

## Technical Memorandum

**To:** Erik Carlson and Mike Kunz  
**From:** Tina Pint  
**Subject:** AWMP Engineering Controls and Assumptions in Model Files  
**Date:** July 18, 2012  
**Project:** NorthMet SDEIS – 23690862.00 042 002  
**c:** Jim Scott, PolyMet

This memorandum summarizes the model assumptions and engineering controls associated with the AWMP that are contained with the Mine Site and Plant Site GoldSim models that were submitted to the Co-lead Agencies for review on July 5, 21012. This memorandum does not identify all assumptions and engineering controls contained within the models, but focuses on components associated with the AWMP and identifies whether the models used assumptions/model inputs are associated with AWMP version 1, AWMP version 2 or the original Project Description.

- Category 1 Waste Rock Stockpile Cover System – included in the model with percolation rate from AWMP version 1; pH based on enriched pCO<sub>2</sub> conditions (this was done in error and is not consistent with pH assumptions presented in AWMP version 1 and AWMP version 2)
- Category 1 Waste Rock Groundwater Containment System Extension – included in model as presented in AWMP version 2
- Category 1 Waste Rock Stockpile Groundwater Containment Passive Treatment System – included in the model as presented in AWMP version 2
- Additional WWTF Lead and Antimony Treatment in Closure – included in the model as presented in AWMP version 2
- West Pit Overflow Passive Treatment – included in the model as presented in AWMP version 2

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- Flotation Tailing Basin Adaptive Water Management – included in the model as presented in AWMP version 2
- Flotation Tailings Basin Cell 1E/2E Enhanced Cover System – percolation rates from enhanced cover in pond area and percolation rates for beach areas as described in the Project Description, consistent with AWMP version 2, are included in the GoldSim model. However, the pond percolation rates from AWMP version 2 are not included in the Plant Site MODFLOW model, which is used to develop some model inputs to the GoldSim model (Tailings Basin area contributing to each groundwater flow path for example).
- Flotation Tailings Basin Groundwater Seepage Passive Treatment System – model consistent with AWMP version 2 (model assumes 75% Pb removal, two values presented in AWMP version 2)