



britannia beach

community visioning charrette

Canadian Environmental Mining Research Centre (CEMR)

project summary

Project Summary

Introduction

The University of British Columbia, through its new Centre for Environmental Research in Minerals, Metals, and Materials (CERM3) has prepared a 10.6 million dollar submission to the Canada FOundation for Innovation and the BC Knowledge Development Fund to build a research centre at Britannia Beach.

This facility, to be named the Canadian Environmental Mining Research Centre (CEMR), will conduct innovative research to address past, present and future impacts of mining activities on both local and global environments. The park will house about 60 researchers from a variety of organizations including universities, mining companies, mine suppliers, engineering firms, and government organizations. Funding is expected from these sources, not only to build the facility, but also to support the ongoing research.

CERM3 Research at Britannia Beach

UBC has had a presence at Britannia Beach since the summer of 2001 when CERM3 began to construct a research field station at the 2200 Level of the mine. The station was completed in December 2001 allowing UBC to conduct research on a project called the Millenium Plug. The Millenium Plug is a new approach to close mine tunnels in which the seal is designed to last 1000 years. It is constructed with bulk materials that include sand, gravel and rip-rap together with an impervious bentonite clay core to prevent water flow. These materials were selected because of their acid-resistance and their ability to withstand seismic loading. The plug itself is designed to withstand hydraulic heads of up to 300 metres. This research is currently underway in collaboration with Britannia Mines and Reclamation Corporation, the site owners, and with TSS Tunnel and Shaft Sealing Inc. of Squamish, BC, a recognized world leader in the design and construction of tunnel plugs. Installation of this facility has had the added benefit of stopping acidic pollution flowing into Britannia Creek. For the first time in 25 years (and perhaps longer), Britannia Creek is no longer polluted and metallic pollutants are not directly entering the surface waters of Howe Sound.

With the encouragement of UBC-CERM3, NRCan-CANMET, the Government of Canada's research laboratory for the mining and metallurgical industries, has opened an office at Britannia Beach with the intent to conduct research on mining and the environment. CANMET has committed funds to CERM3 to build a pilot plant to demonstrate how geothermal heat from the Britannia Mine effluent can be extracted to provide space-heating and potable hot-water for the local community at Britannia Beach. This plant will provide proof-of-concept and allow CERM3 to



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study how to reduce the estimated payback of the system from 6-9 years to 3-4 years.

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Purpose of the Research Centre

The research centre will conduct research on all aspects of mining and the environment. Long-term, our goal is for CEMR to become the world mining industry's premier research centre dedicated to protecting the environment. The on-going research will be sponsored by relevant government agencies and by industry under collaborative research agreements. Employees from industry will be seconded to the site to conduct research of direct relevance to their employer and for which they can obtain a post-graduate degree if so desired.

The CEMR will also work with NRCan and the BC Museum of Mining to establish public exhibitions on methods being used and developed by Canadian mining companies to protect the environment. These exhibits will focus initially on different ways to deal with Acid-Rock-Drainage (ARD). Additional exhibitions will include a range of topics, such as:

- Sub-aqueous Waste Disposal
- Mine Reclamation and Revegetation
- Open Pit Mines for Aquaculture Development
- Mining and Communities
- Safe Practices in Underground Mining

Much of the initial research to be conducted in the CEMR will focus on the new water treatment plant planned for installation by the Ministry of Sustainable Resource Management in 2004. The annual cost to operate this plant is estimated to be about 1.6 million dollars. Our initial research will aim to reduce this cost by investigating modifications to the process:

- adding a process to recover the copper and zinc content of the effluent to create revenue
- reducing the quantity of lime sludge produced and the associated disposal costs
- using other pH modifiers such as fly-ash and pulp-mill waste material (cheaper pH modifiers)
- immobilizing the metals contained in the lime sludge (alternative storage possibilities)
- recovering energy from the ARD to heat the townsite and produce electricity
- studying methods to seal the open pits and glory holes at the top of Britannia Mountain