



Mackenzie Valley
Environmental Impact
Review Board

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Our File EA01-004

27 March 2002

Robin Johnstone
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De Beers Canada Mining Inc.
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RE: Mackenzie Valley Environmental Impact Review Board (Review Board) Information Requests (IR).

Please find attached the Review Board's first IR. All future IRs from parties are placed on the public registry before being considered and issued under the Review Board's authority. De Beers has the opportunity of reviewing all IRs before the Review Board considers them, and providing its views before any final decision to issue them is taken.

The Review Board's Work Plan set May 26, 2002 as the last day for De Beers to respond to all IRs from the Review Board and parties. Indian and Northern Affairs Canada (INAC) has indicated it needs more time to prepare its IRs and that it would like to submit them to the Review Board on April 15, 2002 instead of April 8, 2002. This will give De Beers about three weeks to respond to the IRs. Therefore, De Beers has the option of submitting its IR responses on May 6, 2002 or delaying its response to the IRs until on May 13, 2002. If you have any questions or concerns about the included IRs please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'LA', written over a horizontal line.

Luciano Azzolini
Environmental Assessment Officer

A simple handwritten checkmark in black ink.

c.c. Distribution List

**De Beers Canada Mining Inc. (De Beers)
Snap Lake Diamond Project**

**Mackenzie Valley Environmental Impact Review Board (Review Board)
Information Request No. 1**

Wildlife/Terrestrial Ecology

- 1.1 Source: Gartner Lee Limited (GLL) IR 1.1
- Reference: EAR, Section 10.3.1.4
- ToR Line: 228
- To: De Beers Canada Mining Inc.
- Preamble: There is a general lack of detail in the methods section, 10.3.1.4. A better understanding of the methods is required to appropriately review the document.
- Request: Please provide further details on the following items:
- (a) Sampling survey (e.g., size of plots, expand on stratified sampling approach, number of plots by ELC unit for both LSA and RSA, specific areas surveyed for rare plants?);
 - (b) Integration of air photo interpretation with satellite imagery mapping for the LSA;
 - (c) Imagery accuracy (85%) – comment on adequacy for use in impact assessment; and
 - (d) Basis for identifying community types within the identified ELC units, with respect to ecosystem level biodiversity (were the community types defined prior to field investigations? If so, how? Are these community types used elsewhere as a standard?).

- 1.2 Source: GLL IR 1.2
- Reference: EAR, Section 10.3.1
- ToR Line: 228
- To: De Beers Canada Mining Inc.
- Preamble: It is general practice to provide relevant raw data, such as species lists to support the baseline text.
- Request: Please provide the following:
- (a) Species lists for each plot/survey location, including rare and traditional plant species;
 - (b) Names of community types identified for each ELC unit;
 - (c) Sampling plot locations on a map (LSA and RSA); and,
 - (d) Site condition data (e.g., UTM, moisture regime, slope, aspect, microtopography, soil and percent vegetation cover) should be presented in an Appendix for potential use in future monitoring.
- 1.3 Source: GLL IR 1.3
- Reference: EAR, Section 10.3.1.6
- ToR Line: 228
- To: De Beers Canada Mining Inc.
- Preamble: ***Rare Plant Species:*** The source/reference and rarity status for rare plant species is not stated (e.g., COSEWIC). This is required to understand the level of rarity in the context of the EA. The methods for identifying rare plants species is also lacking.
- Request: Please provide the following:
- (a) The reference(s) used for identifying rare plant species (e.g., COSEWIC), and relevant rarity status if applicable; and

(b) The methods used for identifying rare plant species. Were targeted surveys carried out?

- 1.4 Source: GLL IR 1.4
- Reference: EAR, Section 10.3.1.6
- ToR Line: 228
- To: De Beers Canada Mining Inc.
- Preamble: The above noted section states that “the VECs selected for ELC and biodiversity component [rare and traditional plant potential] are representative of public, traditional, and scientific values.” No additional background support in selecting the VECs is provided.
- Request: Please provide further rationale for selecting these VECs.
- 1.5 Source: GLL IR 1.5
- Reference: EAR, Section 10.3.2
- ToR Line: 264-265
- To: De Beers Canada Mining Inc.
- Preamble: Although the environmental consequence of the residual impacts are classified, the “consequences of potential failure” of planned mitigation measures of raw impacts are not explicitly described.
- Request: Please describe the “consequences of potential failure” of planned mitigation measures.

- 1.6 Source: GLL IR 1.6
- Reference: EAR, Sections 10.3.2.2 and 10.3.2.3
- ToR Line: 254 to 259
- To: De Beers Canada Mining Inc.
- Preamble: Reference to scientific literature seems to be lacking, particularly with respect to predicting natural vegetation re-establishment and reclamation success.
- Request: Please provide references/sources used in predicting vegetation re-establishment and reclamation success with respect to areas that will experience loss of vegetation and biodiversity.
- 1.7 Source: GLL IR 1.7
- Reference: EAR
- a) Section 10.3.2.1.3, Figure 10.3-3
b) Section 10.3.2.3.1
- ToR Line: 254-259
- To: De Beers Canada Mining Inc.
- Preamble: The linkage diagram shown in Figure 10.3-3 doesn't show linkage to a potential change in biodiversity due to site clearing and surface disturbance, yet the linkage analysis (Section 10.3.2.3.1) for biodiversity states that "loss or disturbance to ELC units will result in changes to both local and regional biodiversity"
- Request: Please correct/clarify the above noted discrepancy.

- 1.8 Source: GLL IR 1.8
- Reference: EAR
- (a) Section 10.3.2.2.5
(b) Section 10.3.2.3.5
- ToR Line: 254-259
- To: De Beers Canada Mining Inc.
- Preamble: The above noted sections describe monitoring for ELC and biodiversity. These sections lack detail on the proposed monitoring program.
- Request: Please provide further detail on the proposed monitoring programs.
- 1.9 Source: GLL IR 1.9
- Reference: EAR, Section 10.3.2.4.1
- ToR Line: 296
- To: De Beers Canada Mining Inc.
- Preamble: The above noted section states that "Due to direct effects [loss of vegetation through clearing], there will be no ELC units to be indirectly affected by PAI in this area." However, no comment is made on potential for long-term effects on soils from PAI such that vegetation establishment during future reclamation would be affected.
- Request: Please comment on the potential for long-term effects on soils from PAI such that vegetation establishment during future reclamation would be affected.

- 1.10 Source: GLL IR 1.10
- Reference: EAR, Section 10.3.2.5.3
- ToR Line: 369-373
- To: De Beers Canada Mining Inc.
- Preamble: Section 10.3.2.5.3 states that “These ELC units [open spruce forest, tussock-hummock, sedge wetlands, and deep water] can tolerate fluctuations in water levels since they naturally attenuate flooding events in the watershed”. It is unclear as to whether appropriate consideration has been given to the effects of more frequent flooding on the ELC units compared to baseline (assumed to be seasonal fluctuation only?). Can these ELC units tolerate more frequent fluctuations? And to what extent?
- Request: Please provide further explanation/discussion, with appropriate backup (e.g., references) if possible, regarding the extent to which these plant communities are able to tolerate more frequent flooding compared to baseline.

Geotechnical

- 1.11 Source: GLL IR 1.11
- Reference: EAR
- (a) Appendix III.1
(b) Sections 5.4 and 5.5
- ToR Line: 328 to 331
- To: De Beers Canada Mining Inc.
- Preamble: **Text Quote:**
- 5.4 Pile Stability
- The stability of the north pile will depend on the strengths of the shell construction materials and the PK, the porewater pressure (phreatic surface) within the north pile, and the load conditions (static or dynamic). Stability analyses were carried out for *the*

expected values of strength and pore pressure *as well as* for a wide range of strength values and phreatic surface levels to determine the impact of variation of these parameters on the stability of the north pile.

The analyses demonstrated that the north pile will have acceptable stability. For a pile with a containment shell constructed of compacted coarse PK and PK grits and full mix PK pumped behind the shell, the calculated factor-of-safety is greater than 1.6 for static conditions, and greater than 1.5 for pseudo-static conditions, based on the expected strengths from laboratory testing. *Raising the phreatic surface* within the north pile causes a small reduction in the factor-of-safety.

The foundation conditions for the north pile *are good*. Weak soils will be removed from the foundation of the containment berm to expose either the fractured bedrock surface or *competent mineral soils*. The factor-of-safety for slip surfaces extending into the foundation was calculated to be greater than 3.0.

Movement of the face of the north pile will occur as the PK consolidates, as water frozen during the winter thaws *and drains*, and as ice within the north pile creeps under the applied shear stress. *These movements will cause some local flattening of the north pile face, and may cause surface runoff to concentrate and erode the north pile face. These areas will be repaired as the north pile is developed.*

The stability analyses were carried out using thawed strength parameters for the PK. As such, should global warming cause the north pile and foundation to completely thaw, the north pile would be stable. Due to the probable irregular nature of the ice within the north pile, melting of the ice would cause irregular settlement of the surface and could disrupt the surface drainage patterns.

5.5 Pile Freezing and Seepage

Both seepage and thermal analyses were carried out for the north pile. *The analyses were not coupled.* The thermal analyses indicate that frozen and unfrozen layers will occur in the north pile during development. About two years after an area is completed, the north pile will be completely frozen, except for the annual development of an active layer. *Seepage analyses were carried out for thawed conditions within the north pile.* They show that the north pile would drain and a phreatic surface would not develop more than 1-m to 2-m above the foundation even under unrealistically high levels of infiltration. Seepage from frozen

sections of the north pile will be significantly reduced to nonexistent.

The seepage analyses were carried out using thawed parameters for the PK and foundation. They demonstrate that, should global warming cause the north pile and foundation to thaw, most of the annual precipitation would run off, a phreatic surface would not develop high in the north pile and most of the north pile would be unsaturated.”

Comments

The above analyses describe several conditions that certainly illustrate that the designers have considered a range of important scenarios. It is not however, clear from the information provided, whether or not the worst-case scenario has been portrayed.

The sequence and season of construction will determine the degree of freezing and thawing, how pore pressures will dissipate between lifts, the likelihood of development of discrete ice or ice rich zones, material properties of the fills and therefore the stability of the overall pile face. The consequences of a violent slope failure with runout outside the footprint could substantially influence predictions of sediment loads to Snap Lake (particularly on the north face) and cause site degradation outside the footprint.

Request: Please provide the following:

- (a) More information about the details of the sensitivity stability analyses and how they were linked with the thermal analyses and seepage analyses.
- (b) More information about what analyses were performed to illustrate the stability of the North Pile during intermediate stages of construction. Given that the thermal analyses and seepage analyses have not been coupled, what bounding assumptions have the designers made with respect to the effects of freeze-thaw and consolidation on the stability of the North Pile Face.
- (c) More details on the extent and distance of the potential “local flattening of the north pile face” that is described above.

1.12 Source: GLL IR 1.12

Reference: EAR

- (a) Section 10.2.1.2.2
- (b) Section 10.2.1.5

ToR Line: 303 to 316

To: De Beers Canada Mining Inc.

Preamble: **Text Quote:**

“Field investigations were conducted from July 8 to July 15, 1999 to classify, describe, and inventory terrain, soil, and vegetation within each ecological land classification (ELC) unit. ELC units, which are described in more detail in Section 10.3.1, were later reclassified into terrain units. A total of 120 field plots were surveyed collectively within both the LSA and RSA. A helicopter was used to access survey locations and to undertake aerial mapping. These survey locations were used as ground truthing for the final satellite mapping (*i.e.*, to determine that the ELC identified from the satellite correctly identified the ELC observed at that location). The field surveys were focused on sampling large homogeneous ELC units as well as complexes of ELC units to ensure that the satellite imagery could be accurately classified into distinct ELC units. A stratified sampling approach was undertaken, whereby there was a larger number of field plots in ELC units that were more dominant in the RSA and LSA. Some ELC units such as deep water were only identified from an aerial survey. At each survey location, UTM coordinates and site conditions such as terrain, moisture regime, slope, aspect, microtopography (*i.e.*, minor variations in surface relief), soil, and plant percent covers were recorded. All information collected was entered into an ELC database. A data analysis was undertaken to describe ELC units, which included terrain units.

– Satellite imagery was used for mapping ELC units in the RSA and LSA. Landsat Thematic Mapper imagery was acquired from August 1994 and enhanced with false colour infrared wavelengths to increase the contrast associated with various ELC units patterns. ELC units, including terrain, were classified and mapped based on an automated classification process. Manual edits of some terrain features such as eskers were required since these features could not be differentiated through the automated classification process. Once the ELC mapping was finalized, ELC units were reclassified

into prominent terrain features to derive terrain units. Further details on mapping are provided in the ELC section (Section 10.3.1.4.2).

-- Sub-surface investigations carried out at the Snap Lake Diamond Project site were directed at identifying the depth of frost shattered bedrock as well as the presence of substantial ice lenses in either the overburden (mineral) soils or in the upper zone of frost shattered bedrock. To this end, a number of boreholes drilled as part of the subsurface investigation program were completed using a chilled brine solution as the drilling fluid in an attempt to obtain undisturbed, frozen samples of overburden and bedrock for examination."

Comments

The above information describes terrain and field investigation methods. Although the investigation techniques are adequate, without a review of the geotechnical field investigation reports and details of the methodologies, borehole/test pit locations, borehole/test pit logs and detailed terrain maps it is difficult for reviewers to develop a similar level of confidence in the interpolations made between exploration sites as have been made in the De Beers report.

- Request: Please provide copies of all the geotechnical field investigation reports prepared for the Snap Lake Diamonds Project.
- 1.13 Source: GLL IR 1.13
- Reference: EAR, Section 10.2.2.5
- ToR Line: 309 to 310
- To: De Beers Canada Mining Inc.
- Preamble: **Text Quote:**
- "During development and operation of the underground mine, warm air will be vented from the underground. This air will warm the ground in the immediate area of the portal and ventilation raises. Upon closure, the mine will be sealed and the thermal regime around these openings is expected to return to pre-development conditions.
- No thermal modelling was completed to determine the impact

of the underground mine on the ground thermal regime. The impact analysis is discussed in terms of past experience, a brief review of literature on the topic, and the results of the thermal modelling completed for the north pile. During the development of the underground mine for the advanced exploration program, a ramp was excavated from surface. The upper portion of the underground workings is excavated through permafrost. As noted previously, during investigations for the mill and ancillary facilities, no massive ground ice was noted. Similarly, no massive ground ice was noted during development of the ramp. Some warming of the ground surrounding the ramp and the ventilation raises in the permafrost zone is expected as a result of the movement of warm air from the mine to the surface. Upon closure of the mine, it is anticipated that the ground surrounding these openings will freeze once the workings are sealed and the movement of warm air stops. In areas of disturbance around the mine openings, the ground thermal regime will be changed from the pre-development conditions. However, the ground is expected to freeze and an active layer will develop on an annual basis. The depth of the active layer may vary from the pre-development conditions.

Comments

Thermal erosion occurs subsurface at the level of the various drifts (see De Beers Figure 3.3.1). A vertical interface of the frozen and unfrozen rock often occurs with depth below the shoreline. In some regions this has resulted in considerable and unexpected increases in the seepage at these contacts.

Request: Please provide information regarding whether underground thaw erosion effects have been considered when preparing seepage estimates from underground mining activity. If so, what assumptions were made given that no thermal analyses have been conducted.

1.14 Source: GLL IR 1.14

Reference: EAR, Section 3.10

ToR Line: 569 to 574

To: De Beers Canada Mining Inc.

Preamble: **Text Quote:**

“Mine decommissioning and closure will take place using best practicable, northern mine closure techniques that will comply with accepted protocols and standards (refer to Appendix III.11, Decommissioning and Reclamation Plan). Efforts will be focused on promoting natural re-vegetation.”

Comments

Which “accepted protocols and standards” have been referred to?

Request: Please indicate any referenced regulatory requirements, industry standards and existing government agreements that apply to abandonment and restoration of the mine. Also describe from these the minimum standards and criteria that have been adopted.

1.15 Source: GLL IR 1.15

Reference: EAR, Sections 3.4 and 3.5

ToR Line: 106, 116, 126, 127, 132, 134, 148, 149, 150, 167-169

To: De Beers Canada Mining Inc.

Preamble: **Text Quote:**

“The kimberlite dyke will be mined by a modified room and pillar method. A series of parallel drifts will be developed in a panel with a long rib pillar between each pair of adjacent drifts. Once the ore is removed from the drifts in the primary phase, then the second phase of mining begins by slicing the farthest ends of all the rib pillars in the panel at a right angle to the drifts. This leaves an open space at the back of the panel that is backfilled with paste backfill or high strength concrete backfill. Mining continues to retreat until the entire panel is backfilled. The tails from the processing plant (processed kimberlite) will be partially dewatered to form a paste backfill of a toothpaste-like consistency. The paste

will be pumped from a plant on surface through a pipeline distribution system to the pour sites underground to fill the voids remaining after the ore is mined out. Where high strength concrete pillars are used, the concrete will be prepared in a batch plant on surface (Figure 3.1-4) and trucked underground for placement.”

“- The paste-fill plant will be part of the processing plant. The paste will be manufactured by combining coarse PK and PK grits with thickened PK fines. This mixture will be de-watered prior to discharge from the process plant using screens and deep cone paste thickeners. Cement (estimated at 2.5% by weight) and water will then be added to the de-watered solids to form a paste mixture that will be pumped underground..”

Comments

The proposed cement content is low relative to our general experience. The performance characteristics that are targeted by using approximately 2.5 percent cement by weight are not documented.

Ground temperatures will also influence the strength properties of the paste and an assessment of this issue has not been documented.

Request: Please provide the following:

- (a) Will cement be added to any of the paste discharged to the North Pile?
- (b) Will different cement mixes be used for those portions of the mine below land and in cold permafrost?
- (c) Outline the proposed paste backfill performance criteria that have been targeted for application of this material in the underground mine and, if applicable, in the North Pile.
- (d) Identify what quality assurance/control measures will be used.

Reclamation and Mine Engineering

1.16 Source: GLL IR 1.16

Reference: EAR

(a) 2.3.4 Underground Mining.

(b) 3.3 Mining

ToR Line: 63, 194, 626

To: De Beers Canada Mining Inc.

Preamble: The description of the underground mining method selected would be enhanced/clarified by provision of a schematic or plans/sections of the room and pillar mining and the placement of paste backfill and/or the high strength concrete backfill.

Request: Please provide more details as described in the preamble above.

1.17 Source: GLL IR 1.17

Reference: EAR, Section 3.3 Mining

ToR Line: 63, 67, 199, 201

To: De Beers Canada Mining Inc.

Preamble: The EAR includes descriptions of mining rates for kimberlite and rock, but no material balance table to show the distributions of all of the products, backfill etc.

Request: Please provide a typical material balance or production schedule, showing kimberlite, mining dilution, waste rock, backfill and waste deposition volumes/tonnes.

1.18 Source: GLL IR 1.18

Reference: EAR

- (a) 3.3 Mining
- (b) 3.4 Kimberlite Processing
- (c) 3.5.2 Processed Kimberlite Management
- (d) Appendix III.1 North Pile Development Plan

ToR Line: 68, 195, 626

To: De Beers Canada Mining Inc.

Preamble: It is planned to use approximately 50% of the processed kimberlite for paste backfill. No references were made for the basis of this percentage. Normally, a paste backfill system is designed following considerable test work using the proposed materials. This test work would also include cement content needed to produce the required backfill strengths. The implications for the EA relate to storage volumes, potential for supplemental fill material and cement volumes.

Request: Please provide some background on test work for material suitability and cement requirements.

1.19 Source: GLL 1.19

Reference: EAR

- (a) Section 3.10
- (b) Appendix III.11
- (c) Sections 10.2.2.2.2/3.2.2.2/4.2.2.2

ToR Line: 569 to 581

To: De Beers Canada Mining Inc.

Preamble: A total decommissioning and reclamation cost of \$25 million appears in Section 10, however, there are no details.

Request: Please provide a breakdown of the \$25 million estimate, and a description of cost assumptions and basis.

Social and Economic Issues

1.20 Source: GLL IR 1.20

Reference: EAR, Sections 5.2.3.4.7, 5.2.3.5.7, 5.3.1.1.1, 5.3.1.3.3, 5.3.3.3, 5.3.3.5.1, 5.3.3.4, 5.3.4.1, 5.3.4.3.1, 5.3.4.2, 12.2.3

ToR Line: 466, 467, 468

To: De Beers Canada Mining Inc.

Preamble: In 5.3.3.3, De Beers reiterates its recognition, in Section 3 "Project Description", that Aboriginal people and northerners will be sought out and given priority for employment. However, it argues that social conditions, such as level of education and gender, limit the capacity of an individual to initially make use of the work opportunities with the project.

De Beers points out that wage employment opportunities are available to individuals who have the appropriate levels of education and/or training. Some mine jobs require grade 12 in formal education and many jobs require grade 10 as a minimum. This educational requirement limits the pool of potential workers.

De Beers also points out that most people working in the mining industry are male. Across Canada, 85% of workers in the mining, quarrying, and oil well industries are male. Aggregate data for the NWT and Nunavut show that 88% of workers in these industries are male (Appendix V.2). Historically, the potential for women to benefit from work opportunities in mining has been lower than for men.

Request: Please provide the following:

- (a) The number and proportion of the Aboriginal and northern population of the region which could currently expect to meet the employment standards of the mine.
- (b) Given that operations will not commence for three years, plans that will be put into effect by De Beers, or others with the support, financial or otherwise, of De Beers, to ensure that a higher number and proportion of the Aboriginal and northern population can meet the standards of employment at the mine.
- (c) How such plans will be implemented to ensure greater participation by Aboriginal and northern people at the mine.
- (d) Steps that will be taken to ensure that women are more equitably represented in the mining industry.

1.21 Source: GLL IR 1.21

Reference: EAR, Sections 2.7, Employee/worker living conditions (e.g., living quarters, leisure facilities, food, visitors, access to outdoors, etc.)

ToR Line: 202, 203

To: De Beers Canada Mining Inc.

Preamble: De Beers proposes to build a 350-person permanent camp complex of modular construction (pre-fabricated or pre-assembled) with dormitory wings and a core complex for the shared facilities.

De Beers states that, though several alternatives are under consideration for the architectural and recreational design of the permanent accommodations complex, decisions have not been made on possible alternatives. However, De Beers is emphatic that Snap Lake will be a fly-in-fly-out operation and that a permanent townsite will not be developed.

With regard to exterior design, alternatives being considered include minimizing visual and noise impact from operations while maximizing views of natural scenery; minimizing building height

to reduce visual impact; arranging bedroom dorm wings to avoid creation of "dead ends" where wildlife could become cornered; and, providing outdoor deck lounges overlooking the lake. Interior design alternatives include designing bedrooms to ensure maximum quality of life, etc.; both private and shared bathrooms; maximizing natural light and openness; and, providing a balance of recreation and leisure facilities. Design of the project includes linking the camp complex and process plant with heated and insulated corridors.

De Beers will be allowing guided tours for Elders, community consultation, and other visitors.

Request: Please provide the following:

- (a) When will the final decisions on permanent employee accommodations be made?
- (b) Information on the nature and quality of camp facilities that would be used during the construction period.
- (c) What steps may need to be taken to ensure that people do not erect permanent or temporary dwellings near the site?

1.22 Source: Ellis IR 1.1

Reference: EAR, Page 5-105, Section 5.3.2.1.1 Input-Output Models, Direct Impacts

ToR Line: 474

To: De Beers Canada Mining Inc.

Preamble: Direct GDP by industry is estimated by subtracting the value of purchased inputs (from other industries) from the value of gross output of the proposed project. The residual is the value added or direct contribution to GDP. In the input-output framework value-added is comprised labour income and another residual item referred to as "other operating surplus". In the Economic Impact Analysis only direct labour income has been given and it is presented as the value of the proposed project's direct GDP. To accurately present the proposed project's contribution to GDP it is necessary to include the other operating surplus.

Request: Please provide the following:

- (a) An estimate of the direct GDP that includes the “other operating surplus” of the proposed development.
- (b) Describe what comprises the difference between Direct GDP and Direct Labour Income.

1.23 Source: Ellis IR 1.2

Reference: EAR, Page 5-112, Table 5.3-1 Economic Impacts of the Snap Lake Diamond Project

ToR Line: 457-458

To: De Beers Canada Mining Inc.

Preamble: From information provided in the Economic Impact Assessment Statistics Canada’s Regional Input-Output Model was used to estimate the economic impacts on the rest of Canada while the NWT Bureau of Statistics Model was used to provide estimates for the NWT. Statistics Canada’s Model is not closed and does not normally provide induced impacts (although it is possible to produce estimates given a set of assumptions and a second run of the model).

Request: Please provide the following:

- (a) Was Statistics Canada’s Regional Input-Output Model used to estimate the induced impacts in the rest of Canada? If not, what model was used and how was it done?
- (b) If the Statistics Canada Regional Input-Output Model was used to provide estimates of induced activity what assumptions were used?
- (c) What if any proportion of labour income was withdrawn for savings and taxes before household income was converted to the demand for goods and services?

- 1.24 Source: Ellis IR 1.3
- Reference: EAR, Page 5-112, Table 5.3-1 Economic Impacts of the Snap Lake Diamond Project
- ToR Line: 457-458
- To: De Beers Canada Mining Inc.
- Preamble: From information provided in the Economic Impact Assessment the NWT Bureau of Statistics Model was used to provide estimates of induced employment for the NWT. For annual operations the implicit annual average wage for induced employment in the NWT was almost \$74,000 while the annual average for indirect impacts was just over \$56,000. Normally most of the employment associated with induced impacts is in the retail trade and service sectors related to household expenditures. Jobs in these sectors are generally not as highly paid as jobs in businesses that supply the indirect requirements. In spite of this the average wage for induced jobs is more than 30% higher than that for indirect jobs. One would normally expect the opposite to be true.
- Request: Please provide the following:
- (a) What was the value of direct exogenous labour income used for the NWT to estimate induced impacts? Did it represent 60% of the project exogenous labour income or did it represent 100% of the project?
 - (b) Why is the average wage for induced jobs so high? How is this justified?
 - (c) Please provide a listing of indirect and induced jobs by industry (at the most detailed level possible) giving the number of jobs and the labour income and/or average wage.
- 1.25 Source: Ellis IR 1.4
- Reference: EAR, Page 5-112, Table 5.3-1 Economic Impacts of the Snap Lake Diamond Project
- ToR Line: 473
- To: De Beers Canada Mining Inc.
- Preamble: Estimates have been provided for aggregate direct, indirect and induced GDP, Labour Income and Employment but no information has been provided as to where the indirect and induced jobs will be

created. Specifically in what industries will this GDP, labour income and employment be generated. This information is required to assess the overall impact of the proposed project on the NWT.

- Request: Please provide an estimate of indirect and induced impacts by industry for GDP, labour income and employment.
- 1.26 Source: Ellis IR 1.5
- Reference: EAR, Page 5-120, Table 5.3-5 Cumulative Corporate Tax and Royalty Impacts (2004-2027) of the Snap Lake Diamond Project
- ToR Line: 472
- To: De Beers Canada Mining Inc.
- Preamble: A major benefit of the proposed project would be tax benefits that accrue to the federal and territorial governments.
- Request: Please provide the following:
- (a) What corporate tax rate(s) was used to estimate federal and territorial taxes? If more than one rate was used please provide each rate and the year(s) they were applied to.
 - (b) What is the federal surtax? Please provide an explanation of what it is and how it was applied.
 - (c) What rate was used for federal royalties?
- 1.27 Source: Ellis IR 1.6
- Reference: EAR, Page 5-115, Section 5.3.2.3.2 Northwest Territories Impacts: Operations Phase and EAR, Section 4.3.2.3.5 Tax and Fiscal Impacts, Page 5-121, last paragraph
- ToR Line: 459-464
- To: De Beers Canada Mining Inc.
- Preamble: A major benefit of the proposed project would be employment that would be provided by the direct, indirect and induced economic activity of the project. A critical element in providing a realistic assessment of the potential impacts is a good estimate of the unemployed labour force. Statistics Canada introduced a monthly labour force for the NWT that has produced data since February of 2001. This data shows a substantial reduction in the

unemployment rate in the NWT since the 1996 Census and the 1999 NWT Bureau of Statistics Labour Survey. Data provided in section 5.3.2.3.5 predicts an average of 930 FTE's (of which 150 would be filled by in-migration).

Request: Please provide the following:

- (a) Why was the Statistics Canada Monthly Labour Force Survey data not used in the Economic Impact Analysis?
- (b) Are the estimates of a 60% local employment rate and the impact on predicted migration rates still likely or possible given the unemployment rate in the new monthly labour force survey?
- (c) What is your estimate of the impact of the Snap Lake Project on unemployment rates in Yellowknife, the other primary study communities and the catchment communities?

1.28 Source: GLL IR 1.22, Ellis IR 1.7

Reference: EAR, Sections 3.9.1.4 and 5.3.2.3

ToR Line: 462-464, 469

To: De Beers Canada Mining Inc.

Preamble: A major benefit of the proposed project would be the opportunities for NWT businesses to provide goods and services. De Beers states that a northern businesses opportunities strategy is under development. De Beers is committed to working with communities and individuals to increase the likelihood that small, medium, and large enterprises located in the NWT will be able to participate in providing goods and services to the project.

A northern business policy will include the following initiatives:

- A manager of business development will be hired to assist and build relationships with NWT businesses.
- Construction and operations contracts will be structured such that they can be reasonably accessed by a variety of different sized NWT businesses.

- De Beers will publish a business opportunities profile that will provide information required to access potential opportunities. This list of project requirements for goods and services will be provided to the primary communities in advance of its release to the general public.
- To encourage contractors to hire and train Aboriginals and northerners, De Beers will require all contractors to disclose their policies and practices for providing preferential opportunities to Aboriginals and northerners.

While De Beers has indicated that it will provide a northern preference, no specific estimates are provided as to what will be purchased in the NWT and what will be purchased in the rest of Canada or from outside the country.

Request: Please provide the following:

- (a) In the Economic Impact Assessment, what assumptions were used for the construction, operations and closure phases regarding the percentage of total expenditures made in the NWT?
- (b) What percentage of expenditures (i.e. "target") does the proponent expect to make during each phase of the project?
- (c) An indication of the types, volumes and values of goods and services De Beers would expect to purchase in the NWT.

1.29 Source: GLL IR 1.23

Reference: EAR, Section 4.2.2, Appendix IV.2

ToR Line: 23, 36

To: De Beers Canada Mining Inc.

Preamble: As stated by De Beers in Section 4.2.2, the main consultation tools involved regular visits by De Beers into communities and regular visits by community members to the Snap Lake site. This has promoted and supported information exchanges and feedback.

As part of the consultation effort, one-on-one interviews were conducted for the socio-economic impact assessment with a cross section of people in all primary communities. However, Dettah and N'Dilo chose not to participate in this process at that time. Given the range of persons interviewed (leaders, First Nation staff, mine workers, spouses of mine workers, community business leaders, Elders, and youth), it would seem that considerable information would have been lost for the purposes of the socio-economic impact assessment.

Request Please provide information on why Dettah and N'Dilo chose not to participate in the interviews that were conducted for the socio-economic impact assessment.

1.30 Source: GLL IR 1.24

Reference: EAR, Section 3.9.1.1

ToR Line: 42

To: De Beers Canada Mining Inc.

Preamble: For the apparent purposes of ongoing consultation, De Beers proposes to establish a Mine Management Advisory Committee (MMAC). The MMAC's make-up will be determined through consultation, but ideally it will be composed of De Beers personnel and representatives of each of the directly affected communities. The MMAC will have "high-level" input into the management of the mine through regular reviews of mine performance and policy, and through community consultation. The MMAC will meet with mine management at least quarterly and have access to production, safety, environmental, employment, and training data.

Request: Please provide the following:

- (a) Is the MMAC intended only for the operations phase? If yes, is something similar anticipated during construction and decommissioning?

(b) How will the MMAC operate? Will it, for example, hold its meetings at the mine site so that it has first-hand knowledge of the issues under discussion? Will members receive information well in advance of meetings so that discussion can be purposeful and meaningful?

1.31 Source: GLL IR 1.25

Reference: EAR, Sections 12.2, 12.3.5

ToR Line: 555

To: De Beers Canada Mining Inc.

Preamble: De Beers states that an increase in mining activity will challenge communities to make the transition to the wage economy. Increased revenues will accrue to the GNWT, and the need for companies to support the development of a healthy, skilled labour force, may result in increased expenditures (private, public, or in partnership) to build social capacity. Developments other than mining will also stress social capacity. The occurrence of cumulative effects will depend on the location of multiple projects.

De Beers further argues that cumulative effects, both in terms of pressures and increased fiscal resources, will open up opportunities for investing in social capacity building. Training/education and social services might improve, particularly in the smaller communities, having positive effects such as rising literacy rates, improved educational attainment, and better health care and social services. In the longer run, such improvements may contribute to the diversification of the local economy. These improvements, taken together, are essential in creating cohesive and sustainable communities.

De Beers then states that negative social circumstances will occur if partnerships between industry, government, and communities are not developed and nurtured; education, literacy, life skills, and employment training programs are not adequately provided in the communities; individuals and groups are unable or unwilling to

participate in service and/or education programs; commitment by government to education and social services is not demonstrated; and, financial resources are not used efficiently and effectively to provide appropriate social services.

This reviewer notes that the experience of small communities with industrial development, especially Aboriginal communities, throughout Canada has often been negative rather than positive. Small communities have found it difficult to adapt and, despite good intentions, have tended to be marginalized rather than strengthened.

Too much of De Beers's argument is written in the conditional – if this happens, then that *may* happen, etc. De Beers should provide support to its argument.

Request: Please provide the following:

- (a) Reference the experience of other large industrial projects in the territories and the northern parts of the provinces and describe their experience in terms of the kinds of positive and negative cumulative possibilities De Beers puts forward.
- (b) Provide a firmer prediction of possible positive and negative social cumulative effects on the directly affected communities. The mine, along with other large industrial projects, will be a fixture in the social landscape for more than two decades. It should be possible to say more about its social impacts other than offering conditional possibilities.

- 1.32 Source: GLL IR 1.26
- Reference: EAR, Section 12.2.7, Changes on Cultural Practices and Traditions of Aboriginal People
- ToR Line: 557
- To: De Beers Canada Mining Inc.
- Preamble De Beers states that the rate at which participation in the wage economy is occurring, through the existing and proposed mining projects, will affect the lifestyles and opportunities of Aboriginal peoples in the primary communities and their practice of traditional activities. The extent to which it will enable or limit participation in traditional activities, however, is very difficult to predict. To some extent, this will depend on individuals' and communities' own choices to maintain strong cultural traditions. However, De Beers recognizes that it will also depend on employment arrangements that recognize traditional activity cycles (*i.e.*, hunting time, best fishing times) and permits Aboriginal people to continue participation.
- It is noted that, while a two week in/two week out rotational schedule may be satisfactory in accommodating employee needs to hunt and fish locally, it would probably inhibit events like family moves to summer camps and other more extensive activities away from communities.
- Request: Please describe how flexible De Beers will be with regard to accommodating traditional seasonal activities.

1.33 Source: GLL IR 1.27

Reference: EAR, Sections 2.6, 5.3.3.5

ToR Line: 191, 200

To: De Beers Canada Mining Inc.

Preamble: In Section 2.6, De Beers states that, in developing a work schedule, it consulted potential workers and reviewed schedules that worked successfully at other mines. It states that two week in/two weeks out appears to allow sufficient time for a combination of traditional and wage economy activities.

It further states that during the construction period, workers will spend three weeks at the site and one week out. De Beers will continue community consultation and review alternative rotation schedules.

In 5.3.3.5, "Impacts of Rotational Schedule" De Beers states that the two weeks in/two weeks out schedule during operations may expose employees to considerable stress which is also likely to be felt by employees' families. It notes that communities as a whole will be affected too, as generally their most qualified residents will be away for extended periods. The degree of impacts on individuals, families and communities will be determined by factors related to the quality and range of support services provided to employees and families in coping with the lifestyle changes.

Request: Please provide the following:

- (a) As De Beers wants to continue consultations, it is not clear that it is fully committed to a two week in/two week out schedule during the operations phase. Please explain when a final decision on the rotational schedule might be made and how probable it is that the two and two schedule will prevail.
- (b) During the construction period, which is expected to last some three years, a three week in, one week out schedule will prevail. This may suit specialized labour flown in from the

south, but may make it difficult for regional labour to participate, given time spent on the land, families not use to extensive separation, etc. Please confirm whether all construction employees will have to adhere to a 3:1 schedule or whether this could be flexible for labour from the primary and catchment area communities.

(c) Section 5.3.3.5 is written very generally. Please provide supporting evidence from existing fly-in/fly-out operations.

1.34 Source: GLL IR 1.28

Reference: EAR, Sections 3.7.1 and 5.3.3.5

ToR Line: 200

To: De Beers Canada Mining Inc.

Preamble: De Beers states that employees at the Project will work a two weeks on/two weeks off schedule during operations. Section 3.7.1 states that a 350-person permanent camp of modular construction (pre-fabricated or pre-assembled) with dormitory wings and a core complex for the shared facilities will be built.

Request: Please provide the following:

- (a) What shifts will be worked – e.g. eight hours? ten hours? twelve hours?
- (b) Information on the availability of medical and other professional staff on site.

1.35 Source: GLL IR 1.29

Reference: EAR, Section 5.3.3.5

ToR Line: 477

To: De Beers Canada Mining Inc.

Preamble: De Beers states that employees at the Project will work on a two weeks on/two weeks off schedule during operations. This may expose them to considerable stress that is also likely to be directly felt by employees' families. Communities as a whole will be affected too, as generally their most qualified residents will be away for extended periods.

Another source of stress, which De Beers does not appear to consider, could be the flights to and from the mine. A pattern of picking up employees at several communities before flying to the mine could mean long flights for some employees. There is also the question of the quality of airstrips and navigational aids at the primary and catchment area communities. Is it possible to operate to them at all times of the year or under all weather conditions?

It should be noted that De Beers intends to not only recruit people in the primary communities, but also in what it refers to as the employment catchment communities which include Fort Smith, Fort Providence, Fort Resolution, Enterprise, Hay River, and Hay River Reserve (located in Hay River).

Request: Please explain the flight patterns De Beers may use in flying employees to and from the mine and comment on whether or not airstrips and navigational aids at the various communities which may supply labour to the mine are adequate for year round all weather operations.

1.36 Source: GLL IR 1.30

Reference: EAR, Section 5.3.2.3

ToR Line: 478, 481

To: De Beers Canada Mining Inc.

Preamble: Section 5.3.2.3.1 states that, during construction, total employment impact for the NWT is estimated at 1,000 jobs expressed as FTEs. This represents 32% of the total employment impacts for Canada overall. Direct project employment is estimated at 220 FTEs. An additional 560 indirect FTEs and 220 induced FTEs are expected to result from the project.

Section 5.3.2.3.2 states that, during operations, annual employment impacts for the NWT are estimated at 930 FTEs. Direct project employment is estimated at 500 FTEs. An additional 260 indirect FTEs and 170 induced FTEs are expected to result from the project. In the NWT, nearly 19,610 person years of employment are expected to result from mine related activities that are attributable to the 22 year operations phase of the project.

What appears to be ignored here is that a substantial part of the NWT Aboriginal labour force does not work full time and may be more interested in obtaining part time or casual employment that provides the cash income that permit individuals to develop a mixed economy life style. If, through direct, indirect or induced employment, the mine is able to support this mixed economic pattern, the economic impact of the mine may actually be considerably larger than is measurable by estimates of FTEs and income generated in the wage economy.

Request: Please provide information on what proportion of the estimates of FTEs might consist of part time or casual employment.

- 1.37 Source: GLL IR 1.31
- Reference: EAR, Section 5.1.1.3.3
- ToR Line: 503 – 505
- To: De Beers Canada Mining Inc.
- Preamble: De Beers notes that expansion of the wage economy into communities, through the development of the Snap Lake Diamond Project, may exacerbate certain pre-existing dysfunctional conditions in the communities. It further notes that members of the non-governmental women's organizations identified the need to address "pre-existing conditions" within communities, if the benefits of mining activities and mine employment are to reach the primary communities and people.
- Request: Please describe the conditions being referred to, indicate their relative importance and describe how these conditions will be addressed, by De Beers and/or others.
- 1.38 Source: GLL IR 1.32
- Reference: EAR, Section 5.3.3.6 Impacts of Transition to Wage Economy
- ToR Line: 503 – 505
- To: De Beers Canada Mining Inc.
- Preamble: De Beers states that the availability of disposable income will provide opportunities for individuals to improve their quality of life, and may widen the scope of choice that individuals in the primary communities have for shaping their lifestyles. With a consistent monetary income, individuals will have a greater level of security in providing for basic material needs.
- However, De Beers adds that where few opportunities exist within the community to satisfy the individual's spending preferences, the "pull" on individuals to the larger centres will be strengthened.

Stress associated with being away from the family and the communities will then be heightened and there may be “strained relationships” with others in the community, triggered by the individual’s improved material situation. Neighbours or friends may feel envious and reflect their envy by distancing themselves from the individual, asking for money related favours, or borrowing equipment without the owner’s consent. De Beers notes that, given the employee’s need for strong support during his or her transition to the wage economy, as well as to the rotational work schedule, such strained relations may exacerbate personal emotional stress.

De Beers’s tone here seems conditional and hypothetical. There is a considerable body of experience and literature on the transition to the wage economy. For example, the experience of uranium mining workers in northern Saskatchewan might have been used. There, employees returning to communities were pressured to party with friends, and some families moved to Prince Albert or Saskatoon to avoid such pressures.

Request: Please provide a more complete analysis, including references to the impact of existing or past fly in/fly out experiences.

1.39 Source: GLL IR 1.33

Reference: EAR, Section 3.9.1.3

ToR Line: 466, 467, 468

To: De Beers Canada Mining Inc.

Preamble: De Beers makes specific commitments with regard to initiatives to address training and northern employment:

- Ten apprentice positions will be provided to Aboriginals or northerners who meet the requirements of the NWT Apprenticeship Trade and Occupations Act.
- Within three years of production, De Beers will set up a trades training program and will provide 10 positions for Aboriginals

or northerners. The program will be designed for individuals who do not qualify for the apprentice program but will become eligible for the apprentice program through successful completion of the De Beers program.

- Within the first three years of production, a De Beers underground miner training program will be set up and 20 positions will be made available to Aboriginals or northerners. This program will be modeled after the Common Core Program in Ontario.

Request: Please provide the following:

- (a) Describe when De Beers intends to establish the apprentice positions. Also indicate how it will go about selecting candidates for the various training positions.
- (b) Clarify whether the "NWT Apprenticeship Trade and Occupations Act" is the same thing as the "NWT Apprenticeship, Trades and Occupations Certification Act".
- (c) Outline the provisions of the legislation affecting apprenticeship and trades certification in the NWT and the provisions of the Ontario Common Core Program.
- (d) Clarify the term "Aboriginals or northerners" to explain whether the reference is to individuals from the NWT or from all of the territories.

1.40 Source: Ellis IR 1.8

Reference: EAR, Page 5-112, Table 5.3-1 Economic Impacts of the Snap Lake Diamond Project

ToR Line: 461

To: De Beers Canada Mining Inc.

Preamble: A major benefit of the proposed project would be the employment opportunities for NWT residents. All jobs that cannot be "filled" from the existing labour force in the NWT will have to be filled by workers who either move to the NWT or fly-in and fly-out from a southern community.

Request: Please provide the following:

- (a) The number of jobs for the construction, operation and closure phases that are predicted to be filled by residents of:
 - o Yellowknife,
 - o the other primary study communities,
 - o the employment catchment communities, and
 - o from southern communities (fly-in fly-out).
- (b) The number of employees (if any) for the construction, operation and closure phases that will move from the south to take up jobs in:
 - o Yellowknife,
 - o the other primary study communities, and
 - o the employment catchment communities.
- (c) The number of NWT residents that will move:
 - o from the other primary study communities to Yellowknife
 - o from the employment catchment communities to Yellowknife
 - o from Yellowknife to the other primary study communities
 - o from Yellowknife to the employment catchment communities.

1.41 Source: GLL IR 1.34, Ellis IR 1.9

Reference: EAR

- (a) Section 3.9.1.2
- (b) Page 5-112, Table 5.3-1 Economic Impacts of the Snap Lake Diamond Project

ToR Line: 459-461, 466, 467, 468

To: De Beers Canada Mining Inc.

Preamble: A major benefit of the proposed project would be the employment opportunities it presents for northern residents. An integral part of this is providing employment benefits to northern Aboriginal residents.

In Section 3.9.1.2, De Beers makes a commitment to recruiting and hiring as many Aboriginals and northerners as possible during both

the construction and operation phases. Priorities in hiring will be as follows:

- First: Aboriginals born or residing in one of the primary communities;
- Second: residents of the NWT;
- Third: Canadians willing to relocate to the NWT; and,
- Fourth: others from across Canada.

Elsewhere in the EIS, De Beers states that wage employment opportunities are available to individuals who have the appropriate levels of education and/or training. Some mine jobs require grade 12 in formal education and many jobs require grade 10 as a minimum. This educational requirement would seem to limit the participation of Aboriginal people in the primary communities and Aboriginal people generally.

Request: Given the above factors as well as the presence of other developments, please provide the following:

- (a) What is De Beers' target for Aboriginal employment for the construction, operation and closure phases of the Proposed Project?
- (b) What is your realistic estimate of the proportion of the total workforce for the construction, operations and closure phase that will be comprised of northern Aboriginals?
- (c) How this might change over the operating life of the mine?

Traditional Knowledge and Traditional Land Use

1.42 Source: GLL IR 1.35

Reference: EAR, Section: 4.3.2 (consultation), 4.3.3 (use), 4.3.4 (Lutsel K'e TK study)

ToR Line: 47

To: De Beers Canada Mining Inc.

Preamble: De Beers identified four aboriginal organizations representing the persons likely to have relevant traditional knowledge in relation to the project, and consulted all of those organizations. Each organization advised De Beers on its preferred approach to making traditional knowledge available, and each selected a different approach. As a result, and in response to these preferred approaches, De Beers:

- received a TK study from Lutsel K'e;
- made a commitment to the North Slave Metis to incorporate TK in the monitoring program;
- used existing information already prepared by the Yellowknife Dene; and
- relied on non-systematic information gleaned at public meetings with the Dogrib Treaty 11 Council, because the Council indicated that it "might" provide De Beers with a TK study but then did not do so.

Based on De Beers's own account, it would appear that De Beers did in fact "make all reasonable effort to collect" traditional knowledge for the purpose of the EIS, and De Beers described adequately how it did this. However, it is not clear whether De Beers made similar efforts to "facilitate the collection" of TK, because nothing in the material reviewed indicated whether any of the Aboriginal organizations requested, or De Beers offered, funding in order to conduct TK studies. In particular, there is no indication of whether this was a factor in the non-production of a TK study by the Dogrib Treaty 11 Council. (It can be inferred from

the EIS that De Beers did in fact fund the Lutsel K'e TK study but there is no direct indication of this.)

De Beers used the TK that it did obtain to identify:

- VECs
- project issues
- alternatives
- mitigating measures
- follow-up (monitoring) programs
- traditional land use

and to incorporate these findings into the project design stage. TK is presented throughout the study rather than being confined to a stand alone section.

The actual presentation of TK appears to be confined to the use of individual quotes. As De Beers gives no indication of the representativeness or authenticity of the information provided, it appears to rely on anecdotes rather than real information in many cases, and in this respect TK is not given full and equal consideration to western science. Having said this, the consultants observe that this is fairly standard procedure in proponent driven EIS, and however inadequate it may be, proponents may have little alternative. It can be argued that organization and synthesis of TK to an appropriate standard is properly the responsibility of Aboriginal organizations, not proponents.

With respect to the requirements to, on the one hand, give "full and equal consideration" to both TK and western science, and on the other to "refrain from weighing the relative merits of predictions", these are in some ways contradictory. To the extent that De Beers has provided TK information, it may be said to have fulfilled the first, subject to comments above, but it does not appear to have fulfilled the second.

Request: Please provide the following:

- (a) Describe how De Beers and Aboriginal organizations may have mutually approached the collection of TK, and the extent to which De Beers may have funded or otherwise aided the assembly of TK.
- (b) Describe the extent to which De Beers may wish to continue to fund or assist in the collection and updating of TK in the future.

1.43 Source: GLL IR 1.36

Reference: EAR, Section: 6.1.6.2, 6.3.1 (Traditional Land Use)

ToR Line: 457 to 462

To: De Beers Canada Mining Inc.

Preamble: De Beers used appropriate methods to obtain baseline information (noting that certain information is held confidentially by aboriginal parties with overlapping claims). De Beers provided adequate information about current land use, with the exception of some traplines still to be confirmed (see p. 6-52).

Request: Please provide final confirmation with respect to this missing information.

1.44 Source: GLL IR 1.37

Reference: EAR, Sections 5.1.5.3, 5.2.2.3, 5.3.1.2.2, 5.3.4.3.7, 12.2.7

ToR Line: 478

To: De Beers Canada Mining Inc.

Preamble: Section 5.1.5.3 sets out certain methodological limitations in assessing socio-economic impacts that are appropriate and adequate for consideration at the review stage. Sections 5.2.2.3 and 6.3.1 provide a description of land uses.

The baseline community economic profiles in 5.2.3 provide information on participation in traditional activities but not the economic value of those activities or their relationship at the household level to other economic activities. De Beers' assessment of the likely impact of the project on land use and harvesting is reasonable for the level of data available (which is limited as described above).

De Beers' description of community concerns regarding traditional resource use (5.3.1.2.2, p.5-99-100 and chapters 6 and 10) is general but considered to be adequate.

Section 5.3.4.3.7 consists of a statement of intent by De Beers with respect to aboriginal traditional practice support.

De Beers has considered project impacts on "cultural practices and traditions of Aboriginal people" in section 12.2.7, adequately for review purposes.

Request: Please confirm whether De Beers intends to collect additional information and provide more detailed assessment of the importance of the economic value of traditional activities to household income.

Hydrogeology

1.45 Source: GLL IR 1.38

Reference: EAR Figure 9.2-3

ToR Line: 255 and 388

To: De Beers Canada Mining Inc.

Preamble: The groundwater data used for regional flow analysis are 6 large lake levels (Figure 9.2-3). This data indicates radially outward flow in all directions. Subsequent analysis is based on northward flow to North and Northwest Lakes only. Regional gradients

appear to be very flat and local surface water drainage basins do not necessarily define deep regional groundwater flow basins. It would be beneficial to have a larger map area, which extends to Great Slave Lake, to assess the regional groundwater flow.

Request: Please provide further details and data supporting regional flow directions, including and supporting deep groundwater level data and smaller scale surface water map with accurate lake elevations to support regional flow groundwater flow directions.

1.46 Source: GLL IR 1.39

Reference: EAR Section 10.1, Appendix IX.1

ToR Line: 350-356 and 369-373

To: De Beers Canada Mining Inc.

Preamble: There does not appear to be any borehole or groundwater samples from wells. All groundwater data is from floor ditch and borehole samples from the existing mine workings.

Request: Is there monitor well data, including groundwater level, permeability and quality data from the site? If yes, please provide the data. Additionally, as there were a significant number of exploration boreholes drilled, can any be used to provide further information on groundwater resources (static water levels, etc.)?

1.47 Source: GLL IR 1.40

Reference: EAR Appendix IX.1

ToR Line: 350-356 and 369-373

To: De Beers Canada Mining Inc.

Preamble: The information did not provide a complete rationale that chromium will occur in the hexavalent form and that it will be more mobile at the high pH levels from the mine paste.

Request: Please provide the following:

- (a) Additional supporting information or rational as to why it is believed chromium will occur in the hexavalent form.
- (b) Supporting information or rational as to why it is stated that the chromium will be more mobile at the high pH levels from the mine paste.

1.48 Source: GLL IR 1.41

Reference: EAR, Section 9.2.1.2, Page 9-21

ToR Line: 357-361

To: De Beers Canada Mining Inc.

Preamble: No discussion is provided regarding which lakes have been determined to be connected to the deep groundwater flow system via a talik.

Request: Please provide a discussion of how it was decided which lakes are connected to the deep groundwater flow system. What is the geometry and thickness of talik at the edge of the lakes?

1.49 Source: GLL IR 1.42

Reference: EAR, Section 9.2.27, Page 9-68

ToR Line: 369-373

To: De Beers Canada Mining Inc.

Preamble: It is assumed in the EA analyses that placement of a granite cap on the north pile at closure (page 9-68 and other locations) will substantially reduce releases of metals and erosion.

Request: Please provide additional justification for the reduction in metal release.

- 1.50 Source: GL IR 1.43
- Reference: EAR, Section 9.2.3, Page 9-76
- ToR Line: 383-385
- To: De Beers Canada Mining Inc.
- Preamble: Page 9-76 indicates that monitoring wells will be installed in the future but there is no information on proposed locations and depths.
- Request: Please provide information on the proposed monitoring well locations and depths.

Water and Aquatic Resources

- 1.51 Source: GLL IR 1.44
- Reference: EAR, Section 9.3.1.4.7, 9.3.2.2.3., 9.3.2.2.4
- ToR Line: 225
- To: De Beers Canada Mining Inc.
- Preamble: De Beers predicts changes to the hydrology of North and Northeast lakes as a result of altered groundwater flows. These conclusions cannot be assessed in the absence of bathymetry for these lakes.
- Request: Please provide bathymetric maps of North and Northeast lakes, total volumes and average and maximum depths.
- 1.52 Source: GLL IR 1.45
- Reference: EAR, Section 9.4.2.2.4
- ToR Line: 413
- To: De Beers Canada Mining Inc.
- Preamble: De Beers predicts that cadmium concentrations will exceed screening levels in discharge water but only assess this in terms of

toxicity to aquatic life. Cadmium bioaccumulates and so the EAR should address contaminant transfer to humans and wildlife.

Request: Please provide an assessment of cadmium bioaccumulation in Snap Lake aquatic life, particularly fish, and resulting impacts on other wildlife and humans.

1.53 Source: GLL IR 1.46

Reference: EA, Section 9.4.2.2.3, 9.4.2.2.4, Appendix IX-1

ToR Line: 376

To: De Beers Canada Mining Inc.

Preamble: De Beers predicts decreased phosphorus concentrations in Snap Lake under increased loadings from the mine. Some discrepancies exist between EAR figures and the Technical Appendices.

Request: Please provide the following:

(a) Summaries of annual loadings of total phosphorus to Snap Lake from:

- the watershed (local runoff);
- atmospheric deposition; and
- mine operations, in peak and average years.

(b) Confirm the predicted impacts with this information.

(c) Address these loadings in the context of the replacement time for water in Snap Lake. (i.e. provide a model of change in the whole lake and in smaller portions of the lake on an annual basis).

1.54 Source: GLL IR 1.47

Reference: EAR, Section 9.4.2.4.1

ToR Line: 294

To: De Beers Canada Mining Inc.

Preamble: De Beers uses Critical Loads of acidic deposition to predict changes in stream water pH during spring snow melt. Acidic runoff mobilizes aluminum from soils but this was not addressed.

- Request: Please provide predicted pH and aluminum levels in runoff and assess toxicological implications to stream spawners.
- 1.55 Source: GLL IR 1.48
- Reference: EAR, Section 9.4.2.2.4
- ToR Line: 413
- To: De Beers Canada Mining Inc.
- Preamble: De Beers assessed water quality changes on the basis of a mixing zone of 1% of lake volume in the vicinity of the mine water discharge (Fig. 9.4-12). The EAR does not specifically assess the sensitivity of aquatic habitat within the mixing zone.
- Request: Please provide a map of aquatic habitat sensitivity overlain with the 1% water quality impact zone.
- 1.56 Source: GLL IR 1.49
- Reference: EAR, Section 9.4.2.1.1
- ToR Line: 410
- To: De Beers Canada Mining Inc.
- Preamble: De Beers predicts toxicological impact on the basis of a 20% loss of functional roles in the aquatic community due to loss of sensitive species. This does not address potential changes in biodiversity.
- Request: Please provide an assessment of biodiversity changes in Snap Lake as a result of water discharges.
- 1.57 Source: GLL IR 1.50
- Reference: EAR, Section 9.2.1.3
- ToR Line: 350
- To: De Beers Canada Mining Inc.
- Preamble: De Beers presents baseline data on the quality of groundwater in Table 9.2-1. Data are presented for several geological units and within each a wide range of water quality is given. The text

suggests that groundwater quality changes with depth but this is not reconciled with variance of data presented. Variance will influence EAR predictions of mine water discharge quality.

- Request: Please provide information to reconcile variances in groundwater quality and rationale for concentrations used in EAR predictions.
- 1.58 Source: GLL IR 1.51
- Reference: EAR, Section 9.4.1.1
- ToR Line: 225
- To: De Beers Canada Mining Inc.
- Preamble: Reference lake was only sampled once to provide baseline water quality. This is not sufficient to characterize variance but it is recognized that the information is not an EA requirement (it can be obtained over life of mine).
- Request: Please commit to additional sampling of reference lake water quality.
- 1.59 Source: GLL IR 1.52
- Reference: EAR, Section 3.6.3, 9.3.2.2.3
- ToR Line: 358
- To: De Beers Canada Mining Inc.
- Preamble: De Beers presents a minimal water balance for source waters; for initial mine life, 6 years in (peak) and closure. This captures the range of water discharges but does not provide duration or rate of change between years.
- Request: Please provide a water balance for all mine sources for each year of mine life.

- 1.60 Source: GLL IR 1.53
- Reference: EAR, Section 9.4.2.2.3
- ToR Line: 374
- To: De Beers Canada Mining Inc.
- Preamble: De Beers does not provide information on whether the treated sewage stream will be disinfected and by what means. Will the project introduce bacteria and pathogens into Snap Lake?
- Request: Please provide information on the method of disinfection of STP discharge before entering into the main effluent discharge.
- 1.61 Source: GLL IR 1.54
- Reference: EAR, Section 3.10.2
- ToR Line: 529
- To: De Beers Canada Mining Inc.
- Preamble: De Beers provides reassurances that the geotechnical stability of the North Rock Pile is sufficient to withstand a warmer climate. Closure plans appear to be based on an assumption that the core of the pile remains frozen so that seepage is eliminated. The EAR does not provide any discussion of the implications of thawing of the interior of the North Pile on post-closure conditions.
- Request: Please provide an assessment of the implications of thawing on the quantity and quality of post-closure seepage from the North Rock Pile.
- 1.62 Source: GLL IR 1.55
- Reference: EAR, Section 9.4.2.2.1
- ToR Line: 364
- To: De Beers Canada Mining Inc.
- Preamble: De Beers assessment assumes that the treated discharge to Snap Lake will consist of "major ions, with low concentrations of metals and fine TSS ... The majority of dissolved metals and fine TSS is expected to remain in the water column". This analysis is used to

suggest that the discharge will have no effect on sediment quality, such that no further assessment is warranted (p. 9-211). Fine TSS are generally clays, which are charged and will attract metals from solution and which will ultimately settle out in Snap Lake. A deep hole is located in the immediate vicinity of the discharge and this may serve to "focus" sediments, thus concentrating them. The analysis provided does not present enough detail to discount the linkage between discharge and impacted sediments in the lake.

Request: Please provide an assessment of the levels of fine solids and trace metals in the discharge, an analysis of reactivity between the two and a discussion of the fate of discharged sediments to support the interpretation that the mine discharge will not affect sediment quality.

1.63 Source: GLL IR 1.56

Reference: EAR, Section 9.4..2.2.1, Section 7.3.3.4.1

ToR Line: 296

To: De Beers Canada Mining Inc.

Preamble: De Beers provides estimates of the deposition of Polynuclear Aromatic Hydrocarbons (PAH) from diesel combustion. These compounds will bioaccumulate but no analysis of potential accumulation in aquatic organisms is provided.

Request: Please provide an assessment of the fate and impacts of PAH on water quality and aquatic organisms.

1.64 Source: GLL IR 1.57

Reference: EAR, Section 9.5.1.2

ToR Line: 222

To: De Beers Canada Mining Inc.

Preamble: Habitat data has been summarized and presented in the report but details on how area calculations were made were not provided.

Request: Please provide additional information on the method used to quantify habitat areas (i.e. are area calculations from GIS based on two or three dimensional area calculations?)

1.65 Source: GLL IR 1.58

Reference: EAR, Section 9.5.1.2.4

ToR Line: 222

To: De Beers Canada Mining Inc.

Preamble: On page 9-265, the EAR indicates non-lethal aging structures were collected for aging lake trout. Otoliths are the recommended aging structure to be used for lake trout.

Request: Please provide evidence supporting the accuracy of using non-lethal aging structures for lake trout. This information will be needed to monitor development impacts on lake trout populations during the construction and operational phases and beyond.

1.66 Source: GLL IR 1.59

Reference: EAR, Section 9.5.1.4

ToR Line: 222 and 402/404

To: De Beers Canada Mining Inc.

Preamble: The EAR indicates that the greatest impact of the mine will be on fish and fish habitat of the North and Northeast Lakes.

Request: Please provide additional details on fish and lifestages that use these lakes and the types of habitat found in these lakes. The information is necessary to fully evaluate the impacts of contaminated groundwater on the fish that use these lakes.

- 1.67 Source: GLL IR 1.60
- Reference: EAR, Section 9.5.2.2.3
- ToR Line: 406
- To: De Beers Canada Mining Inc.
- Preamble: On page 9-303, there is an assessment that predicts that changes in water quality in Snap Lake will be confined to the deepwater basins greater than 8 m deep and these areas are unlikely to represent critical feeding habitat. In some lakes, the deepwater areas provide important over wintering habitat.
- Request: Provide an assessment of the value of the deepwater habitats in Snap Lake in relation to overwintering habitat needs of the fish population in the lake.
- 1.68 Source: GLL IR 1.61
- Reference: EAR, Section 9.5.2.3.3
- ToR Line: 402
- To: De Beers Canada Mining Inc.
- Preamble: On page 9-344, the report estimates that there could be an 8% flow reduction in the outlet creek of North Lake and that the associated impact would be less than 10% of the useable habitat in the creek. Depending on channel characteristics an 8% reduction in flow can result in much less or much more than a 10% change in useable habitat.
- Request: Provide more detailed information about the relationship between flow and habitat in this creek to fully assess the impact on this creek.