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PROJECT MEMORANDUM

To:	**Department of Indian and Northern Affairs**	**Fax No.:**	**(867) 975-4286**
Attention:	**Mr. Carl McLean, Manager Lands Administration**	**CC:**	**Philippe di Pizzo (867) 360-6369**
From:	**Holger Hartmaier (Ext. 113)**	**Date:**	**September 24, 2003**
Subject:	**Polaris Mine- Additional Underground Storage for Hydrocarbon Contaminated Soils**		
No. of Pages (including this page): 3 Pages		**Project No:**	**0131-013-01**

As requested in your e-mail message dated September 22, 2003, I have reviewed the letter sent to DIAND (and Nunavut Water Board) by Teck Cominco dated September 16, 2003, which requested approval for using additional areas in the mine for underground storage of hydrocarbon contaminated soils.

The following comments are offered for your consideration:

1. Overall there would no technical grounds for rejecting the proposal, as long as the conditions required in previous approvals were met, i.e. no free phase hydrocarbons, wetting the floors with water to seal fractures in the rock and ensuring surrounding rock temperatures are maintained to prevent thawing.
2. The storage areas will be isolated from other areas of the mine, by plugging with muck, as noted in the Teck Cominco letter.
3. Teck Cominco should be requested to re-submit this letter and provide a realistic update of the volumes of metal and hydrocarbon contaminated soils that need to be placed underground based on numbers to the end of 3rd quarter 2003.
4. The numbers in the letter are confusing to interpret. Based on the Feduniak January, 2003 analysis, there was a total of 194,200 m^3 of underground void space available, comprising 40,000 m^3 for hydrocarbon contaminated soils and 154,200 m^3 for metals contaminated soils, as per the summary table. This volume represents underground space that doesn't require auxiliary ventilation or improving ground conditions or both, prior to storing waste. It is not clear if this volume represents the total volume of underground space available or the volume remaining as of January 2003.

5. In Appendix I of the Feduniak January 2003 memo, the total volumes of contaminated soils to be excavated following mine closure, including a 20% swell factor are:

   - 39,240 m^3 of hydrocarbon contaminated soils
   - 165,060 m^3 of metals contaminated soils

   The original estimate given in the reclamation plan was:

   - 36,700 m^3 of hydrocarbon contaminated soils
   - 92,350 m^3 of metals contaminated soils

   These were based on in situ volumes and did not include any swell factor.

   Appendix I indicated that a total of 58,150 m^3 (in situ volume) had been removed to date (January 21, 2003) and presumably placed underground, however the amount of underground void space available seems insufficient for the anticipated volumes of metals contaminated soils and barely enough to store the anticipated volumes of hydrocarbon contaminated soils.

6. Attachment #2 of the Teck Cominco letter indicates an additional 27,700 m^3 of void space in the 820, 790 and 760 level drifts to be used for storing hydrocarbon contaminated soils, however the Teck Cominco letter states that this volume was previously included in the 154,200 m^3 amount for metals contaminated soils identified by Feduniak in January, 2003 and there was no net increase in overall storage capacity. From this I would interpret that the revised amount of underground void space would now be:

   - Available volume for metals contaminated soils = 154,200 - 27,700= 126,500 m^3.
   - Available for hydrocarbon contaminated soils= 40,000 + 27,000= 67,000 m^3.

   In 2003, subsequent to Feduniak's analysis, an additional 800 m^3 of hydrocarbon contaminated soils were removed from the fuel bladder area, plus at least 4700 m^3 from the dock cells, which was not anticipated. This reduces even more the volume of underground storage available for metals contaminated soils and the volumes of hydrocarbon contaminated soils seem to be increasing and are as yet undefined.

7. The volumes summarized in Appendix I should be updated with current values (to 3rd quarter, 2003), including an accounting of how much of the underground space has been used up for metals and hydrocarbon contaminated soils. As remediation proceeds, the actual volumes of contaminated soils to be placed underground can realistically be expected to increase above the estimated values given in Appendix I. The data in Appendix I is based on work done and estimates made to January 2003. The table should be expanded to include original estimated volumes, amount removed to date and current estimated remaining volumes for each of the contaminated site locations, based on the latest figures from the contractor.

Closure

The data presented in the Teck Cominco letter does not clearly present the current status of the soil remediation efforts. Although there is no technical basis for disapproving of the application for using additional underground space, a key concern is the potential for having insufficient space underground to store all the contaminated soils being removed from the site. Teck Cominco should be requested to update their volume estimates, as noted in the above comments so that there is no ambiguity concerning the proposed remediation program.

I trust that this information meets with your requirements at this time. If you have any questions or require additional information, please do not hesitate to contact me.

Yours truly,
Per BGC Engineering Inc.

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