90 MW-906	4 1/90 MW-907	4 1/90 MW-908	5 4/91 MW-904	5 4/91 MW-906	5 4/91 MW-907	5 4/91 CP-903	5 4/91 CP-902
Vinyl Chloride	12	ND	27	ND	ND	ND	ND	ND	18	ND	NA	31	NA	NA	NA
1,1-Dichloroethane	12	ND	12	ND	6J	5	ND	36	ND	ND	NA	ND	NA	20	20
1,2-Dichloroethylene	6	ND	6	ND	ND	ND	ND	ND	ND	ND	NA	79	NA	ND	ND
2-Butanone	ND	ND	ND	ND	68J	ND	110	ND	ND	ND	NA	ND	NA	NA	NA
Aluminum	ND	ND	ND	ND	1130	ND	ND	445J	ND	ND	NA	ND	NA	NA	NA
Calcium	18000	9700J	21100	7140	16800	18400	6650	12000	26600	18200	NA	10700	NA	NA	NA
Iron	ND	3600J	ND	3430	1950	ND	3700	ND	ND	ND	NA	115	NA	NA	NA
Magnesium	5700	ND	5960J	ND	5610	5730	ND	ND	5570	ND	NA	ND	NA	NA	NA
Manganese	160	240J	167	207	123	155	223	336	2500	823	NA	52.5	NA	NA	NA
Mercury	0.22J	ND	0.23	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
Sodium	7500	17000J	5410	14000	8040	ND	17800	36700	16100	10800	NA	35100	NA	NA	NA
Zinc	ND	ND	ND	ND	25.3	ND	ND	ND	ND	ND	NA	ND	NA	NA	NA
Bicarbonate	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	43	74	100	NA	NA
Chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.3	29	24	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.9	8.8	6.2	NA	NA

Notes:

All concentrations in µg/L except bicarbonate, chloride, and sulfate which are in mg/L.
Sample locations are shown in Figure 1-2.

µg/L = micrograms per liter
mg/L = milligrams per liter
J = estimated concentration
ND = not detected
NA = not analyzed

TABLE B-2
SUMMARY OF GROUNDWATER ORGANIC ANALYSES (1993)

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

		SOUTH OF NEPTUNE DRIVE							NORTH OF NEPTUNE DRIVE		
	CRQL	*LT-901 3/18/93	MW-904 2/4/93	MW-906 2/4/93	MW-907 2/4/93	MW-908/DUP 2/4/93	MW-909 2/4/93	MW-910 2/4/93	MW-914 3/18/93	MW-915/DUP 3/18/93	MW-916 3/18/93
VOCs (µg/L)											
Vinyl Chloride	10	ND	8J	ND	9J	ND/2J	ND	ND	ND	10J/8J	ND
1,1-DCA	10	ND	ND	ND	2J	ND	ND	ND	ND	1J/1J	ND
1,2-DCE	10	ND	1J	4J	1J	ND	ND	ND	ND	ND	ND
Toluene	10	1J	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (µg/L)											
PAHs (Total)		30J	5J	12J	1J	ND/ND	1J	ND	4J	3J/ND	ND
Pest/PCB (µg/L)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

J = Estimated Value
LT = Leachate
DUP = Duplicate Sample
MW = Monitoring Well
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
Pest/PCB = Pesticides/Polychlorinated Biphenyl
µg/L = micrograms per liter
ND = not detected
CRQL = Contract Required Quantitation Limit
* = LT-901 is a leachate water sample and not a monitoring well water sample

TABLE B-3
SUMMARY OF GROUNDWATER INORGANIC ANALYSES (1993)

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

		SOUTH OF NEPTUNE DRIVE									NORTH OF NEPTUNE DRIVE			
ANALYTE	CRDL (µg/L)	*MCL (µg/L)	**MEGS (µg/L)	*LT-901 3/18/93 (µg/L)	MW-904 2/4/93 (µg/L)	MW-906 2/4/93 (µg/L)	MW-907 2/4/93 (µg/L)	MW-908/DUP 2/4/93 (µg/L)	MW-909 2/4/93 (µg/L)	MW-910 2/4/93 (µg/L)	MW-914 3/18/93 (µg/L)	MW-915/DUP 3/18/93 (µg/L)	MW-916 3/18/93 (µg/L)	Bkg. Conc. of Inorg./NAS8 (µg/L)
Aluminum	200	50-200 S	1,430	4,940	ND	ND	ND	ND	241J	ND	5,510	1,910/1,830	ND	652
Antimony	60	6	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Arsenic	10	50 R	-	9.4J	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8
Barium	200	2,000	1,500	64.4J	ND	ND	ND	ND	ND	ND	229	443/441	46.4J	17
Beryllium	5	4	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Cadmium	5	5	5	ND	ND	ND	ND	ND	ND	ND	6.4	ND	ND	-
Calcium	5,000	-	-	16,700	18,400	14,100	40,300	24,100/25,700	2,140J	4,180J	33,800	51,300/51,300	22,000	18,000
Chromium	10	100	100	16.3	ND	ND	ND	ND	ND	ND	9.9J	ND/4.3J	ND	6.3
Cobalt	50	-	-	7.8J	ND	ND	ND	ND	ND	ND	ND	ND	ND	8
Copper	25	1,300 T	-	23.1J	ND	ND	ND	ND	ND	ND	ND	ND	ND	4
Iron	100	300S	-	7,190J	ND	314J	ND	ND	360J	ND	30,100J	12,000J/12,100J	220J	4,430
Lead	3	15 T	20	32.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	10
Magnesium	5,000	-	-	2,180J	5,520	4,310J	5,530	3,000J/2,990J	775J	709J	3,050J	4,490J/4,500J	2,290J	8,300
Manganese	15	50 S	200	219	183	56.7	6,720	609/689	22.8	27.8	230	991/1010	14.7J	570
Mercury	0.2	2	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11
Nickel	40	100	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Potassium	5,000	-	-	3,040J	ND	2,190J	2,460J	2,630J/2,470J	ND	ND	3,570J	7,430/7,430	3,920J	4,800
Selenium	5	50	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Silver	10	100 S	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-

continued

TABLE B-3
SUMMARY OF GROUNDWATER INORGANIC ANALYSES (1993)

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

		SOUTH OF NEPTUNE DRIVE									NORTH OF NEPTUNE DRIVE			
ANALYTE	CRDL (µg/L)	*MCL (µg/L)	**MEGS (µg/L)	*LT-901 3/18/93 (µg/L)	MW-904 2/4/93 (µg/L)	MW-906 2/4/93 (µg/L)	MW-907 2/4/93 (µg/L)	MW-908/DUP 2/4/93 (µg/L)	MW-909 2/4/93 (µg/L)	MW-910 2/4/93 (µg/L)	MW-914 3/18/93 (µg/L)	MW-915/DUP 3/18/93 (µg/L)	MW-916 3/18/93 (µg/L)	BKG. CONC. OF INORG./NASB (µg/L)
Sodium	5,000	-	-	711,000	6,240	35,400	16,200	15,100/16,200	4,030J	2,550J	4,100J	27,900/27,900	58,800	52,500
Thallium	10	2	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1
Vanadium	50	-	-	11.0J	ND	ND	ND	ND	ND	ND	6.2J	ND	ND	9.2
Zinc	20	5,000 S	-	195	8.8J	6.9J	13.8J	ND/8.1J	10.4J	7.9J	ND	ND	ND	105
Cyanide	10	-	154	11.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	-

Notes:

CRDL = Contract Required Detection Limit
µg/L = micrograms per liter
MW = monitoring well
DUP = duplicate sample
ND = not detected
J = estimated value
LT = leachate
* = LT-901 is a leachate sample and not a monitoring well sample
+ = According to Safe Drinking Water Act (SDWA), U.S. Environmental Protection Agency (USEPA), 1992, Fact Sheet: Drinking Water Regulations and Health Advisories. Office of Water, Washington, D.C., December, 1992.
++ = Maximum Exposure Guideline, as established in the Maine Drinking Water Rules (10-144A CMR - Chapters 231-233).
R = Under Review
S = Secondary Drinking Water Standard
T = Based on Treatment Technique. Value given is an action level.
- = Value not available

MEDEP LETTER OF CONCURRENCE

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN R. McKERNAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

DEBRAH RICHARD
DEPUTY COMMISSIONER

September 16, 1994

W.A. Waters
Captain, CEC, U.S. Navy
Commanding Officer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 10112-5094

RE: Naval Air Station Brunswick Superfund Site, Brunswick, Maine

Dear Captain Waters:

The Maine Department of Environmental Protection (MEDEP) has reviewed the August 1994 Draft Final Interim Record of Decision (ROD) for the groundwater operable unit at Site 9 for the Naval Air Station Brunswick Superfund Site located in Brunswick, Maine.

On the basis of this ROD, and on the understanding that additional source investigations will be conducted at Site 9, the MEDEP concurs with the selected remedial action.

This interim remedial action consists of groundwater remediation through natural attenuation, long term environmental monitoring, institutional controls to prevent exposure to contaminated groundwater, and five-year site reviews. Environmental monitoring of groundwater, surface water, sediment, and leachate seep will be conducted to measure the changes in contaminant concentrations due to natural attenuation.

The results of field investigations conducted in 1988, 1990, and 1993 indicate the presence of vinyl chloride and DCE in groundwater at concentrations in excess of their MCLs and vinyl chloride, DCE and DCA in excess if their MEGs. The field investigations did not, however, identify any distinct source areas for these VOCs. Therefore, the Navy recommended an interim remedial action of the groundwater operable unit at Site 9 because no definitive source area was found.

The Navy will be conducting additional field investigations in the vicinity of Site 9 to evaluate other potential source areas of groundwater contamination. A final remedy and subsequent ROD for the site including both groundwater and source operable units will be developed after conducting additional source investigations.

This concurrence is based upon the State's understanding that:

A. The MEDEP will continue to participate in the Federal Facilities Agreement dated October 19, 1990 and in the review and approval of operational designs and monitoring plans.

B. Surface water monitoring results will be compared to the State of Maine's Ambient Water Quality Criteria for the protection of human health and aquatic life.

C. The Navy will conduct additional source investigations at Site 9.

The MEDEP looks forward to working with the Department of the Navy and the USEPA to resolve environmental problems posed by this site. If you need any additional information, do not hesitate to contact me or members of my staff.

Sincerely,

Deborah N. Garrett

Deborah N. Garrett
Acting Commissioner

pc: Captain D.J. Nelson
Elizabeth Walter, ABB-ES
Robert Lim, USEPA Region 1
Mark Hyland, MEDEP

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

TABLE D-1
CHEMICAL-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARs
GROUNDWATER/ SURFACE WATER				
Federal	SDWA - MCLs (40 CFR 141.11 - 141.16)	Relevant and Appropriate	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Under Alternative 9B, the selected remedy, the MCLs will be attained through natural attenuation within two to 15 years.
	RCRA-Subpart F Groundwater Protection Standards, Alternate Concentration Limits (40 CFR 264.94)	Relevant and Appropriate	This requirement outlines standards, in addition to background concentrations and MCLs, to be used in establishing clean-up levels for remediating groundwater contamination.	Under Alternative 9B, the selected remedy, the MCLs will be attained through natural attenuation within two to 15 years.
Federal Guidance and Criteria To Be Considered	USEPA Risk Reference Doses (RfDs)	To Be Considered	RfDs are the levels considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in water, USEPA RfDs will be used to characterize risks due to noncarcinogens in groundwater, as necessary, during the five-year reviews.
	USEPA Human Health Assessment Group Cancer Slope Factors (CSFs)	To Be Considered	Carcinogenic effects present the most up-to-date information on cancer risk potency derived from USEPA's Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminants in water, USEPA CSFs will be used to compute the individual incremental cancer risk resulting from exposure to certain compounds, as necessary, during the five year reviews.

continued

TABLE D-1
CHEMICAL-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE

INTERIM RECORD OF DECISION: SITE 9
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARs
State	Maine Drinking Water Rules (10-144A CMR Chapters 231-233)	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs. When state levels are more stringent than federal levels, the state levels may be used.	Under Alternative 9B, the selected remedy, the MCLs will be attained through natural attenuation within two to 15 years.
State Criteria and Guidance To Be Considered	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A CMR Chapter 233, Appendix C)	To Be Considered	Appendix C outlines Maximum Exposure Guidelines (MEGs) for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Where no MCL or other ARAR exists, MEGs are considered in developing clean-up concentrations. The clean-up concentration for DCA was established using the MEG. Under Alternative 9B, the selected remedy, the MEG for DCA will be attained through natural attenuation with two to 15 years.

Notes:

ARAR = Applicable or Relevant and Appropriate Requirement
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CFR = Code of Federal Regulations
CMR = Code of Maine Rules
CPF = carcinogenic potency factor
FS = feasibility study
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MEG = Maximum Exposure Guidelines
MEDEP = Maine Department of Environmental Protection
MRSA = Maine Revised Statues Annotated
NAS = Naval Air Station
OSWER = Office of Solid Waste and Emergency Response
RI = remedial investigation
RCRA = Resource Conservation and Recovery Act
RfD = reference dose
SARA = Superfund Amendments and Reauthorization Act
SDWA = Safe Drinking Water Act
USEPA = U.S. Environmental Protection Agency

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SECTION 1: PRELIMINARY ASSESSMENTS

Volume 1: *Initial Assessment Study of Naval Air Station Brunswick*, Maine, prepared by Roy F. Weston, Inc.; June 1983 (Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10).

Correspondence: NOT APPLICABLE TO SITE 9

SECTION 2: SITE INSPECTIONS

Volume 1: *Pollution Abatement Confirmation Study, Step 1A - Verification*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; June 1985 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Memo to Don Smith, NUS Corporation, from Colin Young, NUS Corporation, regarding the site inspection at the U.S. Naval Air Station; September 22, 1983.

2. Memo to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the schedule of on-site exploration and sampling activities during the Pollution Abatement Confirmation Study; October 30, 1984.

3. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary data from the Confirmation Study at Brunswick and the status of fieldwork; December 11, 1984.

4. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the preliminary results of the NACIP Study at Brunswick and the expected completion of the sampling; January 3, 1985.

5. Memo of conversation between Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, and William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the results of the NACIP Study at Brunswick and the expected submittal of the report; January 15, 1985.

6. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental

Protection Section, regarding comments on the Draft Confirmation Study Verification Step report; April 15, 1985.

7. Meeting minutes of May 22, 1984[5], meeting among Department of the Navy, Northern Division, NAS Brunswick, and E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding the NACIP Confirmation Study Verification Phase report; May 24, 1985.

8. Letter to William Fisher, E.C. Jordan Co. [ABB Environmental Services, Inc.], from A. Rhoads, Department of the Navy, Northern Division Environmental Protection Section, regarding comments on the revised Confirmation Study Verification Step Report; August 2, 1985.

9. Letter to Robert Jackson, U.S. Environmental Protection Agency (USEPA), from L.K. Jones, Naval Air Station, Brunswick, regarding transmittal of the June 1985 [Pollution Abatement Confirmation Study, Step 1A - Verification] Report; December 3, 1985.

10. Letter to L.K. Jones, Naval Air Station, Brunswick, from Robert Jackson, USEPA, regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

11. Letter to L.K. Jones, Naval Air Station, Brunswick, from Anthony Leavitt, Maine Department of Environmental Protection (DEP), regarding comments on the [June 1985] Pollution Abatement Confirmation Study, Step 1A - Verification Report; January 13, 1986.

12. Letter to Jim Shafer, Department of the Navy, Northern Division, from Nancy Beardsley, MEDEP, regarding MEDEP's comments on future planned field activities and the TRC meeting discussion for Site 9; April 1, 1993.

SECTION 3: REMOVAL ACTIONS

Volume 1: NOT APPLICABLE TO SITE 9

Volume 2: NOT APPLICABLE TO SITE 9

SECTION 4: REMEDIAL INVESTIGATIONS

Volume 1: *Remedial Investigation/Feasibility Study Work Plan*, formerly Draft Pollution Abatement Confirmation Study Work Plan - Step 1 prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; April 1988 (Sites 1,2,3,4,7,8,9).

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Addendum to RI/FS Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1988 (Sites 1,2,3,4,7,8,9).

Additional Sampling Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from Matthew Hoagland, USEPA, regarding comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; November 24, 1986.

2. Letter to Matthew Hoagland, USEPA, from T.G. Sheckels, Naval Air Station Brunswick, regarding responses to USEPA comments on the September 1986 Draft Pollution Abatement Confirmation Study Work Plan - Step 1B: Characterization; March 31, 1987.

3. Letter to Commander L.K. Jones, Naval Air Station Brunswick, from David Webster, USEPA, regarding clarification as to the status of incorporating USEPA's comments into the revised report, and communication of their concerns for Site 8; April 9, 1987.

4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration (NOAA), regarding comments on the RI/FS Workplan for Phase II field activity; April 14, 1989.

5. Letter to Charlotte Head, USEPA, from Sharon Christopherson, National Oceanic and Atmospheric Administration (NOAA), regarding responses to Navy comments on NOAA's work plan recommendations; May 8, 1987.

6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the [Pollution Abatement Confirmation Study, Step] 1B - Characterization Work Plan meeting, and a discussion for the Superfund program; June 29, 1987.

7. Meeting summary of June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; June 30, 1987.

8. Letter to Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Jack Hoar, Camp, Dresser & McKee, regarding meeting notes from a June 12, 1987, planning meeting at USEPA Region I offices in Boston, Massachusetts, among USEPA; U.S. Navy; E.C. Jordan Co. [ABB Environmental Services, Inc.]; Maine DEP; NOAA; Camp, Dresser & McKee; July 8, 1987.

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9. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form; November 10, 1987.

10. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Merrill Hohman, USEPA, regarding comments on the [January 1988] Pollution Abatement Confirmation Study RI and Extended SI Studies, the Site Quality Assurance Plan, the Site Health and Safety Plan, and the Quality Assurance Program Plan; March 15, 1988.

11. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Cynthia Kuhns, Maine DEP, regarding comments on the January 1988 Remedial Investigation Work Plan, and the January 1988 Quality Assurance Program Plan (see Section 10 of this index); April 7, 1988.

12. Letter to Charlotte Head, USEPA, from Gordon Beckett, U.S. Fish and Wildlife Service, regarding comments on the [April 1988] RI/FS Work Plan; May 10, 1988.

13. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the [April 1988 Remedial Investigation/ Feasibility Study] Work Plan; May 13, 1988.

14. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from Cynthia Kuhns, Maine DEP, regarding comments on the April 1988 Remedial Investigation/ Feasibility Study Work Plan; June 6, 1988.

15. Letter to Captain E.B. Darsey, Naval Air Station Brunswick, from David Webster, USEPA, regarding comments on the April 1988 Remedial Investigation/ Feasibility Study] Work Plan; June 17, 1988.

16. Memo from M. Aucoin, Naval Air Station Brunswick, regarding laboratory analytical methods discussed in the RI/FS Work Plan; August 12, 1988.

17. Letter to Naval Facilities Engineering command, Northern Division, from Anthony Sturtzer, Naval Energy and Environmental Support Activity, regarding laboratory approval for Installation Restoration Program analyses; August 22, 1988.

18. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding status and completion of the first phase of fieldwork and sampling under the RI/FS Work Plan: October 26, 1988.

19. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the April 1989 Draft Additional Sampling Plan; May 22, 1989.

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20. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the April 1989 Draft Additional Sampling Plan; June 9, 1989.

21. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding approval of the Draft Additional Sampling Plan; June 15, 1989.

22. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Melville Dickenson, E.C. Jordan Co. [ABB Environmental Services, Inc.], regarding transmittal of the Additional Sampling Plan and some outstanding issues that needed further discussion with the regulatory agencies; August 9, 1989.

23. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding comments on the August 1989 Draft Additional Sampling Plan; September 26, 1989.

24. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Denise Messier, Maine DEP, regarding comments on the August 1989 Additional Sampling Plan; December 28, 1989.

Volume 2: *Post-Screening Work Plan, prepared by E.C. Jordan Co.* [ABB Environmental Services, Inc.]; July 1990 (Sites 1,2,5,6,8,9,11,12,13, Eastern Plume; Treatability Studies 8; 11).

Addendum - Post-Screening Work Plan, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; November 1990 (Sites 1,2,5,6,8,9,11,12,13,14, Eastern Plume; Treatability Studies 8; 11).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Post-Screening Work Plan; May 1, 1990.

2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study - Development and Screening of Alternatives, and the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

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4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1990 Post-Screening Work Plan; July 27, 1990.

5. Letter to James Shafer, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the July 1990 Post-Screening Work Plan; August 30, 1990.

Volume 3: *Round I Data Package, Phase I - Remedial Investigation*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

2. Letter to Ronald Springfield, Department of the Navy, Northern Division, from David Gulick, E.C. Jordan Co. [ABB-ES] regarding the transmittal of the Round I Data Package; January 13, 1989.

3. Letter to T.G. Sheckels, Department on the Navy, Northern Division, from David Webster, USEPA, regarding comments on the Round I Data Package and recommendations on future data packages; March 13, 1989.

4. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Rounds I and II Data Packages; March 13, 1989.

Volume 4: *Round II Data Package. Phase I - Remedial Investigation*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1989 (Sites 1,2,3,4,7,8,9).

Round III Data Package, Phase I - Remedial Investigation, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; July 1989 (Sites 1,2,3,4,7,8,9).

Correspondence:

1. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round II Data Package; March 10, 1989.

2. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, from David Gulick, E.C. Jordan, Co. [ABB-ES], regarding transmittal of and comments on the Round III Data Package; July 14, 1989.

3. Letter to Jack Jojokian, USEPA, from John Walker, Camp, Dresser & McKee Federal Programs Corporation, regarding comments on the Round III Data Package; August 31, 1989.

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4. Letter to Ronald Springfield, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round III Data Package; October 4, 1989.

Volume 5: *Remedial Investigation Feasibility Study - Round IV Data Package*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; January 1990 (Sites 1,2,3,4,7,8,9,11,13).

Correspondence:

1. Letter to Meghan Cruise, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the Round 4 [IV] Data Package; August 28, 1989.

2. Letter to Kenneth Marriott, Northern Division, Naval Facilities Engineering Command, regarding comments on the Round IV Data Package; March 5, 1990.

Volume 6: *Draft Final Remedial Investigation Report Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the April 1990 Draft Remedial Investigation Report; May 15, 1990.

2. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Michael Jasinski for David Webster, USEPA, regarding comments on the April 1990 Draft Remedial Investigation Report and the April 1990 Draft Post-Screening Work Plan; May 17, 1990.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 10, 1990.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the August 1990 Draft Final Remedial Investigation Report; October 17, 1990.

Volume 7: *Draft Final Remedial Investigation Report Volume 2: Appendices A-J*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

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Volume 8: *Draft Final Remedial Investigation Report Volume 3: Appendices K-P*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Volume 9: *Draft Final Remedial Investigation Report Volume 4: Appendix Q - Risk Assessment*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from Charlotte Head for David Webster, USEPA, regarding the inclusion of the [Step] 1A Verification Study data in the risk assessment for the air station; September 15, 1988.

2. Letter to T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding review comments on the Phase I Feasibility Study Preliminary Development of Alternatives, and the Preliminary Risk Assessment; May 5, 1989.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe for Denise Messier, Maine DEP, regarding comments on the February 1989 Preliminary Risk Assessment; February 8, 1990.

4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the April 1990 Draft Remedial Investigation Report; May 17, 1990.

Volume 10: *Remedial Investigation Feasibility Study Round V Data Package*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1991 (Sites 5,6,8,9,11,12,14, Eastern Plume; Treatability Study for Sites 8,11).

Volume 11: *Draft Final Supplemental RI Report Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding comments on the [April 1991] Draft Focused Feasibility Study for Sites 1 and 3; the [April 1991] Draft Supplemental Remedial Investigation; and the [April 1991] Draft Supplemental Feasibility Study for Sites 5, 6, and 12; May 1, 1991.

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2. Letter to Captain H.M. Wilson, Naval Air Station Brunswick, from Samuel Butcher, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 1, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [April 1991] Draft Supplemental Remedial Investigation Report; May 30, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding additional comments on the April 1991 Draft Supplemental Remedial Investigation Report; June 19, 1991.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 4, 1991.

7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [August 1991] Draft Final Supplemental Remedial Investigation Report; September 10, 1991.

Volume 12: *Draft Final Supplemental RI Report Volume 2: Appendices A-J*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Volume 13: *Draft Final Supplemental RI Report Volume 3: Appendices K-Q*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1991 (Sites 5,6,8,9,11,12, Eastern Plume).

Volume 14: *Technical Memorandum: Site 9*, prepared by ABB Environmental Services, Inc.; May 1994 (Site 9).

Correspondence:

1. Letter to Jim Shafer, Deparment of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [June 1993] Draft Technical Memorandum: Site 9; August 6, 1993.

2. Letter to Jim Shafer, Deparment of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [June 1993] Draft Technical Memorandum: Site 9; August 10, 1993.

3. Letter to Carolyn LePage, R. G. Gerber Inc., from Deborah Roy, President, Safe Tech Consultants, Inc. regarding comments on the risk assessment in the [June 1993] Draft Technical Memorandum: Site 9; August 10, 1993.

4. Letter to Jim Shafer, Deparment of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the [June 1993] Draft Technical Memorandum: Site 9; August 11, 1993.

5. Letter to Fred Evans, Deparment of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [September 1993] Draft Final Technical Memorandum: Site 9; October 26, 1993.

6. Letter to Fred Evans, Deparment of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [September 1993] Draft Final Technical Memorandum: Site 9; October 27, 1993.

7. Letter to Fred Evans, Deparment of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [September 1993] Draft Final Technical Memorandum: Site 9; October 27, 1993.

8. Memorandum from Fred Evans, Department of the Navy, Northern Division, to the Technical Review Committee regarding the [May 1994] Final Technical Memorandum: Site 9; August 29, 1994.

SECTION 5: FEASIBILITY STUDIES

Volume 1: *Draft Final Phase I Feasibility Study Development and Screening of Alternatives*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; August 1990 (Sites 1,3; 2; 4,11,13; 7; 8; 9).

Correspondence:

1. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1989 Phase I Feasibility Study: Preliminary Development of Alternatives, and February 1989 Preliminary Risk Assessment reports; May 5, 1989.

2. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/ Feasibility Study (RI/FS); March 6, 1990.

3. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 17, 1990.

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4. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from David Webster, USEPA, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives; April 23, 1990.

5. Letter to Kenneth Marriott, Department of the Navy, Northern Division, from Susan Weddle, TRC community member, regarding comments on the February 1990 Draft Phase I Feasibility Study Development and Screening of Alternatives, and the April 1990 Draft Post-Screening Work Plan; May 23, 1990.

6. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on Draft Final Phase I Feasibility Study Development and Screening of Alternatives; September 28, 1990.

Volume 2: NOT APPLICABLE TO SITE 9

Volume 3: *Feasibility Study Volume 1*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from John Lindsay, National Oceanic and Atmospheric Administration, regarding comments on the [July 1991] Draft Feasibility Study Report; August 16, 1991.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Feasibility Study Report; September 20, 1991.

3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Feasibility Study Report; September 23, 1991.

4. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the November 1991 Draft Final Feasibility Study; December 26, 1991.

5. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the November 1991 Draft Final Feasibility Study Report; January 2, 1992.

6. Comments from BACSE on the Feasibility Study Report, February 18, 1992.

Volume 4: *Feasibility Study Volume 2: Appendices A - O*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; March 1992 (Sites 2; 4,11,13; 5,6; 7; 9; 12; 14; Eastern Plume).

Volume 5: NOT APPLICABLE TO SITE 9

SECTION 6: PROPOSED PLANS AND PUBLIC HEARING TRANSCRIPTS

Volume 1: NOT APPLICABLE TO SITE 9

Volume 2: NOT APPLICABLE TO SITE 9

Volume 3: *Proposed Plan*, prepared by ABB Environmental Services, Inc.; July 1994 (Site 9).

Transcript of the Public Hearing for Site 9, prepared by Mason Lockhart Hagopian & Ramsdell; July 14, 1994 (Site 9).

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding the Site 9 Proposed Plan/Interim Groundwater Record of Decision; December 8, 1993.

2. Letter to Carl Deloi, USEPA, from Gordon E. Beckett, U.S. Fish & Wildlife Service, regarding comments on the [May 1994] Draft Proposed Plan; June 2, 1994.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [May 1994] Draft Proposed Plan; June 15, 1994.

4. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [May 1994] Draft Proposed Plan; June 15, 1994.

5. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [May 1994] Draft Proposed Plan; June 16, 1994.

6. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [June 1994] Draft Proposed Plan; July 7, 1994.

7. Letter to Nancy Beardsley, Maine DEP, from Fred Evans, Department of the Navy, Northern Division, regarding the Source Investigation Work Plan Site 9 and responding to the Maine DEP letter of December 8, 1993; July 19, 1994.

SECTION 7: RECORDS OF DECISION

Volume 1: NOT APPLICABLE TO SITE 9

Volume 2: NOT APPLICABLE TO SITE 9

Volume 3: *Interim Record of Decision for the Groundwater Operable Unit at Site 9* prepared by ABB Environmental Services, Inc.; September 1994 (Site 9)

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [June 1994] Draft Interim Record of Decision for the Groundwater Operable Unit at Site 9; July 15, 1994.

2. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [June 1994] Draft Interim Record of Decision for the Groundwater Operable Unit at Site 9; July 18, 1994.

3. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [June 1994] Draft Interim Record of Decision for the Groundwater Operable Unit at Site 9; July 18, 1994.

4. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [June 1994] Draft Interim Record of Decision for the Groundwater Operable Unit at Site 9; July 29, 1994.

5. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [August 1994] Draft Final Interim Record of Decision for the Groundwater Operable Unit at Site 9; September 1, 1994.

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6. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [August 1994] Draft Final Interim Record of Decision for the Groundwater Operable Unit at Site 9; September 1, 1994.

7. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [August 1994] Draft Final Interim Record of Decision for the Groundwater Operable Unit at Site 9; September 2, 1994.

SECTION 8: POST-RECORD OF DECISION

Volume 1: NOT APPLICABLE TO SITE 9

SECTION 9: COMMUNITY RELATIONS

Volume 1: *Community Relations Plan - for NAS Brunswick NPL Sites* prepared jointly by Public Affairs Office, Navy Northern Division, and E.C Jordan Co. [ABB Environmental Services, Inc.]; September 1988

Correspondence:

1. Public notice for the Remedial Investigation and Feasibility Study schedule for Brunswick Naval Air Station Superfund Site published in the Portland Press Herald; February 24, 1988.

2. Memo to Commanding Officer, Naval Air Station Brunswick, from T.F. Rooney, Department of the Navy, Northern Division, regarding community relations interviews, and comments on the Draft Community Relations Plan; July 14, 1988.

3. Press release regarding the USEPA and U.S. Navy announcing the signing of the Federal Facility Agreement for the Brunswick Naval Air Station; October 6, 1989.

5. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding Freedom of Information Act request; March 6, 1990.

6. Press release regarding an extension of application notification deadline for Technical Assistance Grant Application to be filed; March 26, 1990.

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7. Letter to [Joshua] Katz, from T.J. Purul, Naval Air Station Brunswick, regarding the availability of information requested under the Freedom of Information Act; April 6, 1990.

8. Letter to Kenneth Marriott, Naval Facilities Engineering Command, from Joshua Katz, Brunswick Area Citizens for a Safe Environment, regarding the Freedom of Information Act request; a March 22, 1990 public information meeting; and the preliminary response to an April 8, 1990 site visit: April 12, 1990.

11. Fact sheet for Naval Air Station Brunswick regarding question and answers about National Priorities List Sites; August 15, 1990.

12. Press release announcing the public comment period for the Federal Facility Agreement for Brunswick Naval Air Station; November 2, 1990.

13. Press release regarding Brunswick citizens receiving a $50,000 federal grant for a Superfund advisor; January 3, 1991.

24. Public notice announcing the public meeting/hearing and public comment period for Site 9 Proposed Plan; July 1994.

25. Fact sheet regarding the Proposed Plan for Site 9, The Neptune Drive Disposal Site; July 1994.

Volume 2: *Technical Review Committee Meeting Minutes (November 1987 to December 10, 1992).*

1. Meeting minutes of December 3, 1987, Technical Review Committee (TRC) meeting to get acquainted, to discuss results of completed and planned investigations, and to establish future review procedures; undated.

2. Meeting minutes of January 11, 1988, TRC meeting to discuss the project schedule; January 26, 1988.

3. Memo to TRC members from Geoffrey Cullison, Naval Air Station, Brunswick, regarding corrections to the January 11, 1988, meeting minutes; February 3, 1988.

4. Meeting minutes of May 17, 1988, TRC meeting to discuss the draft charter for the TRC at Brunswick and a review of the revised April 1988 RI/FS work plan; undated.

5. Meeting minutes of July 8, 1988, TRC meeting to attend a site tour and to confirm proposed locations; of field investigations, undated.

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6. Meeting minutes of November 22, 1988, TRC meeting to review analytical data from the first round of sampling, and to establish parameters for the second round of sampling; undated.

7. Meeting minutes of February 22, 1988, TRC meeting to review validated analytical data from the first round of sampling, and to present preliminary information for the forthcoming risk analysis and alternative development deliverables; undated.

8. Memo of TRC meeting minutes of March 28, 1989, to discuss the structure of the third round of sampling; April 10, 1989.

9. Letter to Bruce Darsey, Department of the Navy, Naval Air Station, Brunswick, requesting copies of the March 27, 1989, TRC meeting minutes; April 18, 1989.

10. Letter to Senator William Cohen from E.B. Darsey, Department of the Navy, Naval Air Station, Brunswick, regarding a copy of the requested TRC meeting minutes, and the contact for the IRP program at the base; April 28, 1989.

11. Meeting minutes of June 20, 1989, TRC meeting to discuss the Additional Sampling Plan, the RI/FS program, and the schedule for its implementation; July 11, 1989.

12. Meeting minutes of August 10, 1989, TRC meeting to discuss the third round of sampling; undated.

13. Meeting minutes of February 13, 1990, TRC meeting to discuss the fourth round of sampling; January 22, 1990.

14. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding the May 22, 1990, TRC meeting minutes in which the Draft Initial Screening report, Draft Remedial Investigation report, and Draft Post-Screening Plan were discussed; July 12, 1990.

15. Memo to James Shafer, Department of the Navy, Northern Division, from Geoffrey Cullison, Naval Air Station, Brunswick, transmitting the omitted handout from the previous letter; July 19, 1990.

16. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the September 13, 1990, TRC meeting; October 31, 1990.

17. Letter to TRC members from James Shafer, Department of the Navy, Northern Division, regarding minutes from the January 10, 1991, TRC meeting; January 28, 1991.

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18. Letter to James Shafer, Department of the Navy, Northern Division, from Melville Dickenson, ABB Environmental Services, Inc., regarding minutes from the October 3, 1991, TRC meeting; January 28, 1991.

19. Meeting minutes of February 20, 1992, TRC meeting to discuss the schedule and status of the IRP sites; undated.

20. Meeting minutes of May 20, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and Remedial Design, the site inspection work plan for Swampy Road Debris site and Merriconeag Extension Debris site, Site 8 Focused Feasibility Study and Proposed Plan, and the multi-site Feasibility Study; the minutes also included a discussion of the future actions scheduled for other sites; undated.

21. Meeting minutes of October 1, 1992, TRC meeting to discuss schedules for the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the Building 95 Removal Action, the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site, the proposed plans for Site 8, and Sites 5 and 6; the minutes also included a discussion of the future actions scheduled for other sites; undated.

22. Meeting minutes of December 10, 1992, TRC meeting to discuss schedules for the Building 95 Removal Action, the proposed plans for Sites 5 and 6, Site 8, and Site 9, the Sites 1 and 3 and Eastern Plume Records of Decision and remedial design, the remedial designs for Sites 5, 6, 8, 9, and Building 95, and the site investigation at Swampy Road Debris site and Merriconeag Extension Debris site; undated.

Volume 3: *Technical Review Committee Meeting Minutes (March 1993 to September 1994)*
Technical Meeting Minutes (May 1994 to August 1994)

Correspondence:

1. Meeting minutes of March 18, 1993, TRC meeting to discuss the Building 95 Removal Action; Site 8 Proposed Plan; Sites 5 and 6 Proposed Plan; Remedial Design for Sites 1, 3, 5, 6, 8, 9, and Eastern Plume; Site Inspections for Swampy Road and Merriconeag Extension Debris Sites; undated.

2. Meeting minutes of June 10, 1993, TRC meeting to discuss the Building 95 Action Memorandum; Site 8 Record of Decision; Sites 5 and 6 Record of Decision; Remedial Design for Sites 1, 3, and Eastern Plume; Site 9 Technical Memorandum; Site Inspections for the Swampy Road and Merriconeag Extension Debris Sites; undated.

3. Meeting minutes of September 23, 1993, TRC meeting to discuss the Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Sites 5 and 6 Record of Decision; Site Inspection report for the Swampy Road and

Merricioneag Extension Debris Sites; Site 9 Technical Memorandum; buried drums at Site 11; undated.

4. Meeting minutes of January 13, 1994, TRC meeting to discuss the Site 11 Technical Memorandum; Site 9 Interim Groundwater Record of Decision; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; and the Site Investigation report for the Swampy Road and Merriconeag Extension Debris Sites; undated.

5. Meeting minutes of April 28, 1994, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9 Interim Groundwater Record of Decision; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Long Term Monitoring for Building 95, Sites 1 and 3 and Eastern Plume; undated.

6. Meeting minutes of May, 19, 1994, technical meeting to discuss additional source investigations at Site 9; undated.

7. Meeting minutes of June 23, 1993, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9 Proposed Plan and Interim Groundwater Record of Decision; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; confirmatory sampling at West Runway Study Area; undated.

8. Meeting minutes of August 4, 1994, technical meeting to discuss the construction status for Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; the Site 11 Removal Action; Site 9 ROD and Work Plan; migration of the Eastern Plume; additional sampling at Building 95; undated.

SECTION 10: PROGRAM GUIDANCE

Volume 1: *Quality Assurance Program Plan*, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; February 1988 (all sites)

Federal Facility Agreement among the U.S. Department of the Navy, USEPA, and Maine DEP; October 10, 1990.

Correspondence:

1. Letter to Robert Kowalczyk, Department of the Navy, Northern Division, from Cynthia Bertocci, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 24, 1986.

2. Letter to L.K. Jones, Naval Air Station Brunswick, from Anthony Leavitt, Maine DEP, regarding the state's interest in the Installation Restoration Program for Brunswick Naval Air Station; February 25, 1986.

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3. Letter to Naval Facilities Engineering Command, Northern Division, from L.K. Jones, Naval Air Station Brunswick, regarding the Navy's assessment and control of installation pollutants (NACIP) program and guidance involving federal and state regulatory agency oversight; March 11, 1986.

4. Letter to Commanding Officer, Naval Air Station Brunswick, from Commanding Officer, Naval Facilities Engineering Command, Northern Division, regarding federal and state environmental agencies oversight authority of the NACIP program; April 7, 1986.

5. Letter to David Webster, USEPA, from K.J. Vasilik, Naval Air Station Brunswick, regarding the definition of the RI/FS program at the NAS Brunswick; January 20, 1987.

6. Letter to David Epps and Robert Kowalczyk, Naval Facilities Engineering Command, Northern Division, from Charlotte Head, USEPA, regarding the current status and goals of the investigations; June 29, 1987.

7. Letter to Charlotte Head, USEPA, from R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, regarding the Navy's timetable to complete Remedial Investigation Feasibility Study at the Naval Air Station Brunswick, and outlining the Navy's understanding of the responsibilities of the various agencies involved in the RI/FS program; October 22, 1987.

8. Letter to Charlotte Head, USEPA, from Kenneth Finkelstein, National Oceanic and Atmospheric Administration, regarding the June 10, 1987, Trustee Notification Form for Naval Air Station Brunswick; November 10, 1987.

9. Letter to Charlotte Head, USEPA, from T.G. Sheckels, Department of the Navy, Northern Division, regarding the listing of Naval Air Station Brunswick on the NPL, the establishment of the Administrative Record, and the Technical Review Committee for the base; November 16, 1987.

10. Letter to R.L. Gillespie, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the schedule to be published by February 1988, a mechanism for delineating the roles and responsibilities of the agencies, and the USEPA's concerns over the progress to date; November 20, 1987.

11. Memo to Charlotte Head, USEPA, from Joan Coyle, USEPA Water Monitoring Section, regarding sampling results from the Jordan Avenue Well Field in Brunswick, Maine; December 10, 1987.

12. Letter to G.D. Cullison, Naval Air Station Brunswick, and T.G. Sheckels, Naval Facilities Engineering Command, Northern Division, from David Webster, USEPA, regarding the definition of the commencement of the

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RI/FS under the Comprehensive Environmental Response, Compensation, and Liability Act; December 17, 1987.

13. Letter to Merrill Hohman, USEPA, from E.B. Darsey, Naval Air Station Brunswick, regarding comments received at the February 10, 1988, TRC meeting on the status of the RI/FS program; February 17, 1988.

14. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the extent of quality assurance and quality control of validation for samples at Naval Air Station Brunswick; April 25, 1988.

15. Letter to Ronald Springfield, Naval Facilities Engineering Command, Northern Division, from David Webster for Charlotte Head, USEPA, regarding the evaluation of sites that were not incorporated into the [Hazard Ranking System] package, especially Sites 5 and 6; April 25, 1988.

16. Letter to Meghan Cruise, USEPA, from Alan Prysunka, Maine DEP, regarding comments on the Federal Facility Agreement; November 8, 1989.

17. Letter to Meghan Cruise, USEPA, from Susan Weddle, TRC community member, regarding comments on the Federal Facility Agreement; November 16, 1989.

18. Letter to Meghan Cruise, USEPA, from Jeanne Johnson, Town of Brunswick Conservation Commission, regarding a request for an extension for review and comment of [the documents included in the Information Repository for] the Brunswick Naval Air Station; November 17, 1989.

19. Letter to Alan Prysunka, Maine DEP, from Merrill Hohman, USEPA, regarding the state's comments on the [Federal Facility] Agreement; December 18, 1989.

20. Letter to William Adams, E.C. Jordan Co. [ABB Environmental Services, Inc.], from R.L. Gillespie, Department of the Navy, Northern Division, regarding a schedule extension for the Draft Initial Screening Report [Feasibility Study]; February 1, 1990.

21. Letter to T.G. Sheckels, Department of the Navy, Northern Division, from Merrill Hohman, USEPA, regarding an amendment to the Federal Facility Agreement; February 9, 1990.

22. Letter to Alan Prysunka, Maine DEP, from T.G. Sheckels, Department of the Navy, Northern Division, regarding Applicable or Relevant and Appropriate Requirements (ARARs) for Remedial Investigation/ Feasibility Study at Naval Air Station Brunswick; March 6, 1990.

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23. Letter to Ken Marriott, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a request concurrence between the agencies for an extension to the Remedial Investigation schedule; March 12, 1990.

24. Letter to Thomas Sheckels, Naval Facilities Engineering Command, Northern Division, from Alan Prysunka, Maine DEP, regarding ARARs [Applicable or relevant and appropriate requirements] for Naval Air Station Brunswick; April 9, 1990.

25. Letter to Meghan Cassidy, USEPA, from K.R. Marriott, Department of the Navy, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; May 18, 1990.

26. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Meghan Cassidy, USEPA, regarding a notice to proceed with the Feasibility Study activities at Naval Air Station Brunswick; June 21, 1990.

27. Letter to Meghan Cassidy, USEPA, from James Shafer, Naval Facilities Engineering Command, Northern Division, regarding an extension under the FFA for preparing the response to comments on the Draft Feasibility Study and Draft Remedial Investigation reports; June 25, 1990.

28. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding invertebrate tissue analysis for mercury along the Maine coast for establishing background mercury levels; February 24, 1992.

29. Letter to Cmdr. Ron Terry, Naval Air Station Brunswick, from Meghan Cassidy, USEPA, regarding sampling of Mere Brook, April 23, 1992.

30. Letter to James Shafer, Naval Facilities Engineering Command, Northern Division, from Mary Sanderson, USEPA, regarding the proposed accelerated schedules for the naval air station; January 11, 1993.

By Reference ONLY with location noted:

U.S. Environmental Protection Agency, 1988. "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"; Office of Solid Waste and Emergency Response; OSWER Directive 9335.3-01; Interim Final; October 1988.

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