

STATE OF ALASKA

SARAH PALIN, GOVERNOR

**DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM**

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February 22, 2008

Mr. Gary Reimer, District Manager
Bureau of Land Management
Anchorage District Office
6881 Elmore Road
Anchorage, AK 99507

Re: Red Devil Mine; Red Devil, Alaska

Dear Mr. Reimer:

Representatives from the Alaska Department of Environmental Conservation (DEC) and the Environmental Protection Agency (EPA) met with David Howell, Wayne Svejnoha and Larry Beck of the Bureau of Land Management (BLM) on January 31, 2008 to discuss contamination present at the Red Devil Mine.

The EPA has recently completed a revised scoring of the site using the Hazard Ranking System and has determined that the site is eligible for inclusion on the National Priorities List (NPL). However, the EPA has agreed that in lieu of including the site on the NPL, the State and BLM have the option of signing a two-party agreement which outlines the mutually agreed upon future actions at the site along with a schedule for completion. A general template of such a two-party agreement was made available to the BLM representatives for consideration at the aforementioned meeting.

During the January 31, 2008 meeting, BLM requested that DEC provide a list of data gaps which it identified as remaining at the site. DEC staff have reviewed the site file documents and have screened potential areas of concern against federal and state cleanup and screening levels for various media in order to determine if contamination is present; specifically 18 Alaska Administrative Code (AAC) 75 for soil and groundwater, 18 AAC 70 (Alaska Water Quality Standards) for surface water, and the National Oceanic and Atmospheric Administration sediment values for sediment. DEC realizes that less stringent screening values may be appropriate based upon naturally-occurring background concentrations of metals, however, that information is not currently available. The attached list provides the data gaps resulting from this file review and screening analysis.

DEC requests that once BLM has had the opportunity to review the attached list of data gaps that BLM contact both DEC and EPA in order to set up a meeting to discuss the list. DEC envisions that at this meeting, each data gap would be evaluated and a decision made as whether or not to address it and, if it is to be addressed, a strategy to fulfill the data gap would be agreed on by all parties. DEC also requests that BLM bring aerial photos of the site and other materials that would assist in these discussions, as well as a list of any additional data gaps that BLM staff members identify. We would like for this meeting to occur in March or early April, before the start of the busy field season.

If you have any questions about this site, please do not hesitate to contact me at 269-7553 or Anne Marie Palmieri, of my staff, at 766-3184.

Sincerely,



Jennifer Roberts
Federal Facilities Section Manager

cc: Larry Beck, BLM (via electronic mail)
Ken Marcy, EPA (via electronic mail)

Attachment: "BLM Red Devil Mine Data Gaps"

BLM Red Devil Mine Data Gaps

Area-Wide

Kuskokwim River

Are there any impacts to Kuskokwim River from the site?

- Need upgradient and downgradient sediment and surface water samples for mercury, arsenic, antimony, and methylmercury.
- Identification of ecological receptors.

Red Devil Creek

What are the impacts to Red Devil Creek?

- Mapping locations and depths of tailings in Red Devil Creek (*Site Investigation*, 1989)
- What is the location of the 35' high tailings pile next to the creek (*Site Investigation*, 1989); are the tailings still present?
- Have the creek tailings been affected by the Kuskokwim River floods of 1971, 1987, or 1991; highest flood stage was 212' in 1971 and lowest elevation of the mine is 279' (*Retort Building Demo*, 2001) which does not include migration of tailings downstream.
- Sediment and surface water samples along creek, mercury, arsenic, antimony, and methylmercury.
- Identification of any ecological receptors.

Groundwater

- Need to determine background concentrations of metals in groundwater.
- Current well locations do not show the extent of contamination (metals).
- Petroleum may exist in the groundwater in the AST area; current well locations are not ideal for determining if contamination is present..
- Need to evaluate how long it will take for groundwater to naturally attenuate.
- Current wells are installed in highly mineralized areas or tailings (MW04 screened at 30' bgs in tailings per boring log, *Retort Building Demo*, 2001) – is contamination due to area-wide groundwater contamination or localized contamination from well locations?

Background Soil Determination

- A statistical background determination, in accordance with EPA guidance, needs to be conducted. Previous background samples have been single sample locations.

Conceptual Site Models/Risk Assessment

- How is site used currently?
- What types of subsistence resources are used – aquatic/terrestrial animals, wildfoods.
- What ecological receptors are present?
- What is the most likely future use of the property?
- What types of institutional controls have been or could be placed on the property?
- How bioavailable are the metals in the naturally-occurring soils and in the tailings?
- Develop both human health and ecological CSMs.
- Streamlined Risk Assessment conducted without DEC oversight or report approval and did not follow DEC guidance. Calculations are based on previous data which may or

may not be appropriate. The Risk Assessment needs to be redone with updated data and DEC risk assessor involvement.

Adits/Shafts

Five shafts and one adit backfilled (*Retort Building Demo*, 2001). 1971 EPA inspection noted water found to be flowing from the mine entrance (*Site Investigation*, 1987); is any water flowing out of the former mine adits, shafts, or entrances? If so, what are the contaminant concentrations in the water and where is it flowing?

East Side of Red Devil Creek

Retort Building

Free-phase mercury present on western side of building (*Retort Bldg Demo*, 2001)

- Is it migrating?
- Needs to be addressed/recovered.

Monofill placed on concrete foundation (*Debris Consolidation and Disposal Report*, 2003).

- What are the concentrations of metals below the concrete?
- Former sump present on southwestern side of the concrete foundation; is contamination present?
- Building debris pressure washed on retort foundation and IDW water with elevated metals discharged on retort foundation migrating through cracks to the soil (*Retort Building Demo*, 2001).

Elevated arsenic and mercury on western side of building, including ~390 cubic yards of arsenic and mercury characteristic hazardous waste. (*Source Area Removal*, 2001)

- Samples were collected prior to development of monofill; what are current concentrations at surface and at depth?
- Arsenic TCLP results greater than 5.0 mg/L in 14 locations – were these all covered by the liner and monofill?
- Area has been covered with rock fill; need to sample the original surface.
- Former sump present on southwestern side of the concrete foundation; is contamination present?
- Building debris pressure washed on retort foundation and IDW water with elevated metals discharged on retort foundation migrating through cracks to the soil (*Retort Building Demo*, 2001).
- What are the antimony concentrations here?

Retort Exhaust Port - area of highest mercury concentrations (*Limited Waste Removal Action Report*, 1999);

- Some mercury ash removed – was the area addressed additionally or simply covered with the monofill? No samples were collected after the ash was removed.

East and West Chemical Sheds:

- Elevated antimony, chromium, and mercury found to be present (*Limited Waste Removal Action Report*, 1999).
- Visible (free-phase) mercury was present at the East Shed (*Retort Building Demo*, 2001)
- Were soils placed into the monofill or was the monofill simply placed on top of this area?
- Drum storage area noted on northern side of building (*Limited Waste Removal Action Report*, 1999); no samples were collected in this area.

Hazardous Waste – Monofill 2 (*Debris Consolidation and Disposal Report*, 2003)

- Is contamination migrating out of the monofill?
- What type of sampling strategies will show if contamination is migrating?
- What is the proposed lifespan for the monofill?
- 3223 cy of tailings placed in monofill treated only with arsenic encapsulant; tailings need to be sampled for mercury TCLP.
- No QA/QC samples were collected from material treated with Ecobond to ensure that it was applied correctly in the field; tailings inside and outside of liner need to be sampled for arsenic TCLP. Samples need to be collected for QA/QC purposes.
- Retort bricks: Ecobond not applied consistently with lab study (study required crushing to 3/8"); need to be sampled for mercury and arsenic TCLP. Bricks not originally sampled for total mercury (*Retort Building Demo*, 2001).
- RCRA requires that soil containing mercury concentrations greater than 260 mg/kg be re-retorted prior to landfilling; this was not done.
- Retort slag was not sampled; needs to be sampled for total metals and TCLP (*Retort Building Demo*, 2001). Slag was treated with mercury and arsenic Ecobond, but no QA/QC samples were collected (*Debris Consolidation and Disposal Report*, 2003).

Non-Hazardous Waste – Monofill 1 (*Debris Consolidation and Disposal Report*, 2003)

- Tailings from west side of Red Devil Creek used as void filler and cover; no encapsulant treatment on tailings; need to sample the tailings.
- Monofill placed on former laboratory pad area; what were the concentrations of metals below the monofill? How deep are the tailings in this area?
- Five buildings (total 725cy debris) were sampled and found to contain TCLP lead > 5 mg/L. Subsequent samples show results below 5 mg/L. Debris placed in monofill without any treatment. Is lead leaching from the monofill?
- Hundreds of suspected 'unused' bricks placed in monofill without treatment; bricks sampled with one composite where mercury = 1.7 mg/kg (*Site Investigation*, 1989). Was one sample representative? Are the bricks leaching mercury?

Drum Storage Area

- Elevated mercury present (*Limited Waste Removal Action Report*, 1999); is there still contamination present? If not, where did the soil go?
- DRO and RRO were not included in the analytes.

Gravel Pad

- Elevated mercury, lead, arsenic, and antimony present (*Limited Waste Removal Action Report*, 1999); is there still contamination present? Delineate lateral and vertical extents.
- Area used as work area in 2002 and mercury Ecobond applied to surface (*Debris Consolidation and Disposal Report*, 2003); no QA/QC samples collected to see if the Ecobond was applied correctly in the field.
- Some heat tracing with a bulk lead covering was stored here (*Addendum to the EE/CA*); where did that go?

Tailings (post 1955 retort area)

- Elevated mercury, arsenic, copper, nickel, and antimony present exceeding cleanup levels (*Limited Waste Removal Action Report*, 1999). What concentrations are now on the surface and subsurface?
- Tailings need to be mapped in location and depth around the site.

- It is unknown what tailings remain at the tailings borrow area location after some were placed in the monofill from (*Debris Consolidation and Disposal Report*, 2003); what are the concentrations of metals in these tailings?
- Previous estimate of on-site tailings is 51,600 cubic yards (*Site Investigation*, 1989), is this a valid estimate?

Settling Ponds

- Elevated mercury, arsenic, chromium, and antimony present (*Limited Waste Removal Action Report*, 1999). What concentrations are now on the surface and subsurface and what is the depth of the contamination?
- Extent of downgradient contamination not determined (*Limited Waste Removal Action Report*, 1999).
- Have ponds been filled in or soils removed?
- Drums were noted to be present northeast of the ponds (*Site Investigation*, 1989); was this area investigated?
- Materials for the flotation unit came down a “chute” into the settling ponds – what are the contaminant concentrations along the chute pathway? What material was the chute made of (i.e. wood, metal, dirt)? Where is it now? (*Site Investigation*, 1987)
- Lead acetate was used in the tanks which discharged to the ponds (*Site Investigation*, 1987); was this investigated?

West Side of Red Devil Creek

Shop Pad

- Elevated arsenic, mercury, antimony present (*Limited Waste Removal Action Report*, 1999); is there still contamination present? If not, where did the soil go?
- Drum area not evaluated.
- Samples were not collected on three sides of the pad; there was contamination on one side which was sampled.

Shop Building

- This area was discussed in *Limited Waste Removal Action Report*, 1999, however not evaluated with collection of samples.
- Batteries noted to be stored on west side, but no samples collected in this area.

Shop Building, Pad A

- Elevated lead was found to be present at the whole and broken battery storage area (*Limited Waste Removal Action Report*, 1999); is there still contamination present? If not, where did the soil go? Contamination needs to be delineated vertically and laterally and sampled for lead and other metals and TCLP.

Shop Building, Pad B

- No samples collected, (*Limited Waste Removal Action Report*, 1999); were there any fuel tanks used or materials stored here which would give a reason to believe that there might be contamination present?

Steam Plant

- Drums noted to be present, but no samples collected (*Site Investigation*, 1989)

- No samples collected, (*Limited Waste Removal Action Report*, 1999); were there any fuel tanks used or materials stored here which would give a reason to believe that there might be contamination present?

Housing Complex

- Houses were painted with lead-based paint, however no lead samples were collected from soil.
- Did each building have it's own fuel tank? No samples were collected for DRO/RRO.

Tailings

- Need to map locations and depths of tailings.
- Surface and subsurface samples need to be collected.
- Pre-1955 Facility has been buried; were tailings used to bury the old buildings or was it waste rock or soil from some other location?

Pre-1955 Facility (*Historic Source Area Investigation*, 2005)

Rotary Furnace

- 13 samples were collected with elevated mercury and arsenic found; additional samples are needed to determine extent of contamination. Sample analyzed for mercury, arsenic, and mercury speciation only; antimony needs to be included in list of analytes and TCLP as well.

Calcine (Burned Ore) Dump

- Located northwest of retort area; no samples were collected (*Site Investigation*, 1987).
- No burned ore was visibly identified, but sample showed elevated mercury concentrations; additional samples are needed to determine extent of contamination. Sample analyzed for mercury, arsenic, and mercury speciation only; antimony needs to be included in list of analytes and TCLP as well.

Pre-1955 Retort Building

- Individual firebricks were found and should be sampled for metals and TCLP.
- Burned rock/ore stockpile – 1 sample collected showing elevated concentrations of mercury and arsenic. Additional samples are needed to determine lateral and vertical extent of contamination. Sample analyzed for mercury, arsenic, and mercury speciation only; antimony needs to be included in list of analytes and TCLP as well.
- 10 samples were collected with elevated mercury and arsenic found; additional samples are needed to determine extent of contamination. Sample analyzed for mercury, arsenic, and mercury speciation only; antimony needs to be included in list of analytes and TCLP as well.

Rotary Furnace Stack

- In the Post-1955 area, the highest mercury and arsenic concentrations were found at the rotary furnace exhaust port. Is the exhaust port similar to the furnace stack?
- 1 sample was collected with elevated arsenic present, additional samples needed to define the lateral and vertical extent of contamination. Need to confirm location.