FACILITY: OPEN PIT[1]

REFERENCE NO.	TECHNICAL ISSUE	BACKGROUND AND GENERAL DESCRIPTION	PROPONENT'S PERSPECTIVE	COMMENTARY
OP-1	Level of effort for feasibility level open pit design - Goose and Portage Pits vs. Vault Pit.	Feasibility level open pit designs were developed by Golder Associates for the Portage and Goose Island Deposits (April 5, 2007) and the Vault pit (January 9, 2004).	Vault pit design is included in Appendix A of Meadowbank Gold Project - Mine Waste and Water Management.	Feasibility level open pit designs were developed by Golder Associates for the Portage and Goose Island Deposits appear to be to a higher level of effort than the open pit design for the Vault pit; however, many of the same technical issues still apply. Based on the references reviewed, it is unclear if any of the key recommendations in the Vault Pit Design Memo have been carried out.
OP-2	Level of site investigation between Goose and Portage open pits and water control dikes.	Geotechnical investigation borehole locations for the Portage Lake and Goose Island areas are shown in Figure 3.1 of the open pit design report.	Not addressed.	Borehole information is relatively limited between the open pits and the proposed dikes, in particular between the East Dike and the Portage Pit, and the Goose Island Dike and the Goose Island Pit. Is sufficient information available on the slope of the bedrock surface above the crest of the open pit to adequately address concerns about the overall stability of the dike and the overburden slope between the toe of the dike and the open pit?
OP-3	Pit slope depressurization	Based on stability analyses, pit wall depressurization is required in the southeast walls of the Portage and Goose Pits, and the northeast wall of the Goose Pit Figure 13.1) to achieve an acceptable factor of safety. Unless it can be demonstrated that particular discontinuity sets that could contribute to instability have a sufficient amount of rock bridges to prevent that instability from occurring, the pit walls will have to be depressurized.	Adequate depressurization can be achieved from 90m long horizontal drainholes spaced 24m vertically and 15m horizontally.	This assumption is based entirely on packer testing results. No aquifer testing has been carried out to confirm the hydraulic conductivity of the rock. The hydraulic conductivities calculated from the packer testing are relatively low, indicating that if wells were to be installed that they would have to be on a relatively tight spacing, which may be impractical and cost prohibitive. However, it should be pointed out that the horizontal drains are a passive dewatering system that cannot be installed until the bench face is excavated and therefore depressurization cannot be achieved in advance of mining. It should be clarified in the report whether or not the delays in depressurization using this passive system will result in unacceptable slope movements.
OP -4	Pit wall design - Southeast wall of Portage Pit	Discontinuity sets determined from oriented core drilling have been selected for kinematic analysis to develop interramp slope designs, and have been incorporated into a stability analysis model for the overall slope.	Several discontinuity sets were picked for the kinematic analyses of Structural Domains TP-3 East and TP-3 West (Figures 5.9 and 5.10, respectively of Golder, 2007_).	Two relatively strong discontinuity sets were not included in the kinematic analyses conducted. These sets dip between 10 and 50 degrees to the southeast/east and could have a significant impact on the stability of the southeast pit wall beneath the Bay Zone Dike. Also, the discontinuity sets described in Section 11.6.5 which are described as "controlling the stability of the slope" do not appear to correspond with those shown in the stereonets in Figures 5.9 and 5.10.
OP-5	Pit wall stability and impacts on the Goose Island dike.	Displacements of the area between the pit crest and the dike toe in the southeast corner of the Goose Pit have been estimated using numerical modeling techniques. These displacements are important to quantify due to their potential impact on the dike performance, which prevents lake inflows to the open pit.	Displacements at the toe of the Goose Island dike are predicted to be less than about 2.5 cm, which is considered acceptable and non-threatening to dike integrity.	Accurate prediction of displacements can only be achieved with careful calibration of numerical models. This generally requires collecting actual slope performance and deformation information, which cannot be undertaken until mining begins. Also, relatively minor changes in the structural geology (i.e. structure location, dip and dip direction) can significantly change the predicted displacements. Therefore, predictions of displacements should be used with caution and contingencies should be developed for the dewatering methods and dike construction to account for potentially higher deformations.
OP-6	Pit wall stability and impacts on the Bay Zone dike.	Limit equilibrium modeling has been carried out for the southeast wall of the Portage Pit; however, deformation modeling, similar to that conducted for the Goose Island pit, has not.	Not addressed.	It is unclear why deformation modeling of the southeast wall of the Portage Pit has not been carried out, as this pit wall is just as critical as the southeast wall of the Goose Pit. Displacements may be of concern, particularly if discontinuity sets identified in OP-4 are incorporated into the stability analysis model.

NOTES: 1. Reports reviewed include: Golder Associates, 2007, "Final Report on Pit Slope Design Criteria fo the Portage and Goose Island Deposits, Meadowbank Project, Nunavut", Volumes 1 and 2, report submitted to Meadowbank Mining Corporation, April 5, 2007; Stacey Mining Geotechnical, 2007, letter to Meadowbank Mining Corporation Re: Independent Review of Pit Slope Design Criteria for the Portage and Goose Island Deposits, April 14, 2007; Meadowbank Mining Corporation, 2007, "Mine Waste and Water Management, Meadowbank Gold Project", August 2007.