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Your file - Votre référence
05MN047
Our file - Notre référence
5510-5-11

August 9, 2005

Delivered Via E-Mail & Facsimile

Ms. Stephanie Briscoe
Executive Director
Nunavut Impact Review Board
PO Box 2379
Cambridge Bay, NU X0E 0C0

Dear Ms. Briscoe,

Re: Information Requests for Miramar-Hope Bay Ltd. regarding the adequacy review of the Doris North Draft Environmental Impact Statement

Indian and Northern Affairs Canada (INAC), as per the August 5, 2005 instructions of the Nunavut Impact Review Board (NIRB), has assembled a list of Information Requests for NIRB regarding the Doris North proposal. It is INAC's understanding that the intent of the information request process is to ask specific questions in order to further the adequacy review of the Miramar Hope Bay Ltd's Draft Environmental Impact Statement (Draft EIS). The series of information requests, from INAC, is included as an Appendix to this letter and are grouped by relevant topic area, and may include contextual information to help clarify the request.

Our report on the adequacy of the Draft EIS will be submitted on the August 15 deadline to NIRB. However, upon completion of the Department's review, there may be other Information Requests to bring forward at the technical meetings scheduled for August 23-25th, 2005.

Please contact me at (867) 975-4280, or Peter Scholz, Environmental Assessment Coordinator at (867) 975-4567, if you have questions or comments.

Sincerely,

Original Signed By

Carl McLean
Director of Operations

Canada

APPENDIX:
INFORMATION REQUESTS (IRs)

Information Requests relating to the Cumulative Effects Assessment (CEA) in the draft EIS

Preamble

The NIRB guideline relating to CEA is reproduced below.

> ***4.22 Cumulative Effects Assessment*****:** *…The Proponent shall determine which other human activities have affected or are likely to affect the same VECs, VSECs, or ecosystems as the Project. The Proponent shall then predict the impacts of the Project in combination with those of the other past, present, and reasonably foreseeable future projects, using the most appropriate methodology on a case-by-case basis that is capable of incorporating all of the relevant impacts. At a minimum, it shall consider the cumulative effects of: other existing and reasonably foreseeable mines and exploration camps in the region.*
>
> *The discussion of cumulative effects shall include a comparison of the incremental contribution of the Project to regional thresholds for VECs and VSECs, as established by the Proponent or by any other authoritative source, and shall indicate to what degree a threshold is likely to be approached or exceeded. It shall also acknowledge the influence of biophysical cumulative effects on socioeconomic systems, and shall evaluate how cumulative socio-economic effects might influence the regional environment.*
>
> *The Proponent shall describe and justify all assumptions, models, and information limitations and associated levels of uncertainty. It shall explain its approach to handling the uncertainty associated with CEA.*

The general observation of the Department is that the Proponent has met the requirements of the first paragraph of the guideline above. Their overall methodology and efforts were reasonably consistent for VECs related to the biophysical environment but not for the VSECs related to the socio-economic environment.

With respect to establishing thresholds, the Proponent provided a mixed response. In developing the explanation of the residual effects and determination of significance, the Proponent provided descriptors for what a "major significant" impact may "look like" but

did not provide a threshold reference for when that threshold was about to be breached. Again, this was done for the biophysical effects but not the socio-economic effects. INAC, however, acknowledges that frequently thresholds are not easily available and the challenge of establishing thresholds.

Related to the comments above is an observation about the application of the cumulative effects methodology described in Section 8.5. In that summary, the Proponent defines what appear to be four measures for cumulative effects evaluation (project-related synergistic effects through to cumulative effects in relation to other projects (global)). Regrettably, the "thresholds" defining significance of residual impacts (synergistic) do not directly relate to the significance rating of project effects in combination with other projects. For example, in Chapter 15, the residual effects focused on the ability for caribou to maintain recruitment (synergistic) while the "global" cumulative focus was on habitat loss. It might have been more effect to expand on the discussion on how much habitat would have to be altered in order to determine if there would be disturbance to natural recruitment.

Also, with respect to paragraph 3.0, the Proponent could have made a better effort of describing the uncertainties encountered.

The Department's first information request arrives from this quote from Chapter 8 of the Technical Report:

> ***Second**, the potential adverse environmental effects of each Project phase are rated in the residual adverse environmental effects section of each VEC chapter. Therefore, it is the cumulative potential adverse environmental effects of, for example, noise, habitat loss, human presence, etc. that occur during construction on caribou that are rated as significant or not significant, thus achieving an additional level of cumulative effects assessment. **Third**, in addition to rating the residual adverse environmental effects of each phase of the Project, the residual adverse environmental effects of the planned Project overall are rated for each VEC, thus achieving another level of cumulative effects analysis in this environmental assessment.*

IR #1 CEA Methodology

Please provide clarification on the interpretation of the paragraph above; in particular, the second cumulative effects evaluation for the residual effects of the direct effects. Where and how was the analysis of these "synergistic" effects undertaken? The Department currently interprets that this evaluation in the form of the descriptors for "major, moderate and minor" significant impacts. If this is accurate, it leaves the reviewers with the need to determine for themselves the current "health" of the VEC under examination because that is not provided in the text (e.g., p.15-26).

IR#2
Please explain why the methodology for cumulative effects assessment as described in Section 8.6 did not extend to the socio-economic evaluation of cumulative effects.

IR#3 Boundary Selection
Regarding this reference from Section 15-16 of Chapter 15 of the Technical Report:

> *The range boundaries of these three herds will be used as the environmental assessment area for caribou (Fig. 15.4). This area includes the Project footprint and a zone of influence around the Project footprint. The zone of influence represents an area in which changes in caribou activity budgets have been observed and are believed to be a result of industrial activity.*

Please expand your explanation for the reason why the projects selected for the cumulative effects review (Table 15.8) do not include Victoria Island, Kitikmeot Region and all the Slave Geological Province activities, although they were discussed under 15.3.8.1 and Supporting Document D6. The justification for the focus on larger developments is not clear. Related to this, please explain the omission of the zones of influence of the hamlets from the evaluation.

IR#4
Please explain how Table 15.8 (Technical report) relates to the five categories of human disturbance described in Supporting document D6 and whether these categories of activity were factored into the evaluation. Please clarify if it was for the reason explained in 15.3.8.4 (i.e., no habitat mapping available).

IR#5
Clarify if projects such as abandoned mines and the DEW line sites fall under the category of contaminated sites (supporting document D6; section 2.1.3) or where or how these were captured in the analysis, particularly, Roberts Lake mine and the Ida Lake mines.

IR#6
What threshold level(s) is referred to in the discussion related to changes in behaviour in the last paragraph on page 38 of Chapter 15 of the Technical Report.

IR#7
Have you compared your Zones of Influence findings with those calculated under GLOBIO and the Mackenzie Gas Project? If so, how does this other arctic work on zones of influence compare to your findings? This question relates to SD D6.

Information Requests relating to the Cumulative Effects Component of the Socio-Economic Impact Assessment in the draft EIS

Preamble

The Proponent identifies (Technical Report (TR) 3.12 p 3-132 to 3-139, and Table 3.27 p 3-133) other projects and activities that may have the potential to act in combination with the Project. The cumulative effects associated with the two VSECs are discussed in TR 24.3.8 p 24-15, and TR 25.3.8 p 25-23, 24. The potential for cumulative effects are identified in the following areas:

- Demand for employment is added to similar demand from other projects. Estimated total job creation (not West Kitikmeot) is estimated (TR p 25-8) for Snap Lake (500 workers) and Jericho (116 workers). Other current projects such as Ekati, Diavik, do not include workforce estimates. Nor are estimates for regional workforce demand provided for projects such as High Lake, the Lupin winter road, Gahcho Kué, Lupin, Bathurst Port & Road, or other exploration activities;
- Adverse effects on community services and infrastructure "similar to those arising from other sources of increased income, increased disposable income and poor health and social choices." (TR p 24-15);
- The Proponent considers "the potential effect of the Project in combination with other projects and activities in this region to be not significant." (TR p 24-15);
- The Project's economic contribution "will simply increase the benefits currently being captured by the communities…from other projects and activities." (TR p 25-23); and
- "Current levels of unemployment in the communities in the environmental assessment area indicate…that there is capacity to allow MHBL to fulfil its expectations with respect to community hiring and employment for its Project in combination with other projects and activities (TR p 25-24).

The Proponent indicates (Supplement Appendix K Table 4) their understanding that "all projects create the demand for employment and increased opportunities in the wage economy; increased demands on the community due to increased income; and possible benefits to quality of life due to increased income". Their determination is that the Project effect in combination with other projects is "not significant".

IR#8 Thresholds for Labour Force Supply

The Proponent does not present threshold information to justify their determination that adverse effects of the Project are "not significant". At a minimum, thresholds should be explored in the following areas:

- Level of demand that the local and regional labour force can supply over the short term, and a discussion of the socio-economic implications of exceeding this level of demand;
- The threshold of labour force stress at which community service agencies begin to

lose workers that cannot be adequately replaced (or a discussion of the pathway that avoids critical labour force stress); and

- Some discussion of pathways by which cumulative effects to which the Project contributes might lead to increased pressures on community services and/or infrastructure and the thresholds at which these pressures might become significant.

IR#9 Social Interactions

In the area of social interactions related to effects of work and income experienced by individuals, it is recognized that both beneficial and adverse outcomes may arise. Absence due to rotational work, for example, may lead to stress, and other adverse effects at the household level. Work may also, however, reduce stress by presenting the opportunity for individuals to become productive providers for their family. Similarly, income may, as the Proponent has suggested, lead to both adverse and beneficial effects at the individual, household and family level. This creates a challenge for cumulative effects assessment (for example, see attached "*The Nanisivik Legacy in Arctic Bay: A Socio-Economic Impact Study*" prepared in 2002 by Brubacher & Associates for the GN Department of Sustainable Development). It would be helpful, as a minimum, for the Proponent to discuss the pathways by which the thresholds of community stability might begin to be significantly affected, and at which family integrity might begin to be significantly affected.

IR#10 Monitoring and Attributing Cumulative Effects

A challenge for mitigation planning will be the intermingling of socio-economic effects from diverse sources. The Project may be implemented during the same period that the Jericho project is being initiated. Other similar effects may arise from other mining projects or from other sectors. The Proponent does not discuss any approach to how these cumulative effects might be monitored or to how this monitoring data might be integrated in specific mitigation activities. For example, the Project could adversely affect the ability of community service agencies by directly hiring an employee away from a service agency. However an equally adverse effect might arise by increasing the difficulty faced by service agencies in recruitment from an ever-tightening skilled local labour pool. All potential employers in the local labour market, not only the Proponent, induce this latter effect. Therefore, the Proponent should explain how they plan to:

- attribute socio-economic changes to either Project-related causes or to other causes. (See July Supplement Item 78 p 82 to 83); and
- coordinate their monitoring efforts with those of other projects to avoid duplication and consistency in information gathering.

Information Requests relating to the Socio-Economic Impact Assessment (SEIA) in the draft EIS

IR#11 Socio-economic model

Preamble
An explicit socio-economic interactions model could be useful in identifying the needed baseline data, in understanding the 'scale' at which data and analysis should be carried out, in thinking about the pathways of socio-economic effects, and in identifying the indicators that could provide early warning as part of an effective monitoring system. Understanding the underlying model should also help to focus discussion about the significance of any data issues.

IR#11 Apart from the macro economic model (NUNAVUTMOD), has MHBL adopted any explicit model for assessing the social and economic effects of the Project at the level of the target communities and/or the West Kitikmeot region? If so, can MHBL describe this model?

IR#12a-b: Boundary selection

Preamble
If there is something about Kugaaruk and its relationship with the Project that will naturally insulate it from Project interactions, then its exclusion would be understandable. Without evidence to support exclusion of this community, the potential exists that significant employment interactions with the Project might occur with no prior assessment of the impact these interactions would be expected to have (according to the relevant socio-economic impact model).

IR#12(a) What is the evidence/rationale for not including Kugaaruk in the set of 'key' communities? Is reference in TR p 1-11 to Kugaaruk as a 'point-of-hire' community an error?

Preamble
The spatial, or 'social', scale of analysis is important in order to identify significant effects. Discussion of the scale at which adverse and beneficial effects are distributed is important to ensure the Project does not create "winners" and "losers" and to ensure that mitigation measures are efficiently focussed at the appropriate social scales. Consideration of effects at a community level is probably the largest scale at which analysis can be meaningful. Regional-level analysis is a scale that simply 'averages' or 'smooths' out community-level analysis. It is only relevant if community-level effects are homogeneous—something that would need to be demonstrated.

IR#12(b): Does MHBL expect that the pattern of beneficial and adverse outcomes arising from the rotational work and the income provided by the Project will be different in communities such as Gjoa Haven and Taloyoak that have less previous mine sector experience than in more experienced communities such as Kugluktuk and Cambridge Bay?

IR#13 Project component – VSEC assessment

Preamble

Without any indication of the location, magnitude, significance of these effects prior to mitigation efforts, and only limited exploration of the "pathways of potential effects" it is very unclear how high or how low the stakes might be for successful mitigation—or how costly such mitigation might be for other parties to the mitigation efforts. Lack of pre-mitigation assessment at this point reduces the level of understanding of the importance of mitigation measures.

IR#13 Are any of the potential Project – VSEC interactions assessed to be "significant", at any scale, prior to mitigation? If so, what are these "significant" interactions? What is their spatial distribution (e.g. community and social level where impact is anticipated)? Their magnitude?

IR#14 Mitigation

Preamble

This information will help to identify if some of the 'key' communities are likely to be less prepared for engagement in the mining sector than others. If this is the case, mitigation measures—such as pre-employment training focused on 'soft skills' related to the transition into an industrial workplace—might be designed and targeted toward these specific communities.

IR#14 Have all four of the 'key' communities previously been designated as point-of-hire communities for mine-sector work? What is the level of previous mine sector experience held in the labour force of each 'key' community?

Information Requests relating to the Water Management and Control Regime of the Tailings Impoundment in the draft EIS

IR#15 Preamble

Supporting Document (SD) A1 states that the design full supply level (FSL) for the North Dam is 33.5 m elevation. In order to prevent overtopping of the dam, which might result in erosion or failure of the dam, a spillway is proposed to be constructed around the northeast abutment. The description of subaqueous tailings disposal in SD A3, Section 2.2.1 states that "a permanent spillway, excavated into

bedrock is designed" and suggests that construction of the spillway is a contingency measure since the water balance suggests that the FSL may never be reached.

Sections 2.5 and 2.6.1 of the Dam Design Report (SD A1) state that "A spillway will be constructed at this elevation" (i.e., 33.5 m elevation). Section 2.6.1 of that report elaborates further that construction of the spillway can be delayed until after construction of the dam because the shortest suggested timeframe for filling to the FSL is 5 to 6 years.

Section 2.6.1 of SD A.1 also introduces the concept of installing a "decant pumping system and …components in the dam design that would support short term overtopping" and that "this alternative approach will be investigated at the final design stage". Related to this, Section 2.6.1 of SD A1 suggests that "this minimum 5-year period could potentially be used to monitor the level of Tail Lake and maybe determine the best approach for the spillway during the first few years of operation".

These statements appear to be somewhat contradictory as regards the nature and timing of providing protection for the frozen-core dams against overtopping. It is unclear whether the structure is proposed to include an overflow spillway or whether the structure is proposed to be monitored for the first few years of operation for the purpose of determining whether protection against overtopping is required and, if so, what the means of protection should be.

The risks of uncontrolled overtopping are substantial as this event could lead to failure of the dam and release of a large flow of non-compliant water. Although detailed engineering designs are not required for review of the EIS, it is nonetheless important to have an understanding of the design intent and the operating plan for the dam to ensure that it can provide adequate protection against adverse effects.

We did not locate, in the draft EIS, any reference to the need, or lack thereof, for protection against overtopping for the South Dam. Given that the elevation of the South Dam is the same as the North Dam, it appears appropriate that this should be considered.

IR#15a-d

We request clarification from the proponent regarding:

- a) The design intent regarding provision of protection against overtopping for the North Dam;
- b) A clear discussion of the need, or lack thereof, for providing protection against overtopping for the South Dam;
- c) The intent of the Operating Plan for both dams as regards the provision of

protection against overtopping; and

- d) What is the design depth of water over the spillway crest when it is passing the 1:500 year design flood?

IR#16: Surface Flow at South Dam

Section 2.5 of the Dam design Report (SD A1) describes the South Dam as situated "on the watershed boundary between Tail and Ogama Lakes and is higher than elevation 28.3 m" (i.e., the natural outlet of Tail Lake) as reason for not removing the dam for closure. This is confirmed in Section 2.2.1 of SD A3 which also adds "The south dam will not be breached … and will not affect the regional hydrology in any way." Elsewhere in the DEIS, the suggestion is made that Ogama Lake may flow into Tail Lake.

The proponent should clarify and confirm that leaving the South Dam in place for closure will not disrupt the natural local hydrology under either normal or extreme events and clarify the discussion of the implications for leaving, breaching or removing the South Dam for closure.

IR#17: **Proximity To Doris Lake Talik**

The proposed mine plan involves mining of ore in the Doris North zone. It is understood that this zone is essentially contiguous with the ore zone which extends under Doris Lake where unfrozen conditions are believed to exist. Inflow of groundwater from the Doris Lake talik has the potential to significantly alter the project water balance. It is important that this condition be avoided.

There is no information regarding the location of the edge of the talik. No specific criteria are provided in the mine plan as to how the edge of the talik will be avoided. The Proponent should describe where the extents of the talik lie and how the mining plan will avoid these areas.

IR#18a-d: Dam Structures

The frozen core dam sections were noted to be based on the designs used at Ekati™. The foundation conditions there are probably comprised of bedrock, or bedrock overlain by relatively thin till.

- a) What has the performance been of these structures at Ekati™ and what precedent experience do frozen core structures have on foundations comprising deep, ice rich glaciomarine silts and clays?
- b) Have the dams at Ekati™ experienced the magnitude of deformations expected at Tail Lake resulting from the thawing of ground ice in the upstream portion of the foundation?

- c) Provide more details on analyses and monitoring that will be required for these structures to ensure that deformation and cracking does not jeopardize the integrity of the frozen core.
- d) The soil samples from Tail Lake were noted to contain 2% pyrite. Please confirm and explain why there is pyrite in the marine silts and clays.

Information Requests relating to the Jetty

IR#19a-c: Jetty

- a) Have any stability analyses been done to confirm that the geogrids will actually support the fill as it is being placed on the seabed, especially in the section where there is no permafrost?
- b)Will the 40^{o} side slopes be sustainable with the soft sediment foundation, or will the fill spread out, increasing the footprint of the structure?
- c) What are the details of staged construction methodology being considered for the deeper water sections?

Information Requests relating to the Atmosphere and Climate Characterizations in the draft EIS

IR#20: Atmospheric Environment

As per Section 9.3.6, Monitoring and Follow-up Programs, a meteorological station was installed at the site in May 2003. This station includes equipment to monitor TSP, PM10, PM2.5 and dustfall at the Project site: NAPS monitors particulate matter (PM) data including PM2.5 and PM10 (particles with aerodynamic diameters of less than 2.5 and 10 micrometers respectively) for mass, lead and sulphate.

The NAPS Network has not reported suspended particulate matter data since 2003. For this project, the EIS should re-consider monitoring for total suspended particulates, but include chemical analysis of potential metals from the milling process. The Proponent is requested to comment on this suggestion and how it would be implemented.

IR#21a-c: Suspended Particulates

On pages 9-31, there are no air quality or noise effects expected after the decommissioning of the Project. PM 10 & 2.5 could remain high during A&R and

until stabilization of site. Use of camp and immediate area for further exploration will extend the time that particulates will remain. The Department requests that:

- a) The Proponent state that residual effects are not significant and are mitigable.
- b) Add and review references related to Environment Canada's National Air Pollution Surveillance (NAPS) Network
- c) The Proponent provide the type of meteorological station, its location, distance from buildings, and other relevant parameters.

IR#22a-c: Snowfall

On page D-4 of SD B1, the Proponent states "The snowfall data reported by Rescan for Boston are judged to be unreliable, as they are based not on direct measurements but on calculations and assumptions that cannot be validated. Snowfall (and total precipitation) was therefore estimated from regional station data. The best approach was considered to be application of the correlation relationship found for monthly rainfall."

- a) The EIS should explain why the Rescan reported data was unreliable and why the rainfall correlations were adequate for snowfall.
- b) Tables 3 to 6 should include maximums and minimums for the period, for each year and for each month.
- c) Some discussion of water equivalency of snow at the stations should be included. For example, Table 6: Mean Annual Precipitation at Doris North and Regional Stations (1959-2001), water equivalency varied from 10:1 at Lupin to 8.5:1 at Cambridge Bay.

IR#23: Design Rainfall Storm Events

In Section 2.3.3 of SD B1, the Proponent states "The storm events estimated for the regional stations were transferred to the project site using the equation". The Department is unclear how this correlation was developed, and so cannot judge whether it was reasonable. Explanation is required as to why the slope of the probability curve for Doris North matches Lupin but is less than Cambridge Bay.

Information Requests relating to Surface Hydrology Descriptions in the draft EIS

IR#24: Extension of the Local Stations Period of Record

In Section 3.2.4, the EIS states "Gordon River flows to the northeast into Bathurst Inlet approximately 150 km south of the site and Ellice River flows north to Campbell Bay approximately 100 km northeast of the site." The Department feels that the EIS should compare the overlapping record of the two hydrometric stations to indicate if runoff differs greatly.

IR#25a-c: Baseline Surface Water Quantity Summary

In Table 17, the EIS correlated weekly flow estimates to estimates of annual runoff probability, without an explanation of methodology.

- a) INAC is concerned that because the Ellice watershed is larger than the Doris, important factors such as seasonal length and reaction profiles will differ. The Proponent should consider and comment on this concern.
- b) As well, on page D-16, the EIS states "Although data was available on Ellice River from 1971 to present, "...during a quality Assurance Program audit in 2002, WSC found that streamflow was seriously underestimated at four sites prior to 1984, one of which was Ellice River." (Environment Canada, 2003). INAC is concerned that since only data from 1984 was used, Document "D" is inconsistent. The Proponent should consider and comment on this.
- c) Finally, the EIS does not explain and show how it moved from 232 mm of lake evaporation, lake outflow and annual precipitation to a water balance for each basin.

Information Requests relating to Waste Rock and Tailings Characterization in the draft EIS

IR#26a-d Quarries

With respect to Supporting Document A2 (Revised and Updated Water Quality Model):

- a) What is the makeup (rock type, ABA characteristics) of the "up to 155,000 tonnes of waste rock that may be stored on surface" during the mine life (page 22, section 3.2.4). There needs to be clarification on what waste rock is produced, and the logistics of when it is produced, since it is not clear how much may potentially be brought to surface, and the practical methods for how the runoff will be contained (the water quality model in A2 assumes that all runoff from the ore and waste rock piles is captured and sent to the tailings facility).
- b) The proponent must show a practical way of capturing all this runoff.
- c) Clarify why it is considered appropriate to use an average release rates from the final cycles of 5 kinetic test results (including Doris North mafic

volcanic, gabbro, mafic volcanic with veining, quartz (>1% pyrite, and Boston Property altered basalt) (pg 22, sec 3.2.4) as representative of the up to 155,000 tonnes of waste rock that may be stored on surface during the mine life.

- d) Clarify why it is considered appropriate to use leach extraction data for quarried rock from Q1, Q2 and Q3 (AMEC 2003c) for ramp development rock? i.e. show comparison quarry rock geochemical characteristics and rock types to the geochemical characteristics of ramp development rock potentially to be used for construction).

IR#27 Updated Surface Infrastructure Preliminary Design

With respect to Updated Surface Infrastructure Preliminary Design (SD A7),what has been planned for the surface waste rock storage area, which is not shown in the report? Although Section 5.11 indicates that any excess "will be stored directly onto the tundra immediately downslope of the ore stockpile", no area is shown that is suitable for up to 115,000 tonnes as assumed in the Revised and Updated Water Quality Model (page 22).

IR#28 a-d

Regarding the Technical Report, Project Description (Chapter 3):

- a) Page 3-50 indicates that humidity cell tests were conducted on samples from Quarry 1, 2 and 3, subsequent to SCB2 (extraction tests and static ABA test results). The results and interpretative report for these humidity cell tests would be appreciated.
- b) Also, please provide the single ABA result from Quarry 4 at the proposed mill site, along with the geological description of the sample relative to the quarry geology, volume of material to be produced and it's potential use.
- c) Since results from the samples from Q1, Q2 and Q3 were used in the water quality model to approximate characteristics for construction rock from the adit and ramp development, the samples submitted for humidity cell tests should be discussed in terms of how representative they are in relation to the rock types and range of geochemical characteristics of the portal material and the sample from Q4.
- d) Page 3- 91 indicates that "Wall rock from near the ore zones, which is carbonate altered, will be selected for construction of a carbonate rich pad of rock to be places beneath the surface ore stockpile area." Clarify the rock type, and the type of carbonates in this rock type. Previous geochemical descriptions indicate that the ore is characterized by iron carbonate. Iron carbonate does not provide effective buffering. Clarify the type of leachate that may be expected from this pad over the long-term

under neutral conditions, as well as during short term exposure to acidic drainage from the ore stockpile. It is not clear how this material relates to the samples that were submitted for kinetic testing.