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Record of Decision
for Site 9
Naval Air Station, Brunswick, Maine

Contract No. N62472-92-D-1296
Contract Task Order No. 0047



Prepared for

Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
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Prepared by

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September 1999
FINAL
296.0082

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6 October 1999

Mr. Michael Barry
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Ms. Claudia Sait
Maine Department of Environmental Protection
State House, Station 17
Augusta, Maine 04333-0017

RE: Final (Signed) Record of Decision for Site 9
EA Project No. 29600.82

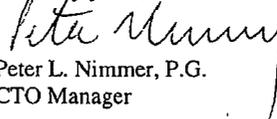
Dear Mr. Barry/Ms. Sait:

On behalf of the Department of the Navy, EA Engineering, Science, and Technology is pleased to submit two copies of the final (signed) Record of Decision (ROD) document for Site 9, Naval Air Station, Brunswick, Maine for your files.

This Final ROD was developed in conjunction with the Draft EPA Region 1 Model ROD, and incorporates changes discussed with RAB members. The original signature copy has been provided for the EPA's retention.

We greatly appreciate the opportunity of being involved in the process of developing one of the first EPA Region 1 RODs based on the latest guidance, and are pleased to have obtained signatures prior to the scheduled date of 30 September 1999. If you have any questions or would like additional copies, please do not hesitate to contact me.

Sincerely yours,


Peter L. Nimmer, P.G.
CTO Manager

PLN/mkp
Enclosures

cc: E. Klawitter, NAVFAC (2 copies)
T. Williams, NAS Brunswick (1 copy)
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LIST OF ACRONYMS

ARAR	Applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
COC	Contaminants of concern
EPA	U.S. Environmental Protection Agency
MCL	Maximum Contaminant Level
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guideline
NAS	Naval Air Station
NPDES	National Pollutant Discharge Elimination System
PAH	Polycyclic aromatic hydrocarbon
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
VOC	Volatile organic compound

PART 1—DECLARATION

I. SITE NAME AND LOCATION

Naval Air Station Brunswick
CERCLIS ID NUMBER: OU6-SITE9-ME8170022018
Site 9, Neptune Drive Disposal Site
Brunswick, Maine

II. STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Site 9, Neptune Drive Disposal Site, at Naval Air Station Brunswick. This remedial action was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, 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. This decision is based on information documented in the Administrative Record which can be viewed by the public at the Public Works Office at Naval Air Station Brunswick or at the Curtis Memorial Library on McKeen Street, Brunswick, Maine.

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

III. ASSESSMENT OF THE SITE

The response action selected in this Record of Decision is necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

IV. DESCRIPTION OF SELECTED REMEDY

The selected remedy for Site 9 is natural attenuation with long-term monitoring and institutional controls. The following major components of the selected remedy are needed to address soil and groundwater contamination at Site 9:

- Continue utilizing natural attenuation to degrade volatile organic chemical contaminants present in groundwater.
- Implement institutional controls, such as land use restrictions, to prevent human contact with groundwater and landfill contents.
- Continue long-term monitoring of groundwater to verify that landfill contents are not impacting groundwater, to monitor the progress of natural attenuation, and to monitor for contaminant plume migration.

- Continue long-term monitoring of surface water, leachate seeps, and stream sediments for indications of contaminant migration.
- Perform 5-year reviews.

It should be noted that no active sources of contamination have been identified at Site 9. The threat of consumption of contaminated groundwater is not immediate as groundwater at Site 9 is neither a source of drinking water nor a significant potential future source of drinking water. To date, no evidence of movement of contaminants of concern from Site 9 above Federal Maximum Contaminant Levels or State Maximum Exposure Guidelines has been detected. Therefore, the selected remedy does not employ source treatment or containment activities.

The selected remedy addresses principal and low level wastes, including volatile organic compounds and inorganic contamination at Site 9 by continuing long-term monitoring of the natural attenuation process and by implementing institutional controls.

V. STATUTORY DETERMINATIONS

The remedy selected for Site 9 satisfies the statutory requirements of Section 121(b)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act in that it is protective of 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.

Based on the size of the inactive ash landfill and the fact that its contents are located beneath both a soil cover and military barracks that were constructed in 1953, after the landfill was closed and the soil cover installed, it was concluded that it was impracticable to excavate and treat the contaminants of concern in a cost effective manner. Also, in relation to the groundwater, the time to actively treat the groundwater was similar to natural attenuation of the contaminants of concern. Therefore, since the groundwater is neither a current nor a significant potential future drinking water source, it was concluded that it was more cost effective to utilize natural attenuation coupled with institutional controls as the remedy for groundwater. Thus, the remedy at this site does not satisfy the statutory preference for treatment as a principal element of the remedy.

Because this remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within 5 years after the initiation of remedial action, and every 5 years thereafter, to ensure that the remedy continues to provide adequate protection of human health and the environment.

VI. RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record File for this site.

- Contaminants of concern and their respective concentrations
- Baseline risks represented by the contaminants of concern
- Cleanup levels established for contaminants of concern and the basis for the levels
- Current and future land and groundwater use assumptions used in the baseline risk assessment and Record of Decision
- Land and groundwater use that will be allowed at the site as a result of the selected remedy
- Estimated capital, operation and maintenance, and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected
- Decisive factor(s) that led to selecting the remedy including cost, practicability, and implementability.

VII. AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

This Record of Decision represents the selected remedial action for Site 9 at Naval Air Station, Brunswick.

Concur and recommend for immediate implementation.

Department of the Navy

By: Keith F. Koon Date: 27 Sep 99

Keith F. Koon
Captain
Commanding Officer
Naval Air Station Brunswick
U.S. Department of the Navy

Project No.: 296.0082

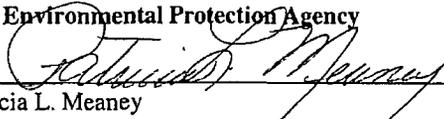
Revision: FINAL

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September 1999

EA Engineering, Science, and Technology

U.S. Environmental Protection Agency

By: 

Patricia L. Meaney

Director

Office of Site Remediation and Restoration

Region I

Date: 9/28/99

PART 2—DECISION SUMMARY

I. SITE NAME, LOCATION, AND BRIEF DESCRIPTION

A. Name and Location

Naval Air Station (NAS) Brunswick is located in Brunswick, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123 (Figure 2-1). The Neptune Drive Disposal Site (Site 9), addressed in this Record of Decision (ROD), is located in the central portion of NAS Brunswick and extends north and south across Neptune Drive (Figure 2-2).

B. Comprehensive Environmental Response, Compensation, and Liability Act Information System Identification Number

The Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) identification number for NAS Brunswick/Site 9 is OU6-SITE9-ME8170022018.

C. Lead Agency

The Navy is the lead agency with regulatory oversight from the U.S. Environmental Protection Agency (EPA) and State of Maine Department of Environmental Protection (MEDEP).

D. Site Description

- NAS Brunswick is an active base owned and operated by the Federal government through the Department of the Navy. The primary mission of NAS Brunswick is flight operations related to anti-submarine warfare.
- NAS Brunswick lies at the head of a peninsula with tidal areas nearby. It is located on 3,094 acres of land of which approximately 75 percent is forested areas, grassland, miscellaneous shrubland, marsh, and open water. The remaining 25 percent includes base operations in areas composed of office buildings, barracks, recreational facilities, base housing, hangars, repair shops, and other facilities to support NAS Brunswick, as well as paved areas including flight ramps and runways.
- Topography of NAS Brunswick is characterized by low, undulating hills with deeply incised brooks and bedrock outcrops. Topography at Site 9 is flat with incised drainage at the south end.
- Ground surface elevations range from mean sea level in lowland drainage areas and the Harpswell Cove estuary to over 110 ft mean sea level west and southeast of the southern end of the runways. Site 9 ground surface elevations are approximately 55 ft above sea level.

- Current property uses surrounding NAS Brunswick are primarily suburban and rural residential with some commercial and light industry along nearby Routes 1, 24, and 123. An elementary school, a college, and a hospital are located within 1 mi of the base boundary. The southern edge of the base borders the estuary of Harpswell Cove.
- Site 9 is approximately 20 acres in area and is located in the central portion of the base. Land use is residential/commercial, and present structures include barracks, a dining facility, and picnic/recreation areas.
- Site 9 is generally flat with two steep-sided stream channels in the southern portion of the site. Impoundment ponds have been constructed and receive surface drainage from the majority of the operations (industrial) area of the base, including the flight line and hangar areas.
- Groundwater occurs at Site 9 at a depth of 10-14 ft below ground surface, and is unconfined. Based on groundwater elevation data gathered as part of the Long-Term Monitoring Program, groundwater flow direction is generally towards the unnamed stream and surface water impoundment ponds. Figure 2-3 shows a generalized cross-section and inferred groundwater flow patterns at Site 9.

A more complete description of Site 9 can be found in Chapter 11 of the Remedial Investigation (E.C. Jordan Co. 1990).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Land Use and Site Activity History

NAS Brunswick has been an active base since it was commissioned in 1943, except between 1946 and 1951 when the property was used by Bowdoin College and small commercial enterprises. Site 9 was the former location of an incinerator and ash landfill/dump and a reported hazardous waste disposal area. These historical activities may have contributed to current environmental conditions.

Site 9 is composed of three areas of concern: (1) the former incinerator and ash landfill area, (2) a reported disposal area southeast of Building 201, and (3) the two unnamed streams (Figure 2-2).

1. Former Incinerator and Ash Landfill/Dump Area

- No record of the precise location of the incinerator or ash landfill has been found. The Navy has assumed that the incinerator was located in the northeast corner of what is now the location of Building 220, and the landfill was in the current location of Buildings 218 and 219. All three of these buildings are military barracks.

- It is believed that the incinerator was in operation from April 1943 until 1946. The incinerator may have been used as late as 1953 when the current buildings (barracks) were built.
- It is reported that the wastes disposed of in this area were solvents that may have been burned on the ground, paint sludges, and wastes from the metal shop.
- Both the incinerator and ash landfill were in operation and closed prior to the effective date of Resource Conservation and Recovery Act (RCRA) regulations (1976).
- Construction maps showing grading in the vicinity of the barracks (Buildings 212 through 220) indicated an oval "dump area" approximately 125 ft × 75 ft, underlying the current location of Buildings 218 and 219. The plans also show an old 42-in. diameter drain adjacent to the dump area. This drain ran from north of Orion Street, past the ash landfill area, under Neptune Drive, between Buildings 201 and 293 to the unnamed stream. This drain may have been a potential pathway for contaminant migration. The drain was reportedly removed during construction of the barracks, and no evidence that this drain is still in place has been found.
- Prior to 1953, the inactive ash landfill was closed and a soil cover installed over it. In 1953, Buildings 218 and 219, which are currently military barracks, were constructed over the former landfill area.
- Currently, this area is developed with military barracks.

2. Building 201

- Historical documents and aerial photographs show what was once a possible solvent burning or dumping area southeast of Building 201. This former burning or dumping area may have been a potential source of contamination. In addition, a septic system associated with Building 201 was suspected to be a potential source of contamination at Site 9.
- Building 201 was used as the Chief's Club until 1993 when it was converted into its present use as the galley (cafeteria).
- A picnic area and barbecue pit are currently located directly to the southeast of Building 201.

3. Unnamed Streams

- Building 201 is bordered on the northeast and south sides by two unnamed streams, which discharge into the Picnic Pond, located 2,000 ft downstream of Site 9.

- Groundwater seeps have been observed flowing into the northern stream.
- In 1997, surface water impoundment ponds were constructed to capture the runoff from the central portion of the base including runways, parking lots, and roads. Construction of the impoundment ponds have consequently flooded the former southern unnamed stream, and partially flooded the northern unnamed stream.

Future Land Use

Future land uses at Site 9 are likely to remain the same. NAS Brunswick has no plans to cease active base status. Groundwater for use as a potable or domestic source is not expected to occur. Estimated cleanup of Site 9 groundwater via natural attenuation is estimated to take up to 20 years.

B. History of Federal and State Investigations and Removals and Remedial Actions

- In 1983, an Initial Assessment Study was completed identifying past hazardous waste activities at NAS Brunswick; 10 sites, including the Neptune Drive Disposal Site (Site 9), were identified (R.F. Weston 1983).
- In 1984, a Pollution Abatement Confirmation Study recommended further investigation of 7 of the 10 Initial Assessment Study sites, including the Neptune Drive Disposal Site (Site 9) (E.C. Jordan Co. 1985).
- In 1987, NAS Brunswick was placed on EPA's National Priorities List.
- Also in 1987, a Remedial Investigation/Feasibility Study (E.C. Jordan Co. 1990) was conducted for the seven sites recommended for further investigation in the Pollution Abatement Confirmation Study.
- In 1987 and 1990, the Navy conducted environmental field activities at this site as part of a Remedial Investigation (E.C. Jordan Co. 1990) and Supplemental Remedial Investigation (E.C. Jordan Co. 1991) to determine if contamination at the site posed an unacceptable risk to human health or the environment. The investigations focused on an area adjacent to Building 201 used for solvent burning and disposal. The inactive landfill was not considered to be of concern as it had been closed and covered with soil, and barracks were erected on top prior to 1953, in effect capping the landfill area and preventing exposure to the landfill contents.
- In 1990, the Navy completed the Draft Final Remedial Investigation Report (E.C. Jordan Co. 1990). Vinyl chloride contamination was identified in groundwater, but test pits and soil borings found no source of the contamination.

- A Baseline Risk Assessment was completed as part of the Draft Final Remedial Investigation Report for Site 9 to determine potential risk to human health and the environment from exposure to groundwater, surface water, sediment, leachate, and soil contaminants (E.C. Jordan Co. 1990; Appendix Q, Volume 4). Results of the risk assessment indicated that a potential elevated cancer risk was present at the site based on ingestion or contact with groundwater due to the presence of vinyl chloride. In addition, the risk assessment noted an elevated hazard index for groundwater due to the presence of manganese.
- A Draft Final Supplemental Remedial Investigation Report was completed for several sites at NAS Brunswick, including Site 9 in 1991 (E.C. Jordan Co. 1991). This supplemental investigation determined that vinyl chloride contamination was localized in groundwater but failed to identify a source. It identified as a possible source area an old septic system to the east of Building 201 that had operated for 20 years prior to the installation of the base sewer system.
- Also in 1991, the Navy completed the Phase I Feasibility Study Report (E.C. Jordan Co. 1991), which identified remedial action objectives and alternatives for the sites studied.
- A Feasibility Study was completed for several sites at NAS Brunswick, including Site 9 in 1992 (E.C. Jordan 1992).
- Field investigations were performed in 1993 to further characterize the inactive ash landfill, provide information to support possible remedial action and continued groundwater monitoring, and assess the likelihood that the septic system east of Building 201 could be the primary source of vinyl chloride in Site 9 groundwater.
- A Technical Memorandum was completed in May 1994 that presented the results of these field investigations (ABB-ES 1994a). The Technical Memorandum concluded that volatile organic compounds (VOCs), including vinyl chloride, were present in Site 9 groundwater at concentrations above Federal Maximum Contaminant Levels (MCLs) and State Maximum Exposure Guidelines (MEGs), but that no distinct source area for the vinyl chloride contamination could be identified. It determined that the septic system was no longer an active source of vinyl chloride in the groundwater but could have been a historical source. In addition, the Technical Memorandum concluded that polycyclic aromatic hydrocarbons (PAHs) were present in the ash in the inactive landfill, but not in groundwater downgradient from the landfill. A risk assessment was not performed on the contents of the landfill because no potential pathway exists. It also found that elevated concentrations of metals above Federal MCLs and State MEGs, including aluminum, iron, and manganese, were present in groundwater downgradient of the inactive landfill.
- The Navy published a Proposed Plan and held a public hearing on the Plan in July 1994 (ABB-ES 1994b). In September 1994, an Interim ROD was signed that selected natural attenuation and long-term monitoring as the interim remedy for groundwater

contamination at Site 9 (ABB-ES 1994c). The Interim ROD required that the Navy conduct an additional source investigation to determine the source of the vinyl chloride contamination at the site.

- The additional source investigation was conducted in 1995-1996 (ABB-ES 1997). Results of this investigation failed to pinpoint a specific source for the vinyl chloride contamination, but indicated that the contamination may be attributed to the inactive landfill or the Building 201 septic system.
- In 1995, in accordance with the Interim ROD, the Navy initiated a Long-Term Monitoring Program to characterize groundwater, leachate seep, surface water, and stream sediment and to monitor natural attenuation and contaminant migration at Site 9 (ABB-ES 1995).
- To date, 14 sampling events have been completed. The findings of the Long-Term Monitoring Program are summarized in the Annual Reports for 1995 through 1998 (EA 1996, 1997, 1998, 1999a).
- In 1997, the U.S. Fish and Wildlife Service performed a Toxicity Test and Sediment Chemistry Investigation (USFWS 1997) to characterize sediment chemistry and toxicity of the unnamed streams and assess the potential risk for sediment in the streams to affect aquatic organisms. The U.S. Fish and Wildlife Service determined that the concentrations of PAHs and other contaminants in the sediment were not toxic to the two test organisms.
- The Navy published a Proposed Remedial Action Plan for Site 9 on 1 July 1999 and held a public meeting on 15 July 1999 to present the selected remedial alternatives for Site 9 (EA 1999b).

This ROD presents the selected remedial action discussed in the July 1999 Proposed Remedial Action Plan and addresses the public comments regarding the preferred alternative. Responses to written and oral comments are included in Appendix A of this ROD, the Responsiveness Summary.

C. History of Comprehensive Environmental Response, Compensation, and Liability Act Enforcement

In 1990, the Navy entered into a Federal Facility Agreement with EPA and MEDEP that established goals and responsibilities among the Navy and the regulatory agencies and set enforceable cleanup schedules.

III. COMMUNITY PARTICIPATION

A. Public Outreach Effort

Throughout the history of Site 9, community concern and involvement have been high. The Navy has kept the community and other interested parties apprised of site activities through informational press releases and public meetings. Below is a brief chronology of public outreach events:

- In 1987, the Navy established the Administrative Record, which includes all documents relevant to Site 9 investigations. The Administrative Record is available at the Curtis Memorial Library on McKean Street in Brunswick and at the Navy Public Works office at NAS Brunswick.
- In 1988, a Technical Review Committee, now known as the Restoration Advisory Board, was established to create a forum for the Navy, EPA, MEDEP, and community representatives to discuss site issues. The Restoration Advisory Board meets quarterly to review the program and receive community input.
- In September 1988, the Navy released a community relations plan (E.C. Jordan 1988) that outlined a program to address community concerns and keep citizens informed of and involved with remedial activities.
- On 16 August 1990, the Navy held an informational meeting to discuss the results of the Remedial Investigation.
- In July 1994, the Navy published a notice announcing a public informational meeting, and a brief analysis of the Interim Proposed Plan for Site 9 in *The Times Record*. The Navy made the Plan available to the public at the Curtis Memorial Library in Brunswick.
- On 14 July 1994, a public meeting was held to present the Interim Proposed Plan to a broader community audience than those already involved at the site. At this meeting, representatives from EPA, MEDEP, and the Navy answered questions about problems at the site and the interim remedial alternatives. EPA also used this meeting to solicit a wider cross-section of community input on the reasonable anticipated future land use and potential beneficial groundwater uses at the site.
- From 12 July through 10 August 1994, a public comment period on the Interim ROD was held.
- On 30 September 1994, the Interim ROD for Site 9 was signed by the Navy and EPA, with concurrence by MEDEP.

- On 13 July 1999, the Navy published a notice announcing a public informational meeting and a brief analysis of the Proposed Plan for Site 9 in *The Times Record*. The Navy made the Plan available at the Curtis Memorial Library in Brunswick.
- On 15 July 1999, a public information meeting was held to present the Proposed Plan for Site 9. This included a poster session followed by a presentation and a question-and-answer period.
- From 13 July to 13 August 1999, a public comment period on the Proposed Plan was held.
- Public comments; EPA, MEDEP, and the Navy's response to comments; and notes of the 15 July 1999 meeting are included in the Responsiveness Summary (Appendix A).

B. Public Outreach Results

The public outreach efforts at Site 9 have been effective in informing residents who live near the site.

The results of the public outreach effort have been:

- Two public meetings, with approximately 15 people in attendance
- Quarterly Restoration Advisory Board update newsletters, reaching up to 150 people
- Numerous local newspaper articles
- Written comment letters on the Proposed Remedial Action Plans (Appendix A).

C. Technical Assistance Grants

Local residents formed the Brunswick Area Citizens for a Safe Environment to monitor site activities. They have applied for and have been awarded a Technical Assistance Grant from EPA, and have retained a Technical Assistance Grant consultant since 1991 who attends all Restoration Advisory Board and technical project meetings.

IV. SCOPE AND ROLE OF RESPONSE ACTION

A. Problems Addressed

Based on the investigations performed by the Navy, this ROD addresses the groundwater contamination and the inactive ash landfill at Site 9. Contamination associated with the unnamed streams will be addressed in accordance with the Clean Water Act National Pollution Discharge Elimination System (NPDES) Program and will not be further addressed in this ROD.

1. Groundwater Contamination

VOCs have been detected in groundwater at Site 9, and may represent a low level threat to groundwater. These compounds degrade into daughter products, including vinyl chloride. Groundwater sampling data indicate that VOC concentrations are generally steady or have decreased over time, although vinyl chloride concentrations at 3-4 monitoring locations have exceeded the State MEG of 0.15 parts per billion and the Federal MCL of 2.0 parts per billion. Because VOCs in groundwater that discharges into the unnamed streams is likely to volatilize upon reaching the surface, this contamination appears to be limited to the groundwater at this site. To date, the Navy has not detected any evidence of movement of contaminants of concern (COCs) from Site 9 above Federal MCLs or State MEGs.

2. Inactive Ash Landfill

Past investigations have indicated that the inactive ash landfill may be a low level threat source of groundwater contamination. However, groundwater does not appear to have been impacted by either PAHs or inorganics, the primary COCs in soil. Elevated concentrations of inorganics have been detected in groundwater; however, concentrations are consistent with background levels for NAS Brunswick and, consequently, may not be attributed to Site 9 activities.

Landfill contents are currently inaccessible because the landfill was closed and a soil cover installed prior to 1953, and buildings were constructed over the former landfill area in 1953. Because the landfill is not an active source of contamination, and no migration of COCs above Federal MCLs and State MEGs from the landfill has been identified, removal and/or active remediation is not considered practicable for this site. The establishment of institutional controls will protect human health by preventing contact with impacted media. The Navy will continue the Long-Term Monitoring Program to gauge the progress of natural attenuation and detect any contaminant migration, which may potentially occur.

3. Summary

Site 9 groundwater and the contents of the inactive ash landfill are currently inaccessible. Because the threat to human health is not immediate, there are no active sources of contamination, and there is no evidence of offsite contaminant migration above the Federal MCLs or State MEGs, removal and/or active remediation is not considered practicable for this site. The utilization of natural attenuation will reduce contaminant concentrations in the site groundwater over time, and the establishment of institutional controls will protect human health by preventing contact with impacted media. The Navy will continue the Long-Term Monitoring Program to gauge the progress of natural attenuation and detect any contaminant migration which may occur. In summary, the principal and low level threats addressed within this ROD are:

Contaminant	Media	Contaminant	Action
Principal Threats			
None at Site 9	Not applicable	Not applicable	Not applicable
Low Level Threats			
VOCs	Groundwater	Vinyl Chloride	Natural attenuation with long-term monitoring and institutional controls
PAHs	Inactive Landfill	PAHs	Long-term monitoring and institutional controls

B. Planned Sequence of Action

The following remedial actions are planned for Site 9.

1. Groundwater Contamination

The planned sequence of action with regard to Site 9 groundwater contamination includes the following:

- The Navy will implement institutional controls to prevent use of and contact with groundwater at Site 9 without prior written approval from EPA and MEDEP. These institutional controls will consist of groundwater use restrictions in the current NAS Brunswick Operations Instructions in effect. The Operations Instructions are used to identify and screen environmental areas for inappropriate construction or development activities. Within a reasonable time after signature of this ROD, the Navy will provide a draft version of these groundwater use restrictions to EPA and MEDEP for review and comment. The Navy shall revise the draft use restrictions in accordance with EPA and MEDEP comments to ensure that the restrictions adequately protect human health and the environment. When finalized, the groundwater use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 9. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 9 remedy.
- Should the Navy transfer or lease any real property affected by Site 9, whether or not as a result of base closure, the Navy will notify EPA and MEDEP of the transfer or lease and will include in all documents evidencing the transfer or lease appropriate provisions (i.e., restrictive covenants or other use restrictions) preventing use of and contact with site groundwater without prior written approval from EPA and MEDEP. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

- The Navy will continue the Long-Term Monitoring Program, which will be adjusted based on sample results. The revised monitoring plan will be reviewed and approved by EPA and MEDEP in consultation with the Restoration Advisory Board and the public. The goals of the Long-Term Monitoring Program are as follows:
 - Assessing variations in the concentrations of VOCs in groundwater, leachate surface water, and sediment to determine the effectiveness of natural attenuation
 - Assessing whether groundwater downgradient of the ash landfill is impacted by inorganics from the site
 - Assessing whether contamination is migrating offsite
 - Assessing variations in groundwater flow patterns
 - Monitoring structural integrity of the groundwater monitoring wells.

2. Inactive Ash Landfill

Upon closure of the landfill, the area was graded and covered with soil prior to 1953, and the barracks were constructed in 1953. Therefore, the planned sequence of actions with regard to the inactive landfill would include the following:

- The Navy will implement institutional controls to prevent the disturbance of and contact with the contents of the inactive ash landfill at Site 9 without EPA or MEDEP approval. These controls will consist of land use restrictions in the current NAS Brunswick Operations Instructions in effect. These land use restrictions will be subject to the same review and comment as the groundwater use restrictions described above, and will also be incorporated into the Operations Instructions and placed in the Administrative Record for Site 9. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 9 remedy.
- Should the Navy transfer or lease any real property affected by Site 9, whether or not as a result of base closure, the Navy will notify EPA and MEDEP of the transfer or lease and will include in all documents evidencing the transfer or lease appropriate provisions (i.e., restrictive covenants or other use restrictions) preventing use of and contact with site groundwater without prior written approval from EPA and MEDEP. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

- The Navy will continue the Long-Term Monitoring Program to ensure that materials remaining in the inactive landfill is not impacting the environment by monitoring groundwater downgradient of the landfill for metals and PAHs to assess whether the landfill is impacting groundwater and/or has the potential to impact surface water.
- If the exterior walls or foundations are disturbed in the future in a way that would compromise the remedy, the remedy for the landfill may be reassessed.

In addition, at Site 9, a review will be completed at least once every 5 years to evaluate the progress of the remedial action and to ensure that human health and the environment continue to be protected.

V. SUMMARY OF SITE CHARACTERISTICS

A. Site Overview

- Site 9 is approximately 20 acres in area and is located in the central portion of NAS Brunswick. It consists of military barracks, a dining facility, and picnic and recreation areas. Two unnamed streams containing impoundment ponds border Site 9 on the south. The impoundment ponds receive surface drainage from the majority of the operations area of the base, including the flightline and hangar areas. Construction of the ponds in 1997 resulted in flooding of the streams.
- Site 9 is generally flat, with the two steep-sided stream channels in the southern portion of the site.
- Hydrogeology at Site 9 is characterized by shallow groundwater in the overburden soil and the water table varies in depth between 10 and 14 ft below ground surface.
- Overburden soil at Site 9 is a stratified formation consisting of a sand layer, transition layer, and a clay layer. The depth to bedrock at the site has not been determined.
- Groundwater flow at the site is south-to-southeast and discharges into the two impoundment ponds, which are currently partially flooded, located at Site 9.
- Historical data indicate Site 9 was the location of a former incinerator and abandoned ash landfill/dump, and an area where hazardous material disposal activities reportedly occurred.
- Unnamed streams flow into Mere Brook which flows into the Harpswell Cove estuary at the southern edge of the base. Harpswell Cove is an area of commercial fishing.
- Current land use at Site 9 includes buildings for military residence (barracks), a cafeteria, and picnic and recreation areas.

- Groundwater at Site 9 is not currently used as a source of drinking water or for domestic purposes. NAS Brunswick receives drinking water from the Brunswick Water District.
- Older children aged 7-12 comprise the population potentially at highest risk from Site 9 contamination as they would be the most likely group to be playing in soil, surface water, or sediment, and would have less supervision than younger children. Risk associated with adult residents and workers is minimal.
- Wildlife populations at or near Site 9 include aquatic organisms, birds, reptiles, amphibians, and small mammals. There are no threatened or endangered species living at or near Site 9.

A more complete description of Site 9 can be found in Chapter 11 of the Remedial Investigation report (E.C. Jordan Co. 1990).

B. Type of Contamination and Affected Media

1. Groundwater Contamination

The groundwater contamination at Site 9 is considered to represent a low level threat based on the following:

- The primary COC in groundwater is vinyl chloride, which has been detected above the Federal MCLs and State MEGs. Other COCs include 1,2-dichloroethylene and 1,2-dichloroethane.
- No evidence of offsite migration of COCs above Federal MCLs or State MEGs has been detected.
- These contaminants have been detected above Federal MCLs and State MEGs, but at levels that would present only a low level risk in the event of exposure.
- Site 9 groundwater is neither a current drinking water source nor a significant potential future drinking water source.
- Manganese has been detected at elevated concentrations.

2. Inactive Ash Landfill

The contents of the inactive ash landfill are considered to represent a low level threat based on the following:

- Inorganic compounds are the primary COCs. Other COCs include PAHs and pesticides.

- Landfill contents are currently inaccessible, as the landfill was closed and a soil cover installed prior to 1953; the barracks were constructed over the former landfill area in 1953.
- No evidence of offsite contaminant migration has been detected.

An overview of the significant findings of the investigations at Site 9, and a description of the types of contamination and the affected media, are provided in Table 2-1.

C. Contamination Sources and Sampling Strategies

Media that have been sampled during field investigations include surface soil, subsurface soil, groundwater, surface water, stream sediment, and leachate. To date, a Remedial Investigation, Supplemental Remedial Investigation, Technical Memorandum Investigation, Toxicity Test and Sediment Chemistry Investigation, Source Investigation, and 14 Long-Term Monitoring Program events have been completed. These investigations identified the following potential sources of contamination:

Contaminant Type	Media Affected	Suspected Source
VOCs	Groundwater	No known source
PAHs	Soil	Motor vehicle and aircraft exhaust, barbecue pit, burning materials
PAHs	Surface water and stream sediment	Stormwater runoff from paved areas
Pesticides	Soil, stream sediments, leachate	Historical base usage
Fuel Oil/Gasoline	Soil	Possible fuel release, stormwater runoff
Inorganics	Soil, groundwater, surface water, stream sediment	Natural site conditions, former landfill
Inorganics	Leachate	Former landfill

1. Fate of Chemical Contaminants

The fate of chemical COCs at Site 9 is as follows.

Soil

- Impacted soils associated with the inactive ash landfill are currently inaccessible to humans and wildlife as a soil cover was installed prior to 1953, and barracks were constructed over the former landfill in 1953.
- PAHs and pesticides in soil are relatively immobile and have low solubility in water. Therefore, they pose limited threat to groundwater and offsite receptors.

- Based on the monitoring results to date, there is no evidence of offsite contaminant migration from the landfill in groundwater or soil.

Groundwater

- VOCs have been detected in groundwater. These compounds degrade into daughter products, including vinyl chloride.
- The presence of elevated concentrations of these decay products, including vinyl chloride, suggests that the natural attenuation process may be occurring in groundwater at Site 9.
- Monitoring data report VOC concentrations are generally steady or have decreased over time, although concentrations of vinyl chloride at 3-4 monitoring locations have exceeded the State MEG of 0.15 parts per billion and the Federal MCL of 2.0 parts per billion.
- VOCs in groundwater which pass through stream sediment and discharge into a portion of the northern unnamed stream and the adjacent impoundment pond are likely to volatilize upon reaching the surface, hence contamination appears to be limited to the groundwater.
- Groundwater at Site 9 is neither a drinking water source nor a significant potential future drinking water source.
- To date, no evidence of movement of COCs from Site 9 above Federal MCLs or State MEGs has been detected.

Surface Water

- Vinyl chloride is below Ambient Water Quality Criteria and is not considered a threat to ecological receptors.
- PAHs in surface water are attributed to non-point sources such as runoff from roads and runways and, therefore, are not considered to be the result of historical Site 9 activities.

Stream Sediment

- PAHs have been detected in stream sediments above health-based risk ranges. PAHs are considered to be immobile in sediments.
- Toxicity testing did not detect PAHs in stream biota, nor do contaminants appear to have affected survival, reproduction, or populations of aquatic test organisms.

- PAHs in sediments are attributed to non-point sources such as stormwater runoff and are not considered to be the result of historical activities at Site 9. These sediments are periodically removed in accordance with the NAS Brunswick NPDES Permit under the Clean Water Act and supervised by the MEDEP.

D. The Conceptual Model

1. Site Description

Site 9 is approximately 20 acres in size. The site is generally flat, although two steep-sided stream channels are located in the southern portion of the site. The streams are now partially flooded, creating two surface water impoundment ponds which form the southern boundary of Site 9. Buildings, roadways, parking areas, and lawn cover the majority of the site. No areas of archaeological or historical importance are known to be present.

2. Geology and Hydrogeology

The Site 9 area is underlain by fine to medium sand at depths ranging in thickness up to 40 ft. The sand unit decreases in thickness from east to south. Underlying the sand is a transition unit composed of fine sand and silt with clay. A clay unit underlies the transition unit and extends to an undetermined depth. The depth to bedrock at the site has not been determined.

Groundwater occurs at the site at a depth of less than 20 ft below ground surface, and is unconfined. Based on groundwater elevation data gathered during the Long-Term Monitoring Program, the groundwater flow direction is generally towards the northern unnamed stream and surface water impoundment ponds. Groundwater is believed to discharge to the unnamed stream and surface water impoundment ponds. Figure 2-3 shows a generalized cross-section and inferred groundwater flow patterns at Site 9.

3. Impacted Media and Migration Route

Soil

Surface soil at Site 9 does not pose a risk to human health or the environment. Soil impacts are limited to the subsurface soil and contents of the inactive landfill. Likely migration routes for human exposure to the landfill contents are by invasive construction, which could cause ingestion or dermal contact with these materials. The volume of the landfill material is approximately 40,000 yd³. Figure 2-4 summarizes the conceptual model for soil.

Groundwater and Other Media

Groundwater has been impacted by VOCs, most notably vinyl chloride. Groundwater may be impacted by infiltration or percolation through the contents of the inactive landfill, where metals and semivolatile organic compounds have been detected. Plume migration of contaminated groundwater has the potential to impact other media, including leachate, stream sediment, and

surface water. Likely migration routes for human exposure to these media are through contact or ingestion. The quantity of impacted groundwater at Site 9 is limited to the shallow aquifer. Figure 2-5 summarizes the conceptual model for groundwater, leachate, stream sediment, and surface water.

E. Principal and Low Level Threat Wastes

Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. Wastes generally considered to be principal threats are liquid, mobile, and/or highly-toxic source material.

Low level threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Wastes that are generally considered to be low level threat wastes include non-mobile contaminated source material of low to moderate toxicity, surface soil containing COCs that are relatively immobile in air or groundwater, low leachability contaminants, or low toxicity source material.

Principal and low level threat wastes at Site 9 are summarized in the following table:

Source Media	Affected Media	Contaminant(s)	Reason	Concentration	Receptors
Principal Threats					
None at Site 9	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Low Level Threats					
Not determined	Groundwater	VOCs Vinyl chloride DCE	Dissolved-phase monitoring, institutional controls	0-23 ppb 0-28 ppb	Not a drinking water source
Subsurface soil	Stream sediments NOTE: primary sources are not Site 9 (surface water runoff)	PAHs	Limited mobility, monitoring, institutional controls	102.9 ppb	Children ages 7-12 incidental ingestion and contact
Background conditions	Groundwater	Manganese	Not related to site institutional controls	1,010 ppb	None, not a drinking water source

F. Site-Specific Factors

1. Inactive Ash Landfill

The inactive ash landfill was closed and covered prior to 1953, and made further inaccessible by the construction of barracks over the former landfill area in 1953. Use of this portion of Site 9 for barracks is expected to continue for the foreseeable future. In addition, monitoring results to date indicate that the landfill is not an active source of groundwater contamination.

2. Stream Sediments

Because the stream receives surface water runoff from a large portion of the base, Site 9 is likely a minor source of the PAHs in stream sediments. PAHs were not detected in groundwater samples from downgradient monitoring wells during the Remedial Investigation. These sediments are periodically removed in accordance with NAS Brunswick's NPDES Permit under the Clean Water Act and supervised by MEDEP.

Vinyl Chloride in Groundwater

Extensive investigations in three separate efforts have not located the exact source of vinyl chloride at Site 9, and an active source may no longer exist. Other possible low level sources beyond the current boundary of Site 9 are shown on Figure 2-2. Analysis of long-term monitoring data at the 5-year reviews will evaluate the validity of the remedy and site boundary. Contaminant effects upon all areas of concern downgradient of Site 9 have been fully characterized and evaluated.

The risk assessment has not materially changed from that presented in the 1994 Interim ROD. Risks due to stream sediments have been primarily attributed to non-Site 9 sources. The presentation format in the tables is different per new EPA guidance in 1998.

VI. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Current and potential future site and resource uses are summarized in the following table:

Resource	Current Onsite Use	Current Adjacent Use	Potential Use	Potential Use Basis	Potential Use Time Frame
Land	Barracks, dining facility, picnic and recreational areas	Office buildings, runways, base housing, hangars, repair shops, and runways	Residential and recreational	NAS Brunswick plans to remain active. If it should close, Site 9 could become a residential area	Unknown
Shallow Groundwater	None	None	Minimal potable use potential	Low yielding aquifer	Unknown
Deep Groundwater	None	None	Minimal potable use potential	Low yielding aquifer	Unknown
Adjacent Surface Water	Impoundment pond retains base runoff	Impoundment pond retains base runoff streams	Impoundment pond, stream habitat	Impoundment ponds constructed to retain runoff	Unknown

Currently, NAS Brunswick is operated by the Department of Defense. Should the base close, the re-use of Site 9 will be assessed through the base closure process.

VII. SUMMARY OF SITE RISKS

A baseline risk assessment was completed as part of the Remedial Investigation at Site 9 to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with Site 9 assuming no remedial action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways needed to be addressed by the remedial action. The Human Health Risk Assessment followed a 4-step process:

1. **Contaminant identification**—that identified those hazardous substances which, given the specifics of the site, were of significant concern
2. **Exposure assessment**—that identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure
3. **Toxicity assessment**—that considered the types and magnitude of adverse health effects associated with exposure to hazardous substances
4. **Risk characterization**—that integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

A summary of those aspects of the Human Health Risk Assessment that support the need for remedial action is discussed below followed by a summary of the ecological risk assessment. An additional risk assessment was completed as part of the Technical Memorandum (ABB-ES 1994a) to calculate risks associated with groundwater at Site 9, since the Remedial Investigation did not find groundwater as a source of significant contamination. Additional risk calculations were presented in the Technical Memorandum to include data collected as part of that investigation (ABB-ES 1994a).

A. Human Health Risk Assessment

The Human Health Risk Assessment was completed for Site 9 surface soil, surface water, stream sediment, leachate, and leachate sediment. At the time of the Remedial Investigation, groundwater and the contents of the inactive landfill were not considered significant hazards and, thus, were not included in the Human Health Risk Assessment. In 1994, groundwater risks were calculated for the ingestion route of exposure in the Technical Memorandum (ABB-ES 1994a). The Human Health Risk Assessment was completed in 1990 (E.C. Jordan Co. 1990; Appendix Q) using the established methods at that time. Note that risk assessment procedures have changed since then, and that sufficient characterization of Site 9 has been completed.

Thirty-six COCs were identified in the Remedial Investigation and were selected for evaluation in the Human Health Risk Assessment. COCs were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence

in the environment. Tables Q-7, Q-23, Q-24, Q-32, and Q-33 in Appendix Q of the Draft Final Remedial Investigation Report (E.C. Jordan Co. 1990) show a summary of all COCs, exposure point concentrations used to evaluate the reasonable maximum exposure scenario, and estimates of average or central tendency exposure concentrations.

Table 2-2 presents each COC and its exposure point concentration for groundwater and stream sediment. This table includes the average and maximum concentrations detected for each COC, the frequency of detection, the exposure point concentration, and how the exposure point concentration was derived. The maximum concentration for each COC was used to determine the worst-case scenario risk estimate at Site 9.

Risk estimates for groundwater were taken from the Technical Memorandum (ABB-ES 1994a). Estimates for stream sediments were taken from Appendix Q of the 1990 Remedial Investigation (E.C. Jordan Co. 1990). A Human Health Risk Assessment was not conducted for the contents of the inactive ash landfill because there is no significant exposure route due to the presence of soil cover and, more significantly, military barracks located on top of the landfill site.

Potential human health effects associated with exposure to the COCs were estimated quantitatively or qualitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site.

Assumptions included the following:

- Present land use at Site 9 is for barracks, a dining facility, and picnic and recreation areas for base personnel.
- Groundwater at Site 9 is not currently used as a source of drinking water.
- It is predicted that land and groundwater use will remain the same, as there are no plans to close the base in the foreseeable future.
- Risks were also calculated to determine residential exposure based on incidental ingestion of soil occurring 350 days per year for 30 years. This scenario includes potential risk for both current and reasonable future land use.

The following paragraphs contain a brief summary of the exposure pathways that were found to present a significant risk. A more thorough description of all exposure pathways evaluated in the risk assessment, including estimates for an average exposure scenario, can be found in Appendix Q of the Remedial Investigation (E.C. Jordan Co. 1990).

Table 2-3 provides carcinogenic risk information relevant to the COCs in both soil and groundwater. Cancer slope factor adjustments were used for chemicals with less than 50 percent absorption via the ingestion route. However, adjustments were not necessary for the chemicals

evaluated at this site. As a result, the same values presented in Table 2-3 were also used as dermal carcinogenic slope factors. Inhalation and external radiation routes of exposure were not applicable at Site 9.

Table 2-4 provides risk estimates for the significant routes of exposure at Site 9. These risk estimates are based on a reasonable maximum exposure and were developed by taking into account various conservative assumptions about the frequency and duration of an exposure to stream sediment and groundwater, as well as the toxicity of carcinogenic PAHs and vinyl chloride. Risk estimates for surface soil, surface water, and leachate seep and sediment were not included in this table as they did not pose a significant risk. It should be noted that the contents of the ash landfill were not included in any of the risk assessments conducted at Site 9.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying a daily intake level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g. 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a one in a million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the stated concentration. All risks estimated represent an "excess lifetime cancer risk," or the additional cancer risk on top of that which we all face from other causes such as cigarette smoke or exposure to ultraviolet radiation from the sun. The chance of an individual developing cancer from all other (non-site-related) causes has been estimated to be as high as 1 in 3.

EPA's generally acceptable risk range for site-related exposure is from 10^{-4} to 10^{-6} . MEDEP's incremental carcinogenic guideline is 1×10^{-5} . Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse effects other than cancer, a hazard quotient is calculated by dividing the daily intake level by the reference dose or other suitable benchmark. Reference doses have been developed by EPA, and they represent a level to which an individual may be exposed that is not expected to result in any deleterious effect. Reference doses are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. A hazard quotient indicates that a receptor's dose of a single contaminant is less than the reference dose, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index is generated by adding the hazard quotients for all COCs that affect the same target organ (e.g., liver) within or across all media to which a given individual may reasonably be exposed. A hazard index <1 indicates that toxic non-carcinogenic effects are unlikely.

1. Groundwater

Risks associated with future groundwater use were calculated as part of the Technical Memorandum (ABB-ES 1994a). The assessment assumed a 70-kg adult consuming 2 L of water per day for 30 years. The hazard index was 6.0 for the maximum concentrations and 3.0 for the average concentration. These values are above the EPA target level and MEDEP guideline of 1.0, and are attributed to the elevated concentrations of manganese.

The assessment also indicated a cancer risk of 2×10^{-4} for vinyl chloride exposure based on ingestion or dermal contact with contaminated groundwater. This exceeds the EPA target risk levels of 1×10^{-6} and MEDEP guideline of 1×10^{-5} .

Table 2-5 provides non-carcinogenic risk information relevant to the COCs in groundwater. Dermal contact and inhalation were not considered applicable routes of exposure at Site 9 (ABB-ES 1994a).

Table 2-6 provides hazard quotients for ingestion of groundwater at Site 9. The estimated hazard index of 6.0 indicates that the potential for adverse non-cancer effects is likely from exposure to contaminated groundwater containing manganese.

2. Stream Sediment

The Site 9 Remedial Investigation risk assessment identified sediment as the only media having an exposure risk above the EPA target range due to total carcinogenic PAHs contamination (as shown in Table 2-2). Risks were evaluated for exposure via dermal contact or accidental ingestion for older children (aged 7-12) playing in stream sediment 48 times per year for 6 years. The most probable risk estimate was 2.98×10^{-5} , falling within EPA's acceptable target range, but slightly above the MEDEP guideline (E.C. Jordan Co. 1990; Appendix Q). The worst-case estimate for this age group was 2.56×10^{-4} which exceeds the target range, based on the maximum concentration at the site (Table 2-4). Since the Interim ROD in 1994, risks due to stream sediment have been primarily attributed to non-Site 9 sources. Moreover, contamination in stream sediment will be addressed in accordance with the Clean Water Act NPDES program.

3. Leachate, Water, and Surface Soil

Exposure to surface water and leachate is below the EPA target ranges and is not considered a human health risk. Surface soil at Site 9 had lifetime exposure risks ranging from 3.1×10^{-5} to 8.6×10^{-5} due to the presence of PAHs. These risks are within EPA's acceptable target range of from 10^{-4} to 10^{-6} , but slightly above the MEDEP guideline of 1×10^{-5} for site-related exposures. It should be noted that this estimate is for surface soil, not landfill contents. The contents of the inactive landfill were not included in the Human Health Risk Assessment.

Risk Assessment Uncertainties

Risk assessment uncertainties identified in the Human Health Risk Assessment may include the following factors:

- Use of established standards, criteria, and carcinogen exposure values for calculation of site risk
- Extrapolating potential adverse human health effects from animal studies
- Extrapolating effects observed at high dose to low dose effects
- Modeling dose response effects.

To minimize the impact of these uncertainties on the outcome of the risk assessment, realistic lower and upper bounds of risk are provided for each exposure scenario. These numbers are not indices of absolute risk, but rather a range that should include the actual risk.

B. Ecological Risks

Ecological risks indicate that the presence of contaminants in surface water may have the potential for deleterious effects on aquatic organisms, however, the impacts of chemical-related stress are not predicted to be severe. Additionally, much of the impact is attributed to elevated levels of contaminants that are found basewide and cannot be associated with Site 9 activities. Risks to terrestrial organisms with regards to contact or ingestion with soil, leachate seep, surface water, or stream sediment, are presumed to be minimal or insignificant. Groundwater contamination poses no threat to wildlife, as it is inaccessible.

The baseline risk assessment indicated a potential for serious impact on benthic macroinvertebrates. An additional risk assessment was conducted by the U.S. Fish and Wildlife Service to determine risks associated with sediment toxicity. The U.S. Fish and Wildlife Service determined that chemical constituents in sediment were not toxic to two test organisms.

C. Basis for Response Action

The Response Action for Site 9 is based on the following:

- The use of groundwater in the future may present an unacceptable human health risk.
- The baseline human health and ecological risk assessment and the Technical Memorandum assessment revealed that children may potentially be at risk if exposed to COCs in stream sediments via dermal contact or accidental ingestion.

- However, there is no current pathway of PAHs from the ash landfill to stream sediments. Stream sediments are also periodically dredged and removed offsite in accordance with NAS Brunswick's NPDES program under the Clean Water Act.
- If not addressed by implementing the selected remedy in this ROD, these factors may present an imminent and substantial danger to human health or the environment.

VIII. REMEDIATION OBJECTIVES

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) established several other statutory requirements and preferences, including: a requirement that the Navy's 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 Navy select a remedial action that is cost effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment which permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substance as a principal element over remedies not involving such treatment. Response alternatives were developed to be consistent with these congressional mandates.

Based on preliminary information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial action objectives were developed to aid in the development and screening of alternatives. These remedial action objectives were developed to mitigate existing and potential future threats to public health and the environment. The remedial action objectives for Site 9 are:

- To reduce contaminant concentrations in Site 9 groundwater to below Federal MCL and State MEG target cleanup levels
- To prevent human and ecological exposure (i.e., ingestion, dermal contact) to Site 9 groundwater
- To prevent human and ecological exposure (i.e., ingestion, dermal contact) to the contents of the inactive landfill at Site 9
- To prevent any migration of the Site 9 groundwater plume offsite or of contaminants from the inactive landfill to groundwater and/or surface water.

The basis and rationale for these remedial objectives are the most practical for Site 9 based on current and reasonably anticipated exposure routes. With regard to the groundwater, Site 9 is located on an active military base whose water is supplied by the Brunswick Water District; groundwater from the site is not a current or significant potential future source of water for

drinking or residential use as the shallow aquifer there provides limited groundwater yield and is considered an unlikely source for potential potable use. With regard to the inactive landfill, it has been closed and covered with soil, and barracks were erected on top, in effect capping the landfill area and preventing exposure to the landfill contents.

The remedial action objectives address risks identified in the risk assessment by reducing or eliminating exposure to site contaminants.

IX. DESCRIPTION OF ALTERNATIVES

CERCLA and the National Contingency Plan set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements, a range of alternatives were developed for Site 9. With respect to groundwater response action, the Remedial Investigation/ Feasibility Study developed a limited number of remedial alternatives that attain site-specific remediation levels within different time frames using different technologies; and a No Action alternative.

As discussed in Chapter 8 of the Feasibility Study, soil and groundwater treatment technology options were identified, assessed, and screened based on implementability, effectiveness, and cost. These technologies were combined into source control and management of migration alternatives. Chapter 8 of the Feasibility Study presented the remedial alternative developed by combining the technologies identified in the previous screening process in the categories identified in Section 300.430(e)(3) of the National Contingency Plan. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options. Each alternative was then evaluated in detail in the Feasibility Study.

Of the remedial alternatives screened in Chapter 8 of the Feasibility Study, only the two alternatives were retained and slightly modified for use as possible options for cleanup at the site. It should be noted that alternatives developed in the Feasibility Study were based on the assumption that the septic system located east of Building 201 was an active source of VOC contamination at Site 9. Subsequent investigations have not identified any active sources of contaminants at Site 9. Hence, remedial actions for removing or containing the source of the VOCs in groundwater at the site, including vinyl chloride, would not be appropriate.

This section presents a description of the three remedial alternatives considered for Site 9:

- Alternative 1—No Action
- Alternative 2—Natural Attenuation with Long-Term Monitoring and Institutional Controls
- Alternative 3—Active Remediation and Monitoring.

A. Alternative 1—No Action

Under the No Action alternative, no remedial action would be implemented. The No Action alternative is required by CERCLA to serve as a baseline for comparison. The No Action alternative does not meet the remedial goals for Site 9 because it would take no action to prevent contact with affected groundwater, i.e., it would not require any remedial activity, long-term monitoring, or institutional controls. Hence, the No Action alternative is not protective of human health and the environment. However, 5-year reviews will be conducted.

- Estimated Time for Design and Construction: 0
- Estimated Time for Operation: 0
- Estimated Capital Cost: \$0
- Estimated Annual Operation and Maintenance (Present Worth): \$32,996*
- Estimated Total Cost (20-Year Present Worth): \$32,996

*Includes cost of 5-year reviews for 20 years.

B. Alternative 2—Natural Attenuation with Long-Term Monitoring and Institutional Controls

1. Groundwater Contamination

To address groundwater contamination at Site 9, this alternative would include the following:

- The Navy would utilize natural attenuation, which relies on natural flushing and dispersion processes to dilute, and an *in situ* biological system to degrade, chemical contaminants. In general, the detection of decreasing levels of COCs and the presence of decay products during past monitoring events suggest this process is in effect.
- The Navy would implement institutional controls to prevent use of or contact with site groundwater.
- These institutional controls will consist of land use restrictions that would apply to the entire Site 9 area east of Orion Street and Avenue "F," extending east to MW-NASB-073, and south of Building 52 (Figure 2-6), and would be implemented and enforced by the Navy or other designated agency. The Navy would have ultimate responsibility for ensuring that these controls, as a component of the selected remedy, continue to be in place and effective and protective of human health and the environment.
- The institutional controls would be documented as groundwater use restrictions in the current NAS Brunswick Operations Instructions in effect. Within a reasonable time after signature of this ROD, the Navy would provide a draft version of these use restrictions to EPA and MEDEP for review and comment. The Navy would revise the draft restrictions in accordance with EPA and MEDEP comments to ensure that the restrictions adequately protect human health and the environment. When finalized, the groundwater use

restrictions would be incorporated into the Operations Instructions and placed in the Administrative Record for Site 9. The Operations Instructions would not be modified in any way that affects these use restrictions or the Site 9 remedy.

- Should the Navy transfer or lease any real property affected by Site 9, whether or not as a result of base closure, the Navy will notify EPA and MEDEP of the transfer or lease and will include in all documents evidencing the transfer or lease appropriate provisions (i.e., restrictive covenants or other use restrictions) preventing use of and contact with site groundwater without prior written approval from EPA and MEDEP. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.
- Continuance of the current Long-Term Monitoring Program as specified in the Long-Term Monitoring Plan (currently under revision).

2. Inactive Ash Landfill

Upon closure of the landfill prior to 1953, the area was graded and a soil cover installed. In 1953, the barracks were constructed over the former landfill area, in effect capping the landfill area and preventing exposure to the landfill contents. Therefore, the planned sequence of actions with regard to the inactive landfill would include the following:

- The Navy would implement institutional controls to prevent the disturbance of, and contact with the contents of the inactive ash landfill at Site 9 without prior written approval from EPA and MEDEP. These institutional controls would consist of land use restrictions documented in the current NAS Brunswick Operations Instructions. These land use restrictions will be subject to the same review and comment requirements as the groundwater use restrictions described above, and will also be incorporated into the Administrative Record for Site 9. The Operations Instructions would not be modified in any way that affects these use restrictions or the Site 9 remedy.
- If the building's exterior walls are disturbed in the future, the remedy of the ash landfill will be reassessed.
- Should the Navy transfer or lease any real property affected by Site 9, whether or not as a result of base closure, the Navy will notify EPA and MEDEP of the transfer or lease and will include in all documents evidencing the transfer or lease appropriate provisions (i.e., restrictive covenants or other use restrictions) preventing use of and contact with site groundwater without prior written approval from EPA and MEDEP. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering

long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.

- The Navy would continue the Long-Term Monitoring Program to ensure that the contents of the ash landfill are not impacting the environment, including monitoring groundwater downgradient of the inactive landfill for metals and PAHs to assess whether the landfill is impacting groundwater and/or has the potential to impact surface water.

3. Applicable or Relevant and Appropriate Requirements

Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 Code of Federal Regulations 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)
- Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)
- Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)

- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- Maine Solid Waste Management Rules - General Provisions (06-096 CMR 400)
- Maine Solid Waste Management Rules - Landfill Siting, Design, and Operation (06-096 CMR 401)
- Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)
- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999).

4. Five-Year Review

In addition, a review would be completed at least once every 5 years at Site 9 to evaluate the progress of the remedial action and to ensure that human health and the environment continue to be protected.

- | | |
|---|----------------|
| • Estimated Time for Design and Construction: | 0 |
| • Estimated Time for Operation | Up to 20 years |
| • Estimated Capital Cost: | \$35,410 |
| • Estimated Annual Operation and Maintenance (20-Year Present Worth): | \$849,285 |
| • Estimated Total Cost (20-Year Present Worth): | \$884,695 |

A detailed summary of the cost estimate for this alternative is provided in Table 2-7.

The major cost drivers of this remedial alternative are the sampling, analysis, and reporting associated with long-term monitoring and institutional controls. A major source of uncertainty for this cost estimate is the duration of the Long-Term Monitoring Program.

C. Alternative 3—Active Remediation and Monitoring

1. Groundwater Contamination

This alternative would address groundwater contamination employing active remediation technologies and monitoring as follows:

- A pump-and-treat remedy would be used to pump contaminated groundwater from two extraction wells to a treatment plant
- The treatment process would include pre-treatment of water for metal removal and enhanced chemical oxidation of the organic compounds using ultraviolet light
- The treated water would then be discharged to the base sewer system
- Long-term monitoring and institutional controls, as listed in Alternative 2, would also be implemented.

2. Inactive Ash Landfill

The inactive ash landfill will be addressed as follows:

- The contents of the ash landfill would be excavated and disposed offsite, and the landfill area backfilled and restored
- The Navy would continue long-term monitoring in accordance with the Long-Term Monitoring Plan as revised to reflect the goals of this alternative.

3. Applicable or Relevant and Appropriate Requirements

Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 Code of Federal Regulations 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)

- Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)
- Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)
- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- Maine Solid Waste Management Rules - General Provisions (06-096 CMR 400)
- Maine Solid Waste Management Rules - Landfill Siting, Design, and Operation (06-096 CMR 401)
- Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)
- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999).

With regard to the excavation and offsite disposal of the contents of the inactive landfill, federal ARARs would include the RCRA regulations regarding the identification and listing of hazardous waste (40 CFR Part 261.24), which would be applicable to determine whether excavated material from the landfill would have to be disposed offsite in a Resource Conservation and Recovery Act Subtitle C or Subtitle D waste management unit. State ARARs would include the Maine Hazardous Waste Management Rules on Identification and Listing of Hazardous Wastes (MEDEP Regulation, Chapters 800, 801).

4. Five-Year Review

In addition, a review would be completed at least once every 5 years at Site 9 to evaluate the progress of the remedial action and to ensure that human health and the environment continue to be protected.

- Estimated Time for Design and Construction: 1 year
- Estimated Time for Operation: Up to 20 years
- Estimated Capital Cost: \$1,051,424

- Estimated Annual Operation and Maintenance (20-Year Present Worth): \$1,497,770
- Estimated Total Cost (20-Year Present Worth): \$2,549,194

A detailed summary of the cost estimate for this alternative is provided in Table 2-7.

The major cost drivers of this remedial alternative are the excavation and disposal costs associated with remediation of the inactive landfill, and operations and maintenance costs for the groundwater treatment system. Major sources of uncertainty for this cost estimate are volume of materials which would require offsite transportation and disposal, and the duration of the pump-and-treat remedy.

COMPONENTS AND EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES			
Component	Alternative 1 No Action	Alternative 2 Natural Attenuation with Long- Term Monitoring and Institutional Controls	Alternative 3 Active Remediation and Monitoring
COMPONENTS OF REMEDIAL ALTERNATIVES			
Treatment Technologies	None	Natural attenuation	Pump and treat; excavation of landfill
Containment Components	None	None	Groundwater extraction well
Institutional Controls	None	Land use restrictions to prevent contact with impacted media	Land use restrictions to prevent contact with impacted media
Operations and Maintenance	None	Maintain monitoring network	Maintain extraction well and monitoring network
Monitoring Requirements	None	Assess degree of natural attenuation, track concentration trends, and plume location	Assess degree of natural attenuation, track concentration trends and plume location
5-Year Review for 20 Years	Yes	Yes	Yes
EXPECTED OUTCOME OF REMEDIAL ALTERNATIVES			
Land Use Following Remediation	Industrial or residential	Industrial or residential	Industrial or residential
Duration of Remedy	Not applicable	Determined based on 5-year reviews	Determined based on 5-year reviews
Available Groundwater Use Following Remediation	None	None	None
EXPECTED COST			
20-Year Projected	\$32,996	\$884,695	\$2,549,194

5. Summary of Remedial Alternatives

Component	Alternative 1 No Action	Alternative 2 Natural Attenuation and Long-Term Monitoring with Institutional Controls	Alternative 3 Active Remediation and Monitoring
Treatment Technologies	None	Natural attenuation	Pump and treat excavation of landfill
Containment Compounds	None	None	Groundwater extraction well
Institutional Control	None	Land use restrictions to prevent contact with impacted media	Land use restrictions to prevent contact with impacted media
Monitoring Requirements	None	Assess degree of natural attenuation, track concentration trends, and plume location	Assess degree of natural attenuation, track concentration trends, and plume location
5-Year Review	Yes	Yes	Yes
Expected Outcome of Remedial Alternative			
Land Use Following Remediation		Industrial or residential	Industrial or residential
Duration of Remedy	Not applicable	Determined based on 5-year review	Determined based on 5-year review
Available Groundwater Use Following Remediation	None	None	None
Expected Projected 20-Year Cost	\$32,996	\$884,695	\$2,549,194

X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

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

A. Evaluation Criteria Used for Comparative Analysis

A detailed analysis was performed on the alternative using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine evaluation criteria. These criteria are summarized as follows.

1. Threshold Criteria

The two threshold criteria described below must be met in order for the alternative to be eligible for selection in accordance with the National Contingency Plan:

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

- b. **Compliance with ARARs** addresses whether or not a remedy will meet all of the ARARs of other federal and state environmental laws and/or provide grounds for invoking a waiver.

2. Primary Balancing Criteria

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

1. **Long-term effectiveness and permanence** assesses alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.
2. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.
3. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup goals are achieved.
4. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
5. **Cost** includes estimated capital and operation and maintenance costs, as well as present worth costs.

3. Modifying Criteria

1. **State acceptance** addresses the State's position and key concerns related to the preferred alternative and other alternatives, and the State's comments on ARARs or the proposed use of waivers.
2. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and Remedial Investigation/Feasibility Study report.

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted, as shown below:

Criteria	Alternative 1 No Action	Alternative 2 Natural Attenuation with Long-Term Monitoring and Institutional Controls	Alternative 3 Active Remediation and Monitoring
1. Overall protection of human health and the environment	Poor	Moderate	Moderate
2. Compliance with ARARs	Moderate	Good	Good
3. Long-term effectiveness and permanence	Poor	Good	Good
4. Reduction of toxicity, mobility, or volume through treatment	Poor	Poor	Good
5. Short-term effectiveness	Moderate	Moderate	Moderate
6. Implementability	Good	Good	Moderate
7. Cost	\$32,996	\$884,695	\$2,549,194
8. State acceptance	Not acceptable	Acceptable	Acceptable
9. Community acceptance	Not acceptable	Acceptable	Acceptable
NOTE:	Good indicates the alternative meets the intent of the criteria. Moderate indicates the alternative partially meets the intent of the criteria. Poor indicates the alternative does not meet the intent of the criteria.		

B. Summary of the Comparative Analysis

The section below presents the nine criteria and a brief narrative summary of the alternative and the strengths and weaknesses according to the detailed and comparative analysis. Only those alternatives which satisfied the first two threshold criteria were balanced and modified using the remaining seven criteria.

1. Overall Protection to Human Health and the Environment

This criterion addresses each alternative's ability to provide protection to human health and the environment and describes how risks are reduced, controlled, or eliminated through engineering or institutional controls.

- Alternative 1 provides limited protection to human health and the environment as it does not prevent possible contact with contaminants.
- Alternative 2 and Alternative 3 best fulfill these criteria as both alternatives establish institutional controls to limit human contact with impacted groundwater and soil, thus reducing or eliminating potential for human health hazards. Both alternatives implement a program to monitor potential risks to human health or the environment, which can occur over time, such as contaminant migration. Alternative 3 uses active remediation to remove chemical contaminants.

2. Compliance with Applicable or Relevant and Appropriate Requirements

- Alternative 1 does not comply with ARARs as hazardous chemical contaminants will remain onsite.

- Both Alternative 2 and Alternative 3 comply with the above ARARs through the utilization of natural attenuation, groundwater monitoring, and comparing analytical results of State MEGs and Federal MCLs. Remediation goals include reducing contaminant levels to below federal and state standards and to minimize carcinogenic and non-carcinogenic compounds so that the risk factors are below federal requirements (cancer risk factor between 1×10^{-4} and 1×10^{-6} , and hazard index less than 1.0); and State guidelines (cancer risk of less than 1×10^{-5} and hazard index less than 1.0).

3. Long-Term Effectiveness and Permanence

This criterion refers to the ability of a remedial action to protect human health and the environment over time.

- Alternative 1 would provide no long-term effectiveness.
- Alternatives 2 and 3 provide the greatest long-term effectiveness. Alternatives 2 and 3 would provide institutional controls to limit exposure in the long-term and monitor the changes in chemical concentration and migration over time. This would effectively provide information as to the progress of remediation and provide a warning system should contaminants migrate to areas/media that could be harmful to human health or the environment.

4. Reduction in Toxicity, Mobility, or Volume Through Treatment

This criterion addresses the performance of treatment technologies implemented by the remedial action.

- Alternatives 1 and 2 do not utilize an engineered treatment method.
- Alternative 3 would best reduce toxicity and volume by removing and treating contaminated groundwater. Groundwater at Site 9 is not currently used as a drinking water source nor is it considered a significant potential source. Impacted groundwater appears to be limited to the aquifer where natural attenuation is believed to be ongoing.

5. Short-Term Effectiveness

Short-term effectiveness deals with the period of time needed to achieve remediation goals, including any deleterious impacts that may be caused by the construction and implementation period.

- Alternative 1 would have no short-term effectiveness.

- Alternative 2 provides the best short-term effectiveness. Natural attenuation is already underway. Therefore, no adverse impacts will occur during the implementation of this remedy, since there is no construction phase.
- Alternative 3 presents a minor potential for harmful effects on human health and the environment as construction of the treatment system could expose workers, etc. to impacted media.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedial action.

- Alternative 1 provides the best implementability because no action will be instituted.
- Alternative 2 provides good implementability as it utilizes a naturally occurring process and that monitoring will be conducted in accordance with the Long-Term Monitoring Program that has already been established.
- Alternative 3 would be the most difficult to implement as it would require a construction and operation and maintenance phase due to the extraction and treatment process.

7. Cost

This criterion estimates the monetary cost of the proposed alternatives, over a 20-year period.

- Alternative 1 has the least cost (estimated at \$32,996)
- Alternative 2 is estimated to be \$884,695
- Alternative 3 is estimated to cost \$2,549,194 to complete treatment and monitoring.

8. State Acceptance

This criterion includes the state/support agency preference, comments, and/or support of the selected remedial alternative.

- Alternative 1—Not acceptable
- Alternative 2—Acceptable, the State agrees with the Navy's selection
- Alternative 3—Acceptable

9. Community Acceptance

This criterion includes the community preference, comments, and/or support of the selected remedial alternative.

- Alternative 1—Not acceptable
- Alternative 2—Acceptable
- Alternative 3—Acceptable; Town of Brunswick Conservation Committee prefers this alternative.

XI. THE SELECTED REMEDY

Alternative 2 (Natural Attenuation with Long-Term Monitoring and Institutional Controls) is the selected remedy for Site 9. This remedy is not comprehensive in that it does not utilize source control and/or management of migration. However, it should be noted that no identified source of contamination is present, and monitoring results to date do not show that any offsite migration of COCs above Federal MCLs or State MEGs exists. Under this alternative, the following will be implemented.

An expected outcome of the selected remedy is that Site 9 will no longer present an unacceptable risk to humans via dermal contact or accidental ingestion. The selected remedy will treat the low level threats associated with site contaminants. The amount of time necessary to achieve the goals consistent with groundwater use is estimated to be up to 20 years.

A. Groundwater Cleanup Levels

Interim groundwater cleanup goals were defined in the ABB Interim Record of Decision (1994c) for three COCs in groundwater (dichloroethene, dichloroethane, and vinyl chloride). Target cleanup concentrations were 70, 5, and 2 $\mu\text{g/L}$, respectively, and were equivalent to the Federal MCLs. The cleanup levels for this Final ROD will be 70, 5, and 0.15 mg/L, respectively, since the State MEGs are now ARARs and the MEG for vinyl chloride is 0.15 mg/L.

B. Soil Cleanup Levels

No cleanup levels for soil have been established for Site 9.

C. Description of Remedial Components

Long-term monitoring will be conducted in accordance with the Long-Term Monitoring Plan to monitor groundwater, surface water, leachate, and stream sediment for COCs. The Long-Term Monitoring Plan, which was required by the Interim ROD, is currently undergoing revisions and is scheduled to be finalized in 1999. The revised Long-Term Monitoring Plan will be reviewed and approved by EPA and MEDEP in consultation with the Restoration Advisory Board and the public. The Navy will continue the monitoring program in accordance with the Long-Term Monitoring Plan until it is determined that the program is no longer necessary. This

determination shall be made with the approval of EPA and MEDEP in consultation with the Restoration Advisory Board and the public. The Navy and EPA have concluded that it is impracticable to remove and/or treat the COCs in a cost-effective manner. Thus, the selected remedial action does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element.

1. Natural Attenuation

Natural attenuation involves reliance on natural flushing and dispersion processes and *in situ* biological systems to dilute and degrade chemical contaminants. The Navy will utilize natural attenuation to degrade contaminants in the groundwater at Site 9 to concentrations sustained at or below Federal MCLs and State MEGs. Groundwater monitoring results showing contaminant concentrations will be compared to these remediation goals, and the selected remedy will be continued until they are achieved. The detection of both decreasing concentrations of COCs and the presence of decay products during past monitoring events confirms that the natural attenuation process is underway at Site 9.

2. Long-Term Monitoring

Long-term monitoring will be conducted. The Long-Term Monitoring Plan is currently undergoing revisions, and is scheduled to be finalized in 1999. The final cleanup levels for groundwater are below Federal MCLs and State MEGs. Groundwater concentrations will be compared to these criteria and the selected remedy will be continued until they are achieved.

The current monitoring program as detailed in the Long-Term Monitoring Plan (EA 1999c) includes the following:

- Assessing variations in the concentrations of VOCs in groundwater, leachate surface water, and sediment to determine the effectiveness of natural attenuation
- Assessing whether groundwater downgradient of the ash landfill is impacted by inorganics from the site
- Assessing whether contamination is migrating offsite
- Assessing variations in groundwater flow patterns
- Monitoring structural integrity of the groundwater monitoring wells.

3. Institutional Controls

- The Navy will implement institutional controls to prevent the use of and contact with impacted groundwater at Site 9, and to prevent the disturbance of or contact with the contents of the ash landfill at Site 9 without prior written approval from EPA and MEDEP. These institutional controls will consist of groundwater and land use

restrictions that would apply to the entire Site 9 area east of Orion Street and Avenue F, extending east of MW-NASB-073, and south of Building 52 (Figure 2-6). They will be implemented and enforced by the Navy or other designated agency. The Navy will have ultimate responsibility for ensuring that these controls, as a component of the selected remedy, continue to be in place and effective, and protective of human health and the environment.

- These controls will be documented as groundwater and land use restrictions in the current NAS Brunswick Operations Instructions in effect, which are used to identify and screen environmental areas for inappropriate construction or development activities. Within a reasonable time after signature of the ROD, the Navy will provide a draft version of these use restrictions to EPA and MEDEP for review and comment. The Navy shall revise the draft use restrictions in accordance with EPA and MEDEP comments to ensure that the restrictions adequately protect human health and the environment. When finalized, the groundwater and land use restrictions will be incorporated into the Operations Instructions and placed in the Administrative Record for Site 9. The Operations Instructions will not be modified in any way that affects these use restrictions or the Site 9 remedy.
- If the buildings' exterior walls are disturbed in the future, the remedy of the ash landfill will be reassessed.
- Should the Navy transfer or lease any real property affected by Site 9, whether or not as a result of base closure, the Navy will notify EPA and MEDEP of the transfer or lease and will include in all documents evidencing the transfer or lease appropriate provisions (i.e., restrictive covenants or other use restrictions) preventing use of and contact with site groundwater without prior written approval from EPA and MEDEP. If the property is transferred, or the lease allows capital improvements, a technical evaluation of the effectiveness and appropriateness of the remedy will be undertaken considering long-term monitoring results to date, the proposed land use, and the fact that the Navy may no longer actively own or operate the property.
- Should the barracks be removed, modified, or excavated, the Operations Instruction will restrict excavation in the inactive landfill area without prior written approval from EPA and MEDEP. This use restriction will be included in all documents evidencing any transfer or lease of any real property affected by Site 9.
- If the contents of the landfill are disturbed, they shall be disposed of in accordance with EPA and state hazardous and/or solid waste regulations.
- If the contents are not disturbed, any excavation shall be backfilled to the existing grade.

- The selected remedy does not involve simply “capping” the inactive ash landfill by constructing buildings or asphalt areas such as roadways or parking lots over the landfill area; this would be unacceptable as a landfill remedy under CERCLA, the National Contingency Plan, and EPA guidance. Rather, the remedy for the inactive landfill is institutional controls based on the following site-specific facts: (1) the landfill was closed and covered prior to 1953 and made further inaccessible by the construction of buildings over the former landfill area in 1953, (2) monitoring results to date indicate that the landfill is not an active source of groundwater contamination, and (3) the ROD requires that if the contents of the landfill are disturbed, the Navy will dispose of them in accordance with the federal and state hazardous waste and solid waste regulations as appropriate.

4. Five-Year Review

A review will be completed at least once every 5 years at Site 9 to evaluate the progress of the remedial action and to ensure that human health and the environment continue to be protected. Data collected during the Long-Term Monitoring Program will be reviewed, and recommendations for modifications will be made as part of annual reports and in the 5-year reviews.

5. Applicable or Relevant and Appropriate Requirements

Federal Relevant and Appropriate Requirements

Chemical-Specific:

- Safe Drinking Water Act – MCLs (40 Code of Federal Regulations 141.11–141.16) (U.S. EPA 1999)
- Safe Drinking Water Act – MCL Goals (40 CFR 141.50 –141.51).

Action-Specific:

- RCRA Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24).

State Relevant and Appropriate Requirements

Chemical-Specific:

- Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)

- Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)
- Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854).

Action-Specific:

- Maine Surface Water Toxics Control Program (38 MRS Sections 420, 464, 06-096 CMR-530)
- Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)
- Maine Solid Waste Management Rules - General Provisions (06-096 CMR 400)
- Maine Solid Waste Management Rules - Landfill Siting, Design, and Operation (06-096 CMR 401)
- Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

To Be Considered:

- EPA Risk Reference Doses (U.S. EPA 1999)
- EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999).

6. Outcomes

After completion of the remedial action, groundwater at Site 9 will no longer present a hazard to human health or the environment if it is used as a drinking water source.

During operation of the remedy, human health and the environment will be protected from hazards due to contact with contaminants in the inactive landfill. If excavations are required, proper hazardous material handling will be ensured by following Navy procedures and the Base Operating Instructions under oversight of the EPA and MEDEP. Stream sediments will be indirectly protected by monitoring any inflow of contaminants from Site 9 sources. Periodic dredging will also be executed under NAS Brunswick's NPDES permit.

XII. STATUTORY DETERMINATIONS

The remedial action selected for implementation at Site 9 is consistent with CERCLA and, to the extent practicable, the National Contingency Plan. The selected remedy is protective of human health and the environment, will comply with ARARs, and is cost effective. In addition, the selected remedy utilized permanent solutions and alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this site will adequately protect human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through natural biological processes and institutional controls, and long-term monitoring.

The selected remedy will reduce potential human health risk levels to within EPA's acceptable risk range of from 10^{-4} to 10^{-6} for incremental carcinogenic risk and to below the hazard index of 1 for non-carcinogenic risk. It will reduce potential human health risk levels to protective ARARs levels, i.e., the remedy will comply with ARARs and To Be Considered criteria. Implementation of the selected remedy will not pose any unacceptable short-term risk or cause any cross-media impacts.

B. The Selected Remedy Complies with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all federal and any more stringent state ARARs that pertain to the site. In particular, this remedy will comply with the following federal ARARs:

ARARs for Site 9 include both federal and state guidelines. Federal requirements include:

1. Safe Drinking Water Act MCLs (40 CFR 141.11-141.16) (U.S. EPA 1999)
2. Safe Drinking Water Act MCL Goals (40 CFR 141.50-141.51)
3. RCRA Identification and Listing of Hazardous Wastes; Toxicity Characteristics (40 CFR 261.24).

This remedy will also comply with the following State ARARs:

1. Maine Department of Human Services Rules Relating to Drinking Water (10-144E Chapters 231-233)
2. Maine Department of Human Services Rules Relating to Testing of Private Drinking Water Systems or Potential Hazardous Contaminants (10-144E Chapters 232-233, Appendix B)

3. Maine MEGs through the Maine Hazardous Waste Rules Relating to Performance Standards for Establishing, Construction, Altering, and Operating Certain Types of Hazardous Waste Units (06-096-CMR-854)
4. Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464; 06-096 CMR 530).
5. Maine Solid Waste Management Rules - General Provisions (06-096 CMR 400)
6. Maine Solid Waste Management Rules - Landfill Siting, Design, and Operation (06-096 CMR 401)
7. Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405).

The Navy would use EPA Risk Reference Doses (U.S. EPA 1999) and EPA Human Health Assessment Group Cancer Slope Factors (U.S. EPA 1999) as To Be Considered criteria for characterizing risk from inorganics in groundwater.

C. The Selected Remedial Action is Cost Effective

In the Navy's judgement, the selected remedy is cost effective because the remedy costs are proportional to its overall effectiveness (40 CFR 300.430[f][1][ii][D]). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (i.e., that are protective of human health and the environment and comply with all federal and any more stringent ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria; long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness, in combination. The overall effectiveness of each alternative was compared to the alternative's cost to determine cost effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

D. The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment or Resource Recovery Technologies to the Maximum Extent Practicable

The Navy first identified those alternatives that are protective of human health and the environment by meeting or waiving ARARs as appropriate then identified which alternatives utilized permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. This determination was made by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, or volume through treatment; (3) short-term effectiveness; (4) implementability; and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment; and considered the preference for

treatment as a principal element, the bias against offsite land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-off among the alternatives.

The selected remedial action does not utilize permanent solutions and alternative treatment or resource recovery technologies because they are not the most practicable for this site. Contamination at Site 9 does not pose an immediate threat to human health that would require active remediation. The institutional controls that will be implemented as part of the remedy relay on natural biological processes to dilute and degrade chemical contaminants over time. This remedy when compared to the active remediation alternative had the highest balance of trade-offs.

E. The Selected Remedy Does Not Satisfy the Preference for Treatment Which Permanently and Significantly Reduces the Toxicity, Mobility, or Volume of the Hazardous Substances as a Principal Element

The Navy and EPA have concluded that it is impracticable to remove and/or treat the COCs in a cost-effective manner. Thus, the selected remedial action does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element. However, as groundwater at Site 9 is not used as drinking water and there is no significant potential groundwater source, potential danger to human health or the environment is not immediate. Based on these factors, natural attenuation is the most practicable process for removing contaminants from the groundwater at Site 9 and provides the best balance of trade-offs among the alternatives. In addition, contents of the ash landfill are currently inaccessible due to their location below the barracks. If the barrack's exterior walls are excavated or modified, the selected remedy for the ash landfill will be reassessed.

F. Five-Year Review Requirements

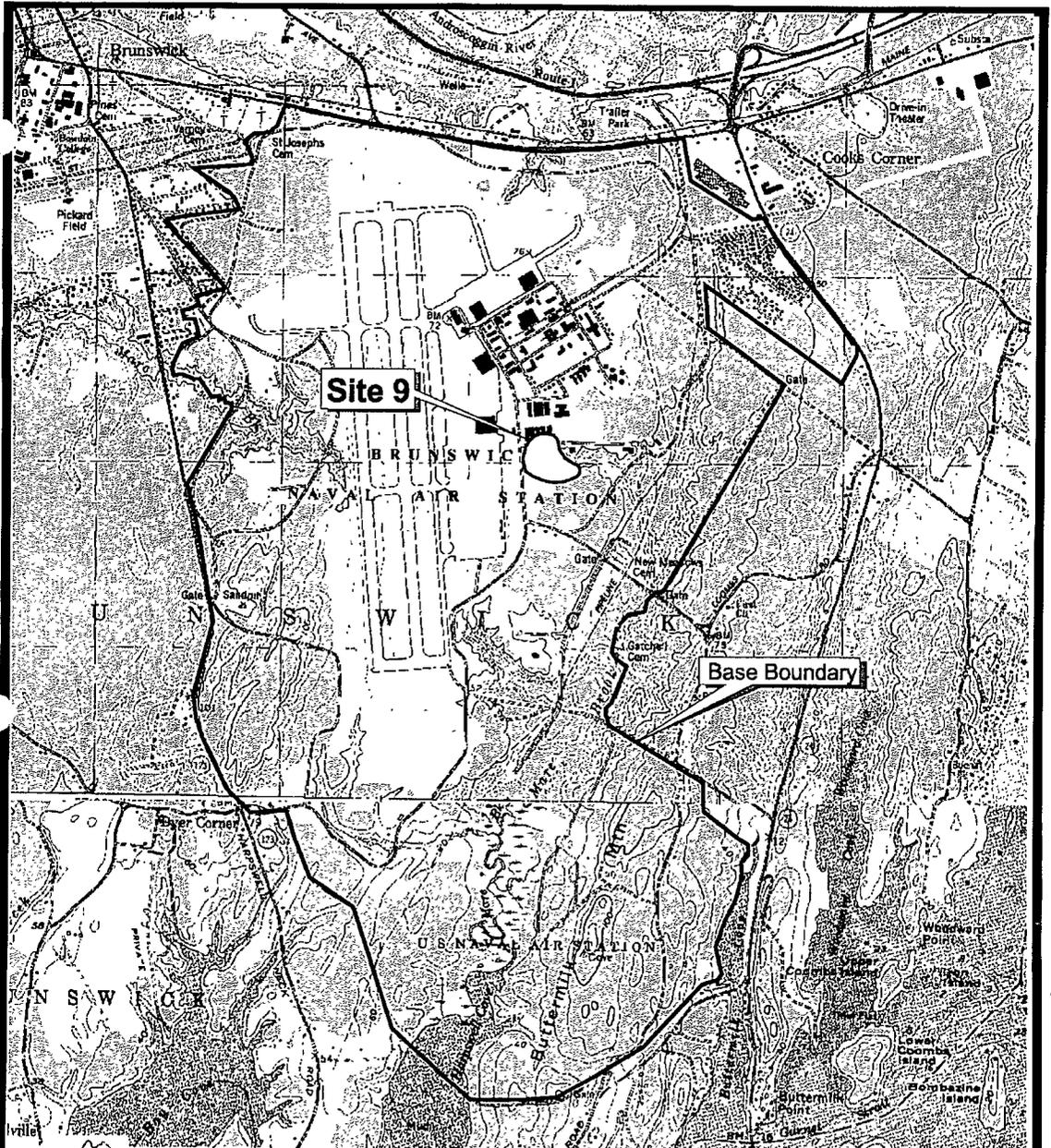
Because this remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within 5 years after initiation of the remedial action and every 5 years thereafter to ensure that the remedy continues to provide adequate protection of human health and the environment.

XIII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan of natural attenuation with long-term monitoring and institutional controls for remediation of Site 9 on 15 July 1999. EPA reviewed all written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

XIV. STATE ROLE

MEDEP has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the Remedial Investigation, Risk Assessment, and Feasibility Study to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. MEDEP concurs with the selected remedy for Site 9. A copy of the declaration of concurrence by MEDEP is provided as Appendix C.



2000 0 2000 4000 Feet



SOURCE MAPS: USGS ORRS ISLAND (1978) AND BRUNSWICK (1980) 7.5 MINUTE QUADRANGLES.



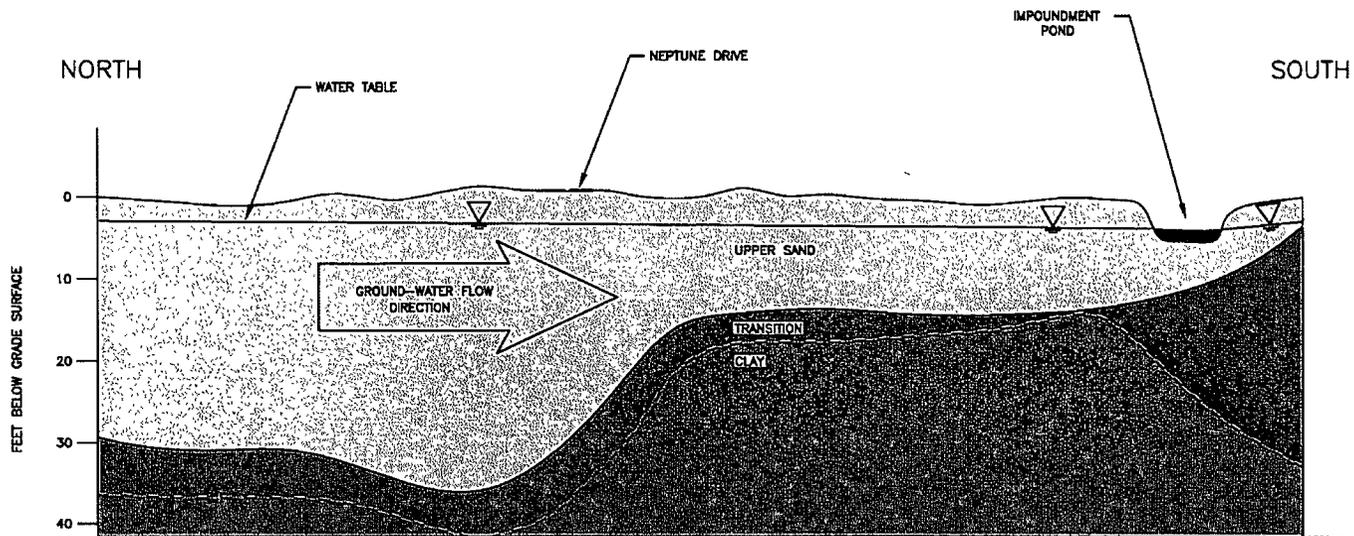
EA ENGINEERING,
SCIENCE, AND
TECHNOLOGY

NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 2 - 1
SITE LOCATION MAP,
SITE 9 (NEPTUNE DRIVE DISPOSAL SITE)

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
PLN	BT	BT	PLN	AS SHOWN	8 AUGUST 1999	29600.82	I:\NASB_GIS NAVY.APR

FIGURE 2-3 GENERALIZED NORTH TO SOUTH CROSS-SECTION OF SITE 9



Appendix A

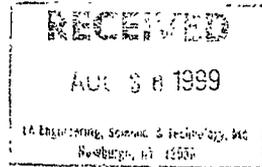
**Responsiveness Summary
and Responses to Written
and Oral Comments**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
1 CONGRESS STREET, SUITE 1100 (HBT)
BOSTON, MASSACHUSETTS 02114-2023

August 27, 1999

Mr. Emil Klawitter (eeklawitter@efdnorth.navy.mil)
Northern Division, Naval Facilities Engineering Command
Code 1823/EK
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090



Re: Draft Record of Decision (ROD) for site 9, Naval Air Station, Brunswick, Maine

Dear Mr. Klawitter:

Thank you for the opportunity to review the site 9 draft ROD. I'd like to commend the Navy and EA Engineer, Science and Technology on drafting a good document, especially given the draft guidance provided

My technical comments are attached. Comments from the EPA case attorney will be forwarded next week. This letter forwards my informal comments from last week; they haven't changed substantially. There are several new comments; most they are minor or editorial (in some cases to correct poor wording taken directly from the Region 1 model ROD). The new comments since last week are in italics in the attachment.

I thought Part 1, The Declaration, was well written. My comments were minor (some redundant text from the model ROD was deleted) and are displayed in the attached red line strike out version of the declaration

I look forward to discussing our comments at the meeting next week. This will probably be the fastest way to resolve all the comments and concur on text for the draft final site 9 ROD.

If you have any questions, please contact me at 617-918-1344 or barry.michael@epa.gov.

Sincerely,

(Signed, 8/27/99 at 11:21 AM)

Michael S. Barry
Remedial Project Manager
Federal Superfund Facilities Section

cc. Carolyn LePage/LePage Environmental (clepagegeo@aol.com)
Betsy Mason/EPA Region 1 (mason.elizabeth@epa.gov)
Pete Nimmer/EA Environmental (pln@eaest.com)
Claudia Sait/ME DEP (claudia.b.sait@state.me.us)
Tony Williams/NASB (WilliamsA@nasb.navy.mil)

7. *Section V. D.; conceptual site model. I moved some of the background material to site description or site overview to reduce redundancies. Also recommend holding the figure number references so they stand out.*
8. *I added a section V.F., site specific section, we have a lot of that for site 9. This section is in the new guidance, but isn't as "hard" a policy basis as the principle threat waste section, but I think it adds to the ROD. Again, please comment if anything is incorrect.*
9. *The risk section reads a lot better than the working draft, but could be easier to read. Unless anyone has a hard spot with it or specific recommendations, I suggest we leave it as is.*
10. *Risks and alternatives. I altered the text that talks about the stream sediments. This was a major risk driver on the IROD, but at this point we are really deferring it to the NPDES. I think this is appropriate, but we should be consistent throughout the ROD. This is a major departure from the interim ROD.*
 - a *Regarding the above, I added a one line paragraph to the end of the stream sediment part of section A, Human Health Risk Assessment:*

. The contents of the inactive landfill were not included in the Human Health Risk Assessment.

Since the interim ROD in 1994, risks due to stream sediments have been primarily attributed to non-site 9 sources.
11. *Section VIII. A., Remedial Objectives; disregard edits from 8/20 comments.*
12. *Section IX., Development and screening of the alternatives. The time duration of alternatives 2 and 3 should be referred to as "approximately 20 years" in the table and various text. The ground water may reach MCL/MEG's prior to or after 20 years as there are many variables and a highly detailed and modeled duration was not undertaken.*
13. *Section X, comparative analysis of the alternatives table. Criteria 4 should be "poor" for alternative 1 and "moderate" for alternative 2.*
14. *Section X. K. and L. The final ROD should have a ME DEP acceptance statement agreeable to ME DEP and a community acceptance statement that the Navy/EPA/ME DEP concur upon. Recommend we discuss this at the meeting on 9/1. Details can be referred to the responsiveness summary.*
15. *Section XI, The Selected Remedy. I deleted the alternative component bullets in my revision of 8/20. On further reflection, though this is redundant it is a good recap of the remedy components and maybe should be included.*
16. *Section XI. A, Interim Ground Water Clean up levels This section should be ground water cleanup levels (confusion from the model ROD?). It's relevant to cover the interim ROD. We suggest:*

Interim ground-water cleanup goals were defined in the ABB Interim Record of

Decision (1994) for three COC in ground water (dichloroethene, dichloroethane, and vinyl chloride). Target cleanup concentrations were 70, 5, and 2 ~~µg/L~~ ^{ppb} ~~µg/L~~, respectively, and were equivalent to the Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines at that time. ~~The cleanup levels for this Final ROD will be the same as the Interim ROD.~~

~~B. Since then, the State Maximum Exposure Guideline for vinyl chloride has been lowered to 0.35 µg/L.~~

A table of cleanup concentrations and basis should also be included.

17. Section XI. C. should also include a number 4, on 5 year reviews as a component of the remedy; suggest the following text:

4. Five-Year Reviews.

The program would be subject to review by the Navy, Regulatory agencies, and other interested parties every 5 years. Data collected during the Long-Term Monitoring Program will be reviewed and recommendations for modifications will be made as part of annual reports, or 5-year reviews.

18. Section XI. D. A new section on outcomes is required by the new guidance, following text is suggested:

D. Outcomes

After completion of the remedial action ground water at site 9 will no longer present a hazard to human health or the environment if it is used as a drinking water source.

During operation of the remedy human health and the environment will be protected from hazards due to contact with contaminants in the ash landfill. If excavations are required, proper hazardous material handling will be ensured by following Navy procedures and the Base Operating Instructions under oversight of the EPA and ME DEP. Stream sediments will be indirectly protected by monitoring any inflow of contaminants from site 9 sources. Periodic dredging will also be executed under the bases NPDES program.

19. Section XII., Statutory Determinations. This section was taken directly from the Region draft model ROD, but some of the text was awkward or not put together well. The following changes are suggested:

- a. Sub section A., delete the last paragraph that starts with At the time.... This is for an interim ROD.
- b. Sub section D, the first few sentences are awkward, suggest changing to:

~~Once the Navy first identified those alternatives that attain or, as appropriate, maintain RAR and that are protective of human health and the environment by~~

either meeting or waiving ARAR's, as appropriate. The Navy then identified which alternatives utilized permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

20. *Responsiveness Summary.*

- a. *EPA concurs to the transcript of the public meeting questions and responses.*
- b. *We recommend a letter be sent to the two individuals that asked questions for which answers were not available at the time. Suggest we discuss this at the meeting on 9/1. I'd also be willing to help with the letter if we choose to address some of the CERCLA process concerns/questions (or sign out a separate EPA letter) - to discuss.*

21. *Tables.*

- a. *EPA concurs to the contents of all the tables.*
- b. *Suggest including the tables within the body of the ROD to improve reability. To prevent messing up the pagination you could insert a blank page in the body where the table will go.*
- c. *I also added grid lines to a few of the tables, this seemed to make them easier to read, at least to me; the different options didn't "bleed" together as much*

22. *IC's should be added to the glossary*

PART 1—DECLARATION

I. SITE NAME AND LOCATION

Naval Air Station Brunswick
CERCLIS ID NUMBER: OU6-SITE9-ME8170022018
Site 9, Neptune Drive Disposal Site
Brunswick, Maine

epa rev

II. STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Site 9, Neptune Drive Disposal Site, at Naval Air Station Brunswick. This remedial action was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, 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. This decision is based on information documented in the Administrative Record which can be viewed by the public at the Public Works Office at Naval Air Station Brunswick or at the Curtis Memorial Library on McKean Street, Brunswick, Maine.

The State of Maine Department of Environmental Protection concur with the selected remedy.

III. ASSESSMENT OF THE SITE

The response action selected in this Record of Decision is necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment.

IV. DESCRIPTION OF SELECTED REMEDY

The selected remedy for Site 9 is natural attenuation with long-term monitoring and institutional controls. The following major components of the selected remedy are needed to address soil and ~~ground water~~ground water contamination at Site 9:

- Continue utilizing natural attenuation to degrade volatile organic chemical contaminants present in ground water.
- Implement institutional controls, such as land use restrictions, to prevent human contact with ground water or landfill contents.

- Continue long-term monitoring of ground water to verify that landfill contents are not impacting ground water, to monitor the progress of natural attenuation, and to monitor for contaminant plume migration.
- Continue long-term monitoring of surface water, leachate seeps, and stream sediments for indications of contaminant migration.
- Perform 5-year reviews.

It should be noted that no active sources of contamination have been identified at Site 9. The threat of consumption of contaminated ground water is not immediate as ground water at Site 9 is not a source of drinking water nor is a significant potential source of potable ground water present. To date, no evidence of offsite contaminant migration has been detected. Therefore, the selected remedy does not employ source treatment or containment activities.

The selected remedial action plans to address principal and low level wastes at Site 9 by continuing long-term monitoring of the natural attenuation process and by implementing institutional controls.

V. STATUTORY DETERMINATIONS

The remedy selected for Site 9 satisfies the statutory requirements of the Comprehensive Environmental Response, Compensation, and Liability Act Section 121 in that it is protective of human health and the environment, complies with federal and State of Maine requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. The selected remedy utilizes permanent solutions and alternative treatment technologies, to the maximum extent practicable.

~~The selected remedy is protective of human health and the environment, complies with Federal and State of Maine requirements that are applicable or relevant and appropriate to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. Based on the size and location of contents of the landfill, it was concluded that it was impracticable to excavate and treat the contaminants of concern in a cost effective manner. Also, in relation to the ground water, the time to actively treat the ground water was similar to natural attenuation of the contaminants of concern. Therefore, since the ground water is also not a potable source, therefore, it was concluded that it was more cost effective to utilize natural attenuation as the remedy for ground water. Thus, the remedy at this site does not satisfy the statutory preference for treatment as a principal element of the remedy.~~

Because this remedy will result in hazardous substances remaining onsite above levels that allow for unlimited use and unrestricted exposure, a review will be conducted within 5 years after the initiation of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

A. Record of Decision Data Certification Checklist

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record File for this site.

- Contaminants of concern and their respective concentrations
- Baseline risks represented by the contaminants of concern
- Cleanup levels established for contaminants of concern and the basis for the levels
- Current and future land and ground-water use assumptions used in the baseline risk assessment and Record of Decision
- Land and ground-water use that will be available at the site as a result of the selected remedy
- Estimated capital, operation and maintenance, and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected
- Decisive factor(s) that led to selecting the remedy including cost, practicability, and ~~implementability~~implementability.

VI. AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

This Record of Decision represents the selected remedial action to continue natural attenuation, long-term monitoring, and establish institutional controls for Site 9 at Naval Air Station Brunswick.

The signatures below concur and recommend these remedial actions for immediate implementation:

Department of the Navy

By: _____ Date: _____

Keith F. Koon
Captain
Commanding Officer
Naval Air Station Brunswick
U.S. Department of the Navy

EA Engineering, Science, and Technology

U.S. Environmental Protection Agency

By: _____

Date: _____

Patricia L. Meaney

Director

Office of Site Remediation and Restoration

Region I

The State of Maine Department of Environmental Protection has provided a letter of concurrence dated *to be determined*, and is included in Appendix A.

From: ELIZABETH MASON
To: rtpmainhub.internet."eeklawitter@efd.north.navfac....
Date: 9/1/99 2:25pm
Subject: EPA legal comments on draft Site 9 ROD

Emil and Pete:

Attached are a clean version and a redline/strikeout version of the draft Site 9 ROD with my comments incorporated as edits to the text. Also attached is a brief list of comments not incorporated into the ROD text. I would request that these both be included in the Administrative Record for the Site, as well as this cover e-mail.

Overall, I think you did a good job of working with the draft model ROD that Mike Barry gave you. However, as Mike probably explained to you at today's meeting, I still have two major concerns from a legal point of view and in light of the new national ROD guidance. First, the draft does not contain all the factual information that the Proposed Plan did. To address this, I have added information from the Proposed Plan so that it will be clear on the face of the ROD itself that there is a sound technical basis for the selected remedy. Especially given the long history of this site and the numerous reports that have been generated, it is important for this ROD to summarize things clearly, i.e., to "tell the story" of Site 9 well.

Second, I am concerned with the lack of specificity in the Description of Alternatives and Selected Remedy sections. Therefore, I have also added language to the ROD to address this, including language on ARARs, to ensure that the ROD is legally sufficient and in accord with the new national ROD guidance.

In these sections, the redline/strikeout version gets messy because I switched the order of the groundwater and inactive landfill sections where they occurred, e.g., in the discussions of each remedial alternative. This makes more sense given that the primary focus of this ROD is the groundwater. Also, please note: I did not make any major changes to the Comparative Analysis section, but it has all shown up redlined because I reorganized it in accordance with the new ROD guidance by adding new section headings.

I know that Mike and Claudia have already submitted their comments, and I recognize that my comments/edits may conflict with some of Claudia's comments. I would request that the Navy incorporate my edits as completely as it can in the proof final ROD, and set up a time to discuss with me and Mike (and Claudia, if she wishes) any edits that it does not want to include. As I noted above, we need to ensure that the final ROD is both factually clear and legally sufficient, and I think this is the easiest way to do that at this point.

Thank you.

Betsy Mason

CC: RICANAL.RIOSRR.BARRY-MICHAEL

MEMORANDUM

TO: Mike Barry

CC: Emil Klawitter, Navy
Claudia Sait, MEDEP
Pete Nimmer, EA

FROM: Betsy Mason

DATE: September 1, 1999

RE: Comments on draft ROD for Site 9 at BNAS

General Comments:

1. Please review for spelling and typographical errors before providing EPA with the proof final version of the document.
1. EPA has made changes to the organization of the draft ROD. Please check the text of Part 2 against the Contents section to make sure that all section and subsection headings are properly reflected in the Contents section. EPA has provided additional specific comments on the Contents section below.

Specific Comments:

1. In the Contents section (and in the corresponding places in the text of the ROD):
 - a. In accordance with the national ROD guidance, the title for the Record of Decision Data Certification Checklist section should be Section 1.VI, not Section 1.V.A, and should be in all caps.
 - a. In accordance with the national ROD guidance, insert "BRIEF" before "DESCRIPTION" in the title for Section 2.I.
 - a. In accordance with the national ROD guidance, the title for Section 2.II.B. should be "History of Federal and State Investigations and Removal and Remedial Actions". Delete the titles for Sections 2.II.B.1 and 2.II.B.2. (See the redline/strikeout version for how this works in the text.)
 - a. In accordance with the national ROD guidance, add a new Section 2.II.C entitled "History of CERCLA Enforcement". (See the redline/strikeout version for how this works in the text.)

- a. The title for Section 2.III.C should be “Technical Assistance Grants”.
 - a. Delete the titles for Sections 2.VI.A and 2.VII.A.1. .
 - a. In accordance with the national ROD guidance, the title for Section 2.VIII should be “REMEDIATION OBJECTIVES”.
 - a. In accordance with the national ROD guidance, the title for the Description of Alternatives section should be 2.X, not 2.IX.B.1.
 - a. In the new Section 2.XI, add a new Section 2.XI.A entitled “Evaluation Criteria Used for Comparative Analysis”, and put current Sections 2.X.A, 2.X.b and 2.X.C under this section as subsections. Also, add a new Section 2.X.B and put current Sections 2.X.D through 2.X.L under this section as subsections. (See the redline/strikeout version for how this works in the text.)
 - a. Add a new section to the Description of Remedial Components section in the Selected Remedy section for five-year reviews.
 - a. In the title for current Section 2.XII.B, “applicable or relevant or appropriate” should be “applicable and relevant and appropriate”, as the remedy will comply with both.
1. In the List of Figures and List of Tables sections, the titles of the figures and table should have initial caps for each word and no period at the end, e.g., “Conceptual Site Model for Soil”
 1. In the List of Acronyms section, add “, as amended by the Superfund Amendments and Reauthorization Act of 1986” to the CERCLA definition.
 1. Page 1-1, Declaration, Statement of Basis and Purpose, 2nd paragraph: “Concur” should be “concur”.
 1. Page 1-2, Declaration, Description of Selected Remedy, 1st full paragraph: Revise the 2nd sentence to read “... as the ground water at Site 9 is neither a current source of drinking water nor a significant potential future source of drinking water”.
 1. Page 1-2, Declaration, Statutory Determinations, 1st paragraph: Revise the 1st sentence to read “The remedy selected for Site 9 satisfies the statutory requirements of Section 121 of the Comprehensive ... in that it is protective ...”.
 1. Page 1-2, Declaration, Statutory Determinations, 2nd paragraph: Revise the next to last sentence to read “Therefore, since the ground water at Site 9 is neither a current nor a significant potential future source of drinking water, it was concluded ...”.
 1. Page 1-3, Declaration, Authorizing Signatures: Revise the 1st sentence to read “This

Record of Decision represents the selected remedial action for Site 9 at Naval Air Station Brunswick". Revise the 2nd sentence to read "Concur and recommend for immediate implementation".

1. Page 1-4, Declaration, Authorizing Signatures: Delete the sentence regarding the State letter of concurrence after the signature block. This information is inappropriate here and is included elsewhere.



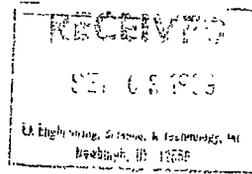
STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

August 27, 1999

MARTHA KIRKPATRICK
COMMISSIONER

Mr. Emil Klawitter
Code 1823 EK
Department of the Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, PA 19113-2090



Re: Site 9-Record of Decision (Draft)
Naval Air Station-Brunswick

Dear Mr. Klawitter:

The Maine Department of Environmental Protection (MEDEP or Department) has reviewed the report entitled Record of Decision for Site 9 (Draft), dated August 1999, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

General Comments:

1. The goals of the Long Term Monitoring Program need to be addressed in the Record of Decision (ROD).
2. Somewhere in this ROD the Navy must address what is being done to reduce the risk of exposure to sediments identified in the risk assessment. While it is not a function of this program, the ROD raise the issue but never explains the resolution.
3. If the barracks are ever removed or demolished it will be necessary to fully analyze the landfill and if necessary remove it. This needs to be included in the ROD.
4. It needs to be noted in the ROD and in any Institutional Controls (IC) that any pumping of ground water in adjacent areas could potentially change the configuration of the plume and pull contamination into new areas. The IC zone as presented may provide insufficient buffer should groundwater extraction take place adjacent to the restricted area. The site and surrounding area must be managed such that the known plume does not migrate or expand beyond current boundaries.

Specific Comments:

5. Section II, Statement of Basis and Purpose, Page 1-1, para 2:

The State of Maine Department of Environmental Protection concur ...

Since the subject is third person singular the verb should be *concurs*.

6. Description of Selected Remedy, page 1-2, para 1:

The principal and low level threats need to be identified in this section.

AUGUSTA
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AUGUSTA, MAINE 04333-0017
(207) 287-7688
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 764-1507

7. Description of Selected Remedy, page 1-2, last para:

The selected remedial action plans to address principal and low level wastes at Site 9...

Plans to sounds very weak. The MEDEP suggests the following language: The selected remedial action *addresses* principal and low level wastes at Site 9...

8. Statutory Determinations, page 1-2, para 2:

a.) "Based on the size and location of contents of the landfill, it was concluded that it was impracticable to excavate and treat the contaminants of concern in a cost effective manner.

It is the MEDEP understanding that it was the existence of the barracks on the landfill that prohibited removal and treatment. This needs to be incorporated into this statement.

b.) Therefore, since the ground water is not a potable source, it was concluded that it was more cost effective to utilize natural attenuation as the remedy for ground water."

MEDEP recommends: .) Therefore, since the ground water is not a potable source, it was concluded that it was more cost effective to utilize natural attenuation *coupled with institutional controls* as the remedy for ground water. Also it is unclear what is meant by "a potable source". Does it mean that it is undrinkable source (if so this is circular logic), a limited source of water, or that it is not used for drinking water? Please clarify.

9. Record of Decision Data Certification Checklist, page 1-3, bullet 5

MEDEP recommends: Land and ground water use that will be *allowed* at the site as a result of the selected remedy

10. Name and Location, Page 2-1, 2nd sentence:

"Naval Air Station (NAS) Brunswick is located south of the Androscoggin River between Brunswick and Cooks Corner, Maine ...

Brunswick consists of the entire municipal limits. A better description would be "between downtown Brunswick and Cooks Corner" or "between Bowdoin College and Cooks Corner".

11. Lead Agency, page 2-1, heading:

According to the following sentence there are two lead agencies. The heading should be changed to *Lead Agencies*.

12. Site Description, page 2-2, bullets 1,2, 3,& 8:

Bullet 1: Overburden soil is a stratified formation ... Please specify if this description is for Site 9 or NAS-B.

MEDEP recommends the following changes:

Bullet 2: Ground-water flow at Site 9 is south to southeast and discharges into the two impoundments located within the site boundary.

Bullet 3: In 1997, impoundment ponds were constricted resulting in partial flooding of the two unnamed streams.

Bullet 8: What is meant by an accessible source? Does it mean a limited source or that it cannot be reached? Please clarify.

The Navy needs to include a bullet stating that the unnamed streams flow to Mere Brook into Harpswell Cove which is a fishery area.

A bullet also should be added describing surround land use and in particular should mention upgradient source such as the Naval Exchange.

13. Land Use and Site Activity History, page 2-3, para 2:

Please add a reference to figure 2-2 in this paragraph.

14. Former Incinerator and Ash Landfill/Dump Area, page 2-3, bullet 1 & 3:

These two bullets appear to contradict each other. MEDEP recommends combining them as follows: No record of the precise location of the incinerator or ash landfill/dump, or the nature of the wastes handled or disposed, exists. Although it is reported that the wastes disposed in this area were solvents which may have been burned on the ground, paint sludges, and wastes from the metal shop.

15. Former Incinerator and Ash Landfill/Dump Area, page 2-3, bullet 6:

MEDEP recommends: Currently, this area *is developed with* military barracks.

16. Building 201, page 2-3, bullet 1:

Please specify what was dumped here, if it is unknown this should be stated. Also the approximate location of this dumping area should be shown on Figure 2-2.

17. Unnamed Streams, page 2-4, para 2-4:

Paragraphs 2, 3, and 4 need headings since they do not related to the unnamed streams. MEDEP recommends Future Land Use, Field Activities, and Long Term Monitor Program.

In paragraph 3 please specify that the septic system was associated with building 201.

18. Comprehensive Environmental Response, Compensation and Liability Act Enforcement History, page 2-5, bullets 2, 6, & 7:

Bullet 2: The reference to E.C Jordan should follow Remedial Investigation/Feasibility Study.

Bullet 6: Please specify the area(s) where the investigation was performed.

Bullet 7: Please specify that the septic system was associated with Building 201.

19. Comprehensive Environmental Response, Compensation and Liability Act Enforcement History, page 2-5, bullet 1:

Please specify the area(s) that were investigated. Also the last sentence states: ... but indicate contamination may be attributed to the landfill area of the septic system located behind building 201. Shouldn't this be *and*? Please clarify.

20. Community Participation, page 2-7, bullets 7 & 10:

Bullet 7: MEDEP did not approve of the Interim ROD it concurred with it. Please correct.

Bullet 10: The verb needs to be changed to was held.

21. Problems Addressed, page 2-8:

This statement contradicts the statement on page 2-6 first bullet. Please explain and clarify as necessary. Also please add the word ash before landfill so that there is not confusion between the ash landfill and the dumping area associated with Building 201.

22. Inactive Ash Landfill, page 2-8, para 1 1st sentence:

MEDEP recommends: Past investigations have indicated that the former inactive ash landfill may be a possible low level threat source of ground-water contamination.

What would the threat(s) from uncovered land fill material. Please describe.

23. Inactive Ash Landfill, page 2-9, para 1:

Please explain why the landfill contents and ground water are inaccessible. Also please clarify the statement that no chemical migration exists-from where? Please clarify that the PAH's are unlikely to migrate and will not attenuate quickly.

24. Ground Water Contamination, Page 2-9, para 1:

MEDEP recommends: Ground-water sampling data indicate volatile organic compound (VOC) concentrations are *generally* steady or have decreased over time, although 3-4 monitoring locations have exceeded the ...

Please change the terms Federal drinking water standard and State drinking water standard to MCL and MEG respectively. Also on the last sentence MEDEP recommends: To date, no evidence of offsite contamination migration has been *revealed by field data*.

25. Inactive Ash Landfill, page 2-9, 1st sentence:

Please add the date that the landfill was closed.

26. Inactive Ash Landfill, page 2-9, bullets:

Bullets 1 & 2. It is unclear what the difference is between the institutional controls and the land use restriction. Please explain. Can these two bullets be combined? Also please add the date of the Operations Instructions to bullet 2. Please include a copy of the base Operation Instruction as it pertains to Site 9 in the ROD.

Bullet 3: MEDEP recommends: Should NAS Brunswick close, *lease*, and/or transfer the property, EPA and MEDEP will be notified and appropriate language will be included in the necessary real estate documents to prevent disturbance of the *ash landfill* without receiving regulatory approval.

Bullet 4: MEDEP recommends: Continuance of a Long Term Monitoring Program to ensure that *material* remaining in the landfill is not impacting the environment, ... downgradient of the inactive

landfill for metals and *SVOCs including PAHs* to assess whether the landfill is impacting ground water...

Another bullet must be added stating the Navy's intention if the barracks are ever removed or demolished.

27. Ground Water Contamination, page 2-10, bullets:

Bullet 1: It is unclear what the difference is between the institutional controls and the land use restriction. Please explain. Can these two bullets be combined? Also please add the date of the Operations Instructions to bullet 2. Please include a copy of the base Operation Instruction in the ROD.

The IC zone as presented may provide insufficient buffer should groundwater extraction take place adjacent to the restricted area. The site and surrounding area must be managed such that the known plume does not migrate or expand beyond current boundaries.

Bullet 3: MEDEP recommends: Should NAS Brunswick close, *lease*, and/or transfer the property, EPA and MEDEP will be notified and appropriate language will be included in the necessary real estate documents to prevent disturbance of the *ash landfill* without receiving regulatory approval.

Bullet 4: Please provide more information on the Long Term Monitoring Program including that it will *monitored for progress* of the natural attenuation and the compounds that will be monitored.

28. Site Overview, page 2-10. Bullets:

Bullet 1 seems redundant. No comment required.

Bullet 3: It needs to be made clear exactly where the ground water flows surface water. Please be more specific.

29. Ground Water Contamination, page 2-11, bullets:

Some mention of manganese must be included in this section.

30. Inactive Ash Landfill, page 2-11, bullet 3:

This statement is confusing. Does this mean from the landfill, or off site? Please clarify.

Earlier in the document (page 2-8) PAHs were discussed in regards to the landfill. Now the ROD indicates that the primary COCs are inorganics. Please clarify if unacceptable levels of PAHs are associated with the landfill.

31. Contamination Sources and Sampling Strategies, page 2-11, table, 3rd column:

Please add the ash landfill as a potential source of PAH. Also the MEDEP continues to believe the source could be up gradient of site 9.

32. Fate of Chemical Contaminants, page 2-12, bullets:

Bullet 1: Please specify why the impacted soils are inaccessible.

Bullet 2: MEDEP recommends: Due to the inaccessibility of the ash landfill contents, the concentrations of PAH and pesticides in soil do not pose a threat to human health or the environment.

33. Ground Water, page 2-12, bullets:

Bullet 2: MEDEP recommends . The presence of elevated concentrations of these *daughter products* including *vinyl chloride* suggests ...

Bullet 3: Please add the word *generally* before the word steady.

Bullet 4: Should this be impoundments and/or streams. Please be more specific. Please state that the VOC pass through sediment before reaching surface water.

Bullet 5: Again, please clarify why this is not a potable source.

34. Stream Sediment, page 2-13, Bullet 3:

Please add the number of aquatic test organisms.

35. Site Description, Page 2-13:

Clarify in the text that the streams are now partially impounded.

36. Geology and Hydrogeology, page 2-13, para 2:

"Ground water is believed to discharge to the unnamed streams and surface water impoundments ponds."

This is a very weak statement. If the Navy believes that the groundwater is not discharging to the impoundments but into the stream downgradient of the impoundments then additional sampling should be being performed further downstream.

37. Current and Potential Future Site and Resource Uses, Page 2-14, table:

Please make the following changes: Identify what the impoundments are being used for under Current Onsite Use and Current Adjacent Use- Adjacent Surface Water-). Also add stream to Current Adjacent Use for Adjacent Surface Water. Add the NEX to Current Adjacent Use-Land. Add stream habitat under Potential Use-Adjacent Surface Water. Under Potential Use Basis for Land it must be addressed what will happen if the barracks are removed. Under Potential Use Time Frame why is "does not apply" used?

38. Human Health Risk Assessment, Page 2-15, bullet 1:

Please identify that that it is Site 9 not NAS-Brunswick that is described.

39. Stream Sediment, page 2-17, last sentence:

Please put in a new heading, such as soil. Also in the same sentence, next page, please add EPA's acceptable target range.

40. Risk Assessment Uncertainties, page 2-18, bullet 4.

Please change does to *dose*.

41. Basis for Response Action, page 2-19, bullet 1:

This is not a complete sentence.

42. Remedial Objectives, page 2-19,

Please remove the parenthesis mark at the end of the sentence.

43. Technology and Alternative Development and Screening, page 2-21, para 3, last sentence:

MEDEP recommends: Subsequent investigations conducted since the Feasibility Study have determined that there are no *identified* active sources of contaminants ...

44. Description of Alternatives, page 2-22:

It is MEDEP understanding there is no limitation to the 5 year review (bullet 2) or duration of the remedy (in table). Please correct. Also an additional heading is needed for costs.

45. Inactive Ash Landfill, page 2-23, bullets:

Bullet 3: As before, MEDEP recommends: Should NAS Brunswick close, *lease*, and/or transfer the property, EPA and MEDEP will be notified and appropriate language will be included in the necessary real estate documents to prevent disturbance of the *ash landfill* without receiving ...

Bullet 4: MEDEP recommends: Continuance of a Long Term Monitoring Program to ensure that *material* remaining in the landfill is not impacting the environment, ... downgradient of the inactive landfill for metals and *SVOCs including PAHs* to assess whether the landfill is impacting ground water...

Another bullet must be added stating the Navy's intention if the barracks are ever removed or demolished.

46. Groundwater Contamination, page 2-23, para 1, 2nd sentence:

The word "Generally" must be added to the beginning of this sentence.

Bullet 3: As before, MEDEP recommends: Should NAS Brunswick close, *lease*, and/or transfer the property, EPA and MEDEP will be notified and appropriate language will be included in the necessary real estate documents to prevent the use of groundwater without receiving ...

47. Groundwater Contamination, page 2-24:

Bullet 2: Eliminated the reference to 20 years.

Headings are needed here. MEDEP recommends: Institutional Controls and Cost. Also the goals for the Long Term Monitoring Program should be added.

49. Alternative 3, page 2-24, bullet 3:

Please include where the sewer discharges.

50. Inactive Ash Landfill, page 2-25, bullets:

A new heading is needed between the 2nd and 3rd bullet to identify costs.

51. Modifying Criteria, page 2-27, table:

If there is no treatment, this should be identified as poor.

53. Compliance with Applicable or Relevant and Appropriate Requirements, page 2-28, State ARAR:

This list must include the Hazardous Waste Management Rules (06-096 CMR Chapter 850-857), Surface Water Toxic Control Program (06-696 CMR Chapter 530.5). In the Site 2 ROD the Maine Drinking Water Rules (10-144 CMR Chapters 231-233) was included. Why is that not an ARAR for Site 9? Also if the landfill is ever excavated or removed then the Solid Waste Management Rules (06-096 CMR Chapter 400-402, 405, and 411) and the Hazardous Waste Management Rules would also apply.

Last paragraph, please correct EPA's cancer risk factor and include the State of Maine's.

54. Short Term Effectiveness, page 2-29, bullet 2:

MEDEP recommends: Natural attenuation is already underway therefore no adverse impacts will occur during the implementation period. With this remedy no construction is planned.

55. Cost, page 2-30, lead sentence:

MEDEP recommends: *This criterion estimates the monetary cost of the proposed alternatives over a 20 year period.* That would allow the reference to the 20 year period to be removed and there would be no confusion that the remedy is in place for only 20 years.

56. Selected Remedy, page 2-30:

Para 1: MEDEP recommends: However, it should be noted that no source of contamination was identified,... The remainder of the sentence should be discussed.

Bullet 2: A different name is used for the Operations Plan. The correct name should be used consistently throughout the document. Please specify what deed notice-this is unclear.

57. Selected Remedy, page 2-31:

Bullet 1: Please replace or with *and* 5 year reviews in the last sentence.

Para 1: This would make more sense as a bullet since it is a crucial part of the remedy. Also please provide more information how it will be determined when the MCL and MEG are achieved.

58. Interim Ground Water Cleanup Levels, page 2-31, entire paragraph:

Since the MEGs are a new ARAR this needs to be updated and the interim groundwater cleanup levels are no longer adequate. Please rewrite.

59. Please address clean up levels if the barracks are ever removed or demolished.

60. Long Term Monitoring, page 2-32, bullets:

Bullet 1: Please add leachate to the list.

Bullet 2: Please add SVOC's.

The goals of the long term monitoring plan need to be added here.

61. Institutional controls, page 2-32, bullets:

Bullet 1: Please clarify that this is the ash landfill.

Bullet 3: MEDEP recommends: Should NAS Brunswick close, lease, and/or transfer the property, EPA and MEDEP will be notified and appropriate language ..

Bullet 4: The EPA criteria requires permanent solutions when feasible, therefore if the barracks are ever removed or demolished the Navy must do additional testing and remove the landfill, if necessary. Please correct.

Bullet 5: If the landfill is ever disturbed or excavated it will be necessary to amend this ROD.

62. The Selected Remedy is Protective of Human Health and the Environment, page 2-33:

The Long Term Monitoring Program needs to be included in this section.

The third paragraph makes no sense due to the number of clauses. It may help if this was put in bullets. Be sure to delete the word interim.

63. The Selected Remedy Complies with Applicable or Relevant and Appropriate Requirements, page 2-33, last bullet:

The ARARS listed in comment # 53 above need to be included here.

64. Figure 2-2:

The groundwater flow direction needs to be added to this figure.

65. Figure 2-6:

The approximate location of the dump area associated with Building 201 needs to be added to this figure. Also the line depicting the septic system should be in yellow.

66. Table 2-1:

It would be helpful to know where these investigations were conducted.

67. Appendix C: In addition to adding the ARAR's mentioned above, don't the ARARs have to be separated in to types, such as Action, Location, and Chemical? Please correct.

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,


Claudia Sait

Project Manager-Federal Facilities
Bureau of Remediation & Waste Management

Cf: File

Larry Dearborn-DEP
Anthony Williams-BNAS
Michael Barry-EPA

Carolyn LePage-LePage Environmental

Peter Nimmer-EA
Ed Benedikt

Lepage Environmental Services, Inc.

P. O. Box 1185 • Auburn, Maine 04211-1185 • 207-777-1048 • Fax: 207-777-1370

August 12, 1999

Mr. Emil Klawitter
Remedial Project Manager (Code 1821 EK)
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, PA 19113-2090

Subject: Comments on the July 1999 *Proposed Remedial Action Plan for Site 9*

Dear Mr. Klawitter:

Lepage Environmental Services, Inc., is submitting the following comments on the July 1999 *Proposed Remedial Action Plan for Site 9* on behalf of the Brunswick Area Citizens for a Safe Environment (BACSE). These written comments are intended to supplement oral comments already presented and entered into the public record at the July 15, 1999, Public Meeting held at the Brunswick Municipal Meeting Room. It is our understanding that all comments, both oral and written, received during the Public Comment Period will be addressed in the Responsiveness Summary that will be included in the *Record of Decision* for Site 9. Therefore, we have not restated the oral comments in this letter.

1. At this time, BACSE could not support the demolition and removal of the barracks (Buildings 216, 217, 218, 219, and 220) located in the vicinity of the landfill and former incinerator. Based on currently available information, the likely cost of such an action outweighs the benefit as there is no guarantee a source of contamination would be identified. However, the results of future monitoring and additional investigations may indicate the removal of the buildings is justified.

2. BACSE continues to be troubled that a source (or sources) of all the contamination at Site 9 has (have) not been clearly identified. While supporting the collection of additional environmental data through long-term monitoring, BACSE believes it is necessary to add new monitoring locations and/or conduct additional investigations to address the uncertainty regarding where the contaminants may be coming from. BACSE also believes the Restoration Advisory Board is the proper forum in which to develop the next steps.

Page 2 of 2, Emil Klawitter
 August 12, 1999
 Comments on Proposed Remedial Action Plan for Site 9

3. BACSE is also concerned with monitoring conditions along the perimeter of the site. Given the uncertainty regarding identification of the source(s) of all the contamination at Site 9, the potential for another source, possibly up-gradient of or adjacent to Site 9, should be considered. The Navy must also address the extent of contamination along the down-gradient boundary of the site. This includes evaluation of the detection of volatile organic compounds in groundwater on the southern side of the southern unnamed stream (now impounded). BACSE believes the Restoration Advisory Board is the proper forum for developing the means to address these issues.

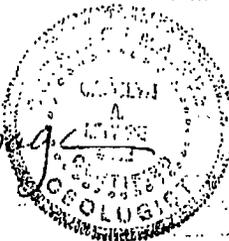
4. As stated previously in several public forums, BACSE is concerned with the impact of contaminants on water and sediment quality and on ecological receptors in the streams (now impounded) adjacent to Site 9 and at down-stream locations, including potential impacts on environmental media and ecological receptors in Harpswell Cove. Environmental media and, potentially, ecological receptors must be adequately monitored so that appropriate remedial actions can be taken as necessary. BACSE believes the Restoration Advisory Board is the proper forum for devising ways to address these concerns.

As noted above, these written comments are submitted in addition the oral comments given at the July 15, 1999, Public Meeting.

Sincerely,
 Lepage Environmental Services, Inc.

Carolyn A. Lepage

Carolyn A. Lepage, C.G.
 President



cc: Tom Fusco (BACSE)
 Loukie Lofchie (BACSE)
 Claudia Sait (MEDEP)
 Mike Barry (USEPA)
 Peter Nimmer (EA) via email

5090
Code 1821/EK

Lepage Environmental Services, Inc
P.O. Box 1195
Auburn, Maine 04211-1195

Subj: PROPOSED REMEDIATION FOR SITE 9, NAVAL AIR STATION,
BRUNSWICK, ME

Dear Ms. Lepage:

Thank you for your comments dated August 12, 1999 on behalf of the Brunswick Area Citizens for a Safe Environment (BASCE). Your comments will be officially recorded in the Responsiveness Summary of the Record of Decision for Site 9. The purpose of this letter is to forward you our responses directly.

One of your predominant concerns seems to be the Institutional Controls and their effectiveness over time, especially should the Site 9 property be leased or transferred. We share your concern and this has been a topic of discussion not only at this site, but also throughout the Navy and the Environmental Protection Agency (EPA) on how to ensure their effectiveness over time. Should the property be leased or transferred, as long as the use of the property remains restricted for environmental reasons, the Navy remains responsible to ensure the Institutional Controls remain in place. This is one reason should the situation for lease/transfer arise, the Navy will review the site to re-evaluate the environmental restrictions and effectiveness of the remedy.

We also share your concern with not being able to find the source of ground water contamination at Site 9. As you know we have been investigating this site since 1992. A 1994 Interim Record of Decision required we further investigate the source of ground water contamination. The 1995 to 1996 investigation concluded that there was no specific source for the ground water contamination. Please be assured that we will continue to monitor the site and believe an unidentified source would be apparent in the Long Term Monitoring results. Also, if we have sufficient information to point us to a source, in conjunction with the Environmental Protection Agency (EPA) and Maine Department of Environmental Protection (MEDEP) we will consider the suspect area.

Another of your concerns relates to the Long Term Monitoring of the site. You have been intimately involved in the development of the current Long Term Monitoring Plan and selection of sampling locations and frequency. We intend to continue to discuss the Long Term Monitoring Plan and the sampling results with the Restoration Advisory Board (RAB). We hope

you will continue to be involved in the RAB and subsequent future revisions of the Long Term Monitoring Plan.

Again, we thank you for your comments, and should you have any questions, please contact Mr. Tony Williams at (207) 921-1719 or myself at (610) 595-0567 x161.

Sincerely,

EMIL E. KLAWITTER, PE
Remedial Project Manager
By direction of the
Commanding Officer

Copy to:

Mr. M. Barry, EPA Region I

Ms. C. Sait, MEDEP

Mr. A. Williams, NAS Brunswick

Mr. P. Nimmer, EA Engineering, Science, and Technology

Mr. C. Lepage, Lepage Environmental Associates

Mr. T. Fusco, BACSE

Ms. L. Lofchie, BACSE

Mr. W. Ferdinand, Jr. Brunswick Conservation Commission

Mr. E. Benedikt

Lepage Environmental Services, Inc. Comments dated January 5, 1998

1. Concerns have been voiced at a number of RAB and technical meetings about the potential for dense phase liquid (DNAPL) contamination as a result of past activities at Site 11. At the October 10 Restoration Advisory Board meeting, the Navy indicated that they would be performing additional investigations to the Southeast of Site 11. However, with exception of the revisions to pages 14 and 21 that state that the potential for contaminated soils exists and that No Action Decision for Site 11 may be revisited if groundwater monitoring shows contaminated soils are a continuing source of contamination, the rest of the ROD appears to imply the door is closed to further investigation. It would be appropriate to mention the additional investigations the Navy intends to conduct (and the potential impact on the No Action Decision and long term monitoring) in several places in the ROD, such as the descriptions of Site 11 on page 14 and pages 25 through 28, and in sections describing the response action such as pages 3,21,42, and 45.

Response: We understand your concern and believe we have addressed additional groundwater investigation in MEDEP's comments. We also refer you to our recent letter of January 8, 1998, which addresses this subject.

2. Page 52. The Navy states that it will pursue the option of discharge of treated water to groundwater in Section IV, Scope and Role of Response Action. How does the costs of this option compare with the costs presented on page 52?

Response: The cost is lower but no definite cost comparison analysis has been done to date. Since modification of the treatment plant may be required, we are waiting for the engineering portion of the infiltration gallery study to be completed before we compare the costs.

3. Page 54. In comment 5 in our August 16 letter, we asked if there had been any revisions to the estimate of 13 to 71 years to attain clean-up goals throughout the plume. The text of the latest version of the ROD has not been revised, but it is unclear to us if that is because the estimated cleanup time is still 13 to 71 years or because our comment was overlooked. Please clarify.

Response: No, we have not revised the estimate to attain clean-up goals.

Town of Brunswick, Maine



CONSERVATION COMMISSION

28 FEDERAL STREET • BRUNSWICK, MAINE 04011-1583

August 12, 1999

Mr. E. Klawitter
Remedial Project Manager (Code 1821 EK)
Northern Division, Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Re: Proposed Remediation for BNAS Site 9

Dear Mr. Klawitter:

I am writing on behalf of the Brunswick Conservation Commission in response to the request for public comment on the proposed remediation plan for site 9 of the Brunswick Naval Air Station Superfund cleanup project.

We have reviewed the alternatives you considered, and we have the following comments. We generally agree with the proposed institutional controls for the inactive landfill. However, none of the three alternatives in your plan adequately address the sediment contamination near the stream. We also do not believe that the investigation of the source of the vinyl chloride contamination was extensive enough. The evidence of the vinyl chloride contamination seems to indicate a continuing source that causes fluctuations in the concentrations of this contaminant in the groundwater. You stated in your public presentation that the evaluation of the subsoil under and surrounding Building 2318 does not provide evidence of the vinyl chloride source. A logical conclusion from this evidence is that the source is elsewhere, and one should not assume that ash from the incinerator deactivated in 1948 is the source. The sampling during 1995-1998 continues to have levels of vinyl chloride that exceed both federal and state guidelines.

Based on this concern, we believe that the selection of the remediation plan should be deferred until further investigation of the source of the vinyl chloride is conducted, and the alternatives are reevaluated based on that investigation. This investigation should examine other areas of the base, particularly along the abandoned road between the center of Brunswick and the New Gurnet Bridge (Rte 24) road. We expect that this investigation could occur in the next year, and a revised proposal submitted within the next two years.

In addition to this investigation, we believe the following actions should be included in the selected remediation plan:

1. Remove and/or treat the contaminated stream sediments at the earliest opportunity.
2. Install an additional monitoring at or near Harpswell Cove for all pollutants that have a potential to affect aquatic life and waterfowl, with a minimum of bi-annual sampling.
3. Identify the testing protocols and procedures to be applied in all future sampling.

Thank you for the opportunity to comment.

Very truly yours,



William Ferdinand, Jr.
Chair

cc:

Mr. M. Barry, US EPA Region 1, 1 Congress St., Suite 1100(HBT), Boston MA
02114-2023

Ms. C Sait, MDEP, 17 State House Sta., Augusta ME 04333-0017

Brunswick Town Council, 28 Federal St., Brunswick ME 04011

BASCE, c/o M. Lofchie, Secretary. 20 Forest Terrace, Brunswick ME 04011

5090
Code 1821/EK

Town of Brunswick, Maine
Conservation Commission
28 Federal Street
Brunswick, Maine 04011-1583

Subj: PROPOSED REMEDIATION FOR SITE 9, NAVAL AIR STATION,
BRUNSWICK, ME

Dear Mr. Ferdinand:

Thank you for your comments dated August 12, 1999 on the *Proposed Plan Site 9 – Neptune Drive Disposal Area*. Your comments will be officially recorded in the Responsiveness Summary of the Record of Decision for Site 9. The purpose of this letter is to forward you our responses directly. Your predominant concern seemed to be the source of ground water contamination. We also share your concern with not being able to find the source of ground water contamination at Site 9. As you know we have been investigating this site since 1992. A 1994 Interim Record of Decision required we further investigate the source of ground water contamination. The 1995 to 1996 investigation concluded that there was no specific source of ground water contamination. Please be assured that we will continue to monitor the site and believe an unidentified source would be apparent in the Long Term Monitoring results.

You are correct that levels of ground water contamination exceed both state and federal requirements, and that we cannot conclusively indicate that the source of the contamination is the landfill or the removed incinerator. In your letter, you suggested a source area between the center of Brunswick and New Gurnet Bridge (Rte 24) Road, however if this were the source of vinyl chloride at Site 9, this would be apparent in our current monitoring well network. Please be assured that we will continue to monitor the site, and if we have sufficient information to point us to a source, in conjunction with the Environmental Protection Agency (EPA) and Maine Department of Environmental Protection (MEDEP) we will consider the suspect area.

In response to your specific comments,

- 1) Removal of the stream sediments is handled under NAS Brunswick's National Pollutant Discharge Elimination System (NPDES) permit, which requires the base to dredge the impoundment every five years. The compounds reported in the stream sediment are believed to be from runoff and non-point sources on base such as vehicles, roadways, and aircraft.

2) In response for an additional monitoring well, other ground water monitoring programs (Eastern Plume and Site 1&3 Landfill) at NAS Brunswick have installed numerous ground water monitoring wells between Site 9 and Harpswell Cove. Your representative, Mr. Ed Benedikt was kind enough to sit in on a 3 day meeting May 18 -20, 1998 which discussed the selection of these wells.

3) The testing protocols and procedures you've requested are currently being discussed with the EPA, MEDEP and the Restoration Advisory Board (RAB) and will be formalized in a "Site 9 - Long Term Monitoring Plan." I will forward you a copy of this monitoring plan under separate correspondence. Your representative Mr. Ed Benedikt has sat in on a number of our RAB meetings some of which discussed the Long Term Monitoring Plan.

Since we have exhaustively investigated Site 9 for the source of the ground water contamination, and will continue to work with EPA, MEDEP and the RAB for adequate monitoring of the site, we feel we have addressed your concerns. Since we will be presenting the results of the monitoring at the RAB meetings, we urge you to continue have a representative observe these meetings.

Again, we thank you for your comments, and should you have any questions, please contact Mr. Tony Williams at (207) 921-1719 or myself at (610) 595-0567 x161.

Sincerely,

EMIL E. KLAWITTER, PE
Remedial Project Manager
By direction of the
Commanding Officer

Copy to:

Mr. M. Barry, EPA Region I
Ms. C. Sait, MEDEP
Mr. A. Williams, NAS Brunswick
Mr. P. Nimmer, EA Engineering, Science, and Technology
Mr. C. Lepage, Lepage Environmental Associates
Mr. T. Fusco, BACSE
Mr. E. Benedikt

**SITE 9 PUBLIC MEETING
15 JULY 1999
MEETING NOTES**

1. INTRODUCTION

Tony Williams, IR Program Coordinator	NAS Brunswick, Public Works Environmental
Emil Klawitter, Remedial Project Manager	Northern Division, NAVFACENCOM
Carolyn Lepage, TAG Consultant	Lepage Environmental Services, Inc.
Ed Benedikt	Citizen
Mike Barry, Project Manager	U.S. Environmental Protection Agency,
Region I	
Claudia Sait, Project Manager	Maine Department of Environmental
Protection	
Larry Dearborn, Project Geologist	Maine Department of Environmental
Protection	
Peter Nimmer, Project Geologist	EA Engineering, Science, and Technology
Suzanne Chase, Geologist	EA Engineering, Science, and Technology

2. POSTER PRESENTATION – 6:30 PM

Approximately 6 community members and above listed project personnel. A copy of the posters presented is provided as Attachment A this appendix.

3. PUBLIC MEETING – 7:00 PM

The purpose of the Public Meeting is to talk about a site at NAS Brunswick where the Navy will do cleanup. Under CERCLA, the Navy proposes to the public how the work will be done. Comments will be received orally at the end of the presentation or by mail by 13 August 1999. If a question cannot be answered at this meeting, it will be answered later. All questions will be written down and made part of the record.

Emil Klawitter presented a brief description of each poster (see attached).

4. VERBAL COMMENTS FROM PUBLIC

Ed Benedikt: Does the Navy have Institutional Controls on NAS Brunswick?

Emil Klawitter: Yes, the Base has an Operations Instructions, which includes a map of areas under IC. If someone wants to dig on base and the area is under IC, Environmental has to be contacted.

Walter Rosen of Brunswick: If you are removing ambiguity in the language about IC, why not add IC to this glossary?

Emil Klawitter: OK.

Ed Benedikt of Brunswick: If the Base gets transferred, who will fund the long-term monitoring?

Emil Klawitter: The Government will fund this work, regardless of the property owner. The Navy will continue to do sampling and 5-year reviews unless other arrangements are made. Right now my budget goes to 2012. Would go out further, but that is what is funded now.

Walter Rosen of Brunswick: Vinyl chloride in ground water has been addressed. How will monitoring of ground water be done for landfill contents that are not related to vinyl chloride?

Emil Klawitter: Three wells downgradient of the landfill will be monitored for vinyl chloride and TAL metals. Analysis will include what we would expect to see in a landfill (i.e., magnesium, iron, and aluminum).

Walter Rosen of Brunswick: Can you name the chemicals specifically to be monitored?

Emil Klawitter: Not right now.

Walter Rosen of Brunswick: The remedial action plan lacks specificity. I would like to know methods, what you are sampling for, how you are going to measure those samples, and sampling frequency. That's not here. There is no way reading this document that you can draw any conclusions about how thorough and how careful this whole operation is going to be.

Emil Klawitter: The Navy develops a plan that talks about the methods, sampling frequency, and analytical methods and works with EPA, MEDEP, and RAB to formalize it. There are quarterly meetings and RAB review of reports that discuss this. I have a copy I can share with you. Also would like to invite you to our RAB meetings.

Walter Rosen: My feeling is that this is a plan. Tonight's meeting is being vetted with the public. If I had to vote on this and say if it satisfied my sense of what needs to be done I'd say I don't know.

Emil Klawitter: One thing we tried to do to this plan is narrow it down. The Long-Term Monitoring Plan includes all that information. Tried to make PRAP concise.

Tony Williams of NAS Brunswick Environmental: Tried to make the document as easy to understand as possible. We have a document that is more specific with the sampling procedures and protocol. If we just stated the intent and objectives of what we planned to do, that would achieve the purpose of showing the public.

Walter Rosen: I think the document should be titled objectives. Is there some type of statutory deadline in which to produce the plan? This may be premature. Sampling protocols and so on need to be in the plan.

Emil Klawitter: I don't know of any statutory deadline. This plan has taken a lot of work. I don't want to say we're going to develop a plan. Here it is. Then the public says "No we don't think you should do this, we think you should do something else." This is part of saying we are going to develop a plan.

Walter Rosen: How about citing that plan in here?

Emil Klawitter: OK, I'll have to look at it closer.

Mike Barry from EPA in Boston: You bring up a really good point. Maybe it should be called Plan Objectives because that's what the Proposed Plan is about. Details of monitoring are usually in the LTMP, which comes after the Proposed Plan.

Emil Klawitter: We have already done 14 sampling rounds based on the LTMP, which is in the reference section.

Walter Rosen: Looked in vain for references that say where to go. I want you to make the document complete. You should cite draft protocols.

Emil Klawitter: I have to take a look at the actual wording. We'll make sure that this gets referenced properly.

Walter Rosen: I know this is procedural, I'm not finding fault with the work done. It rubs me the wrong way to look at a list of remedial alternatives, the first of which is No Action. Then we find out that it does not comply with regulatory requirements. That's not an alternative. Call it a baseline if you wish. Really, only given two alternatives here, not three, because the first is not an alternative.

Emil Klawitter: The reason that's put in there is purely procedural.

Walter Rosen: It's an abuse of the language.

Emil Klawitter: I know what you're saying there, but if certain guidance and environmental regulations say we should do something, we try to do it.

Tony Williams: National Environmental Policy clearly states that as a Federal Agency, we have to evaluate the No Action alternative. We agree that it is inadequate and it's not an appropriate alternative, but we have to at least consider what would happen if we did nothing.

Walter Rosen: I wish they wouldn't call it an alternative.

Lukie Lofchie: Why wasn't Alternative 3 selected?

Emil Klawitter: Digging up the landfill was not considered as buildings are there now. Tearing them down and relocating the buildings when we don't see an exposure isn't the best option. For the ground-water pump and treat, it will take just as long. We're talking about very low levels.

Walter Rosen: Have you been able to sample directly from the site? Can you do a test boring through the floor of the building, if necessary, and into the landfill and measure vinyl chloride concentrations?

Emil Klawitter: Yes, we have sampled the landfill for vinyl chloride and it doesn't appear to be a problem.

Walter Rosen: What do you mean by that? Does it mean that it is below the drinking water standards?

Emil Klawitter: I'd have to go back and check that but I believe that is correct. There are other things there that are causing problems, but not vinyl chloride. We did do test pits and ground-water samples. We were able to go into the landfill and get samples.

Aaron Smith with *The Times Record*: Clarifying question. When you refer to the landfill, are you referring only to the area used for solvent burning and disposal?

Emil Klawitter: The solvent burning occurred closer to the pond. The landfill at Site 9 is the yellow area on the figure, under the barracks.

Ed Benedict: There should be a cost associated with the No Action item.

Emil Klawitter: We'll look into that.

Aaron Smith: What is the difference between natural attenuation and doing nothing?

Emil Klawitter: Natural attenuation with long-term monitoring looks to see if the contamination is breaking down. Doing nothing would be not monitoring.

Carolyn Lepage for the Brunswick Area Citizens for a Safe Environment: What if the Navy finds natural attenuation is not effective and the contaminant concentrations are actually rising?

Emil Klawitter: That will be assessed in the annual report or 5-year review. Actions could include removal, putting in monitoring wells, or extraction wells. The Navy would look at the whole site again with EPA and MEDEP.

Carolyn Lepage: What role would the public have in future reports and decisions?

Emil Klawitter: 1. Look in the library at the Administrative Record, 2. Join the RAB which meets quarterly to review what's going on at NAS Brunswick.

Ed Benedikt: What is the procedure for joining the RAB?

Emil Klawitter: I will put a response in later and get you that information.

Carolyn Lepage: What if concentrations go down to non-detect?

Emil Klawitter: We would confer with EPA and MEDEP. We might reduce the monitoring frequency, which would require regulatory approval.

Carolyn Lepage: What if the Navy wants to demolish the buildings and dig in the landfill?

Emil Klawitter: If digging were to occur, 1. EPA and MEDEP would be notified, and 2. It would be applicable to other environmental regulations.

Walter Rosen: Are any NAS Brunswick Superfund sites?

Emil Klawitter: NASB is listed on the National Priorities List, so Site 9 is considered a Superfund site.

Ed Benedikt: I have heard that there may be a large sewer pipe (approximately 42 in. diameter) present. Please define the status of the pipe.

Emil Klawitter: Backhoe excavations did not find the pipe. Records were not found to indicate that the pipe had been removed.

Carolyn Lepage: If the Base closes, and institutional controls are in place, how are they maintained and tracked?

Emil Klawitter: Each town/zoning is different. May be tracked as part of the 5-year review or other method.

Ed Benedikt: You said vinyl chloride levels are very low, but they exceed MEG/MCL.

Emil Klawitter: Vinyl chloride exceeds federal and state levels. I didn't mean to say that it is below problem levels.

Carolyn Lepage: Estimated time for cleanup of 20 years. What is the basis for that?

Emil Klawitter: I will have to get back to you on that. Did calculations to get levels of vinyl chloride. Looked at how natural attenuation was degrading vinyl chloride and we extended line out based on that.

Aaron Smith: Who pays for the LTMP and who reviews them?

Emil Klawitter: The Navy pays for monitoring and does the reviews with the EPA and MEDEP. All work together for the 5-year review. The Navy issues the reports with concurrence from the regulators.

Carolyn Lepage: Point was raised earlier and you were reluctant to answer it. The contaminants of concern for Site 9 need to be clarified.

Emil Klawitter: I'm not reluctant. It's a matter of vinyl chloride is a major one in ground water. The other contaminants for ground water are probably DCE. I'd have to check because I don't want to be inaccurate. The landfill contaminants would be metals and possibly PAHs.

Carolyn Lepage: Any consideration for dioxins?

Emil Klawitter: No, none of the reports indicated the need to look for them.

Walter Rosen: You mentioned iron and manganese. What about cadmium, lead, arsenic, and mercury?

Emil Klawitter: Those are to be included in this list.

Walter Rosen: I want to illustrate once more the foolishness of Alternative No. 1. The Comparative Ranking of Alternatives to Nine CERCLA Criteria, No. 7, state acceptance for Alternative No. 1, which is No Action, is listed as to be determined. But it's against the law. If you are going to go out and determine the State's acceptance to Alternative No. 1, you're going to be wasting your time.

Emil Klawitter: The only purpose of the "to be determined" under the State's acceptance for Alternative No. 1 was to put once we come up with the Proposed Plan, there's an Official EPA and MEDEP acceptance. We want the official acceptance.

Walter Rosen: Until you get the acceptance, can you put in the box NA for not applicable?

Ed Benedikt: Clarification. Are you required to provide 3 alternatives?

Emil Klawitter: I don't think there's a regulatory requirement.

Mike Barry: I have seen 2-12 alternatives, based on the site.

Walter Rosen: Are there alternatives that have not been included?

Emil Klawitter: These are the major alternatives. If we looked at Alternative No. 3, there would be subsets.

Walter Rosen: The cost to remediate for Alternative No. 3 is under \$2 million for 20 years and that doesn't include demolishing of buildings. That does not seem prohibitive expensive. Would the buildings have to be replaced? Should have the cost to remove the buildings.

Can the buildings be moved? Would it be cost effective to move them or eliminate them?

Emil Klawitter: We'll look into the cost of demolition a little more. Right now, they are habitable. They are rather long buildings. I'm not saying they can't be moved. They are 3-story buildings.

Ed Benedikt: Item No. 7 on Table 2, the cost should be stated as undefined instead of zero.

Emil Klawitter: OK.

Carolyn Lepage: Potential impacts of Site 9 on the surface water and sediment. Could you provide additional information about how the impact will be monitored?

Emil Klawitter: Will directly monitor the surface water and sediments for site contaminants of concern.

Carolyn Lepage: What are likely scenarios if Site 9 is shown to impact surface water/sediments?
What happens if it does impact it?

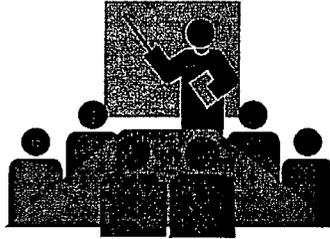
Emil Klawitter: 1. Determine if it is impacting the surface water and sediments; 2. If so, that's a failure of remedy. Will consider determining what to do to prevent impact.

Attachment A
Poster Presentation

PUBLIC INFORMATION MEETING



Proposed Remedial Action Plan For Site 9 (Neptune Drive Disposal Area) Naval Air Station, Brunswick, Maine



AGENDA

- 6:30 PM Informal Discussion/Posters
7:00 PM Presentation of Proposed Plan

Questions/Comments will be taken immediately after the Presentation of Proposed Plan.

Formal comments made prior to 13 August 1999 will be addressed in the Record of Decision.

Formal Comments Can Be Addressed As Follows:

In Writing:

Drop off your comments/questions in the envelope below.

Send comments to:

Emil Klawitter

Remedial Project Manager

10 Industrial Highway, MS 82

Lester, PA 19113

(610) 595-0555

Orally:

Oral comments may be made immediately after the Presentation.

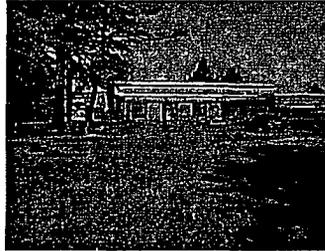


SITE 9: SUMMARY OF INVESTIGATIONS



Remedial Investigation - 1990

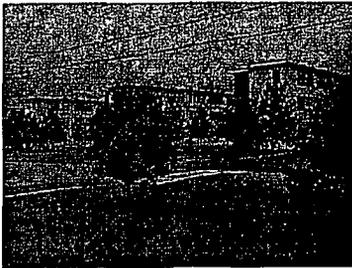
- ❖ Focused on area adjacent to Building 201 that was used for solvent burning and disposal.
- ❖ Vinyl chloride contaminated groundwater was found.



*Disposal Area east of Building 201
(Dining Facility)*

Supplemental Remedial Investigation - 1991

- ❖ Source of groundwater contaminated was investigated further.
- ❖ Vinyl chloride contamination was found to be localized



Location of Inactive Landfill

Technical Memorandum - 1994

- ❖ Inactive landfill was characterized.
- ❖ Metals found in groundwater downgradient from landfill.
- ❖ Old septic system was investigated, but was found not to be the source of vinyl chloride groundwater contamination.

Interim Record of Decision - 1994

- ❖ Since no source of groundwater contamination was found, the Navy agreed to continue monitoring and complete an additional investigation to identify the source of groundwater contamination.

Sediment Investigation - 1998

U.S. Fish & Wildlife study determined that environmental contaminants in the sediment were not toxic to two test organisms.



*Upper Impoundment Pond
(Flooded Unnamed Stream)*

Additional Source Investigation - 1997

This was specifically accomplished to determine the source of vinyl chloride groundwater contamination. However, no additional source was found.

SUMMARY OF CONCERNS



Landfill

- ❖ Landfill contents may impact groundwater.
- ❖ Contact with landfill if this area is disturbed.

Contaminated Groundwater

- ❖ Vinyl chloride, a volatile organic compound, is the primary contaminant in groundwater.
- ❖ Contamination in groundwater may impact the ponds (surface water).¹
- ❖ An elevated risk is present based on ingestion or contact with groundwater.

REMEDIAL OBJECTIVES

- ❖ Prevent the disturbance of inactive landfill contents.
- ❖ Prevent human exposure to the contaminated groundwater while reducing the contaminant of concern.

SUMMARY OF THE SITE CLEANUP PROPOSAL

After careful study the Navy proposes the following plan:

Inactive Landfill

- ❖ Establish institutional controls to restrict disturbances of the landfill contents.
- ❖ Continue long-term monitoring to verify landfill contents are not impacting groundwater.
 - ❖ Perform 5-year reviews.

Vinyl Chloride Groundwater Contamination

- ❖ Continue natural attenuation.
- ❖ Establish institutional controls such as land use restrictions for groundwater.
- ❖ Continue long-term monitoring with 5-year reviews.

Surface Water and Sediment

- ❖ Continue long-term monitoring to verify vinyl chloride is not significantly impacting these media.



COMPARISON OF THE PROPOSED REMEDIAL ALTERNATIVES

Remedial Alternatives	Components	Comment
1. No Action	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Provides limited protection of human health and the environment Does not comply with regulatory requirements Cost: \$0 (20-year projection)
2. Natural Attenuation with Long-Term Monitoring and Institutional Controls	<p>Inactive Ash Landfill</p> <ul style="list-style-type: none"> Institutional controls to restrict disturbance of the inactive ash landfill contents Long-term monitoring to verify no unacceptable releases from the inactive ash landfill <p>Groundwater Contamination</p> <ul style="list-style-type: none"> Natural attenuation of vinyl chloride in groundwater Institutional controls to restrict excavation in the vinyl chloride groundwater contaminated area and restrict installation of drinking water wells Continued long-term monitoring of groundwater 5-year site reviews 	<ul style="list-style-type: none"> Protects human health Will monitor potential risks to the environment to determine compliance with regulatory requirements Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines are key applicable or relevant and appropriate requirements Cost: \$852,000 (20-year projection)
3. Active Remediation and Monitoring	<p>Inactive Ash Landfill</p> <ul style="list-style-type: none"> Excavate landfill <p>Groundwater Contamination</p> <ul style="list-style-type: none"> Pump and treat impacted groundwater Institutional controls to restrict excavation in the vinyl chloride groundwater contaminated area and restrict installation of drinking water wells Continued long-term monitoring of groundwater 5-year reviews 	<ul style="list-style-type: none"> Protects human health and the environment Decreases time for site cleanup Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines are key applicable or relevant and appropriate requirements Cost: \$1,901,040 (20-year projection) (Cost does not include demolition of existing buildings and construction of new buildings)

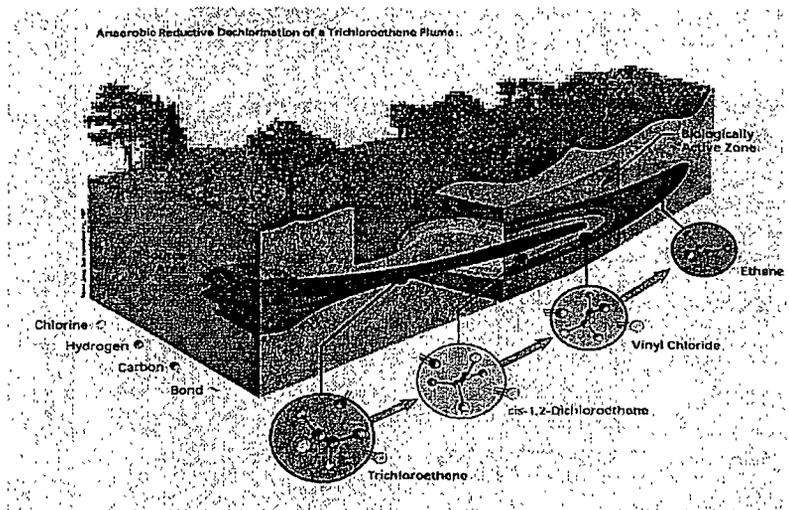
COMPARATIVE RANKING OF ALTERNATIVES TO NINE CERCLA CRITERIA

CERCLA Criteria	Alternative 1 – No Action	Alternative 2 – Natural Attenuation with Long-Term Monitoring and Institutional Controls	Alternative 3 – Active Remediation and Monitoring
1. Protection of Human Health and Environment Ranking	Poor	Moderate	Moderate
2. Compliance with Applicable or Relevant and Appropriate Requirements Ranking	Moderate	Good	Good
3. Long-Term Effectiveness Ranking	Poor	Good	Good
4. Reduction in Toxicity, Mobility, and Volume through Treatment Ranking	No Treatment	No Treatment	Good
5. Short-Term Effectiveness Ranking	Moderate	Moderate	Moderate
6. Implementability Ranking	Good	Good	Moderate
7. Cost (\$)	0	852,000	1,901,040
8. State Acceptance	To Be Determined	To Be Determined	To Be Determined
9. Community Acceptance Ranking	To Be Determined	To Be Determined	To Be Determined
<p>NOTE: Good = Alternative meets the intent of the criteria. Moderate = Alternative partially meets the intent of the criteria. Poor = Alternative does not meet the intent of the criteria. To Be Determined = These criteria will be evaluated following the Public comment period.</p>			



WHAT IS NATURAL ATTENUATION ?

The natural attenuation with long-term monitoring alternative involves reliance on natural flushing and dispersion processes to dilute, and *in situ* to degrade, chemical contaminants.



WHAT ARE INSTITUTIONAL CONTROLS?

Institutional controls will be designed to prevent human contact with or use of impacted groundwater and surface water.

At Site 9, they will consist of the following:

- ❖ Land use restrictions shall be documented in the current NAS Brunswick Operations Instructions. Drinking water wells will not be permitted.
- ❖ The Operations Instructions are used by NAS Brunswick to identify areas with environmental issues and screen inappropriate construction or development.
- ❖ Should NAS Brunswick ever close and/or transfer this property, EPA and MEDEP shall be notified and appropriate wording shall be included in the necessary real estate documents to prevent use of groundwater without regulatory review and approval.
- ❖ The land use restrictions address the existing risks by preventing human use and exposure to the affected soil and groundwater.





VINYL CHLORIDE



Vinyl chloride is a colorless gas with a mild, sweet odor, which does not occur naturally in the environment. It may be the result of solvent spillage or disposal.

In current industry most of the vinyl chloride produced in the United States is used to make polyvinyl chloride (PVC). This material is used to manufacture a variety of plastic and vinyl products including pipes, wire and cable coatings, packaging materials, furniture and automobile upholstery, wall coverings, housewares, and automotive parts. Much smaller amounts of vinyl chloride are used as a cooling gas and in the manufacture of other compounds.

VINYL CHLORIDE AT SITE 9:

- ❖ A total of 14 sampling events have been accomplished at Site 9 with the primary emphasis placed on groundwater monitoring of vinyl chloride concentrations.
- ❖ These results indicate a general reduction or stabilization of the vinyl chloride concentrations at several monitoring locations.
- ❖ However, 3-4 monitoring locations continue to detect vinyl chloride above the Federal Maximum Contaminant Levels and State Maximum Exposure Guidelines.
- ❖ The vinyl chloride concentrations in Site 9 groundwater have been decreasing at some locations, however, 3-4 monitoring locations have exceeded the State drinking water standard of 0.15 parts per billion and the Federal drinking water standard of 2.0 parts per billion.

Appendix B

**Specific Applicable or
Relevant and
Appropriate Requirements
for Site 9**

APPENDIX B

LIST OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR SITE 9

ACTION-SPECIFIC			
Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
Federal Applicable or Relevant and Appropriate Requirements			
Resource Conservation and Recovery Act Identification and Listing of Hazardous Waste Toxicity Characteristics (40 CFR 261.24)	Relevant and Appropriate	This requirement identifies the maximum concentrations of contaminants for which the waste would be a Resource Conservation and Recovery Act characteristic waste because of its toxicity. The analytical test set out in Appendix II of 40 CFR Part 61 is referred to as the Toxicity Characteristic Leaching Procedure.	In the event that the barracks or their foundations are removed, modified, or disturbed and/or the contents of the inactive ash landfill are disturbed, the landfill contents will be analyzed by the Toxicity Characteristic Leaching Procedure to determine whether they are characteristic hazardous wastes under Resource Conservation and Recovery Act. Excavated materials that are determined to exceed Toxicity Characteristic Leaching Procedure allowable concentrations will be disposed offsite in a Resource Conservation and Recovery Act Subtitle C treatment, storage, or disposal facility. Excavated materials that are determined to be below Toxicity Characteristic Leaching Procedure allowable concentrations will be disposed offsite in a Resource Conservation and Recovery Act Subtitle D or other appropriate treatment, storage, or disposal facility.
State Applicable or Relevant and Appropriate Requirements			
Maine Surface Water Toxics Control Program (38 MRSA Sections 420, 464, 06-096 CMR-530)	Relevant and Appropriate	These rules set forth the ambient water quality criteria for toxic water pollutants and procedures necessary to control levels of toxic pollutants in surface waters.	Under Alternative 2, the selected remedy, surface water will be monitored under the Long-Term Monitoring Program to ensure that it meets the standards set out in these rules.
Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	This applicable or relevant and appropriate requirement will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundations were removed or modified.

ACTION-SPECIFIC			
Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
Maine Solid Waste Management Rules - General Provisions (06-096 CMR 400)	Relevant and Appropriate	These rules regarding administrative matters and general standards concerning solid waste facilities and solid waste handling.	The substantive requirements of these rules will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundation are removed or modified.
Maine Solid Waste Management Rules - Landfill Siting, Design and Operation (06-096 CMR 401)	Relevant & Appropriate	This establishes requirements for siting, design, and operation of landfills for the disposal of municipal solid waste, special wastes, construction/demolition debris, land clearing debris, and wood wastes.	The substantive requirements of the closure and post-closure provisions of these rules will be met in the event that the inactive ash landfill is disturbed or excavated, or the barracks and its foundation are removed or modified.
Maine Solid Waste Management Rules - Water Quality Monitoring, Leachate Monitoring, and Waste Characterization (06-096 CMR 405)	Relevant & Appropriate	Water quality monitoring, leachate monitoring and the characterization of wastes stored or disposed of are tools used for the detection and analysis of potential threats to public health and safety or the environment. The applicable tools are required to be implemented at solid waste facilities where the Department identifies potential threats to public health and safety or the environment because of the nature of the wastes stored or disposed of and/or the type, location, design or operation of the solid waste facilities.	The substantive requirements of these rules will be used in the monitoring of the inactive landfill.

CHEMICAL-SPECIFIC			
Requirement	Status	Requirement Synopsis	Action to be Taken to Attain Applicable or Relevant and Appropriate Requirements
Federal Applicable or Relevant and Appropriate Requirements			
Safe Drinking Water Act – Maximum Contaminant Levels (40 Code of Federal Regulations 141.11–141.16) (U.S. EPA 1999)	Relevant and Appropriate	Maximum Contaminant Levels have been promulgated for many 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 ground-water aquifers used for drinking water.	Under Alternative 2, the selected remedy, the Maximum Contaminant Levels will be attained through natural attenuation.
Safe Drinking Water Act – Maximum Contaminant Level Goals (40 CFR 141.50–141.51)	Relevant and Appropriate	Maximum Contaminant Level Goals have been promulgated for many common organic and inorganic contaminants. These levels indicate the level of contaminants in drinking water at which no known or anticipated adverse effect on the health effect of a person would occur, allowing for an adequate margin of safety. Maximum Contaminant Level Goals are non-enforceable public health goals.	Under Alternative 2, the selected remedy, where Federal Maximum Contaminant Levels have not been established, non-zero Maximum Contaminant Level Goals will be attained through natural attenuation.
EPA Risk Reference Doses (U.S. EPA 1999) ^(a)	To Be Considered	Risk Reference Doses are the concentrations considered unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Risk Reference Doses will be used to characterize risks due to non-carcinogens in ground water, as necessary, during the 5-year reviews.
EPA Human Health Assessment Group Cancer Slope Factors ^(a)	To Be Considered	Carcinogenic effects presented the most up-to-date information on cancer risk potency derived from EPA's Human Health Assessment Group.	Because there are only a limited number of promulgated standards for contaminants in water, EPA Cancer Slope Factors will be used to characterize risks due to carcinogens in ground water, as necessary, during the 5-year reviews.
State Applicable or Relevant and Appropriate Requirements			
Maine Department of Human Services (Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144A Code of Maine Regulations Chapter 233, Appendix C)	Relevant and Appropriate	Maximum Exposure Guidelines include health advisories, which are maximum allowable concentrations of specific contaminants in drinking water.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through natural attenuation.
Maine Hazardous Waste Rules relating to Performance Standards for Establishing, Constructing, Altering, and Operating Certain Types of Hazardous Waste Units (06-096 CMR 854)	Relevant and Appropriate	This requirement outlines the State of Maine's rules relating to establishing, constructing, altering, and operating certain types of hazardous waste units.	Under Alternative 2, the selected remedy, the Maximum Exposure Guidelines will be attained through natural attenuation.
Maine Department of Human Services Rules Relating to Drinking Water (10-144E, Chapters 231-233)	Relevant and Appropriate	Maine's primary drinking water standards are similar to Federal Maximum Contaminant Levels as drinking water standards under the Maine Safe Drinking Water Rules. When State standards are more stringent than Federal standards, and have been legally and constantly applied, the State levels shall be used.	Under Alternative 2, the selected remedy, State drinking water standards that are more stringent than Federal standards will be attained through natural attenuation.
(a) U.S. Environmental Protection Agency (EPA). 1999. Integrated Risk Information System On-Line Database Maintained in Toxicology Data Network by the National Library of Medicine Bethesda, Maryland. EPA Environmental Criteria and Assessment Office, Cincinnati.			

Appendix C

**Letter of Concurrence
from the Maine Department
of Environmental Protection**



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

MARTHA KIRKPATRICK
COMMISSIONER

September 24, 1999



Mr. Emil Klawitter
Code 1823 EK
Department of the Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, PA 19113-2090

Re: Record of Decision for Site 9
Naval Air Station, Brunswick, Maine

Dear Mr. Klawitter:

The Maine Department of Environmental Protection (MEDEP or Department) has reviewed the Final Record of Decision (ROD) for Site 9, (September 1999) at the Brunswick Naval Air Station, Brunswick Maine. Based on the Final Record of Decision, the Department concurs with the Navy's selected remedy of natural attenuation with monitoring and institutional controls as outlined in Section XI, which is summarized below.

Natural Attenuation with Long Term Monitoring and Institutional Controls is the selected remedy for Site 9, Neptune Drive Disposal Site. No active source of contamination has been found and monitoring results do not show significant offsite migration of the contaminants of concern above the Federal Maximum Contaminant Levels or the State Maximum Exposure Guidelines.

The major components of the natural attenuation with long term monitoring and institutional controls include:

- Continue to utilize natural attenuation to degrade volatile organic chemical contaminants present in groundwater.
- Implement institutional controls to prevent human contact with groundwater and ash landfill contents.
- Continue long term monitoring of groundwater to ensure that landfill contents are not impacting groundwater, to monitor the progress of natural attenuation, and to monitor for contaminant plume migration.
- Continue long-term monitoring of surface water, leachate seeps, and stream sediments for indications of contaminant migration.
- Perform 5 year reviews to ensure that human health and the environment continues to be protected.

It is the State's understanding that the United State's Navy will prevent the use of and contact with groundwater and the contents of the ash landfill at Site 9 without the prior written approval of EPA and MEDEP. All restrictions and preventative actions will be outlined in the Naval Air Station Brunswick Operations Instructions. The Navy will provide a draft version of the groundwater and ash landfill restrictions to EPA and MEDEP for review and comment. The final approved groundwater and ash landfill restrictions and Operations Instructions will be part of the Administrative Record for Site 9.

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312 CANCO ROAD
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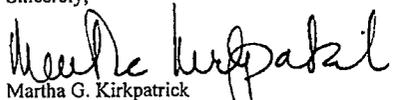
PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 764-1507

The State's concurrence in the selected remedy, as described above, should not be construed as the State's concurrence with any conclusion of law or finding of fact, which may be set forth in the ROD or site listed above. The State reserves any and all rights to challenge any such finding of fact or conclusion of law in any other context.

This concurrence is based on the State's understanding that the MEDEP will continue to participate in the Federal Facilities Agreement and in the review and approval of operational, design, and monitoring plans.

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 my staff or me.

Sincerely,



Martha G. Kirkpatrick
Maine Department of Environmental Protection

Cf: File
Mark Hyland-MEDEP
Claudia Sait-MEDEP
Michael Barry-EPA
Peter Nimmer-EA