

## **FACT SHEET ACID MINE DRAINAGE**

### **The Problem**

The formation of acid mine drainage and the contaminants associated with it have been described as the largest environmental problem facing the U.S. mining industry.<sup>1</sup> Acid mine drainage occurs when sulfide minerals in the waste rock react with air and water to form sulfuric acid. This acid leaches out metals in the rock, which can enter nearby streams, rivers or seep into groundwater.

Acid mine drainage and metal leaching are a particular concern because they can continue indefinitely, causing environmental damage long after the mine operation has ended.<sup>2</sup> Acid mine drainage still occurs from hard-rock mines in Europe that were worked by ancient Romans prior to A.D. 476.<sup>3</sup> Due to the severity of water quality impacts from acid mine drainage, many hardrock mines across the west require water treatment in perpetuity.

In the western U.S., the U.S. Forest Service estimates that between 20,000 and 50,000 mines are currently generating acid on Forest Service lands, and that drainage from these mines is impacting between 8,000 and 16,000 kilometers of streams.<sup>4</sup> In addition to the acid contribution to surface waters, acid mine drainage can cause metals such as arsenic, cadmium, copper, silver, and zinc to leach from mine wastes.

In Alaska, the Red Dog mine in northwest Arctic near Kivalina, and the Greens Creek mine on Admiralty Island near Juneau, are both mines that are already generating acid from pit walls, tailings, waste dumps, roads and pads. To protect aquatic and human health, mine operators will have to employ complex technology to contain the acid drainage and leaching heavy metals. Even with these measures, water-treatment for decades, even hundreds of years, may be required.

### **Environmental and Human Impacts**

If mining waste is acid-generating, the impacts to fish, animals and plants can be severe. The most immediate and serious impacts of acid mine drainage are on natural waterways. High levels of dissolved metals may kill off all of the resident fish and aquatic life. Migratory creatures not resident to mining sites are also affected. The death of migratory birds has been documented at mine sites where contaminated water filled abandoned pits or accumulated in tailings ponds.

Left unremedied, acid mine drainage can leave streams and rivers and areas downstream biological dead zones for decades, if not centuries. Metals contamination can also weave itself into the food chain causing serious physical stress to plants and animals, impacting biodiversity and food sources used for human subsistence.

## **Fiscal Impacts**

The fiscal impacts of mitigating the damage caused by acid mine drainage can be enormous. Several large-scale environmental and taxpayer disasters have been caused by bankrupt mining companies. For example, at the Summitville Mine, located on state lands in Colorado, the mining company walked away and taxpayers are paying \$120-150 million to clean the site.<sup>5</sup> At the Zortman Landusky Mine in Montana, Pegasus Gold Corp. declared bankruptcy in 1998, leaving the state of Montana with reclamation and water treatment costs of \$33 million.<sup>6</sup> In South Dakota, Dakota Mining Co. abandoned the Brohm mine in 1998, leaving South Dakota with \$40 million in reclamation costs – largely due to acid mine drainage.<sup>7</sup> The site has recently been declared a federal Superfund site.

Alaska is one of several states with weak reclamation bonding standards which do not adequately address the specter of acid mine drainage at mining sites around the state. State law should be amended to insure that reclamation bonds cover the full cost of reclamation to protect Alaskans and their natural resources.

## **Sources:**

<sup>1</sup>USDA Forest Service 1993, Acid Mine Drainage from Impact of Hardrock Mining on the National Forests: A Management Challenge. Program Aid 1505. p. 12.

USDA Forest Service 1992. A Conceptual Waste Rock Sampling Program for Mines Operating in Metallic Sulfide Ores With a Potential for Acid Rock Drainage. Written by Gene Farmer with the Department of Agriculture, Forest Service, Ogden, Utah.

<sup>2</sup>Placer Dome 2002, Available:

**<http://www.placerdome.com/sustainability/environment/reports/ard.html>**

<sup>3</sup> University of Washington. 2000. Environmental Impacts of Hardrock Mining in Eastern Washington. Written by: Center for Streamside Studies, College of Forest Resources and Ocean and Fishery Sciences, Seattle WA.

<sup>4</sup>USDA Forest Service 1993, Acid Mine Drainage from Impact of Hardrock Mining on the National Forests: A Management Challenge. Program Aid 1505. p. 12.

<sup>5</sup> McClure, Robert. "The Mining of the West: Profit and Pollution on Public Lands".

Seattle Post-Intelligencer, June 13, 2001. Available:

**<http://www.seattlepi.nwsourc.com/specials/mining>**

<sup>6</sup>*ibid.*

<sup>7</sup>*ibid.*