United States Army
Corps of Engineers

Formerly Used Defense Sites Program

# Decision Document and No Department of Defense Action Indicated Report

Former Yakutat Air Base
Hazardous, Toxic, or Radioactive Waste (HTRW)
Project # F10AK0606-02
Yakutat, Alaska

September 2015

Prepared By:
U.S. Army Corps of Engineers - Alaska District
Environmental Engineering Branch
P.O. Box 6898
JBER, Alaska 99506-0898

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# EXECUTIVE SUMMARY

ES.1 This Decision Document presents the selected remedy for the Yakutat Army Air Base, Hazardous Toxic and Radioactive Waste (HTRW) Project Number F10AK060602.

ES.2 The selected remedy is No Department of Defense Action Indicated (NDAI) for fifteen areas of concern (AOCs) that are located within the Yakutat Army Air Base, Formerly Used Defense Sites (FUDS), Property Number F10AK0606. The selected remedy decision is based upon the Administrative Record for this site, the 1995 Inventory Project Report (INPR), the 1984 Debris Cleanup and Site Restoration, the results of the 2000, 2001, 2005, 2006, and 2010 remedial investigations, removal actions during 2003 and 2008, 2010 Feasibility Study, and the 2015 Proposed Plan with a public meeting and public comments. The decision document summarizes these activities.

ES.3 The Yakutat Army Air Base consisted of approximately 46,080 acres and the total areas of the AOCs is estimated to be less than 50 acres. The 15 AOCs are scattered throughout the former air base and land ownership consist of Yak-Tat Kwaan, Inc., U.S. Forest Service and Alaska Department of Natural Resources (ADNR). All of the properties are undeveloped but the property owned by ADNR is platted for future residential use.

ES.4 For 14 of the 15 AOCs the remedy is protective of human health and the environment and no remedial action, land use control (LUCs) or five year reviews are required. For the remaining AOC, a NDAI designation was determined because the contamination resulted from non-DoD sources and no additional DoD action is warranted.

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## Acronyms and Abbreviations

| | |
|---|---|
| ACOR | Air Corps Operations Reserve |
| ADEC | Alaska Department of Environmental Conservation |
| AOC | Area of Concern |
| amsl | Above mean sea level |
| AST | Aboveground Storage Tank |
| CAA | Civil Aeronautics Administration |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| COPC | Chemical of Potential Concern |
| COC | Chemical of Concern |
| DoD | Department of Defense |
| DRO | Diesel Range Organics |
| ENSR | ENSR Corporation |
| FCAO | Former Coast Artillery Outpost |
| FS | Feasibility Study |
| FUDS | Formerly Used Defense Sites |
| mg/kg | Milligrams per kilogram |
| mg/L | Milligrams per liter |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NDAI | No Department of Defense Action Indicated |
| NFA | No Further Action |
| POL | Petroleum, Oil, and Lubricants |
| RAB | Restoration Advisory Board |
| RAO | Remedial Action Objectives |
| RI | Remedial Investigation |
| S&W | Shannon & Wilson, Inc. |
| TAPP | Technical Assistance for Public Participation |
| UST | Underground Storage Tank |
| USACE | United States Army Corps of Engineers |

# PART 1: DECLARATION

## 1.1 SITE NAME AND LOCATION

This document addresses Hazardous, Toxic, and Radioactive Waste (HTRW) project -02 named POL Contaminated Soil, at the Former Yakutat Army Air Base, Formerly Used Defense Site (FUDS) property #F10AK0606. The State of Alaska, Department of Environmental Conservation (ADEC) tracks the fifteen sites proposed for closure in this document with Hazard Identification numbers 1986, 3715, 26287, and 26289.

Yakutat, located at the mouth of Yakutat Bay, is approximately 200 miles northwest of Juneau and 380 miles southeast of Anchorage at 59° 33' N Latitude, 139° 44' W Longitude. The fifteen sites are scattered throughout the Yakutat Air Base and the locations are shown on Figure 2.

## 1.2 STATEMENT OF BASIS, PURPOSE AND STATUTORY DETERMINATIONS

This Decision Document presents the selected remedy for the Yakutat Army Air Base, HTRW-02 project. The Department of Defense (DoD) is authorized to carry out a program of environmental restoration at former military sites according to Title 10 of the United States Code, Section 2701(a). The Defense Environmental Restoration Program was set up to accomplish this task. The cleanup of Formerly Used Defense Sites (FUDS) is a part of this program. FUDS are those properties that the DoD once owned or used, but no longer owns or controls. The remedy described in this Decision Document was selected in accordance with the USACE Engineer Regulation (ER) 200-3-1, FUDS Program Policy, and is consistent with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S. Code (USC) § 9617), as amended by the Superfund Amendments and Reauthorization Act of 1986.

The U.S. Army Corps of Engineers is an agent for DoD and has been assigned the responsibility of coordinating activities at FUDS sites. This Decision Document and No Department of Defense Action Indicated Report are issued by the U.S. Army Corps of Engineers Alaska District (Alaska District), the lead agency for the Yakutat Air Base FUDS.

The selected remedy is No Department of Defense Action Indicated (NDAI) for fifteen areas of concern (AOCs) at the Yakutat Army Air Base, Yakutat, Alaska. For 14 of the 15 AOCs (a.k.a. Sites) the remedy is protective of human health and the environment. For the remaining site (AOC E2), a NDAI designation was determined because the contamination resulted from non-DoD activities.

This decision is based upon the Administrative Record for this site, the 1995 Inventory Project Report (INPR), the 1984 Debris Cleanup and Site Restoration, the results of the 2000, 2001, 2005, 2006, and 2010 remedial investigations, removal actions during 2003 and 2008, 2010 Feasibility Study, and the 2015 Proposed Plan with a public meeting and public comments. The accompanying decision document summarizes these activities.

Detailed information supporting the selected remedial action is also contained in the Administrative Record for this site, located at the U.S. Army Corps of Engineers Alaska District Office on Joint Base Elmendorf Richardson, Alaska, and the Information Repository presently housed at the Yakutat Tlingit Tribe offices located in Yakutat, Alaska.

## 1.3 ASSESSMENT OF SITE

This Decision Document provides an overview of the 15 AOCs at the Yakutat Army Air Base. It summarizes the site description, previous investigations and remedial activities, and the selected remedy. Based on remedial investigations and site histories, the predominant contaminants of concern identified were petroleum hydrocarbons and metals. The primary sources of known contamination include rusted and leaking drums, debris, potential former aboveground storage tanks (ASTs) or underground storage tanks (USTs), transformers, wastes associated with historical disposal practices at abandoned or demolished buildings, and metal debris.

There are 12 AOCs with no contaminants remaining above cleanup levels:

1) L1 – Air Corps Operations Reserve (ACOR) Tank Farm - North Drum Dump
2) L2 – ACOR Tank Farm, Pipeline System - 7 Junctions
3) L3 – ACOR Tank No. 1302 (AST 2) foundation
4) L3 – ACOR Tank No. 14 (AST 4) foundation
5) L3 – ACOR Tank No. 1315 (AST 5) foundation
6) L3 – ACOR Tank No. 1312 (AST 6) foundation
7) L3 – ACOR Tank No. 1309 (AST 9) foundation
8) L3 – ACOR Tank No. 1307 (AST 10) foundation
9) L3 – ACOR Tank No. 1311 (AST 12) foundation
10) L3 – ACOR Tank No. 1310 (AST 13) foundation
11) L3 – ACOR Tank No. 1304 (AST 15) foundation
12) L5 – ACOR Tank Farm Pump House

There are 2 AOCs which had contaminants identified above cleanup levels but with a de-minimis quantity of impacted soils, which presents no unacceptable risk to human health or the environment:

13) C7 – Point Carrew Garrison 7.5 kW Powerhouse - No. 1093
14) Former Coast Artillery Outpost (FCAO)

The selected remedy for the above 14 AOCs was assessed and found to be protective of public health and welfare or the environment from actual or threatened releases of hazardous substances into the environment.

AOC E2 was not assessed as to whether it is protective of public health and welfare or the environment. There are polychlorinated biphenyls (PCBs), diesel range organics (DRO), selenium, mercury and barium that exceed ADEC cleanup levels at this AOC, but because these contaminants are not attributable to DoD, the FUDS policy in Engineer Regulation No. 200-3-1 directs that the NDAI decision be applied.

### 1.3.1 Cleanup Levels

Two contaminants of concern (COCs) were identified as being above ADEC method two cleanup or background levels for soil. For arsenic, one sample out of nine was above the calculated background. The duplicate result for this same sample was below the background level and the level of arsenic above background is de minimis.

At the FCAO six surface soil samples were collected. One of the six samples had a detected level of 2,4-Dinitrotoluene (DNT) and it was above the migration to groundwater cleanup level. The results show that the DNT is at a de minimis level. DNT can be found in ammunition and fireworks. The FCAO area is a relatively remote park where the recreational discharge of firearms and fireworks has occurred. It is likely that the trace levels of DNT found are attributable to these recreational activities.

Except for arsenic, soil cleanup levels are based on 18 Alaska Administrative Code (AAC) 75.341, Table B1. Because naturally occurring arsenic concentrations were above the ADEC cleanup level, a calculated background level was used as the site specific cleanup level.

Because the contaminants at AOC E2 are from non-DoD activities, cleanup levels are not being proposed as part of this document. For AOC C7 and FCAO the cleanup levels for identified contaminants of concern for soil are found in Table 1.

**Table 1 – Cleanup Levels**

| Media | Contaminant of Concern | Cleanup Level (mg/kg) |
|---|---|---|
| Soil | 2,4-Dinitrotoluene | 0.0093 |
| | Arsenic | 11.6 * |

* Calculated Background Level

## 1.4 DESCRIPTION OF SELECTED REMEDY

The selected remedy is no further action. For the 14 AOCs, the remedy is protective of public health, welfare, and the environment.

For AOC E2 there is no assessment of protectiveness but NDAI is warranted based on the contamination resulting from non-DoD activities.

## 1.5 DECLARATION

In accordance with the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), the U.S. Army Engineer District, Alaska, has completed all activities required for the selected remedy at the Yakutat Air Base, Hazardous, Toxic, or Radioactive Waste (HTRW) Project # F10AK060602, Yakutat, Alaska. The accompanying Decision Document/NDAI Report supports the conclusion that the 14 AOCs have been sufficiently characterized and that no further HTRW actions are required. For AOC E2, the Decision Document/NDAI Report supports the conclusion that contamination at the site is from non-DoD sources and no additional DoD action is warranted. This decision may be reviewed and modified in the future if new information becomes available which indicates the presence of eligible HTRW that may cause a risk to human health or the environment.

Date 8SEP15

Michael S. Brooks
Colonel, U.S. Army Corps of Engineers
District Commander

## REVIEW AND CONCURRENCE

The State of Alaska, through the Department of Environmental Conservation agrees that the 14 AOCs at Former Yakutat Army Air Base have been sufficiently characterized and that no further HTRW actions are required. For AOC E2, ADEC agrees with the conclusion that contamination at the site is from non-DoD sources and no additional DoD action is warranted. The decision may be reviewed and modified in the future if information becomes available that indicates the presence of contaminants or waste that may cause unacceptable risk to human health or the environment.

_____ Date 9/28/2015

John Halverson
Department of Defense Environmental Program Manager
Alaska Department of Environmental Conservation

# PART 2: DECISION SUMMARY

This Decision Summary provides an overview of the conditions at fifteen Former Yakutat Army Air Base sites. It summarizes the data from removal actions, pipeline removal, and remedial investigations. For AOC E2 the summary explains why No Department of Defense Action Indicated (NDAI) status was determined based on the site not being eligible under FUDS policy. For the remaining 14 AOCs, the summary describes the selected remedy of no further action and evaluates the remedy using the criteria set forth in the National Contingency Plan (NCP). The Decision Summary explains the rationale for selecting the remedy, and how the remedy is consistent with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), if applicable.

## 2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The Yakutat Army Air Base site is located in Yakutat, Alaska in Southeast Alaska. The FUDS property name and number are YAKUTAT AIR BASE and F10AK0606. The Project name and number are POL CONTAMINATED SOIL and HTRW-02. The site is also known as the "Former Yakutat Army Air Base" and "Yakutat Air Force Base". The State of Alaska, Department of Environmental Conservation (ADEC) tracks the fifteen sites proposed for closure in this document with Hazard Identification numbers 1986, 3715, 26287, and 26289. The site is not connected via road to other permanent Southeast Alaska communities, and is only accessible by air or water.

Yakutat, located at the mouth of Yakutat Bay, is approximately 225 miles northwest of Juneau and 380 miles southeast of Anchorage, Alaska at 59° 33' N Latitude, 139° 44' W Longitude (Section 30, Township 27 South, Range 34 East, Copper River Meridian). Yakutat is surrounded by the Wrangell-Saint Elias Mountains and Yakutat Bay to the north, by the Saint Elias Mountains and Tongass National Forest to the south and east, and by the Gulf of Alaska to the west. The Yakutat Borough has a population of 590, approximately half of whom are Alaska Native. Yakutat's economy is dependent on commercial and sport fishing, fish processing, and government employment.

The fifteen sites are scattered throughout the Yakutat Air Base and the locations are shown on Figure 2.

### 2.1.1 Site Specific Locations

The approximate central locations of the AOCs are as follows:

| AOC Name | Latitude | Longitude |
|---|---|---|
| AOC C7 – Point Carrew Garrison 7.5 kW Powerhouse - No. 1093 | 59.547350° N | 139.826050° W |
| AOC E2 – Quartermaster Loop - Debris Disposal/Barrel Dump | 59.525043° N | 139.675627° W |
| Former Coast Artillery Outpost (FCAO) | 59.493467° N | 139.726467° W |
| L1 – ACOR Tank Farm North Drum Dump | 59.5345497° N | 139.7172208° W |
| L2 – ACOR Tank Farm Pipeline System - 7 Junctions | 59.5337109° N | 139.7089469° W |
| L3 – ACOR Tank No. 1302 (AST 2) foundation | 59.5353436° N | 139.7162565° W |
| L3 – ACOR Tank No. 1314 (AST 4) foundation | 59.5326283° N | 139.7113896° W |

| | | |
|---|---|---|
| L3 – ACOR Tank No. 1315 (AST 5) foundation | 59.5318623° N | 139.7132910° W |
| L3 – ACOR Tank No. 1312 (AST 6) foundation | 59.5326594° N | 139.7152828° W |
| L3 – ACOR Tank No. 1309 (AST 9) foundation | 59.5340656° N | 139.7108761° W |
| L3 – ACOR Tank No. 1307 (AST 10) foundation | 59.5335982° N | 139.7162421° W |
| L3 – ACOR Tank No. 1311 (AST 12) foundation | 59.5332277° N | 139.7141018° W |
| L3 – ACOR Tank No. 1310 (AST 13) foundation | 59.5339464° N | 139.7125889° W |
| L3 – ACOR Tank No. 1304 (AST 15) foundation | 59.5339860° N | 139.7183434° W |
| L5 – ACOR Tank Farm Pump House | 59.5340100° N | 139.7162231° W |

### 2.1.2 Section and Township Locations

The Section/Township/Range locations of the AOCs are as follows:

| AOC | Section | Township | Range |
|---|---|---|---|
| AOC C7 | Section 28 | Township 27 South | Range 33 East |
| FCAO | Section 18 | Township 28 South | Range 34 East |
| “L” AOCs | Section 31 | Township 27 South | Range 34 East |
| E2 | Section 33 | Township 27 South | Range 34 East |

All the AOCs are in the Copper River Meridian.

## 2.2 SITE HISTORY

United States (U.S.) military interest in Yakutat began by Executive Order in 1929 with the creation of the Yakutat Bay Naval Reservation. However, occupation was not set in motion until 1939 with a proposal by the Civil Aeronautics Administration (CAA), now known as the Federal Aviation Administration, to develop a landing field. Runway construction began in 1940 for an "Auxiliary Landing Field and Staging Area" (also known as the Yakutat Air Base). With the arrival of the first troops in October of that year, the Yakutat Landing Field was activated. A dock and wharf facility were built on Monti Bay in support of the Yakutat Air Base. Natural resources of timber and aggregate were used in bridge and foundation construction. The air base was completed in June 1943. An additional 42,437 acres, known as Tract B, which included the City of Yakutat and the active Yakutat airport, were obtained from the U.S. Department of the Interior that September, making the total area approximately 46,080 acres.

The Yakutat Naval Base was established as a "Naval Air Facility" in September 1942, and was re-designated as a "Naval Auxiliary Air Facility" in February 1943, after the base’s completion and addition of land. This small naval facility included a Seaplane Base.

The base (redesignated Yakutat Army Air Base in 1944) was placed on caretaker status in April 1944. A similar reduction took place at the seaplane base, which was officially closed on July 22, 1944. The air base was declared surplus by the Army in December 1945 and ceased operations in 1946. Tract B was relinquished to the U.S. Department of the Interior, Bureau of Land Management (BLM) in two portions in 1946 and 1947.

On December 1, 1945, the CAA assumed responsibility for maintenance and operation, leading to the transfer of the airfield (not the air base) and all associated facilities from the War

Department to CAA on April 4, 1947. The Yakutat Army Air Base improvements, equipment, and materials, not transferred to CAA, were declared to the War Assets Administration for disposition in May 1948, pursuant to the Surplus Property Act of 1944.

Another section, Tract C, containing 147 acres, was retransferred to the CAA in 1948, while the remaining 3,499 acres, Tract A, were relinquished and retransferred to the Department of the Navy in 1949. The Yakutat Bay Naval Reservation was revoked in 1953, and all but 266 acres were designated as part of the Tongass National Forest. The remaining land was placed in federal land holding for the CAA (now known as the Federal Aviation Administration).

## 2.3 INVESTIGATION AND REMOVAL ACTION HISTORY

Removal actions, investigations and reports have been conducted at the 15 AOCs as part of ongoing activities at the Former Yakutat Army Air Base. A brief summary of previous investigation activities and results identifying media impacts for each AOC is presented below. Details of these investigations can be found in the documents listed in Table 2. The specific site plans for the AOCs are found in Figures 3 through 9.

**Table 2 – Previous Investigations, Removal Actions, and Reports**

| In-Text Citation | FRMD # | Report Title | Report Date | Subject AOCs addressed |
|---|---|---|---|---|
| USACE 1984 | F10AK060601_01.04_0500_p | Environmental Restoration Defense Account Debris Cleanup and Site Restoration Design, Yakutat, Alaska | Jul-84 | C7, E2 |
| Ecology & Environment (E & E) 1994 | F10AK0606--_01.09_0500_a | Field Investigation Report, Former Yakutat Air Base, Formerly Used Defense Site, Yakutat, Alaska, Site No. F10AK060600 | Aug-94 | E2, “L” AOCs |
| E&E 1997 | F10AK0606--_01.09_0501_a | Draft Yakutat Air Base/Ocean Cape Radio Relay Site Investigation Report, Yakutat, Alaska, Site No. F10AK060600. Anchorage, Alaska. Prepared for Environmental Protection Agency. | Dec-97 | |
| ENSR Consulting and Engineering (ENSR) 2003a | F10AK060602_03.10_0006_a | 2000 Remedial Investigation Report – Final – Remedial Investigation/Feasibility Study, Yakutat Area, Alaska | Feb-03 | FCAO |
| ENSR 2003b | F10AK060602_03.10_0005_a | 2001 Remedial Investigation Report – Final – Remedial Investigation/Feasibility Study Yakutat Area, Alaska | Mar-03 | C7, E2, “L” AOCs |
| Bethel Services, Inc. (BSI). 2004. | F10AK060601_02.02_0504_a | Final Remedial Action Report, Yakutat Pipeline, Pig and Inert Project, Yakutat, Alaska. November. | Nov-04 | "L" AOCs |

| In-Text Citation | FRMD # | Report Title | Report Date | Subject AOCs addressed |
|---|---|---|---|---|
| BSI 2008 | F10AK060601_02.13_0500_a | Final Pipeline Closure Report for Former Yakutat Air Force Base Air Corps Operations Reserve Tank Farm, Mainline Removal, Drain, or Pig, FUDS No. F10AK060601, Yakutat, Alaska. September. | Sep-08 | "L" AOCs |
| ENSR 2005 | F10AK060602_04.09_0500_a | Final Feasibility Study, Yakutat Area RI/FS. Former Yakutat Air Force Base, Yakutat, Alaska | Jan-05 | C7, E2, "L" AOCs |
| Shannon & Wilson (S&W) 2006a | F10AK060602_03.10_0001_a | Final Focused Remedial Investigation, Former Yakutat Air Force Base, Yakutat, Alaska | Apr-06 | C7, E2, FCAO, "L" AOCs |
| S&W 2006b | F10AK060602_03.10_0002_a | 2005 Final Focused Remedial Investigation, Former Yakutat Air Force Base, Yakutat, Alaska | Aug-06 | "L" AOCs |
| USACE 2006 | F10AK060602_03.10_0007_a | Final Rapid Optical Screening Tool (ROST)/Laser-Induced Fluorescence (LIF) Focused Remedial Investigation Former Yakutat Air Force Base, Yakutat, Alaska | Sep-06 | "L" AOCs |
| BC Contractors – Jacobs Joint Venture (BCC-J) 2007 | F10AK060602_03.10_0004_a | Former Yakutat Air Force Base Remedial Investigation Report, Yakutat, Alaska, Final | Mar-07 | "L" AOCs |
| USACE 2008 | F10AK0606--_01.09_0505_a | Military Munitions Response Program CERCLA Preliminary Assessment for the Yakutat Air Base Yakutat, Alaska | May-08 | FCAO |
| S&W 2010 | F10AK060602_04.09_0503_a | Final Feasibility Study Report, Former Yakutat Air Force Base, Yakutat, Alaska | Jul-10 | C7, E2, FCAO, "L" AOCs |
| S&W 2012 | F10AK060602_03.10_0008_a | 2010 Supplemental Remedial Investigation Former Yakutat Air Force Base, Yakutat, Alaska | Feb-12 | E2, FCAO |

#### 2.3.1.1 AOC C7 - Powerhouse No. 1093

Powerhouse No. 1093 was part of the WWII Yakutat Army Air Base and contained a 7.5-kilowatt gasoline-engine generator to provide power to the warehouses in the ammunition storage area of the Point Carrew Garrison.

In 1984, USACE carried out debris cleanup and site restoration operations at this site. Structures and debris were removed and disposed of.

In 2001, USACE investigated this site for contamination. Surface and subsurface soil sampling was conducted by ENSR during the 2001 RI field activities. Arsenic was reported in one surface soil sample at a concentration (26.3 mg/kg) which exceeds the background concentration of 11.6 mg/kg. This was the primary sample but the reported concentration in the associated field QC duplicate sample (8.31 mg/kg) was below the background concentration. Arsenic was found

above the background concentration in only one sample and at one location. The duplicate sample was below background concentration. These two factors support the conclusion that arsenic is not chemical of concern. (ENSR 2003b, ENSR 2005).

Also in the 2001, chromium concentrations in surface soil exceeded the ADEC Method 2 soil cleanup level and background level. Chromium was reported in one surface soil sample from the shallow ditch south of the powerhouse foundation at a concentration (42.7 mg/kg) which exceeds the background concentration of 37 mg/kg. The ADEC total chromium soil cleanup level is based on the assumption that chromium detected is hexavalent chromium (Cr6+), a known carcinogen. The cleanup level for Cr3+ is 124,000 mg/kg. In 2010, Shannon & Wilson conducted soil sampling and determined that chromium concentrations in the Yakutat area soil were not Cr6+ and therefore the cleanup level defaulted to 124,000 mg/kg, the cleanup level for Cr3+. All of the soil samples concentrations were well below this ADEC cleanup level.

No PCB contamination (possibly associated with the former powerhouse) was detected at this site. Evidence of petroleum contamination was detected in trace amounts; however, the concentrations were below cleanup levels (ENSR 2003b). No other analytes in the surface soil or subsurface soil samples exceeded ADEC Method 2 soil cleanup levels (ENSR 2003b).

During the 2001 RI, three groundwater monitoring wells were also sampled. Lead (0.0575 mg/L), arsenic (0.0587 mg/L), and chromium (0.186 mg/L) concentrations in groundwater exceeded ADEC cleanup levels. The elevated metals concentrations were attributed to suspended solids associated with sample turbidity. There was evidence the wells were not properly developed and sampled. Additional groundwater sampling was conducted in 2004, after developing the wells, and then using low flow sampling techniques. Chromium was detected at an estimated concentration of 0.0111 mg/L, well below the ADEC cleanup level of 0.1 mg/L. Arsenic and lead were not detected in groundwater. No other analytes in groundwater exceeded ADEC groundwater cleanup levels.

#### 2.3.1.2 AOC E2 - Debris Disposal/Barrel Dump Area - Quartermaster Loop

The Debris Disposal/Barrel Dump Area, AOC E2, is located on Quartermaster Loop, approximately 1 mile from Engineer's Road. A site plan showing the general location of AOC E2 is provided on Figure 3.6-2. In the 1984 Environmental Assessment, Site 234 (Quartermaster Loop Barrel Dump) is described as an "old solid waste dump and empty barrel dump. Drums and debris spread over area; about 1.5 acres" (USACE 1984). In addition, a site note description on debris cleanup maps states: "Barrel dump, loosely scattered. Structures and other items shown but not identified to be disposed of, are to remain, or in many cases are nonexistent." (USACE 1984, ENSR 2003b).

In 1994, E&E investigated the Quartermaster Loop drum dump (AOC E2) located on the southwest side of Quartermaster Loop Road. The area was densely vegetated with alders, willows, and spruce. A wrecked Coast Guard airplane was observed off Quartermaster Loop Road on the way to the drum dump. No drums, debris, or other evidence of potential contamination were visible. No samples were collected (E&E 1994).

During the 1999 site walkover, one 55-gallon drum with a red stake was found along Quartermaster Loop about 200 yards northeast of the former rail line trail. The origin and contents of the drum (if any) were not determined. An additional 10 to 15 drums were found during the 2001 field season grouped in a ditch near the red stake. It appeared as if these drums had been run over by a tracked vehicle. Another grouping of 3 or 4 drums were found near the larger grouping of drums. A few other scattered drums were also observed partially buried in the sides of the ditch. The total number of drums in this area was not determined due to the condition of the drums and excessive vegetation in the area. (ENSR 2003b).

In 2001, two surface soil samples were taken (one down slope from each group of drums) in the most likely location for contamination, if present. No analytes in surface soil exceeded ADEC Method 2 soil cleanup levels. It was noted that the total number of drum in the area had not been determined.

In 2010, the site was re-sampled as part of a focused RI, concentrations of polychlorinated biphenyls (PCBs) (2.5 mg/kg) in surface soil, diesel range organics (DRO), selenium, and mercury in sediment, and barium in surface water exceed the cleanup levels for these analytes in their respective media and was considered COCs. However, the presence of an abandoned Colorado Gas Corporation sign, and the exceedance of barium, a common drilling additive, in surface water suggest that AOC E2 may not be a FUDS site. Further evaluation of aerial photographs and topographic maps point to non-DoD origins for this site. USACE has concluded the weight of evidence suggests the likely source of the contamination at E2 is from the Colorado Oil & Gas Co. Well YAKUTAT 1 drilled in 1957.

USACE has determined that because of the non-DoD origin of contamination, this AOC is no longer eligible as a FUDS site and No Department of Defense Action is Indicated.

#### 2.3.1.3 Former Coast Artillery Outpost (FCAO)

The FCAO was the site of two 6-inch naval guns located at the south end of Cannon Beach Road. Two buildings associated with the operations of the naval guns existed at the site. One of the former buildings at the FCAO reportedly served as a power source for a small installation on Cannon Beach Road. The area is currently being used as recreational site (park) for residents of Yakutat and consists of a covered stage where local bands perform, with benches, grassy area, and picnic and camping areas.

In 2000, the ENSR field team investigated this area and found a small metal and debris pile and a wooden foundation in the forested area (ENSR 2003a).

In 2008, a CERCLA Preliminary Assessment under the Military Munitions Response Program was conducted by USACE. There was no evidence found that munitions were buried at the FCAO.

During the 2010 Supplemental RI preliminary site visit, remnants of a World War II military tank, sawed off 6-inch cannons, electric lines, hydraulic lines, and concrete debris piles were found northwest of the approximate former building locations. Six surface soil samples were collected and analyzed for petroleum hydrocarbons, metals, PCBs, VOCs, and SVOCs. One

surface sample result showed that 2,4-dinitrotoluene was detected at an estimated concentration of 0.623 J mg/kg, which exceeds the ADEC migration to groundwater cleanup level of 0.0093 mg/kg. However, the concentration is well below the direct contact cleanup level of 8.8 mg/kg.

The presence of 2,4-dinitrotoluene at the site is not considered a significant risk to human health and the environment and was likely from non-FUDS activities. There was only one sample that exceeded the migration to groundwater ADEC's cleanup level, and it was below the direct contract cleanup level. The quantity of the contaminated soil is de-minimis and at the surface and unlikely to migrate to the groundwater.

2,4-dinitrotoluene is a component of gun propellants and because the sample was from the surface, it is not unreasonable that this could have resulted from recreational gunfire. Moreover, 2,4- dinitrotoluene is readily broken down by sunlight and by bacteria and therefore it unlikely that historic contamination would persist at the surface.

Generally, 2,4-dinitrotoluene is found at hazardous waste sites that contain buried ammunition wastes but there is no evidence that munitions have been buried at the FCAO, there were no other analyticals found associated with munitions, and it was only found at one surface soil sample point.

The most likely scenario is that the 2,4-dinitrotoluene found in the soil sample was due to recreational gunfire and there is no reason to conduct any further action at the FCAO.

#### 2.3.1.4 AOC L1 – Air Corps Operations Reserve (ACOR) Tank Farm, North Drum Dump

A drum dump, designated AOC L1 - North Drum Dump, was located west of the Tank 1 foundation of the Air Corps Operations Reserve (ACOR) Tank Farm. During the 2001 RI/FS activities, a geophysical survey was conducted at the debris/drum dumpsite west of Tank 1 prior to sampling activities to delineate the extent of possible buried debris. Several anomalies observed within the survey area were interpreted as surface debris, indicating no drums or debris were buried at this site. Based on RI results from 2001, 2004, 2005, and 2006 fieldwork, concentrations of COPCs in the soil and groundwater do not exceed their corresponding ADEC cleanup levels.

During the 2001 RI/FS activities, one surface soil sample was collected west of Tank 1.

Additionally, one soil boring (AP-076) was advanced west of Tank 1. A monitoring well was installed at the boring. No analytes in surface soil exceeded ADEC Method 2 soil cleanup levels (ENSR 2003b). Arsenic, barium, cadmium, and chromium concentrations in groundwater collected from Well AP-076 exceeded ADEC groundwater cleanup levels however; these results were considered invalid since they could be attributed to suspended solids in the samples. It appears that the well was not developed and sampled properly.

In 2004, groundwater was re-sampled by Shannon & Wilson. Well AP-076 was appropriately purged and sampled. A water sample from AP-076 was analyzed for arsenic, chromium, and lead. Concentrations of arsenic, chromium, and lead in the water sample from AP-076 were not detectable (S&W 2006a).

During the 2005 ROST/LIF investigation, eight probes were advanced in the drum dump area northwest of former Tank 1. Results indicate that there is no significant petroleum-oil-lubricants (POL) contamination. None of the correlation or confirmation samples had analytical results that exceed ADEC Method 2 soil cleanup levels (USACE 2006).

#### 2.3.1.5 AOC L2 - ACOR Tank Farm, Tank Farm Pipeline System Junctions

The pipeline system junctions investigated as AOC L2 consisted of seven concrete junction vaults within the tank farm including Valve Pit A1; Valve Pit C5; Lateral C Break; Drain Line Break; Lateral D Break; Separator Tank, consisting of a booster pump, an oil-water separator, and an air release tank on the main pipeline which moved fuel to truck fill stands located along Engineer Road; and a Fuel Hose with Nozzle, consisting of a truck fill stand located along Engineer Road. Based on RI efforts conducted in 1999, 2000, 2004 and 2005, concentrations of COPCs in the soil and groundwater do not exceed ADEC cleanup levels.

One of the seven pipeline junctions visited during a 1999 site walkover consisted of a 4 feet by 4 feet concrete vault extending approximately 5 feet below ground surface (bgs). Standing water was visible in the vault. The fuel dispensing hose was found by the edge of Airport Road about 250 feet northeast of Tank No. 3. A booster pump, oil-water separator, and air release tank on the main pipeline (separator tank), which moved fuel to truck fill stands located along Airport Road and on the Air Base, were found about 100 feet southeast of Tank 3 (ENSR 2003b).

During the ENSR 2000 RI, six of the seven junction vaults, the fuel dispensing hose associated with a tank truck fill stand, and the separator tank were visited. Water was not present in the vaults or at the separator tank. The junction box near Tank 5 was in an area of thick, overgrown brush and could not be found. Boring/Monitoring Well AP-079 was advanced in the area of the tank truck fill stand by Airport Road. Surface soil, subsurface soil, and groundwater at the tank truck fill stand were sampled and analyzed. Very low levels of target analytes in surface and subsurface soil and groundwater were detected in the samples collected near the fuel hose. None of these detected analytes exceed ADEC cleanup levels (ENSR 2003b).

In 2004, groundwater sampling was conducted at AOC L2 by Shannon & Wilson during Focused RI field activities. Monitoring Well AP-079 was appropriately purged and sampled for the 8 RCRA metals. Primary and duplicate water samples from the monitoring well had low levels of barium (0.0276 mg/L) and lead (0.000699 mg/L). These concentrations are less than the ADEC Table C groundwater cleanup criterion of 2.0 mg/l and 0.015 mg/L, respectively (S&W 2006a).

During the 2005 ROST/LIF investigation, probes were advanced at Valve Pit A1 (6 probes), Valve Pit C5 (4 probes), Lateral C Break (5 probes), Drain Line Break (5 probes), Lateral D Break (9 probes), and the separator tank (5 probes). Results indicate that there is no significant POL contamination. None of the correlation or confirmation samples had analytical results that exceed the applicable ADEC Method 2 soil cleanup level (USACE 2006).

#### 2.3.1.6 AOC L3 – ACOR Tank Foundations 2, 4, 5, 6, 9, 10, 12, 13, 15 (9 AOCs)

Fifteen aboveground petroleum storage tanks, which held nearly 750,000 gallons of fuel, and an associated pipeline system, were built as part of the Air Corps Tactical Gas System during World War II. The ASTs were removed shortly before the ACOR Tank Farm site was transferred to the CAA in 1948. Remnants of the fifteen tank sites, designated Tank Foundations 1 through 15, were investigated during previous RI efforts. COPCs in soil and groundwater do not exceed cleanup levels at Tank Foundations 2, 4, 5, 6, 9, 10, 12, 13, and 15. COPCs in soil and groundwater exceed cleanup levels at Tank Foundations 1, 3, 7, 8, 11, and 14 and are not part of this decision document.

In 2003 and 2008, the connecting pipelines were either removed or emptied and closed-in-place and pipeline closure assessments were performed. Screening and sample analyses did not identify petroleum, oil, and lubricant (POL) contaminated soil.

Fifteen ASTs were removed shortly before the ACOR Tank Farm site was relinquished to the Territory of Alaska in 1948. The connecting pipeline system was not removed. The tank end of the service lines were observed sticking out of the ground and filled with debris at most of the tank foundations. Sets of four concrete supports, each 3 feet high, 4 feet wide, and 10 feet long, remain at each former tank location. These supports appear to be in their original locations, with the exception of the supports at Tank 5, which appear to have been moved. The service line at Tank 5 was not visible but was delineated by a geophysical subcontractor (ENSR 2003b).

During the ENSR 2001 RI, two surface soil locations were sampled at each of 15 tank foundations to determine whether residual fuel contamination exists in the surface soil. 15 soil borings were advanced (AP-080 through AP-094), one at each tank foundation to determine whether residual fuel contamination exists in the subsurface soil. Monitoring Wells AP-080 through AP-094 were installed in the borings. Samples were collected from each well to determine whether contaminants were leaching into the groundwater (ENSR 2003b).

Very low levels of target analytes in subsurface soil and groundwater were detected in the samples collected from the 15 soil borings and monitoring wells at AOC L3. None of these detected analytes exceeded ADEC cleanup levels (ENSR 2003b).

In 2004, groundwater sampling was conducted at AOC L3 by Shannon & Wilson during Focused RI field activities. Monitoring Well AP-091 (Tank 12) was appropriately purged and sampled for the 8 RCRA metals. Primary and duplicate water samples from the monitoring well had low levels of barium (0.0657 mg/L), chromium (0.00182 mg/L), and lead (0.00132 mg/L). These concentrations are less than the ADEC Table C groundwater cleanup criterion of 2.0 mg/L, 0.10 mg/L, and 0.015 mg/L, respectively (S&W 2006a).

In 2006, groundwater sampling was conducted at AOC L3. Monitoring Wells AP-081(Tank 2), AP-083 (Tank 4), AP-084 (Tank 5), AP-085 (Tank 6), AP-088 (Tank 9), AP-089 (Tank 10), and AP-092 (Tank 13) were appropriately purged and sampled for the 8 RCRA metals. Monitoring Well AP-094 (Tank 15) was not purged or sampled due to low water in the well. Because the re-sampling of the other eight wells confirmed that exceedances of metals was due to inadequate purging and sampling it was unnecessary resample AP-094 (Tank 15).

The maximum levels of the metals detected in the groundwater for these 9 AOCs were: arsenic (0.00515 mg/L), barium (0.0347 mg/L), cadmium (0.00002 mg/L), chromium (0.00152 mg/L), lead (0.00813 mg/L),mercury (0.00004 mg/L), selenium(0.00571 mg/L), and silver ( 0.00001 mg/L) and none of these concentrations exceeded ADEC groundwater cleanup levels.(BC-J 2007).

#### 2.3.1.7 AOC L5 - ACOR Tank Farm, Pump House

According to the 1942 Yakutat Army Base War Department maps, the ACOR Tank Farm Pump House was located at the low point of the tank farm. The piping manifold was designed to permit pumping from a tank in one lateral line to a tank in another lateral line or to the main line. The southwestern half of the foundation was framed by a vertical curb with a doorway in the west corner. A pump and part of the collapsed building were present on this part of the foundation. The northeastern half of the foundation extended below grade to form an L-shaped concrete vault that contained part of the severely rusted and fragile pipe manifold. This vault extends under the western half of the facility.

Pipelines and vaults at the L AOC were either removed or emptied and abandoned in place and pipeline closure assessments were performed in 2003 and 2008. Based on subsurface investigations during RI efforts conducted in 2001, 2004, 2005, and 2008, concentrations of COPCs in the soil and groundwater do not exceed their corresponding ADEC cleanup levels.

During the 2001 RI, a petroleum sheen was observed on standing water within the vault, and a heavy, colorful sheen emerged after a stone was dropped in. The vault itself was not sampled but there was a concern that contamination might have been released from the vault and the surrounding soil was investigated. During this 2001 RI, four surface soil locations and three subsurface locations around the Pump House foundation were sampled to determine whether residual fuel contamination exists in the surface soil. Three soil borings (AP-096, AP-097, and AP-098) were advanced to a depth of 12 to 13 feet bgs. Monitoring Wells AP-096, AP-097, and AP-098 were installed in the borings. Samples were collected from each well to determine whether contaminants were leaching into the groundwater. No target analytes in surface soil, subsurface soil, or groundwater had concentrations exceeding ADEC cleanup levels (ENSR 2003b).

In 2004, groundwater sampling was conducted at AOC L5 by Shannon & Wilson during Focused RI field activities. Monitoring Wells AP-096, AP-097, and AP-098 were appropriately purged and sampled for the 8 RCRA metals. Primary, duplicate and/or triplicate water samples from the monitoring well had either non-detectable levels or very low levels of metals. Cadmium, selenium, and silver were not detected in the water samples. The maximum concentration for arsenic was an estimated value of 0.0008 mg/L, for barium was 0.0393 mg/L, for chromium was an estimated value of 0.000118 mg/L, for lead was 0.00038 mg/L, and for mercury was an estimated value of 0.0013 mg/L. Arsenic, barium, chromium, lead, and mercury concentrations in groundwater collected from these wells did not exceed ADEC groundwater cleanup levels of 0.010 mg/L, 2.0 mg/L, 0.1 mg/L, 0.015 mg/L, and 0.002 mg/L, respectively (S&W 2006a).

During the 2005 ROST/LIF investigation, ten probes were advanced at the Pump House. Results indicate that there is no significant POL contamination. None of the correlation or confirmation samples had analytical results that exceed the applicable ADEC Method 2 soil cleanup level (USACE 2006).

## 2.4 ENFORCEMENT HISTORY

Remedial investigation and removal work at Yakutat Air Base has been carried out under the Defense Environmental Restoration Program (DERP) FUDS program. There have been no enforcement actions or notices of violation pertaining to the Department of Defense activities at the Yakutat Air Base.

## 2.5 COMMUNITY RELATIONS ACTIVITIES

Public participation has been an important component of the CERCLA process at the Yakutat Army Air Base. A Restoration Advisory Board (RAB) comprised of community members and other interested parties was established in 2001. RAB meetings are held approximately once per year to keep the public informed of ongoing project activities. Detailed meeting minutes are recorded and distributed after each meeting. The RAB is served by a technical advisor, under the Technical Assistance for Public Participation (TAPP) program, to provide technical guidance and comments on workplans, reports, proposed remedies, and potential environmental and human health impacts.

The opportunity for public review and commentary on project documents has been made available throughout all phases of the project. Detailed responses to comments are available in the correspondence file at the Information Repositories or in appendices of the final documents. All comments received are documented in the administrative record file.

Project documentation, reports, and other materials are available at the Information Repository at the Yakutat Tlingit Tribe offices located in Yakutat, Alaska and U.S. Army Corps of Engineers, Alaska District offices at JBER, Alaska.

## 2.6 SCOPE AND ROLE OF RESPONSE ACTION

The CERCLA process is intended to identify solutions to contamination issues where they exist. There is no proposed response action; because after a thorough investigation and analysis, it was determined that no contamination issues exist. The no further action described in this Decision Document addresses potential threats to human health and the environment posed by contamination at these 14 Yakutat Army Air Base AOCs:

C7 – Point Carrew Garrison 7.5 kW Powerhouse - No. 1093
Former Coast Artillery Outpost (FCAO)
L1 – Air Corps Operations Reserve (ACOR) Tank Farm - North Drum Dump
L2 – ACOR Tank Farm, Pipeline System - 7 Junctions
L3 – ACOR Tank No. 1302 (AST 2) foundation
L3 – ACOR Tank No. 1314 (AST 4) foundation
L3 – ACOR Tank No. 1315 (AST 5) foundation
L3 – ACOR Tank No. 1312 (AST 6) foundation

L3 – ACOR Tank No. 1309 (AST 9) foundation
L3 – ACOR Tank No. 1307 (AST 10) foundation
L3 – ACOR Tank No. 1311 (AST 12) foundation
L3 – ACOR Tank No. 1310 (AST 13) foundation
L3 – ACOR Tank No. 1304 (AST 15) foundation
L5 – ACOR Tank Farm Pump House

The initial RI reported threats of soil and groundwater contaminants. During these initial investigations there appeared to be soil and groundwater contamination that had potential risk to the public health or the environment. Further sampling and analysis demonstrated that there was no unacceptable risk to human health or environment at the 14 AOCs and no further action is required at these sites.

AOC E2 was determined to be ineligible for further action under FUDS due to the non-military source of potential contamination.

## 2.7 SITE CHARACTERISTICS

This section provides an overview of the former Yakutat Army Air Base sites, including geographical information, hydrology, ecological resources, and land use.

### 2.7.1 Conceptual Site Model

The Conceptual Site Model for Yakutat Army Air Base describes potential sources, release mechanisms, transport media, exposure routes, and human and ecological receptors. The primary sources of contaminants are releases to surface soils. Transport or receiving media include soil, sediment, groundwater, surface water, air, flora, or fauna.

The primary contaminants of concern at for the 14 AOCs at Yakutat Army Air Base are chemicals associated with petroleum hydrocarbon releases, metals, and 2,4-dinitrotoluene. 2,4-dinitrotoluene has a short half-life when exposed to the environment and would not be retained long in surface soil but could have a long retention in subsurface soil.

Figures 10 and 11 present graphical conceptual site models (CSM) for Yakutat. These graphical representations show potential sources, release mechanisms, transport media, exposure routes, and human and ecological receptors. Human receptors are expected to include site visitors, seasonal subsistence users, and future permanent residents. Several potential exposure scenarios were identified in the conceptual site model:

- incidental ingestion of soil/sediment
- dermal contact with soil/sediment/surface water
- inhalation of dust from soil or volatile organic compounds in groundwater
- ingestion of surface water or groundwater
- consumption of subsistence food items

The potentially affected biological resources evaluated included vegetation, birds, fish, shellfish, terrestrial mammals, marine mammals, and special status species.

### 2.7.2 Geographic Setting and Topography

Geographically, the town is bordered by Yakutat Bay and the Wrangell-Saint Elias Mountains to the north, by the Saint Elias Mountains and Tongass National Forest to the south and east, and by the Gulf of Alaska to the west. The elevation of most of the Yakutat forelands lies between 0 and 65 feet above mean sea level (amsl).

### 2.7.3 Geology

The following summary of the surficial geology of the Yakutat area is taken largely from U.S. Geological Survey (USGS) papers published in 1909 and 1979 (USGS 1909, 1979). According to the USGS, "Within the Yakutat region are some of the tallest mountains, some of the heaviest snowfalls, and one of the largest glaciers (Malaspina) in North America. Between the abrupt mountain front and the Gulf of Alaska lies a very gently sloping plain of outwash derived from repeated cycles of advance and retreat of glaciers during the Quaternary Period."

The city of Yakutat is located on the Yakutat foreland, a gently sloping glacial outwash plain between the Saint Elias Mountains and the Gulf of Alaska. Artificial fill is mostly present under the airport runways and other areas that were extensively modified during construction, including the developed areas of Yakutat. Numerous bogs and ponds are present between moraine ridges. Subordinate alluvial deposits, including kames, eskers, crevasse fillings, and minor outwash, also exist between moraine ridges.

Repeated cycles of glacial advance and retreat deposited the moraine complex and outer border of the outwash that now make up the Yakutat Forelands. A great glacier occupying Yakutat Bay extended to Ocean Cape, creating the Phipps Peninsula and other moraine deposits in the area.

Eight dominant surficial deposits, primarily of Holocene age, have been mapped in the Yakutat area. These include organic, eolian, beach, delta-estuarine, alluvial, outwash, moraine deposits, and artificial fill. Sediments beneath the site principally include outwash and moraine deposits. These deposits contain layers of both well-graded and poorly-graded sand, sand with gravel, and silty sand.

### 2.7.4 Ecological and Biological Resources

Historically, the rich fisheries, wildlife, and plants of the region have been used for subsistence living. The Yakutat area hosts numerous productive habitat types that are generally healthy and affected little by human intervention. The local economy is largely dependent on the natural resources of the area. Most residents still rely at least partly on subsistence hunting and fishing.

Three types of plant communities exist within the coastal area: true forest, grass-sedge meadows, and muskeg. The true forest generally consists of dense old-growth Sitka spruce, some western hemlock, and cottonwood, with skunk cabbage and devil's club for ground cover. Salmonberries, blueberries, and high bush cranberries are found within the forest. The forested areas in and around the Ankau Slough on Point Carrew have historically been used to gather berries. Grass-sedge meadows often border freshwater ponds and lakes, and are found at the mouth of river deltas. Fireweed, lousewort, paintbrush, lupine, and strawberries exist in this

environment. Muskeg are interspersed throughout the forest, containing sedges, deer cabbage, heather, Alaska cotton grass, Arctic iris, yellow pond lily, willow, and Nagoon berry.

Yakutat is renowned for its wealth of wildlife. Many land animals and birds frequent the area. Mammals that may frequent the project sites include moose, deer, wolves, coyote, black bear, brown bear, and numerous smaller fur-bearing and rodent species (BLM 1980). Wolverines, weasels, martens, mink, marmots, and fox are all found on the Yakutat foreland. River otters and beaver occupy the riparian habitats. Squirrels, voles, shrews, and brown bats can also be found. Some of these animals are important food sources for the local residents. The Cape Phipps Peninsula is an important productive subsistence area (USACE 1984). Many species listed as endangered by the U.S. Fish and Wildlife Service thrive in Alaska. Currently, the Alaska Department of Fish and Game (ADF&G) lists five species as endangered. Two of these species have a range that includes the Yakutat area: the short-tailed albatross and the humpback whale (ADF&G 2009).

The State of Alaska also administers a list of "Species of Special Concern," last updated in November 1998. Several of the listed species have a habitat range that includes the Yakutat area, such as the American peregrine falcon, the Arctic peregrine falcon, and the Townsend's Warbler.

### 2.7.5 Sampling Strategy

Field sampling activities occurred primarily during RI activities in 2000, 2001, 2006, 2007, and 2010. The primary objectives of the RI activities were to define the horizontal and vertical extent of hydrocarbon and other contamination in soil and groundwater. During the phased investigation activities, numerous samples were collected from surface soil, subsurface soil and groundwater. Information obtained from the RI was evaluated and compared to ADEC risk based cleanup levels or in the case of arsenic, background levels.

### 2.7.6 Known or Suspected Sources of Contamination

At the time of the remedial investigations, all of the potential primary sources of contamination had been removed along with all the buildings and ASTs.

AOC C7 was a powerhouse with diesel generators. The most likely contamination at this site would be POL, PCBs, and metals in soil and groundwater.

The suspected sources of contamination at the L AOCs were the former ASTs, piping system, pumphouse, and an area with abandoned drums. It is known that this was an aviation gasoline tank farm and the analytical sampling was targeted to components of aviation gasoline.

For the FCAO, the 2008 CERCLA Preliminary Assessment stated that the former building on the site might have been used for ammunition storage. There has been no documentation or evidence that ammunition was left in this building after WWII, but there may have been a release during the war. The surface soil in the area of the former building was sampled for volatile organic compounds (VOCs), Semi-volatile organic compounds (SVOCs) (including explosive related SVOCs), POL, metals and PCBs.

### 2.7.7 Types of Contamination and the Affected Media

Analytes detected in each area of concern were compared to background concentrations and the most conservative ADEC Method Two cleanup levels to determine the contaminants of concern (COCs). Chemical analyses were conducted for petroleum-related compounds, volatile organic compounds, semi-volatile organic compounds, metals, pesticides, and PCBs.

Based on the results of the initial remedial investigations, contaminants exceeding action levels in the groundwater were identified to be lead, arsenic, barium, cadmium, and chromium. Based on further remedial investigation, with redevelopment and sampling the monitoring wells these metals were found to be below risk based cleanup levels. Initial remedial investigations identified arsenic and chromium as soil contaminants exceeding action levels. Further investigation and analysis identified chromium to be in a chemical form that was below cleanup levels. Arsenic above background was found in one duplicate sample and was not in sufficient quantity and high enough concentrations to warrant further action.

At FCAO, one contaminant, 2,4-dinitrotoluene, was found in the surface soil but was not in sufficient quantity and high enough concentrations to warrant further action.

### 2.7.8 Location and Extent of Contamination at Sites Recommended for No Further Action

The environmental investigation process determined that the 14 AOCs at the Former Yakutat Army Air Base had no contamination or de-minimis amounts of contamination remaining above the pertinent risk-based cleanup levels. Soil cleanup levels are based on 18 AAC 75 Table B1, over 40 inch zone, ingestion or inhalation soil cleanup levels. Groundwater cleanup levels are based on ADEC 18 AAC 75, Table C Cleanup Levels.

The C7 - Point Carrew Garrison 7.5 kW Powerhouse - No. 1093 site meets risk-based cleanup levels for all contaminants of concern, with the exception of arsenic. Arsenic was detected in 1 of 9 soil samples at a concentration of 26.3 mg/kg, compared to the site-specific background level of 11.6 mg/kg. There is a de-minimis quantity of impacted soils, and no unacceptable risk to human health or the environment.

The FCAO - Former Coast Artillery Outpost site meets risk-based cleanup levels for all contaminants of concern, with the exception of 2,4-dinitrotoluene (DNT). 2,4 DNT was detected in 1 of 6 soil samples at a concentration of 0.623 mg/kg, compared to the risk-based cleanup level (18 AAC 75.341(c), Table B1) of 0.0093 mg/kg. There is a de-minimis quantity of impacted soils, and no unacceptable risk to human health or the environment.

## 2.8 CURRENT AND POTENTIAL FUTURE LAND USES

AOCs C7 is located on Phipps Peninsula, north of the Ankau Slough and is owned by Yak-Tat Kwaan, Inc. and Sealaska Corporation (subsurface owner). The property is undeveloped, and used for recreation and subsistence. There is no planned change in use. The FCAO is located in the Tongass National Forest, at the southwest end of Cannon Beach Road, and is used as a public recreational area. The property containing the " L" AOCs is owned by the Alaska Department of Natural Resources, Division of Mining, Land and Water and is southwest of Airport Road (a.k.a.

Engineers Road) at the intersection of Glacier Bear Avenue. This area is undeveloped but platted for future residential use.

### 2.8.1 Topography

AOC C7 is located on Phipps Peninsula, north of Ankau Slough. The AOC is situated on glacial moraine and marine beach deposits at elevations ranging from approximately 17 to 25 feet amsl. The topography at AOC C7 slopes to the south-southeast, toward Ankau Slough.

The L AOCs are located near the Yakutat Airport on a relatively flat glaciofluvial outwash plain. The topography is relatively flat, with a surface elevation of approximately 16 feet amsl.

FCAO is located southwest of the Yakutat Airport on a relatively flat glacial moraine and marine beach deposits. It is bounded by Tawah Creek on the east and the Gulf of Alaska on the west.

### 2.8.2 Hydrogeology and Hydrology

The Yakutat Forelands aquifer is a water-table aquifer, fed by precipitation infiltration and drained by small streams. Recharge also can occur by the streams when the stage of streams is higher than the local water table. Groundwater generally occurs within 10 feet of the ground surface in most locations. Groundwater flows both vertically and laterally through the unconfined regional aquifer. The flow of groundwater in the region generally follows topography, toward streams, lakes, the coastline, and manufactured drains. Glacial moraine and outwash deposits make up the majority of the regional aquifer. These materials typically exhibit a wide range of hydrogeological parameters that are based on the depositional history and grain size of the deposits. Outwash deposits are generally well-sorted, coarsely grained materials with higher permeability than moraines and tills (USGS 1998).

### 2.8.3 Drinking Water Sources

Yakutat has a water system that serves 265 homes which includes most of the developed area of town and the schools. Drinking water is pumped from two wells, one 174 feet deep with static water level measured about 70 feet and one 125 feet deep with a static water level about 69 feet bgs, on Ocean Cape Road. These wells are designated “ARCO Well #1” and “ARCO Well #2,” and are reportedly constructed of 12-inch diameter casing. Water is pumped into a 125,000-gallon wooden tank, chlorinated and then pumped to an 880,000-gallon steel tank on Ridge Road. The water then enters the distribution system by booster pump. According to Borough staff, the wells provide ample water to meet the community’s current needs. Those who are not on the Yakutat water system are believed to use private individual wells.

All of the 14 AOCs are in undeveloped areas and the groundwater is not used for a private or public drinking water system, is not within the zone of contribution of an active private or public drinking water system, and is not within a recharge area for a private or public drinking water well, a wellhead protection area, or a sole source aquifer.

### 2.8.4 Surface Water Use

The primary surface drainage features within the investigation areas are the Ankau Slough, Ophir Creek, and Tawah Creek. The Ankau Slough is a tidally influenced shallow water system on Point Carrew, connected to Monti Bay through the Ankau Head. The Slough is brackish and is

not a potential source of drinking water. Ophir Creek begins in the hummocky glacial moraine terrain between Monti Bay and Redfield Cove, and flows toward the southwest to Summit Lake. Tawah Creek begins at Summit Lake and flows southeast to Lost River, collecting many small streams and constructed drains originating in the area. Most streams in the Yakutat foreland flow toward the southwest. The southeasterly flow of Tawah Creek is due to the beach deposits creating a topographical barrier along the Gulf of Alaska. These water bodies are used for recreation, fishing, hunting and subsistence. There are no plans to use any of these water bodies for a primary drinking water source.

## 2.9 SUMMARY OF SITE RISKS

Sufficient data has been collected from the multiple Remedial Investigations to evaluate the potential risks to human health and the environment. A baseline risk assessment for the former Yakutat Air Base has not been conducted, and is not deemed necessary for the 14 AOCs addressed in this document.

### 2.9.1 Human Health Risk Evaluation

This document does not assess AOC E2 for human health risk because the contamination at the site has been determined to be of non-DoD origin.

The remaining 14 AOCs were found to not contain contaminants at levels above ADEC's most stringent risk based cleanup levels, or not contain contaminants above naturally occurring background levels. For two of the AOCs, contaminants were found above action levels but in de-minimis quantities that would not pose an unacceptable risk to human health. There are no unacceptable human health risks that would limit use or exposure at these AOCs.

### 2.9.2 Ecological Risk Evaluation

This document does not assess AOC E2 for ecological risk because the contamination at the site has been determined to be of non-DoD origin.

For the remaining 14 AOCs, either the AOCs did not contain contaminants above naturally occurring background levels, or they were found to not contain contaminants at levels above ecological screening levels that could pose an unacceptable risk to environment. There are no unacceptable ecological risks that would limit use or exposure at these AOCs.

## 2.10 REMEDIAL OBJECTIVES

The remedial goals of the DERP-FUDS Program are to reduce the risk resulting from past Department of Defense activities to safe levels, in a timely, cost-effective manner. The selected remedy for the 14 AOCs is No Further Action (NFA) and No Further Department of Defense Action Indicated (NDAI) has been determined for the sites. The remedy is protective of human health and the environment because the contaminants are below ADEC risk based cleanup levels, and do not pose an unacceptable risk to human health or the environment due to a de-minimis volume of contamination. No further action is required at this site and there is no significant threat to public health, safety or the environment resulting from past activities by the Department of Defense.

This decision is based on the results of removal activities and investigations, which were conducted from 1984 to 2010 at the former Yakutat Army Air Base FUDS. Detailed information supporting the NDAI Report is also contained in the Administrative Record for this site.

For AOC E2, the contamination at the site is not a result of past DoD activities and therefore DoD remedial goals are not applicable.

## 2.11 DESCRIPTION OF ALTERNATIVES

There is no significant threat to public health, safety or the environment resulting from past military activities at the 14 AOCs, therefore the no further action (NFA) alternative is applicable for these sites.

**Alternative 1 - No Further Action**

No further action is the appropriate response action when no additional remedial actions are necessary to protect human health and the environment, based on established cleanup levels and regulatory standards.

## 2.12 COMPARATIVE ANALYSIS OF ALTERNATIVES

For the 14 AOCs, the Remedial Investigations provided detailed data supporting the NFA alternative for these sites. The Corps of Engineers evaluated the presumptive remedial alternative based on the nine evaluation criteria established under CERCLA. Each alternative must meet the threshold criteria of overall protection of human health and the environment and compliance with ARARs (for CERCLA-regulated compounds only) or pertinent risk-based standards (for petroleum hydrocarbons). Five balancing criteria are used to analyze the alternatives: long-term effectiveness and permanence, reduction in toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, and cost. Two additional modifying criteria, state acceptance and community acceptance, are evaluated based on public comments on the Proposed Plan.

### 2.12.1 Overall Protection of Human Health and the Environment

AOCs L1, L2, L3-AST 2, L3-AST 4, L3-AST 5, L3-AST 6, L3-AST 9, L3-AST 10, L3-AST 12, L3-AST 13, L3- AST 15, and L5 have no contaminants above ADEC cleanup levels or background levels. For AOCs C7 and FCAO, a cleanup level was exceeded for one chemical and one sample, but was considered a de-minimis quantity. The cleanup levels are risk based therefore unrestricted use and unlimited exposure is applicable for these AOCs. No long-term management, periodic reviews or land use controls are necessary. NFA at these AOCs is appropriate because there is no unacceptable risk to human health or the environment. NFA is protective of human health and the environment and complies with Applicable or Relevant and Appropriate Requirements (for CERCLA-regulated compounds only).

### 2.12.2 Long-Term Effectiveness and Permanence

Because the remedial objectives have been met, NFA will provide long-term effectiveness and permanence.

### 2.12.3 Reduction in Toxicity, Mobility, and Volume through Treatment

Because the remedial objectives have been met, no treatment is required to reduce Toxicity, Mobility, and Volume.

### 2.12.4 Short-Term Effectiveness

Because the remedial objectives have been met and no construction will be conducted, there will be no risk for workers, residents, and the environment.

### 2.12.5 Implementability

No additional remedial action will need to be implemented. The remedial objectives have been met and NFA proposed.

### 2.12.6 Costs

No remedial action is proposed and therefore the cost is $0.

### 2.12.7 State Acceptance

This criterion evaluates whether the State of Alaska agrees with the analysis and recommendations resulting from the field investigations and the Proposed Plan. ADEC has fully participated throughout the process at this site and concurs with the selected remedies.

### 2.12.8 Community Acceptance

The Proposed Plan for Yakutat Air Base, Alaska (USACE 2015) was released for public comment in February 2015 and presented the preferred remedy of No Further Action for all fifteen AOCs. The public comment period was held for 30 days. An open house was held on 24 February 2015 at the Yakutat High School. The proposed plan was made available to local residents, community stakeholders, and the Yakutat Restoration Advisory Board. One comment was received from a local resident, which was unrelated to proposed plan and the AOCs in the plan. The community has no objections to the proposed remedies.

## 2.13 SELECTED REMEDY

The selected remedy is No Further Action for 14 AOCs:

1) AOC C7 – Point Carrew Garrison 7.5 kW Powerhouse - No. 1093,
2) Former Coast Artillery Outpost (FCAO),
3) L1 – Air Corps Operations Reserve (ACOR) Tank Farm - North Drum Dump,
4) L2 – ACOR Tank Farm, Pipeline System - 7 Junctions,
5) L3 – ACOR Tank No. 1302 (AST 2) foundation,
6) L3 – ACOR Tank No. 14 (AST 4) foundation,
7) L3 – ACOR Tank No. 1315 (AST 5) foundation,
8) L3 – ACOR Tank No. 1312 (AST 6) foundation,
9) L3 – ACOR Tank No. 1309 (AST 9) foundation,
10) L3 – ACOR Tank No. 1307 (AST 10) foundation,
11) L3 – ACOR Tank No. 1311 (AST 12) foundation,
12) L3 – ACOR Tank No. 1310 (AST 13) foundation,
13) L3 – ACOR Tank No. 1304 (AST 15) foundation, and
14) L5 – ACOR Tank Farm Pump House.

Alternative 1 (No Further Action) is the selected remedy only for those sites that do not have contamination in the soil exceeding the risk-based soil cleanup levels. No risk is identified at these sites, so no further action is appropriate to avoid unnecessary remedial actions that could cause unintended risk to workers and the environment. The selected remedy satisfies the requirements under Section 121 of CERCLA and the NCP.

No DoD Action Indicated (NDAI) was also determined for AOC E2 - Debris Disposal/Barrel Dump Area - Quartermaster Loop. During the remedial investigation, polychlorinated biphenyls (PCBs), diesel range organics (DRO), selenium, mercury and barium were detected at levels that exceeded ADEC cleanup levels. However, the presence of an abandoned Colorado Gas Corporation sign, and the exceedance of barium, a common drilling additive, in surface water suggest that AOC E2 may not be a FUDS site. Further evaluation of aerial photographs and topographic maps also point to non-DoD origins for this site. USACE has concluded the weight of evidence suggests the likely source of the contamination at E2 is from the Colorado Oil & Gas Co. Well YAKUTAT 1 drilled in 1957. The identified contaminants are not attributable to DoD activities and thus not eligible for further action under FUDS. Therefore, the FUDS policy in Engineer Regulation No. 200-3-1 directs that the NDAI decision be applied.

## PART 3: RESPONSIVENESS SUMMARY

A Proposed Plan dated February 2015 was distributed to interested stakeholders and the public. The submitted comments addressed a local citizen's concern of a possible environmental problem not associated with the AOCs in the proposed plan, the Forest Service and State of Alaska's request to clarify land ownership, and the State of Alaska statement of legal rights.

Public Comment Period: 17 February - 17 March 2015
Public Meeting held at Yakutat High School: 24 February 2015
Public Meeting Notices: published in the Driftwood Dispatch, Juneau Empire, & Capital City Weekly, advertised on Yakutat area bulletin boards, and posted to the Alaska District website

A list of comments with USACE's responses is found in Table 3.

### Table 3 – Summary of Proposed Plan Comments and Responses

| No. | Commenter | Comment | Affects Proposed No DoD Action Indicated for Sites | Response |
|---|---|---|---|---|
| 1 | The Alaska Department of Natural Resources, Division of Mining, Land and Water, Southeast Regional Office (DMLW) | As a reviewer, it would be helpful to see a depiction or indication of the underlying land ownership status (e.g., state owned, state selected, tentatively approved, etc.) | No | In the future, the land ownership will be clarified in the document site description. The DMLW online land records will in part, be relied upon for current land status information. |
| 2 | DMLW | Figure 2 delineates several sites as "No Further Action Proposed for the Following 15 Areas of Concern." To the extent that any of these sites slated for "no further action" fall on state land (which are not clearly identified in Figure 2), the State of Alaska reserves its right to hold the United States responsible for clean-up for any damages for which the United States is the proximate cause of such damages on state land. | No | It is noted that DMLW is stating the State of Alaska's legal rights. The proposed plan did not propose a legal agreement between the State of Alaska and United States. |

| No. | Commenter | Comment | Affects Proposed No DoD Action Indicated for Sites | Response |
|---|---|---|---|---|
| 3 | DMLW | Several of the clean-up sites near the Yakutat Airport appear to fall on State-owned land. Because of this nexus with your project, and as neighboring land owners to the other sites in Figure 2, will you please add the following names and email addresses on your routing list regarding any future public notices concerning the sites identified in the Proposed Plan, progress reports, or any pertinent communication regarding the Proposed Plan:<br><br>Robert H. Edwardson, Southeast Regional Manager: rob.edwardson@alaska.gov<br><br>Steve Winker, Natural Resource Manager: steve.winker@alaska.gov<br><br>Anne Johnson, Natural Resource Manager: anne.johnson1@alaska.gov<br><br>Lee Cole, Natural Resource Manager: lee.cole@alaska.gov | No | The listed personnel will be added to the stakeholder distribution list for Yakutat FUDS work. |
| 4 | Local Citizen | During the Open House held on 24 February 2015, a local citizen reported the appearance of "blackened rocks" along the beach near the Ankau Bridge the previous summer. He was concerned that may indicate contamination in the area. | No | *Note: The Ankau Slough is not included on the list of NDAI Areas of Concern proposed for closure in this proposed plan.* On 25 February 2015, USACE and ADEC inspected the Ankau beach and determined that the "blackened rocks" were actually vast beds of mussels that were exposed during the extreme low tide. The widespread mussel beds were evident on both the north and south beaches of the Slough. There was no visible or olfactory evidence of contamination during the inspection. |
| 5 | United States Forest Service (USFS) | USFS asked USACE to confirm that the area of concern E2 is located in sec 4 of T28S, R34E. | No | The oil well (AOC E2) appears to be in Sec 33 of T27S, R34E, but contamination could possibly extend into Sections 4 & 5 of T28S and Section 32 of T27S. |

## PART 4: REFERENCES

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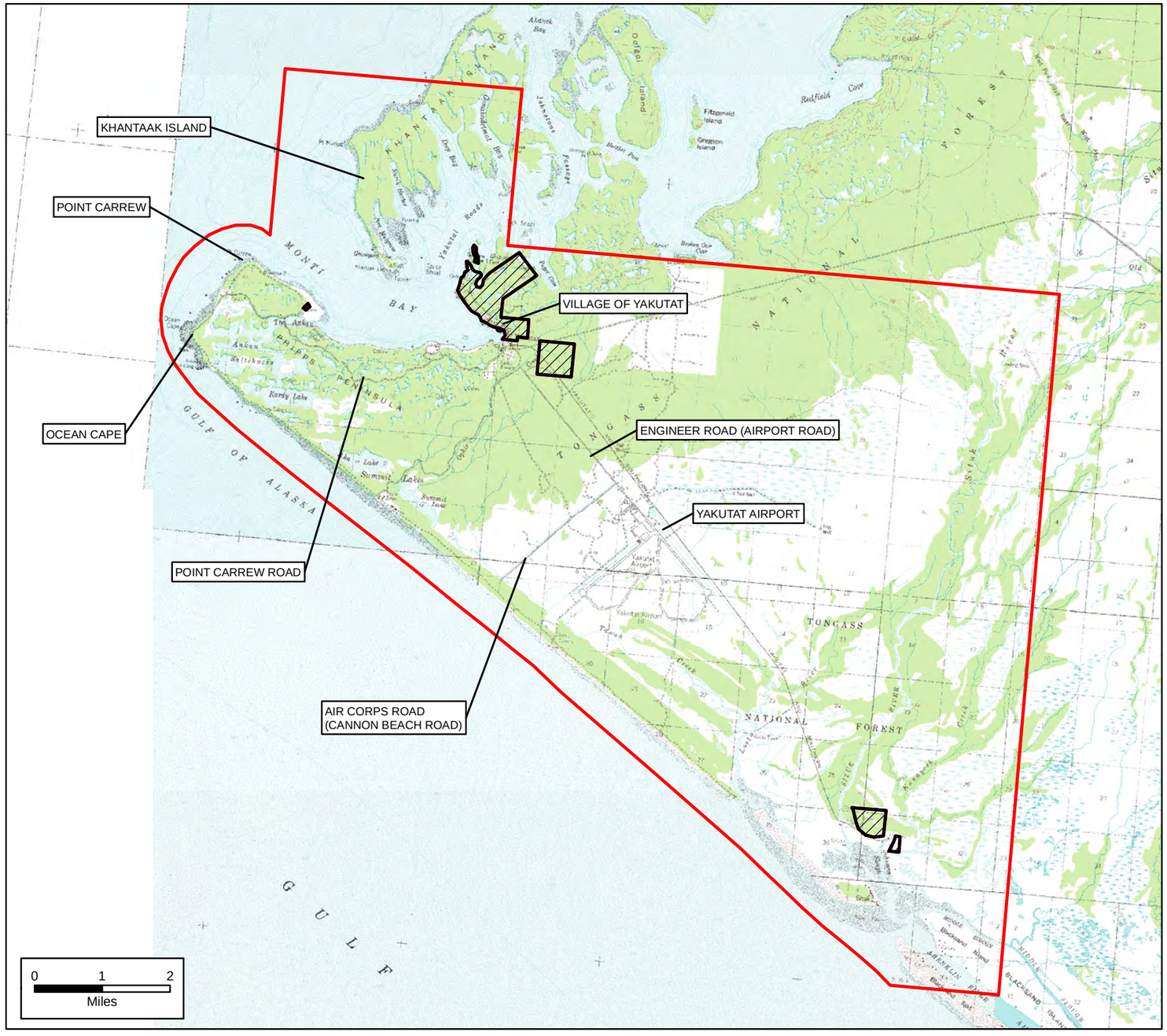
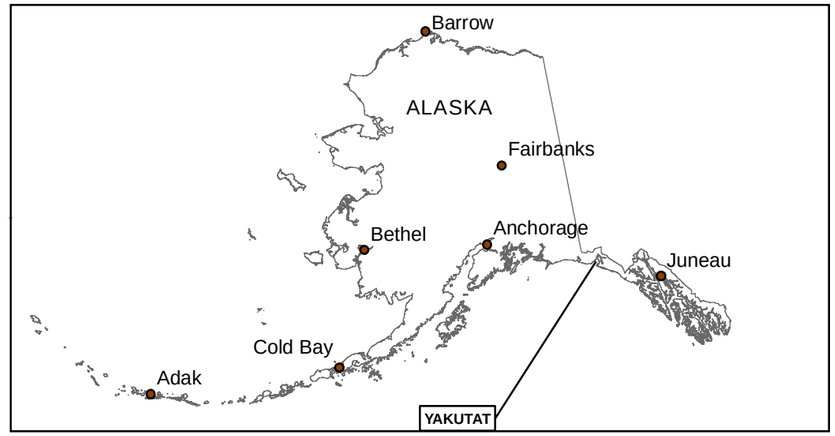
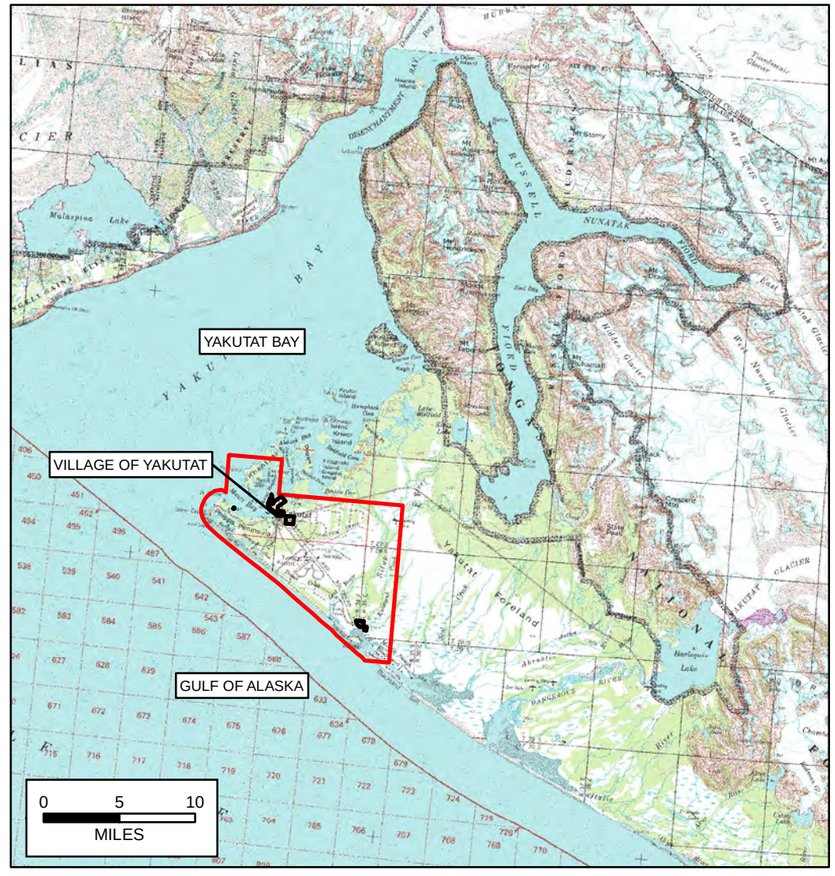
# ATTACHMENT 1 – FIGURES




**REFERENCES**
BACKGROUND MAPS ARE USGS TOPOGRAPHIC MAPS:
YAKUTAT B-5, 1959, 1:63,360
YAKUTAT C-5, 1970, 1:63,360
YAKUTAT C-4, 1972, 1:63,360
YAKUTAT, ALASKA 1982, 1:250,000

**NOTES**
1. FUDS PROPERTY BOUNDARY IS BASED ON MAP TITLED "REAL ESTATE, YAKUTAT AIR BASE MILITARY RESERVATION" DATED 16 APRIL 1949.

**ACRONYMS AND ABBREVIATIONS**
USACE - U.S. ARMY CORPS OF ENGINEERS
USGS - U.S. GEOLOGICAL SURVEY

**LEGEND**
FUDS PROPERTY BOUNDARY
PROPERTY WAS NOT OWNED, LEASED, OR OTHERWISE POSSESSED BY DOD AND IS EXCLUDED FROM FUDS

N

# LOCATION AND VICINITY MAPS

U.S. ARMY CORPS OF ENGINEERS ALASKA DISTRICT

**YAKUTAT AIR BASE - F10AK0606**
YAKUTAT, ALASKA

**FIGURE 1**

O:\ESP\Private\FUDS_Properties\Yakutat F10AK0606\02-HTRW\FS_PP_DD\2015 DD Closeout Report\Figures\Fig1_LocVicMap_28Aug2015.mxd. 26 Aug 2015

# FORMER YAKUTAT ARMY AIR BASE AOC LIST

**No Department of Defense Action Indicated for the Following 15 Areas of Concern:**

- AOC C7 - Pt. Carrew Garrison - Powerhouse No. 1093
- AOC E2 - Debris Disposal/Barrel Dump Area
- **Former Coast Artillery Outpost**
- AOC L1 - North Drum Dump
- AOC L2 - Tank Farm Pipeline System- 7 Junctions
- AOC L3 - Tanks 2, 4, 5, 6, 9, 10, 12, 13, 15 (9 AOCs)
- AOC L5 - Pump House

KHANTAAK ISLAND
U.S. SURVEY 400
U.S. SURVEY 2134 (CEMETERY)
POINT CARREW ROAD
C7
U.S. SURVEYS 659, 1897, 1758
VILLAGE OF YAKUTAT
U.S. SURVEYS 179
L1 (NORTH)
L5
L3
L2
ENGINEER ROAD (AIRPORT ROAD)
E2
AIR CORPS ROAD (CANNON BEACH ROAD)
YAKUTAT AIRPORT
FORMER COAST ARTILLERY OUTPOST

**REFERENCES**
BACKGROUND MAPS ARE USGS TOPOGRAPHIC MAPS:
YAKUTAT B-5, 1959, 1:63,360
YAKUTAT C-5, 1970, 1:63,360
YAKUTAT C-4, 1972, 1:63,360

**ACRONYMS AND ABBREVIATIONS**
USACE - U.S. ARMY CORPS OF ENGINEERS
USGS - U.S. GEOLOGICAL SURVEY
AOC - AREA OF CONCERN

**NOTES**
1. FUDS PROPERTY BOUNDARY IS BASED ON MAP TITLED "REAL ESTATE, YAKUTAT AIR BASE MILITARY RESERVATION" DATED 16 APRIL 1949.
2. AOC LABELS HAVE RED BORDERS.

**LEGEND**
- FUDS PROPERTY BOUNDARY
- PROPERTY WAS NOT OWNED, LEASED, OR OTHERWISE POSSESSED BY DOD AND IS EXCLUDED FROM FUDS

N
0 0.5 1
Miles

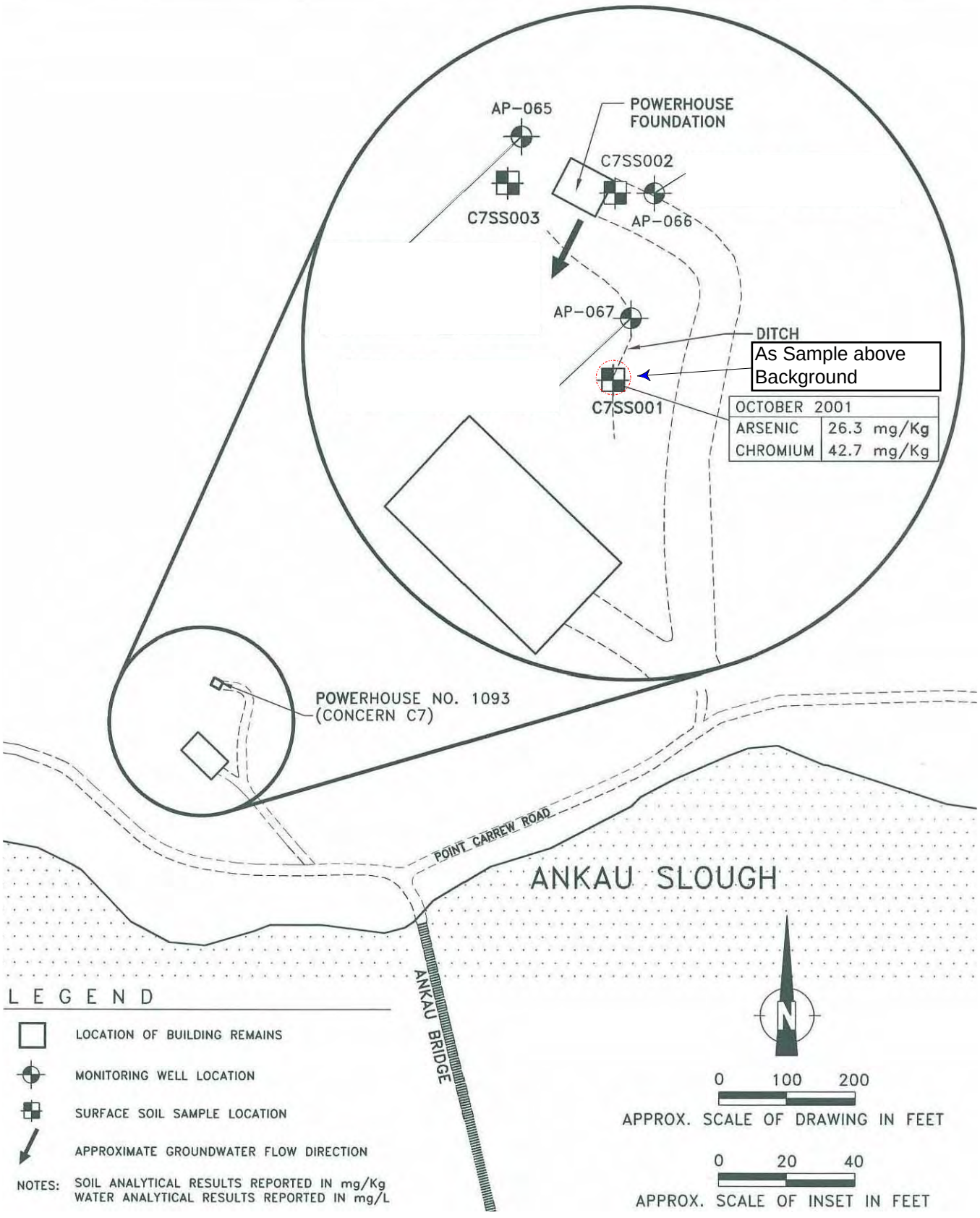
# AREAS OF CONCERN (AOC) LOCATIONS

US ARMY CORPS OF ENGINEERS ALASKA DISTRICT

**YAKUTAT AIR BASE - F10AK0606**
YAKUTAT, ALASKA

**FIGURE 2**

O:\ESP\Private\FUDS_Properties\Yakutat F10AK0606\02-HTRW\FS_PP_DD\2015 DD Closeout Report\Figures\Figure 2_AOC Locations_31Jul2015.mxd, 26 Aug 2015




Approximate boundary of Area for Remedial Action. Used for impacted area and volume calculations and is based on data from ENSR 2003b. All sampling data and analytical results not shown.

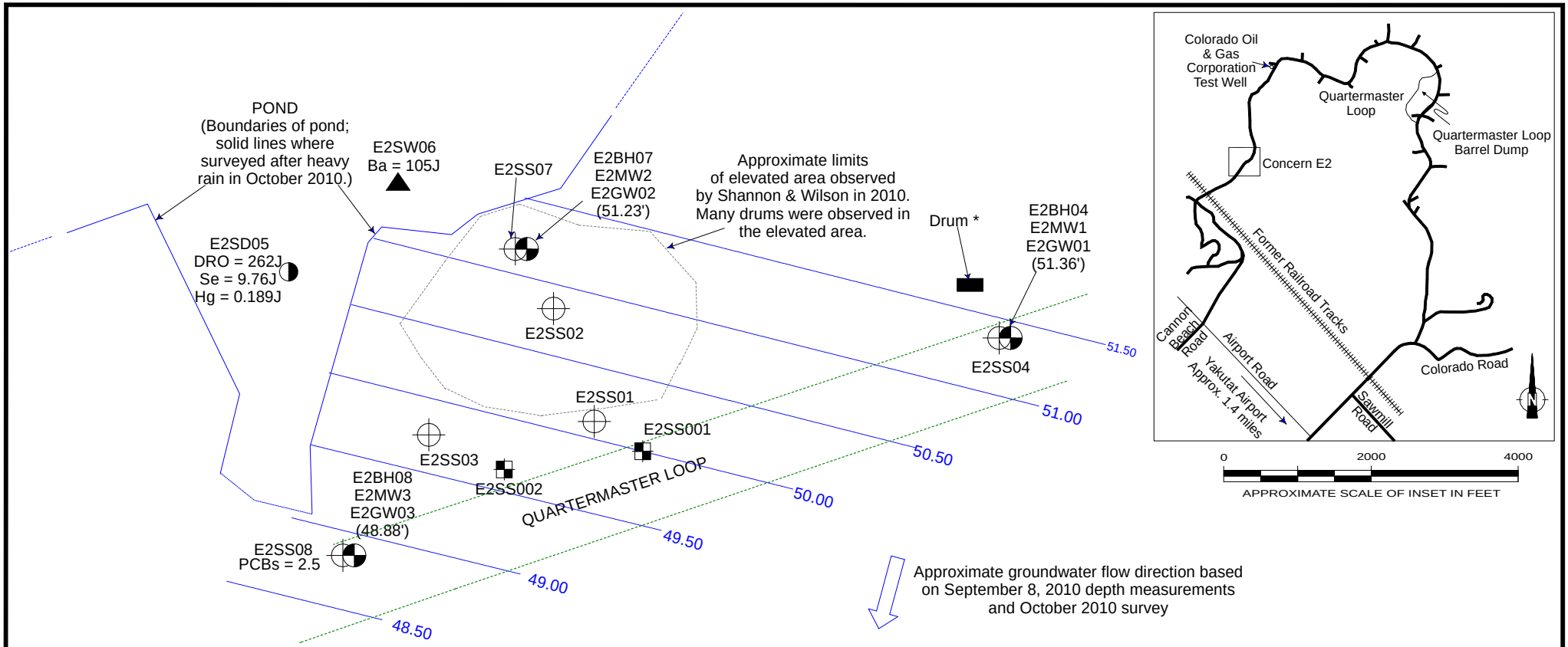
Base map prepared for USACE by ENSR and presented in "2001 Remedial Investigation Report-Final-RI/FS, Yakutat Area, AK". Modified by Shannon & Wilson for 2010 Feasibility Study.

Former Yakutat Air Base
Yakutat, Alaska

**AOC C7 SITE PLAN**

U.S. ARMY CORPS OF ENGINEERS
ALASKA DISTRICT

**FIGURE 3**







## LEGEND

E2SS08 PCBs = 2.5 — Approximate Surface Soil Sample Location E2SS08 collected by Shannon & Wilson, Inc., August 2010. PCB concentration = 2.5 milligrams per kilogram (mg/kg).

E2SD05 DRO = 262J Se = 9.76J Hg = 0.189J — Approximate Sediment Sample Location E2SD05 collected by Shannon & Wilson, Inc., August 2010. Diesel range organics [DRO], selenium [Se], and mercury [Hg] concentrations in mg/kg.

E2SW06 Ba = 105J — Approximate Surface Water Sample Location E2SW06 collected by Shannon & Wilson, Inc., August 2010. Barium (Ba) concentration in surface water sample in micrograms per liter (ug/L).

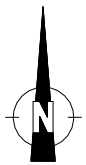
E2BH08 E2MW3 E2GW03 (48.88) — Approximate location of Boring E2BH08 and Monitoring Well E2MW3 and Groundwater Sample Location E2GW03 collected by Shannon & Wilson, Inc., in August and September 2010. Groundwater elevation measured on September 8, 2010 in monitoring well = 48.88 feet Mean Lower Low Water (MLLW).

E2SS001 — Approximate Surface Soil Sample E2SS001 collected by ENSR in 2001, based on 2001 survey data.

48.50 — Approximate Groundwater Elevation Contours in feet MLLW.

J = Concentrations are considered estimated values.

Notes:
Only concentrations greater than the To Be Considered (TBC) Criteria reported in the 2010 Supplemental Remedial Investigation are shown.
*Only one drum was surveyed by Del Norte in 2010; however, many drums were observed at the site in 2010. The boundaries of the scattered drums, elevated areas, and depressions are approximate due to dense vegetation and deterioration of the drums.

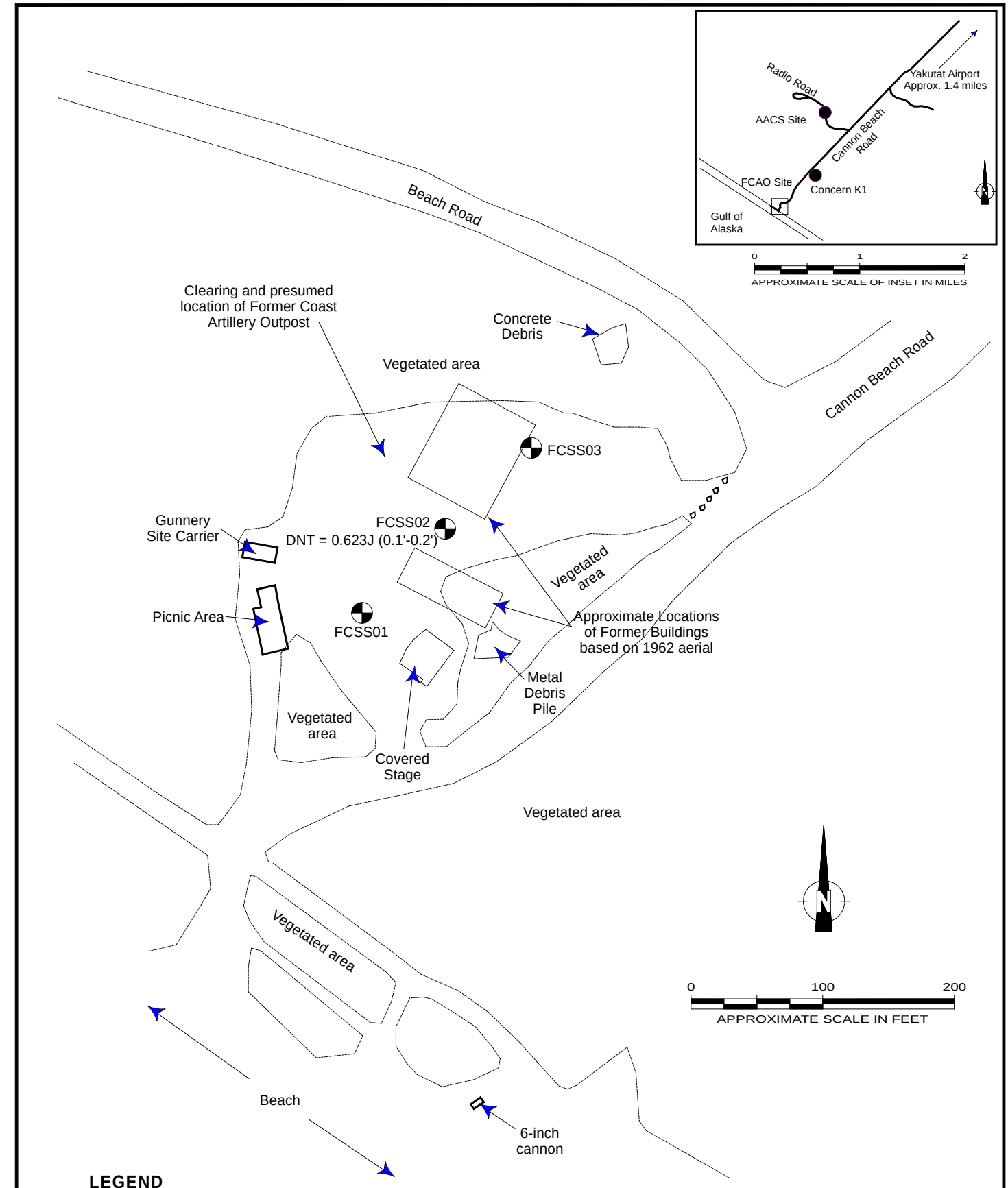



0 20 40
APPROXIMATE SCALE IN FEET

Former Yakutat Air Base
Yakutat, Alaska

**CONCERN E2 SITE PLAN**

**FIGURE 4**




## LEGEND

FCSS02
DNT = 0.623 J (0.1'-0.2')

Approximate Suface Sample Location FCSS02 by Shannon & Wilson in August 2010. 2,4-Dinitrotoluene (DNT) concentation = 0.623 milligrams per kilogram (mg/kg).

J = Concentrations are considered estimated values.

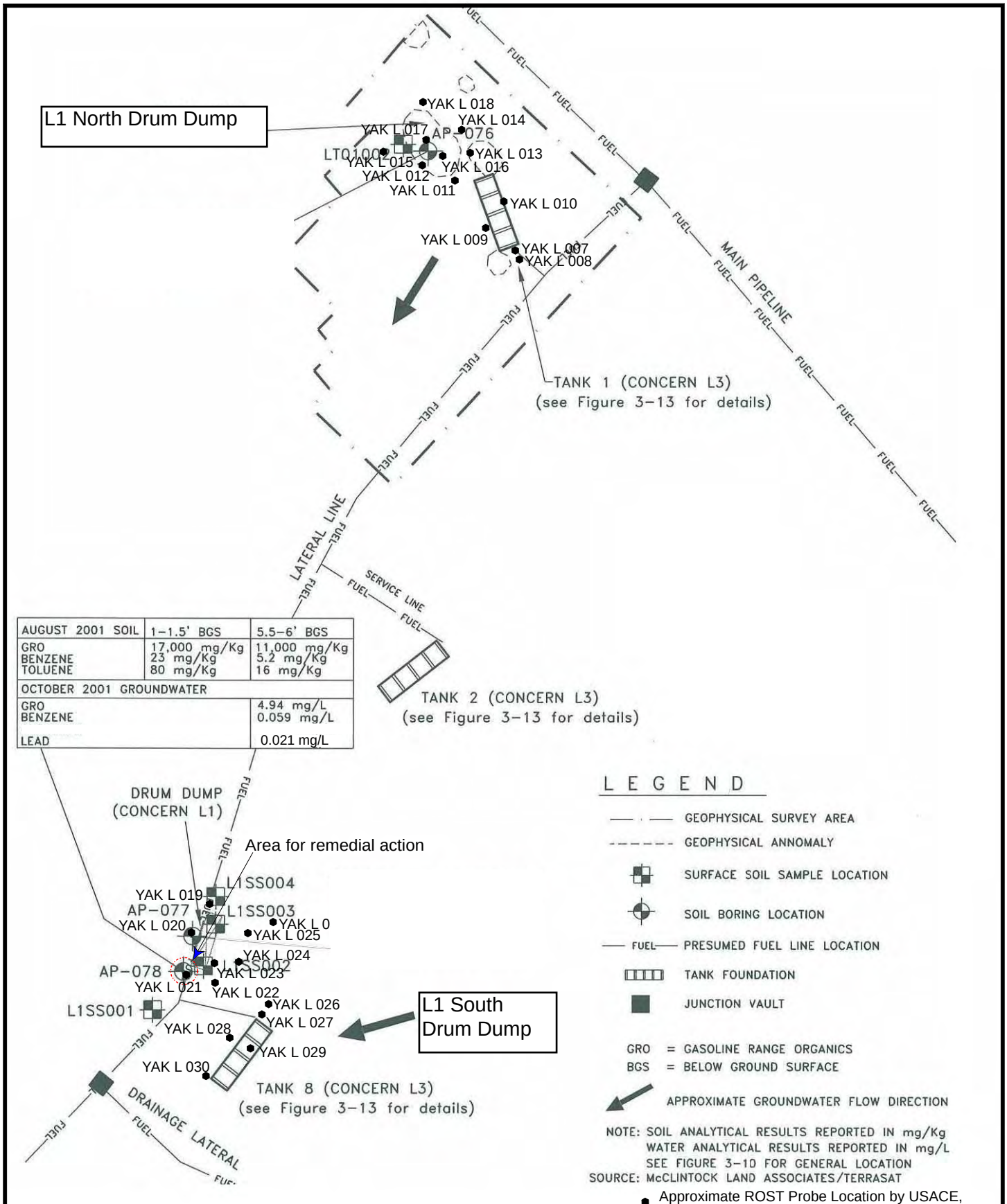
Note: Only concentrations greater than the To Be Considered (TBC) Criteria reported during the 2010 Supplemental Remedial Investigation are shown.

Former Yakutat Air Base
Yakutat, Alaska

**FCAO SITE PLAN**

US Army Corps of Engineers, Alaska District

**FIGURE 5**




| AUGUST 2001 SOIL | 1-1.5' BGS | 5.5-6' BGS |
|---|---|---|
| GRO | 17,000 mg/Kg | 11,000 mg/Kg |
| BENZENE | 23 mg/Kg | 5.2 mg/Kg |
| TOLUENE | 80 mg/Kg | 16 mg/Kg |
| OCTOBER 2001 GROUNDWATER | | |
| GRO | | 4.94 mg/L |
| BENZENE | | 0.059 mg/L |
| LEAD | | 0.021 mg/L |

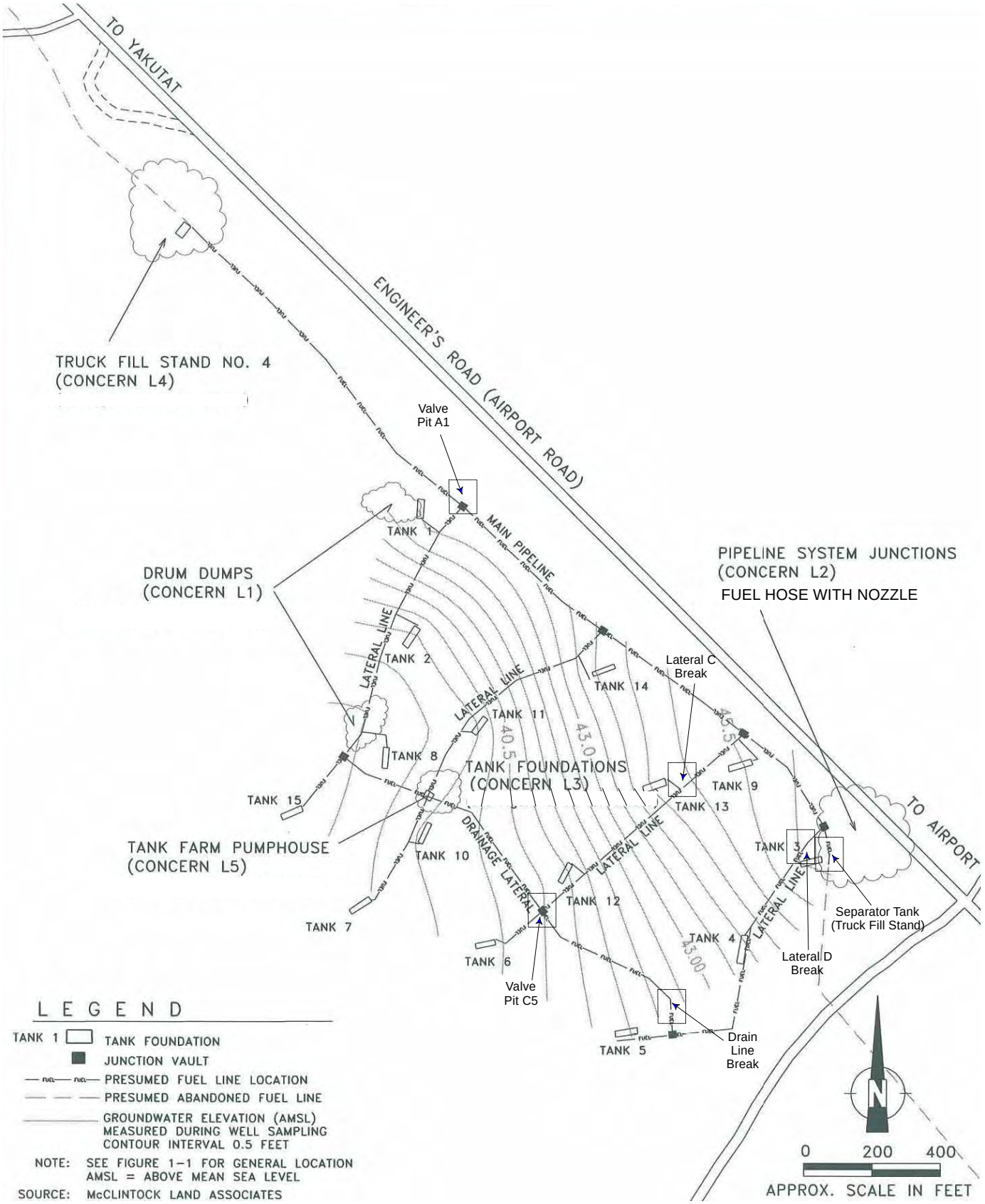
Base map prepared for USACE by ENSR and presented in "2001 Remedial Investigation Report-Final-RI/FS, Yakutat Area, AK". Modified by Shannon & Wilson for 2010 Feasibility Study.

Former Yakutat Air Base
Yakutat, Alaska

**AOC L1 SITE PLAN**

US Army Corps of Engineers, Alaska District

**FIGURE 6**



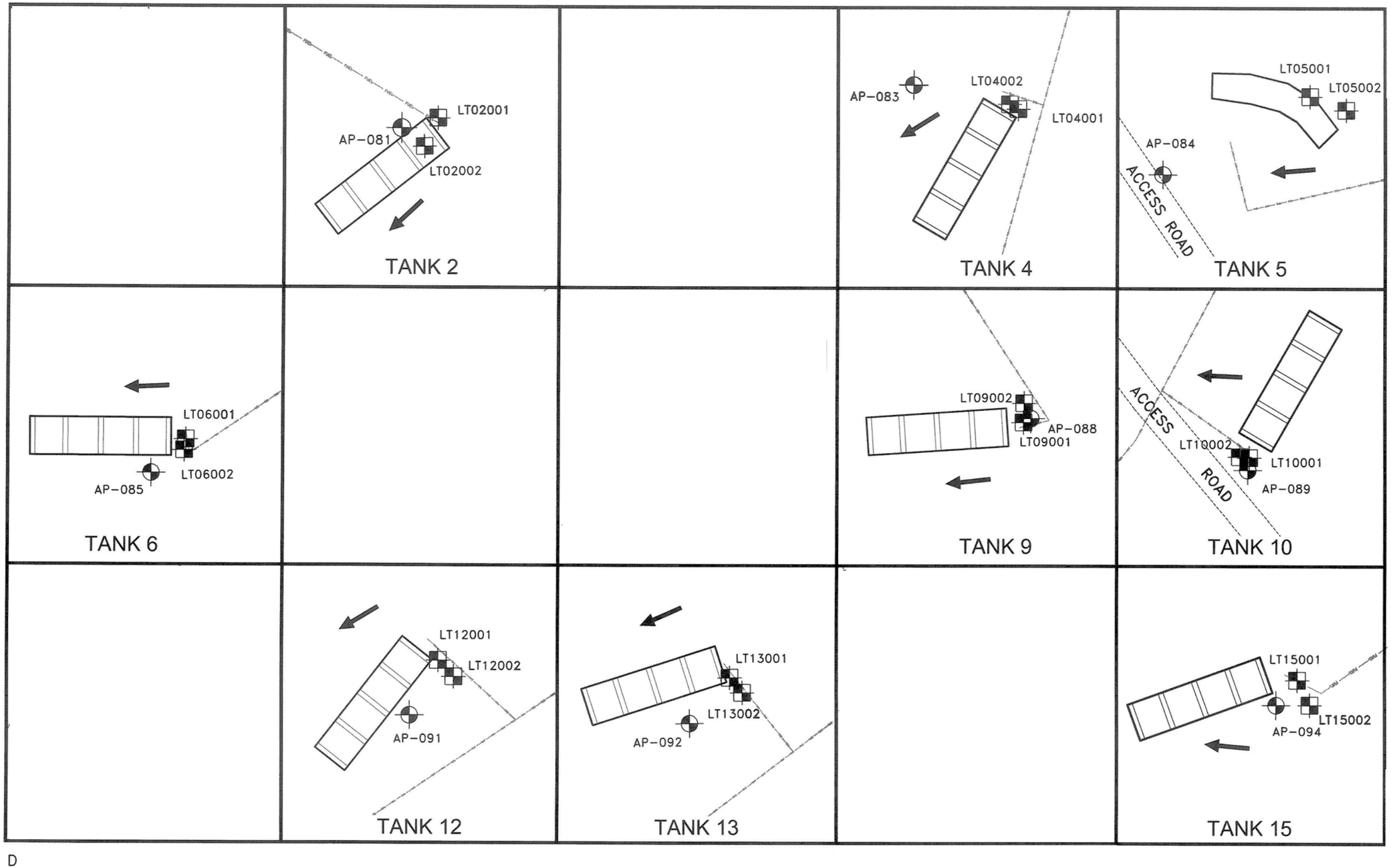

Base map prepared for USACE by ENSR and presented in "2001 Remedial Investigation Report-RI/FS, Yakutat Area, AK". Modified by Shannon & Wilson for 2010 Feasibility Study.

Former Yakutat Air Base
Yakutat, Alaska

**AOC L2 SITE PLAN**

US Army Corps of Engineers, Alaska District

**FIGURE 7**




LEGEND

- SURFACE SOIL SAMPLE LOCATION
- SOIL BORING LOCATION
- GRO = GASOLINE RANGE ORGANICS
- DRO = DIESEL RANGE ORGANICS
- PRESUMED FUEL LINE LOCATION
- TANK FOUNDATION (CONCERN L3)

SOURCE: McCLINTOCK LAND ASSOCIATES/TERRASAT

- GEOPHYSICAL SURVEY AREA
- GEOPHYSICAL ANOMALY
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE: SOIL ANALYTICAL RESULTS REPORTED IN mg/Kg
WATER ANALYTICAL RESULTS REPORTED IN mg/L
SEE FIGURE 3-10 FOR TANK FOUNDATION LOCATIONS AND GROUNDWATER CONTOURS

0 40 80
APPROXIMATE SCALE IN FEET

Base map prepared for USACE by ENSR and presented in "2001 Remedial Investigation Report-Final-RI/FS, Yakutat Area, AK". Modified by Shannon & Wilson for 2010 Feasibility Study.

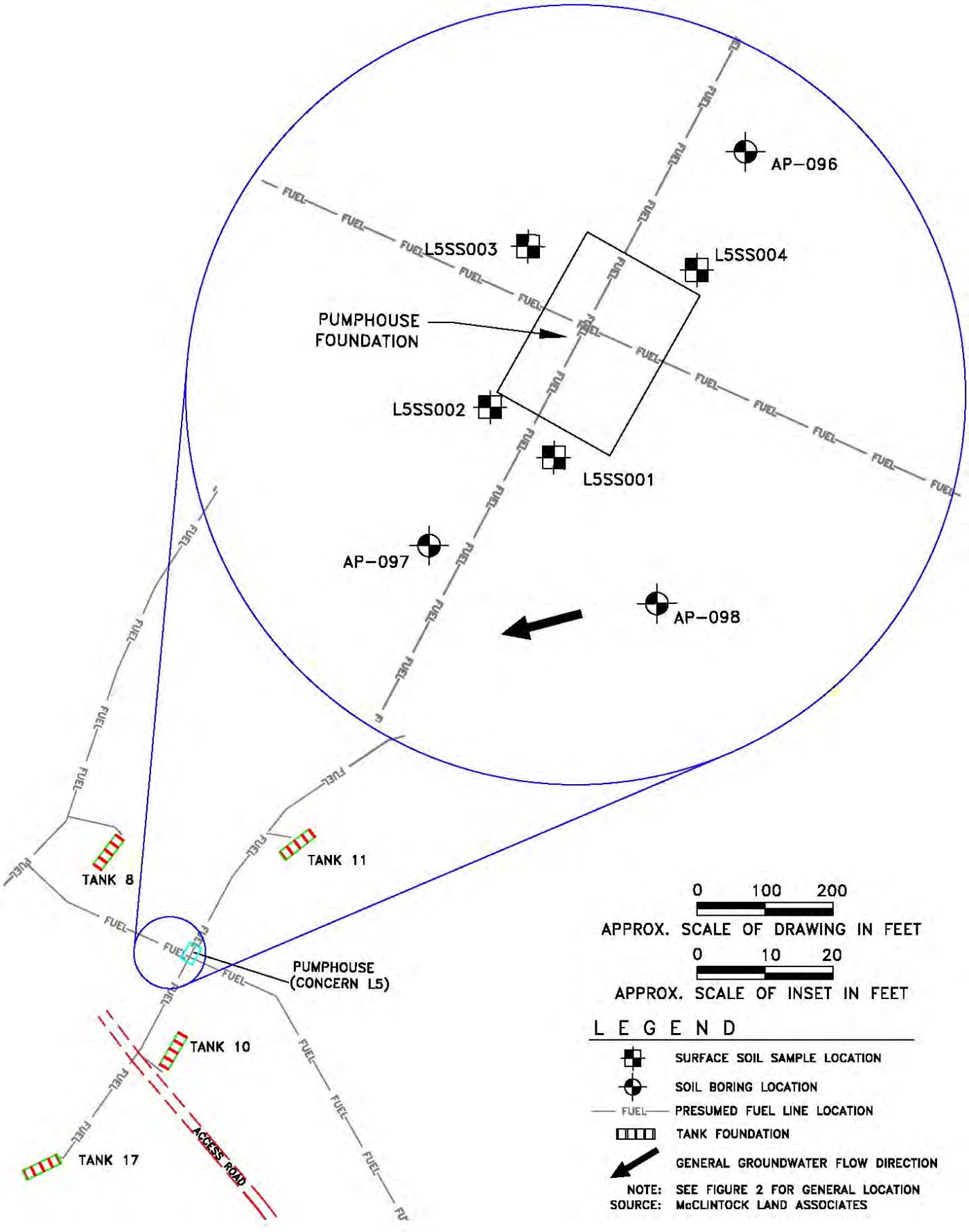
N

Former Yakutat Air Base
Yakutat, Alaska

**AOC L3 SITE PLAN**

US Army Corps of Engineers, Alaska District

**FIGURE 8**



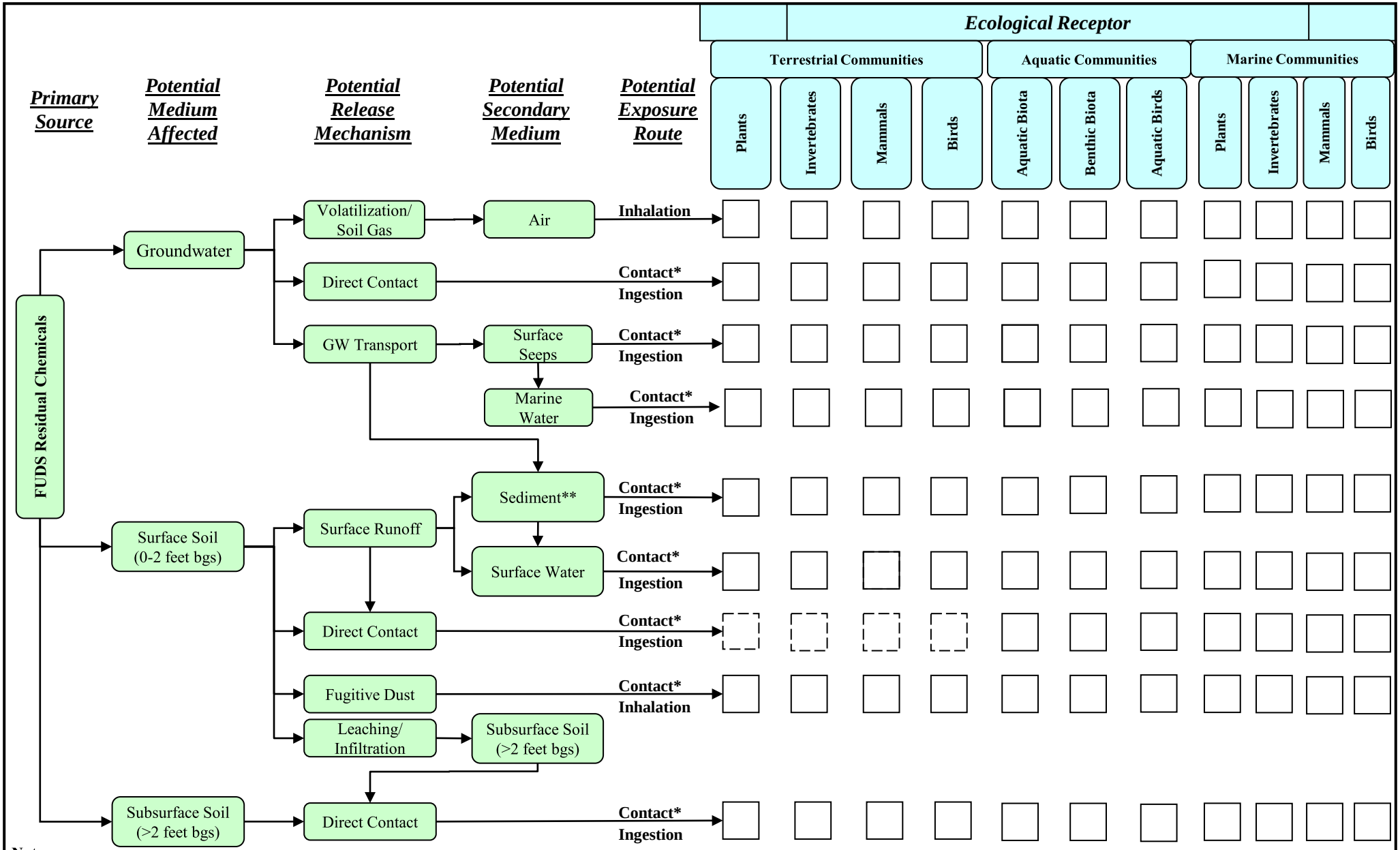

Base map prepared for USACE by ENSR and is presented in "2001 Remedial Investigation Report-Final-RI/FS, Yakutat Area, AK". Modified by Shannon & Wilson for 2010 Feasibility Study.

Former Yakutat Air Base
Yakutat, Alaska

**AOC L5 SITE PLAN**

US Army Corps of Engineers, Alaska District

**FIGURE 9**




**Notes:**

- Incomplete Exposure Pathway – not proposed for evaluation
- Complete but Insignificant Exposure – not proposed for evaluation
- Complete and Significant Exposure - proposed for evaluation

**littoral/shallow sediment and intermittent (seasonal) sediment areas are effectively considered soil for terrestrial endpoints.
Soil horizons per ADEC CSM Guidance (ADEC 2010). The shallow interval (0-2 ft bgs) encompasses the biologically active zone relevant for most ecological exposures (i.e., 1 ft bgs, per Anderson et al., 2010)

*Contact includes uptake directly from indicated medium for community level receptors; dermal contact is considered insignificant for ecological receptors. Uptake for wildlife assumes direct contact (ingestion of medium) and uptake via biota in diet.

| | | |
|---|---|---|
| | Former Yakutat Air Base<br>Yakutat, Alaska | **Ecological Conceptual Site Model** |
| | 7/30/2015 | US Army Corps of Engineers, Alaska District |
| | | FIGURE 10 |

Print Form

# HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

*Site:* Former Yakutat Army Air Base

*Completed By:* USACE

*Date Completed:* 31 July 2015

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

**(1)** *Check the media that could be directly affected by the release.*

**(2)** *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

**(3)** *Check all exposure media identified in (2).*

**(4)** *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

**(5)** *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

| Media | Transport Mechanisms | Exposure Media | Exposure Pathway/Route | Current & Future Receptors: Residents (adults or children) | Commercial or industrial workers | Site visitors, trespassers, or recreational users | Construction workers | Farmers or subsistence harvesters | Subsistence consumers | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| ☑ Surface Soil (0-2 ft bgs) | ☑ Direct release to surface soil → check soil | ☑ soil | ☑ Incidental Soil Ingestion | F | F | C/F | F | C/F | | |
| | ☑ Migration to subsurface → check soil | | ☑ Dermal Absorption of Contaminants from Soil | F | F | C/F | F | C/F | | |
| | ☑ Migration to groundwater → check groundwater | | ☐ Inhalation of Fugitive Dust | | | | | | | |
| | ☑ Volatilization → check air | | | | | | | | | |
| | ☐ Runoff or erosion → check surface water | | | | | | | | | |
| | ☑ Uptake by plants or animals → check biota | | | | | | | | | |
| | ☐ Other (list): | | | | | | | | | |
| ☑ Subsurface Soil (2-15 ft bgs) | ☑ Direct release to subsurface soil → check soil | ☑ groundwater | ☑ Ingestion of Groundwater | I | I | | | | | |
| | ☑ Migration to groundwater → check groundwater | | ☑ Dermal Absorption of Contaminants in Groundwater | I | I | | I | | | |
| | ☑ Volatilization → check air | | ☑ Inhalation of Volatile Compounds in Tap Water | I | I | | | | | |
| | ☐ Uptake by plants or animals → check biota | | | | | | | | | |
| | ☐ Other (list): | | | | | | | | | |
| ☐ Ground-water | ☐ Direct release to groundwater → check groundwater | ☑ air | ☑ Inhalation of Outdoor Air | F | F | C/F | F | C/F | | |
| | ☐ Volatilization → check air | | ☑ Inhalation of Indoor Air | F | F | | | | | |
| | ☐ Flow to surface water body → check surface water | | ☐ Inhalation of Fugitive Dust | | | | | | | |
| | ☐ Flow to sediment → check sediment | | | | | | | | | |
| | ☐ Uptake by plants or animals → check biota | | | | | | | | | |
| | ☐ Other (list): | | | | | | | | | |
| ☐ Surface Water | ☐ Direct release to surface water → check surface water | ☐ surface water | ☐ Ingestion of Surface Water | | | | | | | |
| | ☐ Volatilization → check air | | ☐ Dermal Absorption of Contaminants in Surface Water | | | | | | | |
| | ☐ Sedimentation → check sediment | | ☐ Inhalation of Volatile Compounds in Tap Water | | | | | | | |
| | ☐ Uptake by plants or animals → check biota | | | | | | | | | |
| | ☐ Other (list): | | | | | | | | | |
| ☐ Sediment | ☐ Direct release to sediment → check sediment | ☐ sediment | ☐ Direct Contact with Sediment | | | | | | | |
| | ☐ Resuspension, runoff, or erosion → check surface water | | | | | | | | | |
| | ☐ Uptake by plants or animals → check biota | | | | | | | | | |
| | ☐ Other (list): | | | | | | | | | |
| | | ☑ biota | ☑ Ingestion of Wild or Farmed Foods | I | | I | | I | I | |

US Army Corps of Engineers, Alaska District

Figure 11

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