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U.S. DEPARTMENT OF THE NAVY
INSTALLATION RESTORATION PROGRAM

NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

RECORD OF DECISION

FOR NO FURTHER ACTION
AT SITES 4,11, AND 13

AND

A REMEDIAL ACTION
FOR THE EASTERN PLUME

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Prepared for

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DECLARATION

SITE NAME AND LOCATION

Naval Air Station (NAS) Brunswick
Acid/Caustic Pit: Site 4;
Fire Training Area: Site 11;
Defense Reutilization and Marketing Office Area: Site 13; and
the Eastern Plume
Brunswick, Maine

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected final remedial action for the Eastern Plume and the no action decision for Sites 4, 11, and 13 at NAS Brunswick. 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 remedy, by hydraulic containment, recovery, and treatment, the threat to human health and the environment caused by contaminated groundwater. The decision to select these remedial actions is based on information contained in the Administrative Record for the site which was developed in accordance with Section 113(k) of CERCLA and is available for public review at the information repositories located at the Public Works Office at NAS Brunswick and the Curtis Memorial Library, 23 Pleasant Street, Brunswick, Maine.

The State of Maine Department of Environmental Protection (MEDEP) concurs with the selected remedy.

ASSESSMENT OF THE SITE

The Navy has determined that No Further Action is necessary for the soil at Sites 4, 11, and 13 since risk estimates for direct contact and incidental ingestion exposure to site soil are below U.S. Environmental Protection Agency (USEPA) and MEDEP target risk levels. Risks associated with the Eastern Plume, groundwater that originated at Sites 4, 11, and 13, exceed the target risk levels. An interim remedial action consisting of extraction, treatment, and discharge of the groundwater has been operating since 1995 to address groundwater contamination.

Actual or threatened releases of hazardous substances from the Eastern Plume, if not addressed, may pose a risk to human health and the environment. This risk will be addressed by continued operation of the groundwater remedy outlined in the Eastern Plume Interim Record of Decision (ROD) signed in June 1992, by expanding the long-term groundwater monitoring program with additional monitoring wells in the vicinity of Sites 4, 11, and 13, and by assessing the need for additional soil investigations at Site 4 in the event that Building 584 should ever be demolished.

DESCRIPTION OF THE SELECTED REMEDY

The Navy and USEPA, with concurrence of MEDEP, have determined that No Further Action is necessary for soil at Sites 4, 11, and 13 because the soil do not pose an unacceptable risk from direct contact or incidental ingestion. The selected final remedy for the Eastern Plume (the groundwater associated with Sites 4, 11, and 13) is the same remedy that was implemented as an interim remedial action, and includes:

- operation of the groundwater extraction and treatment system installed in 1995;
- discharge of the treated water to the publicly-owned treatment works (Brunswick Sewer District) or returning the treated water to the aquifer through an Infiltration gallery (this would require USEPA and MEDEP review and approval);
- long-term groundwater monitoring to evaluate the effectiveness of the extraction system and confirm that the source areas are not continuing to impact groundwater, and
- five-year reviews.

This action addresses the threat of discharge of contaminated groundwater to surface water by containing the Eastern Plume. The potential threat to human health is not an immediate threat because water from the contaminated plume is not used as a drinking water supply.

STATUTORY DETERMINATIONS

The statutory requirements of CERCLA Section 121 for remedial actions are not applicable to the No Further Action decision for the source area soil at Sites 4, 11, and 13.

For the Eastern Plume, the selected remedy 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 remedial action, and is cost-effective. The selected remedy uses permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable, and satisfies the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element.

Because the Eastern Plume remedy will result in hazardous substances remaining on-site in groundwater above health-based cleanup levels, a review will be conducted by the Navy, the USEPA, and the MEDEP at intervals not to exceed every five years to ensure that the remedy continues to provide adequate protection of human health and the environment. This review will evaluate both the effectiveness of the groundwater extraction system and the appropriateness of the No Further Action decision for Sites 4, 11, and 13.

DECLARATION

This ROD represents No Further Action for source area soil at Sites 4, 11, and 13, and the selection of a final remedial action under CERCLA for the Eastern Plume. The foregoing represents the selection of a 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.

Concur and recommend for immediate implementation:

Department of the Navy

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 16 areas (Sites) within NAS Brunswick that have been investigated. This Record of Decision (ROD) relates to the No Further Action decision for source area soil at Sites 4, 11, and 13, and the final remedial action for the groundwater contamination within the Eastern Plume.

NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine, south of Route I 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 shrubland, 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.

Sites 4, 11, and 13 are all located within several hundred feet of each other off Old Gurnet Road between the intersection of Orion Street and Sandy Road (see Figure 1). Site 4, the Acid/Caustic Pit, is under the eastern portion of Building 584. The pit was used from 1969 to 1974 for the disposal of liquid wastes. The wastes were poured into the pit, which was approximately 4 feet square and 3 feet deep.

Site 11 is a former Fire Training Area (FTA) that was used regularly over a 30-year period but has not been used since the fall of 1990. Waste liquids (fuels, oils, degreasing, solvents) were used as fuel for the fire training exercises.

Site 13 is the Defense Reutilization and Marketing Office (DRMO) Area immediately south of Building 584 and Site 4. Site 13 consisted of three underground storage tanks: one for diesel fuel, the other two for storing waste fuels, oils and degreasing solvent. All three tanks were removed in the late 1980s. The diesel tank was replaced with a fiberglass underground storage tank; however, this tank was subsequently removed and replaced with an above-ground tank.

The Eastern Plume is the groundwater contamination resulting from Sites 4, 11, and 13. The 1990 estimated boundaries of the Eastern Plume groundwater contamination and current boundaries exceeding federal maximum contaminant levels (MCLs) or State of Maine maximum exposure guidelines (MEGs) are shown on Figure 2. The boundaries of the exceedances are based on the current distribution of the monitoring wells and may not be the actual distribution of contamination. The installation of additional monitoring wells based on a reevaluation of the monitoring network could modify the areas inferred to be above the State MEGs/federal MCL groundwater concentrations. Groundwater in the area of the plume is not currently used for drinking water or other purposes, therefore, there are no human receptors. The likely future discharge point of the plume was projected to be Harpswell Cove, potentially affecting many ecological receptors. Because the Navy has implemented a groundwater extraction and treatment system, the plume is no longer expected to reach Harpswell Cove. The contamination of groundwater in the Eastern Plume has not affected the current use of natural resources. Use of groundwater and surface water in this area is very limited; however, the presence of contaminated groundwater does prevent the use of this natural resource in the future.

II. 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 bases 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.

Sites 4, 11, and 13 at NAS Brunswick are believed to be past contributors to groundwater contamination in the Eastern Plume. Site 4, the Acid/Caustic Pit, was used from 1969 to 1974 for the disposal of liquid wastes. The wastes were poured into the pit, which was approximately 4 feet square and 3 feet deep. The actual location of the former disposal pit could not be sampled because a structure (Building 584) was constructed at that location in approximately 1975. However, investigations showed that subsurface soil around Site 4 did not contain detectable concentrations of volatile organic compounds (VOCs), and only one of the six groundwater monitoring wells at Site 4 contained detectable levels of VOCs (trichloroethylene [TCE] in MW-405 at concentrations ranging from non-detectable to 26 micrograms per liter [µg/L]). Based on these results, it is believed that Site 4 no longer contributes to groundwater contamination in the Eastern Plume. In the event that Building 584 is ever demolished, the Navy, in consultation with the U.S. Environmental Protection Agency (USEPA), Maine Department of Environmental Protection (MEDEP), and the public, will assess the need for additional soil sampling at Site 4.

Site 11 is a former Fire Training Area that was used regularly over a 30-year period until it was closed in the fall of 1990. Waste liquids including fuels, oils, and degreasing solvents were used as fall for the fire training exercises. The most prevalent contaminants in groundwater (i.e., 1,1,1-trichloroethane [TCA] and TCE) are consistent with the wastes used at the Fire Training Area. Soil from the ground surface down to the groundwater table also contained these contaminant, however, the Navy removed these soil from Site 11 in two separate removal actions. This eliminated the direct exposure risks (i.e., dermal contact, inhalation, and ingestion). There is the potential that contaminated soil still exist below the groundwater table, with a continuing impact to groundwater. The groundwater exposure pathway will be assessed under the groundwater monitoring program and additional groundwater investigation at Site 11.

Site 13, the DRMO Area, consisted of three underground storage tanks located south of Site 4. One tank was used for diesel fuel. The other tanks reportedly were used for storage of waste fuels, oils, and degreasing solvents (R.F. Weston, Inc., 1983). All three tanks were removed during the late 1980s. Groundwater sampling downgradient of Site 13 has shown decreasing VOC contamination since removal of the tanks. The most recent groundwater samples from this area contained only low levels of contamination, indicating that Site 13 is no longer acting as a source of contamination for the Eastern Plume.

A more detailed description of the history of Sites 4, 11, and 13 can be found in the Draft Final RI Report in Subsections 8.1, 12.1, and 13.1 (E.C. Jordan Co., 1990b).

B. ENFORCEMENT HISTORY

The Navy's cleanup of hazardous wastes at NAS Brunswick falls under the Navy's Installation Restoration Program (IRP) and meets the requirements of the Comprehensive Environmental Response, Compensation and Liability Act and the Superfund Amendments and Reauthorization Act (CERCLA). The program was conducted in several stages:

- In 1983, an Initial Assessment Study (IAS) detailed historical hazardous material usage and waste disposal practices at NAS Brunswick.
- In 1984, a Pollution Abatement Confirmation Study was conducted. These studies recommended further investigation of seven of the nine hazardous waste sites originally identified.
- In 1987, NAS Brunswick was placed on the USEPA's NPL.
- The Remedial Investigation/Feasibility Study (RIFS) process began in 1987 for seven sites.
- In February 1988, the first Technical Review Committee (TRC) meeting was held. The TRC meetings (now known as the Restoration Advisory Board [RAB] meetings) have been held quarterly since that initial meeting.
- Two sites were added to the RI/FS program in 1989, as well as the two additional sites originally identified in the IAS.
- Two other sites were added to the program in 1990.

- In October 1990, the Navy entered into a Federal Facility Agreement (FFA) with the USEPA and 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 Draft Final RI and Phase I FS Reports (E.C. Jordan Co., 1990b and 1990c). The RI described field sampling investigations, geology, and hydrogeology, and presented contamination and risk assessments. The 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 submitted a Draft Final Supplemental RI report for an additional four sites in August 1991. The report also contained additional field sampling results for Site 11 and the Eastern Plume.

Each of the stages and documents listed above pertain to Sites 4, 11, and 13 and the Eastern Plume. Information on many of the other sites at NAS Brunswick is also included in these reports.

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 involved identifying the sites for which enough information currently existed to proceed to the ROD and design phases of the process. Separate timetables were established for completing the Final FS reports and RODs for those sites. The Navy identified the groundwater associated with Sites 4, 11, and 13 (i.e., the Eastern Plume) as a distinct area of contamination and initiated the remedial process in 1992 by signing an Interim ROD for the Eastern Plume (NAVY, 1992). The interim remedial action was intended to control and prevent further migration of contaminated groundwater toward Harpswell Cove and to begin reducing the amount of contamination within the Eastern Plume.

Because the RI/FS concluded that Sites 4, 11, and 13 did not pose unacceptable direct-contact risks, and that only Site 11 posed a potential continuing risk of impact to groundwater, the Navy postponed a final decision for Sites 4, 11, and 13 to a later date.

III. COMMUNITY PARTICIPATION

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

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 at the Jordan Acres School in Brunswick to discuss the results of the RI.

In August 1987, the Navy established an information repository for public review of site related documents at the Curtis Memorial Library in Brunswick. On October 8, 1996, the Navy placed the Proposed Plan detailing the Preferred Alternative for Sites 4, 11, and 13 in the information repository at the Curtis Memorial Library (ABB-ES, 1996). The Administrative Record for Sites 4, 11, and 13, and the Eastern Plume is available for public review at NAS Brunswick in the Public Works office and at the Curtis Memorial Library. A notice and brief analysis of the Proposed Plan was published in the local newspaper, The Times Record, on October 11, 1996.

From October 11 to November 9, 1996, the Navy held a 30-day public comment period to accept public input on the alternatives presented in the Proposed Plan. On October 17, 1996, the Navy and regulatory representatives held an informational public meeting to discuss the Proposed Plan for Sites 4, 11, and 13. A transcript of this meeting and the Responsiveness Summary is included as Appendix A. The Navy received several verbal comments on the Sites 4, 11, and 13 Proposed Plan at the public meeting. These are discussed in the Responsiveness Summary. No written comments were received by the Navy during the 30-day public comment period.

From 1988 until July 1995, the TRC was an important vehicle for community participation. In July 1995, the TRC became known as a RAB whose membership includes the Navy, USEPA, MEDEP, and various community representatives. The community members of the RAB include representatives from Brunswick, Harpswell, and Topsham as well as the Brunswick Area Citizens for a Safe Environment, who became active participants subsequent to 1988. The RAB also has representatives from the Brunswick-Topsham Water District. The RAB meets quarterly, reviews the technical aspects of the program, and provides community input to the program.

IV. SCOPE AND ROLE OF RESPONSE ACTION

The Navy has determined that No Further Action under CERCLA is appropriate for soil at Sites 4, 11, and 13, and that continued operation of the groundwater extraction and treatment system, discharge of treated water to the Publicly Owned Treatment Works (POTW), and groundwater monitoring are the appropriate actions for the Eastern Plume. An additional option that will be pursued is the discharge of the treated water to the groundwater. This will require USEPA and MEDEP review and approval.

The No Further Action decision for Sites 4, 11, and 13 is based on the FS which concluded that the only risk at these sites was for the potential of continuing impacts to groundwater from soil at Site 11. Removal actions completed at Site 11 since the FS included excavation of metallic debris, drums, and contaminated soil. The metallic debris and drums were disposed off-base (Halliburton NUS, 1995), and the soil were used as sub-grade fill beneath the Sites 1 and 3 landfill cover (OHM 1996). Because the CERCLA contaminants have been removed to acceptable risk levels or are at levels that do not pose a risk, No Further Action is required for soil at Sites 4, 11, and 13. The No Further Action decision can be revisited if future conditions indicate that an unacceptable risk to human health or the environment would result from exposure to contaminants at these sites or there is a change in land use. However, while the direct contact pathways have been eliminated, there may be residual contamination in the subsurface soil contributing to the Eastern Plume. The No Further Action decision for Site 11 may be revisited if groundwater monitoring or further investigation shows the soil below the water table are a continuing source of contamination to the Eastern Plume. Also, if Building 584 is removed, the Navy, with input from USEPA, MEDEP and the public, will evaluate whether additional investigations are appropriate.

The selected remedy for contaminated groundwater associated with these sites, the Eastern Plume, is extraction, treatment, and discharge as outlined in the Eastern Plume Interim ROD (NAVY, 1992). The interim action was intended to control and prevent further migration of contaminated groundwater off NAS Brunswick property and to reduce the contaminant concentrations until the final remedy was chosen. A long-term monitoring program was included in the interim action to assess the effectiveness of the groundwater extraction system. The monitoring program will also continue, and will be modified as necessary to ensure proper coverage of the Eastern Plume area.

V. SUMMARY OF SITE CHARACTERISTICS

Site 4 (the Acid/Caustic Pit), Site 11 (FTA), and Site 13 (the DRMO Area) are all located within several hundred feet of each other off Old Gurnet Road between the intersection of Orion Street and Sandy Road (see Figure 1). Based on RI results, the Navy combined these sites to address both source (e.g., soil) and groundwater contamination. The results and discussions presented in the RI and the risk assessment indicate similar contaminants at the three sites including VOCs such as tetrachloroethylene (PCE) and TCE in soil and groundwater (E.C. Jordan Co., 1990b). Groundwater is the medium most impacted by past disposal activities at these sites.

The area of contaminated groundwater associated with these three sites has been studied and reported in the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991). The region of contaminated groundwater has been designated as the Eastern Plume. The Navy identified the Eastern Plume for expedited remediation and initiated an interim action for groundwater remediation, postponing a source control decision for Sites 4, 11, and 13 until a later time.

Because the magnitude and distribution of contamination differs at and downgradient of these sites, each is discussed separately in this section. A more detailed discussion of the site history, geology, hydrogeology, risk, and contamination is in the Draft Final RI and Draft Final Supplemental RI reports (E. C. Jordan Co., 1990b and 1991, respectively).

Acid/Caustic Pit: Site 4. The potential source for Site 4 contamination was believed to be the Acid/Caustic Pit currently located under the eastern portion of Building 584 (R.F. Weston, Inc., 1983). The Acid/Caustic Pit was used from 1969 to 1974 for the disposal of liquid wastes. The wastes were poured into the pit, which was approximately 4 feet long by 4 feet wide and 3 feet deep. To evaluate the presence and extent of potential contamination associated with the Acid/Caustic Pit, a soil gas survey was conducted, and subsurface soil and groundwater were sampled and analyzed for Target Compound List (TCL) organic and Target Analyte List inorganic compounds.

Halocarbon soil gases were detected in locations near Building 584, but below detection levels in all other samples. Similarly, VOC contamination in groundwater is restricted to low levels of TCE in one monitoring well adjacent to Building 584. The TCE results are consistent with soil gas data collected in the same area as the monitoring well. Subsurface soil adjacent to Building 584 at Site 4 did not contain detectable quantities of VOCs; however, subsurface soil samples were not collected directly from the suspected pit location due to the presence of Building 584 at that location. If this building is ever removed, further

investigations and remedial actions may be required.

Groundwater contamination was not detected in monitoring wells at Site 4 except for monitoring well (MW) MW-405 where 6 to 23 mg/L of TCE was reported in two of the four sampling rounds (E.C. Jordan Co., 1990b). The federal MCL for TCE is 5 μ g/L and the State of Maine MEG is 3 μ g/L. There are several wells downgradient of Building 584 (and MW-405) that do not have solvent contamination. These observations suggest that only low concentrations of TCE are present at or near the source, and that these low levels are diluted to values below detection downgradient of the building. Additional groundwater sampling in this area to confirm these findings will be incorporated into the long-term groundwater monitoring program.

Air monitoring was not performed within Building 584, but air blanks taken outside of the building did not detect VOCs (E.C. Jordan Co., 1990b). Outdoor monitoring was proposed in the RI/FS Work Plan that was approved by the USEPA, and was done to characterize the ambient air at Site 4. Indoor monitoring was never proposed or required by the USEPA or MEDEP, and was not considered by the Navy due to the low level of detected soil and groundwater contamination.

FTA: Site 11. Site 11, the FTA, was added to the list of sites under investigation in 1989. Three sampling rounds (Rounds IV and V and the Post-Screening Work Plan) have been conducted at Site 11 including monitoring wells, test pits, and soil and groundwater screening. The FTA was used regularly for approximately 30 years, but was closed in the Fall of 1990.

Environmental contamination was found in subsurface soil and groundwater at Site 11. Apparently, the site was contaminated during fire training exercises as the detected compounds are consistent with that practice. The IAS reports the use of waste liquids as fuel for the fire training exercises (R.F. Weston, Inc., 1983). The waste liquids identified in the study include fuels, oils, and degreasing solvents.

Results from sampling surface and shallow soil identified VOCs, semivolatile organic compounds (SVOCs), and inorganics-1 VOCs and lead were reported in the groundwater immediately downgradient of Site 11 (E.C. Jordan Co., 1990a, 1990b, and 1991). Interpretive groundwater flow directions at Site 11 indicate potential flow to the northeast, east, and southeast. Additional data were collected from Site 11 during the Post-Screening Work Plan to further characterize the extent of soil and groundwater contamination.

Test pit excavation and subsurface soil sampling demonstrated the presence of VOCs and SVOCs in shallow soil, and VOCs in deeper soil. No samples were collected from beneath the fire training pit during the RI due to the presence of the concrete pad. Calculations were used to assess the potential for contamination beneath the pad. These calculations estimated that concentrations of TCE in soils beneath the concrete pad may be on the order of 16 milligrams per kilogram (mg/kg). For the other contaminants, 1, 1-dichloroethane (DCA), 1,2-dichloroethylene (1,2-DCE), TCA, and PCE, the estimated concentrations were 16, 794, 693, and greater than 50 micrograms per kilogram (μ g/kg), respectively.

Based on these samples, a 50-by-100 foot area of soil contamination extending from the southern end of the fire training pit, north to the location of hollow-stem auger HA-1102, was assumed. It was also assumed that contamination extended to the groundwater table approximately 10 feet below ground surface (bgs). However, because the primary contaminants are dense non-aqueous phase liquids (DNAPL), there is a potential for residual contaminants to remain at depth.

The VOC and lead contamination in groundwater previously identified at Site 11 was confirmed by resampling MW-1103. To evaluate potential deeper groundwater contamination at Site 11, a monitoring well was installed below MW-1103 above the clay layer (MW-304). Groundwater sampling results demonstrated that concentrations of total TCL VOCs increased in MW-1103, a shallow well, from 500 to 2,900 mg/L over the period from fall 1989 to fall 1990, and low levels of total VOCs (18 mg/L) were reported in the deeper groundwater. (MW-304). This increase in VOCs was also correlated with a 2-foot increase in water level, and groundwater upgradient of Site 11 did not contain VOC contamination. These observations indicated that the source of groundwater contamination at Site 11 was the contaminated soil at the site. The correlation of increasing water level with increasing groundwater contamination observed at Site 11 amplified that the capillary fringe region of the subsurface soil acted as a source of groundwater contamination (E.C. Jordan Co., 1991). However, because the primary contaminants are DNAPLs, there is a potential for residual contaminants to remain at depth. The capillary fringe in sandy soil is typically 1 to 3 feet thick. When groundwater levels were low, less of the capillary fringe was in contact with groundwater and the concentration of VOCs was lower. When groundwater was at higher elevations, more of the capillary fringe zone of contamination was in contact with groundwater and VOC concentrations were higher.

The Navy has implemented two removal actions at Site 11 since completion of the RI. The first, completed in December 1994, consisted of the excavation and removal of buried drums and metallic debris from several locations around the site (Halliburton NUS Corporation, 1995). The second was completed in June 1995, and

included the removal of the concrete pad and approximately six to ten feet of soil from the 0.5-acre site (OHM 1996). This material was placed under the landfill cap that was being constructed at Sites 1 and 3. Samples were collected from the bottom of the excavation area to document the condition of the soil left in place. Analytical results showed that TCA ranged from non-detect to 6.5 mg/kg TCE ranged from not-detect to 5.3 mg/kg, and PCE ranged from non-detect to 1.4 mg/kg, TCE ranged at Site 11 was then filled with clean soil and planted with grass.

DRMO Area: Site 13. The DRMO Area is immediately south of Building 584 and Site 4. Originally, these two sites were considered the same; however, additional sampling and the identification of underground storage tanks (USTs) warranted separation of the two.

Environmental contamination detected at Site 13 during the RI program was observed in shallow soil, subsurface soil, and groundwater. Dichlorodiphenyltrichloroethane (DDT) was detected in several surface and shallow soil samples from test pits at relatively low (e.g., less than 0.02 mg/kg) concentrations, and is probably related to historic use of DDT in this area.

Fuel-related SVOCs (i.e., naphthalene and 2-methylnaphthalene) were detected in the subsurface soil at one monitoring well location. A visible sheen and odor were noticed on the soil above the water table and on drilling equipment at this location. The soil contamination is believed related to an old diesel UST. However, fuel-related contamination was not detected in groundwater from this monitoring well. The diesel UST was removed in the late 1980s and replaced with a fiberglass UST. The fiberglass UST was subsequently removed and replaced with an above-ground tank.

Site 13 groundwater contamination in the area next to the DRMO is restricted to VOCs. Groundwater flow direction in the Site 13 area is to the southeast, and the contaminated groundwater was detected downgradient of three former UST locations. Two 5,000-gallon tanks were located on the southern side and one 10,000-gallon tank was on the southeastern side of the DRMO. These USTs were used to store waste fuels, oils, and degreasing solvents, as well as the diesel fuel referred to above (R.F. Weston, Inc., 1983). The two USTs on the southern side of Site 13 were removed in the late 1980s; the UST on the southeastern side of the DRMO was removed in October 1989. Soil were not removed with the USTs.

Monitoring wells directly downgradient of the UST locations on the southeastern and southern sides of Site 13 (MW-GZA3 and MW-1303) have shown decreasing VOC contamination through time. MW-GZA3 is downgradient of the southwestern USTs removed in 1986. Before removal of the eastern UST, levels of 1,2-DCE exceeded 700 mg/L in MW- 1303. Groundwater sampling at MW-1303 after the UST was removed demonstrated that 1,2-DCE levels had decreased to 63 mg/L. These data indicate that the decrease in VOC concentrations is a result of the UST removals.

Eastern Plume. The contaminated groundwater downgradient of Sites 4, 11, and 13 is referred to as the Eastern Plume. The distribution of contaminants within this plume was determined by sampling monitoring wells and piezometric cone penetrometer testing sampling. Based on the sampling results, an area of VOC-contaminated groundwater was identified northeast, east, and southeast of Sites 4, 11, and 13. Total VOC concentrations within the Eastern Plume vary from low levels near the plume boundary, to concentrations as high as 12,000 mg/L within the plume. Groundwater contamination has not been observed in bedrock monitoring wells within the plume boundary or east of the plume.

Groundwater flow at the site occurs within an unconfined to semi-confined aquifer system composed primarily of transitional stratified silty sands and coarse sands. These transitional soil overlay a glacio-marine, clay considered to be an underlying aquitard to the shallow groundwater flow system. The clay unit ranges from about 20 to 60 feet thick, and is found throughout most of the Eastern Plume area. The transitional soil are separated into an upper stratified sandy silt unit and a lower coarse sand unit. Schematic depictions of the geology of the Eastern Plume area in east-west and north-south orientations are shown in Figures 3 and 4, respectively.

In general, VOCs occur within the lower coarse sand unit. Groundwater flow is generally to the southeast at the site, although radial flow away from the source areas also occurs. Groundwater flow is largely influenced by Mere Brook and Merriconeag Stream. Average hydraulic conductivities at the site range from 9.4 feet per day (ft/day) for the coarse sands, 0.5 ft/day in the stratified silts, and 0.11 ft/day for the stream bottom sediments. Groundwater seepage velocities range from 1,200 feet per year (ft/yr) in the vicinity of the source areas to 85 ft/yr in the vicinity of the clay trough area. Downward vertical gradients exist near the source areas with upward gradients generally present throughout the remaining portions of the site. See the Draft Final Supplemental RI Report (E.C. Jordan Co., 1991) for addition discussion and data.

Groundwater monitoring is underway which monitors the plume boundaries. To date, no evidence of contamination from the Eastern Plume has been found in any surface water bodies. The ultimate discharge zone for the contaminated groundwater has been predicted to be to local surface water. Although the affected portion of the aquifer is not currently being used, the groundwater is a potential drinking water source. The groundwater monitoring plan will track changes in contamination concentrations and potential migration. A more detailed discussion of the hydrology and contaminant distribution in the Eastern Plume is in the Draft Final Supplemental RI (E.C. Jordan Co., 1991).

A risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Sites 4, 11, and 13. The risk assessment followed a four step process:

- 1) contaminant identification identified those hazardous substances that, given the specifics of the site, were of significant concern;
- 2) exposure assessment identified current or future potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure;
- 3) toxicity assessment considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and
- 4) risk characterization integrated the three previous steps to summarize the potential and actual carcinogenic and non-carcinogenic risks posed by hazardous substances at the site.

Carcinogenic and noncarcinogenic risks are quantitatively evaluated for each site. Carcinogenic risks are compared to the USEPA target carcinogenic risk range of 1×10^{-4} to 1×10^{-6} , and to the NEDEP maximum acceptable incremental lifetime carcinogenic risk of 1×10^{-5} . Noncarcinogenic risks are compared to the USEPA noncarcinogenic Hazard Index (HI) of 1.0 (USEPA, 1989b).

A. HUMAN HEALTH RISK ASSESSMENT

Human health risks associated with contaminant exposure at Sites 4, 11, and 13 and the Eastern Plume were estimated based on analytical data collected during Sampling Rounds I through IV, and are presented in Appendix Q of the Draft Final RI (E.C. Jordan Co., 1990b). Analytical data collected during the Post-Screening Work Plan were reviewed and additional risk estimates calculated for exposure to contaminated soil at Site 11. The groundwater data collected as part of the Post-Screening Work Plan were consistent with earlier data and additional risk calculations were not considered necessary. No additional contaminants of concern or routes of exposure were identified. These data are presented in the Draft Final Supplemental RI report (E. C. Jordan Co., 1991).

The baseline risk assessment identified ingestion of groundwater as the route of exposure associated with a human health risk. VOCs were detected in the Eastern Plume at concentrations exceeding drinking water standards (e.g., MCLs and MEGs) and health-based criteria (e.g., maximum contaminant level goals and Reference Doses). Although groundwater in the Eastern Plume is not currently used for potable purposes, human health risks associated with exposure to groundwater were considered. The contaminants of concern in groundwater include 1,1-dichloroethylene (1,1-DCE), DCA, 1,2-DCE, TCA, TCE, and PCE. These contaminants, and their respective MCLs and MEGs, are listed in Table 1. Benzene, lead, and cadmium were eliminated as contaminants of concern based on their low concentrations and frequency of detection. This rationale is consistent with USEPA guidance for selecting contaminants of concern (USEPA, 1989a and b). The decrease in concentrations observed in the wells immediately downgradient of Site 13 may be attributed to the removal of the USTs.

Risks associated with exposure to contaminants through direct contact and ingestion of soil were evaluated separately for Sites 4, 11, and 13. These risk estimates are presented in Appendix Q of the Draft Final RI and the Supplemental RI reports (E.C. Jordan Co., 1990b and 1991). Minimal health risks were associated with exposure to surface soil at Sites 4 and 13. The area of potential contamination at Site 4 is located beneath the eastern portion of Building 584, effectively limiting any potential exposure. Contamination in surface soil at Site 13 was limited to DDT. However, the maximum detected concentration (i.e., 0.02 mg/kg) of this compound is below levels considered to present a health risk (direct contact and incidental ingestion exposure). The quantitative risk estimates calculated for Site 13 (residual scenario) range from 3×10^{-9} to 6×10^{-10} for incremental carcinogenic risks and 0.00005 to 0.00003 for noncarcinogenic HIs. These risk estimates are well below the USEPA target risk range (10^{-4} to 10^{-6}) and the MEDEP maximum incremental risk (10^{-5}) for carcinogenic risks, and an HI of 1.0 for noncarcinogenic risks (Appendix Q, Draft Final RI).

Additional soil samples were collected at Site 11 during the Post-Screening Work Plan to better delineate the distribution of contamination in the source area. Analytical results indicated that surface soil contamination (i.e., down to 1 foot bgs) was limited to one test pit location (i.e., TP-1106). SVOCs and

inorganic metals were the only contaminants detected in this sample. The polynuclear aromatic hydrocarbon (PAH) compounds fluoranthene, benzo(b)fluoranthene and benzo(k)fluoranthene were detected at a total concentration of 2.8 mg/kg. The sum of benzo(b)fluoranthene and benzo(k)fluoranthene (probable carcinogenic PAHs) concentrations was 1.8 mg/kg. Human health risks were estimated based on exposure to the maximum detected PAH concentration. These compounds were considered contaminants of concern. No VOCs were detected in surface soil at Site 11. The distribution of contamination at Site 11 was similar to those observed at fire training areas at other military installations. This distribution is characterized by minimal surface soil contamination with much greater contamination in deeper soils. The noncarcinogenic HI was less than 1.0. The lifetime incremental carcinogenic risk for direct contact and incidental ingestion exposure was 6.7×10^{-5} . The carcinogenic risk estimate fell within the USEPA target risk range of 10^{-4} to 10^{-6} , but slightly exceeded the MEDEP maximum acceptable risk of 1×10^{-5} .

B. ECOLOGICAL RISK ASSESSMENT

An ecological risk assessment evaluated the potential risks to terrestrial organisms from contaminant exposure at Sites 4, 11, and 13 (E. C. Jordan Co., 1990b). Since sampling from both the remedial investigation and the current long-term monitoring program has determined that the Eastern Plume has not migrated beyond the most downgradient wells (i.e., MW-230A, MW-231A&B, MW-318), exposure to aquatic receptors in Harpswell Cove has not been evaluated. If the Eastern Plume does migrate and discharge to surface water, potential exposure may result. If it appears that the plume has migrated beyond the most downgradient points, the Navy will institute additional downgradient monitoring wells and/or conduct monitoring in surface water.

The ecological risk assessment evaluated the risks to terrestrial receptors from soil contaminant exposure. As discussed, relatively low concentrations (e.g., 0.02 mg/kg of DDT and 1.8 mg/kg of PAHs) of surface soil contamination have been detected at these sites. The risk assessment concluded that exposure to soil contaminants by terrestrial receptors appears minimal (E.C. Jordan Co., 1990b). Therefore, no remedial response action objectives were developed.

VII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

Since Sites 4, 11, and 13 require no further action under CERCLA, this section applies only to the Eastern Plume. Additional groundwater remediation alternatives were not developed because alternatives for the Eastern Plume were developed in the Feasibility Study prior to the issuance of the ROD. Since the issuance of the Interim ROD, existing data no longer indicate Sites 4, 11, and 13 are major source areas of the Eastern Plume. Therefore, it was unnecessary to reopen the FS or to develop additional alternatives.

A. STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

The primary goal at NPL and similar sites is to undertake remedial actions that are protective of human health and the environment. Sections 120 and 121 of CERCLA establish several statutory requirements and preferences, including: a requirement that the remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that the remedial action is cost-effective and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies that include treatment to permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances as a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these congressional mandates.

TABLE 1
COMPARISON OF CONTAMINANTS IN GROUNDWATER (EASTERN PLUME)
TO MAXIMUM CONTAMINANT LEVELS
AND MAINE MAXIMUM EXPOSURE GUIDELINES

SITES 4, 11, 13, AND EASTERN PLUME ROD
 NAS BRUNSWICK

RANGE OF CONCENTRATIONS DETECTED

COMPOUND	SHALLOW WELLS (NEAR SOURCE) (ppb)	DEEP WELLS (DOWNGRAIDENT) (ppb)	FEDERAL MCLs (ppb)	STATE MEGs (ppb)
1,1-DCE	ND-6	ND-1,810	7	7
1,1-DCA	ND-130	ND-170	-	5(70**)
cis-1,2-DCE	63-680*	ND-98*	70	70
trans-1,2-DCE	*	*	100	70
1,1,1-TCA	13-1,200	11-11,000	200	200
TCE	5-770	6-2,800	5	5
PCE	ND-42	ND-68	5	3

Notes:

- * Dichloroethene was reported by the laboratory as total (i.e., the distinction between cis- and trans- was not determined).
- ** revised MEG recommended by State of Maine on June 19, 1995
- MCL Maximum Contaminant Level
- MEG Maximum Exposure Guideline
- ND Not detected
- ppb parts per billion

Based on types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to mitigate existing and future potential threats to human health and the environment. These response objectives are:

1. To minimize further migration of the Eastern Plume.
2. To minimize any future negative impact to surface water resulting from discharge of contaminated groundwater.
3. To reduce the potential risk associated with ingestion of contaminated groundwater to acceptable levels.
4. To restore the aquifer.

B. TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

In making the transition from an interim action to a final action, additional remedial action alternatives were not developed because the FS report identified and analyzed alternatives for both source and groundwater contamination. The Navy's selection of the interim remedial action as the final action is the result of a comprehensive evaluation of different groundwater treatment options.

The FS report described and evaluated five alternatives: no action; groundwater extraction and treatment; and three different source control options for Site 11 in conjunction with groundwater extraction and treatment. Since groundwater extraction and treatment was common to each treatment alternative and because it was desirable to stop the migration, an interim remedial action for groundwater was chosen. It was acknowledged that groundwater extraction and treatment could be part of a final site remedy even if additional time were taken to evaluate a source control alternative for Site 11. The decision to take an interim action provided a timely response to the migration of the Eastern Plume groundwater contamination.

In the time since the Interim ROD, the Navy conducted two removal actions at Site 11 under their removal authority. Existing data no longer indicate Sites 4, 11 and 13, are major source areas of the Eastern Plume. Therefore, no source control alternatives are evaluated and only groundwater extraction and treatment will be discussed further in this final ROD.

VIII. DESCRIPTION OF ALTERNATIVE

This section summarizes the remedial action for the Eastern Plume. The remedial action consists of extraction, treatment, and discharge of treated groundwater. The extraction system consists of five groundwater extraction wells that are designed to hydraulically contain the plume and reduce contamination throughout the plume. A monitoring program has been developed to ensure that the remedial action obtains hydraulic capture of the Eastern Plume. Changes to the remedial action will be made if the monitoring results determine that the remedial action does not achieve hydraulic capture of the plume or that such changes would improve the effectiveness and/or efficiency of the remedial action.

Extracted groundwater is treated to remove iron and manganese. If iron and manganese are not removed, they would interfere with the VOC treatment processes. The VOC treatment technology for the remedial action is ultraviolet(UV)/oxidation. The effluent is sampled to ensure that the water meets appropriate discharge requirements.

Discharge of the treated water is through a new sewer connection from the on-site treatment building to the public sewer system for conveyance to the local POTW. A discharge permit with the Brunswick POTW outlines specific discharge limitations.

Other discharge methods were considered, and at least one, infiltration of treated water back into the aquifer upgradient of the Eastern Plume, is potentially feasible. In the event that circumstances make discharge to the POTW undesirable, the Navy may evaluate infiltration again, and with the concurrence of USEPA and MEDEP, may propose to change the discharge method to infiltration into the aquifer.

IX. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

This section applies to only the Eastern Plume remedial action. Section 121(b)(1) of CERCLA presents several factors that at a minimum must be considered in the assessment of alternatives. Building upon these specific statutory mandates the National Contingency Plan articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A. 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 remedial action for addressing groundwater contamination provides overall protection of human health and the environment. Protection is provided by containment of the plume to prevent the migration of contaminated groundwater to currently uncontaminated areas, and by restoration of the aquifer to potentially allow the future use of the aquifer. A long-term groundwater monitoring program is included to provide data to verify the effectiveness of the remedial action, or for modifying the remedial action as necessary.

B. COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether or not a remedy complies With all state and federal environmental and public health laws and/or provides grounds for invoking a waiver. A list of ARARs is included in Appendix B of this ROD. The remedial action for the Eastern Plume is designed to meet action- and chemical-specific ARARs for the discharge of treated groundwater and disposal of sludge resulting from the pretreatment process. All location-specific ARARs are also met.

C. 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 cleanup goals are met.

The remedial action is expected to fulfill the cleanup objectives by preventing migration of the plume and by removing and treating the water.

D. 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 amendments to the Superfund statute emphasize that, whenever possible, the USEPA should select a remedy that uses a treatment process to permanently reduce the level of toxicity of contaminants at a site, the spread of contaminants away from the source of contamination, and the volume or amount of contamination at a site.

The purpose of groundwater extraction and treatment for the Eastern Plume is to prevent further migration of contaminants and to restore the aquifer. Five extraction wells, placed within the plume, control plume migration and reduce groundwater contaminant concentrations. The extraction wells are designed to address the majority of the Eastern Plume contamination which is located in deeper portions of the aquifer. Groundwater from the extraction wells is treated using UV/oxidation for the volatile organic compounds. Treatment of the extracted water permanently reduces the toxicity and mobility of contaminants.

E. SHORT-TERM EFFECTIVENESS

Short-term Effectiveness refers to the likelihood of adverse impacts on human health or the environment that may be posed during the construction and implementation of an alternative until cleanup goals are achieved. In continuing the operation of the groundwater extraction and treatment system, no short-term impacts are expected since no significant construction is anticipated.

F. IMPLEMENTABILITY

Implementability refers to the technical and administrative feasibility of an alternative, including the availability of materials and services needed to implement the alternative. There are no implementability issues with continuing the operation of the groundwater extraction and treatment system. As part of discharge requirements, the Navy provides the Brunswick Sewer District with monthly reports detailing sampling and analysis results and total volumes of treated water.

G. 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 projected life of the remedial action. Because the groundwater extraction and treatment system has already been constructed, the capital costs of the remedial alternative are minimal. Annual costs are estimated at approximately \$725,000 per year, not including 5-year reviews. The total present worth cost estimate is \$8,450,000, and is presented in Appendix E, Cost Estimate for the Selected Remedy.

H. STATE ACCEPTANCE

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 proposes for the remedial action.

As a party to the FFA, the State of Maine provided comments on the Sites 4, 11, and 13 proposed plan and documented its concurrence with the remedial action. A copy of the letter of concurrence is presented in Appendix C of this ROD.

I. COMMUNITY ACCEPTANCE

Community Acceptance addresses whether the public concurs with the Navy's Proposed Plan. The community has access to documents pertaining to Sites 4, 11 and 13 and the Eastern Plume in the Administrative Record which resides at the Curtis Memorial Library in Brunswick, Maine. A list of these documents is included as Appendix D. Community acceptance of the Eastern Plume Proposed Plan was evaluated based on comments received at the public meetings and during the public comment period for that plan. This was documented in the Responsiveness Summary for the Eastern Plume Interim ROD and the Responsiveness Summary attached to this ROD (Appendix A).

X. THE SELECTED REMEDY

Since the soils at Sites 4, 11, and 13 require no action under CERCLA, this section applies only to the Eastern Plume.

A. GROUNDWATER EXTRACTION AND TREATMENT

In June 1992, the Navy and the USEPA, with concurrence of the MEDEP, signed an Interim ROD for construction of a groundwater extraction and treatment system for the Eastern Plume. The system, which began operation in May 1995, includes pretreatment to remove inorganics, UV/oxidation to destroy volatile organic compounds, discharge of treated water to the local POTW, and periodic disposal of filter press sludge from the inorganics treatment process. The remedial action was designed to: prevent further movement of contaminants toward surface water; reduce concentrations of contaminants in the portions of the plume with the highest levels; and, together with natural degradation, result in the attainment of cleanup levels throughout the plume over a time period estimated to be between 13 and 71 years. When operating at full capacity, the system treats approximately 110 gallons per minute of groundwater.

It is the Navy's objective to attain the groundwater remediation goals, shown in Table 2, throughout the Eastern Plume area. Groundwater extraction and treatment is generally the most effective method of reducing concentrations of highly contaminated groundwater, but may be less effective in further reducing low levels of contamination to achieve remediation goals. Natural attenuation may play a vital role in achieving the final increment of cleanup once the groundwater extraction and treatment system reaches the point of diminishing returns. USEPA, MEDEP, and the public will review all proposed changes, and all comments received by the Navy will be addressed, prior to implementing any changes to the final remedy.

B. GROUNDWATER MONITORING

Beginning in March 1995, the Navy has been collecting groundwater samples at regular intervals from a network of 39 monitoring wells throughout the Eastern Plume area. This long-term monitoring program is designed to measure the performance of the groundwater extraction system, and ensure that the contaminants currently in the groundwater do not continue migrating towards surface water. The Navy will be revising the number of wells to refine the coverage in the area Sites 4, 11, and 13. The actual number of wells and their locations will be determined in discussions with USEPA and MEDEP. The groundwater monitoring plan will be revised and reviewed and approved by USEPA, MEDEP, and the community. The goals of the plan are as follows:

- provide a tiered approach to attain the requirements of NIEDEP water quality standards;
- monitor changes in the plume boundaries and potential migration pathways;
- monitor changes in the groundwater contamination;
- monitor the effectiveness of the remedial action for the protection of human health and the environment; and
- monitor the treatment plant effluent.

The Navy issues monitoring reports after each sampling event and an annual report that evaluates the progress the system is making towards attaining remedial action objectives. The Navy will continue this monitoring program until it is no longer necessary, as decided in consultation with the USEPA and the MEDEP.

TABLE 2
GROUNDWATER REMEDIATION GOALS

SITES 4, 11, 13, AND EASTERN PLUME ROD
NAS BRUNSWICK

COMPOUND	FEDERAL MCL (PPB)	MAINE MEG (PPB)	REMEDIATION GOAL (PPB)
1,1-DCE	7	7	7
1,1-DCA	-	5 (70**)	5
1,2-DCA	5	5	5
cis-1,2-DCE	70	70	70
trans-1,2-DCE	100	70	70
1,1,1-TCA	200	200	200
1,1,2-TCA	5	3	3
TCE	5	5	5
PCE	5	3	3

Notes:

- Not available

MCL Maximum Contaminant Level

MEG Maximum Exposure Guideline

ppb parts per billion

** revised MEG recommended by State of Maine on June 19, 1995

C. FIVE-YEAR REVIEWS

Because the Eastern Plume remedy will result in hazardous substances remaining in on-site groundwater above health-based levels for a period estimated to exceed five years, a review of the monitoring data will be conducted at least every five years to ensure that the remedy continues to provide adequate protection of human health and the environment. Based on this evaluation, the Navy may propose modifications to the final remedy. Possible revisions could include changes to the location, number, or operation of extraction wells, modifications to the long-term monitoring program, changes to the treatment plant configuration, and/or termination of the groundwater treatment system. In addition, conditions at Sites 4, 11, and 13 will be evaluated to determine whether additional actions may be necessary at those sites. For example, if Building 584 was to be removed the need for additional sampling in that area will be assessed.

D. COST

The present worth cost of operating the groundwater extraction and treatment system, conducting long-term groundwater monitoring and performing five-year reviews is approximately \$8,450,000. The present worth cost analysis is included in Appendix E.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at NAS Brunswick for Sites 4, 11, 13, and the Eastern Plume is consistent with CERCLA and, to the extent practicable, the National Contingency Plan. The final remedy will be protective of human health and the environment, attain ARARs, and be cost-effective. The selected remedy also satisfies the statutory preference for treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element. Additionally, the selected remedy uses alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

Although the Feasibility Study evaluated both source control and groundwater alternatives, the decision to select groundwater extraction and treatment was taken because there was a concern with controlling the migration of the Eastern Plume. Since it was a common component of all the remedial alternatives, it was acknowledged that groundwater extraction and treatment could be consistent with the final remedy and the only difference would be the source control alternative for Site 11. In the time since the Interim ROD, the Navy conducted two removal actions at Site 11 under their removal authority obviating the need for further action under their program. It was, therefore, not necessary to reopen the Feasibility Study and develop remedial alternatives for the Eastern Plume.

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

The selected remedy at this site will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through treatment; more specifically, protection is provided by containment of the plume to prevent the migration of contaminated groundwater to currently uncontaminated areas, and by permanent reduction of contaminant concentrations in the water through treatment. The selected remedy treats extracted groundwater to levels that are protective of human health, posing human health risks that are below the USEPA and MEDEP incremental cancer risk targets and are less than the Hazard Quotient of 1.0 for noncarcinogens. Finally, continuation of groundwater extraction and treatment does not pose any unacceptable short-term risks or cross-media impacts, there is little danger to workers or the community during treatment and the contaminants removed will be destroyed.

B. THE SELECTED REMEDY ATTAINS ARARS

This remedy will attain all applicable or relevant and appropriate federal and state requirements that apply to this final action. The selected remedy for the Eastern Plume will meet the federal and state ARARs listed in Appendix B.

C. THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

The selected remedy is cost-effective, that is, the remedy affords overall effectiveness proportional to its costs. The Navy evaluated the overall effectiveness of the remedial action by assessing the relevant three criteria: long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs.

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

The selected remedy uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy was evaluated for the balance of trade-offs 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 final remedial action provides the best balance of trade-offs among these criteria prior to determination of a final remedy.

E. THE SELECTED REMEDY SATISFIES THE PREFERENCE FOR TREATMENT WHICH PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

The principal element of the selected remedy is the extraction of groundwater and treatment with UV/oxidation. The final remedial action satisfies the statutory preference for treatment as a principal element by destroying contaminants in the extracted groundwater with UV/oxidation.

XII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan for Sites 4, 11, and 13 (ABB-ES, 1996). The Proposed Plan described the Navy's decision to pursue No Further Action at Sites 4, 11, and 13. In addition, the final remedy for the Eastern Plume will be the same as has been implemented as an interim remedy for groundwater: extraction, treatment, and discharge. No significant changes have been made to the No Action decision stated in the Sites 4, 11, and 13 Proposed Plan.

XIII. STATE ROLE

MEDEP has reviewed the RI Report and Proposed Plan, and indicated its support for the selected remedy. MEDEP concurs with the selected remedy for NAS Brunswick Sites 4, 11, and 13, and the Eastern Plume. A copy of the letter of concurrence is presented in Appendix C of this ROD.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ARARs	applicable or relevant and appropriate requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethylene
1,2-DCE	1,2-dichloroethylene
DDT	dichlorodiphenyltrichloroethane
DNAPL	dense non-aqueous phase liquid
DRMO	Defense Reutilization and Marketing Office
FFA	Federal Facility Agreement
FS	Feasibility Study
FTA	Fire Training Area
ft/day	feet per day
ft/yr	feet per year
HI	Hazard Index
IAS	Initial Assessment Study
IRP	Installation Restoration Program
MCL	maximum contaminant level
MEDEP	Maine Department of Environmental Protection
MEG	maximum exposure guideline
mg/kg	milligrams per kilogram
MSL	mean sea level
MW	monitoring well
NAS	Naval Air Station
NPL	National Priorities List
PAH	polynuclear aromatic hydrocarbon
PCE	tetrachloroethylene
POTW	publicly owned treatment works
RAB	Restoration Advisory Board
RI	Remedial Investigation
ROD	Record of Decision
SVOC	semivolatile organic compound
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCL	Target Compound List
TRC	Technical Review Committee
Ig/kg	micrograms per kilogram
Ig/L	micrograms per liter
USEPA	U.S. Environmental Protection Agency
USTs	underground storage tanks
UV	ultraviolet
VOC	volatile organic compound

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES) 1996. "Proposed Plan Sites 4, 11, and 13", Portland, Maine; October.
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APPENDIX A

**RESPONSIVENESS SUMMARY
AND
PUBLIC MEETING TRANSCRIPT**

The Navy held a 30-day comment period from October 11 to November 9, 1996, to provide an opportunity for the public to comment on the Proposed Plan and other documents developed for Sites 4, 11, 13 and the Eastern Plume. Sites 4, 11, 13 and the Eastern Plume are located at the Naval Air Station Brunswick Superfund Site, in Brunswick, Maine. The Proposed Plan is the document that recommends an alternative to address a site.

The Navy made a recommendation of its preferred alternative in the Sites 4, 11, and 13 Proposed Plan. The Proposed Plan was issued on October 8, 1996, before the start of the comment period. All documents on which the preferred alternative is based were placed in the Administrative Record for review. The Administrative Record is a collection of the documents considered by the Navy when choosing the remedial action for Sites 4, 11, 13 and the Eastern Plume.

The Navy received no written comments on the Proposed Plan during the 30-day public comment period. Several verbal questions and comments were offered at the public meeting on October 17, 1996. Many of these were seeking clarifications of the information being presented at the meeting, or were pointing out subjects that were not covered in the technical presentation but were of interest to the public. Responses were provided verbally for each question and comment during the meeting, and these are documented in the Public Meeting Transcript, which is attached to this Responsiveness Summary. There were no comments that indicated disagreement with the proposed remedy.

The Navy is selecting the No Further Action Alternative for Sites 4, 11, and 13. In addition, the Eastern Plume interim action is being selected as the final action for the groundwater contamination associated with these sites. Since May 1995, an extraction, treatment, and discharge system has been in place to contain the Eastern Plume. The Eastern Plume remedial action also consists of long-term groundwater monitoring to measure the performance of the extraction system and to ensure that the contaminants currently in the groundwater do not continue migrating towards surface water.

NAVAL AIR STATION - BRUNSWICK

PUBLIC MEETING

SITES 4, 11, 13 PROPOSED PLAN

OCTOBER 17, 1996

OLD BRUNSWICK HIGH SCHOOL
Brunswick, Maine

7:00 p.m. - 8:00 p.m.

PANEL MEMBERS

CAPTAIN E. F. CARTER, JR.	Commanding officer, NAS Brunswick
FRED EVANS	Program Manager, NORTHDIV
JEFF BRANDOW	Project Manager, ABB-ES
BOB LIM	EPA Project Manager
NANCY BEARDSLEY	Maine DEP Project Manager
GREG APRAHAM	NAS Brunswick

Robin Jansen
BROWN & MEYERS
Post Office Box 937
Yarmouth, ME 04096-0937
(207) 846-0420

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1 MR. APRAHAM: My name is Greg Apraham and
2 tonight we are going to talk about the proposed
3 plan for the sites 4, 11 and 13 on the Naval Air
4 Station, that the remedial advisory board, a
5 working group of both the State and Federal
6 regulators, Naval personnel, as well as the
7 citizens representative of the Town of Brunswick
8 and the BACSE group, that has been working on this
9 for several years.

10 The people at the front table is our new
11 Commanding Officer, Captain Carter; he took over
12 September 6th. Bob Lim is from EPA, Region 1.
13 Jeff Brandow is the Project Manager from ABB
14 Environmental in Portland; he is our consultant on
15 the work. Next to him is Nancy Beardsley, who is
16 the Maine DEP Project Manager, and then Fred Evans
17 who works for the Naval Command down in
18 Philadelphia, Pennsylvania, who's the technical
19 contract folks, as well as the technical experts
20 for the Navy in his field. And the lady down the
21 end of the table is the court reporter.

22 There is a mailing list sign-up sheet out at
23 the table out here in the ante room. There is a
24 complete and full administrative record of the
25 entire remedial work, investigation and feasibility

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1 studies that the Navy has undertaken at the Naval
2 Air Station at the Curtis Memorial Library. It has
3 all of the records, all of the proposed plans, if
4 anybody cares to see anything. All of the
5 documents that have been produced over the years
6 are over there.

7 There is also a proposed plan for what we're
8 looking to talk about tonight, Sites 4, 11 and 13,
9 also out in the ante room by the sign-out table.
10 And the court reporter is here to record the public
11 hearing because it becomes part of the public
12 record, and there will be a question-and-comment
13 period at the end of the presentation.

14 Having said that, I'm going to turn this over
15 to Jeff to do the presentation with regard to the
16 proposed plan. Oh, I'm sorry. Captain Carter has
17 a few remarks.

18 Captain Carter: Good evening. Again, my name
19 is Captain Fred Carter, as was stated took over
20 command on 6th of September. Again, I'd like to
21 welcome you all to this public meeting to present
22 the Navy's proposed plans for Sites 4, 11 and 13.
23 The meeting is the latest in a series of public
24 forums where the Navy presents for public input its
25 plan for the environmental cleanup of the Navy Air

1 Station, Brunswick.

2 Tonight you will be hearing about the Navy's
3 proposed plans for the group of three sites, 4, 11
4 and 13. These sites constitute the sources of the
5 Eastern Plume as it is described, the subject that
6 many of you have heard about in the past and all of
7 you will hear about it again tonight. As I
8 understand it, the past has witnessed a great deal
9 of activity at the Naval Air Station, Brunswick.
10 We completed the work on 8 of 13 sites. And the
11 groundwater treatment plant is actively treating
12 the Eastern Plume.

13 As mentioned, I took command of the Naval Air
14 Station at Brunswick a little over a month ago and
15 am certainly a new member of the team, but
16 personally wanted to reassure all of you that I'm
17 fully committed to continuing the Installation
18 Restoration Program and the cleanup that will occur
19 from that. Obviously, I'm learning, as well as
20 perhaps some of you out there, on all of the
21 aspects of the Installation Restoration Program at
22 Naval Air Station, Brunswick.

23 In the short time I've been here, however, the
24 Navy has -- but in front of you tonight the Navy
25 has assembled a team of people here that are

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1 certainly experts on the subject and had a great
2 deal of interaction with the base in that regard.

3 With that I'll allow the team to provide their
4 briefing, and I hope to learn as well as the rest
5 of you in answering your questions.

6 MR. EVANS: We're here tonight for the public
7 meeting portion of the CERCLA or Superfund Process.
8 Up to this point for Sites 4, 11 and 13, we've
9 performed a remedial investigation and a
10 feasibility study. And as part of the process for
11 the record of decision for the end of the
12 feasibility study, we need to propose our plan to
13 the public and give the public a chance to comment
14 and recommend if they have changes to what we want
15 to do.

16 This is a critical point in the process of
17 what we need to do. Following the completion of
18 this meeting, any comments that are recorded as
19 part of this meeting or that are written and mailed
20 in to myself, as part of the public comments
21 period, will be addressed in the Responsiveness
22 Summary, which will be included as part of the
23 record. And then we will go into the design and
24 long-term monitoring operation phase of the
25 cleanup.

1 And, with that I'd like to turn it over to Jeff
2 Brandow of ABB to explain what we've done, what
3 we've proposed to do.

4 MR. BRANDOW: Thanks, Fred. I guess I'll
5 start off by saying that I'm not a professional
6 public speaker; I'm an engineer. And hopefully I
7 can try to avoid using a lot of technical jargon
8 and not make that too terribly boring. I'd like to
9 do just a general overview background description
10 of the site that we're here to talk about tonight
11 and then talk a little bit about some of the
12 actions that the Navy has taken thus far to try to
13 address some of the environmental concerns that are
14 related to those sites and then quickly summarize
15 the proposed plan, the formal plan that the Navy is
16 proposing to move forth from this point.

17 We're talking about three of the original 13
18 installation restoration sites on the base, Sites
19 4, 11 and 13. They're located more or less in the
20 east central portion of the Air Station, just south
21 of the major developed part of the installation.

22 As you can see, these three sites are located
23 quite close to each other. And it's just to orient
24 you here, this photograph was taken looking to the
25 south, so the orientation of the three sites is

1 sort of reversed from that previous overhead. But
2 the three sites are located quite close together.
3 This has caused the Navy over the years to tend to
4 group these three sites together when they're
5 evaluating the impact they may have had on the
6 environment. We're going to continue doing that
7 tonight.

8 I'm going just quickly describe the three
9 sites. I'm just going right through in order and I
10 will start with Site 4. I'll just draw your
11 attention here for the moment to this building
12 that's located at Site 4. Site 4 is known as the
13 former acid and caustic waste disposal pit. This
14 was basically a hole in the ground about 4 feet by
15 4 feet and about 3 feet deep. It was used over a
16 period of approximately five years from 1969 to
17 1974 for disposal of waste liquids. Liquids were
18 essentially just dumped into the pit and allowed to
19 infiltrate.

20 Types of waste that generally were disposed of
21 at the site were acidics and caustics, though there
22 are some reports that there may have been some
23 waste oils and waste solvents also disposed of in
24 the pit. The pit no longer exists. It was filled
25 in and a building that I pointed out to you was

1 built on top of that location. So this is not a
2 site that you can actually go out and see at this
3 point.

4 Site 11, this is the former fire training area
5 on base. And it's probably the more interesting of
6 the three sites. The fire training area is a
7 location where the emergency response crews would
8 go to practice their fire fighting training
9 exercises. Site 11 was used for at least 30 years
10 for this purpose. In general, what would happen is
11 waste, flammable liquids consisting of waste fuels,
12 waste oils, solvents, whatever was available, was
13 placed directly onto the ground and ignited, and
14 then the response crews would practice their fire
15 fighting techniques as they extinguished the fire.

16 The site was upgraded in 1987 to include that
17 concrete pad you saw in the previous photograph.
18 And also there was an underground storage tank
19 installed at that time to collect any excess
20 liquids that might have remained at the end of the
21 training exercise.

22 In 1990 the Navy ceased its fire training
23 exercises at Site 11; and in fact, currently is not
24 conducting any fire training exercises with live
25 fires.

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1 And finally Site 13 is the DRMO, or Defense
2 Reutilization and Marketing Office. This is the
3 facility on base that is -- that deals with surplus
4 and waste products. Of most interest at the DRMO
5 was the presence of three underground storage
6 tanks. These tanks were used to store wastes,
7 solvents, oils and waste fuels. The three tanks
8 have all been removed. They were removed in the
9 late '80s, and currently there are no underground
10 storage tanks at the DRMO.

11 Fred already mentioned the CERCLA Process.
12 CERCLA, being the Superfund Process. That process
13 generally starts with a remedial investigation and
14 feasibility study. And the remedial investigation
15 feasibility study activities at these sites
16 occurred over the 1989, 1990 time frame. The
17 investigation consisted of numerous soil and
18 groundwater samples collected from around the three
19 sites and adjacent areas.

20 I'm not going to go through these studies in
21 any detail tonight. That's been done in previous
22 public meetings. And these documents are available
23 at the Curtis Memorial Library for your review if
24 you would like additional information. I'm just
25 going to hit on a couple of key points from these

1 studies.

2 Probably the most important finding from the
3 remedial investigation was the identification of a
4 fairly extensive area of groundwater that is down
5 gradient or down stream, if you will, of the three
6 sites. And this area of groundwater contains
7 site-related chemicals that we believe originated
8 from the three sites. This figure represents the
9 entire area encompassing any location that we
10 actually had a detection of any of these chemicals.
11 It does not represent an area that exceeds any
12 particular number, but just any detection of
13 chemicals. This was as of 1991 when that -- when
14 that study was completed.

15 Now, I've referred to site-related chemicals,
16 and just to let you know what I'm talking about
17 here, the chemicals that we see in the groundwater
18 that we believe are related to the site are
19 primarily solvents. And of these, probably
20 trichloroethane and trichloroethylene are the most
21 abundant. These are both common degreasing
22 solvents that have been used widely in industry and
23 used widely in the Air Station, as well as for
24 degreasing purposes and other purposes.

25 This table shows the target cleanup levels

1 that were established for the interim remedial
2 action in the ROD. I'm kind of getting ahead of
3 myself there. Let's set that aside for a moment.

4 Now, the feasibility study is a report that
5 evaluates the cleanup options that are available to
6 address the contamination that's identified in the
7 remedial investigation. In the feasibility study
8 we've identified three principle conclusions that
9 are related to the three sites we're talking about
10 tonight.

11 And the first is, of course, there was
12 groundwater in that Eastern Plume area that has
13 been identified that exceeded drinking water
14 standards. Nobody is currently drinking that
15 groundwater. There are no wells in that area, and
16 nobody uses it as a drinking-water source, but
17 because there is the potential that at some point
18 in the future somebody could use that water as a
19 drinking -- water-well source, we have used a very
20 conservative evaluation criteria, which is drinking
21 water standards.

22 The second conclusion that we came to was that
23 the soils, the surface and subsurface soils at the
24 three sites, did not pose a risk from direct
25 contact. In other words, if you were walking out

1 on the site or even digging in the soil at the
2 site, you were not getting an exposure to chemicals
3 that was considered to be harmful to you. So the
4 concentration in the soils were not causing a
5 direct contact risk. However, we did conclude that
6 the soils at Site 11 could be causing a continued
7 groundwater impact and could be acting as a source
8 of continued groundwater contamination.

9 Now, by source, you typically think of a
10 source as a landfill or a leaking underground
11 storage tank or in the case of Site 4, a pit. But
12 even after you have removed those types of items,
13 you may still have an area of soil that has
14 absorbed contaminants. And then as rain falls on
15 the soil, it moves through the soil; it can move
16 those contaminants down into the groundwater if the
17 concentrations are high enough. And we believe
18 that there was reason to believe that might be the
19 case at Site 11 but not at the other two sites. So
20 we have basically two issues to deal with, the
21 groundwater in the Eastern Plume and the soil at
22 Site 11.

23 Now, since the RI and the FS have been
24 completed, the Navy has taken a number of actions
25 to start to address those issues. And these

1 include a couple of excavation activities at Site
2 11, the design and construction of a groundwater
3 extraction treatment system at the Eastern Plume
4 area and a groundwater monitoring program to
5 evaluate the conditions in that groundwater in the
6 Eastern Plume. I'll go through each of these in a
7 little bit of detail.

8 MR. HOLBROOK: Could you redefine Eastern
9 Plume for me, please?

10 MR. BRANDOW: Sure. A plume is an area of
11 groundwater, groundwater being water that's down
12 beneath the ground. It fills the spaces between
13 the soil particles. And this is water that's
14 generally in the soil throughout the State of
15 Maine. It's what you sink your well into to get
16 drinking water. A plume is an area of groundwater
17 where you have detectible concentrations of
18 chemicals that may have originated from a source
19 area. So you can think of it as an area of
20 groundwater contamination that has moved with the
21 groundwater flow away from those sites.

22 MR. HOLBROOK: Why do you say "Eastern"?

23 MR. BRANDOW: We call it the Eastern Plume
24 primarily because it's located on the eastern
25 portion of the base, along the eastern boundary of

1 the base. That's all.

2 Let me talk first about the removal action
3 that occurred at Site 11. The Navy discovered
4 buried metallic objects at Site 11 in 1994 when
5 they were following up some verbal reports from
6 some of the former fire fighting crews. And these
7 buried metal objects were thought to probably be
8 drums, possibly containing liquid wastes. Because
9 a drum of liquid waste in the ground represents a
10 real potential threat of major impact to
11 groundwater, the Navy decided they wanted to go
12 ahead and get those materials out of there. So in
13 1994 the Navy located and excavated those buried
14 metallic objects at Site 11. And they were
15 properly packaged and taken off-site to a permanent
16 facility for disposal. Also at that time they
17 removed that underground storage tank that had been
18 tied to the fire training pad.

19 In 1995, the Navy installed a series of
20 groundwater extraction wells throughout the Eastern
21 Plume area. If you go out in that area today,
22 you'll see a series of five of these concrete
23 blocks, each of which contains a groundwater
24 extraction well, a well that's been placed into the
25 ground to try to capture that underground water.

1 The wells have been -- let me go back to an
2 earlier overhead, the one that shows the plume.
3 The wells have been located generally in a north
4 south pattern through the plume. There's five of
5 them. And their main purpose is, Number one, to
6 prevent this area of groundwater from moving any
7 further to the south toward Harpswell Cove, which
8 is -- it starts about down here. And then the
9 second objective is to begin the restoration of the
10 groundwater system.

11 Now, the water that's being pumped from those
12 extraction wells is pumped out of the ground and
13 sent to a groundwater treatment plant that the Navy
14 has constructed on the Air Station. This was
15 designed and constructed by the Navy in 1995. The
16 treatment plant houses a series of tanks and
17 treatment units who's purpose is to remove the
18 chemicals from the groundwater. It's a fairly
19 complex treatment scheme. But the major treatment
20 unit is -- this UV/Oxidation Unit -- this is a
21 treatment unit where the organic chemicals, the
22 solvents that are in the groundwater are destroyed
23 by a combination of ultraviolet light and hydrogen
24 peroxide. So this is where the actual treatment
25 and the destruction of the chemicals occurs prior

1 to the treated groundwater being discharged to a
2 sewer and then to the Brunswick treatment plant.

3 However, there's several additional treatment
4 processes that have to occur before the water goes
5 into that system, and this is mainly to prepare
6 that water so that the destruction unit is more
7 efficient and more effective.

8 I guess that I should point out that some of
9 these have just recently been added. For instance,
10 these processes here have been added to deal with a
11 cloudy-water issue that we have found in a couple
12 of the wells. The water coming out of the wells is
13 cloudy due to very fine soil particles in the
14 water. If that cloudy water were to get to the
15 treatment unit, it could interfere with the
16 effectiveness. So we're going to change the design
17 slightly to make sure that does not happen.

18 I guess I should also point out, though, that
19 the system has been operating effectively since its
20 start-up in the spring of 1995, and it has been
21 meeting its discharge standards that were set by
22 the treatment plant.

23 MR. HOLBROOK: Water which comes into the
24 extraction wells, do you obtain that water because
25 there's a dug hole in the ground, or because it's a

1 overgrown point, shall we say, that has been driven
2 into the ground?

3 MR. BRANDOW: It's a drilled well. We had a
4 large well-drilling unit come out and drill a large
5 diameter hole into the ground about a hundred feet
6 deep, and we placed a six-inch diameter well.

7 MR. HOLBROOK: Okay. So six inches, about 100
8 feet, and the submersible pump is down at the
9 bottom?

10 MR. BRANDOW: Yes, it is.

11 MR. HOLBROOK: Is that well strictly in the
12 clays? Do any of them go into the bedrock?

13 MR. BRANDOW: No. The wells are located in
14 the zone of soils just above the clays. That's the
15 area we're most concerned with, the area from the
16 top of the groundwater down to the clay area.

17 Now, back to Site 11 for a minute, in order to
18 deal with the concern that the soils at Site 11
19 were acting as a continuing source of groundwater
20 impact, in 1995 the Navy decided to just go ahead
21 and dig all that soil up. They did so and
22 transported all of that soil over to the old base
23 landfill, which was being closed under a related
24 program at the base. The soil was placed
25 underneath the engineered cap that was being put on

1 top of the landfill. It was used primarily as
2 grading fill to help establish the necessary grades
3 or slopes with a cap on the landfill.

4 So this became an option that was both
5 technically and financially very desirable for the
6 Navy, and the Navy went ahead and did that. So all
7 of the soils at Site 11 were excavated and removed.
8 The site was then backfilled with clean soil and we
9 seeded it. And now if you go out there, you'll see
10 a nice grassy field at Site 11.

11 MR. HOLBROOK: You stopped at six feet in
12 excavating these soils?

13 MR. BRANDOW: Well, actually we went as deep
14 as we could. We went down to the groundwater
15 elevation which was as far as we could practically
16 excavate.

17 And finally the other action that the Navy has
18 been taking is the long-term monitoring program.
19 This is a program where groundwater samples are
20 regularly collected throughout the Eastern Plume
21 area. And the Navy's been doing this since March
22 of 1995 to help keep track of the progress that the
23 extraction and treatment system is making in
24 containing the Eastern Plume.

25 Now, the results of these sampling events are

1 reported. Each event is reported and each year an
2 annual report is prepared which describes -- which
3 discusses the Navy's interpretation of those -- of
4 all that data that's been collected. And these
5 reports are available also at the Curtis Memorial
6 Library. So that brings us to where we are today,
7 which is the Navy's proposed plan.

8 Now, the actions that have been taken to date
9 have been considered to be interim actions by the
10 EPA. And that's dictated by the process that we
11 are going through under CERCLA. The Navy believes,
12 though, that these actions have been the
13 appropriate ones to address the issues that we've
14 seen from Site 4, 11 and 13.

15 Under the CERCLA Process, the Navy must now
16 propose a final plan or final remedy for those
17 sites. Hopefully, you've had a chance to see the
18 Navy's proposed plan which was issued about two
19 weeks ago. The cover looks like this. It's on
20 blue paper. If you haven't, we have some copies
21 here tonight, and there's also additional copies at
22 the library.

23 Now, in this plan, the Navy is formally
24 recommending that the actions taken to date become
25 the final remedy for Sites 4, 11 and 13. And in

1 particular, the Navy will continue to operate the
2 groundwater extraction and treatment system as long
3 as it's determined to be necessary.

4 We do not see the need for any additional
5 source removal action. We have removed the soils
6 from Site 11. And the soils associated with the
7 other sites were not considered to be posing any
8 type of a problem.

9 The Navy will also continue to perform the
10 groundwater monitoring program to provide the data
11 necessary to evaluate the ongoing treatment system.
12 And they will perform periodic reviews of the whole
13 program in conjunction with the Maine DEP and the
14 U.S. Environmental Protection Agency and in
15 conjunction with the members of the public to
16 evaluate the conditions at the site, including
17 performance of the treatment system and extraction
18 system and any changed conditions that might occur
19 that would effect the overall remedies, such as,
20 for instance, if this Building 584 were ever torn
21 down, the Navy would evaluate whether there's a
22 need to do additional soil investigations in that
23 area, because that area was not accessible to us
24 when we did our studies.

25 MR. HOLBROOK: Building 584, as I might drive

1 around the areas that are available to the public,
2 is there a Number 584 in evidence on a building?

3 CAPTAIN CARTER: Yes, there is.

4 MR. HOLBROOK: As I would be driving along,
5 that is clearly evident that it is 584?

6 CAPTAIN CARTER: Yes.

7 MR. BRANDOW: You would be able to see that
8 from the roadway that heads down to the golf
9 course.

10 MR. HOLBROOK: As I went from the main gate to
11 the golf course it would be on my left?

12 MR. BRANDOW: Yes. That's the extent of the
13 technical portion of our presentation tonight. I'm
14 going to bring Fred Evans back up for a couple of
15 words before we have our question-and-answer
16 period.

17 MR. EVANS: The public comments period runs
18 from -- it opened on October 11 and it's running
19 until November 9th. We will be willing to answer
20 any oral comments that we can at tonight's meeting
21 and any written comments to be forwarded to myself
22 at the address in Philadelphia. And we will
23 address all comments in the Responsiveness Summary
24 which will be included as part of the Record of
25 Decision which will document how we went through

1 our decision process to do what we ultimately
2 decide to do based on the comments and what we
3 propose.

4 Before we open it up for oral comments, I
5 would like to say that the current proposed plan is
6 saying that we will clean up the groundwater to the
7 Federal Drinking Water Standards. And the State of
8 Maine has taken the position that we should clean
9 them up to the maximum exposure guidelines, and
10 that is currently under review by both EPA and the
11 Navy. With that I'd like to open --

12 MR. APRAHAM: For those of you who are
13 interested, that gray piece of paper has the
14 address for Philadelphia to send your written
15 comments to.

16 We'll take questions and comments at this
17 point in time now. Because this is a public
18 hearing and becomes part of the public record,
19 would you please state your name and address when
20 you have a question or comment.

21 MR. BRUSAL: My name is Frank Brusal;
22 Brunswick is my home. Sites 4, 11 and 13 are they
23 the only sites under surveillance or consideration?
24 Will there be more? Or has whatever survey been
25 made satisfied the Navy and EPA and so on? Are

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1 these the only sites of concern?

2 MR. APRAHAM: No. They are not the only sites
3 of concern. As a matter of fact, I think by last
4 count --

5 MR. EVANS: I think we have a total of 17
6 right now.

7 MR. APRAHAM: Yes. I was going to say there's
8 like 17 different areas we have looked at on the
9 base. This process has been ongoing on the base
10 since 1981 when we did the initial assessment
11 study. Then the Technical Review Committee got
12 started in the mid '80s. And subsequent to that
13 with the signing of the Federal Facilities
14 Compliance Agreement that brought the EPA and the
15 DEP and the Navy, as well as the citizen
16 representative from the town, as well as the
17 representative from the Brunswick Citizen's --
18 Concerned Citizen for a Safe Environment as part of
19 the decision-making process, so this has been going
20 on for well over the 10 or 12 years. And what
21 we've done is, because all of the units on the base
22 are in essence discrete, except for the Eastern
23 Plume as a process that's gone, we've been able to
24 close some of the landfills and some of the old
25 sites out. We've done that through public hearings

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1 and mailings. And a complete record of everything
2 that's ever been done for the last 12 years is in
3 the Curtis Library.

4 So, no. These are not the only three sites.
5 These are the three sites that we're addressing
6 specifically tonight.

7 Any other questions? Comments?

8 MR. KATZ: I have a question. Josh Katz; I'm
9 a Brunswick resident. Do you ever test any of the
10 drilled wells on Coombs Road?

11 MR. APRAHAM: We've done that once, Josh, and
12 we've just sent letters out to the residents with
13 wells in this area asking permission to go back on
14 the property and do it again.

15 MR. KATZ: I know there has been at least one
16 well drilled since, I hope there certainly will be
17 others. Thank you.

18 MR. APRARAM: That's always been one of our
19 prime concerns is the potential effects.

20 MR. KATZ: One other question. What's the
21 difference between the maximum exposure guidelines
22 and Federal Drinking Water Standards?

23 MR. EVANS: For the most part they're very
24 close, but there are some particular chemicals that
25 there's a significant difference on. Of the

1 solvents that we're currently protecting in the
2 Eastern Plume, I don't think there's a significant
3 difference.

4 MR. KATZ: Do you think these are State of
5 Maine proposed MEGs?

6 MR. EVANS: No. These were --

7 MS. BEARDSLEY: They're not proposed. They
8 are actually the MEGs that were issued in 1992?

9 MR. APRAHAM: For the State of Maine.

10 MS. BEARDSLEY: For the State of Maine; right.
11 Usually they are the same as MCLs. But in some
12 cases they can be slightly different.

13 MR. KATZ: Do they tend to be more or less
14 stringent?

15 MS. BEARDSLEY: They tend to be more
16 stringent.

17 MR. APRAHAM: The state has always been a
18 little more stringent than the Federal guidelines.

19
20 MR. EVANS: If they were less stringent we
21 wouldn't be having to review the -- these are the
22 MEGs over in this column here. And then the MCLs
23 are here. So the differences would be that this
24 would be 70 parts per million for the MEG versus --
25 per billion -- versus 100 parts per billion. The

1 significant difference would be vinyl chloride,
2 which for the state is .15. And for the Federal
3 Drinking Waters is 2 parts per billion. And we
4 have not detected that in the Eastern Plume at this
5 point.

6 MR. APRAHAM: Josh, we'll be happy to leave
7 that out for you to take a look at.

8 MR. KATZ: That answers my question. Thank
9 you.

10 MR. APRAHAM: Do we have anymore questions or
11 comments?

12 MS. WEDDLE: Susan Weddle from Brunswick. I
13 also will say these comments are from Brunswick
14 Area Citizens for the Environment. One question
15 was, can you define at all what additional
16 investigation you might do beneath building 584 if
17 in fact it is removed? Do you have anything
18 planned for that? Any contingencies or deed
19 restrictions or anything like that in the event
20 that it comes down later?

21 MR. APRAHAM: Well, there is going to be a
22 notation, obviously, made with regard to the sites
23 there. If the building is ever destroyed, then we
24 will go in and treat it the same as we did with
25 Site 7 with a magnetometer survey with the test

1 pits until we actually locate it and take a look at
2 it and determine what's there and go through this
3 whole process again.

4 But right now, and maybe somebody else can
5 shed some more light on it, Fred possibly, is
6 there's nothing more than the deed restriction,
7 quote, unquote, per say, with regard to the site
8 being there. My guess is, and it is just a guess
9 at this point in time, is the same kinds of things
10 that went there, that went into Site 7, we would
11 find the same kind of thing.

12 MR. EVANS: As with the other investigations
13 that we've done, we would develop a work plan and
14 have that available to review. And we would answer
15 whatever comments so that we could develop a work
16 plan that everybody felt comfortable with to try
17 and determine whether or not there was anything
18 still left at that site.

19 MS. WEDDLE: Okay. The additional wells that
20 you talk about in page 4 of your handout to
21 increase the area of coverage, do you have any more
22 information on the number of those, the location or
23 the time frame for installation and testing?

24 MR. EVANS: At this point in time, no. Our
25 experience has been that when you do a groundwater

1 extraction system we try to make the best estimate
2 in the beginning of where these wells should go.
3 And then we have -- we find, based on our
4 monitoring program, then we're able to go back and
5 refine that system so that we can make it even
6 better.

7 So at this time, no. We know that we're going
8 to have to modify the system. We're not sure how
9 we have to modify it at this point. But we know we
10 do have the possibility that we will need to
11 install additional extraction wells. We have done
12 additional investigations because of higher levels
13 of contamination, and we've also since completed
14 construction of the treatment plant that Jeff has
15 pointed out. We're going to install the new
16 clarifiers so we can clear up the cloudy water.
17 And that will be online in January.

18 So we are taking measures and we will continue
19 to take measures to keep that treatment plant
20 running to effectively clean up the plume.

21 MR. APRAHAM: This whole process is going to
22 be brought before the Remediation Advisory Board as
23 well as all the other sites. All the modifications
24 will be brought to the Board to be thrown out on
25 the table and discussed among the Navy, the

1 regulators, the citizens representatives. This is
2 for those that are not familiar with what we call
3 the RAB. This is discussed in detail amongst that
4 forum for which Captain Carter chairs.

5 MS. WEDDLE: Another question was, in your
6 handout you said that the plume had been predicted
7 to reach the discharge zone as early as 1997. I
8 was wondering if you could tell the people here
9 where you think the leading edge of the plume is,
10 if it has, in fact, moved from the diagram that you
11 had up there and also any investigations that you
12 have in the future for doing samplings to try to
13 better determine the configuration of the plume at
14 this point?

15 MR. EVANS: We don't know the exact location
16 of the leading edge of the plume. We do have the
17 extraction wells, one extraction well. One which
18 is the southernmost well extraction well is
19 designed to be able to draw the plume back. And we
20 do have monitoring wells in our monitoring well
21 program over below this point, which we have not
22 picked up detections at this point.

23 MS. WEDDLE: When was the last time those were
24 sampled?

25 MR. EVANS: The last time those were sampled

1 was in July.

2 MS. WEDDLE: Okay.

3 MR. EVANS: And that report was just issued, I
4 believe, last week.

5 MS. WEDDLE: Currently, you're discharging the
6 water from the treatment plant to the Brunswick
7 Sewer Department. But the possibility has also
8 been discussed at some point in time of recharging
9 it in the ground. How will that be addressed in
10 terms of the final ROD? Is the final ROD just
11 using the PTOW? Or does the final Rod include
12 contingencies for both?

13 MR. EVANS: The final ROD would be written the
14 same as the interim. We would propose to write it
15 to allow contingency for either discharge to POTW
16 or to discharge into that -- back into the ground,
17 somewhere in the area of Site 11. And that would
18 be discussed at our RAB meetings. And you would be
19 involved in that.

20 MR. APRAHAM: Susan, if you have got questions
21 specifically on the Eastern Plume, we can, if you
22 don't mind, take those after we close out the
23 Hearing on 4, 11 and 13. I understand there is
24 some kind of a nexus.

25 MS. WEDDLE: Right. What I was doing now was

1 just making points that our consultants -- in
2 review of this we wanted to have these points,
3 Number one, upon the record because this is part of
4 the hearing. And these are things that are just
5 comments that I want the other members of the
6 public that are here to also know, for example,
7 that there is the possibility that the discharge
8 could be in the ground as well as the -- to the
9 sewer system. So these are just bringing up the
10 points in the public forum and also for the public
11 record.

12 MR. EVANS: If we did discharge back to the
13 ground, we would also need to either, depending on
14 what the decision is, either the Federal drinking
15 water levels or the Maine Maximum Exposure
16 Guidelines, also, so that we would have a stricter
17 criteria on us than what is the current agreement
18 of your district. I think for all but maybe one
19 contaminant, we meet the drinking water levels for
20 discharge into sewer level.

21 MR. APRAHAM: Any more comments?

22 MR. HOLBROOK: As he defined --

23 MR. APRAHAM: Excuse me. Could we have your
24 name and address, please?

25 MR. HOLBROOK: I have written it down on the

1 sheet there. I will read it into the record soon.

2

3 Are there other plumes on the base besides
4 this Eastern Plume that you're watching for other
5 reasons?

6 MR. EVANS: There is a landfill associated
7 with Sites 1 and 3 right here. Sites 1 and 3 were
8 a landfill right here, and there is a plume
9 associated with that. And that groundwater
10 contamination is also being treated by the same
11 treatment plant. We've already gone through a
12 public meeting and public comment period on that
13 five years ago.

14 MR. HOLBROOK: I understand from the other
15 gentleman's definition that the plume tends to
16 move. You're seeing this plume move, seeing the
17 north arrow on there, sort of in a south, southeast
18 direction?

19 MR. EVANS: I'm -- I can't really -- I'm not
20 prepared to answer the question on Sites 1 and 3.
21 We need to get back beyond that. But I believe
22 that the major problem in the area is the Eastern
23 Plume, which is --

24 MR. HOLBROOK: To which I refer. Is that
25 Eastern Plume Site 4 and --

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1 MR. EVANS: 4 and 11.

2 MR. HOLBROOK: Does that tend to move toward
3 the ocean?

4 MR. EVANS: It tends to move towards Harpswell
5 Cove, which is right down here.

6 MR. HOLBROOK: As I said it showed no tendency
7 to move in a northerly direction?

8 MR. EVANS: No.

9 MR. APRAHAM: Any other questions or comments
10 on Site 4, 11 or 13?

11 MR. HOLBROOK: Yes, I want to read onto the
12 record that my last name is Holbrook,
13 H-o-l-b-r-o-o-k, my first name is, Sumner,
14 S-u-m-n-e-r. I'm representing my son tonight, who
15 is Seth, S-e-t-h, Holbrook. He's already on your
16 mailing list, but I'll give you his address again
17 if you choose. I will read onto the record as I
18 understand it that you can submit comments to Mr.
19 Evans up to and including November 9. And I have
20 no verbal comment tonight but have a proposal to
21 write to Mr. Evans before the deadline, November
22 9th. Thank you.

23 MR. APRAHAM: Thank you. Any other comments,
24 questions on 4, 11 or 13? I think our public
25 hearing is closed and if anybody has any questions

1 they would like to ask on the Eastern Plume, we can
2 take a five minute break and come back and do
3 those.

4 Fred? Jeff? Nancy? No? Thank you very much
5 for your attention.

6 (The hearing concluded at 8:05 P.M.)

7

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APPENDIX B
ARARs TABLES FOR EASTERN PLUME

TABLE B-1
CHEMICAL-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE
ROD: SITES 4, 11, 13
NAS BRUNSWICK

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR	
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.	Primary MCLs have been set as the cleanup goals when the primary MCL is available and a more stringent State standard does not exist. Groundwater extraction and treatment of the Eastern Plume will continue to prevent further migration and to restore the aquifer. Monitoring of the Eastern Plume will continue to determine if cleanup goals have been met. It is estimated that cleanup goals will be attained throughout the plume over a time period between 13 and 71 years.
		SDWA - MCLGs (40 CFR 141.50 - 141.51)	Relevant and Appropriate	MCLGs are health-based criteria. As promulgated under SARA, MCLGs are to be considered for drinking water sources. MCLGs are available for several organic and inorganic contaminants.	The 1990 National Contingency Plan states that non-zero MCLGs are to be used as goals. Because groundwater at NAS Brunswick is not a current source of drinking water, MCLGs are not applicable, but may be relevant and appropriate. Contaminant concentrations in groundwater were compared to their MCLGs.
	State	Maine Drinking Water Rules (10-144 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.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, State Drinking Water Standards are relevant and appropriate. Contaminant concentrations in groundwater were compared to State standards to assess the potential risks to human health due to consumption of groundwater.
	Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144 CMR Chapter 233, Appendix C)	Relevant and Appropriate	Appendix C outlines MEGs for organic and inorganic compounds. MEGs include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Groundwater at NAS Brunswick is not a current source of drinking water; therefore, MEGs are relevant and appropriate. Contaminant concentrations in groundwater were compared to MEGs to assess the potential risks to human health due to consumption of groundwater.	

Notes:

ARAR = Applicable or Relevant and Appropriate Requirement

AWQC = Ambient Water Quality Criteria

CFR = Code of Federal Regulations

CMR = Code of Maine Rules

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

MEG= Maximum Exposure Guidelines

MRSA = Maine Revised Statues Annotated

NAS = Naval Air Station

SARA = Superfund Amendments and Reauthorization Act

SDWA = Safe Drinking Water Act

**TABLE B-2
LOCATION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE**

**ROD: SITES 4, 11, 13
NAS BRUNSWICK**

MEDIA	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
State	Maine Standards for Classification of Groundwater (38 MRSA, Section 470)	Applicable	This law requires the classification of the state's groundwater to protect, conserve, and maintain* groundwater resources in the interest of the health, safety, and general welfare of the people of the state. Under the Maine standards, groundwater is classified as GW-A.	This regulation will apply if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick POTW. If discharge to groundwater is employed, the classification and uses of groundwater will be evaluated during development of discharge limits.
	Maine Site Location Development Law and Regulations (06-096 CMR Chapters 371-377)	Applicable	This act and associated regulations govern new developments, including those that handle hazardous waste. New developments cannot adversely affect existing uses, scenic character, or natural resources in the municipality or neighboring municipality.	Those regulations concerning No Adverse Environmental Impact (i.e., Chapter 375) are applicable to implementation of the remedy. In particular, standards for protection of groundwater apply to construction and groundwater treatment activities. However, any licenses required, by reference, will not need to be obtained since permits are not required for actions conducted on-site at federal Superfund sites.
	Surface Water Toxics Control Program (06-696 CMR Chapter 530.5)	Relevant and Appropriate	Except as naturally occurs, surface waters must be free of pollutants in concentrations which impart toxicity and cause those waters to be unsuitable for the existing and designated uses of the water body. This rule promulgates federal water quality criteria established by USEPA pursuant to Section 304(a) of the Clean Water Act.	Groundwater is to be managed such that Maine's water quality standards are met.

Notes:

- ARAR = Applicable or Relevant and Appropriate Requirements
- CMR = Code of Maine Rules
- MRSA = Maine Revised Statutes Annotated
- MEDEP = Maine Department of Environmental Protection
- NAS = Naval Air Station
- POTW = publicly owned treatment works
- RCRA = Resource Conservation and Recovery Act

**TABLE B-3
ACTION-SPECIFIC ARARs, CRITERIA, ADVISORIES, AND GUIDANCE**

**ROD: SITES 4, 11, 13
NAS BRUNSWICK**

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Federal			
RCRA Land Disposal Restrictions (40 CFR 268)	To be determined	Land disposal of RCRA hazardous wastes is restricted without specified treatment. It must be determined that the waste, beyond a reasonable doubt, meets the definition of one of the specified restricted wastes and including TCLP testing. LDRs are the remedial action must constitute "placement" for the land disposal restrictions to be considered applicable. For each hazardous waste, the LDRs specify that the waste must be treated either by a treatment technology or to a concentration level prior to disposal in a RCRA Subtitle C permitted facility.	During treatment of groundwater, sludge containing hazardous constituents will be generated. The selected remedy includes provisions for analysis of this sludge, potentially applicable if the sludge fails TCLP. The selected remedy does address handling and disposal of the sludge as a hazardous waste, if necessary.
Underground Injection Control Program	Applicable	These regulations outline minimum program and recordkeeping as required for permitting are set forth in Part 146.	This regulation will be applicable if treated groundwater is (40 CFR 144, 146, 147, 1000) performance standards for underground injection discharged back to groundwater. The Navy's current programs. Technical criteria and standards for siting, discharged option is the Brunswick POTW. Discharge of operation and maintenance, and reporting and treated groundwater, by well as meet all state Underground Injection Control Program requirements. Treated groundwater must meet all SDWA standards prior to well injection.

CWA - Pretreatment Standards for POTW Discharge (40 CFR Part 403)

Applicable

This regulation specifies pretreatment standards for discharges to a POTW. If treated groundwater is discharge to a POTW, the POTW must have mechanisms available to meet the requirements of the National Pretreatment Program - Introduction of Pollutants which cause pass through or interference are prohibited. Discharges must also comply with any local POTW regulations. If hazardous waste is discharged to the POTW, the POTW may be subject to RCRA permit-by-rule.

This regulation is applicable since the Navy's current discharge option is the Brunswick POTW. Because treated groundwater is discharged to a POTW, the treated water must meet all discharge limitations imposed by the POTW.

Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (06-096 CMR, Chapter 543)

Applicable

This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class IV well. The subsurface discharge into or through a Class IV well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.

These regulations will be applicable if treated groundwater is discharged back to groundwater. The Navy's current discharge option is the Brunswick POTW. For discharge to the subsurface, groundwater must be treated to a target clean-up level less than or equal to the Maine MEGs to be recharged to the aquifer.

**TABLE B-3
ACTION-SPECIFIC ARARS, CRITERIA, ADVISORIES, AND GUIDANCE**

**ROD: SITES 4, 11, 13
NAS BRUNSWICK**

REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Maine Underground Storage Tank Rules relating to standards for the installation, operation, and proper closure of USTs 106-096 CMR Chapter	Applicable	The rules require the registration of all existing, new and replacement underground storage facilities with the MEDEP and authorizes and provides direction for the Board of Environmental Protection to develop rules for the design, installation, replacement, operation and closure of underground oil storage tanks except for tanks used for the storage of propane. The requirements for corrective action specify that when a leak or discharge occurs, the contamination should be mitigated. These rules define contamination as applied to groundwater, soils, and surface water when one of the following is present: 1) the presence of free product of an oil sheen; 2) an exceedance of primary drinking water standards (i.e., Maine MCLs); 3) an exceedance of MEGs (as set forth in Maine DHS memorandum dated 10/23/92); or 4) a statistically significant increase in the concentration of measured parameters when compared to background.	Groundwater impacted by underground tanks shall be mitigated.
Maine Hazardous Waste Management Rules 06-096 CMR, Chapters 800-802, 850, 851, 853-857) Notes: CFR = Code of Federal Regulations CMR = Code of Maine Regulations CWA = Clean Water Act DHS = Department of Human Services (State of Maine) LDRs = Land Disposal Restrictions MCL = Maximum Contaminant Level MEDEP = Maine Department of Environmental Protection MEG = Maximum Exposure Guidelines NAS = Naval Air Station POTW = publicly owned treatment works RCRA = Resource Conservation and Recovery Act	Relevant and Appropriate	The rules provide a comprehensive program for handling, storage, and recordkeeping at hazardous waste facilities. They supplement the RCRA regulations. SDWA = Safe Drinking Water Act TCLP = Toxicity Characteristic Leachate Procedure UST = underground storage tank	Because these requirements supplement RCRA hazardous waste regulations, they are relevant and appropriate.

APPENDIX C

MEDEP LETTER OF CONCURRENCE

This concurrence is based on the State's understanding that the DEP will continue to participate in the Federal Facilities Agreement and in the review and approval of operation, design, and monitoring of the monitoring and extraction well network and treatment system. This concurrence is also based upon the understanding that the proposed site investigation outlined in the January 08,1998, letter is implemented and that the revised language shown in the enclosure (1) included with the letter dated January 22, 1998, is included in the final ROD.

The Department looks forward to working with the Department of the Navy and the Environmental Protection Agency to resolve the environmental problems posed by these sites. If you need additional information, do not hesitate to contact me or my staff.

pc: etc

APPENDIX D

ADMINISTRATIVE RECORD INDEX
AND
GUIDANCE DOCUMENTS

NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX

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**NAVAL AIR STATION BRUNSWICK
ADMINISTRATIVE RECORD INDEX**

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:

1. USEPA Notification of Hazardous Waste Site Forms identifying three landfills, and one asbestos disposal area at Naval Air Station Brunswick; May 22, 1981.

SECTION 2: SITE INSPECTIONS

Volume 1: Field Site Inspection Report for the U.S. Naval Air Station, Brunswick, Maine, prepared by NUS Corporation; August 1984 (Sites 1, 2, and 3).

Pollution Abatement Confirmation Study, Step 1A - Verification, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; June 1995 (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, F.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 Sites 4, 11, 13 and the Eastern Plume
- Volume 2: Not applicable to Sites 4, 11, 13 and the Eastern Plume
- Volume 3: Action Memorandum, Site 11 - Fire Training Area, prepared by Halliburton NUS, Corp.; October 1994.
- Drum Investigation Summary Report Revision 1 for Site 11 - Fire Training Area, prepared by Halliburton NUS, Corp.; August 1995.

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).
- 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.
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.
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.
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.
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 I, 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).

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.
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 11, prepared by ABB, Environmental Services, Inc.; January, 1994.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the [November 1993] Draft Technical Memorandum: Site 11; December 6, 1993.
2. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the [November 1993] Draft Technical Memorandum: Site 11; December 8, 1993.
3. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the [November 1993] Draft Technical Memorandum: Site 11; December 10, 1993.

Volume 15: Not applicable to Sites 4, 11, 13 and the Eastern Plume

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.
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.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the August 1990 Draft Final Phase I Feasibility Study Development and Screening of Alternatives; October 16, 1990.

Volume 2: Numerical Modeling Report, prepared by ABB Environmental Services, Inc.; January 1993 (Sites 1 & 3; Eastern Plume).

Correspondence:

1. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 [Draft] Numerical Modeling Work Plan; November 22, 1991.
2. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the [October 1991] Draft Numerical Modeling Work Plan; December 5, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the [October 1991 Draft] Numerical Modeling Work Plan; January 13, 1992.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Mark Hyland, Maine DEP, regarding comments on the Draft Numerical Modeling Report; December 4, 1992.

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 - 0, 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 Sites 4, 11, 13 and the Eastern Plume

SECTION 6: PROPOSED PLANS AND PUBLIC HEARING TRANSCRIPTS

Volume 1: Proposed Plan for the Eastern Plume, prepared by E.C. Jordan Co. [ABB Environmental Services, Inc.]; December 1991.

Transcript of the Public Hearing for Sites 1 and 3 and the Eastern Plume, prepared by Downing & Peters Reporting Associates; December 12, 1991 (Sites 1 and 3; Eastern Plume).

Correspondence:

1. Letter to James Shafer, Department of the Navy Northern Division, from Meghan Cassidy, USEPA, regarding comments on the July 1991 Draft Proposed Plan - Eastern Plume; August 2, 1991.

2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the July 1991 Draft Proposed Plan - Eastern Plume; August 15, 1991.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Meghan Cassidy, USEPA, regarding comments on the October 1991 Draft Proposed Plan - Eastern Plume; October 31, 1991.
4. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the October 1991 Draft Proposed Plan - Eastern Plume; November 6, 1991.
5. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund Benedikt, regarding comments on the Brunswick Naval Air Station clean-up proposals [Proposed Plans for Eastern Plume and Sites 1 and 3, dated December 1991] submitted for public review; January 3, 1992.
6. Letter to James Shafer, Department of the Navy, Northern Division, from Ralph F. Keyes, Merrymeeting Audubon Society, regarding comments on the Proposed Remedial Action Plan [Proposed Plans for the Eastern Plume and Sites 1 and 3, dated December 1991]; January 8, 1992.
7. Letter to James Shafer, Department of the Navy, Northern Division, from Loukie Lofchie, Brunswick Area Citizens for a Safe Environment, regarding comments on the December 1991 Proposed Plans, Sites 1 and 3 and Eastern Plume; January 13, 1992.
8. Letter to James Shafer, Department of the Navy, Northern Division, from Susan C. Weddle, Brunswick community representative, regarding public comments on the December 1991 Proposed Plan Eastern Plume, the December 1991 Proposed Plan Sites 1 and 3; January 13, 1992.
9. Letter to James Shafer, Department of the Navy, Northern Division, from Edmund E. Benedikt, Friends of Merrymeeting Bay, regarding comments on the December 1991 Proposed Plans for Sites 1 and 3 and the Eastern Plume; January 3, 1992.

Volume 2: Not applicable to Sites 4, 11, 13 and the Eastern Plume

Volume 3: Proposed Plan for Sites 4, 11 and 13, prepared by ABB Environmental Services, Inc.; October 1996.

Transcript of the Public Meeting [Hearing] for Proposed Plan, Sites 4, 11, and 13, prepared by Brown & Meyers; October 17, 1996.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the Draft Proposed Plan - Sites 4, 11, and 13; July 24, 1996.
2. Letter to Fred Evans, Department of the Navy, Northern Division, from Loukie Lofchie, BACSE, regarding comments on the Draft Proposed Plan - Sites 4, 11, and 13; July 25, 1996.
3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Proposed Plan - Sites 4, 11, and 13; July 26, 1996.

SECTION 7: RECORDS OF DECISION

Volume 1: Record of Decision for an Interim Remedial Action - Eastern Plume, prepared by ABB Environmental Services, Inc.; June 1992.

Correspondence:

1. Letter to Meghan Cassidy, USEPA, from Gordon Beckett, Fish and Wildlife Service, regarding the Draft Records of Decision for Sites 1 and 3 and the Eastern Plume, March 25, 1992.
2. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding comments on the March 1992 Draft Record of Decision for Sites 1 and 3 and March 1992 Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.
3. Letter to James Shafer, Department of the Navy, Northern Division, from Mary Jane O'Donnell, USEPA, regarding comments on the [March 1992] Draft Interim Record of Decision for the: Eastern Plume; April 2, 1992.
4. Letter to Thomas Dames, Department of the Navy, Northern Division, from Dean Marriott, Maine DEP, regarding Maine DEP's concurrence with the interim remedial action presented in the June 1992 Draft Interim Record of Decision for the Eastern Plume; June 4, 1992.

Volume 2: Not applicable to Sites 4, 11, 13 and the Eastern Plume

Volume 3: Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume, prepared by ABB Environmental Services, Inc.; February 1998.

Correspondence:

1. Letter to Loukie Lofchie, BACSE, from Carolyn Lepage, Lepage Environmental Services, Inc., regarding comments on the Draft Record of Decision for a Remedial Action at Sites 4, 11, and 13; April 3, 1997.
2. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, MEDEP, regarding comments on the Draft Record of Decision for a Remedial Action at Sites 4, 11, and 13; April 4, 1997.
3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Record of Decision for a Remedial Action at Sites 4, 11, and 13; April 10, 1997.
4. Letter to Loukie Lofchie, BACSE, from Carolyn Lepage, Lepage Environmental Services, Inc., regarding comments on the Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; August 16, 1997.
5. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; August 18, 1997.
6. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, MEDEP, regarding comments on the Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; August 25, 1997.
7. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; December 17, 1997.
8. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, MEDEP, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; December 30, 1997.

9. Letter to Loukie Lofchie, BACSE, from Carolyn Lepage, Lepage Environmental Services, Inc., regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; January 5, 1998.
10. Letter to Robert Lim, USEPA, and Claudia Sait, MEDEP, from Emil Klawitter, Department of the Navy, Northern Division, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; January 22, 1998.
11. Letter to Carolyn Lepage, Lepage Environmental Services, Inc., from Emil Klawitter, Department of the Navy, Northern Division, regarding comments on the Revised Draft Final Record of Decision for No Further Action at Sites 4, 11, and 13 and a Remedial Action for the Eastern Plume; January 22, 1998.

Volume 1: Remedial Design Summary Report, prepared by ABB Environmental Services, Inc.; May 1993 (Sites 1, 3, 5, 6, 8, and the Eastern Plume).

Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume, prepared by ABB Environmental Services, Inc.; August 1994.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume; December 20, 1993.
2. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Draft Final Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume; March 2, 1994.
3. Letter to Fred Evans, Department of the Navy, Northern Division, from Nancy Beardsley, Maine DEP, regarding comments on the Draft Final Long Term Monitoring Plan: Building 95, Sites 1 and 3, and Eastern Plume; March 7, 1994.

Volume 2: Environmental Contaminants in Fish From Mere Brook, prepared by U.S. Fish and Wildlife Service; February 1997.

Correspondence:

1. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, Maine DEP, regarding comments on the Packer Test Pilot Study of the Eastern Plume; March 12, 1997.
2. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, Maine DEP, regarding comments on the Work Plan for the Geostatistical Assessment of the Eastern Plume; February 7, 1997.
3. Letter to Fred Evans, Department of the Navy, Northern Division, from Robert Lim, USEPA, regarding comments on the Work Plan for the Geostatistical Assessment of the Eastern Plume; February 13, 1997.
4. Letter to Fred Evans, Department of the Navy, Northern Division, from Claudia Sait, Maine DEP, regarding comments on the Final Work Plan for the Geostatistical Assessment of the Eastern Plume; July 16, 1997.

Quarterly Monitoring Event 1 - March 1995, Sites 1 and 3 and Eastern Plume, prepared by EA Engineering, Science, and Technology; June 1995.

Quarterly Monitoring Event 2 - May 1995, Sites 1 and 3 and Eastern Plume, prepared by EA Engineering, Science, and Technology; August 1995.

Quarterly Monitoring Event 3 - August 1995, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; December 1995.

Quarterly Monitoring Event 3 - August 1995, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; December 1995.

Quarterly Monitoring Event 4 - November 1995, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; February 1996.

Quarterly Monitoring Event 4 - November 1995, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; February 1996.

1995 Annual Report - Monitoring Events 1 Through 4, prepared by EA Engineering, Science, and Technology; July 1996.

Quarterly Monitoring Event 5 - February 1996, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; July 1996.

Quarterly Monitoring Event 5 - February 1996, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science and Technology; July 1996.

Final Report Remediation of Sites 1, 3, 5, 6 and 8, Vols. I-IV, prepared by OHM Remediation Services Corp.; July 1996.

Quarterly Monitoring Event 6 - June 1996, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; October 1996.

Quarterly Monitoring Event 6 - June 1996, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; October 1996.

Results of Direct-Push Groundwater Sampling Conducted on 27-29 August and 4 September 1996 in the Vicinity of MW-311, prepared by EA Engineering, Science, and Technology; October 25, 1996.

Final Report Eastern Plume Groundwater Treatment Plant, prepared by OHM Remediation Services Corp.; July 1996.

Packer Test Pilot Study of the Eastern Plume, prepared by EA Engineering, Science, and Technology; January 1997.

Quarterly Monitoring Event 7 - November 1996, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; March 1997.

Quarterly Monitoring Event 7 - November 1996, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; March 1997.

Final Report Monitoring Event 8 - March 1997, Sites 1 and 3 and Eastern Plume, Vol. 1 of 2, prepared by EA Engineering, Science, and Technology; July 1997.

Final Report Monitoring Event 8 - March 1997, Sites 1 and 3 and Eastern Plume, Vol. 2 of 2, prepared by EA Engineering, Science, and Technology; July 1997.

Final Work Plan for the Geostatistical Assessment of the Eastern Plume, prepare by EA Engineering, Science, and Technology; July 1997.

SECTION 9: COMMUNITY RELATIONS

Volume 1: Community Relations Plan - for NASB 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.

4. Letter to Commander Geoffrey Cullison, Naval Air Station Brunswick, from Ted Wolfe, Maine DEP, regarding analytical results from water samples collected from a Coombs Road residence; December 27, 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.
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.
9. Letter to file from Geoffrey Cullison, Naval Air Station Brunswick, regarding Site 8 and off-site influences; April 23, 1990.
10. Letter to James Shafer, Department of the Navy, Northern Division, from Ted Wolfe, Maine DEP, regarding data from the sampling at Consolidated Auto, and the revised May 30, 1990 Maximum Exposure Guidelines; June 22, 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.
14. Fact sheet regarding the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.
15. Public notice announcing the public meeting/hearing and public comment period for the Sites 1 and 3 Proposed Plan, and the Eastern Plume Proposed Plan; December 1991.
16. Press release regarding the signing of the Record of Decision for Sites 1 and 3 cleanup at Naval Air Station Brunswick; June 1992.
17. Public notice announcing the public meeting/hearing and public comment period for cleanup of the Perimeter Road Disposal Area [Site 8] at Naval Air Station Brunswick; October 1992.
18. Fact sheet regarding the Site 8 Proposed Plan; October 1992.
19. Public notice announcing the public meeting/hearing and public comment period for removal of Building 95 pesticide shop and surrounding soils; November 1992.
20. Fact sheet regarding the proposed removal actions at Building 95; November 1992.
21. Public notice announcing the public meeting/hearing and public comment period for the revised Proposed Plan for Site 8 that now includes excavation; March 1993.
22. Public notice announcing the public meeting/hearing and public comment period for the Sites 5 and 6 Proposed Plan; March 1993.
23. Fact sheet regarding the Proposed Plan for Sites 5, the Orion Street Asbestos Disposal Site, and Site 6, the Sandy Road Rubble and Asbestos Disposal Site; March 1993.

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.
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 29, 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.
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/Restoration Advisory Board Meeting Minutes
(March 1993 to April 1997)
Technical Meeting Minutes (March 1994 to September 1996)

Correspondence:

1. Meeting minutes of March 18, 1993, TRC meeting to discuss the accelerated schedule, undated.
2. Meeting minutes of June 10, 1993, TRC meeting to discuss schedule update, undated.
3. Meeting minutes of September 23, 1993, TRC meeting to discuss schedule update, 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 March 17, 1994, technical meeting to discuss the Site 11 Time Critical Removal Action; Building 95 construction project; West Runway Study Area Site Investigation Report; and well purging and sampling procedures; undated.
6. 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.
7. Meeting minutes of May, 19, 1994, technical meeting to discuss additional source investigations at Site 9; undated.
8. Meeting minutes of June 9, 1994, technical meeting to discuss Site 11 Time Critical Removal Action,
9. Meeting minutes of June 23, 1994, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9 Proposed Plan and Interim Groundwater ROD; Remedial Design for Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; confirmatory sampling at West Runway Study Area; undated.

10. Meeting minutes of August 4, 1994, technical meeting to discuss the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume, the Site 11 Removal Action; Site 9 Interim Groundwater ROD and Long Term Monitoring Plan, Site, 9 Site Investigation Work Plan; migration of the Eastern Plume; additional sampling at Building 95; undated.
11. Meeting minutes of September 22, 1994, TRC meeting to discuss the Site 11 Time Critical Removal Action; Site 9, Long Term Monitoring Plan and Site Investigation Work Plan; construction status for remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; establishment of a Restoration Advisory Board; undated.
12. Meeting minutes of November 3, 1994, technical meeting to discuss Proposed Plans and RODs for Sites 2, 7, 12, and 14; the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; the Site 11 Removal Action; Site 9 Long Term Monitoring Plan and Site Investigation Work Plan; additional sampling at Building 95; undated.
13. Meeting minutes of December 8, 1994, technical meeting to discuss the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; Proposed Plans and RODs for Sites 2, 7, 12, and 14; the Site 11 Removal Action; Site 9 Site Investigation Work Plan; confirmatory sampling at Building 95; relative risk evaluation; undated.
14. Meeting minutes of January 11, 1995, TRC meeting to discuss Proposed Plans and RODs for Sites 2, 7, 12, and 14; the Site 9 Source Investigation Sampling and Analysis Plan; construction status of remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; status of the Restoration Advisory Board; undated.
15. Meeting minutes of March 8, 1995, technical meeting to discuss the construction status for remediation of Building 95 and Sites 1, 3, 5, 6, 8 and Eastern Plume; Proposed Plans and RODs for Site 2; Site 11 Soil Analysis, Site 9 Long Term Monitoring; confirmatory sampling at Building 95; undated.
16. Meeting minutes of April 19, 1995, TRC meeting to discuss the Site 9 Source Investigation; construction status of remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Site 11 excavation; basewide long term monitoring; status of the Restoration Advisory Board; undated.
17. Meeting minutes of July 25, 1995, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; basewide long term monitoring; Site 9 Source Investigation; Site 11 excavation; undated.
18. Meeting minutes of September 13, 1995, technical meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume and Building 95; Site 9 Source Investigation; basewide long term monitoring; Site 11 post-removal action; undated.
19. Meeting minutes of October 25, 1995, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Site 9 Source Investigation; basewide long term monitoring; undated.
20. Meeting minutes of January 25, 1996, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Proposed Plans and RODS for Site 2, Sites 4, 11, and 13, Site 7, Site 12, and Site 14; Site 9 Source Investigation; basewide long term monitoring; undated.
21. Meeting minutes of May 1, 1996, RAB meeting to discuss the construction status of the remediation of Sites 1, 3, 5, 6, 8, Eastern Plume, and Building 95; Proposed Plans and RODS for Site 2, and Sites 4, 11, and 13; Site 9 Source Investigation; basewide long term monitoring; Pump Test Report/Numerical Modeling Report; Building 95 Closure Report; undated.

22. Meeting minutes of August 1, 1996, RAB meeting to discuss Proposed Plans and RODS for Site 2, and Sites 4, 11, and 13; basewide long term monitoring; Remedial Action Final Inspection; extraction well issues; monitoring well MW-311; undated.
23. Meeting minutes of September 5, 1996, technical meeting to discuss Proposed Plans and ROD for Sites 4, 11, and 13; basewide long term monitoring; extraction well status; monitoring well MW-311; undated.
24. Meeting minutes of October 31, 1996, RAB meeting to discuss the ROD for Sites 4, 11, and 13; basewide long term monitoring; extraction well issues; monitoring well MW-311; undated.
25. Meeting minutes of January 30, 1997, RAB meeting to discuss the Proposed Plan and ROD for Site 2; ROD for Sites 4, 11, and 13; basewide long term monitoring; geostatistical analysis work plan; Site 9 Source Investigation Report; extraction well issues; treatment plant modifications; undated.
26. Meeting minutes of April 23, 1997, RAB meeting to discuss the ROD for Sites 4, 11, and 13; basewide long term monitoring; geostatistical analysis work plan; extraction well issues; treatment plant status; status of the IRP sites; undated.

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 19, 1990.

SECTION 10 (continued)

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.
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 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.
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.

U.S. Environmental Protection Agency, 1988. "Engineering Evaluation/Cost Analysis"

APPENDIX E

COST ESTIMATE FOR THE SELECTED REMEDY

TABLE E-1

COST ESTIMATE FOR THE SELECTED REMEDY

SITES 4, 11, 13, AND EASTERN PLUME ROD
NAS BRUNSWICK

Cost Item	Cost	Present Worth
Treatment Plant Operation and Maintenance	\$300,000/yr	\$3,120,000
Utilities	\$ 75,000/yr	\$ 780,000
Disposal Fee to Sewer District	\$200,000/yr	\$2,080,000
Long-term Groundwater Monitoring	\$150,000/yr	\$1,560,000
5-year Reviews	\$ 75,000/5-yr	\$ 140,000
Sub-total		\$7,680,000
Administrative & misc. (10 percent)		\$ 770,000
Total Present Worth		\$8,450,000

Notes:

i = 7%

n = 20 yrs