



EARTHWORKS

FILED

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Jim Ruby, Executive Secretary  
Environmental Quality Council

October 18, 2010

Mr. Jim Ruby  
Executive Secretary  
Environmental Quality Council  
122 W. 25<sup>th</sup> St. Herschler Bldg. Rm 1714  
Cheyenne WY 82002

Re: Petition to Designate Sand Creek under Very Rare and Uncommon (VRU) statute

Please accept the following information on behalf of Earthworks, a national conservation organization dedicated to protecting communities and the environment against the adverse impacts of mining.

Hardrock mining has caused significant impacts to water, wildlife and communities across the western United States. To evaluate the track record of modern hardrock mines in the western U.S., and their impacts to water quality, EARTHWORKS commissioned a study by mining engineer Jim Kuipers, P.E. and geochemist Ann Maest, PhD. The research, which took two years to complete, was published in December 2006 and entitled, "*Comparison of Predicted and Actual Water Quality at Hardrock Mines.*"<sup>1</sup>

(<http://www.earthworkSACTION.org/pubs/ComparisonsReportFinal.pdf>).

To complete the research, Environmental Impact Statements (EIS) from modern mines across the western United States were reviewed to determine what water quality predictions were made during the permitting process. These predictions were compared to the water quality data collected after the mines were developed to determine the accuracy of those permitting predictions. The study came to the following conclusions:

**Major Findings: Prediction vs. Reality: Overall Water Quality Impacts to Ground and Surface Water**

Of the mines sampled, 100 percent of mines predicted compliance with water quality standards before operations began (assuming pre-operations water quality was in compliance). After the mine was developed:

- 76% of mines polluted groundwater or surface water severely enough to exceed water quality standards.
- 60% of mines polluted surface water severely enough to exceed water quality standards.

- Mitigation measures predicted to prevent water quality exceedances failed at 64 percent of the mines studied in detail.

### **Predictions vs. Reality: the Failure of Mitigation**

In the cases where water quality standards were exceeded, in some cases the mine proponent anticipated the potential for pollution and prepared mitigation strategies (e.g. a mine waste dump lined with plastic to prevent acid drainage leaching into groundwater). Predictions of the efficacy of mitigation were no more reliable than overall predictions of water quality:

- 73% of mines exceeded surface water quality standards despite predicting that mitigation would result in compliance. The other mines didn't predict the need for mitigation.
- 77% of mines that exceeded groundwater quality standards predicted that mitigation would result in compliance. The other mines didn't predict the need for mitigation.

### **Predictions vs. Reality: Mines near Water with Elevated Acid Drainage or Contaminant Leaching Potential are High Risk**

Some mine projects are so high risk that water quality exceedances are a near certainty: those mines that are both near groundwater or surface water resources, and possess an elevated potential for acid drainage or contaminant leaching.

- 85% of the mines near surface water with elevated potential for acid drainage or contaminant leaching exceeded water quality standards
- 93% of the mines near groundwater with elevated potential for acid drainage or contaminant leaching exceeded water quality standards.
- Of the sites that did develop acid drainage, 89% predicted that they would not.

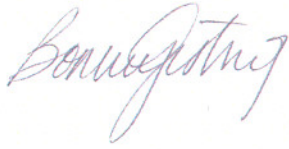
### **Water Quality Pollutants**

Of the mines that exceeded water quality standards, the pollutants that exceeded standards were as follows:

- Toxic heavy metals such as lead, mercury, cadmium, copper, nickel or zinc exceeded standards at 63% of mines
- Arsenic and sulfate exceeded standards at 58% of mines.
- Cyanide exceeded standards at 53% of mines.

This research demonstrates that water quality impacts from hard rock mines are common, and that the existing regulatory structure does not ensure that high quality waters are protected. Furthermore, mitigation measures intended to prevent water quality impacts often fail. As a result, hard rock mining in the Sand Creek area would place its high quality waters, and the species that depend on it, at unacceptable risk. Thus, designating the Sand Creek Area under the Very Rare and Uncommon statute is warranted.

Sincerely,



Bonnie Gestring  
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<sup>1</sup> Peer review was provided by Tom Myers, PhD, hydrogeologist, Dave Chambers, PhD, Center for Science in Public Participation and Glenn Miller, PhD, biochemist, of the University of Nevada- Reno. Technical review and editing was performed by Peggy Utesch and Sarah Zuzulock.

Various versions of the database, report and sections of the report were sent to state and federal regulators and industry consultants for review and comment. Reviewers included regulators from EPA, BLM and the Forest Service as well as industry consultants, and included Stephen Hoffman and Patricia McGrath of the EPA; and Jack Mazingo (Black & Veatch) and Andrew Robertson (Robertson Geoconsultants).