Red Devil Mine Waste Ponds, Bethel

Prelminary Assessment

ADEC 9/25/84

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

Site Name: Red Devil Mine Waste Ponds Date: 9/25/84
EPA ID # AK-D980495618
Location: Kuskokwim River
City: Bethel State: Alaska

Site Description and History:

Red Devil Mine is a hard rock underground mercury mine located 8 miles downstream from Sleetmute on the Kuskokwim River in western Alaska. The mine was discovered in 1933 by Hans Halverson and operated periodically until the spring of 1971. During the last few years of operation, ore (cinnabar) (crystaline mercuric sulfide, HgS), was concentrated and shipped to Japan for processing. Before that time, recovery was on-site and involved crushing, heating, and condensing. Over 26,000 76-lb flasks of mercury were produced and a similar amount is estimated to still be in place (unmined) underground. In 1943, New Idria - Alaska Quicksilver Mining Company installed furnacing and retort equipment (Hazardous Waste Site Survey - Red Devil Mine - U.S. EPA Alaska Operations Office, Anchorage, AK, July 31, 1979).

Physical Setting:

The mine and mill are located near the mouth of Red Devil Creek, a small tributary of the Kuskokwim River. The site is located on a gradual slope that descends northeast to the Kuskokwim River.

Three tailing ponds (see site sketch) are located near the southeast side of Red Devil Creek, approximately 600 ft upstream from the Kuskokwim. The mine portal and headworks are located across the creek and the mill is southwest of the tailing ponds.

Waste Summary:

Mercury--

On July 31, 1979, (Hazardous Waste Site Survey - Red Devil Mine - U.S. EPA, Alaska Operations Office, Anchorage, AK, July 31, 1979) five sites were sampled at the Red Devil Mine and analyzed for elemental mercury. Sample locations are referenced on the site sketch.

All samples were water samples except #31011 which was old sandy solids obtained from the bottom of dried-up settling pond Number 1.

The analytical results are as follows:

Sample 31010	Red Devil Creek above mine and mill	0.21 ug/l
31011	Solids from bottom of settling pond #1	216 ug/gm wet wt. = ppm
31012	Red Devil Creek below third pond	0.14 ug/l
31013	50 ft above Red Devil Creek in Kuskokwim River	0.28 ug/l
31014	Red Devil Creek at mouth	0.14 ug/l
31015	100 ft downstream from Red Devil Creek in the Kuskokwim River	0.14 ug/l

Mercury concentrations in all water samples were below the natural background levels obtained May 25, 1971 (Sceva and Provant).

#1, the results are not indicative of the soil column and cannot be used to rule out the potential for subsurface contamination.

Data Gaps:

The following information is necessary to further assess the Red Devil Mine site:

- Soil and groundwater sampling for mercury at locations near the mill, beneath the tailing ponds, and near the mine portal

- Sampling data for stream and river sediments to indicate presence or absence of elemental mercury and organic compounds of mercury (mono- or dimethylmercury).

Recommendations:

The Red Devil Mine is a remote site and therefore little potential exists for impact on adjacent human populations. The primary concern is undetected entry of mercury into the adjacent surface and groundwater systems.

Although some "grab" samples were obtained in 1979, they are inconclusive regarding soil, groundwater, or aquatic sediment conditions. Of particular concern is the potential for production of soluble organic mercury compounds by anaerobic bacteria and subsequent introduction of mercury into the food chain. It is therefore recommended that a sampling program be devised and executed to better characterize the mercury and arsenic loads and transport at the Red Devil Mine.

P/ ENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

State/Site
AK-D980495618

II. SITE NAME AND LOCATION

SITE NAME	STREET ROUTE NO.
Red Devil Mine	Kuskokwim River

CITY	STATE	ZIP CODE	COUNTY	CODE	CONG
Bethel	AK	99502	Bethel	050	00

COORDINATES	LATITUDE	LONGITUDE
	61 10 12.0	149 56 48.0

DIRECTIONS TO SITE
Fly from Bethel toward McKinley Park. Site is on the Kuskokwim River (4,500 ft. airstrip).

III. RESPONSIBLE PARTIES

OWNER	STREET
Alaska Mines and Minerals, Inc.	P.O. Box 422

CITY	STATE	ZIP CODE	TELEPHONE NUMBER
Anchorage	AK		( ) -

OPERATOR	STREET

CITY	STATE	ZIP CODE	TELEPHONE NUMBER
			( ) -

TYPE OF OWNERSHIP:
X PRIVATE FEDERAL STATE COUNTY
MUNICIPAL OTHER UNKNOWN

OWNER OPERATOR NOTIFICATION ON FILE
RCRA3001 DATE: / / CERCLA103C DATE: / / X NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

ON SITE INSPECTION BY EPA
X YES DATE: 07/31/79
NO

SITE STATUS
___ACTIVE X INACTIVE ___UNKNOWN

YEARS OF OPERATION
FROM: 1933 TO: 1971

DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN OR ALLEGED
mercury
arsenic

DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Mercury and arsenic contamination of aquatic sediments, soils, and groundwater. No immediate hazard to human population.

V. PRIORITY ASSESSMENT

PRIORITY FOR INSPECTION
___HIGH ___MEDIUM X LOW ___NONE

VI. INFORMATION AVAILABLE FROM

CONTACT	AGENCY	TELEPHONE NUMBER
Glenn Miller	Alaska Dept. of Environ. Conservation	(907) 465-2666
PERSON RESPONS. FOR ASSESSMENT	**ORGANIZATION**	**TELEPHONE NUMBER**
Warren G. Hansen	Tetra Tech, Inc.	(206) 455-3838
		DATE 09/25/84

POTENTIAL HAZARDOUS WASTE S.I.
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

State/Site
AK-D980495618

II. WASTE STATES, QUANTITIES AND CHARACTERISTICS

PHYSICAL STATES		WASTE QUANTITY AT SITE	WASTE CHARACTERISTICS	
X SOLID	SLURRY	TONS unknown	X TOXIC	SOLUBLE
			CORROSIVE	INFECTIOUS
X POWDER	LIQUID	CUBIC YARDS	RADIOACTIVE	FLAMMABLE
			X PERSISTENT	IGNITABLE
SLUDGE	GAS	NO OF DRUMS	HIGHLY VOLATILE	EXPLOSIVE
			REACTIVE	NOT APPLIC
OTHER			INCOMPATIBLE	

III. WASTE TYPE

	SUBSTANCE NAME	GROSS AMT.	UNITS	COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEM.			
IOC	INORGANIC CHEMICALS	unknown	lbs	alleged mercury & arsenic
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown	lbs	alleged mercury & arsenic

IV. HAZARDOUS SUBSTANCES

	SUBSTANCE NAME	CAS #	STORAGE DISPOSAL	CONC.	UNITS
	mercury	7439-97-6	NA	unknown	
	arsenic	7440-38-2	NA	unknown	

V. FEEDSTOCKS

	FEEDSTOCK NAME	CAS #		
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VI. SOURCES OF INFORMATION

U.S. EPA Region X - site files
Phone conversation with Mr. Jeff Mach - ADEC - Fairbanks Regional Office, (8/24/84)

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT

State/Site
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PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

VII. HAZARDOUS CONDITIONS AND INCIDENTS

X GROUNDWATER CONTAMINATION OBSERVED DATE: / / X POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

Mercury and/or arsenic may be endangering groundwater.

SURFACE WATER CONTAMINATION X OBSERVED DATE: / / POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

EPA site file - letter of October 20, 1971, from Director of EPA's Alaska operations office cites sampling data showing "very high" levels of arsenic.

CONTAMINATION OF AIR OBSERVED DATE: / / POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

NA

FIRE/EXPLOSIVE CONDITIONS OBSERVED DATE: / / POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

NA

DIRECT CONTACT OBSERVED DATE: / / POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

NA

CONTAMINATION OF SOIL OBSERVED DATE: / / POTENTIAL
AREA POTENTIALLY AFFECTED: (acres) X ALLEGED

Existence of mercury mining and refining operations suggests potential for soil contamination near mill, mine portal, and tailing ponds.

DRINKING WATER CONTAMINATION OBSERVED DATE: / / POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

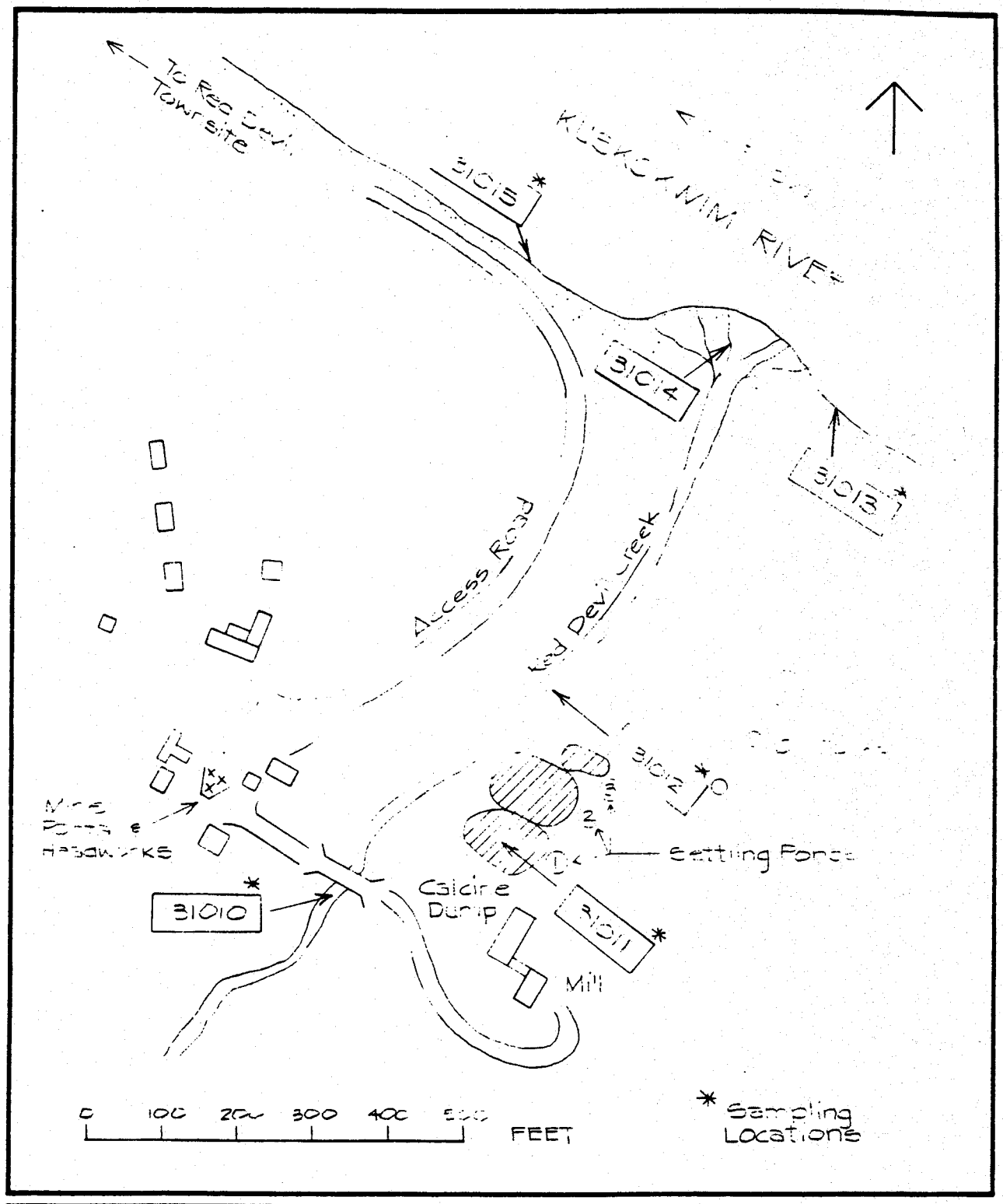
Unknown.

WORKER EXPOSURE/INJURY OBSERVED DATE: / / POTENTIAL
WORKERS POTENTIALLY AFFECTED: ALLEGED

NA - inactive site.

POPULATION EXPOSURE/INJURY OBSERVED DATE: / / POTENTIAL
POPULATION POTENTIALLY AFFECTED: ALLEGED

Minimal - extremely rural site. Small exposure risk only to occasional visitor.



Site Map - Red Devil Mine