

Abstract
Red Devil Mine Remedial Investigation
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BLM is performing a remedial investigation at the Red Devil Mine (RDM) site according to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The RDM site (the Site) is an abandoned mercury mine and ore processing site on the middle section of the Kuskokwim River, approximately 250 air miles west of Anchorage.

Historical mining activities included underground and surface mining. Some of the RDM ore is exceptionally high grade and contained as much as 30% mercury, but most of the ore contained between 2% and 5% mercury. Primary ore minerals are cinnabar (mercury sulfide [HgS]), with abundant stibnite (antimony sulfide [Sb₂S₃]); some realgar (arsenic sulfide [As₄S₄]), orpiment (arsenic sulfide [As₂S₃]), secondary antimony minerals and minor amounts of iron minerals, in a quartz, carbonate, and clay gangue. Ore was processed onsite by crushing, retorting/furnacing, milling, and flotation. Tailings left over from processing are the primary focus of the remedial investigation.

The objectives of the RI/FS are to:

- Characterize the nature and extent of environmental contamination on the site
- Assess the magnitude of potential human health and ecological risks from site-related contaminants
- Evaluate potential remedial alternatives to reduce or eliminate human
- health and ecological risks posed by site contamination

Preliminary data collected in September 2010 demonstrate that tailings contain high concentrations of mercury, arsenic and antimony. Samples collected from Red Devil Creek, near the tailings piles and sediment samples collected from the Kuskokwim River display elevated concentrations of these same metals. Geophysical data collected in August 2010 suggest possible hydraulic connection between subsurface mine workings and Red Devil Creek. The final phase of data collection is scheduled for late summer 2011. Additional surface and subsurface samples will be collected along with flow monitoring in Red Devil Creek to provide the basis for evaluating metals transport in support of a human health and ecological risk assessment. Investigation results will also be used to evaluate the feasibility of multiple cleanup alternatives.

In addition to the remedial investigation, the BLM is conducting a study of metals concentrations in resident fish (primarily pike and lush) along the middle section of the Kuskokwim River and 8 tributaries in the vicinity of the Red Devil Mine. The fish tissue study will assess background metals levels in sediment and surface water, and evaluate bioaccumulation of mercury and methylmercury through multiple trophic levels in the river ecosystem.

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