

**FINAL DECISION DOCUMENT  
NMCB BUILDING T-1416 EXPANDED AREA  
FORMER ADAK NAVAL COMPLEX  
ADAK ISLAND, ALASKA**

**COVER SHEET AND SIGNATURE PAGE**

**SITE NAME:** Naval Mobile Construction Battalion (NMCB) Building T-1416 Expanded Area

**ALASKA DEC DATABASE RECORD KEY:** 200025X110637

**ALASKA DEC REGULATORY AUTHORITY:** Oil and Other Hazardous Substances  
Pollution Control (18 AAC 75, Article 3)

**RESPONSIBLE PARTY:** Navy BRAC Program  
Management Office, West  
1455 Frazee Road, Suite 900  
San Diego, CA 92108-4310

**CHEMICALS OF POTENTIAL CONCERN/MEDIA IMPACTED:**

**Soil:** Petroleum hydrocarbons, semivolatile organic compounds (SVOCs), and  
chlorinated volatile organic compounds (VOCs)

**Groundwater:** Petroleum hydrocarbons, metals, SVOCs, and chlorinated VOCs

**Marine Sediment:** Petroleum hydrocarbons and SVOCs

**ON-SITE CONTAMINANT CONCENTRATIONS:**

Diesel-range organics (DRO) and gasoline-range organics (GRO) were detected in soil at concentrations greater than the alternative cleanup levels (ACLs), which were calculated using Alaska Department of Environmental Conservation (DEC) Method Four [18 Alaska Administrative Code (AAC) 75.340(a)(4)]. The maximum and minimum detected concentrations of DRO and GRO in soil are provided in Table 1. Benzene, DRO, GRO, and lead were detected at concentrations greater than 10 times the tabulated groundwater cleanup levels [18 AAC 75.345(b)(1), Table C]. The maximum and minimum detected concentrations for these chemicals in groundwater are provided in Table 2. The ecological risk assessment established that existing concentrations of contaminants in marine sediment do not pose an unacceptable risk. Therefore, no cleanup levels were established for marine sediments, and contaminant concentrations for marine sediment are not included in the table below.

**Table 1**  
**Concentration of Chemicals Exceeding ACLs in Soil**

Chemical	Soil	
	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)
DRO	4.08 J	43,000 J
GRO	2.1	27,000

Notes:  
 conc. - concentration  
 DRO - diesel-range organics  
 GRO - gasoline-range organics  
 J - estimated value  
 max. - maximum  
 mg/kg - milligram/kilogram  
 min. - minimum

**Table 2**  
**Concentrations of Chemicals Exceeding Ten Times the Tabulated Groundwater Cleanup Levels**

Chemical	Min. Conc. (µg/L)	Max. Conc. (µg/L)
Benzene	0.872	360
DRO	105	44,500
GRO	8.2J	33,000
Lead – Dissolved	1	250
Lead – Total	1.6J	330

Notes:  
 conc. - concentration  
 DRO - diesel-range organics  
 GRO - gasoline-range organics  
 J - estimated value  
 max. - maximum  
 µg/L - microgram per liter  
 min. - minimum

**CLEANUP LEVELS:**

**Soil:** Cleanup levels specified for soil are based on Alaska DEC Method Four criteria [18 AAC 75.340(a)(4)], which uses site-specific risk assessments to establish ACLs. The ACLs for soils at the NMCB Building Expanded Area are:

- DRO 31,000 milligrams per kilogram (mg/kg)
- GRO 1,700 mg/kg

**Groundwater:** Cleanup levels are based on 10 times the tabulated groundwater cleanup levels [18 AAC 75.345(b)(1), Table C] because groundwater is not reasonably expected to be a potential future source of drinking water [18 AAC 75.345(b)(2)]. The groundwater cleanup levels for the NMCB Building Expanded Area are:

- Benzene 50 micrograms per liter ( $\mu\text{g/L}$ ) (0.05 milligrams per liter [ $\text{mg/L}$ ])
- DRO 15,000  $\mu\text{g/L}$  (15  $\text{mg/L}$ )
- GRO 13,000  $\mu\text{g/L}$  (13  $\text{mg/L}$ )
- Lead 150  $\mu\text{g/L}$  (0.15  $\text{mg/L}$ )

**Marine Sediment:** The ecological risk assessment established that existing concentrations of contaminants in marine sediment do not pose an unacceptable risk. Therefore, no cleanup is necessary.

#### **CLEANUP REMEDY:**

Alternative 2 – Institutional Controls, Free-Product Recovery, and Monitored Natural Attenuation (MNA) – is selected as the remedial alternative for the NMCB Building Expanded Area. Free-phase product will be removed via groundwater wells and passive skimmers, petroleum concentrations in groundwater will be reduced through natural attenuation, and institutional controls will be used to protect human health and the environment as long as groundwater concentrations are greater than the groundwater cleanup levels (URS 2005a).

#### **REVIEW OF CLEANUP ACTION AFTER SITE CLOSURE:**

Under 18 AAC 75.380(d)(1), the Alaska DEC may require the Navy to perform additional cleanup if new information is discovered which leads Alaska DEC to make a determination that the cleanup described in this decision document is not protective of human health, safety, and welfare or the environment, or if new information becomes available which indicates the presence of previously undiscovered contamination or exposure routes related to Navy activities.

**ACCEPTANCE BY PARTIES:**

The State of Alaska and the Navy have agreed to the decisions outlined in this document.

Cindy O'Hare

Cindy O'Hare, P.E.  
Adak BRAC Environmental Coordinator  
U.S. Navy, Naval Facilities Engineering  
Command Northwest

3.22.2006  
Date

Jennifer L. Roberts

Jennifer Roberts  
Contaminated Site Program, Section Manager  
Alaska Department of Environmental Conservation

March 16 2006  
Date

## CONTENTS

ABBREVIATIONS AND ACRONYMS .....	ix
1.0 INTRODUCTION .....	1-1
2.0 BACKGROUND .....	2-1
2.1 SITE HISTORY .....	2-1
2.1.1 Site Regulatory History.....	2-2
2.1.2 Site Release History.....	2-4
2.2 PHYSICAL CHARACTERISTICS .....	2-4
2.3 DESCRIPTION OF CONTAMINANTS AND MEDIA IMPACTED .....	2-5
2.4 CLEANUP ACTIVITIES PERFORMED TO DATE .....	2-6
2.5 LAND USE.....	2-8
2.6 GROUNDWATER USE.....	2-8
2.7 INSTITUTIONAL CONTROLS.....	2-9
2.7.1 Land Use Restrictions.....	2-9
2.7.2 Excavation Restrictions .....	2-9
3.0 IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN .....	3-1
3.1 SOIL.....	3-1
3.2 GROUNDWATER.....	3-2
3.3 SURFACE WATER AND SEDIMENT .....	3-3
4.0 CONTAMINANT CONCENTRATIONS AND POTENTIAL EXTENT OF CONTAMINATION.....	4-1
5.0 SUMMARY OF RISK ASSESSMENTS.....	5-1
5.1 HUMAN HEALTH .....	5-1
5.1.1 Human Health Risk Assessment Procedures .....	5-2
5.2 ECOLOGICAL.....	5-8
5.2.1 Ecological Risk Assessment Procedures .....	5-8
5.2.2 Problem Formulation .....	5-8
5.2.3 Screening Level Ecological Risk Assessment .....	5-9
5.2.4 Baseline Ecological Risk Assessment .....	5-10
5.2.5 Conclusion .....	5-10
6.0 REMEDIAL ACTION OBJECTIVES AND CLEANUP LEVELS .....	6-1
6.1 REMEDIAL ACTION OBJECTIVES .....	6-1
6.2 CLEANUP LEVELS .....	6-1

## CONTENTS (Continued)

6.3	EXTENT OF CONTAMINATION .....	6-3
7.0	REMEDIAL ACTION ALTERNATIVES .....	7-1
8.0	COMPARATIVE ANALYSIS OF ALTERNATIVES .....	8-1
9.0	DESCRIPTION OF SELECTED CLEANUP ACTION .....	9-1
10.0	ADDITIONAL ACTIVITIES .....	10-1
11.0	APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS .....	11-1
11.1	CHEMICAL-SPECIFIC ARARS .....	11-1
11.2	LOCATION-SPECIFIC ARARS .....	11-1
11.3	ACTION-SPECIFIC ARARS .....	11-2
12.0	PUBLIC INVOLVEMENT .....	12-1
12.1	PUBLIC INVOLVEMENT ACTIVITIES .....	12-1
12.2	FUTURE CONTACTS .....	12-1
13.0	RESPONSIVENESS SUMMARY .....	13-1
14.0	REFERENCES .....	14-1

## APPENDIX

A	Legal Description
---	-------------------

## CONTENTS (Continued)

### FIGURES

1-1	Adak Island Vicinity .....	1-3
1-2	Site Location, NMCB Building Expanded Area.....	1-5
1-3	Legal Boundaries, NMCB Building Expanded Area.....	1-7
2-1	Potential Petroleum Sources at the NMCB Building Expanded Area.....	2-11
2-2	Inferred Groundwater Flow Map, NMCB Building Expanded Area .....	2-13
2-3	Proposed Future Land Use, NMCB Building Expanded Area .....	2-15
4-1	Estimated Extent of Residual Free Product, NMCB Building Expanded Area.....	4-9
4-2	Estimated Potential Extent of Soil and Groundwater Contamination, NMCB Building Expanded Area.....	4-11
5-1	Human Health Conceptual Site Model, NMCB Building Expanded Area.....	5-13
5-2	Ecological Conceptual Site Model, NMCB Building Expanded Area .....	5-15
6-1	Extent of Soil and Groundwater Contamination, NMCB Building Expanded Area .....	6-5
7-1	Alternative 2 – Proposed Locations of New Product Recovery Wells, NMCB Building Expanded Area.....	7-3
7-2	Alternative 3 – Proposed Soil Excavation Areas and Replacement Wells, NMCB Building Expanded Area.....	7-5
7-3	Alternative 4 – Proposed Excavation Areas, Bioremediations Areas, and Replacement Wells, NMCB Building Expanded Area.....	7-7
8-1	Evaluation of Remedial Alternatives, NMCB Building Expanded Area .....	8-3
9-1	Selected Cleanup Alternative, NMCB Building Expanded Area .....	9-5
10-1	Additional Sampling Activities, NMCB Building Expanded Area .....	10-3

## CONTENTS (Continued)

### TABLES

2-1	Summary of Environmental Field Investigations, NMCB Building Expanded Area....	2-17
2-2	Summary of Site Cleanup Activities, NMCB Building Expanded Area.....	2-18
2-3	Free-Product Recovery Data NMCB Building Expanded Area.....	2-19
4-1	Recoverable Free Product Volume Estimate NMCB Building Expanded Area.....	4-13
4-2	Summary of Analytical Results for Chemicals of Potential Concern NMCB Building Expanded Area.....	4-14
5-1	Assumptions for Worker Exposure to Chemicals in Groundwater Through the Vapor Intrusion Pathway .....	5-17
5-2	Construction Worker Exposures to Groundwater, Exposure Assumptions and Intake Equations.....	5-18
5-3	Construction Worker Exposures to Soil, Exposure Assumptions and Intake Equations.....	5-19
5-4	Carcinogenic Toxicity Criteria for the Chemicals of Potential Concern.....	5-20
5-5	Noncarcinogenic Chronic and Subchronic Toxicity Criteria for the Chemicals of Potential Concern.....	5-23
5-6	Summary of EPCs and Total RME Risks and Hazards for the Building Worker .....	5-27
5-7	Summary of EPCs and RME Risks and Hazards for the Construction Worker From Soil .....	5-28
5-8	Summary of EPCs and Total RME Risks and Hazards for the Construction Worker From Groundwater.....	5-29
5-9	Summary of Total RME Risks and Hazards for the Construction Worker From Groundwater and Soil .....	5-30
5-10	Results of the Screening Level Ecological Risk Assessment to Identify COPCs in Soil at NMCB Building Expanded Area.....	5-31
5-11	Results of the Screening Level Ecological Risk Assessment to Identify COPCs in Marine Sediment at NMCB Building Expanded Area .....	5-32
5-12	Results of the Screening Level Ecological Risk Assessment to Identify COPCs in Marine Surface Water at NMCB Building Expanded Area.....	5-33
5-13	Results of the Baseline Ecological Risk Assessment to Identify COCs in Soil at NMCB Building Expanded Area.....	5-34
5-14	Results of the Baseline Ecological Risk Assessment to Identify COCs in Marine Sediment at NMCB Building Expanded Area.....	5-35
6-1	Soil and Groundwater Screening Criteria and Cleanup Levels, NMCB Building Expanded Area.....	6-7
8-1	Alaska DEC Criteria for Evaluating Remedial Alternatives .....	8-5

**CONTENTS (Continued)**

8-2	What are the Key Issues at NMCB Building Expanded Area and How Do the Alternatives Address These Issues?.....	8-6
8-3	Summary of Advantages and Disadvantages of Alternatives 2 and 3, NMCB Building Expanded Area.....	8-7
9-1	NMCB Building Expanded Area, Cost Estimate for Alternate 2: Institutional Controls, Free-Phase Product Recovery, and MNA .....	9-7

## ABBREVIATIONS AND ACRONYMS

AAC	Alaska Administrative Code
ACL	alternative cleanup level
ARAR	applicable or relevant and appropriate requirements
ARC	Adak Reuse Corporation
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CMP	Comprehensive Monitoring Plan
COC	chemical of concern
COPC	chemical of potential concern
CR	cancer risk
CSM	conceptual site model
cy	cubic yard
DD	decision document
DEC	Department of Environmental Conservation
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
FAA	Federal Aviation Administration
FFA	Federal Facilities Agreement
FFS	focused feasibility study
GRO	gasoline-range organics
HI	hazard index
ICMP	institutional control management plan
J	estimated value
JP-5	jet petroleum
mg/kg	milligram per kilogram
mg/L	milligram per liter
µg/L	microgram per liter
MNA	monitored natural attenuation
mogas	motor vehicle gasoline
NA	not applicable
Navy	U.S. Navy
NMCB	Naval Mobile Construction Battalion
NPL	National Priorities List
O&M	operation and maintenance
OU	operable unit

### **ABBREVIATIONS AND ACRONYMS (Continued)**

PAH	polycyclic aromatic hydrocarbons
PEB	pre-engineered building
RAB	Restoration Advisory Board
RAOs	remedial action objectives
RBSC	risk-based screening concentration
RME	reasonable maximum exposure
ROD	Record of Decision
RRO	residual-range organics
SAERA	State-Adak Environmental Restoration Agreement
SARA	Superfund Amendments and Reauthorization Act of 1986
SOP	Standard Operation Procedures
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
TAC	The Aleut Corporation
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TPH	total petroleum hydrocarbons
UCL95	95 percent upper confidence limit
USGS	United States Geological Survey
UST	underground storage tank
VOC	volatile organic compound

## **DECLARATION**

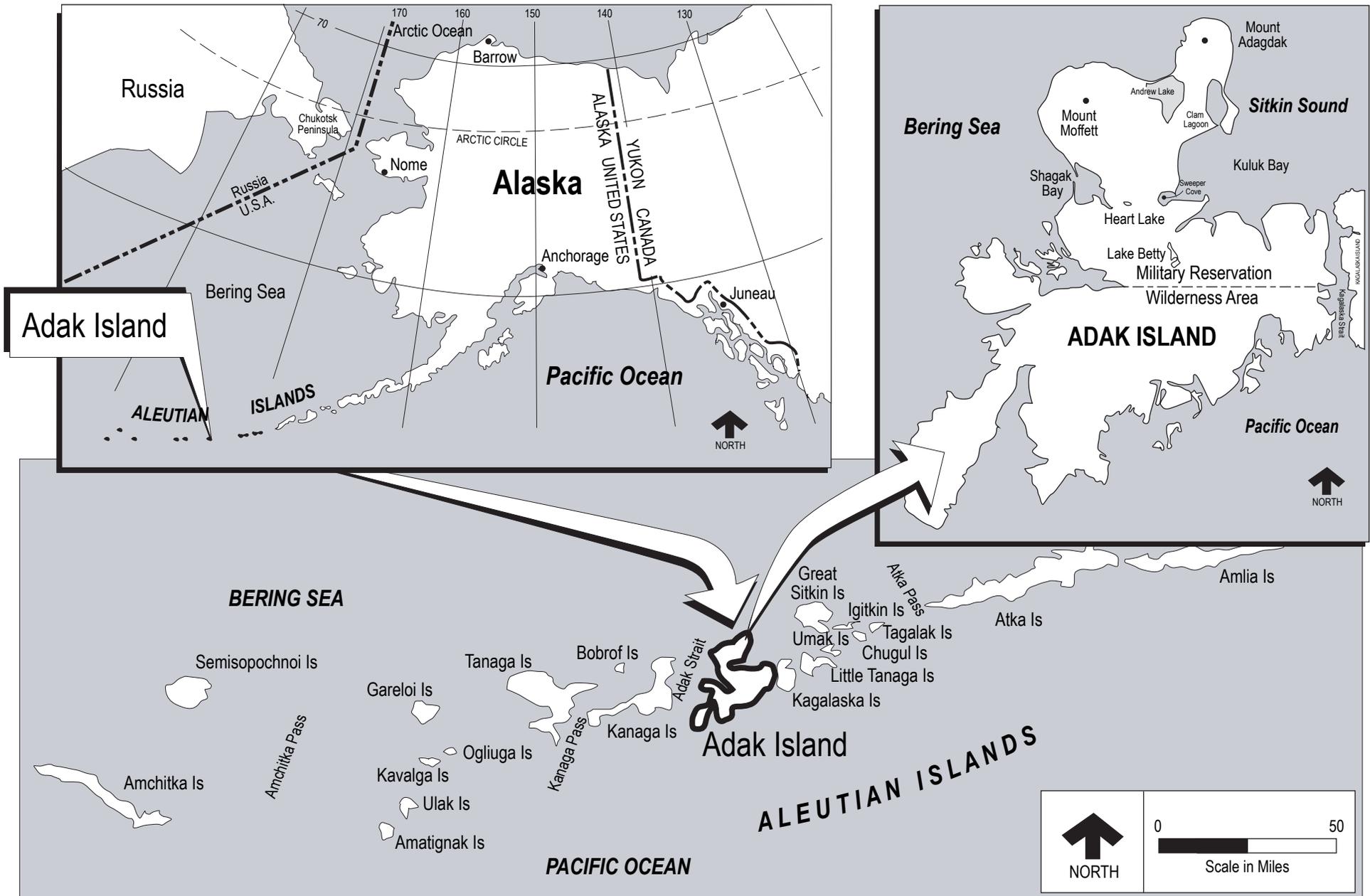
### **1.0 INTRODUCTION**

This decision document (DD) presents the selected cleanup alternative and the supporting rationale for cleanup of the Naval Mobile Construction Battalion (NMCB) Building T-1416 Expanded Area (hereafter referred to as the NMCB Building Expanded Area) at the former Adak Naval Complex, Adak Island, Alaska. The decisions documented in this DD are based on supporting documents in the Administrative Record located at the offices of Naval Facilities Engineering Command Northwest in Silverdale, Washington. The State of Alaska and U.S. Navy (Navy) have agreed to the decisions outlined in this document. Also, The Aleut Corporation (TAC), the current property owner, has concurred with the selected cleanup alternative. The Navy is responsible for implementing the cleanup alternative presented in this DD.

The former Adak Naval Complex is located on Adak Island, which is approximately 1,200 air miles southwest of Anchorage, Alaska, in the Aleutian Island chain (Figure 1-1). Figure 1-2 shows the general location of the NMCB Building Expanded Area. A legal description specifying the boundary of the site is included as Appendix A. A site map showing the legal boundary of the NMCB Building Expanded Area is also provided (Figure 1-3). The legal boundary was developed for land transfer purposes and does not necessarily correspond with the extent of contamination.

Alternative 2 – Institutional Controls, Free-Product Recovery, and Monitored Natural Attenuation (MNA) – is selected as the remedial alternative for the NMCB Building Expanded Area. As part of the remedy, additional activities will be performed at the site to confirm that the remedy is protective. These activities include installation of five new wells, collection of soil samples during the installation of the new wells, collection of additional groundwater samples from the five new wells, and visual monitoring of the Sweeper Cove shoreline. The selected cleanup alternative and additional site activities for the NMCB Building Expanded Area are discussed in more detail in Sections 9 and 10.

This DD was developed in accordance with State of Alaska regulations governing petroleum-release sites, the Alaska Department of Environmental Conservation (DEC) Oil and Other Hazardous Substances Pollution Control Regulations (18 Alaska Administrative Code [AAC] Chapter 75).

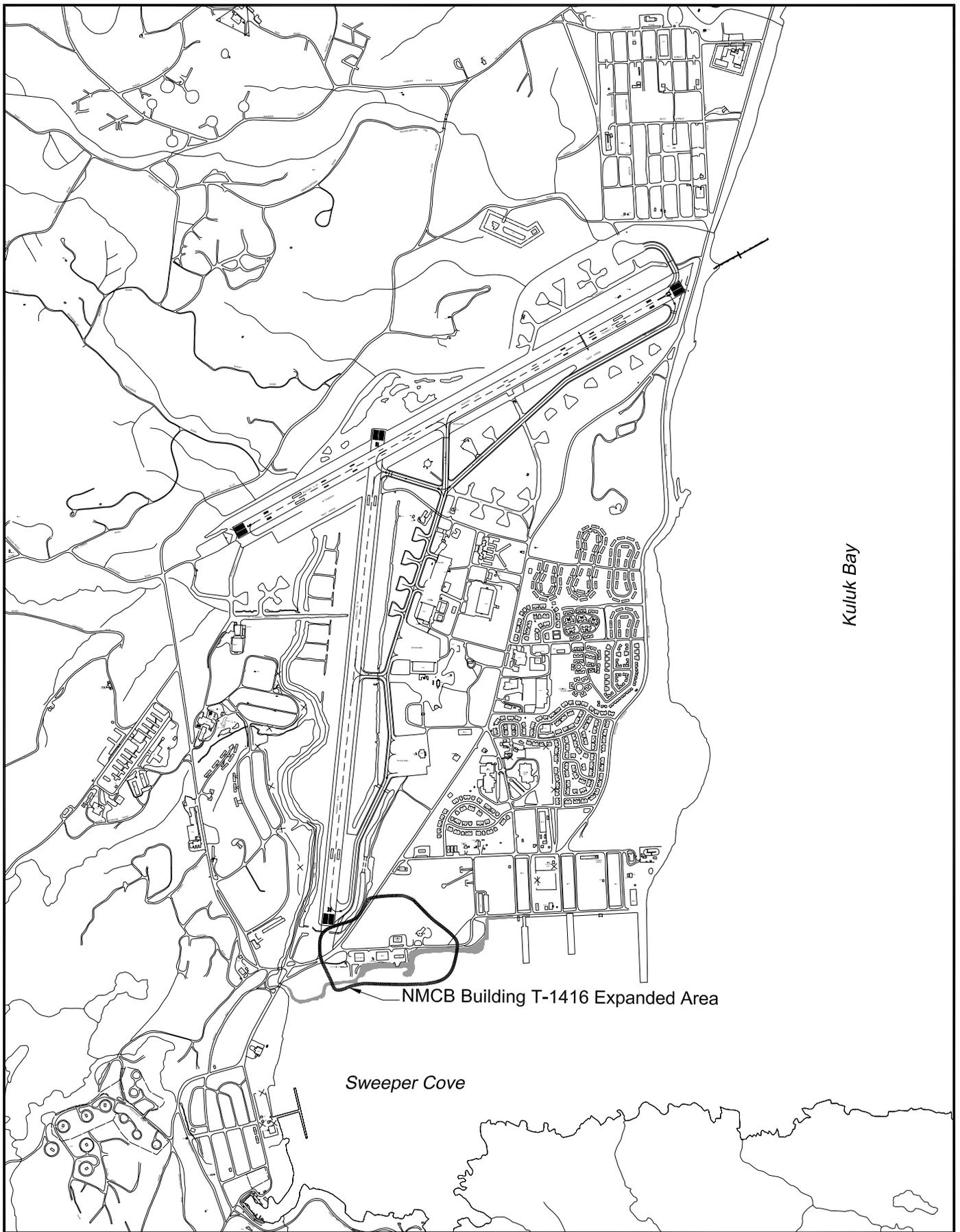


**U.S.NAVY**

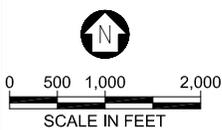
**Figure 1-1  
Adak Island Vicinity**

Adak Island, AK  
DECISION DOCUMENT

FILENAME: T:\ADAK\IDIA\Sub-Tasks\DO 3\NMCB DEC DOC\FIG 1-2 SITE LOC.dwg  
EDIT DATE: 03/17/06 AT: 10:32

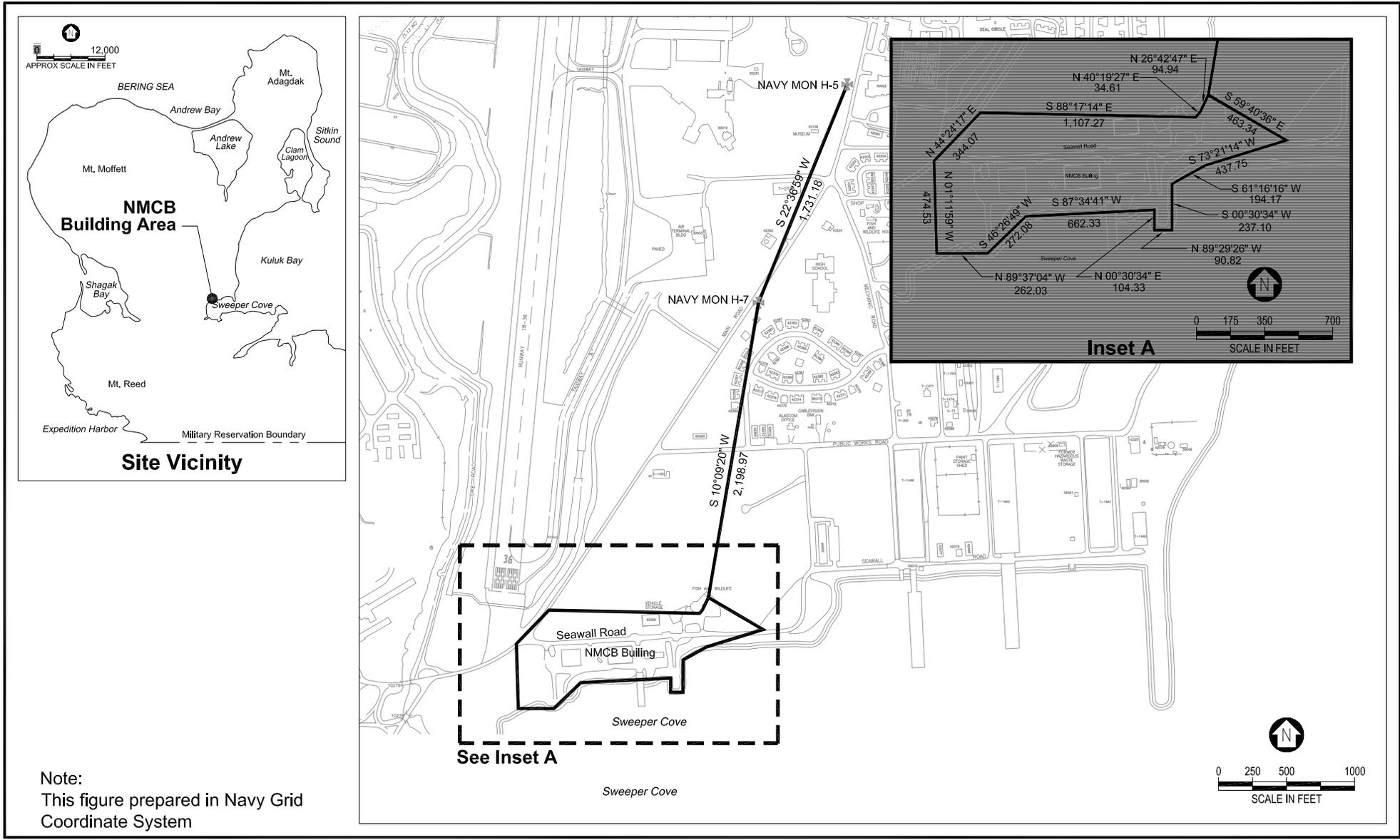


**U.S. NAVY**



**Figure 1-2**  
**Site Location**  
**NMCB Building Expanded Area**

Adak Island, AK  
DECISION DOCUMENT



Scale as Shown

**Figure 1-3**  
**Legal Boundaries, NMCB Building Expanded Area**

Adak Island, AK  
DECISION DOCUMENT