

Appendix 15

Reclamation and Security Brief (SRK, November 2013)



Memo

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From:	Iozsef Miskolczi Maritz Rykaart	Project No:	1CT022.000
Cc:		Date:	November 6, 2013
Subject:	Reclamation and Security Brief for Amendment to Doris North Type A Water Licence No. 2AM-DOH1323		

1 General

This memo describes changes in closure planning associated with site improvements included in the proposed Amendment to Type A Water Licence No. 2AM-DOH1323 for the Doris North Project. The areas affected include:

- Doris Central Vent Raise Pad and Access Road;
- Pad U Waste Rock Expansion Area;
- Pad T Ore Storage Expansion Area;
- Roberts Bay Laydown Expansions; and
- Post-operations water management at the Doris North site (including decommissioning of ocean discharge pipeline).

Table 1 summarizes the incremental reclamation security associated with each of these areas from the current Closure & Reclamation Plan (CRP) for the site. Details of the changes are described in the remainder of this memo.

Table 1: Summary of Reclamation Security variances for the Amendment

Area Description	Change from current CRP	Change in Closure Methodology	Incremental Liability Estimate
Doris Central Vent Raise Pad and Access Road	New vent raise pad(s), access road(s) and overburden storage area(s)	No	\$224,000
Pad U – Waste Rock Expansion Area	Stockpiled waste rock will remain on pad surface at closure and will not be covered	Yes	\$73,000
Pad T – Ore Storage Expansion Area	Expanded camp pad footprint to create a general laydown facility and ore storage area	Yes	\$110,000

Area Description	Change from current CRP	Change in Closure Methodology	Incremental Liability Estimate
Roberts Bay Laydown Expansion	Creation of additional laydown areas adjacent to the Beach Laydown area and the northern segment of the existing Primary Road	No	\$100,000
Post closure water management	Active pumping of water from U/G to TIA; active pumping of water from TIA to Roberts Bay; g of TIA; and pipeline decommissioning	Yes	\$3,872,000

2 Doris Central Vent Raise Pad and Access Road

The existing CRP envisioned closure of one ventilation raise complete with its support pad and associated infrastructure. The addition of a second (and possible third) vent raise at Doris Central in the Amendment will therefore require incremental reclamation liability. This new vent raise will be constructed east of the Doris-Windy All-Weather Road, south of Doris Camp and north of Windy Camp. The Doris Central Access Road will be constructed to provide access to this area from the Doris-Windy All-Weather Road.

The new vent raise will include an infrastructure support pad of about 13,252 m² which will house a fuel transfer station, diesel generator, supporting infrastructure and an emergency shelter. Rock blasted during development of the pad footprint will be used to construct the pad and will subsequently be covered with a 0.15 m thick layer of surfacing material. The pad will be constructed to be free draining away from Doris Lake and the surfacing material specified will be a 1¼ inch crushed rock.

The 675 m long Doris Central Access Road is an extension of the existing Doris-Windy All-Weather Road (with the same design criteria). This road will have one turn out and will connect to a 240 m long sedimentation control berm located east of the proposed overburden storage area located about 100 m west of the new vent raise. All these facilities are located within the existing Commercial Lease boundary for the project.

Using the same closure and reclamation design criteria and costing basis as the existing CRP for the project, the incremental reclamation liability for this new vent raise \$112,000. Should a third vent raise be planned, it would double this total to \$224,000.

3 Pad U – Waste Rock Expansion Area

According to original project plans, waste rock was to be used to plug the Doris North portal and the remaining quantities were to be managed by one of the following methods:

- Sub-aqueous disposal in Tail Lake (if geochemically required);
- Cover with an impermeable liner (if geochemically required); or
- Leave the waste rock in place (if geochemically suitable).

Under the proposed Amendment, additional storage is required for permanent, above-ground storage of up to 1.7 million tonnes of waste rock. There will be two areas where this rock will be stored; at the existing waste rock storage area, and on a new Pad U. A new Pollution Control Pond will be constructed to accommodate the expanded waste rock volume.

Geochemical characterization has confirmed that the waste rock will be geochemically benign and therefore a low infiltration cover is not required at closure. Closure of the waste rock facilities will therefore consist of short term water management followed by breaching of the two Pollution Control Ponds. The total incremental liability associated with these tasks is \$73,000.

4 Pad T – Ore Storage Expansion Area

The existing CRP includes consolidation and covering of 18,000 tonnes of ore which was stockpiled when the project was placed in Care and Maintenance. Consistent with the original CRP for the project however, it is reasonable to assume that all ore stockpiled on site will be consumed by the end of mine life and the liability estimate should be limited to reclamation of the ore storage pads alone.

The proposed Amendment does however include an expanded ore storage and general laydown facility (Pad T), and the reclamation liability associated with these additional pads is \$110,000.

5 Roberts Bay Laydown Expansions

Under the proposed Amendment the laydown area at Roberts Bay expands from 0.6 Ha to 4 Ha with an associated incremental liability estimate of \$100,000.

6 Post-Operations Water Management at the Doris North Site

Under the proposed Amendment, post-operations water management at the Doris North site will require the following:

- Pumping of groundwater from the underground mine workings to the TIA for the first 6 months of the post-operations period.
- Routing of accumulated runoff from the Pad U Pollution Pond into the Pollution Control Pond south of Pad I, and from there to the TIA. It is anticipated that this routing would remain until required target closure criteria for the water from the Pollution Control Pond have been achieved at which point both the Pad U pond and the Pollution Control Pond will be breached to allow natural return of runoff from this area into Doris Lake.
- Annual pumping of approximately 480,000 m³ of water from Doris Lake into the TIA during the winter period (November and December). Current water balance modelling predictions suggest that target water quality closure criteria can be met after 7 years of flushing the TIA with annual water inflows of the indicated volume from Doris Lake.

- Pumping of water from the TIA via a pipeline to a diffuser discharge located on the sea floor in Roberts Bay. It is anticipated that water will be pumped for the duration of the post-operations period (approximately 9 years) at a rate of 120 L/sec during the annual open-water season (May to September). Once target water quality criteria for the TIA closure have been achieved, the North Dam of the TIA will be breached to allow natural outflow of water from the impoundment area into the Doris Creek catchment.

Following this water management period, the final closure plan is still consistent with the original CRP in that the North Dam will be breached, and all pipeline and remaining infrastructure (including the Doris Creek bridge) will be removed. In addition, all the additional pipelines and pump stations will be removed and disposed of, including the Roberts Bay outfall discharge system. The total incremental liability associated with these changes is \$3,872,000.

7 Closure

The total incremental liability associated with the proposed Amendment activities for the Doris North project is \$4,379,000. This has been calculated using the same principles and costing assumptions used in the current CRP for the project.

Regards,
SRK Consulting (Canada) Inc.

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