

TECHNICAL MEMORANDUM

**DETAILED EVALUATION OF ALTERNATIVE 8D
EXCAVATION AND USE AS SUBGRADE MATERIAL
AT SITES 1 AND 3**

Prepared for:

U.S. Department of the Navy
Northern Division
Naval Facilities Engineering Command
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Prepared by:

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Portland, Maine
Project No. 6836-03

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INTRODUCTION

The Excavation and Use as Subgrade Material at Sites 1 and 3 Alternative for Site 8 presented in this Technical Memorandum was developed in response to public comments received during an October 15, 1992 public meeting. At this meeting, the Navy presented its original preferred alternative for Site 8, which included placement of a soil cover system and long-term institutional controls. Members of the public requested the consideration of excavation as a preferred alternative. After serious consideration of this suggestion in light of available data, the Navy is reformulating its original plan and proposing the excavation and use of material from Site 8 as subgrade material at Sites 1 and 3 as a viable alternative. The Draft Final Focused Feasibility Study for Site 8 and the Record of Decision for Sites 1 and 3 are referenced for additional information on the Navy's original preferred alternative and the remedial actions being designed at Sites 1 and 3 (E.C. Jordan 1992a and 1992b).

This technical memorandum describes the Navy's new Preferred Alternative and presents the detailed evaluation of this alternative against the nine evaluation criteria specified in the National Oil and Hazardous Substances Contingency Plan. It is similar in content and format to the detailed evaluation of the other alternatives developed for this site and presented in the Draft Final Focused Feasibility Study (E.C. Jordan Co., 1992a). The Navy's preferred alternative is protective of human health and the environment, is consistent with state and federal regulations, and provides a cost-effective permanent remedy at Site 8.

1.0 DETAILED EVALUATION OF EXCAVATION AND USE AS SUBGRADE MATERIAL AT SITES 1 AND 3

The following subsections present the detailed analysis of the Excavation and Use as Subgrade Material at Sites 1 and 3 Alternative for Site 8. This alternative was identified in response to public comments received during the October 15, 1992 public meeting, and addresses public concern about restricted future land use at the Naval Air Station (NAS) in Brunswick, Maine. Because contaminated soils and construction rubble and debris would be removed from Site 8, no long-term controls would be required.

2.0 ALTERNATIVE 8D: EXCAVATION AND USE AS SUBGRADE MATERIAL AT SITES 1 AND 3

Alternative 8D would involve excavating soils and nonhazardous construction rubble and associated debris disposed of at Site 8 and transporting them to Sites 1 and 3 for use as subgrade material beneath the landfill cap. An engineering evaluation of the fill requirements for the Sites 1 and 3 landfill cap indicates that material from Site 8 could be incorporated without altering the design of the landfill cap. Using the material from Site 8 would also preclude the need to obtain this material from an off-site source. The Navy is currently developing the design of the landfill cap at Sites 1 and 3.

2.1 Description

The remedial actions for Site 8 involve excavating soil and nonhazardous construction rubble and associated debris. Polycyclic aromatic hydrocarbons (PAHs) have been detected in surface soils at Site 8 at concentrations ranging from below detection limit to 53 milligrams per kilogram (mg/kg). These soils were analyzed by the U.S. Environmental Protection Agency's (USEPA) Toxicity Characteristic Leachate Procedure (TCLP) to determine the leachability of PAHs. The TCLP test is used by the USEPA to establish whether a solid waste is a hazardous waste that would require special handling or disposal considerations. However, PAHs are not analyzed for under the TCLP. The raw sample contained measurable amounts of PAHs; however, no PAHs were detected in the TCLP extract. This suggests that PAHs leaching from soils at Site 8 is not significant. No compounds were detected in the

extract at concentrations exceeding their regulatory limit; therefore, the soils at Site 8 are not considered hazardous waste.

The Navy's Preferred Alternative includes the following components:

- site preparation
- excavation and transport of material
- confirmatory sampling
- grading and seeding

These components are described in the following paragraphs.

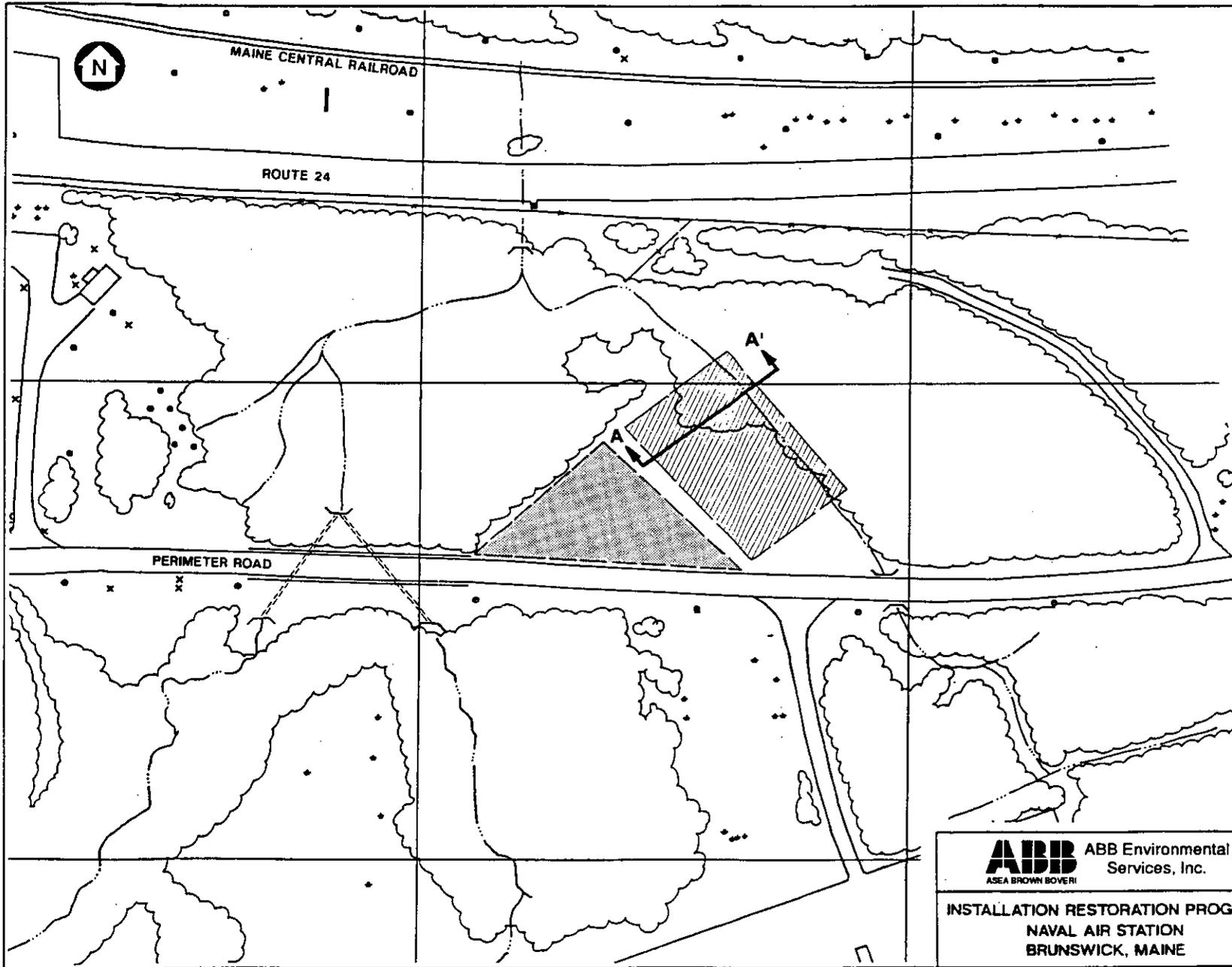
Site Preparation. This alternative would require minimal site preparation because the area is relatively flat and free of heavy vegetation and other major preparatory activities are not required for this alternative. However, some trees and brush would be removed from the embankment.

As part of the site preparation, excavation equipment would be mobilized to the site. The staging area for Site 8, shown on Figure 2-1, would be used to store excavation equipment and any temporary facilities.

To minimize impacts from the excavation on the stream located at the bottom of the embankment, siltation fencing or hay bales would be placed along the edge of the stream to prevent silt from entering the water.

Excavation and Transportation of Material. An estimated 14,000 cubic yards (cy) of soil, construction rubble, and debris would be excavated from the embankment at the site. The approximate area of excavation is shown on Figure 2-1; a conceptual cross-section of this area is shown on Figure 2-2. The amount of excavated material was estimated from boring, test pit, and monitoring well installation logs presented in the Draft Final Remedial Investigation (RI) report and the Draft Final Supplemental RI report (E.C. Jordan Co., 1990 and 1991).

The material would be excavated and loaded using a backhoe with an excavation reach of approximately 20 feet, which would enable the operator to excavate material from the slope without requiring the equipment to be moved to the bottom of the



LEGEND

-  APPROXIMATE AREA OF EXCAVATION
-  PROPOSED STORAGE AREA



 ABB Environmental Services, Inc.	SITE PLAN	
	SITE 8 TECHNICAL MEMORANDUM	
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	8836-03	FIGURE 2-1



A

A'

TP-803

MW-810

APPROXIMATE 2:1 SLOPE

APPROXIMATE 3.5:1 SLOPE

NATIVE MATERIAL

RUBBLE AND DEBRIS TO BE EXCAVATED

STREAM

5

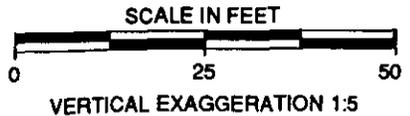


 ABB Environmental Services, Inc. ASEA BROWN BOVERI	CONCEPTUAL CROSS SECTION
	SITE 8 TECHNICAL MEMORANDUM
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	FIGURE 2-2

TECHNICAL MEMORANDUM

embankment. An anticipated 800 to 1,000 cy of material would be excavated and loaded for transportation per day.

Dump trucks would transport the material to Sites 1 and 3. The material would be placed and spread at Sites 1 and 3 for use as subgrade material prior to cap construction. The transport distance from Site 8 to Sites 1 and 3 is approximately 6 miles round trip. It is anticipated that eight to ten 12-cy dump trucks would be required to haul the material to keep pace with the excavation rate. Each truck would haul approximately 90 cy of material per day. Excavation and transport activities are anticipated to take 15 to 20 days.

Confirmatory Sampling. After excavation of the rubble and debris, soil samples would be collected and analyzed to document the conditions of underlying soils. The sampling program would be developed during the design phase and submitted for regulatory review and approval. In addition, results of the confirmation sampling would be submitted to the regulatory agencies for review.

Grading and Seeding. After the excavation is complete, the area would be graded to establish a maximum 3-to-1 (vertical to horizontal) slope down to the stream to promote drainage and minimize erosion. It is anticipated that no additional fill material would be required to achieve the desired 3:1 final slope. The area would be mulched and seeded to reestablish vegetation.

2.2 Overall Protection of Human Health and the Environment

Removal of PAH-contaminated soils from the site would eliminate any future potential health risks associated with exposure to these soils. Placing the soil beneath the Sites 1 and 3 landfill cap would provide adequate long-term protection against future potential exposure. The Sites 1 and 3 landfill would be closed in accordance with federal and state regulations, and the closure would include long-term monitoring and maintenance to confirm proper integrity of the cover system.

Removing debris and rubble from Site 8 would eliminate the physical hazards (i.e., chance of injury) associated with this material at the site. Placing the material at Sites 1 and 3 for use as subgrade material under the landfill cap would limit accessibility to the debris and further reduce the physical hazards associated with it. The material does not pose any chemical or exposure hazards.

Installation Restoration Program

Removing the material from the site would benefit environmental receptors because once the material is removed, the site would be regraded and revegetated to restore a natural physical condition. Final grading and revegetation of the area would occur to minimize erosion and resultant siltation in the adjacent streams. This site restoration would potentially provide a more suitable environment for reestablishing the natural ecosystem at the site.

2.3 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

The material to be excavated at Site 8 is nonhazardous. Several location-specific ARARs would be applicable because material would be excavated near a stream. Preventive measures, such as the use of siltation fencing or hay bales at the bottom of the embankment to prevent silt from impacting the stream, would aid in complying with location-specific ARARs. The following location-specific ARARs would need to be considered when working in the vicinity of a wetland, floodplain, or stream:

- Maine Natural Resources Protection Act (38 MRSA, Section 480-A through S)
- Natural Resources Protection Act, Permit By Rule Standards (Maine Department of Environmental Protection Regulations, Chapter 305)
- Town Shoreland Zoning Ordinances and State Minimum Guidelines

Action-specific ARARs applicable to this alternative include the following:

- Occupational Safety and Health Act Safety and Health Standards (29 CFR Part 1926)
- Clean Air Act National Ambient Air Quality Standards (40 CFR Part 50)
- Maine Solid Waste Management Regulations (38 MRSA Section 1304)

Appropriate health and safety practices would be followed during site activities. During excavation of material, fugitive dust emissions would be controlled so that

ambient air quality standards for particulate emissions are not exceeded. Dust control measures such as wetting the material before excavation to suppress dust generation may be required.

2.4 Long-term Effectiveness and Permanence

Excavation and placement of soil, or construction rubble and debris under the cap at Sites 1 and 3 would remove PAH-contaminated soil and debris from Site 8. Therefore, no risk from exposure would remain. In addition, possible physical hazards associated with the material would be eliminated at this site.

2.5 Reduction in Mobility, Toxicity, and Volume Through Treatment

The excavated soil at Site 8 contains PAHs and construction rubble and debris. TCLP tests conducted on these soils showed that the PAH contaminants are relatively immobile. The rubble and debris at the site are nonhazardous and not contaminated; therefore, no contaminants are considered to be mobile or toxic. No treatment of these soils is proposed; therefore, there would be no reduction in the toxicity of PAHs. The volume of the material, estimated at 14,000 cy, could increase slightly from bulking during excavation and handling. Physical hazards associated with the material would be eliminated once the cap is constructed at Sites 1 and 3.

2.6 Short-term Effectiveness

Excavating the material from Site 8 may pose some potential short-term risks. Precautions would be taken to alleviate hazards associated with excavating an embankment. The excavation equipment (i.e., backhoe) should be suitable to make the excavation on the embankment, and the contractor should be made aware of slope stability considerations. Increased truck traffic at NAS Brunswick while transporting the excavated material to Sites 1 and 3 would be anticipated. Dust emissions generated during the excavation could be controlled by wetting the material prior to excavation. Drainage of surface water and transport of silt could impact the unnamed stream; proper precautions (e.g., diverting surface water runoff and installing siltation fencing or hay bales) would minimize any adverse effects. To the extent practicable, the Navy will conduct excavation activities during the dry summer months to further reduce the potential for erosion.

Installation Restoration Program

2.7 Implementability

Excavation and transportation of material is a common practice and the equipment to perform these functions is readily available.

2.8 Cost

Table 2-1 presents the estimated cost of this alternative. This estimate assumes that 900 cy of material would be excavated and loaded by a backhoe daily. Transportation of the material would be accomplished by eight to ten 12-cy dump trucks. The total cost of the alternative is estimated at \$328,000. Appendix A presents the detailed cost worksheet for this alternative.

TABLE 2-1
ALTERNATIVE 8D:
EXCAVATION AND USE AS SUBGRADE MATERIAL AT SITES 1 AND 3

TECHNICAL MEMORANDUM
NAS BRUNSWICK

EXCAVATE 14,000 cy AT SITE 8	COST	PRESENT WORTH
<u>Direct Costs</u>		
Site Preparation		
Silt Fence	\$1,250	
Necessities (water, toilet)	750	
Mobilization/Demobilization		
All Equipment	6,350	
Excavate, Haul, Spread		
Backhoe and Operator	37,500	
Dump Trucks and Drivers	97,500	
Laborers	10,800	
Dozer	20,250	
Regrade and Revegetate		
Regrade Excavated Slopes	1,350	
Topsoil	24,000	
Seed, Fertilize, Mulch	1,000	
Subtotal	201,000	
Undeveloped Design Details ~ 25%	<u>51,000</u>	
Total Direct Costs:	\$252,000	\$252,000
<u>Indirect Costs</u>		
Health and Safety @ 5% of total direct costs	\$13,000	
Legal, administration, permitting @ 5% of total direct costs	13,000	
Engineering @ 10% of total direct costs	25,000	
Services during construction @ 10% of total direct costs	<u>25,000</u>	
Total Indirect Costs	\$76,000	\$76,000
<u>Annual Operating Costs</u>	N/A	N/A
Total Capital Costs:	N/A	N/A
Total Cost:	\$328,000	\$328,000

tes:
 cy = cubic yard

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ARARs	Applicable or Relevant and Appropriate Requirements
cy	cubic yard
NAS	Naval Air Station
PAH	polycyclic aromatic hydrocarbon
RI	remedial investigation
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	U.S. Environmental Protection Agency

Installation Restoration Program

REFERENCES

- E.C. Jordan Co., 1990. *Draft Final Remedial Investigation Report NAS Brunswick*. Portland, Maine. August.
- E.C. Jordan Co., 1991. *Draft Final Supplemental Remedial Investigation Report NAS Brunswick*. Portland, Maine. August.
- E.C. Jordan Co., 1992a. *Draft Final Focused Feasibility Study: Site 8, NAS Brunswick*. Portland, Maine. April.
- E.C. Jordan Co., 1992b. *Record of Decision Sites 1 and 3, NAS Brunswick*. Portland, Maine. March.

Installation Restoration Program

APPENDIX A
COST ESTIMATING WORKSHEET

Installation Restoration Program

DATE: 28-Jan-93

UNIT COST ESTIMATING WORKSHEET

PROJECT: RELOCATE DUMPED DEBRIS
 LOCATION: BRUNSWICK NAS - SITE 8
 ENGINEER: ABB ENVIRONMENTAL SERVICES, INC.
 ESTIMATOR: P. R. MARTIN

JOB # 6836-03
 DATE 11-Nov-92
 TIME 11:09 AM

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 DIRECT COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL

MOBILIZATION/DEMobilIZATION				
BACKHOE	1	LS	2,500.00	\$2,500
DUMP TRUCK	10	EA	250.00	2,500
DOZER	1	LS	1,350.00	1,350
UNDEVELOPED DESIGN DETAILS ~25%				1,650
TOTAL MOBILIZATION/DEMobilIZATION				----- \$8,000
SITE PREPARATION				
PORT-A-JOHN (2 EA)	6	WK	50.00	\$300
WATER COOLER (2 EA)	6	WK	25.00	150
WATER	6	WK	50.00	300
SILT FENCE	250	LF	5.00	1,250
UNDEVELOPED DESIGN DETAILS ~25%				1,000
SITE PREPARATION				----- \$3,000
EXCAVATE, HAUL, SPREAD				
BACKHOE & OPERATOR	15	DAY	2,500.00	\$37,500
DUMP TRUCK & DRIVER - 10 EA	150	DAY	650.00	97,500
LABORER - 3 EA	360	MNHR	30.00	10,800
DOZER	15	DAY	1,350.00	20,250
UNDEVELOPED DESIGN DETAILS ~25%				41,950
TOTAL EXCAVATE, HAUL, SPREAD				----- \$208,000
REGRADE & REVEGETATE				
REGRADE EXCAVATED SLOPES	1	DAY	1,350.00	\$1,350
TOPSOIL	800	CY	30.00	24,000
SEED, FERTILIZE, MULCH	0.5	AC	2,000.00	1,000
UNDEVELOPED DESIGN DETAILS ~25%				6,650
TOTAL REGRADE & REVEGETATE				----- \$33,000

DATE: 28-Jan-93

UNIT COST ESTIMATING WORKSHEET

PROJECT: RELOCATE DUMPED DEBRIS
LOCATION: BRUNSWICK NAS - SITE 8
ENGINEER: ABB ENVIRONMENTAL SERVICES, INC.
ESTIMATOR: P. R. MARTIN

JOB # 6836-03
DATE 11-Nov-92
TIME 11:09 AM

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SUMMARY SHEET

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL

DIRECT COSTS				
MOBILIZATION/DEMobilIZATION				\$8,000
SITE PREPARATION				3,000
EXCAVATE, HAUL, SPREAD				208,000
REGRADE & REVEGETATE				33,000
TOTAL DIRECT COSTS				----- \$252,000

INDIRECT COSTS

HEALTH & SAFETY @ 5% OF TOTAL DIRECT COSTS				\$13,000
LEGAL, ADMINISTRATION, PERMITTING @ 5% OF TOTAL DIRECT COSTS				13,000
ENGINEERING @ 10% OF TOTAL DIRECT COSTS				25,000
SERVICES DURING CONSTRUCTION @ 10% OF TOTAL DIRECT COSTS				25,000
TOTAL INDIRECT COSTS				----- \$76,000

TOTAL CAPITAL COSTS (DIRECT + INDIRECT) \$328,000