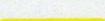


Drawn by D. Severson

8 Nov 2017

C:\Data\WHP\B&L & US Magnesium\FIGURES\Fig 5-1\_Current Waste Pond Concept GW Discharge Control\_11Dec2017.mxd

**CONCEPTUAL GROUNDWATER DISCHARGE CONTROL DESIGN SUMMARY**

-  Barrier wall  
LENGTH: 21,280 ft
-  Existing berm to be retrofitted  
LENGTH: 9,040 ft
-  New berm to be constructed  
LENGTH: 11,846 ft

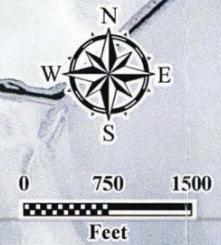
Extent of northern barrier wall to be confirmed during detail design

Refer to Figure 5-2 for typical groundwater discharge control design detail

Refer to Figure 5-3 for conceptual cross-section of retrofitted pond

Extent of southern barrier wall to be confirmed during detail design

- NOTES:**
- Existing berm will be scarified to a depth of 8-inches and re-compacted to 98% Standard Proctor at +/- 2% of Optimum Moisture Content prior to placement of additional berm fill.
  - 20 feet is the minimum embankment width being proposed. Width of embankment may increase to accommodate construction of slurry wall.
  - General Berm Fill is to have a minimum the following properties:  
Percent passing a #200 sieve - 25%  
Plasticity Index - >10% and shall plot above the A-line  
General fill shall be placed in loose lifts not exceeding 8-inches and compacted to 98% (+/-2%) at +/-2% of Optimum Moisture Content.
  - Conceptual depth of slurry wall to "key" into clay is 45 feet bgs (measured from historical ground surface elevation). Ultimate depth of slurry wall will be confirmed based on cone penetration test data to be collected as part of the groundwater discharge permit investigation. Slurry wall will be installed to an elevation of 4216 (2 feet above of top operating water level). Slurry wall mix design will be based on result of compatibility testing to be performed in support of permit application. Refer to Contingency Plan for contingent HDPE cut-off installation.
  - Existing ground underlying new embankments will be scarified to a depth of 12-inches and re-compacted to 98% Standard Proctor. Following compaction, the subgrade receiving berm fill will be proof rolled using a fully loaded haul truck or fully laden water truck. Any weak spots will be excavated to a depth of 12-inches and replaced with competent backfill and compacted to 98% of Standard Proctor at +/-2% of optimum moisture content.
  - Overflow pipe between Current and Former Waste Ponds was installed as part of a contingency action. Under the conceptual design, the overflow pipe will remain to permanently convey water from the Current Waste Pond to the Former Waste Pond to achieve required containment area.



Aerial Photography 2 March 2016

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**CURRENT WASTE POND  
CONCEPTUAL GROUNDWATER  
DISCHARGE CONTROL DESIGN**

**Figure 5**