Attachment 3

Estimated Inflow to Mine

TECHNICAL MEMORANDUM

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TO:	Jon Cherry, KMC Stephen Donohue, FOTH	**DATE:**	February 9, 2006
FROM:	Willy Zawadzki/Don Chorley	**JOB NO:**	05-3236-2c
EMAIL:	wzawadzki@golder.com		
RE:	**ESTIMATE OF PROPORTION OF UPPER AND LOWER BEDROCK GROUNDWATER IN MINE INFLOW - EAGLE PROJECT**		

The following technical memorandum provides approximate estimates of the source of mine inflow for the Eagle Project in Michigan's Upper Peninsula. Specifically, this memorandum discusses estimates of the proportions of groundwater inflow to the mine originating from shallow bedrock and that originating from deep bedrock. These predictions were based on the numerical hydrogeologic model that was developed for the project using FEFLOW. The details of the conceptual model on which the numerical model was based, together with model construction, calibration, and predicted inflows were presented in a separate report. In summary, the model results suggested that the average annual inflow during mine construction and operation could range from approximately 75 USgpm for the Base Case to 215 USgpm for the Upper Bound Case.

Particle tracking together with groundwater velocities predicted from the hydrogeologic model were used to identify flow tubes with travel times of less than 1 year between the shallow bedrock/overburden interface and proposed mine workings. These results allowed the delineation of areas at the shallow bedrock/overburden interface from which a water particle could reach the mine workings in less than one year. The predicted total inflow was then compared with the leakage from these areas of contribution for different times throughout mine life. This analysis suggests that groundwater originating from deep bedrock could account for approximately 30% of total mine inflow.

Overall, the assumption that was used for the design of the treatment plant (45% of groundwater originating from deep bedrock in total inflow) is considered appropriate as it provides a reasonable factor of safety that accounts for model uncertainty.

WZ/cap

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