



# **Background Paper for Candidate National Enforcement Priority: Mineral Processing January 2010**

## **What is mineral processing and mining & why are these activities important?**

Mining operations remove minerals from the ground and concentrate the mineral to produce economically valuable commodities such as phosphates, copper, and gold. Mineral processing operations refine the minerals into more valuable substances or saleable products. Processing large quantities of soil, rock and other materials containing minerals typically involves application of strong chemicals (e.g., cyanide or sulfuric acid) to separate minerals from surrounding material and generates large volumes of waste which must be handled, treated, and disposed of in accordance with environmental laws governing solid and hazardous waste management.

Under the Resource Conservation and Recovery Act (RCRA) that regulates solid and hazardous waste use, generation, transfer, storage, and disposal, facilities must take special precautions to prevent hazardous waste release to the environment given the particularly damaging nature of this type of waste. Mixing non-hazardous waste and hazardous waste together in areas of the facility exposed to wind, rain, and snowfall in unlined or poorly sealed surface impoundment and piles often causes serious environmental degradation of groundwater, drinking water and soil.

Examples of mining and mineral processing operations:

- phosphoric acid
- gold
- copper
- titanium
- lead
- chromium
- lithium

## **Rationale:**

### **Environmental & Human Health Significance**

The mineral processing and mining sectors generate more corrosive and toxic waste than any other industrial sector at the estimated 150 mineral processing and 300 active mining sites nation-wide. Over the past decade, many of the facilities that manage mineral processing and mining waste generated serious groundwater, surface water, and soil contamination. Illegal mixing and disposal of hazardous waste with other less damaging non-hazardous waste, soil, or water are common. Environmental damages from mining and mineral processing often result in severe impacts to wildlife. Damages tend to be more pronounced at large scale operations, however, some small facilities were also found to be the cause of environmental damage. A single mining or mineral processing facility can produce enormous, long lasting environmental impacts on ecosystems and surrounding communities. For example, a leak of one facility's waste stream killed 3 million fish, while another single operation contaminated drinking water supplies for 150 low income families relying on private

wells. Another facility contaminated the municipal drinking water supply of an entire town (pop 20,000). Many facilities are located in close proximity to population centers, posing potential health risks to people living near these facilities.

### **Environmental Justice**

A significant number of these population centers include tribal, low income and minority communities.

### **Non-compliance Data**

A growing body of evidence shows mineral processing and mining waste stored in surface impoundments leak and cause widespread environmental damage even if a portion of the hazardous waste is continuously recycled on-site. EPA inspections conducted in FY2005-2008 demonstrate a pattern of violations of environmental laws for solid and hazardous waste disposal at mineral processing and mining facilities at a significantly higher percentage in this sector than in other sectors.

The operators of many facilities inspected by EPA do not accurately record the specific chemical composition of the substances present in soil or waste impoundments. In some cases, violations exist undetected for years from failure to perform sampling and analysis. Due to the complex nature of many of these facilities, process-based inspections and sampling by EPA are necessary.

### **Federal Government Role**

EPA is well suited to take action to protect human health and the environment from hazardous waste produced by mining and mineral processing as the environmental problem is national in scope and violations involve multiple environmental statutes. A clear federal role is justified by prevalence of environmental violations discovered at previously inspected sites owned by companies operating similar manufacturing facilities in different states across the nation that cross multiple state jurisdictional lines. Evidence indicates that these violations existed for a long time and may not be identified during routine federal and state inspections given the complexity of analyzing all possible pathways for hazardous waste mixtures at these mining and mineral processing operations. Injunctive relief is often complex and requires a level playing field.