



Yellowknives Dene First Nation

P.O. Box 2514, Yellowknife, NT X1A 2P8

February 28th, 2011

Tara Kramers
INAC – CARD
Yellowknife, Northwest Territories
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Dear Ms. Kramers:


Re: Giant Mine EAs

The Yellowknives Dene is pleased to submit the following Information Requests to INAC and the Review Board.

We would like to thank INAC's Environment and Conservation group for assisting the YKDFN not just by providing much needed participant funding but also being supportive and flexible with the deadline. It is a relief to work collaboratively with INAC and hope that this changed relationship continues and we can continue to improve.

If you have any questions or if we can clarify these concerns, please contact YKDFN Lands and Environment at (867) 766-3496.

Sincerely,


Todd Slack

Copy: Alan Erlich – MVEIRB (by email)
Francis Jackson – INAC (by email)
Kevin O'reilly – Alternatives North (by email)
Jeff Humble – City (by email)
Sheryl Grieve – NSMA (by email)

- i. **Source:** Yellowknives Dene First Nation
 To: Indian and Northern Affairs Canada
 Subject: Guiding Principles

Preamble:

Chapter 2-29: “In particular, traditional values about the environment have influenced and confirmed the guiding principles of the remediation plan”. In reviewing the principles outline in section 1.2.1 there seems to be little reflection of traditional values. Instead, the objectives seem to simply prevent further contamination of the surrounding environment. . In terms of proposed remediation activities only Baker Creek is targeted to return it to the productive part of the ecosystem.

Request:

It is requested that INAC explain why only Baker Creek was selected as a focus of environmental health - Why wasn't the whole site restored in a similar manner? If not possible, why wasn't the focus shifted to site usability for the membership of YKDFN and the citizens of Yellowknife.

- ii. **Source:** Yellowknives Dene First Nation
 To: Indian and Northern Affairs Canada
 Subject: Future Reconsideration of Alternatives

Preamble:

Chapter 6.2.2.4: “It should also be recognized that, once the proposed alternative is implemented, long-term risks will be reduced to levels such that will be difficult to justify the costs and increased short-term risks associated with implementing a complexly different alternative”

Request:

If this project, by its very existence, is going preclude any other solutions from being implemented, then it necessarily needs to be accompanied by a commitment to fully fund the project in perpetuity. While the current government may acknowledge its a requirement, future governments may not treat the level of concern in the same way.

- iii. **Source:** Yellowknives Dene First Nation
 To: Indian and Northern Affairs Canada
 Subject: Pit Remediation – Analysis of Pit Remediation Options

Preamble:

Four options for pit remediation were considered. The decision to select a specific option was conducted during a series of closed meetings with technical advisors in 2003 and 2004. It should be noted that no information is provided on the meeting attendees and overall there is limited discussion pertaining to the criteria that was used to select the pit remediation options that were provided in the DAR.

Consequently limited discussion was provided in the DAR with regards to the how the selected pit remediation option will impact future land use and redevelopment. It is unclear if future land use and land redevelopment was considered in the criteria for selection of the preferred pit remediation option. Further, it is unclear how desires from land users were considered in the pit remediation option analysis.

Request:

- a. It is requested that additional details are provided with regards to the selection criteria and weighting used to assess the preferred pit remediation options. From the list of criteria presented, it is requested that specific details regarding future land use and land redevelopment are provided, as well as, what specific stakeholder input factored into the options analysis.
- b. It is requested that any cost estimates to support the selection of the preferred pit remediation options is provided.
- c. It is requested the Proponent detail how the selected pit remediation option will impact land users (e.g., YKDFN) in the area. Further, it is requested that specific recommendations are provided on how land user impact will be minimized.
- d. P6-53: "At that time, the slopes of the [b3] pit will be pushed in to partially fill the excavation and re-vegetated" & the walls of the B4 pit will also be regarded to shallower slopes. It is requested that the proponent explain the use of this option in these pits, as it is not listed under 6.4.2?

iv. **Source:** Yellowknives Dene First Nation

To: Giant Mine Remediation Project

Subject: Pit Remediation – B1 Pit Cover

Preamble:

The proposed remediation plan for the B1 pit will implement a cover that is to be similar in design as that employed for the on-site tailings areas. Several potential cover designs were presented for the tailings areas; however, the final cover design is to be selected based on the results of a cost benefit analysis and completion of performance test plots. As such, the specifics regarding the cover design, goals, and performance monitoring are unknown.

Request:

- a. It is requested that the design objectives for the cover be provided. For example, is the objective of the cover to limit infiltration of water, limit wildlife access, etc.
- b. For each design objective detailed above, it is requested that the monitoring program be detailed that will be used to demonstrate cover performance is achieved and sustained in the future. It is requested that the threshold that distinguishes the limit between a pass or fail on achieving acceptable cover performance be provided and that where permissible, this threshold value be a measurable parameter defined in the monitoring program. For example and illustrative purposes only, if the design objective of the cover is to limit infiltration, the monitoring program may include the capabilities of monitoring moisture movement through the cover, and that a threshold infiltration quantity be established as a pass or fail criterion to understand cover performance.
- c. It is requested that additional details are provided on how the performance test plots used for the tailings areas will be transferable to the B1 pit cover. It is requested that environmental and physical settings between the tailings areas and B1 pit be compared in the response so as to understand the similarities and differences between the locations.

v. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Pit Remediation – Security Fencing

Preamble:

The remediation plan for six of the eight open mine pits specified that any entrances to the mine workings be closed, pit slopes regarded if necessary, and a perimeter security fence installed. These six pits will remain open and unfilled (i.e., not backfilled or flooded). Select efforts to ensure that access to open pits, and associated safety, are uncertain.

Request:

- a. It is requested that the criteria and/or standard that will be applied to ensuring a long-term safe closure of the mine opening and pit stability be provided.
- b. It is requested that additional details be provided with regards to any independent monitoring that will be completed to ensure that the mine openings are satisfactorily closed and long term stability of the pit walls are achieved. It is requested that additional detail be provided on the post-remediation frequency of independent monitoring of the open pits.
- c. Perimeter fences are prone to damage, vandalism, and may not limit access to the open pit by aggressive trespassers of the area. In short, fences are not perfect in limiting access to the open pit. Despite proposed efforts to improve safety of the pits by closing mine work openings and regarding pit site walls, the open pit will

likely be a dangerous place for people and wildlife if there is a successful breach through the perimeter fence. Security of the site has been recommended as one method to control access to areas of the Giant mine site. It is requested that additional details regarding the efforts to limit/control access to the open pits are provided. It is requested that the response include a discussion on the frequency of inspections of the fence integrity, efforts to monitor activity in the vicinity of the fence, and any other relevant security monitoring efforts.

- d. INAC should be directed to examine analogous sites from other parts of the country to evaluate risks. Particular attention should be paid to areas immediately adjacent to urban centres with high levels of winter outdoor activity.

vi. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Pit Remediation – Freezing of contaminated soils in B1 Pit

Preamble:

It is stated in the DAR that 60,000 m³ of contaminated soil can be safely frozen in B1 pit, and that 58,000 m³ of contaminated soil will be placed in B1 pit. The locations and associated volumes of contaminated soil, as well as the contaminant types, were not detailed. There remains uncertainty in the prediction of the volume of contaminated soil estimated.

Since the estimated contaminated soil volume and available disposal volume in the B1 pit are similar, it is possible that the available storage volume could be exceeded if predictions are underestimated. There is uncertainty in the contingency in place should the actual volume of contaminated soil exceed the available storage volume in the B1 pit.

Request:

- a. It is requested that the contaminant types that are typical of that which is proposed to be deposited in the B1 pit be provided.
- b. It is requested that the acceptable contaminated soil types that are permissible for disposal in the B1 pit be defined. If there are restrictions on the contaminated soil types for deposit in the B1 pit, it is requested that the QA/QC measures to control entrance of contaminated soil in the B1 pit be defined.
- c. It is requested that a contingency plan is detailed to account for the possibility of actual contaminated soil to exceed the allowable storage volume in the B1 pit.

vii. **Source:** Yellowknives Dene First Nation

To: SENES Consultants Limited and Indian and Northern Affairs Canada

Subject: Geometric and arithmetic mean

Preamble:

The geometric mean and arithmetic mean are both presented in the summary of historical surface and sediment quality data in the Tier II Risk Assessment Report¹ developed for the DAR. The use of geometric mean tends to dampen the effect of very high or low values in the averaging calculation. In general, geometric mean is commonly use in situations where the data range covers several orders of magnitude. The existing monitoring data was be collected over a very large sampling period – tens of samples over decades, and produced a dataset that contains wide variance, but because the data is independent, these variations should not be ‘processed out’.

The use of the geometric mean to analyze surface water data can produce significantly decreased values. For example in *Table 7.1.4* the geometric mean and arithmetic mean are calculated to be 3.8 µg/L and 28.1 µg/L for 58 respectively for collected surface water samples. The use of the geometric mean of historical surface and sediment water quality data as the input parameter for the numerical model in the risk assessment could result in the underestimation of arsenic loading into the receiving water bodies.

Request:

It is requested that clarification is provided on what type of mean input values of historical collected data for arsenic surface and sediment were utilized in the numerical modeling simulations used in the risk assessment. It is further requested that the proponent indicate the rational for utilizing a geometric mean for the evaluation of future monitoring data, if that is the intention of the proponent.

- viii. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Freezing ground system monitoring

Preamble:

Instrumentation is proposed to monitor the freezing system used to contain arsenic trioxide dust in underground storage areas. Monitoring activities are proposed to: include a ground monitoring system; monitoring of the freezing fluid characteristics during the active or hybrid phase of freezing; and, monitoring of gas pressure and heat loss during the passive phase of freezing.

It was indicated that the proper functioning of the ground freezing system would imply the absence of arsenic trioxide leaks from the containing chambers. For the first step of the freezing process an initial objective was outlined to maintain ground

¹ SENES Consultants Limited, 2006. Tier 2 risk assessment. Giant Mine Remediation Plan. (Giant Mine Remediation Plan Supporting Document N1).

temperature colder than -10 °C over a distance of at least 10 m around and below each chamber stope. An overall long term performance target to maintain the water and arsenic dust to at least -5 °C was outlined for the active freezing phase. Modelling results indicated that active freezing would be required for the first five years of operation and it was estimated that it would take up to ten years for all the dust in the mining stopes to reach -5 °C.

A set of contingency measures were outlined for the freezing system during both the initial freezing process and the long term passive phase; however, the contingency measures were not tied to specific performance criteria. It is noted that in *Section 14: Environmental Monitoring* of the DAR no specific performance criteria or monitoring schedule for the freezing system are provided.

Request:

- a. It is requested that specific performance criteria for the temperature of the freezing system are defined to correspond to the contingency measures that are outlined for the freezing system during the initial freezing, active, and passive phase of operation.
- b. It is requested that a schedule for monitoring all characteristics to understand the freezing system performance be provided.

ix. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Groundwater monitoring

Preamble:

It was proposed that the induced hydraulic capture zone created by the pumping of minewater will limit the release of contaminated groundwater to the surrounding environment. It was indicated that the mine water levels even during reflooding would be maintained in the underground workings sufficiently below static water table levels to promote an inward gradient of groundwater flow into the underground mine workings. It was indicated that historical groundwater data of the piezometric levels and geochemistry would be utilised to establish groundwater conditions and would be utilised to compare changes brought by the planned remedial activities. The collection of ground water data (piezometric and geochemistry) is outlined in the DAR, however it is not clear how the collected groundwater data would be used to evaluate the performance of the hydraulic capture system and its ability to maintain an inward hydraulic gradient. Additionally it is unclear in the DAR on what type of contingency measures and corresponding threshold values would be implemented if the hydraulic capture system is not working as intended.

Request:

It is requested that the proponent outline how the groundwater monitoring data (piezometric level and geochemistry) will be used to evaluate the hydraulic capture zone and its ability to maintain an inward hydraulic gradient into the underground mine workings. As part of describing the evaluation of the hydraulic capture system it is requested that the proponent identify threshold values for piezometric water levels and geochemistry, and detail corresponding contingency activities if the hydraulic system is deemed to be not working efficiently.

- x. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Underground water management

Preamble:

The storage of contaminated water in the underground working was outlined as the preferred option. The storage of contaminated water as a management option will require the flooding of the underground workings. *Section 6.8.3 Underground Water Ground Management* indicates that during the freezing process the mine will be flooded to a safe distance below the bottom of the lowest arsenic stope. Once the freezing system is deemed to be complete it is planned that the mine will be flooded further, to a maximum level just below the bottom of the lowest pit. It should be noted that if the initial freezing of the arsenic dust does not perform as indicated, the volume of contaminated water required for storage could exceed the allowable storage capacity of the underground workings. No contingency measures are outlined for the storage of contaminated water if the freezing system does not perform as planned and the anticipated storage capacity of the underground system is exceeded.

It was indicated that flooding of the mine workings is expected to generate poor quality water due to the release of arsenic from underground materials including tailings, waste rock, backfill contained in the mined out stopes and the mine wall rocks. It was indicated that the minewater treatment system will be designed to accommodate the short duration of higher concentration that are anticipated to occur after the mine has been flooded. It should be noted that it is unclear in the DAR if the minewater treatment system that is being referenced is the existing water treatment system or the proposed water treatment system. It was indicated in the DAR that minewater quality will continue to be monitored; however no performance guidelines are provided about the expected minewater quality for the existing water treatment system and the anticipated new water treatment system. No contingency plans are outlined for the treatment of contaminated water if the

minewater quality is measured to be higher than the intended design criteria of the existing or proposed water treatment system.

Request:

- a. It is recommended that a contingency plan is outlined for the storage of contaminated water if the initial freezing of arsenic dust does not perform as designed and the storage capacity of the underground works is exceeded.
- b. It is requested that performance criteria for minewater quality are established for water treatment of the existing and proposed water treatment system. It is requested that contingency actions are detailed for the condition of minewater quality being in exceedance of the performance criteria.

xi. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Effluent discharge criteria

Preamble:

It was stated that the effluent discharge for the existing water treatment system and the new system which will use an outfall and diffuser will be in accordance to the regulatory limits of the Federal Metal Mining Effluent Regulations (MMER)². The MMER are considered to be applicable for operating mines and for closed mine under certain operating conditions. It should be noted that the MMER are generally considered applicable for operating mines, they normally permit higher discharge limits than would be applicable for a closed mine that is being rehabilitated. It should be noted that the discharge of treated water according to the MMER will result in the exceedance of the CCME water quality guidelines for the protection of freshwater aquatic life. The applicability of using the MMER for effluent discharge during rehabilitation activities is unclear at this time. It should be further noted that no other development in the North would willingly exceed the guidelines as an initial position and to propose this is unacceptable.

Request:

It is requested that the applicability of the MMER as the authority for regulating the regulatory discharge limits is provided. It is further requested that if the MMER do not apply then a regulatory limit for the sampling point in the vicinity of the outfall diffuser be designated. CCME regulatory limits for the protection of aquatic life and Health Canada drinking water quality guideline would be appropriate in this circumstance.

² Metal Mining Effluent Regulations, SOR/2002-222

- xii. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Outfall and diffuser monitoring

Preamble:

Preliminary dispersion analysis modeling of the diffuser indicates that the CCME arsenic water quality guideline for protection of freshwater aquatic life of 5 µg/L can be maintained in Yellowknife Bay within a short distance of (2 to 10 m) of the diffuser discharge point. It should be noted that the modelling was based on assumed average arsenic effluent concentrations of 0.2 mg/L and a short term effluent concentration of 0.4 mg/L; both of which are smaller than MMER regulatory limit of 0.5 mg/L. It should be further noted that the dispersion analysis only considered arsenic as the constituent. It was stated that the water quality will be monitored in the vicinity of the outfall diffuser, outside the initial mixing zone. It is noted that no regulatory limits are stated for this sampling location and also the lateral distance of the sampling point from the diffuser is not stated.

Request:

It is requested that anticipated lateral distance of the sampling away from the diffuser is indicated. It is requested that a regulatory limit for the sampling point in the vicinity of the outfall diffuser be designated. CCME regulatory limits for the protection of aquatic life and Health Canada drinking water quality guideline could be adopted. In addition to the designation of a regulatory limit it is requested that a contingency plan should be outlined for the outfall and diffuser if the regulatory limits for the sampling point outside of the mixing zone cannot be achieved.

- xiii. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Surface water quality monitoring

Preamble:

The Canadian Water Quality Guidelines³ (CWQG'S) for the protection of Freshwater Aquatic Life (FAL) were recommended as the most appropriate criteria for assessing the geochemistry surface water quality data. It was indicated that surface water quality in Baker Creek would not meet the CWQG-FAL for some contaminants (e.g., arsenic). Section 6.9.3 of the DAR outlines a set of proposed remediation activities for Baker Creek, which included rerouting portions of the

³ Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, 1999

creek and the capping and/or removal of contaminant tailings and sediments. It was indicated that the evaluation of the proposed remediation activities at Baker Creek will require a process of public consultation where input will be seek community preferences for the implementation of rehabilitation activities in Baker Creek.

A risk assessment of the post remediation environment in Baker Creek predicted surface water concentrations of 188 mg/l which are above the CCME water quality guideline of 5 µg/L. It was stated that the predicted arsenic surface water concentration may result in potential adverse effects to fish in Baker Creek. The risk assessment considered that sediment in Baker Lake would be removed and some sections of Baker Creek would be realigned, The results of the risk assessment indicated that further clean up of sediments would reduce the risk to fish habitat in Baker Creek. In Section 14.2.2.4 *Surface Water Monitoring* it was stated that the monitoring of health of benthic fish communities will provide the best measure of long-term effects of the remediated Giant Mine site.

Request:

It is requested that surface water quality guidelines are adopted to assess the performance of remediation activities at the Giant Mine site. The Canadian Water Quality Guidelines (CWQG'S) for the protection of Freshwater Aquatic Life (FAL) could be adopted as surface water quality guidelines. Specific to the Baker Creek it is requested that monitoring activities are outlined to assess the performance of the proposed remediation activities in Baker Creek. Monitoring activities should be outlined in the planned public consultation process.

xiv. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Sediment quality monitoring

Preamble:

It was stated that sediment quality guidelines developed by the CCME have been used to evaluate the quality of sediment samples collected from the Giant Mine site. In Section 8.4.4.1 The document does not mention any evaluation criteria for sediments – namely guidelines developed by the Government of the Northwest Territories. It feels as though the remediation of Baker Creek is used as a surrogate for the whole area, but it represents only one part of the impacted environment (See also table 8.5.1, 8.6.1)

In section 14.2.3.2 *Benthic Invertebrates and Sediments* twelve (12) sediment sample sites are proposed to be proposed to be established throughout Baker Creek stretching in area from the Creek mouth to Baker Pond. For Yellowknife Bay benthic sampling is being proposed for a point near the treated effluent discharge location, in Back Bay

within the vicinity of the Baker Creek mouth, and also for a reference area in the south end of Yellowknife Bay. It is unclear if the sediment quality data will be compared to any applicable guidelines. With the exception of the monitoring point located near the proposed effluent discharge, it is uncertain whether the sampling locations are able to analyse the performance of any remediation activities.

Request:

It is requested that surface sediment quality guidelines are adopted to assess the performance of any remediation activities at the Giant Mine site. Sediment guidelines developed by the Government of the Northwest Territories or the CCME could be adopted. It is further requested that the sampling locations for sediment within Baker Creek and at Yellowknife Bay are provided and outlined relative to any planned sediment remediation activities.

- xv. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Historic Modeling of Arsenic Inputs

Preamble:

8.9.3.2 YKDFN are unaware if this information has been published. During the scoping sessions, only rough and incomplete data was available and YKDFN were forced to guess at the levels of arsenic that had been released.

Request:

INAC should publish this data as soon as possible.

- xvi. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Figure 8.9.5

Preamble:

The levels of contamination in Wawa actually are lower than found throughout the GIANT site. It is not clear what assumptions or variances exist between the two 'risk-assessments' especially when the market food criteria represents such a large proportion of 'intake'. YKDFN are unsure why these reports have produced such a degree of variance.

Request:

INAC should be directed to explain why the risk assessment produced much higher results in Wawa when it seems that the actual contamination in the environment was lower.

xvii. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Town Site and Marina – Future Development Risk Assessment

Preamble:

The Giant mine contains legacy buildings that were used to house employees and visitors to the site (collectively referred to as the Town Site). The soil in the vicinity of the Town Site has been identified as a risk to any humans living at the town site⁴. Currently, the Town Site land is leased to the City of Yellowknife, and there are proposed plans to develop the Town Site as a nature area/walkway. In general, remediation proposed for the Town Site includes the demolition of the buildings and the removal of soil that contains arsenic at concentrations above the suggested human health risk-based soil quality objective⁵ of 340 µg/g total arsenic derived for Yellowknife soils at industrial sites. During INAC's public engagement process, which was detailed in the DAR, select participants involved in the engagement expressed a desire to have the Town Site and marina remediated. The DAR indicates that all soil that contains arsenic in excess of the 340 µg/g industrial arsenic objective will be removed and stored, however detailed soil excavation locations and extents have not been provided, making discerning the extent of the soil remediation at the Giant Mine site difficult. It should be noted that the soil at the marina has been identified as containing arsenic above the 340 µg/g, however no direct statements are provided about proposed remediation activities at the Marina location.

Request:

- a. Limited details were provided regarding the remediation of the marina soils. It is requested that additional details are provided regarding the proposed remediation in this location. It is requested that details are provided to explain the potential limitations on land and water use in this region post-remediation.
- b. The YKDFN recognized that discussion of the selection of the industrial arsenic soil concentration objective for the remediation criteria is outside the scope of the assessment, however due to the planned future recreational use of the Town Site and marina the risks of adopting this standard should be assessed. It is requested that additional details are provided with regard to the increase in risk to humans that may result from redevelopment of the Town Site and Marina as a

⁴ SENES Consultants Limited, 2006. Tier 2 risk assessment. Giant Mine Remediation Plan. (Giant Mine Remediation Plan Supporting Document N1).

⁵ Richardson, G.M. 2002. Determining Natural (Background) Arsenic Soil Concentrations in Yellowknife NWT, and Deriving Site-Specific Human Health-Based Remediation Objectives For Arsenic in The Yellowknife Area. Final report, submitted by Risklogic Scientific Services Inc. to the Yellowknife Arsenic Soils Remediation Committee (YASRC), Yellowknife. April 2002.

recreational area after the proposed remediation plan. Discussion of the increased risk to humans should take into consideration the input from the community engagement sessions were considered in the proposed remediation plan for Town Site.

xviii. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Foreshore Historical Tailings Remediation

Preamble:

Riprap and geotextile has been used as a cover over the historical foreshore tailings located on North Yellowknife Bay above the waterline. The proposed remediation plans to extend the riprap and geotextile cover over the submerged tailings (i.e., below the waterline). The proposed spatial extent of rip rap and geotextile cover placed below the waterline is unclear. It is noted that within the Giant Mine Remediation Plan Supporting Document F2⁶ (Appendix B of the DAR), mixed tailings and sediment is present over a large portion of Yellowknife Bay and includes the marina vicinity. The implication of a permanent cover in potential development areas, and use, along the shoreline and in Yellowknife Bay is unclear in the DAR.

The proposed riprap and geotextile cover aims to reduce tailings erosion and to reduce the amount of arsenic leaching into the water column. There are limited engineering design and construction details provided in the DAR regarding the riprap and geotextile cover. As such, there is uncertainty in whether the cover will be effective in achieving erosion control of the tailings below the waterline, limiting re-suspension of tailings below the waterline, and reduction in arsenic leaching from the tailings into the water column.

The DAR suggests that the riprap and geotextile cover will make a suitable environment for fish rearing, feeding, and spawning and invertebrate benthic life production. The water quality in near proximity to the cover, or on the cover, was not detailed in the DAR. As such, it is unclear if the cover environment is suitable or not for aquatic life.

Request:

- a. It is requested that additional details into the potential limitations on infrastructure development, and uses, along the shoreline and in Yellowknife Bay be provided for conditions post-remediation (e.g., after riprap and geotextile cover placement). For example, if a dock/wharf is desired to be constructed in a

⁶ Golder Associates 2005. Investigation of the Historical Distribution of the Tailings in North Yellowknife Bay. (Giant Mine Remediation Plan Supporting Document F2)

- region where riprap and geotextile cover has been placed, any foundation or tie-downs for the dock/wharf may disturb the cover. Details on the acceptability and risk associated with disturbance of the cover should be addressed in the Proponent's response.
- b. It is requested that additional details regarding the engineering design and construction of the riprap and geotextile cover be provided. Items of importance include, but are not limited to: cover placement locations on a map; spatial extent of cover placement and rationale; cover material characteristics; and, cover physical dimensions and rationale for thickness. The details provided are requested to demonstrate how the cover design will achieve the goals of: erosion control, limiting re-suspension of tailings, and reduction in arsenic leaching.
 - c. It is requested that additional details regarding the monitoring that will be completed post-remediation to demonstrate the riprap and geotextile cover is performing as designed. Should monitoring indicate cover performance is not achieving design performance, it is requested that additional discussion regarding the potential corrective actions and adaptive management be provided.
 - d. It is requested that additional details be provided on the expected water quality in near proximity to the rip rap cover. It is requested that water quality criteria be applied to understand the risk of potential impacts to aquatic life that may interact with the cover or vicinity of the cover.

xix. **Source:** Department of Fisheries and Oceans
To: Department of Fisheries and Oceans
Subject: Foreshore Historical Tailings Remediation

Preamble:

Riprap and geotextile has been used as a cover over the historical foreshore tailings located on North Yellowknife Bay above the waterline. The tailings contain elevated levels of arsenic, zinc, copper and lead. The proposed remediation plans to extend the riprap and geotextile cover over the submerged tailings (i.e., below the waterline).

The proposed riprap and geotextile cover aims to reduce tailings erosion and to reduce the amount of arsenic leaching into the water column. There are limited engineering design and construction details provided in the DAR regarding the riprap and geotextile cover. As such, there is uncertainty in whether the cover will be effective in achieving erosion control of the tailings below the waterline, limiting re-suspension of tailings below the waterline, and reduction in arsenic leaching from the tailings into the water column.

The DAR suggests that the riprap and geotextile cover will make a suitable environment for fish rearing, feeding, and spawning and invertebrate benthic life production. The water quality in near proximity to the cover, or on the cover, was

not detailed in the DAR. As such, it is unclear if the cover environment is suitable or not for aquatic life.

Request:

- a. It is requested that the Department of Fisheries and Oceans comment on the acceptability of implementing a submerged tailings cover and its ability to induce marine wildlife to live in close proximity to tailings that contain elevated levels of arsenic and metals.

xx. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Yellowknife Bay and Back Bay Sediments

Preamble:

The sediments in Yellowknife Bay have been identified to be elevated with arsenic, and other metals, in a region ranging from the historical foreshore tailings to the marina. Sediment quality indicated that select locations exceed the CCME probable effects limit for aquatic life for arsenic, copper, lead and zinc.

There is no active, or intrusive, sediment remediation planned for sediments in Yellowknife Bay and Back Bay. The proposed plan is to reduce dissolved constituent (e.g., arsenic and other metals) loadings to Yellowknife Bay and Back Bay from various sources, this, in turn, may result in reduced sediment quality in Yellowknife Bay and Back Bay.

The concentration of arsenic in the sediment has been modeled⁷ and predicted arsenic levels are above the suggested human health risk-based sediment quality objective⁸ of 150 µg/g total arsenic derived for Yellowknife Bay sediments at non-residential, publicly-accessible areas in Back Bay through the year 2100, and in Yellowknife Bay through the year 2050. In Baker Creek the sediment will have a concentration above GNWT guideline, and is predicted to be approximately 1700 µg/g in the year 2100. The elevated sediment quality has potential to limit future land use and development in select regions of Back Bay, Yellowknife Bay, and Baker Creek.

⁷ SENES Consultants Limited, 2006. Tier 2 risk assessment. Giant Mine Remediation Plan. (Giant Mine Remediation Plan Supporting Document N1).

⁸ Richardson, G.M. 2002. Determining Natural (Background) Arsenic Soil Concentrations in Yellowknife NWT, and Deriving Site-Specific Human Health-Based Remediation Objectives For Arsenic in The Yellowknife Area. Final report, submitted by Risklogic Scientific Services Inc. to the Yellowknife Arsenic Soils Remediation Committee (YASRC), Yellowknife. April 2002.

Wildlife has been negatively affected by the sediment quality and will continue to be effected under the current remediation plan. There is no benthic life at sampling station 0-100, which is located 100 meters into Yellowknife Bay from the foreshore tailings. This is in contrast to site 4N-1000 on the Eastern Shore of North Yellowknife Bay, which contains 11,000 organisms/m². It has been identified that sediment that contains arsenic in exceedance of the 150 µg/g objective will negatively effect benthic life.

Terrestrial wildlife (hare, mink and muskrat) and marine wildlife (bottom feeder fish) have been identified as containing arsenic levels in exceedance of the established concentration criteria downstream of Baker Creek after the proposed remediation has been completed. The sediment has been identified as a major source of the wildlife arsenic uptake.

Request:

It is requested that the sediment quality concentrations that are acceptable to the protection of aquatic life be provided. If the sediment quality that is protective of aquatic life is lower than the predicted concentrations of sediment quality in Back Bay, Yellowknife Bay, and Baker Creek, it is requested that:

- a. Any limitations on future land and water uses be provided; and,
- b. Discussion is provided what additional remediation efforts will be implemented ensure protection of aquatic life.
- c. The proponent should prepare a response to the concerns associated with post-remediation impacts on flora and fauna, should the sediments outside the 'foreshore tailings' in Back Bay be disturbed.

xxi. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Oxidic Layer in Yellowknife Bay and Back Bay Sediments

Preamble:

It is noted that a thin oxidic layer has formed in Yellowknife Bay sediments that has captured arsenic and limits arsenic from entering the water column. It is stated this oxidic layer could be reduced during the summer months from addition of organic matter into Yellowknife Bay. This would release the captured arsenic into the water column.

It is stated (DAR, page 7-18) that the preservation of this oxidic layer is paramount to preserving water quality in Yellowknife Bay; however, there is no discussion in the proposed remediation plan regarding the protection of the oxidic layer.

Request:

- a. It is requested that additional details be presented on the Proponent's plans, if any, on the protection of the oxic layer sediment in Yellowknife Bay.
- b. It is requested that the risk of disturbing the oxic layer be discussed from the perspective of activities that should be limited/restricted in Yellowknife Bay and Back Bay to preserve this layer.
- c. It is requested that the risk of disturbing the oxic layer due to natural environmental conditions be detailed (e.g., storm events, lake turnover, organic loading to the Bays) and the potential associated impacts to water quality.

xxii. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Aboriginal Interests – Evaluation Criteria, Traditional Land Use – Evaluation Criteria, Assessment of Potential Effects.

Preamble:

Community perceptions of environmental health is something of a general statement, especially as the project seems to focus on simply reducing risk rather than making the site part of the greater ecosystem.

Request:

INAC should be directed to provide criteria on how they intend to evaluate this and explain what their targets and adaptive management criteria are.

xxiii. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Cumulative Effects Impacts and Monitoring

Preamble:

Throughout the territory there has been a general failure to implement cumulative effects monitoring, despite the focus that it holds during the EA stage/process. The proponents, as regulators, have not pushed nor required actual development and participation from those contributing to the impacts, while industry has steadfastly declared this to be a government responsibility. To avoid this conflict in a project where the regulator and the applicant are one and the same, these plans should be submitted for the Parties and Boards consideration ahead of implementation

Request:

INAC should be directed to complete a draft of the monitoring plan and the adaptive management structures for the Parties consideration.

- xxiv. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada, GNWT
Subject: Land Administration and Regulation

Preamble:

During the EA preliminary period, the proponent(s) conducted a drilling program at the GIANT minesite. During this period, there was considerable uncertainty on the administration, inspection and regulation of this activity. Clarity on this point is important for the long term oversight of this project where the same department/governments occupies so many roles. The interaction between these proponents and regulatory inspection needs to be transparent for the Parties to have faith that the process is being conducted in such a way that it ensures their interests are being considered, not just the proponents.

Request:

It is requested that INAC explain why they did not choose to pursue an MVLWB permit. If the answer is that this site is administered by GNWT, we request that GNWT provide answers as to how this site was regulated, inspected, and administered, including why MVLWB permits were not required. Furthermore, YKDFN request that the applicants provide clear explanations and a framework for all parties to understand the complex regulatory regime for the project moving forward.

- xxv. **Source:** Yellowknives Dene First Nation
To: Indian and Northern Affairs Canada
Subject: Aboriginal and Government Body – Monitoring and Oversight

Preamble:

All parties at the scoping noted the need for independent oversight and monitoring review for this project – there is considerable unease with INAC and GNWT being the proponent, regulator and responsible authority. The perception surrounding the mixed mandate, seen lately in the LUP issues for the test drilling, is an issue that could manifest itself quite rapidly as all staff operate within the same reporting structure. Independent oversight is the only way for the community and First Nation

to have confidence that the remediation is transparent and the concerns of the local people are being addressed rather than that of the current government.

The document acknowledges that the overall responsibility for environmental management in relationship to GIANT mine is a shared responsibility between INAC and GNWT, with local Parties, at best, providing recommendations to the regulatory system. In recent regulatory permit processes, the YKDFN have seen the various regulatory bodies shuffle their concerns between them – each stating that it fell to other Boards and/or Departments, with no one actually stepping forward to ensure that the concerns of the First Nation had been addressed. There is little faith that the Crown can be trusted and the YKDFN refuse to accept a bit part in the guidance of this critical project which has thoroughly contaminated one of the most productive areas in their traditional territory.

Request:

INAC should be required to complete their design of the aboriginal and government body as well as providing information on how this body provides real and tangible oversight of the project. They should be required to outline a comprehensive rationale as to why co-management is inappropriate in this case.

xxvi. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada

Subject: Federal groups collaboration

Preamble:

It was indicated that the projected collaborated with other federal departments including as follows:

- Federal Contaminated Sites Action Plan (FCSAP)
- Environment Canada
- Department of Fisheries and Oceans Canada (DFO)
- Health Canada

It was stated that input from the federal groups were utilised to provide advice on various items of the remediation project including site assessment, risk assessment and the evaluation of remedial option/risk management for the site. It was further indicated that collaboration with federal groups has proven to be important in the selection of remediation options for site components such as Baker Creek. Given this input, it seems that the current remediation plan has the effective endorsement from

the other responsible ministries and the degree of technical review to be provided during the forthcoming EA processes will be substantially reduced compared to other similar projects.

Request:

It is requested that a summary of the collaboration process and how the technical issues of the federal groups were addressed are provided. At minimum information should be provided on the following remediation items:

- Foreshore historical tailings remediation;
- Baker Creek remediation options selection;
- Open pits remediation;
- Proposed outfall and diffuser system

xxvii. **Source:** Yellowknives Dene First Nation

To: Indian and Northern Affairs Canada, GNWT

Subject: Land Administration and Regulation

Preamble:

During the EA preliminary period, the proponent(s) conducted a drilling program at the GIANT minesite. During this period, there was considerable uncertainty on the administration, inspection and regulation of this activity. Clarity on this point is important for the long term oversight of this project where the same department/governments occupies so many roles. The interaction between these proponents and regulatory inspection needs to be transparent for the Parties to have faith that the process is being conducted in such a way that it ensures their interests are being considered, not just the proponents. All parties at the scoping noted the need for independent oversight and monitoring review for this project – there is considerable unease with INAC and GNWT being the proponent, regulator and responsible authority. The perception surrounding the mixed mandate, seen lately in the LUP issues for the test drilling, is an issue that could manifest itself quite rapidly as all staff operate within the same reporting structure.

The document acknowledges that the overall responsibility for environmental management in relationship to GIANT mine is a shared responsibility between INAC and GNWT, with local Parties, at best, providing recommendations to the regulatory system. In recent regulatory permit processes, the YKDFN have seen the various regulatory bodies shuffle their concerns between them – each stating that it fell to other Boards and/or Departments, with no one actually stepping forward to ensure that the concerns of the First Nation had been addressed. There is little faith that the Crown can be trusted and the YKDFN refuse to accept a bit part in the

guidance of this critical project which has thoroughly contaminated one of the most productive areas in their traditional territory.

Request:

It is requested that INAC explain why they did not choose to pursue an MVLWB permit. If the answer is that this site is administered by GNWT, we request that GNWT provide answers as to how this site was regulated, inspected, and administered, including why MVLWB permits were not required. It is the opinion of the YKDFN that independent oversight is the only way for the community and First Nation to have confidence that the remediation is transparent and the concerns of the local people are being addressed rather than that of the current government, INAC should be required to complete their design of the aboriginal and government body as well as providing information on how this body provides real and tangible oversight of the project. They should be required to outline a comprehensive rationale as to why co-management is inappropriate in this case.