



THE STATE  
of **ALASKA**  
GOVERNOR SEAN PARNELL

Department of  
Environmental Conservation

DIVISION OF SPILL PREVENTION & RESPONSE  
Contaminated Sites Program

555 Cordova Street  
Anchorage, Alaska 99501  
Phone: 907.269.7503  
Fax: 907.269.7649  
dec.alaska.gov

File No: 2421.38.003

Jacob Jensen, Superintendent  
Lower Kuskokwim School District  
P.O. Box 305  
Bethel, AK 99559

Re: Decision Document: Chief Paul Memorial School – Kipnuk  
Cleanup Complete Determination – Institutional Controls

Dear Mr. Jensen:

The Alaska Department of Environmental Conservation (ADEC) has reviewed the environmental records for the Chief Paul Memorial School – Kipnuk site. This decision letter memorializes the site history, cleanup actions, and specific conditions required to effectively manage remaining contamination. No further remedial action will be required as long as compliance with these conditions is maintained.

**Site Name and Location:**

Chief Paul Memorial School – Kipnuk  
Latitude: 59.936507  
Longitude: -164.038043  
Kipnuk, Alaska

**Name and Mailing Address of Contact Party:**

Jacob Jensen, Superintendent  
Lower Kuskokwim School District  
P.O. Box 305  
Bethel, Alaska 99559

**DEC Site Identifiers:**

File No: 2421.38.003  
Hazard ID: 25609

**Regulatory Authority for Determination:**

18 AAC 75

**Site Description and Background**

In 2011, the ADEC was notified that the Lower Kuskokwim School District (LKSD) planned to expand and renovate the Chief Paul Memorial School in Kipnuk, Alaska. Project activities included removing several structures and above ground storage tanks (ASTs) within the proposed school footprint, demolishing the schools former tank farm, and adding a new school tank farm near the former village tank farm. Numerous small spills had occurred at the school from numerous ASTs; and as such, the LKSD was required to characterize the nature and extent of contamination at the school.

### Contaminants of Concern

The following petroleum contaminants of concern were identified during the course of the site investigations. They are summarized in the Characterization and Cleanup Activities section of this decision letter.

- Residual Range Organics (RRO)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzene
- Toluene
- Ethylbenzene
- Xylenes

### Cleanup Levels

Concentrations of RRO and several polynuclear aromatic hydrocarbons (PAHs) were detected in soil above the Method Two ingestion and inhalation soil cleanup levels for the under 40-inch precipitation zone established in 18 AAC 75.341(c), Table B1, and 18 AAC 75.341 (d), Table B2.

**Table 1 – ADEC Cleanup Levels**

Contaminant	Soil – Migration to Groundwater* (mg/kg)	Soil – Ingestion (mg/kg)	Soil – Inhalation (mg/kg)
Benzene	0.025	150	11
Toluene	6.5	8,100	220
Ethylbenzene	6.9	10,100	110
Xylenes	63	20,300	63
GRO	300	10,250	12,500
DRO	250	1,400	1,400
RRO	11,000	10,000	22,000
Benzo(a)anthracene	3.6	4.9	N/A
Benzo(a)pyrene	2.1	0.49	N/A
Benzo(b)fluoranthene	12	4.9	N/A

**Notes to Table 1:** mg/kg = milligrams per kilogram  
N/A = not applicable

\*The groundwater pathway is considered incomplete because the groundwater is not considered potable in Kipnuk due to the high salinity; therefore, the migration to groundwater cleanup levels are not being applied at this site.

### Characterization and Cleanup Activities

Characterization and cleanup activities conducted under the regulatory authority of the Contaminated Sites Program began in 2011. These activities are described below.

Between March 29 and April 2, 2011, OASIS Environmental (OASIS) performed a limited soil investigation in areas slated for construction near the school. Four soil borings were advanced to

roughly 20 feet below ground surface (bgs) in areas of general concern outside of the proposed school footprint. An additional soil boring was advanced near the entrance to the community landfill to approximately 15 feet bgs to assess the soils in that area. Nine soil samples, including a duplicate soil sample, were collected from the soil borings for laboratory analysis. All soil samples were collected between 3 and 19 feet bgs. The soil samples were analyzed by an ADEC approved laboratory for gasoline range organics (GRO), diesel range organics (DRO), RRO, and benzene, toluene, ethylbenzene, and xylenes (BTEX). None of the soil samples exhibited contaminant concentrations that exceeded the ADEC cleanup criteria. Surface soil samples were not collected during the March and April investigation activities because the ground was covered with snow.

Following the March and April field activities, and based on two drinking water wells that were drilled in 1965 by the Bureau of Indian Affairs (BIA), it was determined that the groundwater in Kipnuk is not potable because of high salinity. Additionally, the Chief Paul Memorial School utilizes three separate surface water collection points to provide safe drinking water to its students. For these reasons, the ADEC concurred that the groundwater pathway was incomplete for this site.

In June of 2011, OASIS returned to the site to identify locations and quantities of impacted soil that may be encountered during the school renovation project. Numerous soil samples were collected from one and three feet bgs near various ASTs within the schools proposed expansion footprint. Two soil samples were also collected near the schools proposed new tank farm. Analytical results indicated concentrations of DRO, RRO, and several PAHs were present in the surface soils above the ADEC inhalation and direct contact cleanup levels within the schools proposed footprint.

The analytical results from the June 2011 sampling indicated that there was wide-spread fuel contamination at this site; however, it was believed that some of the contamination was the result of biogenic interference. Based on this information, ADEC staff reviewed the soil chromatographs and suggested seven locations be re-sampled and analyzed with silica gel analyses. In October of 2011, OASIS Environmental returned to the site and collected numerous soil samples to evaluate for biogenic contribution based on the ADECs recommendation. All soil samples were analyzed for DRO and RRO with and without silica gel.

Based on the June and October field activities, it was determined that contamination from three individual tank sites (Tanks 3, 6, and 11) were not biogenic in nature, and as such, needed to be remediated. OASIS returned to the site in September of 2012 to excavate contaminated soils from these three individual tank sites. The depth of each excavation was limited by a frozen layer (possibly permafrost) which was encountered between two and three feet bgs.

Tank 3 was located adjacent to a standing structure to the south, and was not removed prior to excavation activities. Excavation continued around Tank 3 to roughly two feet bgs and outwards until the foundation of nearby structures prevented any further expansion of the excavation. Approximately 2.11 cubic yards (cys) of soil were excavated from Tank 3, and stockpiled temporarily before being transferred to the Kipnuk Landfill as land cover. Based on field screening results, three soil samples were collected from the base of the excavation. Following the excavation and sampling activities, the excavation was filled with clean fill.

Excavation was performed at Tank 11 to approximately two feet bgs. Excavation was limited by a nearby building foundation to the northwest. Approximately 15.5 cys of soil were excavated from Tank 11, and stockpiled temporarily before being transferred to the Kipnuk Landfill as land cover.

Based on field screening results, four soil samples, including a duplicate soil sample, were collected from the excavation; three from the base, and one from the sidewall of the excavation.

Tank 6 was located adjacent to a housing structure to the north. Tank 6 was decommissioned and removed prior to field screening activities. The excavation proceeded laterally to the maximum extent practical without jeopardizing the structural integrity of the housing structure. Approximately 28 cys of soil were removed. Based on 2011 data, analytical testing of Tank 6 soils was found to produce leachate that exceeds water quality standards for TAqH and required disposal at a regulated offsite facility. Excavated soils were placed directly into supersacks for shipment offsite for disposal. Based on field screening results, eight soil samples, including a duplicate soil sample, were collected from the excavation. Following excavation and sampling activities, and after a building located north of the excavation was demolished, a geotextile fabric was installed, and the excavation was filled with clean fill.

Soil samples collected from the excavations at Tanks 3, 6, and 11 were analyzed for GRO, DRO, RRO, and BTEX. Additionally, one soil sample from each excavation was analyzed for PAHs. Samples collected from Tanks 3 and 6 exhibited concentrations of RRO and several PAHs that exceeded the ADEC direct contact and/or inhalation cleanup levels.

Because of the elevated concentrations of PAHs, ADEC staff requested that samples be collected between Tank 6 and the nearest surface water body for PAH contaminants. In June of 2013, OASIS collected three soil samples from 0.5-1.0 feet bgs at distances of approximately 80, 120, and 143 feet, respectively, from the Tank 6 excavation to the northeast towards a large surface water body. The soil samples were only analyzed for PAHs. All contaminant concentrations were reported below ADEC approved cleanup levels. No visual or olfactory signs of contamination were observed during these activities.

During the June 2013 field activities, OASIS performed excavation and sampling activities at the school's former tank farm. Excavation was performed using an excavator and proceeded to two feet bgs. Soils were placed directly into super sacks and placed in a temporary stockpile. Excavation boundaries were limited because of a cement foundation to the south, a gravel and pad material to the north and west, and a fuel line to the east. Based on field screening results, four soil samples, including a duplicate soil sample, were collected from the sidewalls of the excavation. Soil samples were analyzed for GRO, DRO, RRO, and BTEX. One soil sample was also analyzed for PAHs. No contaminants were present above the ADEC maximum allowable cleanup levels.

The 2012 and 2013 analytical data indicate that RRO, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene remain in the surface soils above the ADEC direct contact cleanup levels within the proposed school footprint. However, the remaining contamination was capped with clean fill, and the proposed facility design includes provisions for the school to be built on pilings and elevated above the ground surface. Furthermore, access beneath the building will be blocked by chain link fencing, which will restrict access beneath the school. These controls (if maintained) will effectively restrict access and thereby eliminate exposure to remaining contamination. The Site Figure (Attachment B) at the end of the text identifies locations of remaining contamination.

### **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 noncarcinogenic risk standard at a hazard index of one across all exposure pathways.

The total risks exceed the benchmark values of a cancer risk of 0.00001 for groundwater; however, because the groundwater pathway is considered incomplete for the subject site, residual contaminant concentrations do not pose an unacceptable 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	Exposure Controlled	Contamination is present in surface soil (0 to 2 feet bgs) above direct contact cleanup levels; however, exposure to these soils will be mitigated through building design which calls for construction on pilings so that the school building will be elevated above ground surface. Furthermore, access beneath the building will be restricted by chain link fencing.
Sub-Surface Soil Contact	De-Minimis Exposure	Contamination remains in the sub-surface soil (2 to 15 feet bgs), however, below direct cleanup levels.
Inhalation – Outdoor Air	De-Minimis Exposure	Contamination remains in the surface and sub-surface, but is below inhalation cleanup levels.
Inhalation – Indoor Air (vapor intrusion)	Exposure Controlled	Potential impacts to indoor air will be mitigated through building design. The facility design calls for construction on pilings and the school building will be elevated above the ground surface. This construction technique will result in an air gap between the ground surface and the bottom of the building, minimizing the potential for fuel vapors to accumulate within the school building.
Groundwater Ingestion	Pathway Incomplete	Two drinking water wells were drilled in 1965 by the Bureau of Indian Affairs in Kipnuk; both reportedly had non-potable groundwater due to high salinity. Additionally, three separate surface water collection points are utilized by the school to provide safe drinking water. For these reasons, the groundwater pathway is deemed incomplete for this site.
Surface Water Ingestion	De-Minimis Exposure	As described above, surface soil samples were collected from three locations between the school and the nearest surface water body. Contaminants were not identified in any of the soil samples above approved cleanup levels.
Wild and Farmed Foods Ingestion	Pathway Incomplete	The site is not in an area that would likely be used for foraging.

Exposure to Ecological Receptors	Pathway Incomplete	There are no known aquatic or terrestrial routes present at this site.
----------------------------------	--------------------	--

**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

Petroleum contamination remains in surface and sub-surface soil above approved cleanup levels; however, ADEC has determined there is no unacceptable risk to human health or the environment as long as the contamination is properly managed in accordance with the following conditions.

1. Any future change in land use may impact the exposure assumptions cited in this document. If land use and/or ownership changes, these management conditions may not be protective and ADEC may require additional remediation and revised conditions. Therefore the Lower Kuskokwim School District (LKSD) shall report to ADEC every 5 years to document land use, or report as soon as the LKSD becomes aware of any change in land ownership and/or use, if earlier. The report can be sent to the local ADEC office or electronically to [DEC.ICUnit@alaska.gov](mailto:DEC.ICUnit@alaska.gov).
2. Soil contamination remains within the footprint of the school. The school is designed to be built on pilings, elevated above the ground surface with a fence from ground surface to the base of the school which will control access beneath the building. These controls must be implemented and maintained. When the building or fence is removed and/or the soil becomes accessible, the soil must be evaluated and contamination addressed in accordance with an ADEC approved work plan.
3. 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. (See attached site figure.)
4. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.
5. Groundwater in the state of Alaska is protected for aquaculture use. In the event that an aquaculture facility uses groundwater from this site in the future, additional treatment may be required to meet aquatic life criteria under 18 AAC 70.

The ADEC Contaminated Sites Database will be updated to reflect the change in site status as detailed above, and will include a description of the contamination remaining at the site. Institutional controls will be removed in the future if documentation can be provided that shows cleanup levels have been met. Management conditions 4-6 remain in effect after ICs are removed.

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 99801, 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 99801, 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.

**Please sign and return *Attachment A* to ADEC within 30 days of receipt of this letter.** If you have questions about this closure decision, please feel free to contact me at [joshua.barsis@alaska.gov](mailto:joshua.barsis@alaska.gov) or (907) 269-7691.

Sincerely,



Joshua Barsis  
Environmental Program Specialist III

Enclosures: Attachment A,  
Attachment B (Site Figure)

Cc: Stephen Witzmann (OASIS/ERM)  
Kipnuk Traditional Council

**Attachment A: Cleanup Complete-ICs Agreement and Signature Page\***

The Lower Kuskokwim School District (LKSD) agrees to the terms and conditions of the Cleanup Complete Determination, as stated in the decision letter for the **Chief Paul Memorial School – Kipnuk** site, dated March 5, 2014. Failure to comply with the terms and conditions of the determination may result in ADEC reopening this site and requiring further remedial action in accordance with 18 AAC 18 AAC 75.380.

\_\_\_\_\_  
Signature of Authorized Representative, Title  
Lower Kuskokwim School District

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Authorized Representative, Title  
Lower Kuskokwim School District

**Note to Responsible Person (RP):**

**After making a copy for your records, please return a signed copy of this form to the ADEC project manager at the address on this correspondence within 30 days of receipt of this letter.**

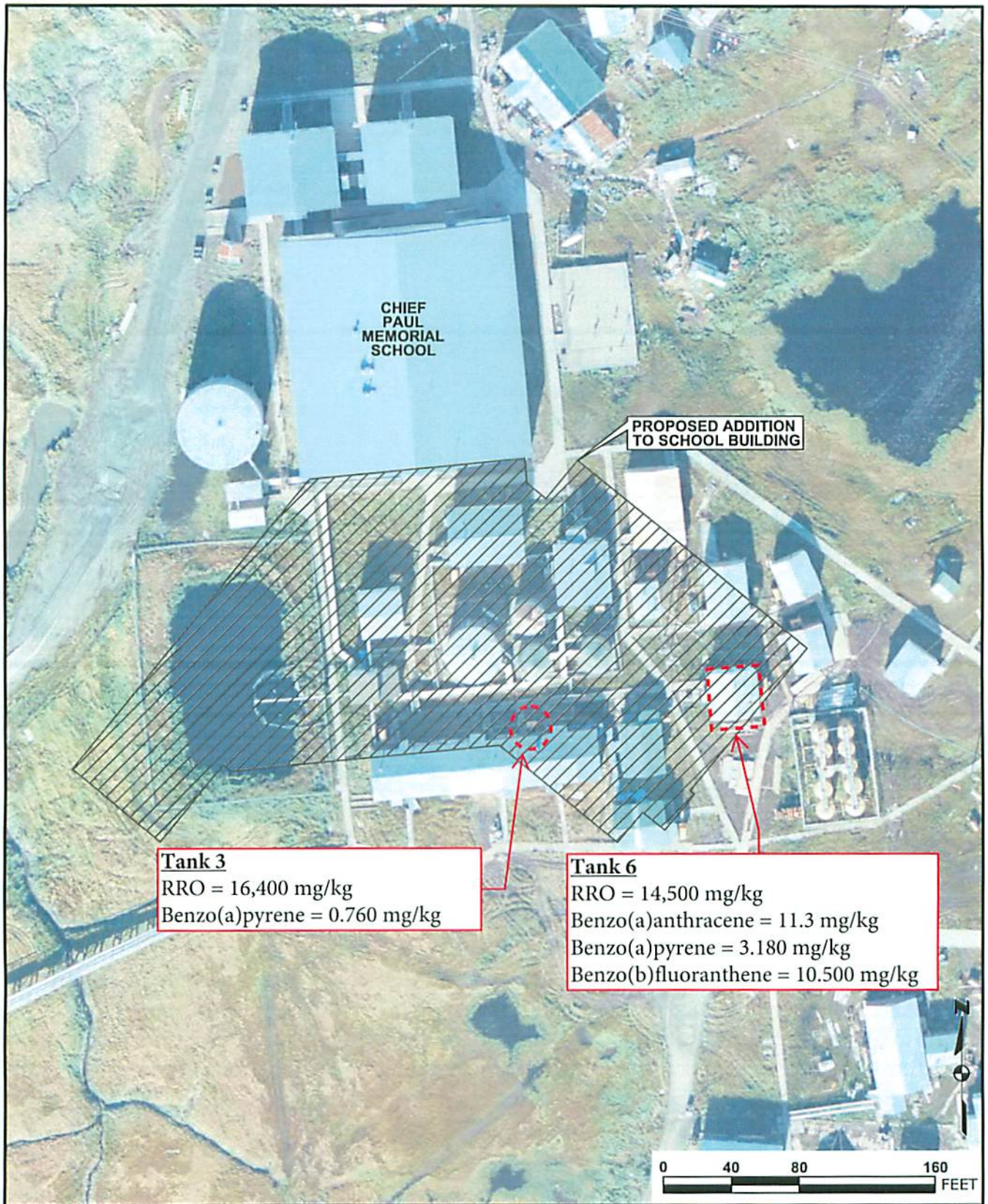
-----  
ADEC File No. 2421.38.003  
Hazard ID: 25609  
ADEC Project Manager: Joshua Barsis

**For Internal Use Only**

**\*Attention ADEC Administration Staff:** Please follow the procedure below after Attachment A is signed/returned to ADEC.

1. Log-in and Date Stamp *Attachment A*
2. Scan and Save to the appropriate electronic folder on the network Drive
3. File the hard copy in the appropriate project/site file Correspondence Folder (blue in Anchorage).
4. Provide the Correspondence folder (with the filed *Attachment A* hard copy) to the ADEC Project Manager





ATTACHMENT B  
AREAS OF REMAINING CONTAMINATION