

**ENVIRONMENTAL ASSESSMENT**  
**Case File No. : AA-081686**  
**AK-040-EA00-011**

**Type of Action:** Building demolition and investigations at the Red Devil Mine.

**Location:** Near Red Devil, Alaska, T. 19 N., R. 44 W., SE 1/4, Section 6, Seward Meridian.

**Applicant:** Bureau of Land Management  
Anchorage Field Office

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**Date:** April 10, 2000

**I. INTRODUCTION**

The Red Devil Mine is located approximately 250 miles west of Anchorage, Alaska, eight miles northwest of Sleetmute, and two miles southeast of the community of Red Devil. The site is bisected by Red Devil Creek, which flows about 0.3 miles north to reach the Kuskokwim River.

The Red Devil mercury mine was operated sporadically from 1933 until 1971. During its operational life approximately 35,000 flasks of mercury were produced. A flask of mercury weighs 76 pounds (~two quarts). The site covers about ten acres and consists of surface mining areas, collapsed adits, incline shafts, tailing piles, settling ponds, five large fuel tanks, drum storage areas; the remains of approximately 18 buildings used for housing, laboratory, mill, steam plant, and chemical storage. Physical hazards at the site such as collapsed adits, vertical shafts, and building ruins will be addressed under the abandoned mine land program.

Site Investigations have been completed by the Alaska Department of Environmental Conservation (ADEC), (Tryck, Nyman & Hayes, 1987), U.S. Environmental Protection Agency (EPA), and BLM between the late 1980's and late 1990's (Weston, Roy F., Inc., 1989; BLM, 1999). In 1999, BLM tasked its contractor to remove hazardous materials from the site. These materials included: mercury contaminated slag, copper sulfate, sodium hydroxide, potassium carbonate, sodium dichromium dihydrate, 55-gallon drums (contents included used oil, fuel, solvent, grease), and lead-acid batteries. Site soil, water, and sediment were sampled and analyzed according to EPA and ADEC guidance.

Results from 1999 samples indicated the water in Red Devil Creek contains up to 366 ug/l of antimony, 116 ug/l of arsenic, and 0.104 ug/l of mercury (HLA/Wilder JV, 1999). Sediments in Red Devil Creek in 1999 were as high as 399 mg/kg mercury, 2,030 mg/kg antimony, and 963 mg/kg arsenic. 1999 soil samples showed mercury up to 35,000 mg/kg, antimony to 1,780 mg/kg, arsenic to 8,740 mg/kg, and lead to 13,500 mg/kg. For more details on past work and investigations see case file number AA-081686.

The final remedial action will address mercury, antimony, and arsenic in tailing piles and soils. These metals are naturally occurring in the area geology. The metals dissolve out of the rocks due to their exposure to water and oxygen. The excavated and crushed rocks that make up the settling ponds and tailings piles likely leach metals as rain water passes through them.

**A. Need for the Proposed Action**

The further investigation and eventual remediation of contaminated soils, sediment, and surface waters at the Red Devil Mine is essential to ensure protection of human health and the environment in the Kuskokwim watershed. ADEC and EPA have requested additional sampling and removal actions such as demolition of the retort building to advance this process. The Proposed Action will help protect the Kuskokwim watershed from future contamination.

**B. Conformance With Land Use Plan**

The lands are within the boundary of the Alaska Southwest Planning Area Management Framework Plan (MFP), dated November 1984. The Proposed Action is covered under the Watershed (W-1.1) Activity Objective of the MFP which states that BLM is to “maintain water quality in accordance with the Alaska Water Quality Standards”.

**C. Relationship to Statutes, Regulations, Policies, Plans, or Other Environmental Analyses**

The Proposed Action is necessary to comply with guidance from EPA and ADEC based on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the Clean Water Act, and associated State of Alaska regulations.

**II. PROPOSED ACTION AND ALTERNATIVES**

**A. Proposed Action**

The Red Devil Mine is near the community of Red Devil, Alaska, at T. 19 N., R. 44 W., SE 1/4, Section 6, Seward Meridian (see attached map). BLM has tasked its Hazardous Materials contractor to develop a detailed formal work plan for the tasks outlined below. The work plan will be sent to ADEC, EPA, Native Corporations, and be made available to the public for comments. BLM will request plan concurrence from the Alaska Department of Natural Resources (ADNR) for this action according to section 906(k) of the Alaska National Interest Lands Conservation Act (ANILCA). The work plan will be implemented by a hazardous material contractor during the 2000 summer field season. Stream crossing will be coordinated with the Alaska Department of Fish and Game (ADF&G), and the U.S. Army Corps. of Engineers as appropriate.

The site will be accessed by flying personnel and equipment by charter aircraft to the Red Devil airstrip. All Terrain Vehicles (ATVs) and/or a pickup truck may be used to drive from the airstrip or local lodge, to the site. Personnel may hire a small boat and operator to access the site from the lodge.

BLM is proposing to demolish the site’s retort building and decontaminate the components with high pressure water. Effluent water will be collected, filtered to drinking water standards, tested, and released on the ground. The uncontaminated building debris will be stored onsite along with the remains and debris of the other 17 buildings. Equipment necessary to demolish the building will likely include a backhoe, a rough terrain scissor lift, and a cutting torch. Out year plans will likely dispose of the debris in an onsite State permitted solid waste landfill.

BLM also proposes to further characterize the soils in the vicinity of the retort building. Sampling and analysis must be completed to determine the horizontal and vertical extent of the contamination. A truck-mounted drilling rig utilizing hollow-stem auger bits will be used to drill the soil borings for sampling. Additional planned activities include an asbestos survey of all site buildings, asbestos removal at the retort building, fuel pipe inspection and cleaning, and the installation of groundwater monitoring wells and a gate at the site entrance.

BLM's contractual Statement of Work for the work plan describes the tasks as follows:

1. Initial site visit - preparatory visit to scope additional field efforts.
2. Asbestos survey for entire site.
3. Asbestos removal on retort building; scope for removal of two feet of Thermal System Insulation (TSI) on upper condensing pipe.
4. Retort building decontamination and demolition; decontaminate by pressure washing contaminated components (condensing pipes and collection troughs); the construction debris will be stored onsite, awaiting future Solid Waste Landfill construction.
5. Fuel pipe inspection and cleaning. This includes the recycling of any recovered fuel in Anchorage.
6. Further site characterization - grid surface and subsurface soil sampling around retort building; vertical sample intervals will be three feet. Samples will be field screened with XRF (x-ray fluorescence spectrometer), (provided by BLM), to determine how deep to drill. Actual horizontal intervals will be determined with input from regulatory agencies and BLM. Use professional knowledge for estimate.
7. Installation of six monitoring wells (three on each site of Red Devil Creek), for groundwater monitoring: sampling, flow direction, and gradient. Wells will only extend through the unconsolidated sediments; drilling will cease at contact with bedrock, if not earlier (based on field screening). If groundwater is not encountered, wells will not be installed.
8. Install a gate at the site entrance (coordinate location and type with BLM).

BLM may also sample and analyze additional site soils, water, and sediment if requested by EPA, and ADEC. Due to a bridge washout on the Red Devil Creek, the eastern portion of the site will be accessed by driving through the Creek via a previously installed crossing. This crossing entails driving through the Creek for about 60 feet, and was approved by ADF&G during the 1999 field work. If ADF&G requires a more direct crossing, BLM contractors may have to bulldoze

tailing piles to gain access. Although the Creek is not classified by ADF&G as anadromous, special consideration and efforts will be made to minimize disturbance of the creek bed and water.

All work areas in this project are on former mine operation areas which have previously disturbed soils and vegetation. Environmental consultants (contractors) will be hired by BLM to plan and implement the removal and sampling operations at the site according to all federal and state environmental and safety regulations. Environmental impacts will be reassessed if future work exceeds the scope of this environmental assessment. Additional, more detailed plan specifications are available in case file AA-081686.

**B. No Action Alternative**

Under the No Action Alternative, the BLM will continue to implement current management practices until another Proposed Action is designed.

**III. AFFECTED ENVIRONMENT**

The Red Devil Mine is located approximately two miles southeast of the community of Red Devil, approximately 0.3 miles south of the Kuskokwim River. The site covers about ten acres. (See the attached map for location. Additional maps are available in case file AA-081686.)

**A. Critical Elements:**

The following critical elements of the environment are either not present or would not be affected by the Proposed Action:

- Areas of Critical Environmental Concern
- Environmental Justice
- Farm Lands, Prime or Unique
- Floodplains
- Invasive, Non-native Species
- Native American Religious Concerns
- Subsistence
- Wild and Scenic Rivers
- Wilderness

**1. Air Quality:**

Ambient air quality at the site was tested with a mercury vapor monitor and photo ionization detector during site investigations in 1988 and 1999. Results indicated mercury and Volatile Organic Compounds were within permissible exposure levels. Surface soil mercury concentrations exceed EPA and ADEC standards for inhalation hazards for long-term exposures.

**2. Cultural Resources:**

Aboriginal inhabitants of this area were the Kuskokwim River Ingalik (VanStone and Goddard, 1981). Traditionally, habitation sites were located along rivers or major streams. While areas such as the Red Devil Mine may have been used by the aboriginal inhabitants in the past, there is little potential for any archaeological remains to have survived the mining activity conducted here in the twentieth century. Mercury was discovered at this site in 1933. Mining began in 1939 and continued under several operators until 1972 with a short hiatus during World War II (Oswalt, 1980). In spite of the relatively recent activity at this mine, none of the structures remain intact. Structures have succumbed to the ravages of weather and human scavenging for building materials. None of the structures appear to have retained sufficient integrity to be eligible to the National Register of Historic Places. Therefore, no further consultation is necessary under Section 106 of the National Historic Preservation Act.

**3. Threatened and Endangered Species:**

The threatened and endangered species clearance dated March 29, 2000, is located in case file AA-081686.

**4. Wastes, Hazardous or Solid:**

The only potential hazardous waste planned to be removed under the Proposed Action is a small quantity of asbestos TSI (less than two linear feet are suspected to be present). Tailings and soils that will be sampled are known to contain mercury, arsenic, and antimony, and have previously passed tests to classify the soils as solid waste. Environmentally safe sampling procedures based on EPA and ADEC guidance will be used.

**5. Water Quality, Surface and Ground:**

Surface and ground water at the site are not used for drinking water purposes. Surface water samples on site and up and down stream have shown elevated levels of metals. The local geology that made the area a viable mining district also causes detectible quantities of metals to be present in surface waters. Water sampled in the Red Devil Creek exceeded EPA drinking water standards for mercury. Water sampled in the Kuskokwim River near the site met EPA drinking water standards for metals analyzed. Surface waters of this region support the local fishing industry and subsistence use. Water quality data are located in case file AA-081686.

**6. Wetlands/Riparian Zones**

The Red Devil Creek flows through the site and to the Kuskokwim River. The banks of these water bodies are riparian zones and may be considered wetlands. However, the portion of Red Devil Creek that flows through the site has been altered due to former mining activities. The creek channel is through tailings piles and is littered with empty 55-gallon drums, wooden timbers, and pipe. The creek's discharge varies seasonally, but was measured at 1.16 ft<sup>3</sup>/sec (BLM, unpublished data, 1999). Observations in July 1998 and 1999 showed the creek's water filled a channel about four to six feet wide and up to six inches deep. The Red Devil Creek is not listed as an anadromous stream by the ADF&G, therefore it may not fall under Alaska Title 16 requirements for a permit from ADF&G. No marshes or similar wetlands have been observed. The topography is steep and well drained. A site specific wetlands survey has not been done for the site.

**B. Lands**

The lands are encumbered by Village Selection F-14936-A (excluded mining claims) and F-14936-A2 (selected all unpatented lands not selected by F-14936-A), (Kuskokwim Corporation), Regional Selection AA-70149, (Calista Corporation) and State Selection AA-74575. There are no easement concerns.

**IV. ENVIRONMENTAL CONSEQUENCES**

**A. Impacts of the Proposed Action:**

There are no impacts expected from the Proposed Action.

**1. Subsistence Uses Under Section 810 of ANILCA:**

At this time, the Proposed Action will not significantly restrict subsistence uses, decrease the abundance of subsistence resources, alter the distribution of subsistence resources, or limit subsistence user access from currently existing conditions on federal public lands in Alaska.

**2. Threatened and Endangered Species:**

The impact of the Proposed Action on threatened and endangered species has been evaluated in accordance with the Threatened and Endangered Species Act. Based on the evaluation, the Proposed Action would not affect threatened and endangered plants, animals, or their habitat.

**B. Impacts of the No Action Alternative:**

Under the No Action Alternative, current management practices would involve continued residence of the retort building and its associated contamination at the site. This will lead to the continued contamination of nearby soils and surface waters and may allow contaminants to migrate off-site.

**1. Critical Elements:**

The following critical elements of the environment are either not present or would not be affected by the No Action Alternative:

- Areas of Critical Environmental Concern
- Cultural Resources
- Environmental Justice
- Farm Lands (Prime or Unique)
- Floodplains
- Invasive, Nonnative Species
- Native American Religious Concerns
- Threatened and Endangered Species
- Wild and Scenic Rivers
- Wilderness

**a. Air Quality:**

Metals in site soils could enter the air by vaporization or as particulates during disturbance. People trespassing on the site could be exposed to site contaminants by inhalation. Digging, walking, or operating heavy equipment could disturb the soil. Suspect friable asbestos on the retort building may be an inhalation hazard to site visitors.

**b. Subsistence:**

Under the No Action Alternative animals that live on the site or regularly visit the site may consume and be exposed to site contaminants. Metals from the site could accumulate in the animals and be passed on to humans who hunt and consume them. Mercury bioaccumulates in fish and in humans through the consumption of fish.

**c. Wastes, Hazardous or Solid:**

Under the No Action Alternative, hazardous and solid materials/wastes would remain on site in violation of federal and State regulations. These wastes may impact the site ecology as well as humans in the area.

**d. Water Quality, Surface/Ground:**

Water quality, surface or ground, is likely to be impacted by the No Action Alternative. The geology of the region and the associated mining activities both led to the increase of metals in surface waters. Water leaving the site is not used as a drinking water source. In the event individuals used the water from the Kuskokwim River near the site, previous testing has shown that

contaminants from this site have not exceeded EPA Drinking Water Standards in the Kuskokwim River.

**e. Wetlands/Riparian Zones:**

The No Action Alternative will allow the contaminants to remain in or near the riparian zone. These contaminants may be harmful to the ecological environment.

**C. Residual and Cumulative Impacts:**

No residual or cumulative impacts are expected by implementation of the Proposed Action. Future plans involve sampling of soils, water, and stream sediments around the mine. Future sampling will have no impact on surface water quality, vegetative cover, soils, or organisms inhabiting the area. The No Action alternative could have residual and cumulative impacts.

**D. Mitigation Measures:**

The Proposed Action includes mitigating measures as part of the action. These measures are found in state and federal regulations which dictate specific procedures to safely handle hazardous materials and work in contaminated environments. No additional mitigating measures are necessary to ensure this action does not impact the environment.

**V. CONSULTATION AND COORDINATION**

**A. Persons and Agencies Consulted:**

The following persons and agencies, along with the general public, have been and will continue to be consulted regarding investigation and cleanup activities at this site:

US EPA Region X  
Mark Ader, Federal Facilities Coordinator  
Nick Ceto, Regional Mining Coordinator  
Matt Carr, On Scene Coordinator, Anchorage Office

ADEC, Contaminated Sites Program  
Eileen Olson

BLM Alaska State Office  
Wayne Svejnoha, Statewide Hazmat Coordinator

Kuskokwim Corp.  
Mike Harper

Calista Corp.  
June Macaty

Alaska Inter-Tribal Council  
Debra Vo, Executive Director

Harding Lawson Associates  
Bryan Lund

Wilder Construction  
Mark Erickson

**B. List of Preparers:**

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**References**

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HLA/Wilder JV, 2000, Engineering evaluation/cost analysis, Red Devil Mine, Red Devil, Alaska: Bureau of Land Management, Anchorage Field Office, variously paged.

Oswalt, Wendell H., 1980, Historic Settlements along the Kuskokwim River, Alaska: Alaska State Library Historical Monograph No. 7, Juneau.

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VanStone, James W. and Ives Goddard, 1981, Territorial groups of West-central Alaska before 1898, *in* Handbook of North American Indians Volume 6: Subarctic (edited by June Helm), Smithsonian Institution, Washington. pp 556-561.

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