Draft Baseline Ecological Risk Assessment Upper Animas Mining District

fact sheet

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION 8 • APRIL 2015

Background

The Animas River originates in the mountain peaks northeast of Silverton, in San Juan County, Colorado, near the ghost town of Animas Forks. It ends in Farmington, New Mexico, where it empties into the San Juan River.

The Animas River and many of its tributaries are impacted by high concentrations of hazardous substances (heavy metals) from both acid rock/mine drainage at mine sites and from natural sources not impacted by mining.

Introduction

The purpose of this fact sheet is to summarize the results of the *Draft Baseline Ecological Risk Assessment of the Upper Animas Mining District* (BERA), which examined water and sediments in the Animas River from approximately two miles upstream of Silverton, Colorado, to approximately 30 miles downstream of the town. Two tributaries of the Animas River, Cement Creek and Mineral Creek, were also studied.

This evaluation did not attempt to separate natural contamination from past mining-related contamination, but assessed the total risk from all sources combined. Due to natural processes, it is unlikely that Cement Creek and portions of Mineral Creek ever supported fish communities. However, these tributaries were investigated as sources of contamination in the Animas River.

EPA is soliciting comments on the BERA until June 30, 2015.

Assessment

A baseline ecological risk assessment is the process for evaluating how likely it is that the environment may be impacted as a result of exposure to one or more environmental stressors.

The surface water data represents samples collected from the waterways between May 2009 and September 2014. The sediment data was collected from May 2012 to September 2014.

This BERA evaluated the likelihood that the following metals in the water and sediments of the investigated waterways would impact the environment: aluminum, arsenic, beryllium, cadmium, chromium, copper, iron, lead, manganese, nickel, selenium, silver, and zinc.

The BERA estimated the risk under current conditions in the waterways to:

- Benthic invertebrates (small organisms that live in or on the bottom sediments of rivers and streams) that are exposed to sediments.
- Fish that are exposed to surface water.
- Wildlife that eat or drink surface water, sediments and food from the waterways.

Goals

The benthic invertebrates (insects and other small organisms), fish, three species of birds and one species of mammal all represent valued ecological resources to be protected in the Animas River, Cement Creek and Mineral Creek.

The data provided by the BERA evaluates if the waterways examined can maintain stable and healthy benthic invertebrate and fish communities as well as stable and healthy bird and mammal populations. This information will support risk management decision making for those waterways.

Lines of Evidence

Three different lines of evidence were used in the BERA: hazard quotient, toxicity testing, and community surveys.

The hazard quotient (HQ) is the ratio of a chemical concentration (*e.g.* heavy metals) in an environmental media (*e.g.* water) and the level at which harmful effects are expected. Therefore, if an HQ is less than one, no harmful effects are expected. If the HQ is greater than one, harmful effects might be found.

Toxicity testing involves taking a environmental media (*e.g.* water, sediments) from a site and exposing laboratory organisms to it to determine if there are harmful effects. The results of this testing can be extrapolated to predict if that substance will produce similar effects on organisms at the site.

Community surveys involve quantifying populations and communities of organisms on site. This is an informative line of evidence as it provides the most realistic and relevant measure of what is occurring in the Animas River.

Results of these lines of evidence are weighed to develop a conclusion regarding the potential for harmful effects on the organisms being evaluated.

Results and Conclusions

Benthic Invertebrates

A diverse benthic invertebrate community is important for maintaining a healthy fishery. Evidence from HQs, sediment toxicity testing and a survey of community structure and function indicates that the benthic invertebrate community is impaired in most sections of the Animas River, Cement Creek and Mineral Creek. Effects are less severe as one moves further downstream from the site, but are apparent down to Bakers Bridge.

Fish

The evidence collected to evaluate potential negative effects on fish included: HQs, toxicity testing with rainbow trout, and fish community surveys. The evidence suggests that water in the Animas River from Arrastra Creek to approximately Cement Creek is likely toxic to all trout species with the exception of Brook trout. Brook trout living in this reach, however, are likely stressed much of the year.

Metals concentrations in the Animas River below Mineral Creek have eliminated virtually all fish down to Elk Creek and all cutthroat and rainbow trout down to Cascade Creek, where only a small community of brook and brown trout exist. This prediction, based on HQs, is supported by surveys conducted by Colorado Parks and Wildlife between 1992 and 2014. HQ results also predict fish populations are likely impaired down to at least Bakers Bridge.

Wildlife

Wildlife populations foraging in the Animas River were evaluated by measuring, or making conservative predictions of, metals concentrations in food items and comparing those to levels causing harmful effects. Based on this evidence, it is unlikely that birdlife or mammal populations are experiencing significant negative effects from metals in the Animas River.

FOR MORE INFORMATION OR TO REQUEST A COPY OF THE BERA, PLEASE CONTACT THE FOLLOWING:

U.S. Environmental Protection Agency, 1595 Wynkoop St., Denver, CO 80202

Dan Wall
Toxicologist
303-312-6560
wall.dan@epa.gov

Liz Fagen
Remedial Project Manager
303-312-6095
fagen.liz@epa.gov

Paula Schmittdiel
Remedial Project Manager
303-312-6861
schmittdiel.paula@epa.gov

Cynthia Peterson
Community Involvement Coordinator
303-312-6879
peterson.cynthia@epa.gov