
Site 5 Decision Document

Hazardous, Toxic, and Radioactive Waste (HTRW)
Project # F10AK069603
Gambell Formerly Used Defense Site (FUDS)
St. Lawrence Island, Alaska

September 2007

F10AK069603_05.09_0002_A



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**Declaration Statement
Site 5 Decision Document
Gambell Site F10AK069603
St. Lawrence Island, Alaska**

Site Name and Location

The Gambell Formerly Used Defense Site (FUDS), project number F10AK069603, is located on St. Lawrence Island in the western portion of the Bering Sea, approximately 200 air miles southwest of Nome, Alaska. The Alaska Department of Environmental Conservation contaminated sites record key (reckey) number for the overall Gambell site is 198532X917919, and the reckey# for the Site 5 Tramway is 198532X917923. The Environmental Protection Agency identification number is AKD981765894. The Gambell site is not listed on the National Priorities List.

Statement of Basis and Purpose

This decision document presents the selected remedy for Site 5 Tramway at the Gambell FUDS on St. Lawrence Island, Alaska, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 United States Code §9601 et seq., and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations Part 300 et seq. The State of Alaska, through the Department of Environmental Conservation concurs with the selected remedy.

This decision is based on the results of a phased remedial investigation which was conducted from 1994 to 2006. 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 Elmendorf Air Force Base, AK, and the Information Repositories located at the Alaska Resource Library and Information Services in Anchorage, the Sivuqaq Lodge in Gambell, the Savoonga City Hall in Savoonga, and the University of Alaska Fairbanks Northwest Campus Library in Nome.

Assessment of Site

The Gambell site was used by the military from 1948 until the late 1950's. Various facilities were constructed near the village of Gambell to provide housing and operations, aircraft radar, communications, and other functions. Site 5 is the former tramway corridor that provided access to the radar site on top of the mountain. The site also incorporates the current village water supply well at the base of the mountain and an associated groundwater monitoring well array. The response action selected in this Decision Document is protective of public health, welfare, and the environment.

Description of Selected Remedy

The selected remedy is no further action. There is no unacceptable risk to human health and the environment caused by the current or future exposure of a resident to contaminated soils or groundwater at Site 5.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to remedial actions, and is cost-effective. A five-year review will not be required. Hazardous substances, pollutants, or contaminants remain on-site at levels that allow for unlimited use and unrestricted exposure.

In accordance with CERCLA and the Defense Environmental Restoration Program for Formerly Used Defense Sites, the U.S. Army Corps of Engineers, Alaska District, has completed all activities required for selection of a response action and determination of no further action at the Gambell Site 5 Tramway located on St. Lawrence Island, Alaska. The accompanying Decision Document supports the conclusions that all known sources of contamination have been investigated and that contaminants are not present at levels determined to be harmful to human health and the environment.

Authorizing Signatures

This Decision Document presents the selected remedial action of no further action at Site 5 Tramway at the Gambell Site, St. Lawrence Island, Alaska. The U.S. Army Corps of Engineers is the lead agency under the Defense Environmental Restoration Program at the Gambell Formerly Used Defense Site (F10AK0969), and has developed this Decision Document consistent with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan. This document, presenting a selected remedy with a present worth cost estimate of less than \$2 million, is approved by the undersigned, pursuant to Memorandum, DAIM-ZA, September 9, 2003, Subject: Policies for Staffing and Approving Decision Documents, and to Engineer Regulation 200-3-1, Formerly Used Defense Sites Program Policy.

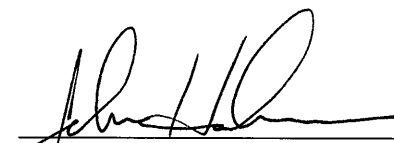


Date 9/26/07

KEVIN J. WILSON
Colonel, Corps of Engineers
District Commander

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This signature sheet documents the decision made for the Gambell Formerly Used Defense Site, St. Lawrence Island, Alaska. The Alaska Department of Environmental Conservation (DEC) concurs with the Corps of Engineers' selected remedy. The decision may be reviewed and modified in the future if new information becomes available that indicates the presence of contamination or exposures that may cause unacceptable risk to human health or the environment. Site 5 will be listed as Conditionally Closed in the DEC Contaminated Sites Database. Soil that contains diesel range organics (DRO) at concentrations above the migration to groundwater cleanup level (250 mg/kg DRO) should not be moved off-site without prior DEC approval.



JOHN HALVERSON
Alaska Department of Environmental Conservation
Department of Defense Cleanup Unit Lead

Date 11/21/07

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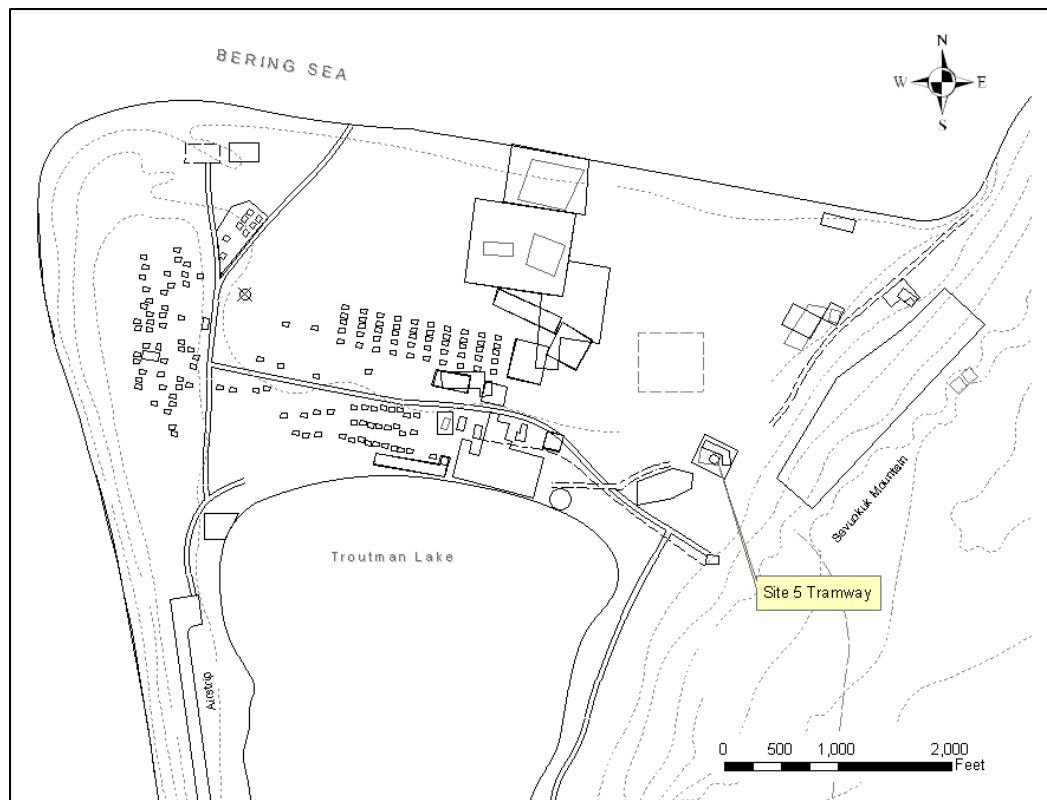
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Glossary of Terms and Acronyms

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ARARs	Applicable or Relevant and Appropriate Requirements
BTEX	Benzene, toluene, ethylbenzene, and xylene
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of concern
DOD	Department of Defense
DRO	Diesel-range organics
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FUDS	Formerly Used Defense Site
GRO	Gasoline-range organics
mg/kg	milligram per kilogram
mg/L	milligram per liter
NCP	National Contingency Plan
NFA	No Further Action
OSCI	Oil Spill Consultants, Inc.
POL	Petroleum, oil, and lubricants
ppm	Parts per million
PAHs	Polyaromatic (or Polycyclic) Hydrocarbons
PCBs	Polychlorinated biphenyls
Priority Pollutant Metals	Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.
RRO	Residual Range Organics
RAB	Restoration Advisory Board
RAO	Remedial Action Objectives
RI	Remedial Investigation
TRPH	Total recoverable petroleum hydrocarbons
USACE	United States Army Corps of Engineers
UCL	Upper Confidence Level
VOCs	Volatile organic compounds

Figure 2 – Site Location Map



1.2 Site History

The military established the Gambell site in the 1950's as part of a surveillance and intelligence-gathering network. Various units of the U.S. Army and U.S. Air Force utilized the area and leased approximately 2,500 acres in Gambell. The Air Force built a base camp in 1950 at the foot of Sevuokuk Mountain and a radar site directly above on the mountain top (both abandoned in 1956). The Site 5 Tramway was located at the base of the mountain and provided a connection to the radar site. The Army occupied several sites during the late 1950s, with a main base camp located just north of Troutman Lake. The Navy also laid communications cables from the village of Gambell, up Sevuokuk Mountain, and south to Brunnell Cape.

Environmental investigations and cleanup activities at Gambell began in the mid 1980's. The goals of the investigations were to locate and identify areas of contamination and to gather enough information to develop a cleanup plan. The first major environmental study, the remedial investigation, was performed at Gambell in 1994. The study divided the concerns among 18 separate sites. The results of the remedial investigation showed that contaminants were present at some but not all sites. Some sites were subdivided into subsites and new sites were also added in subsequent investigations.

In 1996, the second phase of remedial investigation was performed. In this study, additional soil and groundwater samples were collected from Sites 1A, 1B, 2, 3, 4B, 4D, and 5. The study

objectives were to further delineate the extent of contamination, estimate amounts of debris, and conduct a geophysical survey.

In 1997, a USACE contractor, Montgomery Watson, removed all visible surface debris from the island. After this removal action, frost jacking brought additional debris to the surface. During the 1999 field season, Oil Spill Consultants, Inc. (OSCI) performed additional cleanup activities at various sites in Gambell. OSCI removed a total of 26.8 tons of hazardous and non-hazardous containerized wastes such as asphalt drums, paint, generators, batteries, empty drums, and transformer carcasses. They also removed 71 tons of exposed metal debris such as runway matting, cable, fuel tanks and equipment parts; and excavated 72 tons of contaminated soil.

In 2000 and 2001, the Army Engineering and Support Center (Huntsville, AL) conducted extensive research and investigations to locate possible ordnance and explosives materials left behind by the military. During the field surveys, small amounts of ordnance waste were found, consisting primarily of highly weathered 30-caliber small arms ammunition at a beach burial pit southwest of Troutman Lake. An Engineering Evaluation/Cost Analysis dated November 2002 recommended institutional controls as the appropriate response action for military munitions and explosives of concern at the Gambell Site. An Action Memorandum, dated June 2003, documented the selected response action of institutional controls. The institutional controls were implemented during the summer of 2004 and consisted of distributing informational pamphlets and posters about ordnance risks to local residents and businesses and holding a community meeting. All identified ordnance and explosives waste (OEW) was removed and disposed by a Fort Richardson explosive ordnance disposal (EOD) team and the field crew working for the Native Village of Gambell on a Native American Lands Environmental Mitigation Program (NALEMP) project during the summer of 2006.

A supplemental remedial investigation was conducted by Montgomery Watson Harza during the 2001 field season, to verify previously collected confirmation data and investigate the nature and extent of contamination at four newly identified sites. These sites were identified as potential areas of concern based on community concerns and a review of a historical photographic analysis completed by the USACE Topographic Engineering Center in September 2000. The summary report recommended further action at several sites based on a comparison to default cleanup levels and no further action for others. No additional investigation was conducted at Site 5.

The Corps of Engineers completed a Feasibility Study (FS) in February 2004. A Proposed Plan was distributed to the public in July 2004 which summarized site conditions, investigation results, and described the remedial alternatives evaluated in the FS. A public meeting to discuss the plan was held in Gambell on July 21, 2004.

Based on community input, additional remedial investigation (groundwater monitoring) at the Site 5 Tramway was conducted during 2005-2006 by Bristol Construction Services (BCS).

The groundwater monitoring reports and all previous site investigations and removal action reports can be found in the Administrative Record located at the USACE Office on Elmendorf Air Force Base and at the Information Repositories located in Gambell, Savoonga, Nome, and Anchorage.

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

2.0 Community Relations Activities

Public participation has been an important component of the CERCLA process at the Gambell Site. A Community Relations Plan was developed for the project in March 1996 and updated in April 2002. The Community Relations Plan describes the measures used to meet the community relations goal of keeping Gambell residents and other interested people informed about project activities. It provided a means for local residents to share their knowledge about the Gambell area and its history with the project team. It further allowed the residents and other interested persons to provide their feedback and comments on project activities, and gave everyone an opportunity to become involved in the project.

A Restoration Advisory Board (RAB) comprised of community members and other interested parties was established in January 2000. RAB meetings are held approximately 3 times 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.

Public review and comment is requested on all project documentation. Detailed responses to comments are available in the correspondence file at the Information Repositories or an appendix of the final document. All comments received are documented in the administrative record file.

Project documentation, reports, and other materials are available at four Information Repositories located at the Sivuqaq Lodge in Gambell, the Savoonga City Hall in Savoonga, the University of Alaska Fairbanks Northwest Campus Library in Nome, and the Alaska Resource Library and Information Services in Anchorage.

3.0 Site Characteristics

This section provides an overview of the Gambell Site, including geographical information, hydrology, ecological resources, and land use.

3.1 Geographical and topographic information

The Native Village of Gambell is located on St. Lawrence Island, in the western portion of the Bering Sea, approximately 200 air miles southwest of Nome, Alaska (see Figure 1). The village is situated on a gravel spit that projects north and westward from the island. Gambell is relatively flat, with an elevation range from sea level to approximately 30 feet above mean sea level. Sevuokuk Mountain forms the eastern boundary of the gravel spit, and rises steeply to a height of approximately 619 feet. The dominant soil types underlying the Gambell area are

unconsolidated, poorly to well-sorted gravels with sand. These soils are interpreted as washed beach gravels deposited on a wave cut platform. Sevuokuk Mountain is composed of Cretaceous quartz monzonite, a gray rock rich in quartz and feldspars. The majority of the areas of concern are located within or adjacent to the village of Gambell. Site 5 Tramway is located at the base of Sevuokuk Mountain, adjacent to the City of Gambell water supply and approximately 2,000 feet east of the townsite.

3.2 Hydrology and Groundwater Use

The largest and most permanent surface water features in the vicinity of Gambell are Troutman Lake and North Nayvaghat Lakes. Small ephemeral ponds and bogs are also present on the tundra east of Troutman and North Nayvaghat Lakes. The predominant surface water feature, Troutman Lake, is considered slightly brackish due to influences from the Bering Sea.

The groundwater aquifer (10-14 ft depth) that currently supplies drinking water to the community is located at the base of Sevuokuk Mountain, approximately 2,000 feet east of the village on the far eastern edge of the gravel spit. Site 5 is located at the southern edge of this aquifer and encompasses the community water well and pumphouse locations. An array of groundwater monitoring wells surround the community water supply well, within the boundaries of Site 5. Groundwater is also present at depths ranging from 2.5 feet below ground surface (bgs) south of Troutman Lake to 16.5 ft bgs along the North Beach area.

Permafrost in Gambell is commonly encountered at depths ranging from 3 to 15 feet below the ground surface. Continuous permafrost acts as a barrier for soil contaminant migration. However, migration of contaminants may occur with groundwater movement in the active lens above the permafrost layer (suprapermafrost groundwater). Suprapermafrost groundwater occurs sporadically within the village of Gambell (i.e., in the vicinity of Sites 6, 7, 16, 17, 18). Based on water level depths in wells within Site 5 during the summer months, groundwater flow direction at Site 5 is to the north, towards the Bering Sea, a distance of about 1,200 feet.

According to a State of Alaska hydrogeological investigation report (Ireland, 1994), the Gambell aquifer is canoe-shaped, originating along the front of the steep bluff of Sevuokuk Mountain, and continuing down the hydrological gradient across a highly permeable gravel bar towards the ocean. The aquifer appears to be a thaw bulb in the permafrost, and as the permafrost expands or recedes, the aquifer dimensions vary. Warm recharge water originating on Sevuokuk Mountain effectively melts the permafrost where the mountain front joins the gravel spit. Water entering the aquifer comes from two springs that flow from the steep bluffs of the mountain into the gravel. Shallow groundwater across the gravel spit does not appear to be continuous because of the presence of shallow permafrost (Munter and Williams, 1992).

3.3 Ecological and Biological Resources

St. Lawrence Island supports habitats for the following endangered or threatened species: the spectacled eider (endangered), Steller's eider (threatened), and Steller sea lion. Walrus and polar bears are protected under the Marine Mammal Protection Act. The investigation areas of concern do not support sensitive habitats, and are predominantly comprised of gravel and sand within the city of Gambell and adjacent roads or the airport.

The Gambell area supports habitat for a variety of seabirds, waterfowl, and mammals that either breed in or visit the area. The area surrounding the top of Sevuokuk Mountain, above the Village of Gambell, supports a large bird rookery. The birds and bird eggs are a subsistence food source for local inhabitants. The ocean surrounding the Gambell area is used extensively for subsistence hunting of whales, walrus, seals, sea birds, and fish.

3.4 Current and Potential Future Land Uses

St. Lawrence Island is owned jointly by Sivuqaq, Inc., in Gambell, Alaska, and Kukulget, Inc., in Savoonga, Alaska. Non-Native land on St. Lawrence Island is limited to State land used for airstrips and related facilities in Gambell and Savoonga. The Native Village of Gambell is the federally recognized tribe in the community. Gambell is inhabited primarily by Native St. Lawrence Island Yupik people, who lead a subsistence-based lifestyle.

The population of Gambell has been slowly increasing (2 percent per year growth) since 1990; this trend is expected to continue. U.S. Census data from 2000 reports the total population at 649 residents. Residential development is planned to expand to the east of the Village of Gambell; supporting infrastructure for the village may expand to the south of Troutman Lake. Land use at the Gambell site is residential, recreational, and open space or undeveloped. The recreational and open space lands are primarily used for subsistence hunting, gathering, and eco-tourism. Future land use is expected to remain residential with the surrounding area used for recreation and subsistence hunting or gathering.

4.0 Site 5 Tramway Remedial Investigation

This section summarizes the remedial investigation results at Site 5 in Gambell. During the remedial investigation process, soil and groundwater samples were collected and analyzed for petroleum hydrocarbons, metals, and other organic constituents. Petroleum hydrocarbons were detected at predominantly low levels in the soil and groundwater.

Site 5 is located at the base of Sevuokuk Mountain, northeast of Troutman Lake and adjacent to the Village drinking water supply. The site was suspected to contain buried tram cables and transformers. Geophysical surveys were conducted in 1994 and 1996. Two geophysical anomalies were detected. In 1997, the two geophysical anomalies were excavated. One anomaly contained debris from an abandoned Quonset hut and a battery, which were removed by a USACE contractor, Montgomery Watson, and shipped off-site for disposal. The second anomaly contained seven 55-gallon drums filled with gravel and wrapped with wire cable, apparently used as anchors for the former tram system. No soil contamination was evident. The drum anchors were left in place and reburied.

4.1 Soil

During the Phase I investigation (1994), two soil and two monitoring well borings were drilled at Site 5 (see Figure 3). Ten subsurface soil samples were collected and analyzed for petroleum hydrocarbons (diesel range organics (DRO), gasoline range organics (GRO), and total recoverable petroleum hydrocarbons (TRPH), priority pollutant metals, and polychlorinated

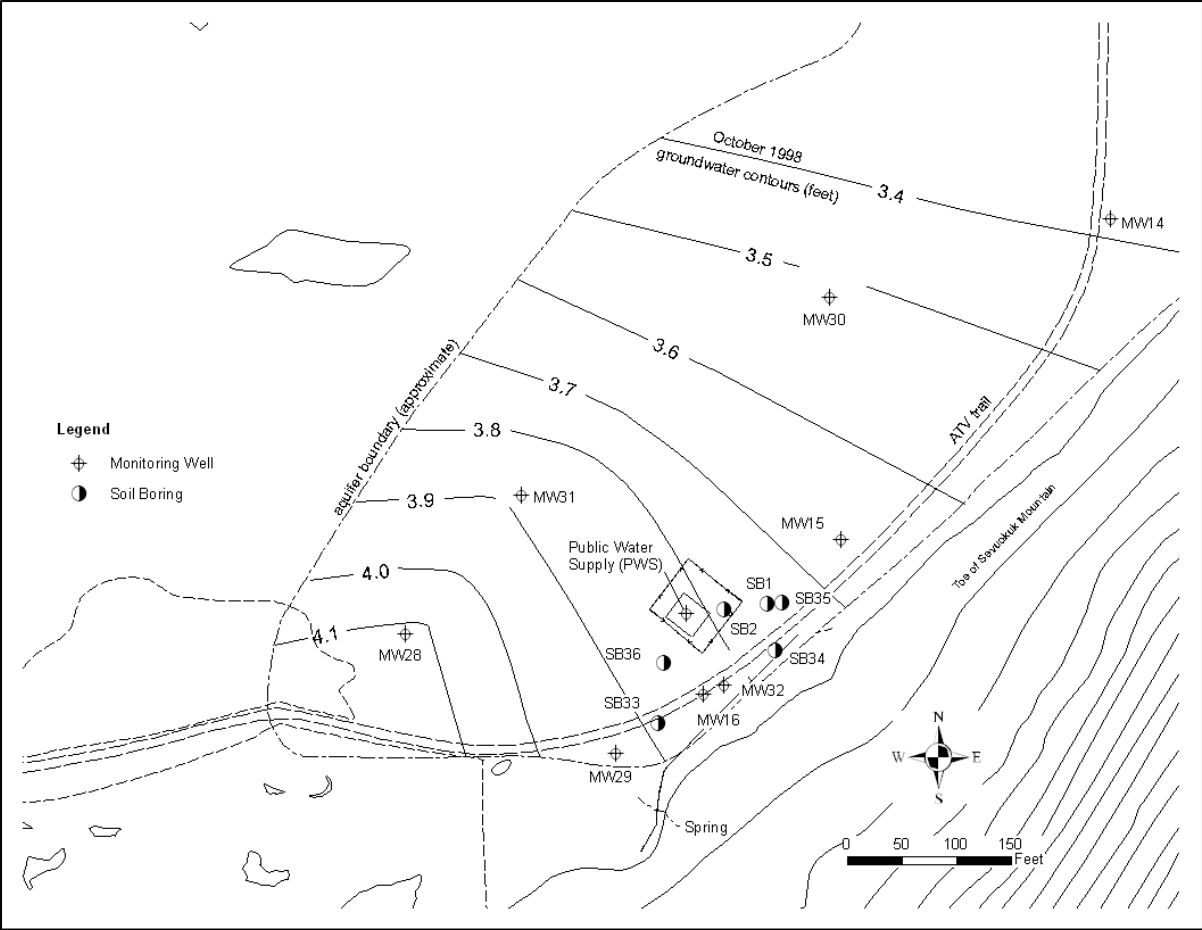
biphenyls (PCBs). DRO and TRPH were detected in soil from one boring (MW16) at concentrations above screening levels (see Table 1). MW16 was located adjacent to an all-terrain vehicle trail.

In 1998, four additional soil and five monitoring well borings were completed to further investigate the isolated detection of petroleum hydrocarbons at MW16. MW32 was drilled adjacent to the former MW16 as an additional assessment of soil conditions in the immediate vicinity (MW16 was damaged by local-resident activity). Subsurface soil samples were collected from each boring and analyzed for DRO, GRO, RRO, benzene/toluene/ethylbenzene/xylenes (BTEX), and polycyclic aromatic hydrocarbons (PAHs). The 1998 soil sampling results indicated contaminant concentrations at all locations were below the ADEC Table B cleanup levels based on the migration to groundwater pathway in 18 AAC 75.341. Table 1 summarizes the soil sampling results.

Furthermore, groundwater sampling events since 1998 indicate that the DRO-contaminated soil identified in 1994 was an isolated occurrence and does not appear to be impacting the unconsolidated aquifer.

Table 1. Soil Sampling Results at Site 5							
DRO	250	1,160 to 1,800	8.7	9.7	ND(4.1)	ND(4.1)	ND(4.1)
GRO	300	ND(5)	0.87	ND(5.2)	ND(5.2)	1.3	ND(5.2)
RRO	11,000	--	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
TRPH	NA	800 to 1,430	--	--	--	--	--
Notes: All results in milligrams per kilogram (mg/kg). Bold indicates value exceeds cleanup level. ND non detect, NA not available ^a 18 AAC 75, Table B, Under 40 Inch Zone, Migration to Groundwater (December 30, 2006) ^b MW32 is a replacement for MW16							

Figure 3 – Groundwater Monitoring Well and Soil Boring Locations at Site 5



4.2 Groundwater

Two monitoring wells (MW15 and MW16) were installed at Site 5 in 1994. Groundwater samples from both wells were analyzed for petroleum hydrocarbons and PCBs. DRO and TRPH were detected in the samples, but were far below ADEC Table C cleanup levels. Table 2 summarizes the historic groundwater sampling results for petroleum hydrocarbons only. Figure 3 shows the groundwater monitoring well locations, groundwater flow contours, and aquifer boundary.

A second phase of investigation was conducted from 1996-1998, due to concerns about possible impacts to the local public water supply well (PWS). In 1996, groundwater from the two original monitoring wells (MW15 and MW16) was resampled and analyzed for DRO and VOCs. DRO was detected in MW16, but below cleanup levels.

In 1997, groundwater samples were collected from the Village public water supply well, before and after the debris excavation activities. Pre-excavation samples were analyzed for DRO only and the post-excavation samples were analyzed for DRO, RRO, GRO, PCBs, and BTEX. Very low concentrations of DRO were detected in the public water supply well; RRO, GRO, PCBs, and BTEX were not detected.

In 1998, five additional monitoring wells were installed. Groundwater samples were collected and analyzed for DRO, GRO, RRO, BTEX, and PAHs. PAHs, RRO and BTEX were not detected in any of the groundwater samples. DRO was detected in the groundwater at two monitoring wells, MW31 and MW32 (a replacement for MW16). DRO exceeded the ADEC Table C groundwater cleanup level of 1.5 mg/L at one location, MW31 (1.9 mg/L). DRO was not detected in groundwater at an upgradient monitoring well (MW28), or the cross-gradient Village public water supply well. There is no known source for this contamination. Soil samples collected from the MW31 boring contained non-detect levels of DRO.

In 1999, the previously installed monitoring wells and village public water supply well were sampled in July and October. The village public water supply was also sampled in March, but the surrounding monitoring wells were frozen and unable to be sampled. All contaminants detected were below ADEC groundwater cleanup levels.

Based on community concerns, three additional groundwater sampling events were completed in September 2005, July and August 2006. The public water supply well and existing monitoring wells at Site 5 were sampled, with the exception of MW28 which had been filled with gravel. Groundwater samples were collected and analyzed for petroleum hydrocarbons, BTEX, PAHs, and metals. None of the sampling results exceeded ADEC groundwater cleanup levels. At MW31, where the only water sample exceeding DRO cleanup levels was collected in 1998, DRO ranged from non-detect to 0.53 mg/L DRO (DRO cleanup level is 1.5 mg/L).

Table 2. Groundwater Sampling Results at Site 5

DRO	ND	0.105	0.58 BW,AZ		0.11		0.11	0.0658 NJ, JL	0.101 NJ, B	ND (0.3)
GRO	ND (0.05)	ND (0.05)	--		ND (0.1)		ND	ND (0.09)	ND (0.1)	ND (0.1)
RRO	--	--	--		ND (0.25)		ND	ND (0.5)	0.210 NJ, B	ND (0.5)
TRPH	0.5	0.4	--		--					--
DRO					ND (0.1)	ND	ND	ND (0.3)	0.118 NJ, B	ND (0.3)
GRO					ND (0.1)	ND	ND	ND (0.09)	ND (0.1)	ND (0.1)
RRO					ND (0.25)	ND	0.29	ND (0.5)	0.253 NJ, B	ND (0.5)
DRO					ND (0.1)	0.32	ND	0.155 NJ, JL	0.200 NJ, B	0.495
GRO					0.054	ND	0.16	ND (0.09)	ND (0.4)	0.0171 NJ, TB, B
RRO					ND (0.25)	0.58	ND	ND (0.5)	0.405 NJ, B	0.113 NJ
DRO					1.9	ND	0.53	ND (0.09)	0.186 NJ, B	NA
GRO					0.026	ND	0.13	0.135–0.271 NJ, JL	ND (0.1)	ND (0.1)
RRO					ND (0.25)	ND	ND	ND – 0.167 (0.5) J	0.261 NJ, B	NA
DRO				0.124, 0.103	ND – 0.07 (0.1)	ND (0.1)	0.21	ND (0.3)	0.101 NJ, B	0.0699 NJ
GRO				ND (0.04)	ND (0.05-0.1)	ND (0.1)	ND	ND (0.09)	ND (0.1)	ND (0.1)
RRO				ND (1.49)	ND (0.2-1.0)	ND (0.25)	ND	ND (0.5)	0.207 NJ, B	0.170 NJ, B

Notes: All results in milligrams per Liter (mg/L). **Bold** values exceed cleanup levels.

ND () – non detect (detection limit)

NA – not analyzed

mg/L – milligrams per liter (parts per million)

AZ – matrix interference

BW – analyte detected in blank sample

J – value estimated

JL – value estimated with potential low bias

NJ – results between PQL and MDL, value estimated

B – analyte also detected in method blank, sample may be biased high or false positive

TB – analyte also detected in trip blank, sample may be biased high or false positive

PWS – public water supply well

^a MW32 is a replacement for MW16

Complete analytical results for 1994, 1996, 1997, and 1998 can be found in MW 1999b.

Complete analytical results for 1999 monitoring events can be found in MW 1999a, MW 1999c, and MW 1999d.

Complete analytical results for 2005 and 2006 can be found in BCS 2006a, 2006b and 2007.

18 AAC 75, Table C (December 30, 2006)

Groundwater Cleanup Levels:

DRO 1.5 mg/L

GRO 1.3 mg/L

RRO 1.1 mg/L

4.3 Data Summary

Monitoring well MW31 is located 185 feet cross-gradient (northwest) from the Village public water supply well, near the edge of the local aquifer. Groundwater level measurement data collected in December 1998 revealed that MW31 froze before the other existing wells, indicating its location at the edge of the aquifer. Groundwater gradients measured on 5 occasions during 1994 and 1998 all indicated the flow is northeast towards the Bering Sea. Groundwater gradients measured in 2005 and 2006 confirmed the approximate flow direction is northeast.

The DRO detected in soils at MW16 during the earliest phase of investigation has not been substantiated by subsequent sampling events. The soil contamination is an isolated occurrence which is not impacting the local water supply. The Village public water supply well has been sampled on multiple occasions and does not contain significant DRO contamination. Therefore, the DRO observed in soil is deemed to be isolated in nature, a de-minimus quantity, and does not pose a threat to human health and the environment.

The single exceedance of the DRO groundwater cleanup level at MW31 in 1998 has not been replicated by continued monitoring events. Subsequent sampling of MW31 and the other monitoring wells surrounding the public water supply was conducted in 1999, 2005, and 2006. These groundwater sampling events confirmed the aquifer is not contaminated with petroleum hydrocarbons above regulatory cleanup levels. MW31 is located cross gradient from the Village public water supply well and lacks evidence of a spill or source area of contaminated soils. The DRO in groundwater at MW31 was an anomalous occurrence.

4.4 Risk Summary

Contaminants of concern were identified during the Remedial Investigation by comparison to risk-based screening levels and cleanup criteria. Screening levels were based on the most stringent Alaska Department of Environmental Conservation (ADEC) soil and groundwater cleanup levels promulgated in 18 Alaska Administrative Code (AAC) 75.340 and 345. The ADEC regulates cleanup of contaminated sites in Alaska. The cleanup levels established by the ADEC are based on an estimate of the reasonable maximum exposure expected to occur under current and future site conditions and are designed to be protective of human health and the environment.

The contaminants of concern identified for Site 5 Tramway are petroleum hydrocarbons. The maximum concentration of DRO in soil was 1,800 mg/kg and did not exceed the ingestion pathway cleanup level¹ of 10,250 mg/kg, although some soil contains DRO above the 250 mg/kg migration to groundwater cleanup level, the soil does not pose an unacceptable risk to human health via the migration to groundwater pathway because the DRO contamination is a small quantity and isolated in extent. Groundwater sampling results confirm the local aquifer is not impacted by fuel contamination above the regulatory cleanup level² of 1.5 mg/L DRO. Site 5 does not pose a unacceptable risk to human health or the environment.

¹ 18 Alaska Administrative Code 75.341 Table B2, Under 40 Inch Zone, Ingestion Pathway, as updated through December 30, 2006.

² 18 AAC 75.345 Table C Groundwater Cleanup Levels, as updated through December 30, 2006.

5.0 Remedial Action 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 remedial action objectives (RAOs) for the Site 5 Tramway are:

- Reduce risks to human health and safety;
- Protect environmental receptors;

Site 5 is located near the base of Sevuokuk Mountain, in close proximity to the water supply well which serves the community. Therefore, the soil and groundwater cleanup goals for Site 5 are based on the ADEC Table B migration to groundwater pathway and Table C groundwater cleanup levels as promulgated in 18 AAC 75.

Table 3. Site 5 Cleanup Levels				
	Groundwater		Soil	
DRO	1.5	mg/L	250	mg/kg
GRO	1.3	mg/L	300	mg/kg
RRO	1.1	mg/L	10,000	mg/kg
Source: 18 AAC 75, Tables B2 and C (December 30, 2006)				

Contaminants at Site 5 either do not exceed established cleanup levels, or they exist in de-minimus quantities. The soil and groundwater risks are below the target threshold of 1×10^{-5} for carcinogenic risk and a 1.0 for a hazard index (non-carcinogens) and result in a no further action decision. This site is available for unrestricted use.

6.0 Summary of Selected Remedy

The Corps of Engineers determines **No Further Action** is appropriate for the Site 5 Tramway. No further action (NFA) is a response action selected when no additional remedial actions are necessary to protect human health and the environment, based on established cleanup levels and regulatory standards. No other site-specific actions were evaluated. The selected remedy satisfies the requirements under Section 121 of CERCLA and the NCP.

Protective of Human Health and the Environment

The selected remedy is protective of human health and the environment. The current and future exposure pathways are incidental ingestion of contaminated soil by local residents and consumption of groundwater as drinking water. The selected remedy, no further action, achieves the risk-based cleanup levels promulgated by the State of Alaska. Based on sampling results, the groundwater pathway does not pose an unacceptable risk to human health or the environment. No sources of contamination were identified upgradient of the community drinking water well to indicate potential future risks.

Applicable or Relevant and Appropriate Requirements

The chemical-specific applicable or relevant and appropriate requirements (ARARs) for the selected remedy are 18 Alaska Administrative Code 75, Tables B and C.

Cost Effectiveness

The selected remedy is cost-effective.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

Not applicable.

Preference for Treatment as a Principal Element

Not applicable.

State Acceptance

The State of Alaska, through the Department of Environmental Conservation (DEC), concurs with the selected remedial responses of no further action at Site 5 Tramway. The decision may be reviewed and modified in the future if new information becomes available that indicates the presence of contamination or exposures that may cause unacceptable risk to human health or the environment. Site 5 will be listed as Conditionally Closed in the DEC Contaminated Sites Database. Soil that contains DRO at concentrations above the migration to groundwater cleanup level (250 mg/kg DRO) should not be moved off-site without prior DEC approval.

Community Acceptance

Comments were received from local residents, community stakeholders, and the RAB's technical advisor during the public comment periods on the groundwater sampling reports. The community remains concerned that inadequate site characterization was conducted at the Gambell site, and inadequate hydrology studies have been conducted. The community has requested additional assurances that sites won't pose a future threat due to changing climate conditions, melting of permafrost, undetected contaminants, and contaminant migration. The remedial investigation results do not support the need for further actions.

All the RAOs for the Site 5 Tramway have been met. Investigation results indicate that any remaining contaminants are below applicable levels of concern. The remaining contaminants pose no adverse threat to human health or the environment, no further remedial actions are necessary.

7.0 References

- Bristol Construction Services, LLC (BCS). 2006a. Groundwater Monitoring Report, Gambell FUDS Remedial Action, Gambell, Alaska. Revision 1. February.
- BCS. 2006b. July 2006 Groundwater Sampling Report. Gambell FUDS Remedial Action, Gambell, Alaska. Revision 1. December.
- BCS. 2007. August 2006 Groundwater Sampling Report. Gambell FUDS Remedial Investigation, Gambell, Alaska. Final. May.
- Montgomery Watson (MW). 1995. Remedial Investigation, Gambell, St. Lawrence Island, Alaska. January.
- MW. 1999a. Remedial Investigation, Groundwater Sampling, Site 5, Gambell, St. Lawrence Island, Alaska. March.
- MW. 1999b. Phase II Remedial Investigation, Site 5, Gambell, St. Lawrence Island, Alaska. Final. May.
- MW. 1999c. Remedial Investigation, July 1999 Groundwater Sampling, Site 5, Gambell, St. Lawrence Island, Alaska. December.
- MW. 1999d. Remedial Investigation, October 1999 Groundwater Sampling, Site 5, Gambell, St. Lawrence Island, Alaska. December.
- Oil Spill Consultants, Inc. (OSCI). 2001. Remedial Action Report for Debris Removal and Containerized Hazardous Waste and Toxic Waste Removal, Gambell, Alaska. Final. February 15.
- United States Army Corps of Engineers (USACE). 2004a. Feasibility Study, Gambell, St. Lawrence Island, Alaska. February.
- USACE. 2004b. Proposed Plan for Remedial Action, Gambell Formerly Used Defense Site, St. Lawrence Island, Alaska. July.
- USACE. 2005. Decision Document, Gambell Formerly Used Defense Site F10AK0696, St. Lawrence Island, Alaska. June.



Alaska District Corps of Engineers Staff / Action Sheet

Please initial concur or non & date

S: 27 Sept 2007

Division	Concur	Non	Date	SUBJECT:	Date:
DC WILSON	<i>[Signature]</i>		09/26/07	Decision Document for Site 5 HTRW, Gambell FUDS Property, F10AK069603, Gambell, AK	21 Sept 2007
DDC BENSON	<i>[Signature]</i>		070924	RECOMMENDATION:	
DD HUNT	<i>[Signature]</i>		09.24.07	DC concurrence and signature on page 5	
OC VANAGEL <i>Burner</i>	<i>[Signature]</i>		9/24	DISCUSSION:	
PM-CW BOARDMAN	<i>[Signature]</i>		9/24	This Decision Document is for Site 5 only; the rest of the Gambell FUDS Site was covered under a separate Decision Document. One groundwater sample and one soil sample have returned diesel fuel (DRO) analyses that exceed ADEC Cleanup levels.	
PM-C-F Andraschko	<i>[Signature]</i>		23 Sep 2007	A complete analytical history of the groundwater samples taken at Site 5 is included in this document. Only one groundwater sample has ever exceeded ADEC Cleanup levels. Subsequent samples have been well below Cleanup levels.	
				Similarly, only one soil sample from Site 5 has exceeded ADEC Cleanup levels. Subsequent sampling has not turned up contaminants of concern. No source of DRO contamination has ever been identified here.	
				This Decision Document proposes no further action as the preferred remedy.	
				The ADEC project manager has reviewed and commented on the draft version this decision document. ADEC concurs with the remedy.	
				APPROVAL AUTHORITY'S COMMENTS:	
				Approval _____ Disapproval _____ See Me _____	
				<i>[Signature]</i>	
				Carey Cossaboom FUDS Project Manager X2689	
				<i>[Signature]</i>	
				Div/Branch Chief's Signature	
				for Release: Stephen Boardman	
POC:	Carey Cossaboom			Phone #:	x5799