Alaska Department of Environmental Conservation

Reuse & Redevelopment Program

Brownfield Assessment

Port Heiden Old Landfill Site

Property Assessment and Cleanup Plan - FINAL

Port Heiden, Alaska

Submitted to:
Department of Environmental Conservation
Reuse & Redevelopment Program

Hoefler
CONSULTING GROUP

By:
Hoefler Consulting Group, Inc.
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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ACS	Alaska Communication System
ADNR	Alaska Department of Natural Resources
ANSCA	Alaska Native Claims Settlement Act
ASTM	American Society for Testing and Materials
BBAHC	Bristol Bay Area Health Corporation
BLM	Bureau of Land Management
BTEX	benzene, toluene, ethylbenzene, xylenes
COCs	contaminants of concern
DBA	DEC Brownfield Assessment
DEC	Alaska Department of Environmental Conservation
DRO	diesel range organics
EDR	Environmental Data Resources
EPA	Environmental Protection Agency
˚F	degrees Fahrenheit
GRO	gasoline range organics
HCG	Hoefler Consulting Group
HUD	Federal Housing and Urban Development
NCPH	Native Council of Port Heiden
OBS	Oil Burn Specifications
PACP	Property Assessment and Cleanup Plan
PAHs	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PID	photoionization detector
RACM	Regulated Asbestos Containing Material
RCRA	Resource Conservation and Recovery Act
SVOCs	semivolatile organic compounds
TASWER	Tribal Association Solid Waste Emergency Response
TCLP	Toxic Characteristic Leaching Procedure
USACE	United States Army Corps of Engineers
VOCs	volatile organic compound

EXECUTIVE SUMMARY

The Native Council of Port Heiden (NCPH) applied to the Alaska Department of Conservation (DEC) for a DEC Brownfield Assessment (DBA) in 2009 to address contamination concerns at the Old Landfill. The Old landfill property is undivided and is currently owned by Meshik, Inc., the Native Corporation for Port Heiden. The Community of Port Heiden stated objective in their DBA was to address contamination issues associated with the property in order to make the property available for sale.

The purpose of this Property Assessment and Cleanup Plan (PACP) is to:

- Identify known or suspected environmental conditions at the old landfill that may pose a threat to human health or the environment; and
- Develop remedial options appropriate to facilitate the planned reuse of the old landfill site.

The conclusions presented in this PACP were developed after reviewing available site information, including 2004 groundwater sampling results, a time series of aerial photographs between 1956 and 2002, and interviews with resident's familiar with the history of the site. Groundwater samples had detectable concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. One compound, lead, exceeded DEC Method Two groundwater cleanup levels under 18 AAC 75.345. Arsenic exceeded the DEC Method Two soil cleanup level for direct contact under 18 AAC 75.341 but is considered to be naturally occurring. Chromium concentrations in soil exceeded the DEC Method Two soil cleanup level for migration to groundwater under 18 AAC 75.341 but were also considered to be naturally occurring. The detection of VOCs suggests a potential fuel source. Drums were identified in the aerial photographs and would also be consistent with fuel related petroleum contamination. However, site characterization is incomplete and specific sources remain unknown.

As a result, additional investigation is recommended. The site investigation should include:

- Site wide surface soil sampling;
- Test pit excavation in the drum storage area;
- Groundwater sampling; and
- Surface water sampling.

It is also recommended that the three existing groundwater wells located at the Old Landfill be thoroughly inspected and if necessary, decommissioned in accordance with DEC guidance as they represent a potential conduit for contaminants to the aquifer.

If, after additional investigation, it is determined there is a human health risk associated with contamination at the site, then site remediation consisting of source removal and disposal would be recommended prior to development. Petroleum contaminated soil, if present, would be suitable for management in Port Heiden using cost efficient passive treatment (e.g., landfarming, landspreading), or with DEC approvals as landfill cover material. Although there is currently no evidence of PCBs or solvent contaminated soil, these compounds, if present, would require offsite treatment and disposal. Domestic waste or buried debris, during the excavation of contaminated soils, would be acceptable in the Port Heiden Landfill. Buried debris not associate with contaminant sources would be left in place until a specific reuse plan for the site is developed.

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1 Introduction

The Native Council of Port Heiden (NCPH) applied to the Alaska Department of Conservation (DEC) for a DEC Brownfield Assessment (DBA) in 2009 to address contamination concerns at the Old Landfill site. The DBA request form is included as Appendix A. The site is located in Township 37 South, Range 59 West, Section 27 of the Seward Meridian and is approximately one mile south of the airport and directly west of Jack's New Meshik Mall (Figures 1-1 and 1-2). The area is undivided and is owned by Meshik, Inc., the Native Corporation for Port Heiden. The Community of Port Heiden's stated objective in the DBA was to address contamination issues associated with the property in order to make it available for sale.

1.1 Purpose of Project

The purpose of this Property Assessment and Cleanup Plan (PACP) is to:

- Identify known or suspected environmental conditions at the Old Landfill that may pose a threat to human health or the environment; and
- Develop remedial options appropriate to facilitate the planned reuse of the old landfill site.

1.2 Scope of Services Summary

The scope services completed in support of this PACP have been divided into two tasks which include:

- Task I – Stakeholder Scoping and Planning Meeting; and
- Task II – Property Assessment and Cleanup Plan.

1.2.1 Task I – Stakeholder Scoping and Planning Meeting

A stakeholder and planning meeting was held for the Old Landfill site on October 15, 2009. The meeting was conducted via teleconference and was attended by representatives from the DEC Alaska Brownfields Program, the United States Environmental Protection Agency (USEPA), the City of Port Heiden, Native Council of Port Heiden (NCPH), Bristol Bay Area Health Corporation (BBAHC), and Hoefler Consulting Group (Hoefler). The purpose of the meeting was to define the Old Landfill reuse objectives and to present background information regarding the site.

Hoefler prepared a summary record of the meeting. A copy of the meeting record is provided in Appendix B.

1.2.2 Task II – Draft and Final PACP Preparation

Hoefler completed field work at the Old Landfill site between October 26 and 30, 2009. Field work at the site included assessing the current site conditions, conducting interviews with community members familiar with the site, and implementing the work.

In October 2009, Hoefler completed a DEC-approved work plan outlining the objectives and activities to be conducted during the site visit. The objectives of the site visit were to perform a physical reconnaissance of the landfill to document site conditions and visible evidence of contamination, and obtain background information on the Old Landfill by conducting personal interviews with persons familiar with the property. Hoefler field notes and interview notes from

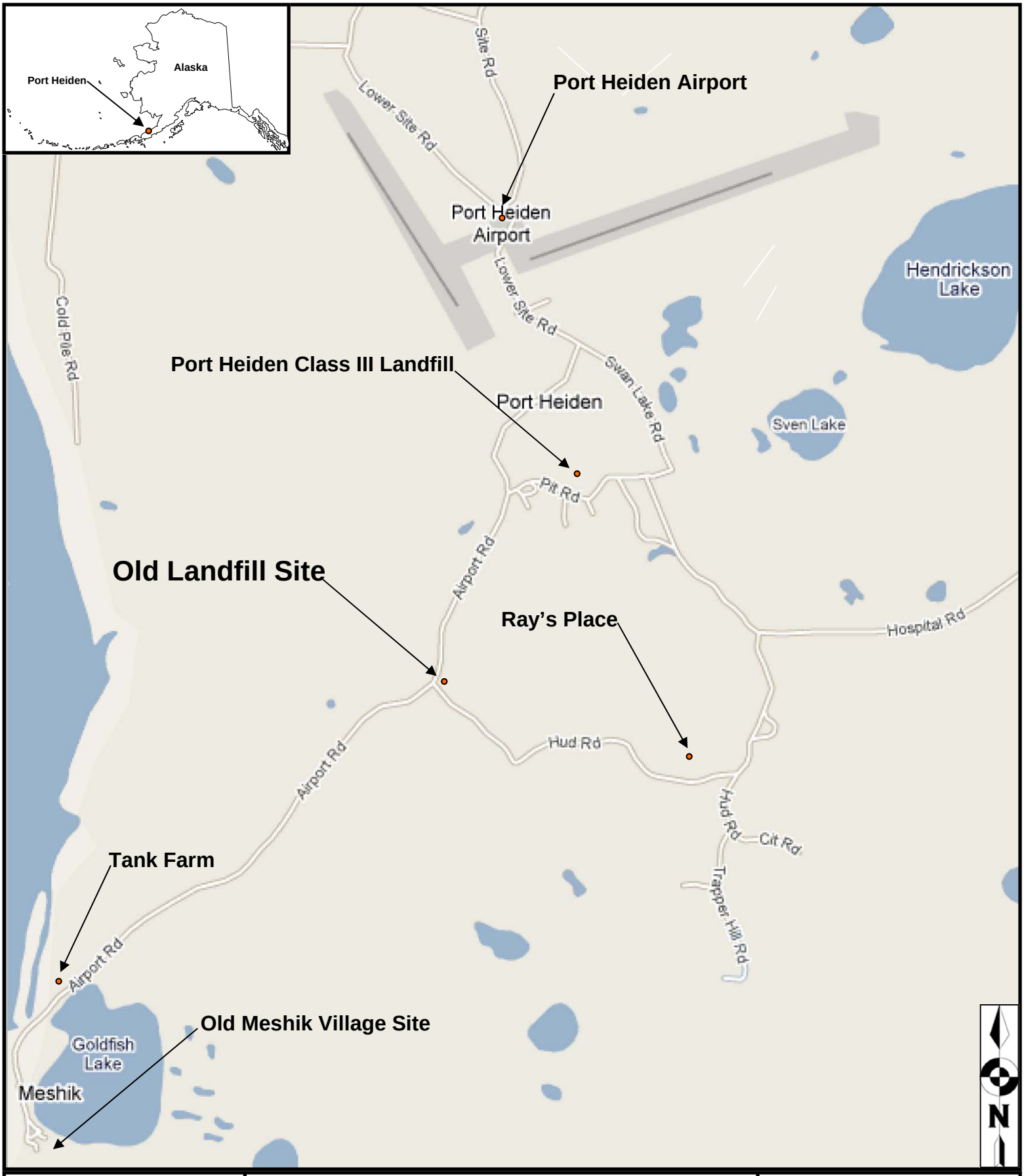
the site visit are provided in Appendix C.

The development of the PACP followed the completion of the site reconnaissance task. This PACP provides a summary of environmental conditions at the site based on information obtained though the DEC Brownfield Assessment process, personal interviews, existing reports, and information obtained during the site visit. The purpose of this PACP is to provide the DEC and stakeholders (i.e., Community of Port Heiden) with documentation of known, potential, or suspected environmental conditions at the Old Landfill that could pose a threat to human health or the environment, and hinder the safe use, reuse, or redevelopment of the property.

1.3 Objectives

The following objectives were used to guide the preparation of this PACP:

- Compile all background information including historical usage, current ownership, community input, and proposed reuse objectives for the site;
- Develop a feasibility estimate including costs associated with reuse of the landfill site; and
- Complete a Property Assessment and Cleanup Plan.



Hoefler Consulting Group	**Old Landfill Site** **Location and Vicinity Map** **Port Heiden, Alaska**	**Project No: 8901-016** **Date: 4/27/2010** **Figure 1-1**

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Hoefler CONSULTING GROUP	**Old Landfill Site** **Site Overview** **Port Heiden, Alaska**	**Project No: 8901-016** **Date: 6/22/10** **Figure 1-2**

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2 Community Overview and Information

2.1 Community General Information

2.1.1 Location and climate

The Community of Port Heiden is located in the Lake and Peninsula Borough of Alaska at the mouth of the Meshik River, 424 miles southwest of Anchorage, at 59.948390 degrees north latitude and -158.629020 degrees west longitude (Township 37 South, Range 59 West, Section 27, Seward Meridian). Port Heiden is located in the Kvichak Recording District. The community is located directly west of Aniakchak National Preserve and Monument. Port Heiden occupies 50.7 square miles of land and 0.7 square miles of water (DCED 2009).

Port Heiden has a maritime climate with cool summers and warm winters relative to interior Alaska. Port Heiden averages 58 inches of snowfall per year. January temperatures average 25 degrees Fahrenheit (˚F) with July temperatures averaging 50 ˚F (DCED 2009).

2.1.2 Community Resources and Infrastructure

Infrastructure in Port Heiden includes a Community Center, also known as Ray's Place, a city owned tank farm and fuel concession, a maintenance shop, a landfill (different location from subject property), electrical and communications utilities, roads, a barge landing area, and an airport.

The community center contains the Port Heiden health clinic, meeting space for community activities, a private furnished apartment that the NCPH maintains as a rental unit, and tribal and city offices including the City of Port Heiden, Port Heiden Tribal Council, NCPH Environmental Coordinator, Bristol Bay Economic Development, Tribal Child Care Workers, and the BBAHC Field Coordinator.

Services provided by the City of Port Heiden include electrical, septic pumping, and refuse collection. A new landfill is located 6.5 miles north of the community. Telephone and communication services are provided by Alaska Communications Systems (ACS) and GCI Communications.

Resources in the Community of Port Heiden are limited, but basic services and equipment necessary to facilitate potential reuse of the project site are available. Specific resources include:

- Lodging facilities owned by the Native Council of Port Heiden, which are located at Ray's Place, and two privately owned bed and breakfast facilities;
- Heavy equipment, including loaders, grader, trucks, and backhoes, are available for rent through Christensen and Sons, LLC, Jens Carlson, and Jack Welbourne. The City of Port Heiden and the Native Council of Port Heiden also offer heavy equipment rentals and, in addition, have storage and repair facilities available;
- Vehicles transporting personnel and equipment are available for rent through various private individuals; and
- Food stuffs and toiletries are available at the New Meshik Mall.

The Native Council of Port Heiden seeks to benefit from the development and reuse of the Old Landfill by using their for-profit company, Aniakchak Contractors.

2.2 Community Involvement

2.2.1 Community Concerns

Based on information obtained from the DEC DBA, the community is concerned that groundwater in the vicinity of the landfill may be affected by contaminants present at the site. Several nearby houses have domestic wells which supply water for cooking, cleaning and bathing. The community also indicated concern for children exposed to contaminants since kids have played at the Old Landfill site for years, sometimes wading directly in the shallow water that is ponded at the bottom of a depression on the Old Landfill property.

2.2.2 Planning and Stakeholder Meeting Summaries

A community and stakeholder planning meeting was conducted on October 15, 2009 to discuss the scope of the Old Landfill project. The meeting included attendees from DEC Brownfield program, USEPA Brownfield program, City of Port Heiden, NCPH, the NCPH Environmental Coordinator, BBAHC, and Hoefler. The purpose of the meeting was to identify the project site, define the planned reuse of the property, outline the concerns the community has with the property, and address the general feasibility of the proposed use of the project site.

Following the meeting, a summary was prepared. A copy of the meeting summary has been provided in Appendix B.

2.2.3 Proposed Community Development and Land Reuse, Including Funding Sources Sought or Obtained for Related Project Work

The Community of Port Heiden is interested in selling the landfill site to Jack Welbourne, a resident of Port Heiden. Mr. Welbourne owns several businesses (Jacks' New Meshik Mall, Fortunes Gift Shop, Hank's Hardware) in Port Heiden, located adjacent to the Old Landfill site. However, there are currently no specific plans for reuse or property development.

2.2.4 Interviews and Input

Interviews were conducted with several individuals knowledgeable with current and historical conditions of the Old Landfill. Summaries of personal interviews are included below. Minutes from the community scoping and planning meeting provided additional input regarding the site (Appendix B). Interview notes are included with the field notes (Appendix C).

2.2.4.1 Native Council of Port Heiden

Hank Matson¸ NCPH President was interviewed on October 28, 2009. Mr. Matson is a longtime resident of Port Heiden and provided background information regarding the historical use. Mr. Matson indicated that the site was not used as a landfill, but remembers seeing large concrete blocks and drums stored at the site. He also recounted that the Old Landfill was a place where seal carcasses were dumped during the 1960's and 1970's. Mr. Matson stated that the U.S. Army Corps of Engineers (USACE) contracted with Underwater Construction to remove the drums from the site (no year provided).

2.2.4.2 Bristol Bay Area Health Corporation

Elaine Holm, Village Coordinator for the BBAHC, was interviewed on October 28, 2009. Ms. Holm indicated that the Old Landfill site was not the primary landfill used in the community. The primary landfill was located closer to the old Meshik village site (Figure 1-1). She added

that at the time the Old Landfill was used, most of the Port Heiden residents lived nearer the coast and did not have transportation (cars) to haul trash to the Old Landfill site. Ms. Holm stated that the road to the Old Landfill was built approximately 30 years ago. She also indicated that the Old Landfill area was larger than it currently appears.

2.2.4.3 Port Heiden Stakeholders

Jack Welbourne, Owner of Jack's New Meshik Mall, Fortunes Gift Shop, and Hank's Hardware, was interviewed regarding his knowledge of the Old Landfill site on October 29, 2009. Mr. Welbourne is the person indentified in the Port Heiden DBA Request as being interested in purchasing the landfill site from the City of Port Heiden. Mr. Welbourne stated that he has lived in Port Heiden since 1970. When asked about historical activities at the Old Landfill, Mr. Welbourne confirmed that seal carcasses were discarded in a pit and empty drums were scattered across the site. Mr. Welbourne stated that the Old Landfill pit and the nearby marshy pond located to the southwest may have been used as material borrows sites for road construction. Mr. Welbourne indicated that the land his home and businesses are on is currently owned by the City of Port Heiden. Mr. Welbourne explained that he resided on the property prior to the Alaska Native Claims Settlement Act (ANCSA). After ANCSA was enacted, the land became the property of the Bristol Bay Native Corporation. Eventually, the Bristol Bay Native Corporation granted the city of Port Heiden a block of land which included Mr. Welbourne's home site. Mr. Welbourne explained that he is not interested in purchasing the Old Landfill, but is interested in purchasing the land his home and businesses are on. He is concerned with potential contamination and buried debris that may be located on the property and would like to have an assessment of the property completed before he agrees to purchase the land from the City. Mr. Welbourne would like to obtain ownership of the land so he is able to will the property to his son.

Mark Welbourne, son of Jack Welbourne and general manager of Jack's New Meshik Mall, was interviewed on October 29, 2009. Mr. Welbourne was asked about the septic system and groundwater well located at the store. Mr. Welbourne stated that a septic tank is located next to the store on the side of the building nearest to the landfill. Mr. Welbourne was asked if there had been any spills from the heating fuel tank located next to the entrance to the store. Mr. Welbourne indicated that there had not been any spills from that tank, but there had been some small spills from a tank located on the other side of the building which had been cleaned up.

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3 Historical Site Overview

3.1 Geologic Setting

Port Heiden is located within the Bristol Bay Lowlands ecological province adjacent to Bristol Bay (Nagorski 2007). Drainage flow within the ecological province is predominately to the west toward Bristol Bay via the Meshik River system which is the principal regional drainage. Aniakchak Caldera is located approximately 20 miles west of Port Heiden within the Aleutian Range (Nagorski 2007). The 6-mile wide caldera, formed during a cataclysmic eruption 3,500 years ago, is a national monument managed by the United States Parks Service. The volcano's most recent eruption occurred in 1931. The geology within the vicinity of Port Heiden includes volcanic, till, estuarine, swamp, alluvial, outwash and marine terrace deposits (Hogan 1995). Soils within the vicinity of Port Heiden are generally poor due to the deposition of volcanic deposits. Soil deposits are well developed, dark brown to reddish in color, and are composed of sand and gravel sized particles (Hogan 1995). Permafrost is not frequently encountered in the area.

Groundwater aquifers in Port Heiden are composed of unconsolidated sand and gravel, pumice and bedrock with silt and clay-rich till layers acting as confining layers (Hogan 1995). Groundwater suitable for domestic use is obtained from a relatively shallow surface aquifer approximately 15 to 20 feet below ground surface.

3.2 Property Use

3.2.1 Historical

Little is known regarding the background of the Old Landfill site. The area is generally referred to as a landfill but was apparently only used as a casual dump site in the past. The DEC DBA request indicated that the site was in use as early as 1953. Elders in the community of Port Heiden reported seeing abandoned vehicles, batteries, scrap metal and wood, animal carcasses (seals), 55-gallon drums and trash at the site. A cache of 55-gallon storage drums can be seen in the 1972 aerial photo of the site (see Appendix D). The drums are no longer visible in the 1983 aerial photo. The trash and debris at the site was reported to be covered over with soil in the 1980's during the construction of Federal Housing and Urban Development (HUD) housing located near the Old Landfill. After the trash and debris was buried, the site continued to be used as a place to store 55-gallon drums, and seal carcasses continued to be dumped there.

Site history was obtained from the DBA request, Stakeholder Meeting, and during interviews with community members during the site visit. Interviews were conducted in the field with Elaine Holm and Jack Welbourne (see Section 2.2.4). Hank Matson's recollection of site history was documented in the DBA request and during the Stakeholder Meeting. Per these community interviews with Port Heiden elders, there was a historical military use of the Old Landfill site dating back to the 1940s according to Hank Mattson.

Inquiries with the USACE (Ron Pflum and Natalia Soto Personal Interview, Appendix C), and DEC (Louis Howard Personal Interview, Appendix C) regarding obtaining documentation for the site were unsuccessful.

Mr. Ron Pflum, Project Manager with the Formerly Used Defense Sites (FUDS) group, was interviewed by telephone on March 12, 2010 regarding FUDS in Port Heiden. Mr. Pflum indicated that the USACE did not have any information regarding the Old Landfill site and was

not personally aware of the area in Port Heiden. Mr. Pflum did provide figures showing the locations of FUDS in Port Heiden. The figures depicted the area where the Old Landfill site located as being a material site. The figure did not indicate that the Old Landfill was a FUDS.

Ms. Natalia Soto, Historian with the USACE, was interviewed on May 26, 2010 by telephone. Ms. Soto was asked if the USACE had any documentation for FUDS in Port Heiden. Ms. Soto indicated that there was no project documentation for Port Heiden. Ms. Soto added that the USACE is missing documentation for several areas, including Port Heiden.

Mr. Louis Howard, Environmental Program Specialist with the DEC, was contacted on April 6 and June 28, 2010 by telephone regarding the Old Landfill site. Mr. Howard stated during the initial interview that he was not aware of the site. During the follow up interview Mr. Howard stated he has consulted with the both Pat Roth of the USACE and Meseret Ghebresllassie with the Air Force 611th regarding the Old Landfill site. Neither the USACE or the Air Force had any documentation for the Old Landfill site. Mr. Howard stated during the phone interview that it may be possible to have the site included as a FUDS due to past apparent military activities there. The process would require DEC to submit the site to the USACE as an amendment to the Defense State Memorandum of Agreement (DSMOA). Acceptance of the Old Landfill would allow it to be given the FUDS designation.

Three groundwater wells were installed at the site in October 2004 by Burns Consulting Services. Location of these wells is shown on Figure 1-2. Mr. Scott Anderson of Port Heiden was present during the installation of these wells. The wells were reportedly installed at approximately 9 feet below ground surface based on his recollection. Neither Mr. Anderson nor the DEC has a copy of the report that was prepared documenting this work, including well log documentation. The laboratory analytical data is the only information available from this effort as provided by DEC with the DBA. Funds to install the wells were obtained through the Tribal Association Solid Waste & Emergency Response (TASWER). The groundwater monitoring wells are located around the periphery of the pond area of the Old Landfill. The wells were installed to address concerns that potential contaminants present at the Old Landfill may be impacting nearby domestic water supplies.

Interpretations of aerial photography of the Old Landfill indicate the area was used as material source for road construction. The site likely became a dump of convenience since it is situated on the road connecting the old Village of Meshik with the airport, but was never the primary dump site for the community. Currently, a large vegetated pond (wetland) is located west of the area that was identified as the dump area. The pond was observed to be partially excavated in the 1957 aerial photograph and was apparently expanded sometime between 1957 and 1972 (Appendix D).

Following is a review of historical aerial photos obtained for the Old Landfill site. The aerial photos are provided in Appendix D:

June 1957, obtained from Aero-Metric, Inc. (no scale)

A 1957 photograph shows the current Port Heiden area, as well as the old Village of Meshik and the airport area. The Old Landfill site can be seen in approximately the center of the photo and appears as a disturbed area with a pond near the center. The scale of the photography is too coarse to interpret site features to determine if the area was being used as an active landfill at the time. Numerous structures remaining from Fort Morrow are also seen near the airport and the White Alice Communication System (WACS) can be seen as under construction east of the

airport. The old native Village of Meshik is located at the bottom of the photo.

September 1972, obtained from Aero-Metric, Inc. (1:4,800)

A 1972 aerial photograph shows the Old Landfill with a large pond to the east side of the site, a smaller pond directly east, and the current pit area with little standing water to the north. The pit area is vegetated indicating it was not recently excavated. A pile of 55-gallon drums can be seen west of the pit area. Additional drums can be seen scattered across the pit area.

June 1983, obtained from Aero-Metric, Inc. (1:12,000)

A 1983 aerial photograph shows a second smaller excavation located south of the original excavation. This second excavation was possibly the result of the removal of material used for a nearby road project. Several new houses are located adjacent to the area including what is now the New Meshik Mall building directly east of the site.

September 1997, obtained from Aero-Metric, Inc. (1:12,000)

A 1997 aerial photograph depicts the Old landfill site much as it is now. The site appears to be completely vegetated and there are no signs of drums or debris which were reportedly removed from the area in the mid 1980's. The New Meshik Mall building is in its current configuration along with the other buildings surrounding the site.

June 2002, obtained from Aero-Metric, Inc. (1: 12,000)

A June 2002 aerial photograph shows no change relative to the 1997 aerial photograph.

3.2.2 Current

The Old Landfill is currently not used for storage or dumping of waste. However, the site is used by local children as an unauthorized play area and the community is concerned because of potential contamination associated with previous use.

3.3 Ownership Information

The Old Landfill is located in Section 27, Township 37 South, Range 59 West, Seward Meridian. Section 27 was one of several sections conveyed from the Bureau of Land Management (BLM) to the Alaska Peninsula Corporation on December 12, 1979 as native selection lands under ANCSA. On March 11, 1982, the land was conveyed from the Alaska Peninsula Corporation to the City of Port Heiden. Currently the Old Landfill is owned by the City of Port Heiden.

3.4 Records review

Records reviewed for the Old Landfill included:

- Generation of an Environmental Data Resources (EDR) report;
- A review of a 2005 groundwater investigation report prepared by Shoalwater Bay Environmental Laboratory;
- Review of aerial photos (1957 through 2002); and
- Alaska Department of Natural Resources (ADNR) land records.

The EDR report provides a comprehensive search of applicable federal, state, and local environmental database records. The EDR report identified six records for sites near the Old Landfill. Review of the entries revealed that all six mapped sites were located greater than one mile from the Old Landfill and, as a result, are unlikely to have any impact to the area. In

addition to the mapped database entries, 25 orphan sites (i.e., sites that are not mapped) were listed within the EDR report. Of the 25 orphan sites, none appear to be on, or adjacent to, the Old Landfill. The EDR report is provided in Appendix E.

In October 2004, three monitoring wells were installed by Burns Consulting around the perimeter of the depression (i.e., pond) at the Old Landfill. Soil and water samples were collected as part of this effort. The soil and groundwater samples were analyzed by the Shoalwater Tribe Environmental Research Laboratory located in Tokeland, Washington for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Resource Conservation and Recovery Act (RCRA) metals. Metals analysis was outsourced to Edge Analytical located in Burlington, Washington. The results of groundwater testing for VOCs and SVOCs indicated several compounds (benzene, toluene, 1,3,5-Trimethylbenzene, tert-butylbenzene, 1,2,4-Trimethylbenzene, 4-Isopropyltoluene, pentachlorophenol, and naphthalene) were present at detectable concentrations in groundwater. One compound, pentachlorophenol, was also detected in the laboratory method blank at a similar concentration and as a result should be considered as not representative of the groundwater in the area. Metals (barium, lead, arsenic, cadmium, chromium, and silver) were detected in both soil and groundwater samples. In soil, arsenic and chromium concentrations exceeded the DEC Method Two soil cleanup levels for direct contact and migration to groundwater, respectively. In groundwater, lead concentrations exceeded DEC Method Two groundwater cleanup levels. Laboratory data are summarized below in Tables 3-1 and 3-2, and analytical laboratory reports are provided in Appendix F.

Aerial photos of the landfill site for the years 1957, 1972, 1983, 1997, and 2002 were obtained from Aero-Metric, Inc. The aerial photos were referenced and discussed in Section 3.2.1 and all aerial photographs are provided in Appendix D.

Table 3-1 2004 Old Landfill Groundwater Sample Results For Three Monitoring Wells

Compound	Cleanup Level – DEC Table C Groundwater Cleanup Level (µg/L)[1]	Sample ID		
		PH1 (µg/L)	PH2 (µg/L)	PH3 (µg/L)
VOCs				
Benzene	5	ND	0.64	0.58
Naphthalene	730	3.9	ND	ND
Toluene	1000	0.5	ND	0.24
1,2,4-trimethlbenzene	1800	6.5	ND	ND
1,3,5-Trimethylbenzene	1800	2.9	ND	ND
tert-Butylbenzene	370	21	ND	ND
4-isopropyltoluene	NA	20.1	ND	ND
SVOCs				
Butyl Benzyl Phthalate	730	ND	ND	0. 54
Pentachlorophenol[2]	1	0.91	0.89	0.72
Metals	**Cleanup Level – DEC Table C Groundwater Cleanup Level (mg/L)[1]**	PH1 (mg/L)	PH2 (mg/L)	PH3 (mg/L)
Arsenic	0.010	ND	0.0017	0.0029
Barium	2.0	0.155	0.251	0.266
Cadmium	0.005	0.0008	0.0003	0.0003
Chromium	0.10	0.0004	0.0023	0.0025
Lead	0.015	0.008	**0.026**	**0.023**
Mercury	0.002	ND	ND	ND
Silver	0.10	0.0003	0.0003	0.001

1. Based on DEC Table C Groundwater Cleanup Level (Table C, 18 AAC 75.345).
2. Compound detected in the method blank.
3. Reference data is from Port Heiden Soil and Water 2004 Analytical Sample Results for Three Monitoring Wells at the Old Landfill (Shoalwater Bay Environmental Laboratory 2005)

ND Non-detect
Bold indicated exceedance of DEC's Table C Groundwater Cleanup Levels.

Table 3-2 2004 Old Landfill Soil Sample Results For Three Monitoring Wells

Compound (mg/Kg)	Soil Cleanup Level - Method Two Under 40 Inch Zone Direct Contact (mg/Kg)[1]	Soil Cleanup Level - Method Two Under 40 Inch Zone Migration to Groundwater (mg/Kg)[2]	Sample ID		
			PH1	PH2	PH3
Metals					
Arsenic	4.5	3.6	**26.0**	**22.5**	**16.6**
Barium	20,300	1,100	33.7	20.6	38.5
Cadmium	79	5.0	1.0	0.5	1.6
Chromium (total)	300	25	16.6	**27.5**	**39.8**
Lead	400	--	7.17	0.92	4.80
Silver	510	11.2	0.7	0.3	1.6

1. Based on DEC Method Two Under 40 Inch Zone Direct Contact Soil Cleanup Level (18 AAC 75.341, Table B1).
2. Based on DEC Method Two Under 40 Inch Zone Migration to Groundwater Soil Cleanup Level (18 AAC 75.341, Table B1).
3. Reference data is from Port Heiden Soil and Water 2004 Analytical Sample Results for Three Monitoring Wells at the Old Landfill (Shoalwater Bay Environmental Laboratory 2005)

Shaded result indicates an exceedance of DEC's direct contact cleanup level.
Bold indicated exceedance of DEC's migration to groundwater cleanup level.

4 Site Reconnaissance and Sampling

4.1 Changes or Variances from the Work Plan

No work plan was developed outlining the October 2009 site reconnaissance activities.

4.2 Methodology

The investigation of the Old Landfill site generally conformed to American Society of Testing and Materials (ASTM) Phase I Environmental Site Assessment guidance (ASTM 1527-05). Elements of the landfill investigation methodology included:

- A site reconnaissance which included photographing key features of the landfill site during the site reconnaissance and recording notes of site observations in a field notebook;
- Conducting personal interviews with persons knowledgeable of the site; and
- Reviewing historical information available for the site including obtaining aerial photographs (1 per decade), reviewing ownership history, reviewing historical site usage, obtaining reports of previous environmental investigations of the site, and reviewing Federal and State environmental records of the site (EDR report).

4.3 Observations

The north half of the Old Landfill site consists of a 5 to 8 foot depression with less than one foot of standing water at the bottom (Figure 1-2). The south half of the Old Landfill is disturbed and undulating ground. The west side of the Old Landfill has an unvegetated gravel surface that has been graded smooth. The Old Landfill is surrounded by several homes located to the north and the New Meshik Mall (the local store) located to the east. A large marshy pit similar to the Old Landfill pit is located southeast of the landfill site (Figure 1-2). Photographs #1 through #5 in Appendix G document general site conditions.

A steel cable was observed protruding from the ground is shown in Photographs #6 and #7 in Appendix G. This observation is consistent with information indicating that debris was buried at the site. The three monitoring wells installed in 2004 were observed around the perimeter of the depression located on the north side of the Old Landfill site (Photograph #8 and #9, Appendix G). The casing on one of the wells has been damaged (Photograph #9, Appendix G). Vent pipes for a septic system belonging to the New Meshik Mall were also observed on the eastern edge of the landfill pit (Photograph #10, Appendix G).

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5 Environmental Review and Summary of Findings

5.1 Historical Environmental Investigations

In general, little background information is available for the Old Landfill site. The only environmental investigation of the area was conducted by Burns Environmental Consulting which is referenced in the DBA (Appendix A). Neither Port Heiden nor DEC had a copy of this report. It also could not be located during Hoefler's review of background information and attempts to contact the company resulted in calls to disconnected phone numbers. The Burns Environmental Consulting investigation was conducted for the NCPH Environmental Office in 2004 after receiving a $20,000 grant from the Tribal Association of Solid Waste & Emergency Response (TASWER) to install and sample three monitoring wells was awarded. Soil and groundwater samples were collected in October 2004. The only part of the report that could be located was the analytical laboratory report (Appendix F). There was no information indicating where the soil samples were collected (i.e. surface or subsurface) or what sample collection methods used. Additionally, there was no information regarding well installation procedures, well development, or groundwater sampling methods. As stated in Section 3.2.1, Mr. Scott Anderson of Port Heiden was present during the installation of these wells and the wells were reportedly installed at approximately 9 feet below ground surface.

Results of sampling indicated there are detections of some VOCs, SVOCs and metals in the samples collected from the site (Tables 3-1 and 3-2). The VOCs detections, particularly the BTEX compounds (benzene, toluene, ethylbenzene) and naphthalene, suggest the possible presence of fuels. This is consistent with observations of drums in aerial photographs and with accounts from Port Heiden residents. All of the detected VOC and SVOC compounds in groundwater were well below the DEC groundwater cleanup levels (18 AAC 75.345 Table C). However, lead was detected in groundwater at concentrations exceeding DEC groundwater cleanup levels of 0.015 mg/L (Table 3-1).

Arsenic was detected in the three soil samples collected at concentrations exceeding the DEC Method Two soil cleanup level of 4.5 mg/Kg for direct contact (Table 3-2). The maximum arsenic detection was 26.0 mg/Kg. Although arsenic compounds exceeded the State of Alaska soil cleanup level, the detections appear to be within the range of background concentrations for arsenic in Alaska (Gough et. al 1988) and as a result, arsenic is likely naturally occurring. Arsenic was only detected at trace concentrations in groundwater several orders of magnitude below the DEC Method Two groundwater cleanup level (Table 3-1).

Chromium was detected at concentrations exceeding the DEC Method Two soil cleanup level for migration to groundwater of 25 mg/Kg. However, chromium concentrations also appear to be within the range of background concentrations in Alaska (Gough et. al 1988) and as a result, chromium is likely naturally occurring. Chromium was only detected at trace concentrations in groundwater several orders of magnitude below the DEC Method Two groundwater cleanup level (Table 3-1).

In 2003, Keres Consulting, Inc. conducted a limited assessment of domestic drinking water wells in Port Heiden (Appendix F). The assessment included collecting water samples from 42 domestic wells including houses #60 and #61 corresponding to Jack Welbourne's home and Hank's Hardware, and from #62 corresponding to Jack's New Meshik Mall. Jack Welbourne's home and Hank's Hardware share a common well. Samples collected from locations #60/#61 and #62 were non-detect for VOCs, PAHs, PCBs, pesticides, DRO and GRO. Both sample

locations contained detections of some metals including arsenic and iron; however, none of the detections exceeded any applicable federal or state screening criteria. In general, compounds detected in the three groundwater wells at the site were detected in nearby domestic wells. This suggests that contaminants detected in the shallow groundwater wells at the Old Landfill are not affecting nearby domestic water supplies.

5.2 Potential Source Areas

Specific source areas at the Old Landfill site have not been identified. However, based on the sampling results of the October 2004 investigation, information obtained from the aerial photographs review, and accounts of debris present at the site in the early 1980's being buried during the construction of the nearby HUD housing, it is possible some contaminants are present at the site. The 1972 aerial photo obtained for the site depicts numerous drums stacked in the area west of the pond in the middle of the site. This may suggest that the area was used for drum storage or staging. A reasonable assumption would be that the drums contained petroleum products and as a result were the source of the detectable concentrations of VOCs from the 2004 sampling event. Additionally, buried debris at the Old Landfill may have included batteries, and as a result been a source for the dissolved lead detected in groundwater. However, without an additional investigation it is not possible to identify contaminants of specific sources associated with the Old Landfill.

5.3 Known or Perceived Data Gaps

The following data gaps have been identified:

- Documentation of construction and usage of the landfill;
- Soil and groundwater analytical data;
- Additional information documenting the burial of waste during the period of time the HUD housing was built in the 1980's; and
- Documentation of USACE activities at the landfill site in the early 1990's.

It is not known when the Old Landfill site was first developed and for what purpose. Also unknown is the nature and volume of the trash and debris dumped at the site. Discarded vehicles, equipment, drums, trash, and seal carcasses have been identified through interviews with local residents as having been dumped at the Old Landfill.

Current analytical data are insufficient to characterize contaminants at the site or determine nature and extent of contamination. This information is needed to evaluate potential risk to human health and the environment.

It was reported that debris at the Old Landfill site was buried during the construction of the nearby HUD housing project in the 1980's. The location and extent of the debris at the Old Landfill site is not known. Residents interviewed also indicated that drums were stored at the Old Landfill.

It was communicated to Hoefler that the USACE cleaned up drums and debris from the Old Landfill site in the early 1990's; however, no documentation has been obtained to verify this activity.

5.4 Conceptual Site Model

A conceptual site model (CSM) was developed for human exposure pathways for the Old

Landfill based on occurrence of contaminated (or potentially contaminated) media to illustrate complete and incomplete exposure pathways following DEC guidance (DEC 2005). The CSM scoping form and pathway presentation are provided in Appendix H.

5.4.1 Potential Contaminants of Concern

If drums containing petroleum products were buried or stored at the site, as is reported, it is reasonable that small releases of petroleum could have occurred. As a result, hydrocarbon compounds such as diesel range organics (DRO), gasoline range organics (GRO), and volatile VOCs such as BTEX should be considered as potential contaminants of concern (COC) in the soil and groundwater. In addition, there were reports by Port Heiden Elders of abandoned vehicles, batteries, scrap metal, and wood being discarded in the Old Landfill. As a result, metals, including lead, are also potential COCs.

Only trace concentrations of VOCs were detected in the three groundwater samples collected as part of the October 2004 sampling event (Table 3-1). All VOC concentrations in groundwater were below DEC Method Two groundwater cleanup levels. However, the fact that VOC occurred, even at trace concentrations, suggests the Old Landfill is a potential source of dissolved phase contamination. Because the groundwater sampling was so limited and no further investigation was completed, VOCs should be considered a potential COC. Lead was detected in groundwater at concentrations that exceeded the DEC Method Two groundwater cleanup level (Table 5-1) and as a result it should also be retained as a potential COC for groundwater.

In soil, arsenic was the only compound detected exceeding the DEC Method Two soil cleanup level for direct contact. However, arsenic concentrations were similar (within a factor of two) in all three samples, and were within the range of potential background concentrations for Alaska (Gough et. al 1988). As a result, arsenic is likely naturally occurring and should not be retained as a COC in soil. Chromium was also detected in soil. Although chromium concentrations did not exceed the human health based DEC Method Two soil cleanup level of 300 mg/Kg for direct contact, concentrations in two of three samples (Table 3-2) did exceed the migration to groundwater cleanup level of 25 mg/Kg. Because chromium does not exceed human health based cleanup levels in soil or water, and the fact that concentrations are within the range of potential background concentrations for Alaska (Gough et. al 1988), chromium is considered naturally occurring and should be not retained as COC.

5.4.2 Exposure Pathways Determination

The most likely exposure pathways for the site are incidental ingestion and dermal absorption of soil and surface water, and consumption of groundwater. Outdoor air may be a complete pathway for volatiles, if VOCs are present, however, this would likely be an insignificant pathway. In a future scenario, indoor air may be a potentially completed pathway if volatiles are found to be present at the site and structures are built on the Old Landfill property. Contaminants present on the surface, if any, could be ingested or absorbed by site users (kids playing) at the landfill site. The community has stated that kids play and ride four wheelers around the landfill site and have been seen wading in the pond and playing in the water. Additionally, groundwater is used as a drinking water source at Port Heiden, although well testing to date has not identified any significant contamination. A DEC CSM scoping form and pathway presentation for the Old Landfill is provided in Appendix H.

5.5 Cleanup Criteria

DEC has not established cleanup criteria for the Old Landfill as the nature and extent of the contamination at the site is not known. If petroleum compounds, solvents, and/or metals were found to be present at the site, which are compounds typically present in landfills, risk based soil and groundwater cleanup levels, 18 AAC 75.341 and 18 AAC 75.345 (DEC 2009a), may be appropriate given the proximity of the site to residential housing and domestic water sources.

5.5.1 Soil Regulatory Cleanup Requirements

Although specific regulatory cleanup requirements for soil have not been established, groundwater does occur beneath the Old Landfill and is used as a drinking water source; therefore, either the direct contact or migration to groundwater cleanup levels for the 40-inch precipitation zone under 18 AAC 75.341 Tables B1 and B2 are likely to be appropriate.

5.5.2 Water Regulatory Cleanup Requirements

Although specific regulatory cleanup requirements for surface and groundwater have not been established, 18 AAC 70 and 18 AAC 75 cleanup levels would likely be appropriate.

5.5.3 Other regulated cleanup criteria

The nature and extent of waste buried at the Old Landfill site is not known. Types of buried waste could include product-containing storage drums, empty storage drums, industrial debris, and construction debris as well as used equipment and automotive parts.

Empty storage drums would be eligible for disposal in the local landfill. Partially full storage drums containing suspected petroleum products would need to undergo Oil Burn Specification (OBS) testing to determine the suitability of the product for energy recovery usage.

Debris that would be regulated would include polychlorinated biphenyl's (PCBs), asbestos containing material, and lead-based paints. Soil containing greater than 1 mg/Kg PCBs would not be eligible for disposal in the local landfill and would be required to be disposed off-site at an appropriate disposal facility.

Paints recovered from the landfill, if lead containing, would be required to undergo Toxicity Characteristic Leaching Procedure (TCLP) testing to determine the disposal method required.

The Class III landfill in Port Heiden is not currently permitted for disposal of regulated asbestos containing material (RACM). This material, if encountered during excavation of the landfill, will require off-site disposal.

5.5.4 Non-regulated cleanup criteria

Excavated wastes, construction debris and empty drums are not wastes regulated by the State of Alaska and, therefore, are eligible for disposal in Port Heiden's Class III landfill.

5.6 General Environmental Overview

Based on the information obtained for the Old Landfill site, including groundwater sample data showing low level detections of petroleum related VOCs and past military use in the area, it is reasonable to assume that there is an existing source of contamination. The likely source area is located west of the pond in the middle of the site where drums were observed being located in the 1972 aerial photograph (Appendix D). This area of the site has been graded flat and there is

little colonization of new vegetation, suggesting surface contamination may be present. Currently, it is not possible to determine if there are completed exposure pathways at the site without additional investigation and characterization.

Buried debris may be present at the site; however, the history of the site suggests that the area was likely used as a material source, and not a primary landfill, reducing the likelihood of significant debris in the area. It was reported that debris was covered over during a HUD home construction project in the 1980s. Buried debris does not represent a significant hindrance to development and is not necessary to remove unless required due to being comingled with site contaminants or because it is determined to be RACM or other regulated waste.

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6 Recommended Actions/Opinion

The following sections summarize actions appropriate to reuse the Old Landfill for the purpose of selling the land to a private party in Port Heiden. The Old Landfill is currently undeveloped and minimal surface debris is present at the site. Little documentation beyond aerial photography (Appendix D) is available regarding the extent the landfill was used by the community of Port Heiden and by the United States Army. Actions that may be appropriate to bring the property to a condition suitable for reuse by the Community of Port Heiden or for sale include:

- Site characterization including soil, groundwater, and surface water;
- Identifying the extent of subsurface contamination and buried debris;
- Soil excavation and debris removal;
- Monitoring well abandonment; and
- Waste and debris management.

6.1 General Overall Environmental Actions

6.1.1 Site Investigation

A subsurface investigation is necessary to characterize the nature and extent of contamination and volume of potentially buried debris at the Old Landfill. Any investigation would be conducted in consultation with DEC and under Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites (DEC 2009b).

Excavating test pits using a backhoe or excavator would be an effective and efficient means of conducting an investigation given the compact size of the potential source area, assumed to be where drums were stockpiled as observed on the 1972 aerial photograph of the site (Appendix D). Test pits would initially be excavated within the center of the presumed source area, approximately 50-foot by 50-foot. If significant contamination or buried debris is encountered, additional 'step-out' test pits would be excavated to expand the investigation area and delineate the full extent of contamination and/or debris. If feasible, a geophysical survey to identify magnetic anomalies would be useful in locating possible source areas (e.g., buried drums) not visible at the surface. If completed, the results of the geophysical survey would be used to locate step-out test pits outside the current presumed source area (i.e., former drum storage area).

6.1.1.1 Excavation Screening

Excavated soils should be screened for total volatile organic carbon to identify areas of subsurface contamination. Screening would be conducted using a photoionization detector (PID) to analyze soil headspace vapors in accordance with the DEC Field Sampling Guidance (DEC 2010). Soils would be screened at two foot intervals beginning at the surface (0-0.5 feet below ground surface). Minimum excavation depths would be determined in coordination with DEC during the development of the work plan.

6.1.1.2 Soil Sampling and Analytical Methods

Site characterization samples should be collected from each test pit. Frequency of sampling would be determined in coordination with DEC during the development of the work plan. The anticipated minimum sampling frequency would be one sample collected from each test pit at the location of the highest PID headspace reading and one sample collected from the bottom of each

test pit.

Analytical methods used to characterize potential soil contamination should screen for fuel related compounds and solvents including:

- GRO/BTEX by Alaska Method (AK) 101/ EPA 8021;
- DRO/RRO by AK 102/103;
- Resource Conservation and Recovery Act (RCRA) Metals EPA Method 6010/6020/7471;
- VOCs by 8260; and
- Polycyclic aromatic hydrocarbons (PAHs) by EPA 8270

6.1.1.3 Groundwater and Surface Water Sampling and Analytical Methods

Existing groundwater wells (PH1, PH2 and PH3) installed and sampled in 2004 had detectable concentrations of VOCs (Table 3-1). Benzene was detected at a maximum concentration of 0.58 µg/L, although well below the DEC Method Two groundwater cleanup level of 5 µg/L (Table C, 18 AAC 75.345). The occurrence of even a trace concentration of dissolved phase VOCs indicates a possible source which has yet to be identified. Further groundwater sampling would be needed to verify that only trace concentrations occur beneath the Old Landfill and downgradient.

If deemed necessary by DEC, additional groundwater samples could be collected from the Old Landfill area. Surface water samples would also be needed to determine if contaminated groundwater (if found) impacted nearby surface water bodies.

Analytical methods used to characterize potential groundwater and surface water contamination should screen for fuel related compounds and solvents and may include:

- GRO/BTEX by Alaska Method (AK) 101/ EPA 8021;
- DRO/RRO by AK 102/103;
- VOCs by 8260; and
- PAHs by EPA 8270

Results should be screened against DEC Table C groundwater cleanup levels under 18 AAC 75.345 and Alaska Water Quality Standards under 18 AAC 70 to evaluate potential risk to human health.

6.2 Recommended Remedial Actions

6.2.1 Soil Removal

If subsurface contamination exceeding DEC cleanup levels is determined to be present at the Old Landfill a removal action should be pursued. A risk-based cleanup strategy should be developed to determine the appropriate residual contaminant concentrations for the site. The cleanup level established for the site could be determined based on the reuse or redevelopment plans for the site. This will limit cleanup costs and maximize the efficiency of the removal action. Based on the size of the drum storage location observed in the 1972 aerial photograph, the potential source area is approximately 30-feet by 30-feet. If a 5 foot average excavation depth is assumed, the total calculated volume is 166 yd^3. This is a conservative estimate and assumes continuous contamination throughout. If contamination is identified in the former drum area it is most likely due to cumulative small spills from leaking drums creating discontinuous hot spots of soil contamination; therefore, the total volume of soil requiring excavation would likely be

significantly less. Field screening during a removal action would be used to drive the excavation limits of contaminated soil.

Excavation is intended as a source removal approach with the objective of eliminating soil ingestion and absorption exposure pathways, as well as migration to groundwater.

6.2.1.1 Debris Removal

The extent of buried debris at the Old Landfill site is not known. The history of the site suggests little debris was discarded over time and that the site was primarily used as a material site and a drum storage cache by the military. Debris at the site could range from minor quantities of domestic waste to industrial debris and buried storage drums. Domestic refuse and industrial debris (i.e. scrap metal, wire, etc.) is suitable for disposal in Port Heiden's Class III landfill. Drums excavated (crushed or intact) without product in them and apparently clean are also suitable for landfill disposal in Port Heiden.

Drums excavated containing product (i.e. fuels, oils and lubricants, solvents, etc.) should have the fluids removed into salvage drums or be placed into over pack containers for offsite disposal. Petroleum products recovered may be suitable for energy recovery usage in Port Heiden if a waste oil burner is available.

6.2.1.2 Monitoring Well Abandonment

Three monitoring wells, PH1, PH2 and PH3, are located in the depression in the center of the landfill site. Two of the wells are currently in good conditions with caps in place and the casings intact. The casing on the third well has been broken near the ground and only a jagged protrusion remains representing a site safety hazard. All three wells represent potential conduits to the aquifer.

If they are deemed to be no longer useful, it is recommended that the monitoring wells at the site be abandoned in accordance with DEC Monitoring Well Guidance (DEC 2009c).

6.3 General Soil Remediation Strategies and Alternatives

The following section discusses remediation strategies and alternatives for contaminated soil at the Old Landfill site.

6.3.1 Soil Management Strategies

Management options for contaminated soil can be divided into two general approaches which include in-place management of contaminated soil and source removal. Commonly used treatment options for contaminated soil include:

- Passive Treatment (monitored natural attenuation);
- Onsite Biological Treatment (landfarming);
- Onsite Landspreading or Landfill Cover Material;
- Onsite Thermal Treatment; and
- Offsite Treatment and Disposal.

Passive management approaches would seek to leave contaminated soils in place allowing them to naturally attenuate over time. This approach may be appropriate if:

- Contaminants (i.e. petroleum related compounds) at the site are likely to naturally degrade over time. Compounds such as polychlorinated biphenyls (PCBs) are slow or

not likely to degrade over time; and
- The majority of the contamination at the site is located at a sufficient depth that incidental contact with site users is unlikely.

Passive soil management approaches are appropriate if it is determined that contaminants at the site present minimal risk to human health and the environment. Passive soil management approaches could be combined with source removal approaches, and engineering approaches including soil capping and/or liner installation, to reduce overall excavation, treatment and disposal costs. Although the overall cost of using a passive soil management approach may be less than options requiring excavation and disposal, it may require long term monitoring. Long term monitoring of natural attenuation may not be desirable because of the long term cost and management involved. Passive soil management may also need to be combined with institutional controls to inform residents of the site conditions.

Active approaches to soil management would be appropriate if it is determined the nature and extent of contamination at the site represents an immediate risk to human health or the environment. This would include excavation of soil and appropriate disposal. Petroleum contaminated soil could be effectively managed in Port Heiden via landfarming, or used as landfill cover material if contaminant concentrations are sufficiently low. Landfarming and using the soil as landfill cover are both cost effective and readily implementable management options in Port Heiden. Thermal treatment of soil is generally expensive and not economical for small scale sites. Offsite treatment and disposal of soils may be appropriate if the nature of the contaminants require more specialized treatment or disposal, as may be the case with RCRA hazardous wastes such as chlorinated solvents or PCBs.

Additional information regarding the planned use of the landfill site, including identifying a potential building footprint and potential depth of foundation, would be required to develop the most cost effective remedial approach.

6.3.2 Available Resources

6.3.2.1 Equipment

Equipment including loaders and excavators suitable for excavation and removal activities are readily available in Port Heiden as a result of the ongoing Federal cleanup activities associated with old Port Heiden Defense Early Warning Line radar site and Fort Morrow. Heavy equipment would be available from multiple sources:

- City of Port Heiden;
- Aniakchak Contracts owned by the Native Council of Port Heiden;
- Christensen and Sons, LLC;
- Jens Carlson; and
- Jack Welbourne.

6.3.2.2 Labor

Site workers would be required to be Occupational Health and Safety Administration (OSHA) 40-hour HAZWOPER trained to participate in potential remedial actions at the landfill. The Native Council of Port Heiden Environmental Office maintains a list of workers in the community qualified to participate in environmental site work.

6.3.2.3 Resource Leveraging Opportunities

As a result of ongoing Federal project activities, there is sufficient equipment and labor infrastructure available to complete a small scale remediation project. A new Class III landfill, created to accept treated soil from the 2009 military site cleanup work, is available for use to dispose of debris and RACM. Ongoing debris removal activities in Port Heiden may be leveraged to dispose of waste from the site if necessary.

6.4 General Cost Estimate Information

Estimated costs for investigation of the site, excavation of contaminated soils, disposal of contaminated soil, waste and debris, and the decommissioning of three monitoring wells is $65,625. This estimate assumes:

- Contaminated soil is present in a 30-foot by 30-foot area at a depth of 5 feet;
- Contaminants are petroleum based and can be managed in Port Heiden through landspreading or as landfill cover;
- Debris (crushed drums, industrial debris and domestic waste) excavated during the proposed soil removal scenario can be disposed of in the Port Heiden Class III landfill; and
- Monitoring well abandonment assumes complete removal and grout sealing in accordance with DEC Monitoring Well Guidance (DEC 2009c).

Several factors will reduce some of the costs associated with site cleanup. The extent of contamination is likely less than the estimated volume; therefore the actual costs are likely less than the estimate for this task. Debris will only be excavated if necessary during the removal of contaminated soil. In general, cost will be reduced if synergy with other on-going or future environmental projects in Port Heiden can be achieved. A cost estimate spreadsheet is provided in Appendix I.

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7 Conclusions

The conclusions presented in this PACP were developed after reviewing available site information including the 2004 groundwater sample information and interviews with residents familiar with the history of the site. There is little information outside of the aerial photography obtained for documenting site conditions. VOCs associated with petroleum compounds detected in groundwater samples collected in 2004 suggest there may be a source of petroleum contamination. Additional investigation of the site is recommended and includes:

- Site wide surface soil sampling;
- Test pit excavation in the drum storage area, possibly in conjunction with a geophysical study;
- Groundwater sampling of the existing wells; and
- Surface water sampling to determine if contaminants are present in the water and to determine if a complete surface water exposure pathway is present.

In addition to the site investigation, it is recommended that the three groundwater wells at the site be abandoned if they are deemed to no longer be useful for site characterization.

If it is determined there is a human health risk associated with contamination present at the site then source removal and disposal is recommended. Petroleum contaminated soil is suitable for management in Port Heiden using cost efficient passive treatment (landfarming or landspreading) or, with DEC approval, as landfill cover material. Other regulated waste, if present, including PCB or solvent contaminated soil, would require offsite treatment and disposal. Domestic waste or buried debris if removed during the excavation of contaminated soil, is acceptable in the Port Heiden Landfill. Buried debris not associate with contaminant sources should be left in place unless a specific reuse plan for the site is developed.

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8 References

Alaska Department of Commerce, Community and Economic Development. 2009. Alaska Community Database Community Information Summaries; Port Heiden. http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.cfm.

Alaska Department of Environmental Conservation (DEC). 2010. *DRAFT – Field Sampling Guidance*. January.

DEC. 2009a. *Selected Oil and Other Hazardous Substances Pollution Control Statutes and Regulation*. September.

DEC. 2009b. *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites*. February.

DEC. 2009c. *Monitoring Well Guidance*. February.

DEC. 2005. *Policy Guidance on Developing Conceptual Site Models.* November 30.

Environmental Data Resources, Inc. (EDR). 2009. Port Heiden Old Military Dump. Port Heiden, Alaska. Inquiry Number: 2601185.1s.

Gough, L.P., Severson, R.C., and Shacklette, H.T. 1988. *Element Concentrations in Soils and Other Surficial Materials of Alaska*. U.S. Geological Survey Professional Paper 1458.

Hogan, E.V., 1995, *Overview of Environmental and Hydrogeologic Conditions Near Port Heiden, Alaska.* U.S. Geological Survey Open-File Report 95-407, 8 p.

Nagorski, S., G. Eckert, E. Hood, and S. Pyare. 2007. *Assessment of Coastal Water Resources and Watershed Conditions at Aniakchak National Monument and Preserve, Alaska. Natural Resource Technical Report NPS/NRWRD/NRTR—2007/371*. National Park Service, Fort Collins, Colorado.

Shoalwater Bay Environmental Laboratory. *2005. Port Heiden Soil and Groundwater 2004 Analytical Sample Results for Three Monitoring Wells at Old Landfill*. January.

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9 Qualifications of Qualified Personnel

Resumes for Hoefler personnel participating and in the development of the PACP have been included in Appendix J.

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