

Estimating Natural Resource Damages from a Hypothetical Failure of a Mine Tailings Impoundment



Sanpoil River – home to Rainbow and Cutthroat trout

Introduction

Thinking about what could happen can be uncomfortable, but it's important for making environmental decisions. For this reason, Ecology's Eastern Regional Office evaluated potential impacts and estimated restoration costs from a potential catastrophic failure of a metals mining tailings disposal facility. This analysis fell outside of our typical permitting process and challenged us to find funding sources and a contractor qualified to do the work. The study results will help determine the appropriate environmental performance bonding for the facility.

Problem

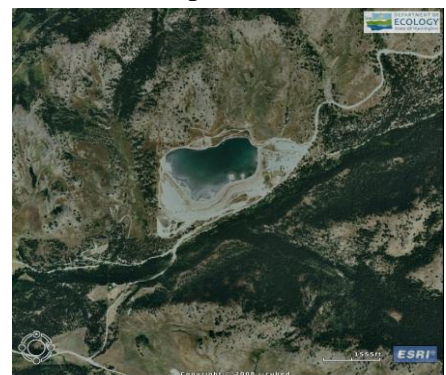
The tailings impoundment lies adjacent to the North Fork of the Sanpoil River, in north central Washington State, near the town of Republic. The facility occupies roughly 100 acres and holds about 8.5 million tons of tailings (a slurry of residual material from the milling of gold and silver ore). During the environmental review and permitting process, the Confederated Tribes of the Colville Reservation, which is downstream of the project, raised concerns regarding a possible dam failure. If the dam failed, the resulting release would devastate downstream fisheries and habitat on the Sanpoil River. The Sanpoil River provides habitat for Rainbow and Cutthroat trout. As a result of tribal and Ecology discussions, we decided to look at the potential impacts and estimate the natural resource damages from such a breach.

The project

We needed a funding source and a contractor to perform the study. The mining company paid into a reimbursement fund to cover Ecology's costs for preparing an environmental impact statement for a mine expansion. This provided convenient money for our study. Next, we required a consultant familiar with dam failures, mining, natural resources damage assessments, and stream restoration. We turned to the Toxics Cleanup Program's prime contract. The prime contract lists pre-selected contractors qualified to complete cleanup program work. Site managers typically use "prime" contractors for work at cleanup sites, making the process of getting cleanup personnel in place faster and easier. The prime contractor can be used for a wide range of services, including natural resource damage assessments. Our study fit nicely under the scope of the prime contract. We had the choice of three highly qualified consultants. Working with Toxic Cleanup Program financial staff, we selected Ecology and Environment, Inc. for our work.

Milestones and outcomes

The consultant and Ecology met with the Confederated Tribes to review our scope of work for the project. Throughout the study, the consultant kept in contact with tribal staff, exchanging information, and coordinating field visits. Ecology and Environment, Inc. completed the study which consisted of the following elements:



Aerial View of Tailings Dam

- (1) A hypothetical failure model of the impoundment through an engineering analysis.
- (2) A natural resource assessment identifying the natural resources that could be affected by the impoundment failure.
- (3) Cost estimates for restoring the hypothetical injured resources and their functions to baseline conditions.

Project highlights

Through the modeling, resource assessment, and stream restoration knowledge, the consultant estimated damages and monetary costs to restore the Sanpoil River in the event of a catastrophic failure of the impoundment. We can use this monetary amount in development of environmental performance bonding at the site.

Partners

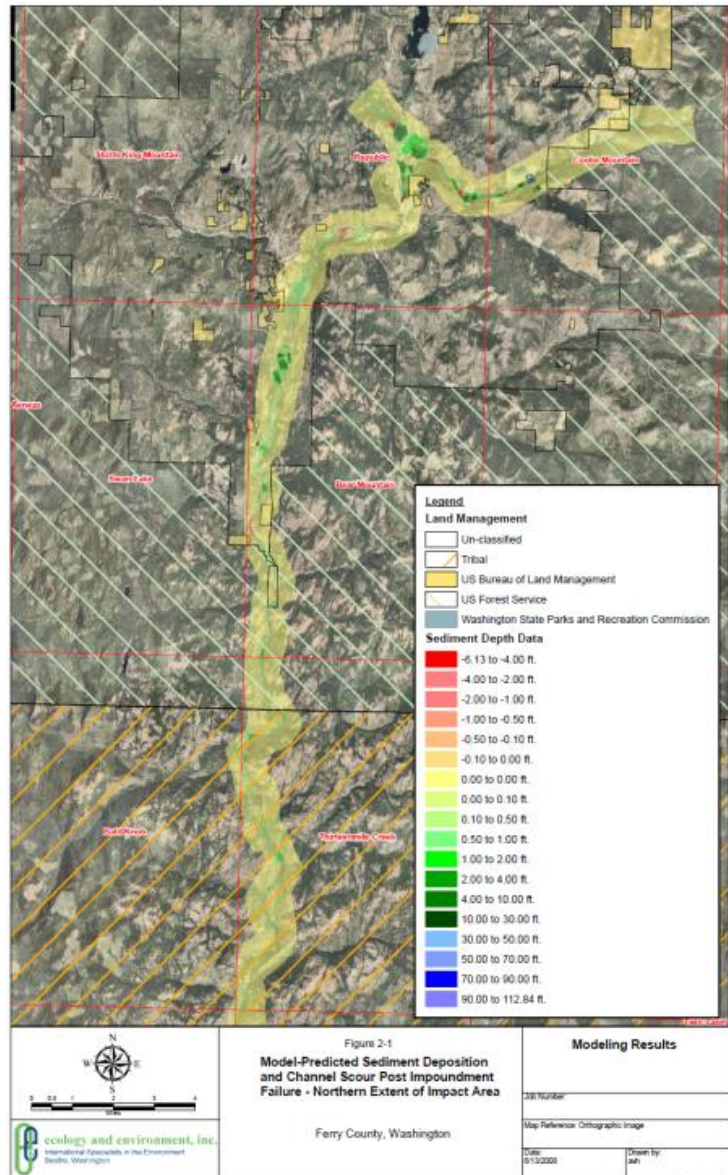
Ecology and Environment, Inc. completed the report. Joe Crossland and Tra Thai from the Toxics Cleanup Program provided assistance with their prime contract. Ron McBride from the Water Quality Program deserves special thanks for closing out the contract and tying up the loose ends.

Funding

This project was paid for through funds paid by the mining company to Ecology's reimbursement account. The study cost \$88,340.

For more information

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Modeled Sediment Deposition