## EXECUTIVE SUMMARY

Hydrogeological Assessment and Development of AMD Control Technology for Myra Falls Waste Rock, September 1990, BCAMD 3.40, MEND CO-3 Nat... Res... Can.

This report describes the studies which occurred during a three year program to assess acid generation and groundwater flow at the Westmin Myra Falls waste rock dump and to evaluate novel approaches for the prevention of acid mine drainage from the waste rock dump at the Westmin Myra Falls site.

The waste dump characterization indicated that the most active areas of oxidation occur within a 10 meter depth of exposed surfaces of the waste rock dump and in deeper zones where relatively high contents of sulfide minerals are encountered. During periods of significant rainfall, the shallow acid-generating zones are flushed with water and acidic water appears beneath the water table. Calculations suggest that a significant portion of the annual production of acidity is retained in the dump and therefore remains available for flushing. As a result, remediation and decommissioning planning must address the neutralization of this acidity or the control of infiltration and water-table variation.

Two acid mine drainage control approaches were evaluated; the use of alternative bactericides to reduce the activity of Thiobacillus ferrooxidans, and the use of solidified mine waste materials for the purpose of sealing waste rock to minimize moisture and air transfer and, hence hinder acid generation. The laboratory studies, and the results of the dump characterization study, suggested that a bactericidal approach would not be effective for control of acid mine drainage from the Westmin waste dump. Limitations include application techniques and the need to control acid formation at depth.

The study program then focused on the possible formation of a durable solidified material using mine waste materials such as wastewater sludges and mine tailings as principal components. The intent is to use the material as a surface sealant and/or grouting material to minimize water and air transfer in the waste rock dump. More than 105 test solidification mixtures were prepared and tested for properties such as strength, setting times, leaching and permeability. Five mixtures were selected for field application and testing on field waste rock piles. The leachates from the field test piles were monitored constantly for pH, and tested at intervals for water quality. The integrity of the solidified materials is observed at intervals and the results suggest that mixtures which can stand the "test of time" with respect to physical and chemical

integrity can be prepared for use as surface sealants. However, it must be recognized that the time-frame for this study was relatively limited. Mixtures for use as grouting materials have been prepared and tested on a field scale. Preliminary results suggest that the mixtures can be successfully used for grouting.

On the basis of laboratory and limited field scale studies, the approach of using solidified mine waste materials as a cover and grouting medium appears promising and further investigation of field application techniques should be pursued. Shotcreting appears to be the most promising means of covering the waste rock dump with the cementitious materials, and field trials are anticipated during 1990.