THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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File No: 2121.38.001

January 29, 2016

LT Jennifer Nutt
Alaska Army National Guard
Construction Facilities Management Office
PO Box 5800
JBER, AK 99505-0800

Re: Decision Document and Approval of the *Final Remedial Action Report* Federal Scout Readiness Center (FSRC), Kipnuk, Alaska December 2015
Cleanup Complete Determination

Dear LT Nutt,

The Alaska Department of Environmental Conservation (ADEC) has received and reviewed the *Final Remedial Action Report Federal Scout Readiness Center, Kipnuk, Alaska*, prepared by Ahtna Environmental Inc., and dated December 2015. This document satisfactorily addressed ADEC comments made on the draft version. The ADEC hereby approves this report in accordance with 18 Alaska Administrative Code (AAC) 75.335(d).

In addition, the ADEC has reviewed the environmental records for the referenced site. This decision letter memorializes the site history, cleanup actions, and standard conditions for long-term site management. No further remedial action is required.

Site Name and Location:
AKARNG Kipnuk FSA
Lot 2 USS 4236
Kipnuk, Alaska

Name and Mailing Address of Contact Party:
Alaska Army National Guard
Construction Facilities Management Office
PO Box 5800
JBER, AK 99505-0800

DEC Site Identifiers:
File No: 2421.38.001
Hazard ID: 1557

Regulatory Authority for Determination:
18 AAC 75

Site Description and Background

The Kipnuk Federal Scout Armory (FSA) is located in Kipnuk, Alaska (85 miles southwest of Bethel) on the bank of the Kuguklik River near the center of the village. The Kipnuk FSA has been in operation since 1959 and was relocated due to erosion of the riverbank to its current location in 1985. The facility consists of a 20 by 60 foot wood frame building connected to a 30 by 40 foot building supported by a wood foundation. An addition (30 by 50 ft.) to the building was added in 2003. Over the history of the facility, there were two aboveground storage tanks (ASTs), one of 3,000 gallon capacity and the other capacity was unknown.

The heating oil spill record for the site identified that a spill of approximately 1,700 gallons was reported to the ADEC in 1992 and the site was given the spill number 1992-2501-189-01. Emergency Response crews recovered about 1,250 gallons of fuel following that spill. Another spill occurred in May of 1998 when approximately 1,370 gallons of diesel was released from the 3,000 gallon AST due to a cracked pipe at the base. The initial cleanup was made by Kipnuk AKARNG personnel. Afterwards, Clean Alaska Inc. was contracted to contain the spill and prevent it from reaching adjacent water bodies. Clean Alaska Inc. was able to recover about 1,140 gallons of fuel but it is unknown whether any characterization or additional cleanup was done at the time.

Contaminants of Concern

The following petroleum contaminants of concern, those above approved cleanup levels, were identified during the course of the site investigations summarized in the Characterization and Cleanup Activities section of this decision letter.

- Diesel Range Organics (DRO)

Table 1 – Approved Cleanup Levels

Contaminant	Soil (mg/kg)
DRO	12,500

Characterization and Cleanup Activities

A Site Assessment was conducted in 1994 by Environmental Health Sciences – Alaska (EHS) to investigate the extent of contamination near the former 3,000 gallon AST. As documented in the February 1995 report, after field screening 18 test borings at 3-4 foot depths with a photoionization detector (PID), a total of eight (8) soil samples were collected and analyzed for DRO and benzene, ethylbenzene, toluene, and xylenes (BTEX). The samples had DRO values ranging from 95-5,500 mg/kg and total BTEX below the regulatory standards used at the time (ADEC's *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Guidance Number 001, Revision 1, July 17, 1991.* Some of the DRO values were greater than the 2,000 mg/kg cleanup level based on the ADEC matrix score sheet (Matrix Level D).

The report *Final Remedial Investigations for POL Spill Alaska Army National Guard Armory Kipnuk, Alaska,* dated October 1998, by ERM-West Inc. and Hart Crowser Inc., documented field activities performed in September 1997 related to the fuel spills around the 3,000 gallon AST. Seventeen hand auger borings were advanced and 36 soil samples were collected. In addition, a well point was installed and an active

layer water sample was collected. The soil was field screened using an organic vapor meter (OVM). All of the soil samples were analyzed for DRO and some samples were additionally tested for residual range organics (RRO), gasoline range organics (GRO), polycyclic aromatic hydrocarbons (PAHs), and BTEX. Other selected samples were analyzed for total organic carbon (TOC) and cation exchange capacity as well as by the synthetic precipitate leaching procedure (SPLP) to help assess remedial options. The water sample was analyzed for GRO, DRO, BTEX, total phosphorous, nitrate/nitrite, total kjeldahl nitrogen, ammonia, total dissolved solids, and chemical oxygen demand. Soil sample results indicated DRO contamination ranging from 32-17,000 mg/kg. However the laboratory chromatograms showed biogenic interference in all of the samples. The RRO and GRO analyses were similar to the DRO results – having biogenic interference. BTEX was detected at levels below ADEC cleanup levels in the soil samples analyzed. DRO was detected in the water sample at 0.42 milligram per liter (mg/L) and BTEX were not detected.

An Interim Removal Action was performed by Clearwater Environmental Inc. in April of 2000 and was documented in the report *Final Interim Removal Action Report Federal Scout Armory Kipnuk, Alaska.* The interim removal consisted of the removal of all petroleum contaminated soils having DRO and GRO greater than the ADEC Method 1 Level D cleanup levels (2,000 and 1,000 mg/kg, respectively) from three (3) areas of the site (areas A, B, and C). The excavation was guided using PetroFLAG and a PID. A total of eight (8) cubic yards (yd^3) of soil was excavated down to two (2) feet below ground surface, placed into 55 gallon drums, and transported to Bethel Native Corporation International (BNCI) (a thermal desorption facility) in Bethel. Four (4) confirmation samples were collected from area A, but due to the high moisture content, the analytical results could not be used for cleanup level comparisons. No samples were collected from area B and the sample from area C also had high moisture content making the results useless.

The *Alternative Cleanup Level Demonstration Project Report*, dated November 2005, by AMEC Earth and Environmental Inc. (AMEC), documented the development alternative cleanup levels (ACLs) based on ADEC regulation and guidance. Grab soil samples were collected from the site from 1-2.5 feet below ground surface. Suprapermafrost water was collected from petroleum affected areas. Soil samples were analyzed for GRO, BTEX, DRO, bulk density, TOC, grain size, GRO and BTEX by SPLP, DRO by SPLP, and total dissolved solids was additionally analyzed on the water samples. DRO was detected in nine (9) of 15 samples at concentrations ranging from 28.5-128 mg/kg. GRO was not detected. Toluene was detected at 0.024 mg/kg in one (1) sample and all others in the BTEX suite were non-detect. TOC by weight ranged from 4.8-8.6%. Three (3) suprapermafrost water samples had DRO concentrations ranging from non-detect to 0.898 mg/L. GRO was not detected and benzene and toluene maximum concentrations were 0.0006 and 0.001 mg/L respectively. Neither xylenes nor ethylbenzene were detected in the water samples. The SPLP analyses indicated that DRO was present in the leachate but GRO and BTEX were not. Background soil samples were analyzed for TOC and the result was an average TOC value of 7%. AMEC presented Method 1, Method 2, and site-specific Method 3 cleanup levels. In addition, AMEC proposed that the site be considered for groundwater aquifer exemption under 18 AAC 75.350 determination because the suprapermafrost groundwater is not suitable for drinking water. The ADEC's response to the Alternative Cleanup Level Demonstration Project was that the report did not address the comments provided by the ADEC in October of 2005 and that the report did not accurately present the data obtained and does not meet the requirements of 18 AAC 75.335.

CH2MHill provided a *Data Gap Investigation Report* for the Kipnuk FSA dated January 2013 to ensure that the AKARNG had all the environmental data necessary to conduct remedial actions at the site. At the time of the report, there was one 3,000 gallon AST and one 1,500 gallon AST on site. The original 3,000 gallon AST was removed prior to the investigation. CH2MHill identified the following data gaps: the lateral and vertical extent of DRO contamination in soil, the lack of BTEX, polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs) data, and surface water conditions. CH2MHill launched a field investigation in July of 2011 to address these gaps. Eight (8) soil borings and five (5) additional stepout borings were made on site in two (2) areas at to a depth of three (3) feet below ground surface. Thirteen soil samples and two (2) duplicates were collected from the borings with the highest PID readings. DRO analysis of these samples indicated concentrations as high as 17,700 mg/kg. However, when silica gel was used on the samples prior to analysis, the DRO concentration was reduced markedly indicating that the DRO analytical results were being influenced by naturally-occurring biogenic material. GRO was also detected in the samples up to 44 mg/kg. BTEX compounds were detected up to 2.1 mg/kg. A surface water sample from standing water near one of the borings was tested for DRO, BTEX, and total aqueous hydrocarbons (TAH) and the results met ADEC surface water quality standards. Groundwater samples collected from the contaminated area contained benzene at 0.00062 mg/L and DRO at 0.47-0.9 mg/L.

A Record of Decision for the AKARNG Kipnuk FSA was signed in 2013 and was based on the previous investigations on the site and the *Data Gap Investigation Report.* The Record of Decision documented that all contaminant concentrations detected in suprapermafrost water and surface water were below ADEC cleanup levels (Table C of 18 AAC 75.345(b)(1)] and 18 AAC 70.020(b)(5)(A)(iii)). The site-specific cleanup level for soil at the Kipnuk FSA was determined to be 12,500 milligram per kilogram (mg/kg) diesel range organics (DRO) based on the *Data Gap Investigation Report.* Soil contaminated with concentrations up to 17,700 mg/kg DRO was found to be present on-site.

The *Final Remedial Action Report Federal Scout Readiness Center Kipnuk, Alaska*, prepared by Ahtna Environmental Inc. (Ahtna), and dated December 2015, documents the final cleanup activities at the site. For excavation purposes, and because the cleanup level for DRO (12,500 mg/kg) specified in the Record of Decision is equal to the maximum allowable concentration, a cleanup level of 10,250 mg/kg DRO was used for field work. Ahtna excavated contaminated soil at the site in four (4) different areas previously identified during prior investigations. These areas were all near the former 3,000 gallon AST and west of the footprint where historical investigations indicated contamination greater than the cleanup level. When needed, the foundations and buildings were moved to access contaminated soil underneath the structures. A PID was used to guide the excavations and confirmation samples (where the PID readings were highest) were collected from the base and sidewalls of the excavations. The confirmation samples were analyzed for DRO with and without silica gel cleanup due to the high amount of organic matter in the tundra soils.

The first excavation occurred at the south side of the FSRC where there had been a soil concentration of 14,400 mg/kg DRO. A liner that had been placed during an earlier excavation was removed and 25 field screening samples were collected and analyzed by PID. About seven (7) yd^3 was excavated from the surface to 18 inches below ground surface. Seven (7) confirmation samples were collected from the base and sidewalls of the excavation and the highest DRO value of these was 3,800 mg/kg without silica gel cleanup. Excavation two (2) was centered on a sample from a previous investigation that had a DRO value of 16,700 mg/kg. Approximately three-quarters (0.75) of a cubic yard was removed from this location from a depth of 16 inches below ground surface. The highest DRO confirmation sample had a

value of 320 mg/kg without silica gel cleanup from the west sidewall. Excavation three (3) centered on an historical sample having a DRO value of 14,000 mg/kg. Approximately three-quarters (0.75) of a cubic yard was removed to a depth of 16 inches below ground surface. Confirmation samples from the base and sidewalls of the excavation had a maximum DRO value of 180 mg/kg. Excavation four (4) was the southernmost excavation and targeted an historical sample having a DRO value of 17,700 mg/kg. An estimated three-quarters (0.75) of a cubic yard was removed and the highest confirmation sample had a value of 910 mg/kg DRO without silica gel cleanup. The depth of the excavation in area four (4) was 12 inches below ground surface.

All of the excavations were backfilled with clean material and the area was seeded with native grasses to prevent erosion. A total of 5.47 tons of petroleum contaminated soil was transported to the Columbia Ridge landfill in Arlington, Oregon landfill for disposal. Confirmation samples taken throughout the site indicate that all of the soil exceeding the cleanup level of 12,500 mg/kg DRO has been removed.

Cumulative Risk Evaluation

Pursuant to 18 AAC 75.325(g), when detectable contamination remains on-site following a cleanup, a cumulative risk determination must be made that the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a cumulative non-carcinogenic risk standard at a hazard index (HI) of one across all exposure pathways. Based on a review of the environmental record, ADEC has determined that residual contaminant concentrations do not pose a cumulative human health risk.

Exposure Pathway Evaluation

Following investigation and cleanup at the site, exposure to the remaining contaminants was evaluated using ADEC's Exposure Tracking Model (ETM). Exposure pathways are the conduits by which contamination may reach human or ecological receptors. ETM results show all pathways to be one of the following: De-Minimis Exposure, Exposure Controlled, or Pathway Incomplete. A summary of this pathway evaluation is included in Table 2.

Table 2 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	De-Minimis Exposure	DRO contamination in surface soil (0 to 2 feet below ground surface) is at its greatest (3,800 mg/kg) which is well below the ingestion (10,250 mg/kg) and inhalation (12,500 mg/kg) cleanup levels.
Sub-Surface Soil Contact	Pathway Incomplete	Contamination is not present in subsurface soil.
Inhalation – Outdoor Air	De-Minimis Exposure	Minimal DRO contamination remains in the surface soil, but is below inhalation cleanup levels.
Inhalation – Indoor Air (vapor intrusion)	De-Minimis Exposure	Minimal DRO contamination is not expected to affect indoor air due to low DRO concentrations and structure design aboveground on footing.
Groundwater Ingestion	Pathway Incomplete	Groundwater present in suprapermafrost is not a potable water source.
Surface Water Ingestion	Pathway Incomplete	Surface water is not contaminated with DRO.

Wild and Farmed Foods Ingestion	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals nor are these items collected on site.
Exposure to Ecological Receptors	Pathway Incomplete	Residual DRO in soil is not expected to negatively affect ecoreceptors.

Notes to Table 2: "De-Minimis Exposure" means that in ADEC's judgment receptors are unlikely to be affected by the minimal volume or concentration of remaining contamination. "Pathway Incomplete" means that in ADEC's judgment contamination has no potential to contact receptors. "Exposure Controlled" means there is an administrative mechanism in place limiting land or groundwater use, or a physical barrier in place that deters contact with residual contamination.

ADEC Decision

As documented by confirmation samples during the Remedial Action, remaining petroleum concentrations in the soil are below the ADEC-approved cleanup levels. This site will receive a "Closed" designation on the Contaminated Sites Database, subject to the following standard conditions.

Standard Conditions

1. Any proposal to transport soil or groundwater off-site requires ADEC approval in accordance with 18 AAC 75.325. A "site" [as defined by 18 AAC 75.990 (115)] means an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership.

2. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.

This determination is in accordance with 18 AAC 75.380 and does not preclude ADEC from requiring additional assessment and/or cleanup action if future information indicates that this site may pose an unacceptable risk to human health or the environment.

Appeal

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99811-1800, within 15 days after receiving the department's decision reviewable under this section. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99811-1800, within 30 days after the date of issuance of this letter, or within 30 days after the department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

If you have questions about this closure decision, please feel free to contact me at (907) 465-5207.

Sincerely,

Danielle Duncan
Project Manager

cc: Anne Marie Palmieri, Environmental Program Specialist IV, ADEC, via electronic mail