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PORT HEIDEN RRS ALASKA

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 02

2 1 File: S.H. 17A-364

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United States Air Force
11th Air Control Wing
11th Civil Engineering
Operations Squadron

Elmendorf AFB, Alaska

Preliminary Assessment
Port Heiden

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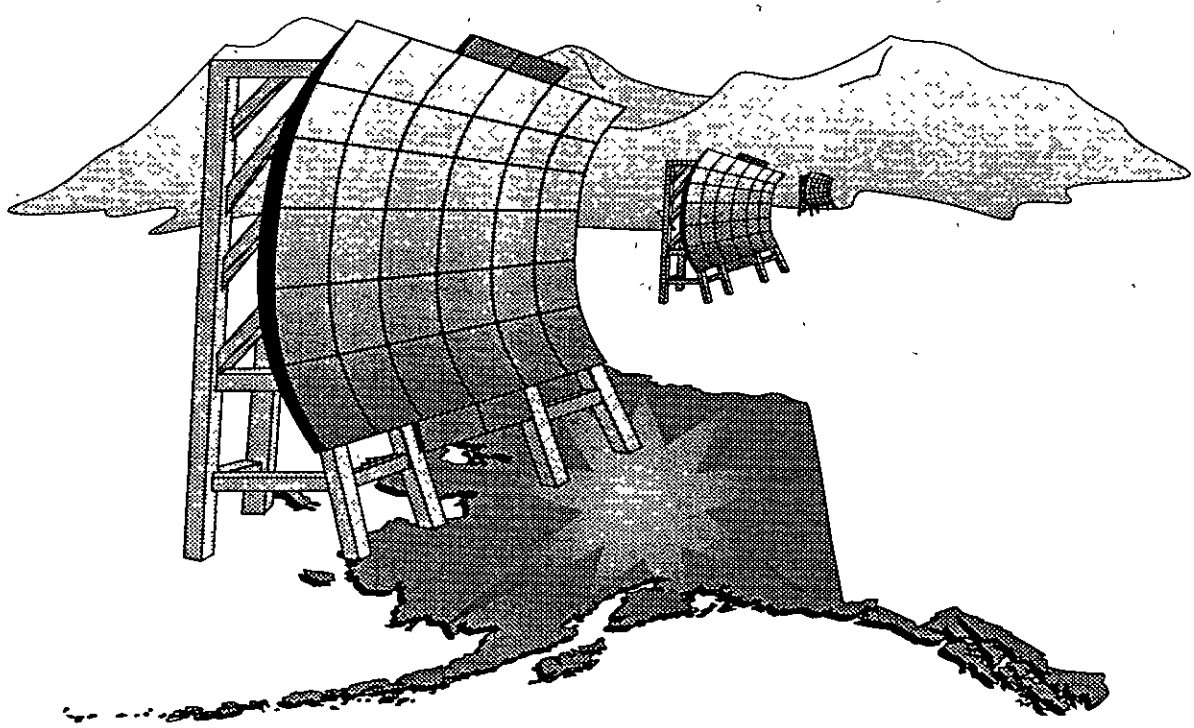

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Preliminary Assessment

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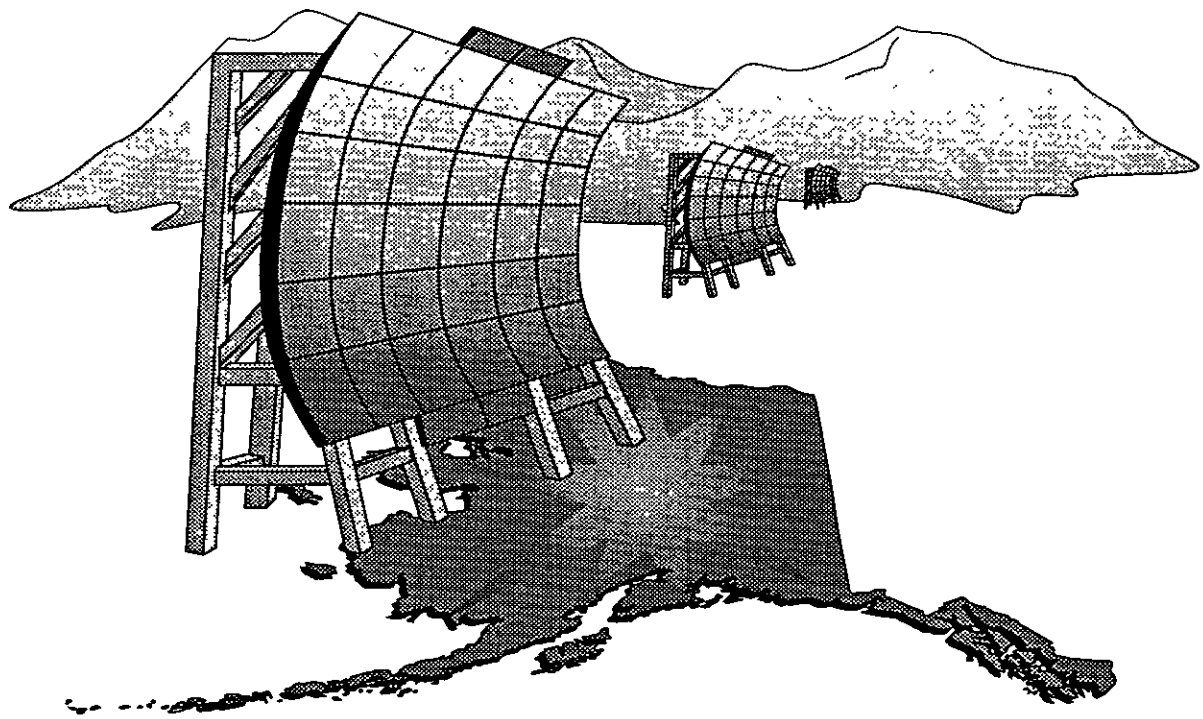

January 1994

Contract No. DACA85-92-D-0007
Delivery Order 0007

U.S. Army Engineer District, Alaska

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Abbreviations and Acronyms

ADEC	Alaska Department of Environmental Conservation
AEIDC	Arctic Environmental Information and Data Center
AFB	Air Force Base
APTUS	APTUS Environmental Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS ID	CERCLA Information System Identification
COE	U.S. Army Corps of Engineers
DDT	dichlorodiphenyltrichloroethane
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DRMO	Defense Reutilization and Marketing Office
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FNSI	finding of no significant impact
IRP	Installation Restoration Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
PA	Preliminary Assessment
PCB	polychlorinated biphenyls
POL	petroleum, oil, and lubricants
SARA	Superfund Amendments and Reauthorization Act of 1986
TCA	trichloroethane
TCE	trichloroethylene
TPH	total petroleum hydrocarbon
UC&AI	Underwater Construction and Associates, Inc.
USAF	U.S. Air Force

USF&WS	U.S. Fish and Wildlife Service
WACS	White Alice Communication System

Section 1

Introduction

1.1 Statutory Authority for Conducting a Preliminary Assessment

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) established federal authority, through the U.S. Environmental Protection Agency (EPA), to investigate, remediate, and seek reimbursement from responsible parties for the disposal of uncontrolled hazardous substances. (A more popular reference to CERCLA is "Superfund.") The EPA enforces CERCLA when existing state and federal regulations prove ineffective in protecting human health or the environment, or when the spill or disposal of hazardous substances predates existing regulations.

In 1986, the Superfund Amendments and Reauthorization Act (SARA) added major new authorities to CERCLA. Furthermore, SARA mandated revision of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to reflect SARA and outlined procedures for implementing the NCP.

Through its service agencies, the U.S. Department of Defense finances the CERCLA process through the Defense Environmental Restoration Account (DERA). The U.S. Air Force (USAF) developed the Installation Restoration Program (IRP) to administer DERA and govern restoration activities. Through the IRP, each military installation implements the provisions of SARA and the NCP.

A preliminary assessment (PA) is the first step in the investigative process under the NCP. It involves a review of existing information and an offsite reconnaissance, if appropriate, to determine whether a release requires additional investigation or action under CERCLA.

A PA may include an onsite reconnaissance. Because of the high cost of mobilization to remote sites, the site reconnaissance was not performed for this PA.

1.2 Scope of Work and Purpose of a Preliminary Assessment

On July 12, 1993, the U.S. Army Corps of Engineers (COE) contracted with CH2M HILL to conduct the preliminary assessment of the Port Heiden White Alice Communication System (WACS) site.

Because the Port Heiden WACS site contains several areas of possible contamination, it is referred to in this PA as "the site"; individual areas within the site are referred to as "source areas" or "sources." Potential source areas investigated for this PA were selected based on previous investigations, building or facility use, and historical waste-management practices.

To complete the Port Heiden WACS site PA, the CH2M HILL project team performed the following tasks:

- Researched available information for data pertinent to the site, including geologic, hydrologic, and wetlands maps; agency files; and documents belonging to the USAF and the COE (See Section 4 for a list of references consulted.)

- Conducted interviews of USAF and COE personnel familiar with the installations

- Synthesized the data collected into an EPA-approved format for presentation and further analysis

The following sources were consulted:

- USAF 11th CEOS (project manager, library, permit files)
- USAF Real Property Office
- COE Materials and Instrumentation Section
- COE Formerly Used Defense Sites Section
- COE Floodplain Management Section
- COE Construction Office
- Alaska Department of Environmental Conservation (ADEC) South Central Region Office
- Alaska Department of Community and Regional Affairs
- Alaska State Historic Preservation Office
- Alaska Department of Fish and Game (ADF&G)
- Alaska Division of Water
- U.S. Department of Commerce National Weather Service
- U.S. Fish and Wildlife Service (USF&WS)
- U.S. Geological Service (USGS) Groundwater Site Inventory Database
- Reeve Aleutian Airways

1.3 Executive Summary

During the past 10 years, extensive site investigation and remediation has occurred at Port Heiden. Much of the contaminated soil and hazardous material has been incinerated or retrograded to Elmendorf Air Force Base for ultimate disposal.

The remaining areas of concern are the tank farm area near the Village of Meshik, the "black lagoon" (outfall and sewer drain) and the "gray lagoon" (diesel storage) areas of the WACS site. The contaminants of concern in each area appear to be long-chain hydrocarbons (diesel and residual range). Because of the hydrogeology of the area, surface

water would be the likely pathway of concern. Also, because of the nature of the contaminants, the toxicity is relatively low.

The plans of the USAF to implement final remedial measures at the three remaining areas of concern and to give the site a low to moderate priority are appropriate. Final verification of past remediation and proper landfill closure also could be accomplished at that time.

Section 2

Background

The Port Heiden WACS site is one of many communication sites owned by the USAF as part of a defense communication network and aircraft warning system across Alaska. The layouts of the installations generally are similar, but vary in building configuration because of topography and specific site needs. The Port Heiden facility included a composite building, which contained a vehicle-maintenance garage, office and storage space, and equipment for standby power generation; four billboard antennas and feed horns (White Alice arrays); storage and distribution facilities for petroleum, oil and lubricants (POL); and a heliport.

The facility was constructed in the late 1950s during the expansion of the Distant Early Warning Line System. The Port Heiden site, which served as a link between King Salmon and Cold Bay, became obsolete with the advent of satellite communication and was abandoned in 1978. The site was demolished in 1990.

2.1 Site Location and Description

The Port Heiden WACS site (CERCLIS ID No. AK8570028698) is within Fort Morrow, halfway down the Alaska Peninsula. The site is about 140 miles southwest of the town of King Salmon and about 4 miles northeast of the Village of Meshik. Situated on the coastal plain of Bristol Bay, the site encompasses 172 acres in Section 15, Township 37 South, Range 59 West, Seward Meridian, as shown in Figure 2.1-1. Access to the site is by air or sea. Because Port Heiden has no harbor facilities, unloading of cargo must be done from the beach.

Original USGS topographic quadrangle maps of the Port Heiden area are included in the map pocket at the back of this report.

2.2 Site Operations and Source Characteristics

Historically, certain generic chemical processes and activities were necessary to fulfill the USAF mission at remote surveillance and communication facilities. These included the following:

- Interior space heating and refueling of aircraft and motor vehicles, requiring the use and storage of petroleum products and antifreeze (both ethylene glycol and methanol)
- Water purification with biocides (calcium hypochlorite)
- Degreasing mechanical equipment with the use of halogenated solvents (TCE and TCA) and petroleum distillate solvents
- Power generation with batteries (lead acid, nickel cadmium, and lithium) and associated electrolyte (ammonium chloride and sulfuric acid)
- Regulating electrical current with transformers, capacitors, and switches (some of which contain polychlorinated biphenyls [PCBs])
- Removal of mineral buildup in boilers with descaling compounds (ammonium bicarbonate)
- Building and equipment maintenance with the use of paints and paint thinners

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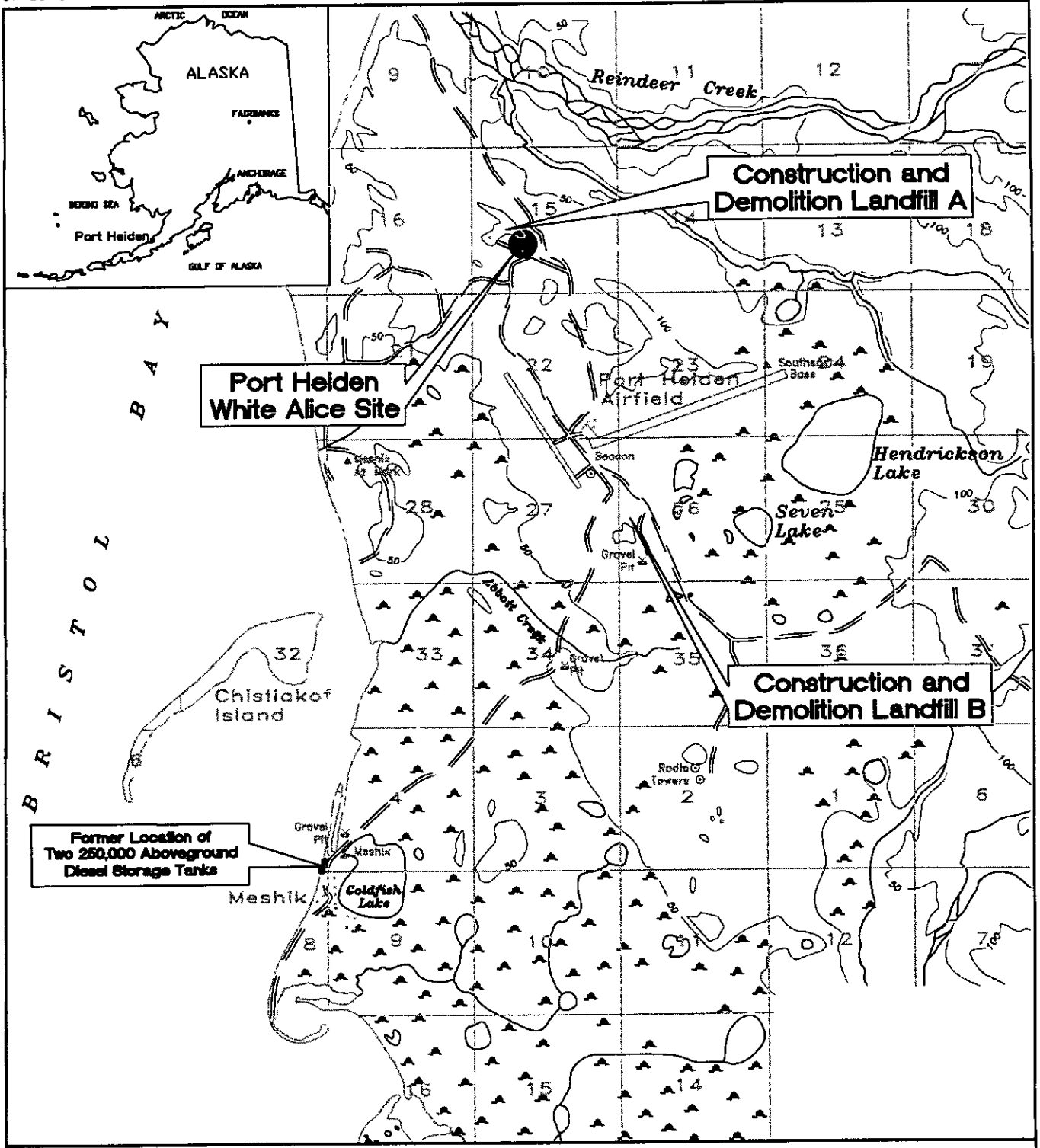

SOURCE. USGS TOPOGRAPHIC QUAD SHEETS BRISTOL BAY (A-2), CHIGNIK (D-2), CHIGNIK (D-3)

FIGURE 2.1-1
PORT HEIDEN
LOCATION MAP
PORT HEIDEN, ALASKA

- Clearing vegetation at the petroleum tank farm and aircraft runway, and in the general vicinity of the facility with herbicides (2,4-D and 2,4,5-T)

- Mosquito vector control, rodent control, and wood preservation with the use of pesticides (DDT, chlordane, lindane, dieldrin, parathion, and Warfarin)

- Road repairs and paving with asphalt products

- Fire protection in areas exposed to heat sources with the use of asbestos pipe insulation, wallboard, and shingles

- Prevention of freezing in liquids with the use of heat recovery and circulation systems (may contain antifreeze or PCBs)

- Road oiling and dust suppression with the use of recycled oils (may contain PCBs and solvents)

Because of the high rate of personnel turnover typical at a military installation, specific information pertaining to historical operations and past waste-management practices at the installation was scarce. In the absence of documented spill information, a 10 percent spill rate was used to account for incidental spills that may have resulted from routine handling and storage of the estimated quantities of products and wastes at the facility. Table 2.2-1 presents estimated amounts of product used (based on storage capacity) and potentially spilled over the 20 years of operation of the facility. Where possible, historical documentation was obtained to verify assumptions.

Table 2.2-1
Estimated Potential for Contaminant Release

Product/Contaminant	Annual Usage (gal./yr)	20-Year Total (gal.)	Spillage (percent)	Total Spillage (gal.)
POLs				
Diesel[a]	1,200,000	24,000,000	0.10	24,000
Avgas[b]	6,000	120,000	0.10	120
Mogas[b]	50,000	1,000,000	0.10	1,000
Oil and lubricants[b]	2,000	40,000	10	4,000
Antifreeze[b]	100	2,000	10	200
Paint thinner[b]	50	1,000	10	100
Pesticides and herbicides[b]	50	1,000	10	100
Solvents[b]	100	2,000	10	200
Batteries[b]	20 (ea)	400 (ea)	50	200 (ea)
PCB liquids[b] (10 to 15 transformers, 500- to 1,000-gallon capacity)		2,000	10	200

Product/Contaminant	Total Materials Onsite	Contaminant Status
Asbestos		
Piping[b]	500 lin ft	Removed in 1990 demolition and cleanup. Placed in asbestos cell of permitted Landfill A.
Building material[b]	25,000 ft^2	

[a]Based on documented storage capacity, assuming tanks filled twice per year.
[b]Estimated quantities.

Because this 10 percent factor was not considered appropriate for heavy-use items such as petroleum products, a 0.1 percent spill and leak factor for 20 years of use of petroleum-related products at the facility was applied to establish a relative potential for contamination. This amount conservatively estimates incidental overflow, as well as valve and pipe leaks, resulting from operation of a fuel system in the harsh climate of the Alaska Peninsula. Any specific reported fuel release was included in this 0.1 percent factor to determine the overall potential for fuel contamination over the life of the facility.

Regarding batteries, past history inspection and interviews have shown that approximately half of the batteries were shipped out by barge or airlift to Elmendorf Air Force Base (AFB) for disposal. The other half of the batteries generated at each facility probably were disposed of in the old site landfill.

The relatively high incidental spill rate can be attributed to product and waste handling operations in extreme climatic conditions. Many of the operations occur outdoors, where limited daylight and inclement conditions frequently occur during the winter months. Extreme winds at Port Heiden would also be a contributing factor in the high incidental spill rate for outdoor operations.

The estimates of 10 percent for general wastes, 0.1 percent for fuel, and 50 percent for batteries represent a general relative guide for a potential for contaminant release at remote Alaska military facilities. These estimates are based on site inspections, analytical data reviews, interviews, partial inventory lists, periodic retrograde activities, and regulatory inspections of hazardous-material storage facilities at Elmendorf AFB.

2.2.1 Source Descriptions

The Port Heiden facility was operated from 1958 until 1978 as a WACS site. The facility was abandoned in November 1978 and demolished in 1990 as part of the Defense Environmental Restoration Program (DERP) cleanup of U.S. Department of Defense (DOD) facilities at Port Heiden.

Through this record review, no documentation of routine solid and hazardous waste management and disposal was discovered. Also, except as noted, no spill logs were kept to record incidental spills. Through interviews and past site investigations in Alaska, we discovered several historic disposal/management practices at remote military installations:

- Storing liquids and solids in drums for future shipment to Elmendorf AFB

- Pouring liquids down shop floor drains or sewer drains
- Disposing of solids in installation landfill or local landfill

Because of the above practices, typical sources of contamination would likely be floor drains, leach fields, sewer outfalls, and landfills. Other likely sources of contamination would be petroleum storage tanks, petroleum piping, generators, transformers and capacitors, and roadways/airstrip (herbicide, petroleums).

Appendix A contains a record of debris removed from several USAF sites between 1984 and 1986. Although the quantities are not representative of annual waste generation amounts, the inventories provide an indication of the types of wastes generated. The estimation of leak/spill quantities given in Table 2.2-1 reflects the potential quantities discharged at the above sources over the life of the facility. During our record search, no record of actual discharge quantities was discovered.

Materials destined for the WACS site were shipped by barge to a beach-staging area near the Village of Meshik or by aircraft to the Port Heiden airfield. Items were then transported by road to the WACS site. A fuel pipeline ran along the road system from two aboveground fuel tanks (whose size varies in descriptions as 250,000 or 100,000 gallons) at Meshik to the airport and then to the WACS site. The pipeline (3 inches and 33,000 linear feet) was alternately buried and laid on top of the ground. According to the COE project manager, the two large tanks (assumed capacity of 250,000 gallons each) were filled twice each year. No information is available about how much fuel was transported by pipeline or truck to the WACS site.

At the time of the demolition of the WACS site, Reeve Aleutian Airways had reconnected the pipeline to new tanks and was using the segment of pipeline from Meshik to the airfield. Pipeline ownership of that segment was changed from DOD to Reeve Aleutian Airways. Diesel fuel was stored onsite in two 20,000-gallon underground storage tanks (USTs) shown in Figure 2.2-1.

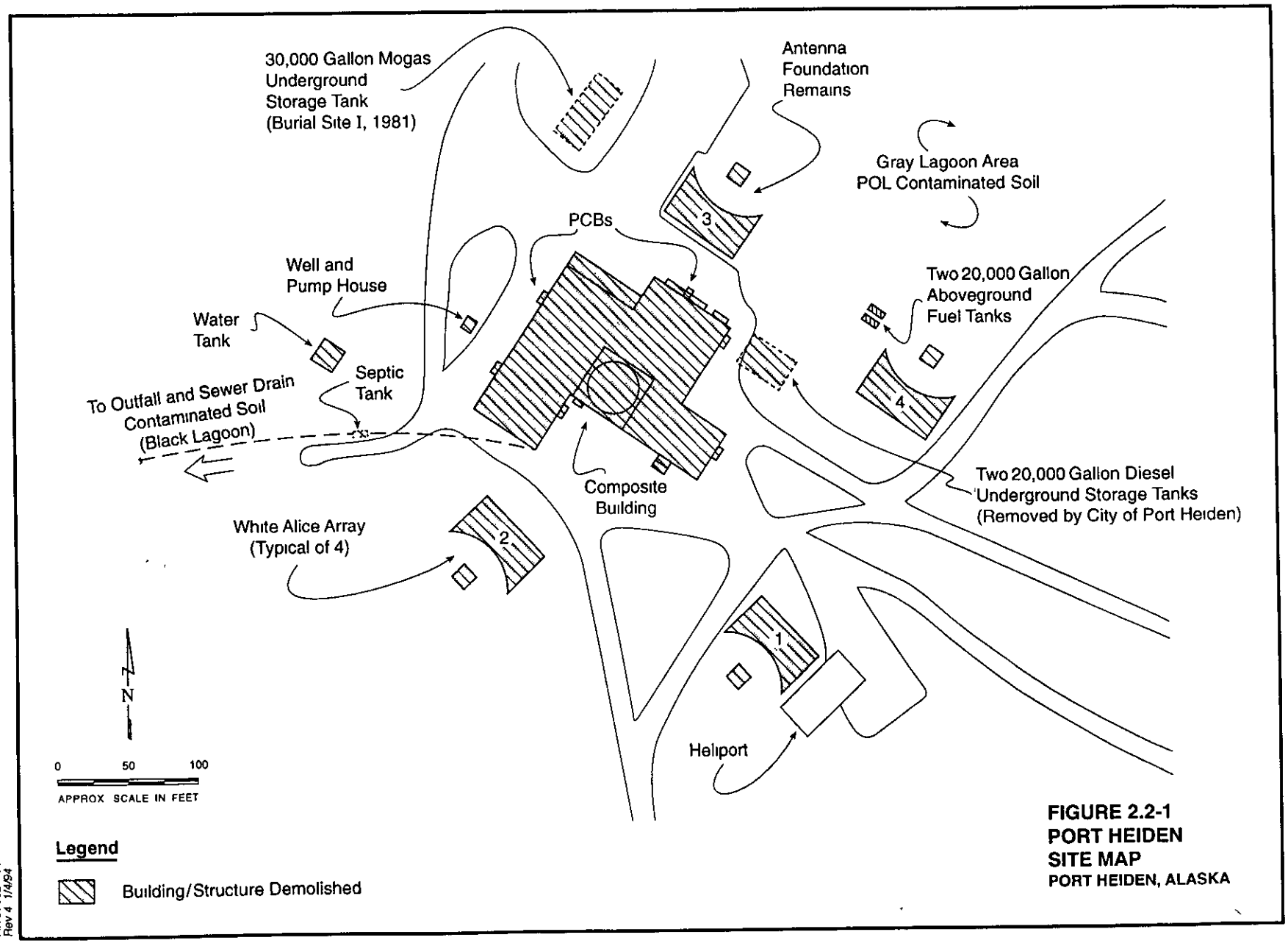

FIGURE 2.2-1
PORT HEIDEN
SITE MAP
PORT HEIDEN, ALASKA

Source COE, 1989

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Table 2.2-1 outlines the potential for contamination over the life of the facility based on product-use information and an estimated potential for spills and leaks.

From 1981 through 1992, the USAF and COE conducted removal and remediation activities and site investigations in Port Heiden at the WACS site, Fort Morrow (World War II facilities), and the Federal Aviation Administration (FAA) tower at the airstrip. Because the bulk of the debris and hazardous materials at Port Heiden was of DOD origin, and "ownership" could not be clearly distinguished among periods of use—World War II, WACS site, and FAA—the COE combined all areas into a DERP cleanup from 1990 to 1992. Table 2.2-2 summarizes the remedial activities that occurred at Port Heiden by type of material encountered. If known, the amounts and locations of contaminants, disposal methods, and remaining hazards are identified. Quantities in some cases are estimated amounts. The following paragraphs describe the procedures used to identify and handle the sources of contaminants.

In 1981, 1984, 1985, and 1986, the 5099th Civil Engineering Operation Squadron (CEOS) of the USAF at Elmendorf AFB retrograded hazardous materials from the Port Heiden WACS site. The standard procedure was to ship the items to Elmendorf AFB for final disposal. Included among the items were PCB-contaminated transformers and capacitors; drums of PCB fluids and wastes, waste oil, oil-based paints, and solvents; and drums of PCB-contaminated soil. A total of 821 drums of PCB-contaminated soil were removed from the gravel pad outside of the WACS composite building from 1984 to 1986. No USAF records are available to indicate how the soils were identified, what PCB concentrations were removed, what remained, or the method of disposal upon reaching Elmendorf AFB (USAF 1981, 1986).

The USAF also buried debris at eight burial sites, identified as BS I through BS VIII, near the WACS site (USAF, 1981). No landfill permits were found for the burial sites. Sites BS II through BS VIII contained empty 55-gallon barrels from World War II. Each burial site was estimated to contain more than 100 barrels. Site BS I, northwest of the WACS site composite building, contained the following items: miscellaneous pieces of scrap iron,

Table 2.2-2
Summary of Remedial Actions at Port Heiden
from 1981 to 1992

Locations and Amounts of Media	Remedial Actions	Final Disposal Location	Remaining Hazards	References
Asbestos				
Pipe insulation from WACS site, 17 boxes sealed in plastic and labeled	Removed by 5099th CEOS, 1981	Buried in BS I, northwest of composite building	None	USAF, 1981
Pipe and exhaust stack insulation, floor tiles, and wallboard materials from WACS and Fort Morrow buildings	Removed by Technics Services, Inc., and Trans-Alaska Environmental Services and Construction Corporation under COE contract, 1990	Buried in permitted Landfill A, northeast of WACS site, in asbestos cell	None	COE, 1990; UC&AI, 1990
Building Materials				
Miscellaneous scrap iron, tin, pipe, wood, wire fence from WACS site	Removed by 5099th CEOS, 1981	Buried in BS I, northwest of composite building	None	USAF, 1981
All buildings, antennas, debris from WACS site, Fort Morrow, and FAA site, non-toxic materials	Removed by UC&AI under COE contract, 1990	Buried in permitted Landfills A, northeast of WACS site, and B, south of airfield	None	COE, 1990; UC&AI, 1990
Paints				
Assorted oil-base paints from WACS site, three boxes	Removed by 5099th CEOS, 1981; left at WACS to be shipped to Elmdendorf AFB at later date	Unknown	None	USAF, 1981
Water- and fish-oil-based paints from WACS site, no heavy metals, 31 gallons	Removed by 5099th CEOS, 1981	Buried in BS I, northwest of composite building	None	USAF, 1981

Table 2.2-2
Summary of Remedial Actions at Port Heiden
from 1981 to 1992

Locations and Amounts of Media	Remedial Actions	Final Disposal Location	Remaining Hazards	References
Paints (Continued)				
Paints, drums	Removed by UC&AI under COE contract, 1990	Northwest Enviroservice, Inc., State of Washington, disposal facility	None	COE, 1990; UC&AI, 1990
Polychlorinated Biphenyls				
PCB-contaminated transformers (8) from WACS site, nine 85-gallon capacity	Retrograded to Elmendorf AFB by 5099th CEOS, 1981	Unknown	None after 1990 removal	USAF, 1981
PCB-contaminated capacitors (48) from WACS site, up to 28-gallon capacity, most under 3 pounds				
PCB fluids from WACS site, 5 drums, 55 gallons each				
PCB-contaminated material, three 10-gallon drums				
PCB oil from WACS site, 9 drums	Retrograded to Elmendorf AFB by 5099th CEOS, 1984	Unknown	None after 1990 removal	USAF, 1986
PCB-contaminated soil from WACS site, 372 drums				
PCB Spill from WACS site, 27 drums				
PCB-contaminated soil from WACS site, 54 drums	Retrograded to Elmendorf AFB by 5099th CEOS, 1985	Unknown	None after 1990 removal	USAF, 1986

Table 2.2-2
Summary of Remedial Actions at Port Heiden
from 1981 to 1992

Locations and Amounts of Media	Remedial Actions	Final Disposal Location	Remaining Hazards	References
Polychlorinated Biphenyls (Continued)				
PCB-contaminated soil from WACS site, 395 drums	Retrograded to Elmendorf AFB by 5099th CEOS, 1986	Unknown	None after 1990 removal	USAF, 1986
PCB-contaminated soil from WACS site and FAA site, 58 drums or 170 cubic yards	Removed from Port Heiden by COE, 1990	APTUS Environmental Services, Kansas; soil was incinerated.	None	COE, 1990; APTUS, 1991
PCB capacitors, decontamination fluids, and equipment	Removed from Port Heiden by COE, 1990	Northwest Enviroservice, Inc., State of Washington, disposal facility	None	COE, 1990; UC&AI, 1990
Transformers and shells, several	Tested by Northwest Enviroservices, Inc., no PCBs found, under COE contract, 1990	Landfill after clearing	None	COE, 1990; UC&AI, 1990
Pesticides and Herbicides				
Esteron (2,4-D) from WACS site, 1 drum	Retrograded to Elmendorf AFB by 5099th CEOS, 1984	Unknown	None	USAF, 1986
Petroleum, Oil, and Lubricants				
Waste oil, 4 barrels	Removed by 5099th CEOS, 1981. Left at WACS to be shipped to Elmendorf AFB at later date	Unknown	None	USAF, 1981
Empty POL barrels from WACS site, est. 800	Removed by 5099th CEOS, 1981	20 buried at BS I; more than 100 each buried at BS II-VIII	None	USAF, 1981
Waste oil, 5 drums	Retrograded to Elmendorf AFB by 5099th CEOS, 1984	Unknown	None	USAF, 1986

Table 2.2-2
Summary of Remedial Actions at Port Heiden
from 1981 to 1992

Locations and Amounts of Media	Remedial Actions	Final Disposal Location	Remaining Hazards	References
Petroleum, Oil, and Lubricants (Continued)				
UST at WACS site	Removed by City of Port Heiden, 1990. Closure form filed by COE with ADEC	Tank owned by City of Port Heiden. Contaminated soil, <5,000 ppm TPH put in landfill cap, >5,000 ppm incinerated or shipped offsite	Some contaminated soil remains, called "gray lagoon"	COE, 1990
USTs at other Port Heiden sites	Pumped and removed by UC&AI, 1990. Closure form filed by COE with ADEC	Contaminated soil, <5,000 ppm TPH put in landfill cap, >5,000 ppm incinerated or shipped offsite	None	COE, 1990
Two aboveground tanks at Meshik	Demolished by COE, 1990. About 10,000 tons of soil, >100 ppm TPH, incinerated at Port Heiden		Soil and groundwater contamination still exists.	COE, 1990; Northwest Enviro-service, Inc., 1992
Pipeline, 3 inches, 33,000 linear feet, from Meshik to WACS site	Parts removed by COE during 1990 cleanup	Transferred segment from Meshik to airport to Reeve Aleutian Airways ownership	Unknown	COE, 1990; UC&AI, 1990
POL-contaminated soils, other fuel sources	Some added to cap of permitted landfills A and B; 70 cubic yards shipped out for disposal in Washington State	Landfill	None in landfill, some may remain in situ	COE, 1990; UC&AI, 1990

Table 2.2-2
Summary of Remedial Actions at Port Heiden
from 1981 to 1992

Locations and Amounts of Media	Remedial Actions	Final Disposal Location	Remaining Hazards	References
Petroleum, Oil, and Lubricants (Continued)				
POL-contaminated soils, WACS building outfall and sewer drain, called "the black lagoon"	Site investigations by COE, 1990	Still in situ	About 4,000 cubic yards of soil, >5,000 ppm TPH	COE, 1990; UC&AI, 1990
Waste oils and fuels, grease, antifreeze	Removed from site by COE, 1990	Northwest Enviroservice, Inc., State of Washington, disposal facility	None	COE, 1990 UC&AI, 1990
POL drums, est. 20,000	Cleaned, crushed, landfilled by COE, 1990			
Solvents, Cleaning Compounds, and Other Miscellaneous Compounds				
Calcium hypochlorite, 14 boxes, toluene liquid, 1 box; all from WACS site	Removed by 5099th CEOS, 1981; left at WACS to be shipped to Elmendorf AFB at later date	Unknown	None	USAF, 1981
Bromochloromethane, 1 drum Calcium hydroxide, 1 drum Carbon cleaning compound, 1 drum Phenol, 1 drum Toluene, 1 drum Trichloroethane, 1 drum All of above from WACS site	Retrograded to Elmendorf AFB by 5099th CEOS, 1984	Unknown	None	USAF, 1986

Table 2.2-2
Summary of Remedial Actions at Port Heiden
from 1981 to 1992

Locations and Amounts of Media	Remedial Actions	Final Disposal Location	Remaining Hazards	References
Solvents, Cleaning Compounds, and Other Miscellaneous Compounds (Continued)				
Solvents, drums	Removed by COE, 1990	Northwest Enviroservice, Inc., State of Washington, disposal facility	None	COE, 1990; UC&AI, 1990

Notes:

ADEC = Alaska Department of Environmental Conservation.
APTUS = APTUS Environmental Services.
est. = estimated.
UC&AI = Underwater Construction and Associates, Inc.
TPH = total petroleum hydrocarbon.

tin, pipe, and wood; empty barrels and gas cylinders; wire fence; an aluminum boat; asbestos pipe insulation; and water- and fish-oil-based paints.

In 1984, the USAF received waste-disposal permits for cleanup operations at Port Heiden (Permit 8421-BA014) and other remote WACS sites. According to the USAF (1984), "The 5099th (CEOS) believes that this one-shot cleanup will remove the last of the hazardous material and bury the remaining general debris at the sites." No record exists about the contents or location of the debris buried at Port Heiden during the 1984 effort. Correspondence indicates that the USAF allowed the permit to expire in October 1984.

In accordance with the National Environmental Policy Act of 1969, the COE released a public notice, environmental assessment (EA), and finding of no significant impact (FNSI) on a proposal to clean up debris at Port Heiden, including the abandoned World War II U.S. Army base of Fort Morrow and the WACS site (COE, 1985). Review comments were received from resource agencies. The U.S. Fish and Wildlife Service (USF&WS), found the EA, FNSI, and cleanup design to be inadequate in three areas: (1) the lack of site-specific information regarding the chemical nature of hazardous and toxic substances and the extent of their habitat contamination; (2) the presence of generic, unsubstantiated statements regarding the environmental safeguards to be employed to minimize the impacts; and (3) identification of solid-waste and hazardous-waste sites (USF&WS, 1986).

As a result of the comments, a revised public notice, EA, and FNSI were issued in 1987 (COE, 1987). The revisions included maps identifying locations of existing barrel dumps, proposed landfills, fuel tanks, and buildings to be demolished. During this same period, the COE hired a contractor to inventory debris and produce preliminary plans and specifications for the DERP cleanup of the site.

In June 1986, August 1987, and June 1988, the COE collected samples of soil, surface water, groundwater, fluids from drums and transformers, and miscellaneous building mate-

rials at Fort Morrow and the WACS site. The analytical results and field observations identified the following sources of contaminants at the WACS site (Figure 2.2-1):

- Asbestos in pipe insulation, floor tiles, and wallboard
- PCB-contaminated sludge in floor trench
- PCB-contaminated soils (200 parts per million [ppm]) to the west and north of the composite building in the upper 2 feet of soil
- Soil contaminated by POL (saturated) and metal (total arsenic, 19 ppm; barium, 136 ppm; chromium, 15 ppm; lead, 28 ppm) in an outfall and sewer drain, called "the black lagoon"
- UST on east side of building

Also, the entire Fort Morrow area was inventoried for debris, and environmental samples were collected for laboratory analyses. Primary areas of concern included the following items:

- Fuel-tank foundation rings at Meshik
- Pipeline running from Meshik to the WACS site
- Debris, including some asbestos from more than 400 World War II Quonset huts and buildings
- Thousands of mostly empty POL drums scattered in piles
- Scattered transformer casings

- PCB-contaminated (190 ppm) soil at the former FAA site
- Asphalt drums and spill areas
- USTs and known fuel spills
- Landfill near the airfield containing domestic garbage and debris
- Water wells improperly abandoned

In 1989, the COE issued revised plans and specifications for the DERP cleanup and restoration of DOD facilities at Port Heiden, including Fort Morrow, the WACS site, and the FAA site. The plans and specifications were reviewed by various resource agencies, including the EPA and Alaska Department of Environmental Conservation (ADEC), and by the public. In late 1989, the COE awarded the cleanup contract to Underwater Construction and Associates, Inc. (UC&AI), of Anchorage. Before field work, UC&AI submitted a quality assurance project plan, health and safety plan, hazardous waste handling plan, and revegetation plan. The following information on the cleanup was taken from COE (1990) and UC&AI (1990) daily inspection reports and laboratory reports (Northwest Enviroservice, Inc., 1990, 1991, and 1992).

In April 1990, representatives of the COE, ADEC, and contractors visited the site. They observed that the City of Port Heiden had removed the 20,000-gallon fuel tanks from the northeast side of the composite building for the city's use. The remaining hole in the ground contained standing water that had a fuel sheen. A 30,000-gallon fuel tank shown on bid documents was not located in 1990.

During the summers of 1990 and 1991, hazardous materials were removed from Port Heiden and disposed of offsite. Nonhazardous materials were disposed of in two landfills: Landfill A northeast of the composite building and Landfill B south of the airfield.

Asbestos-containing materials removed from the composite building and Quonset huts were deposited in Landfill A in a designated cell.

During the DERP cleanup, Northwest Enviroservice, Inc., operated a field lab capable of screening for POLs, PCBs, polynuclear aromatic hydrocarbons, and volatiles. The majority of samples analyzed were tested for POLs and PCBs. Ten percent of the samples were duplicated and sent to Chemical and Geological Laboratory in Anchorage to test by standard EPA methods. In addition, confirmation soil samples were sent to a COE-contract laboratory to verify that cleanup had been achieved.

Soil cleanup levels were negotiated with the ADEC as follows:

- 25-ppm of PCBs at the WACS site composite building
- 10-ppm of PCBs at the FAA site (because of the proximity of a residence)
- 100-ppm of TPH at all sources

The landfill permits and contract specifications did not allow any hazardous wastes or liquid POL products in the landfills. Landfill depths—the bottoms of the landfills were to be at least 4 feet above the water table—were verified by digging test pits. Hard asphalt chunks could be dumped in the bottoms of the landfills. The permits allowed POL-contaminated soil to be placed in a 6-inch lift of the final 24 inches of the cap.

Negotiations between the COE and ADEC resulted in soils of up to 5,000-ppm of TPH being added to the 6-inch lift. Soils exceeding TPH concentration of 5,000 ppm were either incinerated onsite (1991-1992) or disposed of offsite. Because the amount of POL-contaminated soils far exceeded the capacity allowed in the landfill cap, most of the soils between 100 and 5,000 ppm were also incinerated onsite or left in place (discussed in risk assessment summary that follows). Landfill caps were graded according to specifications, then fertilized and reseeded. Currently, the COE is preparing landfill closure reports for Landfills A and B to file with the ADEC (Robert Rozier, COE, personal communication, 1993).

The WACS site composite building, antennas, and associated structures were removed and deposited in Landfill A. The WACS site septic tank and well were demolished and abandoned in place as specified in the contract. Building debris from other areas of Fort Morrow ended up in both landfills. Disturbed areas were fertilized and reseeded according to contract specifications.

During the DERP cleanup, an estimated 20,000 barrels from the Fort Morrow area were inspected, crushed, and placed in a landfill. Drums that were full or partially full were emptied, then steam-cleaned and crushed at a lined-and-bermed staging area, before being buried in a landfill. Fluids from drums and liquid asphaltic material were tested, composited, and disposed of offsite. About 4,200 drums contained residue or fluids and required special handling and disposal of contents. Cleaning water was run through an oil-water separator and disposed of in accordance with ADEC guidelines. According to the COE project manager, PCB concentrations were below 10 ppm in soil samples collected after the drums were removed.

Soil contaminated with PCB was removed from the WACS and FAA sites to below the negotiated cleanup levels (25 and 10 ppm, respectively). Sludge containing PCB was removed from the concrete floor trench in the WACS site composite building to a final level of 1.4 ppm. About 170 cubic yards of PCB-contaminated soil were shipped to a licensed PCB-incinerator in Kansas. Records of receipt and disposal of the soils are on file with the COE (APTUS Environmental Services, 1991).

Other items were shipped to a Northwest Enviroservice, Inc., facility in Seattle, Washington, for disposal. These items included waste paints, solvents, oil and fuel, PCB capacitors, grease, antifreeze, field-laboratory waste, PCB-decontamination fluids and equipment, and steam-cleaning condensate. About 70 cubic yards of POL-contaminated soil, ranging from 5,000 to 300,000 ppm of TPH, also were shipped to Seattle for disposal.

In 1991, the COE issued a risk assessment for the remaining POL-contaminated soil at Port Heiden. Chemical sampling during the first year of the DERP cleanup indicated that

about 20,000 cubic yards of soil containing POLs below negotiated cleanup levels remained on the entire cleanup area. The following is an excerpt from the 1991 COE report: "The soil samples were taken from areas likely to have high concentrations of contamination: under and around fuel tanks, near barrel dumps, in surface-stained soils, etc. Surface and groundwater samples taken at the immediate vicinity as well as downhill from the contamination has been minimal. The fuel spills occurred at least 20 years ago, yet samples at depth indicate that vertical migration has been minor. The groundwater table is about 20 feet below the ground surface. It appears very unlikely that any contaminants would reach ground water, even if no further action were taken to remediate the TPH-contaminated soils. This is probably due to several factors: (1) the relatively small amount of fuel that was spilled or leaked; (2) a relatively high organic carbon content in the soil from vegetation and volcanic ash; and (3) a distinct subsurface clay layer observed in sampling." The assessment went on to conclude that risks from the in-situ contaminated soil to wildlife and humans were negligible.

The recommendations of the 1991 risk assessment were to clean up soils near the tank-foundation rings at Meshik to 100 ppm of TPH by incineration. Soil at other areas (including the WACS site) was to be left in place if containing up to 5,000 ppm of TPH and incinerated if containing above 5,000 ppm of TPH. The soil would be replaced, fertilized, and seeded with grasses after remediation. This replaced soil would act as a cap over the remaining soils.

The 1991 COE risk assessment report stated: "The cap shall be designed not to allow percolation of water to the contaminated soil and will be contoured not to allow erosion. With the major source of contamination removed, the clay layer between the contamination and groundwater, and a vegetated cap, the remaining TPH soil becomes unavailable. This would allow natural processes to degrade the contamination." According to Robert Rozier (COE construction inspector at Port Heiden), these recommendations were accepted by the ADEC.

In 1991 and 1992, an incinerator (Mobile Soil Reclamation Unit) was operated at Port Heiden to treat the large quantities of soil excavated that had greater than 100 ppm of TPH. An EA on the process was distributed for public review in April 1991. The incinerator was operated by VECO Environmental and Professional Services, Inc., under contract to UC&AI. Northwest Enviroservice, Inc., operated the field lab to characterize the concentration and extent of the POL contamination both before and during the excavation and the remediation process.

Initial test burns on the incinerator failed particulate emission tests because of the fine volcanic ash composition of much of the soil. Design changes in the bag house allowed more than 10,000 tons of soils to be incinerated before the contract funds ran out in 1992.

Much of the incinerated soil came from the area of the tank-foundation rings at Meshik. Highest contamination was 80,000 ppm of TPH in clay material of the tank-foundation ring. Also, according to the COE project manager, pure diesel was observed floating on the water surface near the tanks. Contamination and excavation at that source reached the water table, and tidal fluctuations continued to smear contamination at the interface of the water table and vadose zone. A pit that was excavated covered a surface area of nearly half an acre and was about 172 feet long north to south and 72 feet wide east to west on the south end, and 150 feet wide on the north end of the pit. Excavation occurred in all directions until the limits of contamination were found or until the excavation came within 10 feet of the oceanside bluff (left intact as a sea wall). The excavation material was known to be contaminated. Collection and analysis of confirmation samples indicated that the north, south, and east walls of the excavation were free of contamination. The excavation was taken down to within 1 foot of the water table with the exception of two areas that were submerged below water. Most of the confirmation samples indicated that the floor of the excavation was free of contamination. Confirmation sampling was limited to areas not actively flooded with water (Northwest Enviroservice Inc., 1992). According to the COE project manager, TPH concentrations were below 100 ppm.

On the basis of a review of COE inspection reports and field laboratory reports and of an interview of COE personnel, POL-contaminated soil remains at Port Heiden in at least three areas: (1) the tank rings and pipeline at Meshik, (2) the black lagoon at the WACS site, and (3) the gray lagoon at the WACS site. Other spill areas identified by Northwest Enviroservice, Inc., (1992) may need additional testing and excavation.

The black lagoon is a drain outfall area west of the composite building on the WACS site. The term "lagoon" refers to the observation that standing water can be temporarily found in the area following heavy rains or spring snowmelt. Extensive soil sampling has found contamination to 40,000 ppm of TPH, volatiles in the low parts-per-billion range, no PCBs, and no polynuclear aromatic hydrocarbons. Transects cut into the area found soils contaminated at above 5,000 ppm of TPH at the 12-foot depth, the vertical extent of the cuts. The contractor estimated that about 4,000 cubic yards of soil above 5,000 ppm of TPH exist in the black lagoon source. Plume boundaries were not defined completely.

The gray lagoon is the area near the diesel tank excavation northeast of the composite building (Figure 2.2-1). Underground utility lines may have provided channels for fuels to flow to the north of the excavation and Antenna Pad 3. The highest concentration of TPH was 8,600 ppm in a trench dug north of the source. High concentrations were also found around the antenna pad. The concrete antenna pad is the only structure remaining at the WACS site. It was not removed because of the surrounding soil contamination. According to the COE project manager, soil removals were based on PCB concentrations below 10 ppm in remaining soil.

2.2.2 Solid Waste Disposal

Although the Port Heiden WACS site operated from 1958 to 1978, no records identify the location of waste disposal during that period. A former landfill, owned by the USAF and adjacent to the airport terminal building, was used in the past, but is now closed. An EPA report form indicated no apparent releases from the landfill.

Permit 8321-BA014 was issued on June 29, 1984, for debris disposal, but the application does not indicate a site location. The permit files do not contain record drawings, records of use, or closure documentation.

Permit 8721-BA012 was issued for the disposal of demolition debris at Landfill A and 87211-BA013 was issued for Landfill B on February 5, 1988. The proposed site A is located at the WACS site, and site B is one-half mile south of the west end of the runway (Figure 2.1-1). The permit files of the ADEC Solid Waste Management Program do not contain record drawings, records of use, or closure documentation. The permits expired on January 31, 1993.

2.2.3 Wastewater Treatment and Disposal

Wastewater disposal at the Port Heiden WACS site was accomplished with a septic tank and leach field (Figure 2.2-1). The disposal system was demolished and abandoned in place during the COE 1990 site activities. According to the COE project manager, confirmation soil samples were collected during the demolition.

2.2.4 Water Supply

A well location west of the composite building was used to supply water for the WACS site. The well was abandoned during the COE 1990 site demolition activities.

2.3 Demographic Characteristics near the Site

Two main population centers are in the Port Heiden area: the Village of Port Heiden and the Village of Meshik. Port Heiden is incorporated as a second-class city and has a population of about 30 people. The population includes fewer than 10 residents of the Village of Meshik. Meshik has slowly been abandoned over the past few years because of erosion

and subsidence problems. The majority of the population in the Port Heiden area lies along the road between Meshik and the Port Heiden airfield. Table 2.3-1 shows the population distribution by distance from the WACS site. Data in the table are based on estimates of percentages of population within the distance ring. No one lives, works, or attends school or day care within 200 feet of any identified source at Port Heiden.

Table 2.3-1
Population Within HRSII Distance Rings
for the Port Heiden White Alice Site

Distance (miles)	Population[a]
0-1/4	0
1/4-1/2	0
1/2-1	0
1-2	5
2-3	10
3-4	15

[a]Based on estimated percentage of population within ring.

Note: HRSII = Hazard Ranking System II.

2.4 Investigative and Regulatory History

The USAF retrograded PCB transformers, PCB capacitors, solvents and waste oils to Elmendorf AFB for final disposal in 1981 and 1984. The USAF also removed 861 drums of PCB-contaminated soil in 1984, 1985, and 1986.

In 1986, 1987, and 1988, the COE conducted site investigations. From 1990 to 1992, the COE managed a DERP cleanup of DOD debris and hazardous materials at Port Heiden,

including the WACS site, Fort Morrow, and the FAA radio tower site. Debris was buried in two onsite, permitted landfills. The WACS site buildings and more than 400 other buildings of World War II origin (Fort Morrow) were demolished and buried. Soils containing PCB contamination were excavated and transported to Kansas for incineration. More than 10,000 tons of soils contaminated with POLs were incinerated at Port Heiden. Other hazardous materials were shipped to a disposal facility in the state of Washington.

Section 3

Potential Targets

This section discusses possible exposure pathways for potential contamination from the Port Heiden WACS site. These pathways are groundwater, surface water, soil, and air.

3.1 Groundwater Pathway

This subsection discusses the hydrogeologic setting and potential exposures to groundwater near the Port Heiden site. The geologic setting and hydrogeologic characteristics of the area are summarized, and potential groundwater exposures through drinking water and other uses are presented for 1-mile and 4-mile radii of the site.

3.1.1 Geologic Setting

The following discussion of the geologic setting near the Port Heiden site is based on data contained in the public record and existing published reports.

The Alaska Peninsula is an area of recent volcanic and tectonic activity. Two volcanoes in the Port Heiden area, Aniakchak Crater and Mount Veniaminof, form the major geologic features of the site. Fort Morrow and the Village of Meshik are on a gentle, sloping alluvial plain below Aniakchak Crater. Rocks in the area are primarily volcanic; however, some sedimentary material occurs. The area also exhibits glacial features including moraines and paraglacial lakes, in addition to evidence of fluvial surface processes that have produced outwash, floodplains, alluvial fans, beaches, spits, and deltas.

3.1.2 Hydrogeologic Characteristics

Hydrogeologic Setting

The Port Heiden WACS site is in a permafrost-free area (Sloan and Van Everdingen, 1988). Groundwater beneath the site occurs in unconsolidated sediments. The depth to groundwater is 20 to 35 feet (COE, 1991). A clay layer was observed in two test pits excavated to separate contaminated soils and groundwater (COE, 1991). The test pits were excavated to a depth of 27 feet bgs, and were subsequently backfilled with original material.

Groundwater is believed to recharge the shallow ponds, lakes, and creeks in the area (COE, 1987).

Groundwater Contaminant Classification

Petroleum spills and leaks are believed to be the primary sources of contamination at the Port Heiden WACS site. These source areas are considered to be unlined.

Drinking Water Wells and Other Groundwater Uses

The Village of Meshik is the closest populated area (approximately 10 residents). The community profile obtained from the Alaska Department of Community and Regional Affairs states that individual water wells constitute the village's water supply. The U.S. Geological Survey Groundwater Site Inventory Database does not list any wells within a 4-mile radius of the site, however.

3.2 Surface Water Pathway

3.2.1 Surface Water

The Port Heiden WACS site is on the broad flat plain of the Alaska Peninsula that slopes gently towards Bristol Bay. The overall surface-water drainage of the region is to the west and Bristol Bay. The area surrounding the WACS site consists of undulating, moist tundra, with no defined drainage patterns. The WACS site was built on a gravel pad that is slightly elevated above the surrounding terrain. Surface-water runoff can be expected to drain to the surrounding tundra, then percolate into the ground or evaporate.

The prominent surface-water features in the area include Reindeer Creek (locally known as North River) and an unnamed tributary about 1 mile north of the site. A poorly drained lowland with small shallow ponds starts 1 mile south of the site and extends south another mile to Abbott Creek. The lowland drains to Bristol Bay and Port Heiden through unnamed streams and Abbott Creek. Bristol Bay is 1.2 miles west of the WACS site.

The Meshik River lies about 5 miles south of the site. Drainage headwaters originate on Aniakchak Crater and other mountains to the east. The lower Meshik River is an estuary that drains to Port Heiden, an area of tidal mudflats protected from the currents of Bristol Bay by a spit and barrier islands. Surface-water runoff from the Port Heiden WACS site is not expected to reach the Meshik River.

Runoff from the WACS site may travel over a drainage area of about 890 acres to the point of probable entry into Bristol Bay, and roughly 768 acres to the point of probable entry into Reindeer Creek. No discharge data were available for surface waters in the Port Heiden area.

Surface water is not used in the area surrounding the Port Heiden WACS site. Drinking water for Meshik and Port Heiden is provided by individual water wells. Surface-water intakes are not known to exist.

All sources at the Port Heiden WACS site are considered to be unlined.

Surface water is a potential, but minor, pathway for contaminant migration at the WACS site because the lack of distinct surface-drainage patterns at the site allows runoff to percolate into the soil nearby or evaporate.

Surface water is a more significant pathway at the former bulk fuel-storage area in Meshik because of the tidal influences and wind-driven waves near the source.

3.2.2 Floodplains

Port Heiden has not been mapped by the Federal Emergency Management Agency. The flood hazard is low, and residents report no history of flooding. Beach erosion in the coastal sections is a serious problem during high tides and wind-driven waves, however (COE, Alaska District, Alaskan Communities Flood Hazard Data, June 1993).

3.2.3 Sensitive Aquatic Environments and Wetlands

Bristol Bay supports an abundance of marine life, including 22 species of marine mammals, shellfish, salmon, bottomfish, and marine birds. The Port Heiden site area provides important habitat for harbor seals, sea otter, sea lions, and whales. These marine mammals are attracted by the large influx of salmon into the Meshik River system. The system also supports a local commercial fishery that is important to the residents of Meshik.

The presence of larger animals in the shallow-water marine environment indicates an abundance of dissolved nutrients in the offshore water. These nutrients support rich seasonal crops of phytoplankton that provide the primary forage food for the larger species. The shallow bay and ocean provide food for waterfowl, terrestrial birds, seabirds, marine mammals, and land mammals (Figure 3.2-1). Dense beds of kelp and eelgrass are found a short distance offshore and provide essential habitat for numerous marine species.

No endangered species are known to occur in the Port Heiden site area. The Aleutian Canada goose is known to fly over the southern tip of the Alaska Peninsula, more than 100 miles southwest of Port Heiden. Peregrine falcons use the area for feeding and nesting. The falcons found on the Alaska Peninsula are identified as the "Peale's" subspecies, which is not endangered; the "American" subspecies is endangered. On the basis of the location and subspecies distinction, the falcons occurring in the site area are not considered to be endangered.

Although the National Wetlands Inventory has not mapped any wetland areas near the Port Heiden WACS site, wetlands likely occur north and south of the site.

3.2.4 Fishery and Other Aquatic Resources

The Port Heiden WACS site is close to both freshwater and marine fishery resources. Reindeer Creek (1 mile north) is used by sockeye salmon as a spawning area, and Barabara Creek (5 miles southeast) and Birthday Creek (8 miles south) are used by chum salmon for spawning grounds. The coastal regions provide feeding areas for Pacific herring and habitat for chum, king, coho and sockeye salmon (ADF&G, 1986c and 1986d). These species of salmon are also fished commercially throughout the area.

Several small shallow ponds, small lakes, and creeks are found in the immediate area of the Port Heiden site. Interspersed areas of wet bog and tundra also occur throughout the site. All of these aquatic resources are shallow and support various aquatic plant species.

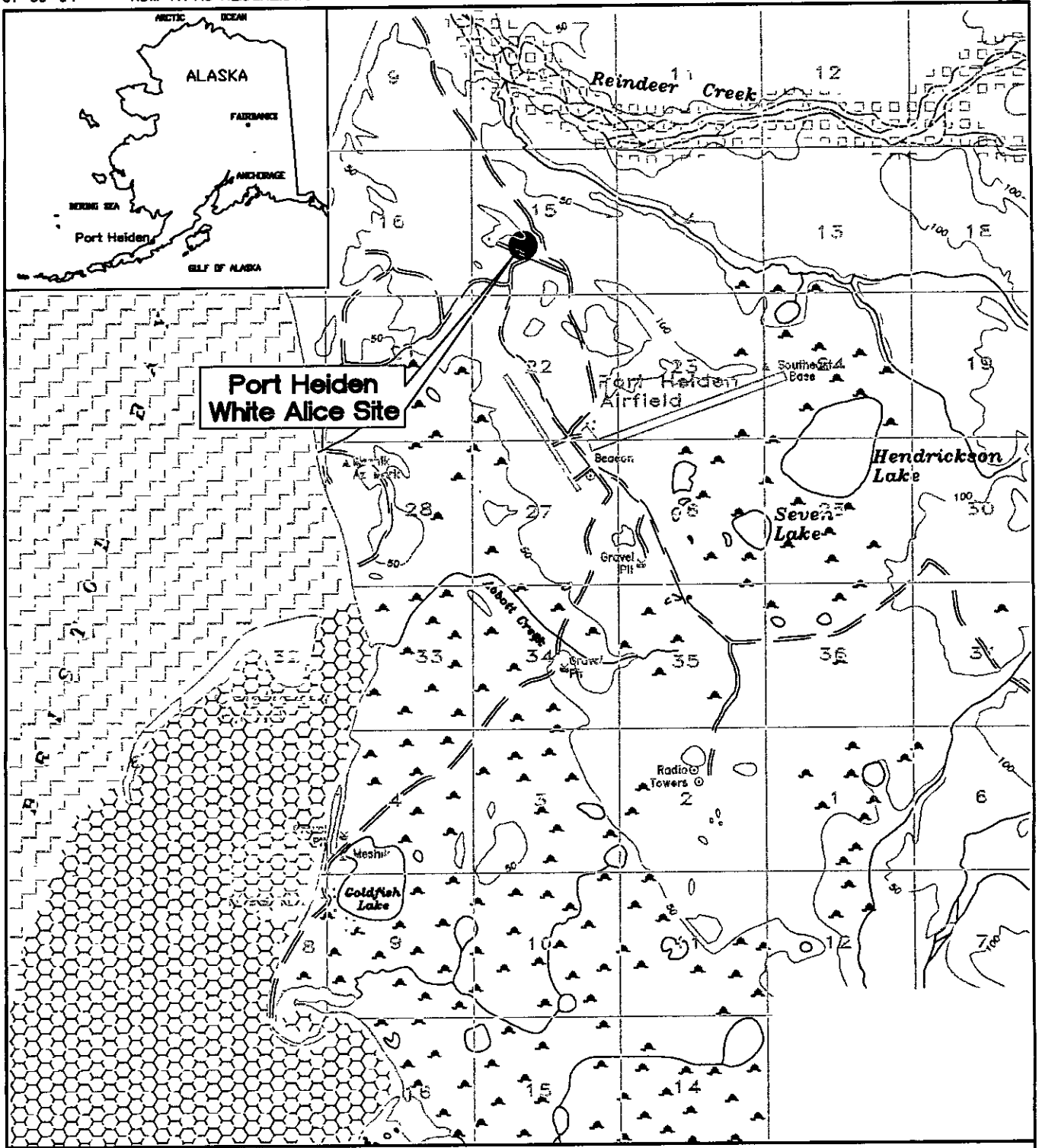
The streams and interconnected ponds and lakes provide habitat for pink, chum, and coho salmon, and Dolly Varden trout. Vegetation in lakes and ponds includes an abundance of pondweeds, sedges, and rushes around the fringes and in the shallow portions. Such vegetation provides essential habitat for salmon and trout fry and for other aquatic species. The nutrient content of the bottom material is rich and enables abundant growth of plants and other aquatic species in limited areas. Waterfowl and shorebirds use these ponds and lakes for feeding and resting on their yearly migrations (ADF&G, 1986c and 1986d).

The Port Heiden WACS site supports diverse and abundant marine species, including waterfowl, seabirds, and mammals, as well as species that use marine waters for feeding or resting. The Port Heiden Bay and estuary are designated as a state critical habitat area, and the Meshik River and drainages flowing into it are designated as critical salmon habitat (ADF&G, 1986c and 1986d).

Commercial and subsistence fishing are a major part of the economy and lifestyle of the residents of the community of Port Heiden, which includes the Village of Meshik, as well as the Village of Port Heiden. Very little information on recreational fishing is available. The most complete harvest information available on recreational or sport fishing is based on mail surveys (Mills, 1992). Because of the low sport-fishing effort on the Alaska Peninsula, the results of the survey do not provide data specific to the streams or ocean shoreline near Port Heiden.

Subsistence Fishing Harvests

Aquatic resources are very important in the diet of residents. Table 3.2-1 shows the subsistence harvest of wild resources by Port Heiden residents for June 1986 through May 1987. Fish used for subsistence are caught specifically for subsistence or as part of the commercial catch. One hundred percent of Port Heiden households responded to the survey that provided data for Table 3.2-1. Seventy-six percent of the households surveyed had members who participated in commercial salmon fishing in 1986. Subsistence fish



Legend

- Harbor Seal
- Pacific Hearing
- Sea Otter
- Seabirds
- Sockeye Salmon - Spawning Habitat

0 1
SCALE IN MILES

FIGURE 3.2-1
SENSITIVE AQUATIC ENVIRONMENTS FOR PORT HEIDEN
PORT HEIDEN, ALASKA

Table 3.2-1
Subsistence Harvest of Wild Resources by Port Heiden Residents from June 1986 Through May 1987

Resource	Total Edible Harvest (pounds)	Per Capita Harvest (pounds)	Estimate of Population Using Resource (percent)
Birds	1,374	13.34	86.5
Cranes	36	0.35	13.5
Ducks	315	3.06	73.0
Eggs	348	3.38	59.5
Geese	416	4.04	43.2
Ptarmigan	259	2.51	73.0
Shorebirds	1	0.01	
Fish	9,971	96.81	97.3
Flounder	30	0.29	10.8
Halibut	148	1.44	21.6
Roe on kelp	50	0.49	2.7
Salmon			
Chinook	2,422	23.51	70.3
Coho	3,468	33.67	83.8
Landlocked	9	0.09	2.7
Pink	10	0.10	8.1
Sockeye	2,266	22.00	73.0
Spawn-outs	592	5.75	24.3
Smelt	13	0.13	48.6
Trout and char	963	9.35	86.5
Land Mammals	25,846	250.93	100.0
Beaver	17	0.17	5.4
Caribou	25,200	244.66	100.0

Table 3.2-1
Subsistence Harvest of Wild Resources by Port Heiden Residents from June 1986 Through May 1987

Resource	Total Edible Harvest (pounds)	Per Capita Harvest (pounds)	Estimate of Population Using Resource (percent)
Moose	540	5.24	21.6
Porcupine	88	0.85	13.5
Marine Invertebrates	1,824	17.71	86.5
Cockles	1,824	17.71	86.5
Marine Mammals	1,543	14.98	32.4
Seal	168	1.63	32.4
Walrus	1,375	13.35	5.4
Vegetation	1,427	13.85	75.7
Berries	1,407	13.66	75.7
Plants, greens, mushrooms	20	0.19	24.3

Source: Fall and Morris, 1987.

nets are set along the beach near the old Village of Meshik, 6 miles south of the WACS site (Fall and Morris, 1987).

Marine mammals, waterfowl, seabird eggs, and cockles are harvested from aquatic environments. Cockles are harvested along the Bristol Bay beach west of the WACS site. Walrus are not hunted, but residents comb the beaches and salvage the fat, flippers, and tusks of walrus that wash ashore.

Most of the bird eggs are from seagulls and terns. Waterfowl are harvested during both the spring and fall migrations. All waterfowl hunters reported using the wetlands and streams closest to the WACS site. Roads through the WACS site provided easy hunting access.

Commercial Fishing Harvests

Table 3.2-2 shows the estimated commercial harvest of salmon for the entire Northern Alaska Peninsula management district, which includes Bristol Bay and the rivers entering it from Port Moller to Ugashik Bay. Most of the salmon harvest occurred south of Port Heiden from Strogonof Point to Port Moller (Geiger and Savikko, 1993). Strogonof Point is 10 miles south of the WACS site; Port Moller is 100 miles south.

The Meshik River supports a commercial run of chinook salmon in late May and a coho salmon run in August (USF&WS, 1993). Commercial harvests of flounder and other deep-ocean fish also occur, but specific harvest figures are not available (Selkregg, 1984).

Table 3.2-2 Estimated 1992 Commercial Harvest of Salmon for the Northern Alaska Peninsula Fishing Area	
Salmon Species	**Number of Fish**
Chinook	13,000
Chum	332,000
Coho	194,000
Pink	179,000
Sockeye	3,529,000
Total	4,247,000
Source: Geiger and Savikko, 1993.	

3.3 Soil Pathway

The Point Heiden site sits on the Bristol Bay Coastal Plain. This area is generally characterized by soils of the Typic Cryandepts association (Soil Conservation Service, 1979). These soils occupy coastal plains and mountain footslopes, and occur where thick layers of volcanic ash and cinder overlay glacial till or outwash. The soils are generally well to excessively drained and are characterized by volcanic ash and cinder with a sandy and loamy texture.

Site-specific studies indicate that soils in the area are primarily volcanic in origin. Upland soils are composed of volcanic ash interspersed with rocks, rubble, or cinders, and are typically silty or sandy. Soils in the lowland areas are thicker and consist of ash with a loamy texture that has high organic content (COE, 1991).

On the basis of EPA criteria for describing surface soil, soils of the Point Heiden site are considered to be predominantly coarse-textured soils with high infiltration rates.

3.3.1 Sensitive Terrestrial Environments

As outlined in the Bristol Bay Regional Management Plan (1985), the Port Heiden area is to be managed primarily for recreation, the habitat and harvest of fish and wildlife, and future oil and gas exploration and development. Future land uses identified include a community-expansion settlement, oil and gas exploration and development on Alaska Peninsula National Wildlife Refuge lands, a trans-peninsula transportation corridor (for roadway or pipeline), and mineral exploration and development.

Land at Fort Morrow was selected for conveyance to the Meshik Village Council and Bristol Bay Native Corporation and includes the Village of Meshik and the Port Heiden WACS site. The State of Alaska is interested in acquiring ownership of the Port Heiden state critical habitat area on the northwest edge of Port Heiden. Two national conservation system units are also adjacent to the Port Heiden WACS site: Aniakchak National Monument and Preserve and the Alaska Peninsula National Wildlife Refuge. Portions of these lands are under review for inclusion in the National Wilderness Preservation System. The Meshik River may be studied for designation as a wild and scenic river.

The WACS site is on a coastal plain adjacent to a large shallow bay and contains several different habitats: the beach, low-shrub, and ericaceous tundra, and the low wet and bog types. The area is considered good wildlife habitat, and is used seasonally by caribou, waterfowl, brown bear, seabirds, and marine mammals (ADF&G, 1986a). A map depicting sensitive terrestrial environments within the Port Heiden area is shown in Figure 3.3-1.

The terrestrial environment of the northern side of the Alaska Peninsula is very diverse. Habitats include the open, low-shrub, and ericaceous tundra found on the tops and windward sides of the small hills, ridges, and exposed sites. This habitat type is dominated by heaths and includes crowberry, bearberry, lichens, dwarf willows, and mosses. Additional species include low-bush cranberry, yarrow, fireweed, grasses, and sedges. The leeward sides of the hills and protected areas support the same species; however, growth is taller

and lusher, and includes additional species such as sedges, alder, willows, cow parsnip, grasses, dewberry, monkshood, dwarf birch, devil's club, and others. On some protected leeward slopes, alder and willow shrubs form a continuous canopy and reach heights of about 6 feet.

Along streams and floodplains, willow and alder shrubs are interspersed with bare gravel bars, marshes, ponds, and grassy areas that support primary successional species of herbs, grasses, and forbs. Dunes and beach areas support beachgrass, other grasses, and various forbs. Lower wet and bog habitat is found throughout the Port Heiden site area. These areas of saturated soils support plant communities dominated by sedges (cottongrass), mosses, and water-tolerant shrub species. The affected habitat for the WACS site is primarily the open, low-shrub, and ericaceous tundra; a limited portion is in the beach-dune habitat (Selkregg, 1984).

The northern portion of the Alaska Peninsula and the surrounding waters support diverse and abundant species of terrestrial wildlife, marine mammals, and birds. The major land mammals include caribou, moose, and brown bear. Caribou are the principal species that could be affected by contaminant migration. A portion of the Alaska Peninsula caribou herd passes through the Port Heiden WACS site area during spring and fall migrations.

During February and March, caribou begin moving down the Alaska Peninsula from winter range between the Ugashik and Naknek rivers to calving grounds primarily south of Port Heiden on a plain between Bear River and Port Heiden Bay. Calving has occasionally occurred northeast of Port Heiden between Port Heiden and the Cinder River. During migration, most cows follow a straight line paralleling the coast between the mouths of the Ugashik and Meshik rivers and reach calving grounds by mid-May. They return by the same route in late September and in October. As a result of these movements, caribou are generally in the Port Heiden area in April and May, and in late September and October (ADF&G, 1986a).

01-09-94 NDM 17PAS HEIDEN3.DWG

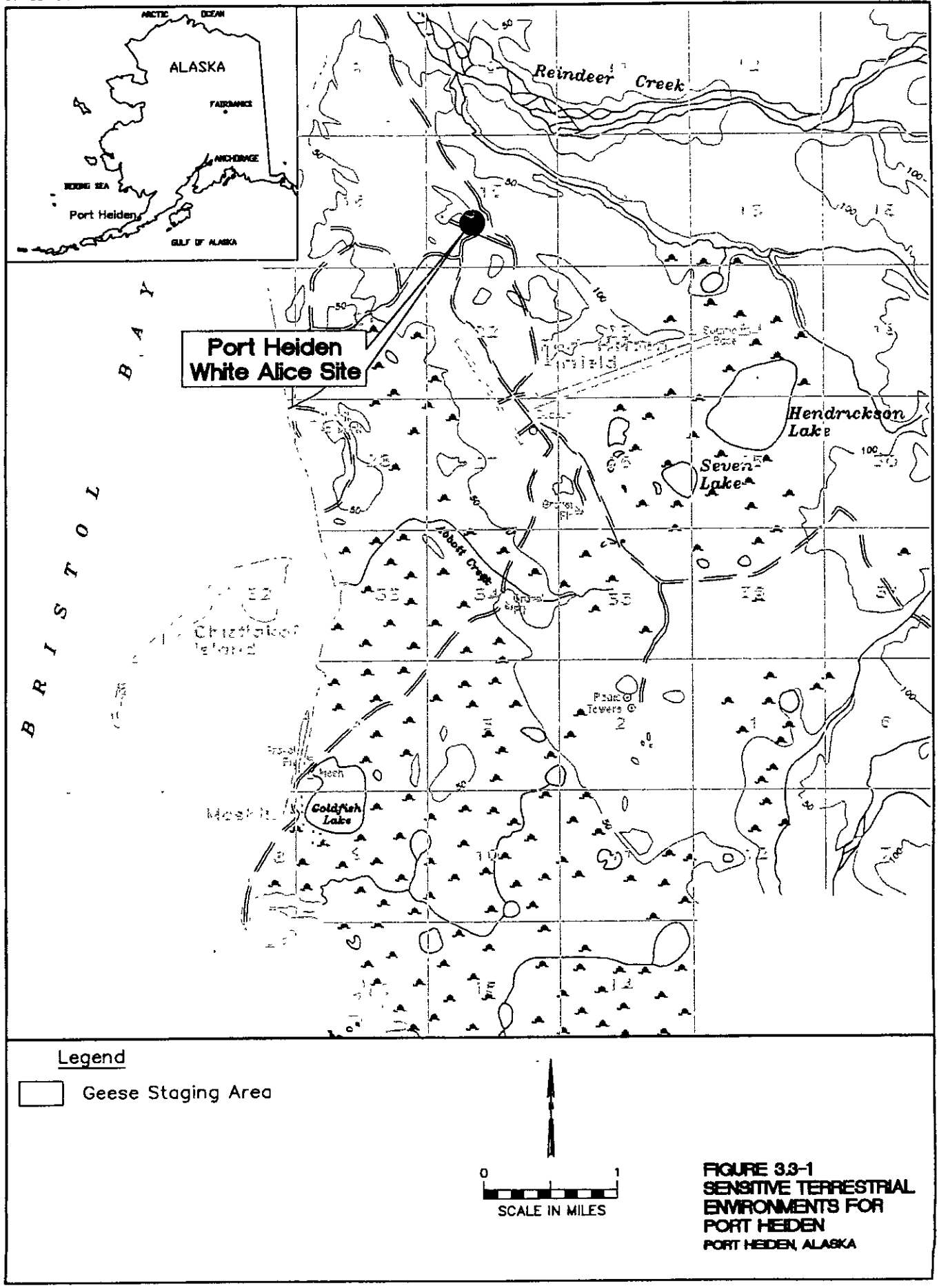


FIGURE 3.3-1
SENSITIVE TERRESTRIAL ENVIRONMENTS FOR PORT HEIDEN
PORT HEIDEN, ALASKA

Moose generally are found inland on the higher elevation foothills and along stream courses. Bears use the area as a function of available food sources. Predators, including red fox, wolves, wolverine, river otter, mink, least weasel, ermine, and, occasionally, lynx and arctic fox, inhabit the area. Herbivores in the area include muskrat, beaver, lemmings, porcupines, and arctic ground squirrels. Before site demolition, red foxes were found denning under old Quonset huts and hunting in the thick vegetation around them (ADF&G, 1986a).

The Port Heiden WACS site is an important migratory stop for large flocks of geese, ducks, passerine species, and shorebirds. They feed and rest in the shallow bay during spring and fall migrations. During the summer, the area supports low-density populations of waterfowl and habitat for nesting passerine species. Port Heiden Bay is used by pelagic bird species, and provides year-round habitat for neritic (shallow water) seabirds and raptors (ADF&G, 1986a).

Bird species that nest near the site include rock and willow ptarmigan, ravens, gulls, swallows, and raptors. Swallows used the rafters in old Quonset huts for nest sites. The tall dense patches of willows, grasses, and plants around Quonset huts were used for escape and nesting cover by passerine species. Raptors, including the gyrfalcon, used the microwave towers as perching and nesting sites. Bird nesting is primarily on the ground, in the water, or in the available short willows and alders (ADF&G, 1991).

3.3.2 Subsistence and Recreational Hunting and Gathering Activities

Table 3.2-1 shows the subsistence harvest of land mammals, berries, and greens by Port Heiden residents from June 1986 to May 1987 (Fall and Morris, 1987). Caribou provided the greatest quantity of edible food from a wild resource. Because the meat also was shared, all residents consumed some caribou meat during the study year. Hunters made multiple hunting trips throughout the year. Fall and Morris (1987) indicate that hunters maintained a cabin on Reindeer Creek that was a popular base from which to search for

caribou. Because the exact location of the cabin was not indicated in the report, its location relative to the WACS site is not known.

Small mammals, especially red fox, were harvested for their furs, but were not eaten. The WACS site is included in the harvest area for fur-bearers.

Wild cranberries, blueberries, and yellow salmonberries were harvested by area residents during the subsistence study.

3.4 Air Pathway and Climate

According to the Federal Aviation Administration, average annual wind speed at the Port Heiden site is 14.6 miles per hour, with the prevailing wind direction from the south-southeast.

According to the COE project manager, 2 feet of sand and gravel were placed as a cover at the demolition landfill (including the asbestos cell). Therefore, the potential for offsite migration of asbestos is low. Because the WACS site has been inactive since 1978, the potential for volatile organic compounds to be released into the air is low.

Port Heiden has a cold maritime climate characterized by high humidity, considerable cloudiness, frequent fog, and light rain or snow. Mean annual precipitation is 15.55 inches, with 8.35 inches of rain between July and October, and 49.1 inches of snow during the winter months (Arctic Environmental Information and Data Center [AEIDC, 1989]). The 2-year, 24-hour rainfall is about 1.5 inches (U.S. Department of Commerce, 1963). Summer temperatures between June and August average 50.4°F. Winter temperatures between November and February average 24.9°F. Extreme temperatures of 87°F and -26°F have been recorded.

Section 4

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Appendix A

Inventory of Debris Removal
Fiscal Years 1984-1986

SITE: ANIAK FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	17	DRUMS

SITE: BEAR CREEK FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB OIL	69	DRUMS

SITE: BIG MOUNTAIN FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	44	DRUMS

SITE: BOSWELL BAY FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	137	DRUMS
PCB OIL	5	DRUMS
TRANSFORMERS	3	EACH
CAPACITORS	1	DRUM
KLYSTRON TUBES	3	EACH

SITE: CAPE NEWENHAM FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB OIL	6	DRUMS
TRANSFORMERS	3	EACH
RETIFIER, PCB	4	EACH
COIL, RETARD PCB	2	EACH

SITE: DUNCAN CANAL FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB OIL	2	5 GAL
WASTE OIL	40	DRUMS

SITE: HOONAH FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	34	DRUMS
WASTE OIL	10	DRUMS

SITE: INDIAN MOUNTAIN FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	240	DRUMS
PCB OIL	85	DRUMS

SITE: KIVALINA FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	36	DRUMS
TRANSFORMERS	6	DRUMS

SITE: NORTH RIVER FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB OIL	1	DRUMS

SITE: PORT HEIDEN FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	372	DRUMS
PCB OIL	9	DRUMS
SPILRES, PCB	27	DRUMS
WASTE OIL	5	DRUM
BROMOCHLOROMETHANE	1	DRUM
CALCIUM HYDROXIDE	1	DRUM
CARBON CLEANING CMP	1	DRUM
ESTERON	1	DRUM
PHENOL	1	DRUM
TOLUENE	1	DRUM
TRICHLOROETHANE	1	DRUM
UNIT DANC, M4 SOLUTN	1	DRUM

SITE: SHEMYA FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	14	DRUMS
TRANSFORMERS	22	EACH

SITE: SMUGGLERS COVE FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	59	DRUMS
PCB OIL	5	GAL
CAPACITORS, PCB	3	DRUMS
SOLVENT,NOS	5	DRUMS

SITE: SPARREVOHN FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SPILRES	1	DRUM
CAPACITORS, PCB	9	EACH
KLYSTRON TUBES	7	EACH
RECTIFIERS	5	EACH

SITE: TATALINA FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	17	DRUMS

SITE: TIN CITY FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SPILRES	1	DRUM
PCB OIL	9	DRUMS
CAPACITORS, PCB	10	EACH
TRANSFORMERS	6	EACH
KLYSTRON TUBES	9	EACH
RECTIFIERS	4	EACH
RETARD COILS	4	EACH
SWITCH JUG	2	EACH

SITE: TIN CITY FISCAL YEAR: 1984

DESCRIPTION	QUANITY	
PCB SOIL	99	DRUMS

SITE: BEAR CREEK FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
HERBICIDE	2	DRUMS
KLYSTRON TUBES	4	EACH
PCB, CAPACITORS (LG)	7	EACH
PCB, CAPACITORS (SM)	28	EACH
PCB SOIL	55	DRUMS
PCB SPILRES	3	DRUMS
SOLVENT, PD-680	3	DRUMS
USED OIL	2	DRUMS

SITE: BOSWELL BAY FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
ANTIFREEZE	2	DRUMS
ASPHALT, CEMENT	8	CANS
CALCIUM HYPOCHLORITE	20	GAL
COMPOUND, CLEANING	14	EACH
CONCRETE, CLEANER	3	EACH
CONCRETE, SEALER	18	EACH
CREOSOTE	1	EACH
DUST MOF TREATMENT	1	BOX
FLUID, HYDRAULIC	12	CANS
FUEL, JP 4	2	DRUMS
GASOLINE	2	DRUMS
GASOLINE & SOLVENT MX	36	DRUMS
GREASE, AIRCRAFT	10	GAL
GREASE, AUTOMOTIVE	115	GAL
INHIBITOR, CORROSIVE	54	CANS
ISOPROPOL, ALCOHOL	1	DRUM
OIL, CUTTING	10	DRUMS
OIL, LUBE	115	GAL
OIL, LUBE	5	DRUMS
PAINT, HARDEN	16	CANS
PAINT, FROZEN	173	CANS
PAINT, SPRAY	60	CANS
PCB OIL	4	DRUMS
PCB SPILRES	1	DRUM
SOLVENT	2	DRUMS
THINNER, LACQUER	2	CANS
TRICHLOROFLUOROMETHANE	20	GAL
TURPENTINE	1	CAN
USED OIL	101	DRUMS

SITE: CAPE NEWENHAM FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
CAPACITORS, PCB	6	EACH
PCB SPILRES	2	DRUMS

SITE: FORT YUKON FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
PCB SOIL	142	DRUMS

SITE: INDIAN MOUNTAIN FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
PCB OIL		GAL

SITE: ELMENDORF FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
AMMONIUM HYDROXIDE 7	1876	BOTTLES
DICHLOROMETHANE	377	DRUMS
GREASE	5	GAL
ISOPROPOLALCOHOL	12	CANS
LIME	2	DRUMS
LAY OUT DYE	1	ETC
MOTOR, REFACTORY	2	CANS
OIL, GEAR	4	DRUMS
OIL INSULATING	5	GAL
PAINT, FROZEN	75	GAL
PAINT, HARDEN	2	GAL
PAINT REMOVER	10	GAL
SCALE REMOVING CMP	20	GAL
SOLVENT, PD 680	2	DRUMS
USED SPEC OIL	27	DRUMS
VARNISH	11	GAL

SITE:GRANITE MOUNTAI FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
AMERICOAT "65" THINN	4	CANS
CAPACITOR (LG)	5	EACH
CAPACITOR (SM)	26	EACH
CEMENT, MAGNESIA #5B	3	BAGS
CEMENT, ROOFING	28	CANS
CLEANER, SPECTIC TNK	12	CANS
CONCRETE SEALER	5	CANS
CREOSOTE	4	CANS
DIMETCOTE "6"	133	CANS
GASOLINE	1	DRUM
METAL CONDITION CMPD	6	CANS
OIL, FORM	2	CANS
OIL, GEAR	2	CANS
OIL, INSULATING ELEC	15	GAL
OIL, LINSEED	3	CANS
PAINT, FROZEN	30	GAL
PRESERVITIVE, WOOD	1	DRUM
PREVENTIVE, RUST	4	CANS
SOLVENT, NOS	3	DRUMS
TAR	5	CANS
THINNER, PAINT	4	CANS
WASTE OIL	45	DRUMS
WATER, PCB	1	DRUM

SITE: KALAKAKET FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
PCB OIL	99	DRUMS
PCB SOIL	28	DRUMS
USED OIL	46	DRUMS

SITE: KING SALMON FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
SWITCH JUG	3	EACH
TRANSFORMERS	14	EACH

From the desk of

SITE: OCEAN CAPE FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
ADHESIVE	10	GAL
BATTERIES	18	EACH
BONDO, AUTO	1	CAN
CLEANER, BENDIX MTL	5	GAL
CLEANER, COMPOUND	10	KITS
CLEANER, GLASS	3	BTL
CLEANER, SPETIC	2	CANS
EXTINGUISHER, FIRE	3	EACH
FLOOR DRESSING	5	GAL
GREASE, PLUG VALVE	2	CNS
INSECTICIDE, FHA	1	DRUM
LAB CHEM EPA90092-no378	3	BTL
OIL, CUTTING	5	GAL
PAINT, FROZEN	38	GAL
PATCHCRETE	20	LBS
STENCIL INK, YELLOW	1	CAN
VALVOLINE UNDERCOATING	3	CANS
WAX, PASTE	4	CANS

SITE: PORT HEIDEN FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
PCB SOIL	54	DRUMS

SITE: SHEMYA FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
PCB, CAPACITORS	7	EACH
PCB OIL	12	DRUMS
PCB SOIL	16	DRUMS
PCB SPILRES	7	DRUMS
TRANSFORMERS	31	EACH

SITE: EARECKUMN FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
COIL, RETARD	3	EACH
PCB OIL	11	DRUMS
PCB SPILRES	1	DRUM
RECTIFIER	1	EACH
SWITCH JUG	1	EACH
TRANSFORMERS	5	EACH

SITE: UNALAKLEET FISCAL YEAR: 1985

DESCRIPTION	QUANITY	
CAPACITORS (LG)	20	EACH
COIL, RETARD	2	EACH
DDT	16	CANS
PCB OIL	1	DRUMS
PCB SOIL	365	DRUMS
PCB SPILRES	3	DRUM
RECTIFIER	9	EACH
TRANSFORMERS	6	EACH
USED OIL	36	DRUMS

From the desk of Skyt Norwood

SITE: CAPE NEWENHAM FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
BATTERIES	4	EACH
DIESEL, OIL	16	DRUMS
TRANSFORMERS	26	EACH
TRANSFORMER OIL	13	DRUMS

SITE: ELMENDORF AFB FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
ANTIFREEZE	6	DRUMS
ASPHALT	255	DRUMS
EMPTY DRUMS	72	DRUMS
FLUID, HYDRAULIC	1	DRUM
FUEL, DIESEL WASTE	1	DRUM
GASOLINE, WASTE	1	DRUM
HEAD, COMPRESSOR	2	EACH
LACQUER	7	CANS
OIL, LUBE	14	CANS
OIL, TURBIN	1	CAN
OIL, SOLUBLE	4	CANS
OIL, WASTE	62	DRUMS
PCB SPILRES	22	DRUMS
PCB TEST KITS	182	KITS
REFRIGERATOR	1	EACH
SOLVENT, WASTE	4	DRUMS
TOLUENE, TECH	30	GAL
TRICHLOROETHANE	4	GAL
WELDING, UNIT	1	EACH

SITE: FIRE ISLAND FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
ANTIFREEZE	2	DRUMS
DIESEL	2	DRUMS
GASOLINE	9	DRUMS
LIQUID HAZARDOUS WASTE	1	DRUM
OIL, WASTE	27	DRUMS
PCB OIL	16	DRUMS
SOLVENT	8	DRUMS
TRANSFORMERS	34	EACH

SITE:GRANITE MOUNTAIN FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
FIRE EXT, CO2	47	BTL
HERBICIDE	1	DRUM
INSECTICIDE	3	DRUMS
OIL, WASTE	25	DRUMS
ORGANIC MIXTURE	7	DRUMS
SOLVENT	13	DRUMS
WATER W/LEAD	1	DRUM

SITE: OCEAN CAPE FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
CLEAR ORGANIC LIQUID	1	DRUM
OIL, WASTE	42	DRUMS
SOLVENT	1	DRUM

SITE: PORT HEIDEN FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
PCB SOIL	395	DRUMS

SITE: SHEMYA FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
PCB SOIL	16	DRUMS
PCB SPILRES	3	DRUMS

SITE: SPARREVOHN FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
CALCIUM HYPOCHLORITE	1	DRUM
OIL, USED	32	DRUMS
OIL, WASTE	10	DRUMS
PCB OIL	17	DRUMS
PCB SOIL	246	DRUMS
PCB SPILRES	6	DRUMS
TRANSFORMERS	45	EACH

SITE: TATALINA FISCAL YEAR: 1986

DESCRIPTION	QUANITY	
CAPACITOR	1	EACH
OIL, USED	4	DRUMS
PCB OIL	6	DRUMS
SWITCH BOX	3	EACH
TRANSFORMERS	13	EACH

From the desk of SSgt Norwood

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE