DE BEERS

April 14, 2003

Mackenzie Valley Environmental Review Board
Attn: Mr. Gordon Wray
P.O. Box 938
Yellowknife, NT
X1A 2N7

BY HAND

Dear Gordon

Re: The record for the De Beers Canada Mining Inc. Snap Lake Diamond Project Environmental Assessment- Socio-economic and Wildlife Questions

De Beers hereby submits further information to address and alleviate the Review Board's concerns with respect to the public record and the hearing for the Snap Lake Diamond Project. In this submission, De Beers provides evidence for the public record regarding socio-economic and commitment related questions.

Please also note that there is information supplementary to the Board's questions that is attached to this submission. This information pertains to the report of Ellis Consulting to the MVEIRB regarding outstanding technical issues. This information has been provided to ensure that all items are addressed to the Boards satisfaction.

Please contact the undersigned if you have any questions.

Yours truly,

Robin Johnstone
Senior Environmental Manager

encl.

DE BEERS CANADA MINING INC.

#300 – 5102 50th AVENUE
YELLOWKNIFE NT X1A 3S8 CANADA
TEL (867) 766-7300 FAX (867) 766-7347

RESPONSE TO MVEIRB Q1(1)

Presented below is the revised section 5.3.2.3.5 from the original EAR. The supporting tables are attached as separate spreadsheet files

Tax and Fiscal Impacts

The Snap Lake Diamond Project will have a number of substantial tax and fiscal impacts for the government of Canada and the GNWT. The following four tables show the tax and fiscal impacts on an annual and cumulative basis.

Combined Table 5.3-3 and 5.3-4 presents the estimated tax and fiscal impacts for the federal and NWT governments, as derived from the tax and fiscal impacts model. The impacts for the construction and the closure phases are presented in their entirety. The operations phase, which occurs over a period of 22 years (2007-2029), is presented in terms of annual impacts. The "other taxes" category is comprised of the following taxes: personal income tax; employment insurance premiums; payroll tax; fuel taxes; property tax; goods and services tax; and tobacco taxes. This category does not include corporate income taxes and mineral royalties, or the potential incremental impact from migration of people into the NWT.

Combined Table 5.3-3 and 5.3-4 presents the estimated cumulative impacts by project phase, for the period 2004-2030 for the federal government and GNWT. As well, a separate total cumulative impact table that represents a summation of the tax and fiscal impacts for all three phases is included. The federal government will receive an estimated total of $493.8 million in other taxes over the life of the project. The GNWT will receive a total of $128.9 million (Combined Table 5.3-3 and 5.3-4).

Table 5.3-5 presents the estimate of cumulative corporate income tax, federal surtax, and mineral royalties to be paid by De Beers on the proposed Snap Lake Diamond Mine. De Beers derived the estimates for all three components and utilized these estimates in the modeling assumptions and procedures.

The federal government will receive an estimated total of $156.6 million in corporate income tax over the life of the project. The GNWT will collect some $43.9 million (Table 5.3-5).

The federal government will collect some $3.5 million through the federal surtax. There is no surtax payable to the GNWT (Table 5.3-5).

Table 5.3-6 presents the estimated total cumulative impact of all of the tax and fiscal impacts from Tables 5.3-4 and 5.3-5. This table represents the estimated total revenues, for the federal and territorial governments, associated with the proposed Snap Lake Diamond Mine over the period 2004-2030.

Under the existing financing formula between Canada and the GNWT, the increase in taxation revenue as a result of the project will result in a reduction of some $35.1 million in the grant to the GNWT. Conversely, the federal government will realize a savings of $35.1 million from the grant reduction to the GNWT (Table 5.3-6).

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Under the terms of the *Canada Mining Regulations* mineral royalties only accrue to the federal government. De Beers has independently calculated the total royalties payable from the project at $80.3 million (Table 5.3-6).

The federal government will realize net revenues of nearly $872.3 million over the life of the Snap Lake Diamond Project. The GNWT will realize net revenues of $34.7 million from the project's activities; this excludes estimated per capita funding of $12,000 annually under the federal formula grant.

The GNWT may receive $84.5 million from per capita funding through increased population from migration into the NWT over the life of the Snap Lake Diamond Project. The grant formula includes a per capita funding factor linked to the gross expenditure base, which is escalated by a three-year moving average of the lesser of:

- growth in provincial-local government spending; or,
- GDP multiplied by the ratio of the three-year moving average of the population growth rate of the NWT relative to the three-year moving average of the population growth rate of Canada as a whole.

In September 2001 Statistics Canada released economic data, which resulted in changes to the provincial-local forecast. The forecast was revised downwards, which lowered the growth rate and therefore the amount each additional individual means to the grant formula by the time the additional person has been in the grant formula for the three years. The $17,450 per capita figure that was initially provided in June 2001 by the Fiscal Policy Division, Department of Finance, GNWT, was revised downward in October 2001 to $12,000 per capita.

Based on the economic modeling assumption that 60% of the labour would originate from outside the NWT, of which 50% would locate in the NWT, the number of persons would be 150. Using the average mining household size of 2.2, based on the profile of mining households from the *1999 NWT Labour Force Survey* (GNWT Bureau of Statistics 1999a), the total population increase would be 330 persons. Using the $12,000 per capita figure, the net grant formula increase to the GNWT would be $3.96 million annually during the operations phase and $0.87 million during the closure phase. The cumulative total over the operations and mine closure phases is estimated at $84.5 million. There is no migration assumed for the construction phase, consequently there is no per capita funding impact.

Tables 5.3-3 to 5.3-6 are attached in the accompanying spreadsheets.

TABLES 5.3-3 and 5.3-4
April 11, 2003

	Federal Government Impacts			Government of the NWT Impacts		
	TOTAL CONSTRUCTION	ANNUAL OPERATIONS	TOTAL MINE CLOSURE	TOTAL CONSTRUCTION	ANNUAL OPERATIONS	TOTAL MINE CLOSURE
Timing	2004-2007	2007-2029	2028-2030	2004-2007	2007-2029	2028-2030
Total Expenditure ('000)	$269,400	na	$25,000	$269,400	na	$25,000
Average Annual Expenditure ('0	na	$120,700	na	na	$120,700	na
		($'000)			($'000)	
Other Taxes	35,570	21,505	4,401	6,373	5,769	766
Grant Reduction	..	..	..	(5,092)	(4,609)	(612)
Savings on NWT Grant	5,092	4,609	612	..	..	..
Net Revenues	40,662	26,114	5,013	1,281	1,160	154

CUMULATIVE IMPACTS 2004-2030	Federal Government ($'000)	GNWT ($'000)
Other Taxes	493,848	128,897
Grant Reduction		(102,987)
Savings on NWT Grant	102,987	
Net Revenues	596,835	25,910

Note 1: Estimates of "Other Taxes" were determined by the Government of the Northwest Territories (GNWT)
Note 2: "Other Taxes" does not include corporate income taxes and mineral royalties
Note 3: "Other Taxes" is comprised of the following taxes: Personal Income Tax; Employment Insurance Premiums; Payroll Tax; Fuel Taxes; Property Tax; Goods and Services Tax; and Tobacco Taxes
Note 4: Federal government and GNWT tax and fiscal impacts are mutually exclusive from one another
Note 5: It is assumed that for the operations phase 50% of the local labour component will come from in-migration to the Northwest Territories (NWT)

TABLE 5.3-6		
April 11, 2003		
CUMULATIVE IMPACTS		
2004-2030	**Federal Government**	**GNWT**
	($'000)	($'000)
Corporate Income Tax	156,551	43,872
Federal Surtax	3,510	..
Other Taxes	493,848	128,897
Grant Reduction	..	(138,085)
Savings on NWT Grant	138,085	..
Mineral Royalties	80,308	-
Net Revenues	872,301	34,685
Note 1: This table is a combination of tables 5.3-4 and 5.3-5		

TABLE 5.3-6		
April 11, 2003		
CUMULATIVE IMPACTS		
2004-2030	Federal Government	GNWT
	($'000)	($'000)
Corporate Income Tax	156,551	43,872
Federal Surtax	3,510	..
Other Taxes	493,848	128,897
Grant Reduction	..	(138,085)
Savings on NWT Grant	138,085	..
Mineral Royalties	80,308	-
Net Revenues	872,301	34,685
Note 1: This table is a combination of tables 5.3-4 and 5.3-5		

RESPONSE TO MVEIRB Q1 (2) (i)

De Beers Canada Mining Inc is responding "yes" that the northern percentage rates for employment that were adopted for the modeling purposes (40% for construction, 60% for operations and 60% for closure) constitute De Beers' prediction for potential impacts on the NWT labour force. The prediction estimates are clearly subject to the actual labour market conditions –on both the supply and demand side - over the life of the project and in combination with the proposed human resource development strategy.

Level Of Uncertainty:

The analysts are confident with the methodology, the associated labour market estimates, and the modeling prediction, subject to the reliability of the government labour market information available at the time of the project EAR submission and the robustness of the Input-Output Tables.

RESPONSE TO MVEIRB Q1 (2) (i) (a) and supplementary to (c)

Employment estimates for construction, operation and closure for the following geographic areas: (1) Yellowknife, (2) the other primary impact communities, (3) the catchment communities, (4) the remainder of the NWT and, (5) southern Canada.

Within the context of the request, the most valid and useful response possible by De Beers Canada Mining Inc is to present the available evidence by the geographic categories of: Yellowknife; Other NWT communities; and southern Canada.

Inter-Provincial Migration and Labour Settlement Patterns: 1986 to 1996

Examination of NWT Bureau of Statistics data and Statistics Canada inter-provincial migration data for the 1986, 1991 and 1996 census periods indicates that some 60 to 65 % of inter-provincial migration has been to Yellowknife. A further 20 to 25% of inter-provincial migration has been to the larger regional centres of Fort Smith, Hay River and Inuvik. Less than 10% of inter-provincial migration is to the other twenty-nine NWT communities.

Labour Force Location By Industry: 2001 Census Data

A review of the 2001 census data on labour force by industry, including a special tabulation completed for the NWT Bureau of Statistics (source: Statistics Canada Tabulation, Table #97F0012XCB009, 2001 census) indicates that the general pattern of inter-provincial migration and settlement have continued since 1996 and are interpreted as being a reliable independent public data indicator of location of labour by industry. The census data and special tabulation were provided for the NWT overall and broken down by Yellowknife and other NWT communities.

Examination of the location of labour force by industry, using the North American Industrial Classification System (NAICS), for the closest fit and estimate of diamond mining labour - which is "*non-metallic mineral mining and quarrying*" (NAICS reference code 2123) indicates that some 61% of that labour category is resident in

Yellowknife and another 39% is in other NWT communities. The table below provides the summary data.

Total NWT Labour (Workers) *"Non-metallic mineral mining and quarrying"*	Yellowknife	Other NWT Communities
490	300	190
100%	61%	39%

Notes:

1. Statistics Canada uses a random rounding process to ensure confidentiality, as a result numbers may not necessarily total.
2. The figures include a small number of persons employed in quarrying.
3. These figures exclude mining support activities.
4. Workers who reside outside the NWT are not included in these figures.
5. Source: Statistics Canada Tabulation, Table #97F0012XCB009, 2001 census)

Diavik Construction Phase Labour Location – Public Reporting Data

Review of the information available from the published Diavik Diamonds Project Socio-Economic Monitoring Reports for 2001 and 2002 provide additional perspective on labour location during the construction phase of Diavik. The Snap Lake Diamond Project modeling projection uses the same estimates of local labour as Diavik: 40% during construction; 60% during operations; and, 60% during closure. There is no other publicly available information on labour location from the experience of BHP Billiton. The relevant reporting data from Diavik is summarized below:

- Projected local labour for construction by DDMI was 40%. The actual reported for 2001 was 45% and 44% in the first six months of 2002 (source: Socio-Economic Monitoring Report, 2001 and 2002).
- Employment by location 2001: 87% of all DDMI employees lived in the north in 2001. Of the total resident in the north, 78% lived in Yellowknife while 9% lived in other northern communities.
- Employment by location 2002: 90% of all DDMI employees lived in the north in 2002. Of the total resident in the north, 87% lived in Yellowknife while 3% lived in other northern communities.
- Contractor employees by location 2001: Of the total person-months of reported work completed by contractors at Diavik, 37% lived in the north, while 63% were resident in southern Canadian communities. Of the contractor employees who lived in the north, some 21% of the contractor person-months were provide by persons who lived in Yellowknife – which represented some 56% of the total NWT contractor person-months of work. A further 16% lived in other northern communities - which represented some 44% of the total NWT contractor person-months of work.
- Contractor employees by location 2002: Of the total person-months of reported work completed by contractors at Diavik, 37% lived in the north, while 63% were resident in southern Canadian communities. Of the

contractor employees who lived in the north, some 25% of the contractor person-months were provide by persons who lived in Yellowknife – which represented some 69% of the total NWT contractor person-months of work. A further 11% lived in other northern communities - which represented some 31% of the total NWT contractor person-months of work.

Estimate of Labour Location By Construction Phase

Based on the analysis of migration and settlement patterns for labour using inter-provincial migration data, the construction experience of Diavik and the results of the NWT Regional Labour Market Cumulative Impact Analysis (see response to Q1 (2) (i) (b)), De Beers Canada Mining Inc has developed the following direct employment estimates for construction, operation and closure for the following geographic categories: Yellowknife; Other NWT communities; and southern Canada.

The key assumptions underlying the direct employment estimates are:

- A direct project workforce of 220 is required for the construction phase.
- A direct project workforce of 500 is required for the operations phase.
- A direct project workforce of 110 is required for the operations phase.
- Local labour: 40% during construction; 60% during operations; and, 60% during closure.
- Resident workers are defined as those who currently live in the NWT and those who will move to take up residency in the NWT and work at the project.
- One-half or 50% of the resident workers are estimated to be recruited from outside the NWT. This 50% assumption applies only to the operation and mine closure phases. There is no migration assumed for the construction phase, in large part due to the specialized skills that are required for a relatively short time.
- The estimated local labour residency share for the construction phase is: 80% in Yellowknife; and 20% in Other NWT communities. It should be noted that the residency share are likely to fall within a range but for purposes of simplicity a single figure is used for presentation.
- The estimated local labour residency share for the operations and closure phase is: 65% in Yellowknife; and 35% in Other NWT communities. It is expected that most of the closure workforce will be drawn from the operations employees.

Estimated Local Labour By Project Phase and Community

	Construction Phase		*Operations Phase*		*Closure Phase*	
Total Local Labour	220 (40%)	88	500 (60%)	300	110 (60%)	66
Yellowknife	80% share	70	65% share	195	65% share	43
Other NWT Communities	20% share	18	35% share	105	35% share	23

Level Of Uncertainty:

The analysts are reasonably confident with the methodology and the associated estimates when grouped into the categories of (a) Yellowknife; (b) Other NWT Communities; and, through modeling projections (c) Southern Canada, subject to the reliability of the government census information available at the time of the project EAR submission and updated where available – including inter-provincial migration data, labour by industry and Diavik construction experience. The inherent limitations of projecting labour origin and mobility have been well documented in literature and previous responses to Information Requests. There is a somewhat lower level of confidence with attempting to estimate employment estimates for construction, operation and closure phases (spanning over two decades) or more geographically discreet areas outside the two groupings of Yellowknife and other NWT communities (which are limited by public data reporting and availability).

RESPONSE TO MVEIRB Q1 (2) (i) (b)

Please find attached a comprehensive quantitative analysis report, *NWT Regional Labour Market Cumulative Impact Analysis* – April 9, 2003, that supports the reasonableness of the prediction estimates given the current labour market situation. This quantitative analysis must take into account the employment impacts of the BHP Billiton and Diavik Mines since Jan-Feb of 1999 and takes into consideration the current labour market as represented by Statistics Canada's Monthly Labour Force Survey. The key summary observations from the report are presented below.

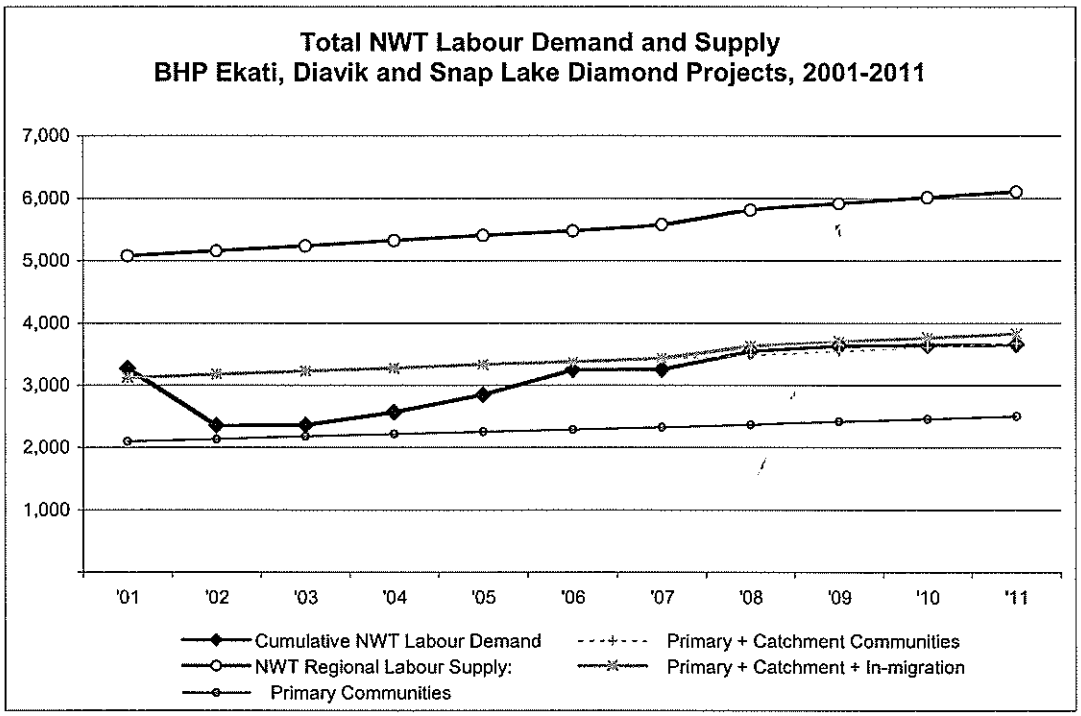
What is at issue is whether there is sufficient NWT regional labour supply to meet the projected annual NWT labour requirements for the Snap Lake project, particularly when this demand is combined with that for the BHP Ekati and Diavik projects.

Labour demand for the Snap Lake and other NWT diamond projects includes (i) direct mine jobs and (ii) jobs due to project economic impacts (i.e., indirect and induced employment). Labour for certain of these jobs will be supplied by NWT residents. Other jobs will be filled by persons living outside the NWT. For direct mine jobs, the employment of NWT residents vs. non-residents is a planning assumption for each mine. For indirect and induced employment, jobs for the NWT region and elsewhere are based on results obtained from input-output analysis (the

Statistics Canada interprovincial input-output model in the case of the Snap Lake project).

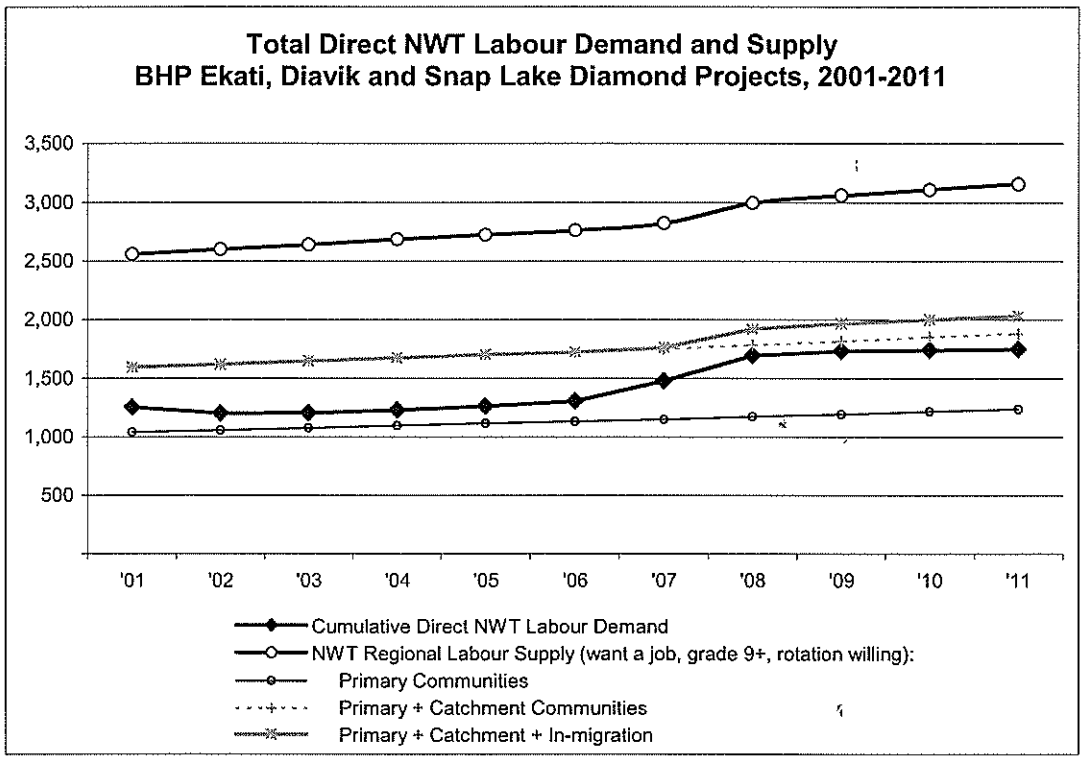
NWT regional labour supply information is based on demographically projecting information about persons wanting a job from the 1999 NWT labour force survey. Direct mine jobs require grade 9+ education and a willingness to do rotational work. The other jobs (indirect and induced) are not assumed to have these requirements. This approach to defining the NWT regional labour supply therefore includes not just those persons who would be officially unemployed according to national labour force definitions but also those who have said that they want to work.

Projected NWT regional labour supply is more than sufficient to meet the cumulative labour demand of the three NWT diamond mine projects during the period 2004 to 2011. (The Snap Lake project construction phase begins in 2004.)



For total labour demand (direct, indirect and induced jobs), the projected NWT regional labour supply exceeds demand by more than 2,200 persons in all years during the 2004 to 2011 period. Further, NWT supply also exceeds the cumulative labour demand for direct mine jobs (those requiring grade 9+ education and willingness to do rotational work) by 1,300 or more persons in all years. (See Figures 1 and 2.)

Figure 2



Additionally, labour supply exceeds cumulative labour demand for both total and direct mine jobs when NWT labour supply is limited to the Snap Lake primary and catchment communities along with planned in-migration. (See Figures 1 and 2). While the analysis has not directly factored in the anticipated contribution to the skilled labour market through a comprehensive and aggressive human resource strategy by De Beers Canada Mining Inc – including literacy, pre-employment apprenticeship training and apprenticeship programs, it is expected to strengthen the available labour market.

While the analysis draws on the 1999 labour force data set, it is recognized that there have been some changes in the NWT labour force that are now becoming available through the Statistics Canada. The changes in the NWT labour market have to a significant extent been shaped by the BHP Billiton operations and Diavik construction activities. The timing of the 1999 Labour Force Survey, just a matter of months following BHP Billiton start of operations, would have reflected the full effect of indirect labour activities. The NWT Regional Labour Market Cumulative Impact Analysis completed by De Beers does factor into the labour demand estimates. Additional confidence in the labour supply side analysis stems from 3.5 years of operations at BHP Billiton and the completion of the construction stage of Diavik in that a significant draw on labour has been experienced but also shows that there is an adequate labour force to meet the requirements of the Snap Lake Diamond Project.

RESPONSE TO MVEIRB Q1 (2) (i) (c)

As outlined in the response to Q1 (2) (i) (a), one assumption underlying the Direct Labour Estimate is that one-half or 50% of the resident workers, i.e. a total of 150 workers, are estimated to be recruited from outside the NWT during operation. Based on the information and data sources discussed in Q1 (2) (i) (a), it is predicted that approximately 65% of persons migrating to the NWT will settle in Yellowknife, and the remaining 35% will settle in other communities. De Beers clarifies for the Board that this would predict that 98 operating jobs will be filled by persons who migrate to Yellowknife and 52 operating jobs will be filled by people moving into other NWT communities.

Level Of Uncertainty:

Based on the mine design and current operational requirements, De Beers Canada Mining Inc are reasonably confident with the methodology and the associated estimates underlying this prediction.

RESPONSE TO MVEIRB Q1 (2) (i) (d)

The essential methodology descriptions, including where appropriate caveats as to the level of uncertainty, are contained within the text of individual responses.

NWT Regional Labour Market Cumulative Impact Methodology

Due to the comprehensive nature of the *NWT Regional Labour Market Cumulative Impact Analysis* – April 9, 2003, a separate section on methodology is contained in an appendix. The key methodology notes are as follows:

M1. Overview

This report focuses on two elements relating to the NWT regional labour market:

- the demand for NWT labour by the Snap Lake, BHP Ekati and Diavik diamond mine projects, and
- the projected supply of labour available in the NWT regional labour market.

The cumulative NWT labour demand for the three mines (i.e., their direct employment and the labour demand due to the indirect and induced impacts of the project) is then compared to projected NWT labour supply to determine whether there is sufficient NWT labour supply available regionally to meet the NWT labour requirements flowing from the mine activity.

The period under consideration is primarily 2004 (when the Snap Lake construction is planned to begin) through 2011. Certain labour demand and supply information is also provided for 2001 through 2011.

M2. Labour demand

Labour demand for the Snap Lake and other NWT diamond projects includes (i) direct mine jobs and (ii) jobs due to project economic impacts (i.e., indirect and induced employment).

Labour for certain of these jobs will be supplied by NWT residents. Other jobs will be filled by persons living outside the NWT.

For direct mine jobs, total employment and the employment of NWT residents vs. non-residents are planning assumptions for each mine.

By comparison, for indirect and induced jobs, labour demand for the NWT region and elsewhere is based on results obtained from input-output analysis (the Statistics Canada interprovincial input-output model in the case of the Snap Lake project).

M2.1 Snap Lake labour demand

The methodology used for forecasting labour demand for the Snap Lake project is outlined in detail in the February 2002 Snap Lake diamond project environmental report, Chapter 5: "Socio-Economic Impact Assessment."

Information presented in that report was updated in March 2003 to reflect changes in project timing, etc. Also, these forecasts are now based on the Statistics Canada interprovincial input-output (I/O) model, which provides NWT and Nunavut information separately.

The Statistics Canada interprovincial I/O model provides forecasts for Snap Lake indirect labour demand for the NWT regional labour market (as well as for other jurisdictions). These estimates reflect inter-industry sales of commodities identified in Statistics Canada surveys and their geographic patterns. Additionally, the NWT Bureau of Statistics has calculated induced labour demand for the project based on the I/O model results.

M2.2 BHP Ekati and Diavik labour demand

The labour demand information for the BHP Ekati and Diavik projects is based on published sources and was developed for the period 2001 through 2011.

BHP Ekati direct employment of NWT residents for 2001 was obtained from the BHP *Annual Report on Northern and Aboriginal Employment: 2001 Operational Phase*. For subsequent years, the BHP Ekati direct employment figures are based on research by Terriplan Consultants. The total BHP indirect and induced employment of NWT residents was estimated using employment multipliers (total jobs per direct job) calculated from Table 29: "Estimate of Cumulative Impacts on Regional Labour Market," *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*.

NWT direct, indirect and induced labour demand for Diavik are based on the *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*, Table 18: "Annual Operating Direct Employment Impact in the Local Study Area, by Location" and Table 19: "Annual Total Operating Employment in the Local Study Area." Data for the years not provided in the two tables were interpolated.

M3. Diamond mine employment requirements – direct jobs

For the purposes of delineating more precisely the regional labour demand and supply for the three diamond mine projects, direct jobs to be filled by NWT residents were assumed to have the following two requirements:

- a minimum of grade 9 education, and
- a willingness to do rotational work.

Grade 9 education is necessary because it is the minimum level for training associated with direct mine employment. The work schedule for all three mines is rotational. By comparison, no minimum education level or willingness to do rotational work requirement is assumed for indirect and induced jobs.

These job requirements are the assumptions made for the Diavik labour projections.

M4. Labour supply

Forecasting the NWT regional labour supply for the Snap Lake and other NWT diamond projects follows the method used for the document *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*. That report took 1994 NWT labour force information and projected it demographically for future years (through to 2002).

For the Diavik projections, the total NWT regional labour supply was defined to be all persons who wanted a job. Of these, persons with grade 9+ education who were also willing to do rotational work represented the potential NWT labour supply for direct mine jobs.

Labour supply for this report is based similarly on demographic projections; in this instance from the more recent 1999 NWT labour force survey. Additionally, the NWT regional labour supply includes persons who are assumed to move to the territory to fill one-half of the direct mine jobs during the Snap Lake operations phase.

M4.1 Demographically projecting NWT regional labour supply

Following the assumptions outlined in *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*, the task of estimating NWT regional labour supply for this report focused on the two components of labour demand resulting from the diamond mine projects:

- direct mine employment (requires grade 9+, willingness to do rotational work)
- indirect and induced jobs (all others who want a job).

In particular, 1999 NWT labour force survey information was used to project the NWT regional labour supply for each of these two labour demand components. (Like the 1994 NWT labour force survey, the 1999 survey asked persons their highest level of schooling, whether or not they wanted a job, and additionally if they were willing to do rotational work.)

These projections were developed for the Snap Lake "primary" communities with information for Yellowknife (including N'dilo) provided separately, for the "employment catchment" communities, and for all other NWT communities.

To demographically project the NWT regional labour supply for years following 1999, the NWT labour force survey information for each community grouping was increased according to the forecast rate of population growth for persons 15+ years of age.

This approach means that the percentage of persons wanting a job, and similarly for those wanting a job with a grade 9 education and also willing to do rotational work, are kept constant over time for each community grouping.

Population growth for persons 15+ years of age was based on NWT Bureau of Statistics population projections for the Snap Lake impact area community groupings (primary, employment catchment, and other). Additionally, population projections were provided separately for Yellowknife (including N'dilo) and for the other primary communities taken as a group.

The Bureau of Statistics provided population projections for the years 2001, 2006 to 2008, 2011 and 2016. Population projections for other years were estimated by linear interpolation (this method showed minimal difference compared to using a compound growth approach).

M4.2 Planned in-migration component of NWT regional labour supply

In addition to the demographically projected labour supply, Snap Lake project planning assumes that one-half of the direct jobs during its operations phase will be filled by persons moving to the NWT. This second component of NWT regional labour supply represents the labour supply for some 150 jobs (at its maximum).

M4.3 NWT regional labour supply information elements

Three data elements are provided for 1999 NWT labour force survey projections:

- all persons wanting a job, represent the potential labour supply for indirect and induced jobs, and
- persons wanting a job who also have a minimum grade 9 education and are willing to do rotational work, representing the potential labour supply for direct mine jobs.
- persons moving to the territory to fill one-half the Snap Lake direct mine jobs during the operations phase

M5. Comparing NWT regional labour demand and supply

Cumulative NWT labour demand for the three mines and the associated NWT regional labour supply were compared for both total and direct jobs for the period 2004 through 2011.

This comparison was done at the total NWT level, as well as for the Snap Lake community groupings. Specifically for community groupings, labour demand was compared to supply for the Snap Lake primary communities, for those communities combined with the employment catchment communities, and for both community groupings combined with the planned in-migration to fill half the Snap Lake operations phase direct jobs.

Level Of Uncertainty:

The analysts are confident with the methodology and the associated labour market estimates, subject to the reliability of the government labour market information available at the time of the project EAR submission.

While the analysis draws on the 1999 labour force data set, it is recognized that there have been some changes in the NWT labour force that are now becoming available through the Statistics Canada. The changes in the NWT labour market have to a significant extent been shaped by the BHP Billiton operations and Diavik construction activities. The timing of the 1999 Labour Force Survey, just a matter of months following BHP Billiton start of operations, would have reflected the full effect of indirect labour activities. The NWT Regional Labour Market Cumulative Impact Analysis completed by De Beers does factor into the labour demand estimates. Additional confidence in the labour supply side analysis stems from 3.5 years of operations at BHP Billiton and the completion of the construction stage of Diavik in that a significant draw on labour has been experienced but also shoes that there is an adequate labour force to meet the requirements of the Snap Lake Diamond Project.

RESPONSE TO MVEIRB Q1 (3)

It is our understanding that Q1 (3) is intended only as a preamble to the request in Q1 (4) and as such does not require a response. The discussion was previously addressed in responses to two previous rounds of Information Requests (IR1.28 (a), (b), and (c); IR 1.25).

RESPONSE TO MVEIRB Q1 (4)

De Beers will provide the requested prediction prior to or at the Public Hearing.

RESPONSE TO MVEIRB Q2.1

As has been publicly stated in the De Beers Human Resources Development Plan approximately 50 of the 500 operating positions at the Snap Lake Diamond Mine will be management positions. Personnel in these positions will be working a 4 days in and 3 days out rotation. Through a "Northern Allowances" program De Beers will encourage its management personnel on the 4/3 rotation to live in the NWT. De Beers anticipates that the majority of management personnel on a 4/3 rotation will take advantage of "Northern Allowances" program and will reside in the NWT.

RESPONSE TO MVEIRB Q2.2

De Beers Canada Mining Inc. has developed several relocation policies with the specific objective of encouraging prospective employees take up permanent residence in the NWT. Some of the relocation policies include, relocation assistance, salary subsidy, accommodation and utilities subsidy, and annual vacation travel subsidy. These policies are briefly described below.

- Relocation Assistance
- Salary subsidy
- Accommodation and Utilities Subsidy
- Annual vacation travel subsidy

RESPONSE TO MVEIRB Q4 (1)

A general analysis of impacts of in-migration of an assumed 150 employees during the start-up of operations follows. This analysis assumes a range of 60 - 70 percent of the 150 employees (90-105) will move with their families to Yellowknife. This range is based-on recent BHP and Diavik experiences. Section 5.3.2.1.5 of EAR (Input-output Model Assumptions) states that demographic multiple used by the NWT Bureau of Statistics for changes in NWT population is 2.2 persons per household based on the profile of mining households from the 1999 NWT Labour Force Survey (EA, p –108). Therefore, the impacts on Yellowknife will be:

- Need for 90 to 105 housing units
- Using the 2.2 persons per household demographic means that about 20 of the employees will have families with children. Using household characteristics similar to current Yellowknife demographics (ages 0-4: 25%, 5-14: 50%, 15-19: 25%) there will need to be about 10 elementary school places and approximately 5 high school places and 5 will be pre-school.
- The 90 to 105 households will also make service demands on health and medical services, safety (police/fire) services, and community and recreation services in the same pattern as current residents.
- The costs to the education system and for community and social services will be borne by the existing tax and user fee structures.
- The housing need is expected to be met by the provision of private sector housing developments.

RESPONSE TO MVEIRB Q.4 (2)

The Canadian economy is comprised of some 300 industries, including the various sectors of mining. While the NWT economy does not have the full range of industries De Beers had provided detailed estimates of impacts by industry aggregation in IR 1.24c and IR 1.25 for the NWT and Canada. To address the current request, it is necessary to examine the current and projected inflationary environment.

Inflation is defined as a persistent rise in the price of goods, services, and factors of production over an extended time, as measured by a price index such as the Consumer price Index (CPI).
The Consumer Price Index is a measure of the rate of price changes for goods and services bought by Canadian consumers. It is the most widely used indicator of price changes in Canada. The CPI is defined as an indicator of the changes in consumer prices experienced by Canadians. It is obtained by comparing, through time, the cost of a fixed basket of commodities purchased by consumers in a particular year. Since the basket contains commodities of unchanging or equivalent quality and quality, the index reflects only pure price movements. The CPI is frequently used to estimate the extent to which this purchasing power of money changes. For these reasons, it is a widely used to measure of inflation (or deflation). A number of key factors impact the CPI, including wages and salary changes. A significant or sustained rise in wages and salaries would become evident in changes to CPI over time as the cost of goods and services rises with demand.

There are two main explanations about the "causes" of inflation: supply-shock and demand-pull. Economist recognizes that in reality there is a complex mixture of the two. The supply-shock scenario is when prices are pushed up by higher wage and raw materials costs; perhaps resulting from employee union power, higher imports as a result of a weak currency, or a jump in commodity prices. The demand-pull scenario occurs when prices are pulled up when spending power (demand) is greater than the availability of goods and services. Factors which can boost aggregate demand include tax cuts, higher government spending, wage rises caused by labour shortages and an increase in consumer borrowing.

CPI for Canada and Yellowknife

The CPI is provided for major centres in Canada, including Yellowknife. There are no CPI measures for any other communities in the Northwest Territories. Examination of the CPI for Canada and Yellowknife for the period 1994 to February 2003, the period for which the construction and operations impacts of the Ekati and Diavik diamond mines would have become evident, indicates that no extraordinary inflationary pressures were experienced in Yellowknife. The CPI for Canada in 1996 was 105.9 (where the base year 1992 = 100) and 122.4 in February 2003. The corresponding numbers for Yellowknife are 108.2 and 118.7 respectively. The relative change in CPI for Yellowknife has remained below that of Canada since 1997.

The February 2003 Consumer Price Index report by Statistics Canada provides continuing evidence of a low inflationary environment. Information released by Statistics Canada indicates that the Yellowknife All-Items Consumer Price Index for February was 3.9% higher than a year earlier. By comparison, the annual price increase was 4.6% for Canada, 7.3% for Edmonton and 4.7% for Whitehorse.

The overall price increase in Yellowknife of 3.9% for February compared with a year earlier can largely be attributed to higher prices for fuel oil and other fuel, gasoline and tobacco products & smokers' supplies. Price declines compared with last year were noted for mortgage interest cost, travel services and fresh or frozen beef.

All-Items Consumer Price Index (1992=100)

				— % Change from —	
	03-Feb	03-Jan	02-Feb	03-Jan	02-Feb
Yellowknife	118.7	118.3	114.2	0.3	3.9
Whitehorse	120.6	119.7	115.2	0.8	4.7
Canada	122.3	121.4	116.9	0.7	4.6
Edmonton	127.8	127.4	119.1	0.3	7.3

A combination of changes in public sector and private sector expenditures and employment patterns, taxation regime changes by the GNWT (Cost of Living Tax Credit; Minimum Credit to provide financial relief to low income northerners; tax relief for seniors and the disabled by increasing the age and disabled tax credits) and Canada,

as well as other structural changes within the economy have likely contributed to what the GNWT Department of Finance has called a low inflationary environment (2003 Budget Address, page 5-5). Based on the aggregate CPI, there is little evidence of wide spread salary dollar pressures which would contribute to increased which is not to say that there are not sectors that have not experienced pressures and labour recruitment and retention challenges.

Examination of the key economic indicators for the NWT illustrates the within the context of robust growth, including significant increases in total investment, exports, and Gross Domestic Product, inflation remains relatively low and is projected to remain low by the Department of Finance: "CPI inflation was 2.5 per cent in Canada in 2001, and in July 2002 was expected to decline to 2.0 per cent in 2002 and 2.3 per cent in 2003. This *low inflationary environment was expected to continue, despite improving economic growth, as a result of rising interest rates and a strengthening Canadian dollar.* The Yellowknife CPI rose 1.6 per cent in 2001, and was expected to increase by about 3 per cent in 2002. The increased 2002 inflation can be attributed, at least partially, to rising public transportation, alcohol, tobacco and electricity prices." (source: Department of Finance, 2003-2006 Business Plan, page 5-5)

Structure and Common Elements of Industries in the NWT

All sectors of the economy, as represented through specific industries and individual businesses, share some common structural elements, which are relevant to the question posed by the MVEIRB:

- Wages and salaries paid to employees comprise a significant portion of total operating costs – whether in the public or private sectors.

- In the "non-public" sectors there are consistent management challenges with respect to keeping operating costs as low as possible to remain price competitive and maintain market share. Businesses attempt to reduce the potential of a "wage-price spiral" – which can occur in situation when employers give significant wage increases and then pass along the increased costs to consumers in the form of higher prices for goods and services. Higher consumer prices, in turn, can lead to new demands for higher wages and salaries, which again are passed along to consumer in the form of higher prices. In this way the process repeats itself and hence the notion of a wage-price spiral.

- Examination of the various sectors of the economy from the perspective of the question posed by the MVEIRB illustrates the existence of "wage differentials" – which are the differences in wage rates paid to different groups of workers (i.e. service industry workers compared to construction industry workers). Wage differences can be based on different levels of skills, education, responsibilities, differences in bargaining power of workers, differences in the productivity of various industries, and differences in living costs in different geographic areas. Wage differentials can be an important market signal to encourage mobility from low-wage sectors to higher-wage sectors. However, changes in the actual wage

differentials between different occupations and professions can also contribute to wage-driven inflation as workers attempt to restore wage differentials. This type of wage differential movement would be evident through changes in inflation rates as measured by the Consumer Price Index.

Average Weekly Earnings Data – Northwest Territories

The wage differential between sectors of the economy is evident through an examination of Average Weekly Earnings data (which covers all industries except agriculture, fishing & trapping, private household services, religious organizations and military service) indicates that there have been relative and real gains across the various sectors of the economy – including non-mining sectors. The gains (4.6 % in 2001; 2.3% in 2002; and a projected increase of 5.2% in 2003 (source: 2003 Economic Outlook, GNWT Department of Finance, page A-2) are viewed as falling within the general interpretation of a *low inflationary environment*. The wage differential and percentage changes from 2001 and 2002 are highlighted in the table below. As can be observed there are different changes from 2001 and 2002 in various sectors, including an aggregate increase of 8.7% in the Construction Industry to an aggregate decline of 1.9% in the Trades sector. It is noteworthy that the Service Producing Industries show an aggregate increase of 2.8% over that period – a change that would not indicate significant salary dollar pressures.

	Goods Producing Industries	Service Producing Industries	Construction	Public Administration	Trades Industries	Health Care & Social assistance
2002 (October)	$1,220	$819	$988	$1,014	$662	$884
2001	$1,124	$797	$909	$1,017	$675	$855
% Change	+8.5%	+2.8%	+8.7%	-0.3%	-1.9%	+3.4%

Source: Statistics Quarterly, V.24, No.4, December 2002, page 22

Based on the analysis of available labour and income data as published in the Consumer Price Index and the Average Weekly Earnings data, there is little compelling evidence that either of the two general causes of inflation - *supply-shock and demand pull* (which would be evident in a wage-piece spiral or significant wage-differential shifts) are factors that would have resulted in significant impacts on employers in general with respect to salary pressures and recruitment and retention challenges. If there were significant causes stemming from *supply-shock* the there would be indications of higher wage demands and increasing vacancies. Similarly, under the *demand-pull* scenario one would expect to observe prices increases due to spending power (demand) exceeding the availability of goods and services, including evidence of significant wage rises resulting from labour shortages or shifts in wage-differentials. There is little evidence to

indicate that overall non-mining related sectors, and indeed generally across all sectors of the economy, have experienced significant wage and salary pressures or what would be evident through diminished ability to attract employees beyond the general competition for qualified labour in a robust economy.

These conclusions are not intended to diminish situations where specific business types or in geographic locations have or may in fact experience these types of challenges, yet it needs to be recognized that the labour force is in general highly mobile and individual choices of type of occupation and/or work location are also influenced by a broader set of criteria beyond wages and benefit packages. In a robust economy that the NWT enjoys individual workers clearly take into consideration perceived opportunity (short and longer term) and alternative choices.

Level Of Uncertainty:

The analysts are confident in the conclusions reached based on the combined Consumer Price Index as well as the labour and income data sets.

RESPONSE TO MVEIRB Q5

Through the EAR, De Beers has developed and committed to fourteen socio-economic impact management measures. The development of the impact management measures was based primarily on the needs, issues and concerns communicated by the communities themselves during the data collection and research for the SEIA analysis.

De Beers will provide resources - financial or human - towards the implementation of each of the Impact Management Measures to which we have committed. The full responsibility to implement some of the measures, however, will need to be shared between government agencies, public institutions, the private sector and the communities who will be involved in, affected by, or benefit from the Snap Lake Diamond Project. Since submission of the EAR, De Beers has continued working in and communicating with a range of different parties, including the communities, for the purpose of furthering the development of partnerships so that all impact management measures will be implemented in a timely and effective manner.

The table below lists the fourteen socio-economic impact management measures committed to through the EAR and the commitments and different partnerships that De Beers has made with regards to each of those measures. De Beers has presently committed $665,000 towards regional human resource development initiatives in 2003 in an effort to mitigate the potential socio-economic impacts of the Snap Lake Diamond Project. De Beers anticipates that the level of financial and resource commitment would increase, as the uncertainty in the development schedule is resolved.

It is important to note that the process towards implementing the impact management measures is still in its earliest stages. De Beers is still going through the permitting process for the Snap Lake project and it is estimated that the mine will not be in operation until 2007. As partnerships are arranged and developed, additional contributions will be made to the commitments. Furthermore, many of the Impact Management Measures will be considered in the context of the Impact Benefit Agreements that are currently being negotiated with each of the communities, as well as the socio-economic agreement which De Beers is also in the process of developing with the GNWT.

Table 5.1: Contributions to the Impact Management Measures by De Beers and Other Partners

Impact Management Measures	De Beers Commitments	De Beers Contributions	Other Partners Contributions
Hiring Priorities	De Beers will adopt a preferential hiring policy for Aboriginal and northern employees so that they can directly benefit from the project through employment.		
Recruitment and employment strategies	Two-fold: to determine Aboriginal and northern workforce skills through a needs assessment and match; and to provide progressive employment for mine employees through training and career planning.	▪ Development of a *Human Resources Development Plan (HRDP)*, outlining a detailed implementation plan for the recruitment and employment strategy. ▪ An initiative to develop a *Career and Technical Center* for the Yellowknife Catholic Schools is currently underway. The center located opposite the St. Patrick High School will introduce trades mining to the middle/high school students and the larger community. The center is developed in partnership between De Beers, Yellowknife Catholic Schools, and GNWT ECE. De Beers will financially contribute to the centre.	▪ Aurora College and Skills Canada will offer courses and share instructors and resources with Yellowknife Catholic schools.
Literacy training	De Beers is committed to ensuring the provision of literacy programs both on-site to its employees, and in the primary communities.	▪ A *book order program* for grade school children in the Dogrib communities, Lutsel K'e, and N'Dilo is presently underway. The program is carried out in partnership between De Beers, Genesis Group Ltd, GNWT ECC, Dogrib Community Services Board, and South Slave Divisional Education Council.	
On-site learning centre	De Beers will establish a learning centre at the Snap Lake Diamond Project to	▪ De Beers will establish a learning centre at the Snap Lake project site. Equipment and resources will be fully funded by De Beers and include, at	▪ To be arranged

Impact Management Measures	De Beers Commitments	De Beers Contributions	Other Partners Contributions
	encourage and facilitate employees to further their educational background and skills development.	a minimum, computers, and a learning centre resource library.	
Employment training programs	These programs will focus on both upgrading and mine employment training. They will be offered to employees on site, and, as appropriate and feasible, to others in the communities.	▪ An initiative has been carried out to develop *NWT Apprenticeship Support Materials*, to provide Northerners with a study curriculum to prepare for the Apprenticeship Trades Entrance Exam. The initiative was carried out in partnership between De Beers, GNWT ECE, Aurora College, INAC, HRDC, Genesis Group Ltd, and Skills Canada. ▪ The above initiative was complemented by another initiative, a *Train the Trainer session* to familiarize educators with the NWT Apprenticeship Support Materials. 30 educators from Yellowknife, Hay River, Inuvik, Wrigley, Fort Simpson, Fort Providence, Fort Smith, Rae, and Lutsel K'e attended the session, which was carried out in partnership between De Beers and Genesis Group. ▪ A *Trades Entrance Study Tutorial Program (TEST)* is currently underway. The program prepares participants for taking the Apprenticeship Trades Entrance Exam. 30 Aboriginal and Northerners and are currently participating. Over 80 individuals applied and so De Beers expanded the course from 12 to 30 students. The program is offered in partnership between De Beers, Genesis Group Ltd., Aurora College, and GNWT ECE Apprenticeship. ▪ **De Beers will seek partnerships to**	

Impact Management Measures	De Beers Commitments	De Beers Contributions	Other Partners Contributions
		establish/support mining trades apprenticeship programs.	
Substance abuse prevention and treatment	Substance abuse programs consist of two components: prevention and awareness, and addiction treatment.	▪ To be negotiated with GNWT and Federal government programs and community programs.	
Community liaison personnel	De Beers will employ at least two full-time community liaison personnel. These people will serve as a communications link between De Beers, employees, and the primary communities.	▪ De Beers will fully finance the salaries and support for the employment of two full-time positions as community liaisons. These positions will be established during the early stages of the construction stage.	N/A
Family support services	De Beers will seek partnerships with community social service agencies, the GNWT, and the federal government to provide ongoing family counseling services in the primary communities for mine employees, employee spouses, and their families.	▪ To be determined through negotiations	▪ To be arranged
Money management training	De Beers will provide money management training in each of the primary communities for employees and their spouses. De Beers will also seek collaboration with recognized financial institutions to establish Internet and telephone based	▪ To be arranged	▪ To be arranged

Impact Management Measures	De Beers Commitments	De Beers Contributions	Other Partners Contributions
	banking services in the primary communities.		
Transportation to the site	De Beers will provide direct flights between the project site and the primary communities whenever feasible. Such flights will not be scheduled to land and/or stop in Yellowknife.	▪ De Beers will pay for all of the costs for flight to Snap Lake site	▪ N/A
Cultural awareness programs	De Beers will arrange to provide cross-cultural training to all onsite staff. In collaboration with the community liaison personnel, De Beers will organize Community Appreciation Days. De Beers will develop a cultural exchange program to provide non-aboriginal site employees. De Beers will arrange mine site visits for mine employees' spouses and families. When commercially available, De Beers will ensure that traditional foods are provided onsite	▪ De Beers will pay all costs for mine site visits for employees spouses and families ▪ De Beers will negotiate agreements with appropriate suppliers if country foods.	▪ To be arranged
Aboriginal traditional practice support	De Beers may assist with funding support to existing or emerging community-based programs or agencies with the mandate to strengthen Aboriginal culture in the	▪ To be arranged with communities	▪ To be arranged

Impact Management Measures	De Beers Commitments	De Beers Contributions	Other Partners Contributions
	primary communities.		
Business development support	De Beers will hire a manager of business development to assist and build relationships with NWT businesses.	▪ De Beers hired a full-time Business Development Coordinator in Spring of 2002. De Beers is wholly responsible for providing the salary and support for this position. The position will remain throughout mine construction and operation.	
Contracts and contact lists	De Beers will provide its list of contract services and needs to the primary communities so that the communities may have a reasonable chance to successfully bid or partner with a potential bidder	▪ DeBeers lists will be available at least 90 days prior to the services being need during the construction and operation	

RESPONSE TO OUTSTANDING ECONOMIC ISSUES FROM THE MVEIRB TECHNICAL SESSIONS
Ellis Consulting Services

ISSUE 3

Presented below in Table 1 is the De Beers Canada Mining Inc estimate of total direct GDP broken down by direct GDP, other operating surplus, and total direct GDP. The information contained in Table 1 is consistent with that produced by Ellis Consulting Services for the MVEIRB following the Technical Sessions.

Table 1 Total Direct GDP Estimate, Total and Annual Average

	Total ('000)	Average Annual ('000)
Direct GDP Estimate	1,240	56
Other Operating Surplus (net income and depreciation)	1,176	56
Total Direct GDP	**2,417**	**112**
Ellis Consulting Services Technical Session Estimate (January 2003)	2,445	111

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ISSUE 4

Snap Lake Diamond Project: NWT Regional Labour Market Cumulative Impact Analysis

1. Introduction

Labour demand for the Snap Lake diamond project includes both direct jobs and those jobs due to the project's economic impacts (i.e., indirect and induced employment). What is at issue is whether there is sufficient NWT regional labour supply to meet the projected NWT labour requirements for the Snap Lake project, particularly when this demand is combined with the labour demand for the BHP Ekati and Diavik projects.

2. Labour demand – Snap Lake diamond project

Total labour demand for the Snap Lake project includes direct jobs for mine construction, operations and closure phases as well as those additional jobs associated with the project's economic impacts (i.e., indirect and induced employment).

The methodology for forecasting labour demand for the Snap Lake project is outlined in detail in the February 2002 Snap Lake diamond project environmental report, Chapter 5 "Socio-Economic Impact Assessment."[1] Information presented in that report was updated in March 2003 to reflect changes in project timing. Also, these new forecasts are now based on the Statistics Canada interprovincial input-output (I/O) model, which provides NWT and Nunavut information separately.

2.1 Snap Lake direct NWT labour demand

Direct jobs for the Snap Lake project are identified in the project's operational plans and include the employment of persons by the company and by contractors working on the project. Total direct labour demand for the Snap Lake project and the share of that demand to be met by NWT regional labour supply are as follows:

Table 1

Snap Lake Labour Demand – Direct Jobs
Construction & Operations Phase Planning Assumptions

Construction phase (2004 to 2007)	450 jobs:	2004 – 45	2005 – 108
NWT labour supply: 40% share		2006 – 200	2007 – 97
Operations phase (2007 to 2029)	2007 – 41 jobs,	2008 – 457 jobs	
NWT labour supply – 60% share	2009 to 2028 – 500 jobs annually		
(1/2 through in-migration to NWT)	2029 – 57 jobs		

For the Snap Lake construction phase, the requirement for NWT labour represents 180 of the total 450 jobs (person years) spread over the period 2004 to 2007. This figure is 40% employment of NWT residents for direct construction jobs.

For the Snap Lake operations phase, NWT residents will account for 60% of direct mine jobs, or 300 of the annual average 500 jobs. One-half of the jobs held by NWT residents are persons migrating to the territory.

2.2 Snap Lake indirect and induced NWT labour demand

The Statistics Canada interprovincial I/O model provides estimates of Snap Lake indirect labour demand for the NWT regional labour market (as well as for other jurisdictions). These estimates reflect inter-industry sales of commodities identified in Statistics Canada surveys and their geographic patterns. Additionally, the NWT Bureau of Statistics calculated induced labour demand for the project based on the I/O model results.

Indirect and induced labour demand for the NWT regional labour market stemming from the Snap Lake project is forecast to be 176 jobs in 2004, the year construction begins, rising to 782 jobs by 2006, the peak year of construction activity. As construction winds down and operations begin, this component of labour demand falls to 425 jobs for 2007 and then increases somewhat, holding steady at around 550 jobs beginning in 2009.

Table 2

Snap Lake NWT Regional Labour Demand, 2004 to 2011
Interprovincial Input-Output (I/O) Model Results

jobs	2004	2005	2006	2007	2008	2009	2010	2011
total:	194	466	862	488	776	850	850	850
direct:	18	43	80	63	274	300	300	300
indirect & induced:	176	423	782	425	502	550	550	550

Multipliers for NWT labour demand (total jobs per direct job):
Direct construction jobs – 10.8; direct operations jobs – 2.8

Compared to the number of direct jobs, the combined indirect and induced labour demand for the NWT regional labour market is considerably greater for the Snap Lake construction phase than for mine operations. This result is due to differences in the inputs for the two phases offset somewhat by the higher NWT resident labour proportion for operations.

Based on Statistics Canada I/O model results, each direct Snap Lake construction job held by an NWT resident corresponds to a further 9.8 jobs of indirect and induced NWT regional labour demand. For each mine operations direct job filled by NWT residents, the additional demand for NWT labour is 1.8 jobs.

3. Cumulative labour demand – NWT diamond projects

In addition to the Snap Lake project's regional demand for NWT labour, there is the demand based on the activities of the two other diamond mine projects; namely, BHP Ekati

and Diavik. The total or cumulative NWT labour demand for these three projects is substantial, rising from 2,562 total jobs in 2004 when Snap Lake construction begins to an estimated 3,656 jobs by 2011.

Table 3

Cumulative NWT Regional Labour Demand, 2004 to 2011
NWT Diamond Mine projects (BHP Ekati, Diavik, Snap Lake)

jobs	2004	2005	2006	2007	2008	2009	2010	2011
total:	2,562	2,841	3,245	3,252	3,550	3,635	3,645	3,656
direct:	1,230	1,261	1,304	1,478	1,697	1,731	1,739	1,747
indirect & induced:	1,332	1,580	1,941	1,774	1,853	1,904	1,906	1,909

Multipliers for NWT labour demand (total jobs per direct job):

Snap Lake:	construction – 10.8;	operations – 2.8
BHP Ekati:	construction – 3.4;	operations – 2.0
Diavik:	construction – 4.3;	operations – 1.7 (avg. 2002 to 2011)

BHP Ekati direct employment of NWT residents for 2001 information was obtained from the *Annual Report on Northern and Aboriginal Employment: 2001 Operational Phase.*[2] For subsequent years, BHP Ekati direct employment figures are based on research by Terriplan Consultants.[3]

NWT labour demand multipliers (total jobs per direct job) for the BHP Ekati project were calculated from Table 29: "Estimate of Cumulative Impacts on Regional Labour Market," *Diavik Diamonds Project, Socio-Economic Environmental Effects Report.*[4] This information was used to estimate indirect and induced NWT regional labour demand for all years.

The NWT direct, indirect and induced employment data for Diavik are based on the *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*, Table 18: "Annual Operating Direct Employment Impact in the Local Study Area, by Location" and Table 19: "Annual Total Operating Employment in the Local Study Area."[5] Data for the years not provided in the two tables were interpolated.

4. Diamond mine employment requirements – direct jobs

For the purposes of defining the regional labour demand and supply for the diamond mine projects, direct jobs to be filled by NWT residents are assumed to have the following two requirements:

- a minimum of grade 9 education, and
- a willingness to do rotational work.

Grade 9 education is necessary because it is the minimum for training associated with direct mine employment. The work schedule for all three mines is rotational. (By comparison, no minimum education level or willingness to do rotational work requirement is assumed for indirect and induced jobs.)

These assumptions are those used for Diavik NWT regional labour market forecasts: "[t]he target labour force for the direct mine jobs are those who are unemployed, have a grade nine or better, and are willing to do rotational work." [6] Unemployed were defined as those persons wanting a job.

5. NWT regional labour supply

Forecasting the NWT regional labour supply for the Snap Lake and other NWT diamond projects follows the method used for the document *Diavik Diamonds Project, Socio-Economic Environmental Effects Report.*[7]

That report took 1994 NWT labour force information and projected it demographically for future years (through to 2002). The total NWT regional labour supply was defined to be all persons who wanted a job. Of these, persons who had grade 9+ education and who were willing to do rotational work represented the potential NWT regional labour supply for direct mine jobs: "A standard minimum of grade nine was established for the trainable positions. The grade nine standard was chosen because these jobs would require a basic level of literacy but candidates can be trained either on the job or with existing educational services in the NWT." [8]

Labour supply for this report is similarly based on demographic projections from the more recent 1999 NWT labour force survey. Additionally, the NWT regional labour supply includes other persons who are assumed to move to the territory to fill one-half of the direct mine jobs for the Snap Lake operations phase.

5.1 NWT regional labour supply for 1999

Following the assumptions outlined in *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*, the task of estimating NWT labour supply focuses on two components:

- direct mine employment (requires grade 9+, willingness to do rotational work)
- indirect and induced jobs (all others who want a job).

Like the 1994 NWT labour force survey, the 1999 survey asked persons their highest level of schooling, whether or not they wanted a job, and additionally if they were willing to do rotational work.[9] For the 1999 survey, some 4,860 NWT residents said that they wanted a job. Of these, approximately one-half or 2,048 had a minimum grade 9 education and were also willing to do rotational work.

This approach to defining the NWT regional labour supply therefore includes not just those persons who would be officially unemployed according to national labour force definitions but also those who have said that they want to work.

This information is shown below for communities grouped according to the anticipated Snap Lake impacts. Here, the "primary communities" are: Yellowknife, N'dilo, Dettah, Rae-Edzo, Wha Ti, Lutsel K'e, Wekweti and Gameti (Rae Lakes). Employment "catchment communities" are: Fort Resolution, Fort Smith, Hay River, Hay River Reserve, Enterprise and Fort Providence. The category "other NWT" refers to the remaining NWT communities.

Table 4

NWT Regional Labour Supply for 1999, by Snap Lake Impact Area

	Total	Grade 9+ and rotation willing	Others who want a job
Total NWT region	4,860	2,452	2,408
Primary communities	2,038	1,008	1,030
Yellowknife (incl. N'dilo)	1,296	595	701
Other primary	742	413	329
Catchment communities	968	529	439
Other NWT	1,854	915	939

Source: 1999 NWT Labour Force Survey

5.2 Demographically projecting NWT regional labour supply from 1999

To demographically project the NWT regional labour supply for years following 1999, the 1999 NWT labour force survey information for each community grouping was increased according to the forecast rate of population growth for persons 15+ years of age. This approach means that the percentage of persons wanting a job, and similarly for those wanting a job who have a grade 9 education and are also willing to do rotational work, are kept constant over time for each community grouping.

Population growth for persons 15+ years of age is based on NWT Bureau of Statistics population projections for the Snap Lake impact area community groupings (primary, employment catchment, and other). Additionally, population projections were provided separately for Yellowknife (including N'dilo) and for the other primary communities taken as a group.

The Bureau of Statistics provided population projections for the years 2001, 2006 to 2008, 2011 and 2016. Population projections for other years were estimated by linear interpolation (this method showed minimal difference compared to using a compound growth approach).

5.3 NWT regional labour supply to 2011

The NWT regional labour supply information used to assess Snap Lake and other diamond mine cumulative labour market impacts has two components. First and most importantly is the demographically projected 1999 NWT labour force survey information by community grouping. Secondly, the Snap Lake project assumes that one-half of the

direct jobs during its operations phase will be filled by persons moving to the NWT; i.e., through a planned level of in-migration. This second component of NWT regional labour supply represents the labour supply for some 150 jobs (at its maximum).

Total NWT regional labour supply is projected to increase from 5,332 persons in 2004, the first year of the Snap Lake construction phase, to some 6,108 persons by 2011. For direct mine jobs, those persons with grade 9+ education and willing to do rotational work, labour supply increases annually from 2,685 persons in 2004 to 3,156 in 2011. The labour supply for direct mine jobs for 2007 through 2011 includes the planned level for persons who will move to the NWT to fill such jobs (150 persons in total).

Table 5

NWT Regional Labour Supply, 2004 to 2011: Demographic Projection of 1999 NWT Labour Force Survey & Planned In-Migration

	2004	2005	2006	2007	2008	2009	2010	2011
Total NWT:								
total	5,322	5,406	5,479	5,582	5,805	5,915	6,013	6,108
direct	2,685	2,727	2,764	2,823	2,997	3,059	3,109	3,156
other	2,637	2,679	2,715	2,759	2,808	2,856	2,904	2,952
Available from planned in-migration:								
total	-	-	-	13	137	150	150	150
direct	-	-	-	13	137	150	150	150
Primary communities:								
total	2,213	2,253	2,286	2,321	2,365	2,411	2,457	2,502
direct	1,095	1,115	1,131	1,149	1,171	1,194	1,217	1,238
other	1,118	1,138	1,155	1,172	1,194	1,217	1,240	1,264
Catchment communities:								
total	1,059	1,073	1,086	1,105	1,124	1,142	1,160	1,178
direct	580	588	593	604	614	624	634	644
other	479	485	493	501	510	518	526	534
Other NWT:								
total	2,050	2,080	2,107	2,143	2,179	2,212	2,246	2,278
direct	1,010	1,024	1,040	1,057	1,075	1,091	1,108	1,124
other	1,040	1,056	1,067	1,086	1,104	1,121	1,138	1,154

Notes: "Direct" refers to persons wanting a job, having grade 9+ and rotation willing.
"Other" refers to other persons who want a job.
Labour supply available from planned in-migration (total: 150) is for "direct" jobs only.

6. Comparing NWT regional labour supply and cumulative demand due to diamond mine projects

Projected NWT regional labour supply is more than sufficient to meet the cumulative labour demand of the three NWT diamond mine projects during the 2004 to 2011 period.

For total labour demand (direct, indirect and induced jobs), the NWT regional labour supply exceeds demand by more than 2,200 persons in all years during the 2004 to 2011 period. Further, NWT supply exceeds the cumulative labour demand for direct mine jobs (requiring grade 9+ education and willingness to do rotational work) by 1,300 or more persons in all years.

Table 6

NWT Regional Labour Supply Minus Cumulative Labour Demand for the Snap Lake, BHP Ekati and Diavik Diamond Mine Projects, 2004 to 2011

	2004	2005	2006	2007	2008	2009	2010	2011
Total NWT region:								
total jobs	2,760	2,565	2,234	2,330	2,255	2,280	2,368	2,452
direct	1,455	1,466	1,460	1,345	1,300	1,328	1,370	1,409
Primary & employment catchment communities plus planned in-migration:								
total jobs	710	485	127	187	76	68	122	174
direct	445	442	420	288	225	237	262	285

Additionally, labour supply exceeds cumulative labour demand for both total and direct mine jobs when labour supply is limited to the Snap Lake primary and catchment communities along with the planned in-migration level (total: 150). See Figures 1 and 2.

Figure 1

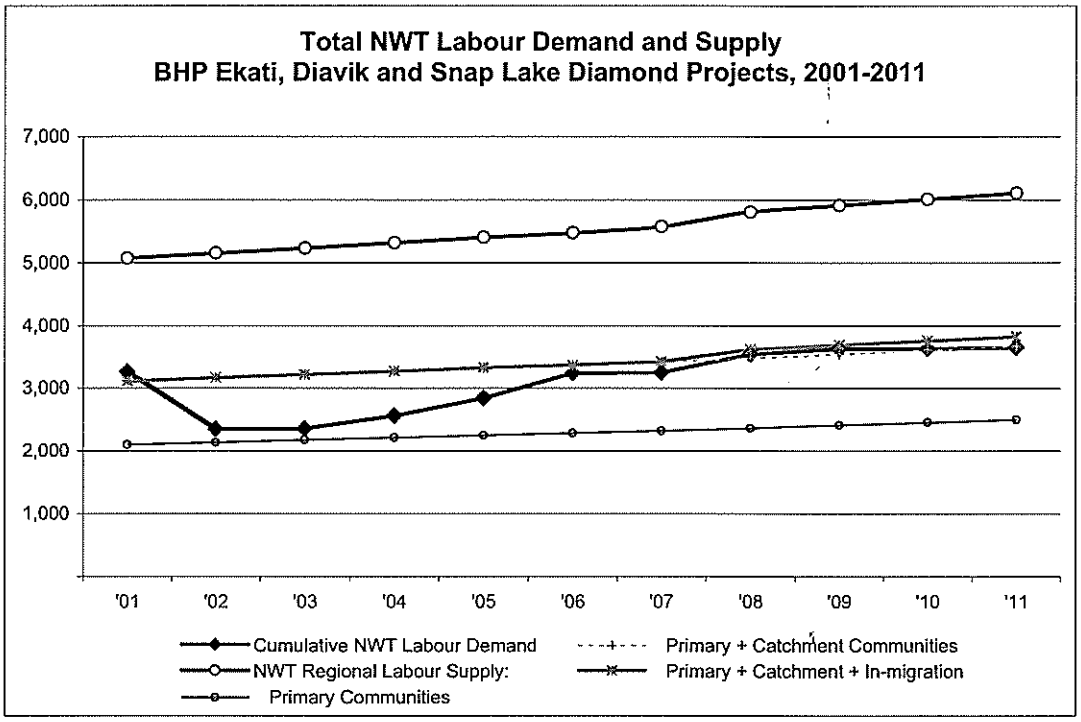
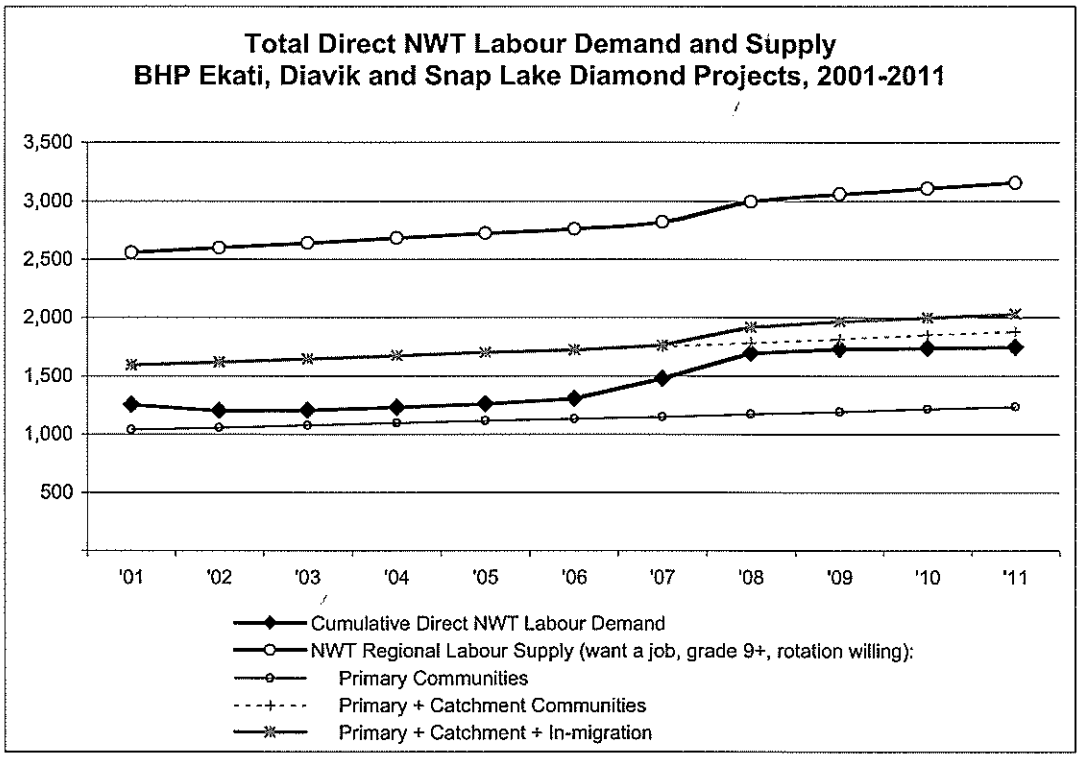


Figure 2



End Notes

1. De Beers Snap Lake Environmental Assessment submission submitted to the MVEIRB on February 25, 2002.
2. BHP Billiton Diamonds Inc., Annual Report on Northern and Aboriginal Employment: 2001 Operational Phase, Tables 2A and 2B, p. 12-13.
3. Based on various reports.
4. Diavik Diamonds Project, Socio-Economic Environmental Effects Report, p. 126.
5. *ibid*, p 112 - 113.
6. *ibid*, p.120.
7. *ibid*.
8. *ibid*, p.112.
9. See the 1999 NWT Labour Force Survey: Q.9 (What is the highest grade ... has completed at school or through upgrading?), Q.23 (Does ... want a job?) and Q.24 (Is ... willing to do rotational work at a job site outside this community? For example, two weeks in and two weeks out.).

Methodology

M1. Overview

This report focuses on two elements relating to the NWT regional labour market:

- the demand for NWT labour by the Snap Lake, BHP Ekati and Diavik diamond mine projects, and
- the projected supply of labour available in the NWT regional labour market.

The cumulative NWT labour demand for the three mines (i.e., their direct employment and the labour demand due to the indirect and induced impacts of the project) is then compared to projected NWT labour supply to determine whether there is sufficient NWT labour supply available regionally to meet the NWT labour requirements flowing from the mine activity.

The period under consideration is primarily 2004 (when the Snap Lake construction is planned to begin) through 2011. Certain labour demand and supply information is also provided for 2001 through 2011.

M2. Labour demand

Labour demand for the Snap Lake and other NWT diamond projects includes (i) direct mine jobs and (ii) jobs due to project economic impacts (i.e., indirect and induced employment).

Labour for certain of these jobs will be supplied by NWT residents. Other jobs will be filled by persons living outside the NWT.

For direct mine jobs, total employment and the employment of NWT residents vs. non-residents are planning assumptions for each mine.

By comparison, for indirect and induced jobs, labour demand for the NWT region and elsewhere is based on results obtained from input-output analysis (the Statistics Canada interprovincial input-output model in the case of the Snap Lake project).

M2.1 Snap Lake labour demand

The methodology used for forecasting labour demand for the Snap Lake project is outlined in detail in the February 2002 Snap Lake diamond project environmental report, Chapter 5: "Socio-Economic Impact Assessment."

Information presented in that report was updated in March 2003 to reflect changes in project timing, etc. Also, these forecasts are now based on the Statistics Canada interprovincial input-output (I/O) model, which provides NWT and Nunavut information separately.

The Statistics Canada interprovincial I/O model provides forecasts for Snap Lake indirect labour demand for the NWT regional labour market (as well as for other jurisdictions). These estimates reflect inter-industry sales of commodities identified in Statistics Canada surveys and their geographic patterns. Additionally, the NWT Bureau of Statistics has calculated induced labour demand for the project based on the I/O model results.

M2.2 BHP Ekati and Diavik labour demand

The labour demand information for the BHP Ekati and Diavik projects is based on published sources and was developed for the period 2001 through 2011.

BHP Ekati direct employment of NWT residents for 2001 was obtained from the BHP *Annual Report on Northern and Aboriginal Employment: 2001 Operational Phase*. For subsequent years, the BHP Ekati direct employment figures are based on research by Terriplan Consultants. The total BHP indirect and induced employment of NWT residents was estimated using employment multipliers (total jobs per direct job) calculated from Table 29: "Estimate of Cumulative Impacts on Regional Labour Market," *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*.

NWT direct, indirect and induced labour demand for Diavik are based on the *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*, Table 18: "Annual Operating Direct Employment Impact in the Local Study Area, by Location" and Table 19: "Annual Total Operating Employment in the Local Study Area." Data for the years not provided in the two tables were interpolated.

M3. Diamond mine employment requirements – direct jobs

For the purposes of delineating more precisely the regional labour demand and supply for the three diamond mine projects, direct jobs to be filled by NWT residents were assumed to have the following two requirements:

- a minimum of grade 9 education, and
- a willingness to do rotational work.

Grade 9 education is necessary because it is the minimum level for training associated with direct mine employment. The work schedule for all three mines is rotational. By comparison, no minimum education level or willingness to do rotational work requirement is assumed for indirect and induced jobs.

These job requirements are the assumptions made for the Diavik labour projections.

M4. Labour supply

Forecasting the NWT regional labour supply for the Snap Lake and other NWT diamond projects follows the method used for the document *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*. That report took 1994 NWT labour force information and projected it demographically for future years (through to 2002).

For the Diavik projections, the total NWT regional labour supply was defined to be all persons who wanted a job. Of these, persons with grade 9+ education who were also willing to do rotational work represented the potential NWT labour supply for direct mine jobs.

Labour supply for this report is based similarly on demographic projections; in this instance from the more recent 1999 NWT labour force survey. Additionally, the NWT regional labour supply includes persons who are assumed to move to the territory to fill one-half of the direct mine jobs during the Snap Lake operations phase.

M4.1 Demographically projecting NWT regional labour supply

Following the assumptions outlined in *Diavik Diamonds Project, Socio-Economic Environmental Effects Report*, the task of estimating NWT regional labour supply for this report focused on the two components of labour demand resulting from the diamond mine projects:

- direct mine employment (requires grade 9+, willingness to do rotational work)
- indirect and induced jobs (all others who want a job).

In particular, 1999 NWT labour force survey information was used to project the NWT regional labour supply for each of these two labour demand components. (Like the 1994 NWT labour force survey, the 1999 survey asked persons their highest level of schooling, whether or not they wanted a job, and additionally if they were willing to do rotational work.)

These projections were developed for the Snap Lake "primary" communities with information for Yellowknife (including N'dilo) provided separately, for the "employment catchment" communities, and for all other NWT communities.

To demographically project the NWT regional labour supply for years following 1999, the NWT labour force survey information for each community grouping was increased according to the forecast rate of population growth for persons 15+ years of age.

This approach means that the percentage of persons wanting a job, and similarly for those wanting a job with a grade 9 education and also willing to do rotational work, are kept constant over time for each community grouping.

Population growth for persons 15+ years of age was based on NWT Bureau of Statistics population projections for the Snap Lake impact area community groupings (primary, employment catchment, and other). Additionally, population projections were provided separately for Yellowknife (including N'dilo) and for the other primary communities taken as a group.

The Bureau of Statistics provided population projections for the years 2001, 2006 to 2008, 2011 and 2016. Population projections for other years were estimated by linear interpolation (this method showed minimal difference compared to using a compound growth approach).

M4.2 Planned in-migration component of NWT regional labour supply

In addition to the demographically projected labour supply, Snap Lake project planning assumes that one-half of the direct jobs during its operations phase will be filled by persons moving to the NWT. This second component of NWT regional labour supply represents the labour supply for some 150 jobs (at its maximum).

M4.3 NWT regional labour supply information elements

Three data elements are provided for 1999 NWT labour force survey projections:

- all persons wanting a job, represent the potential labour supply for indirect and induced jobs, and
- persons wanting a job who also have a minimum grade 9 education and are willing to do rotational work, representing the potential labour supply for direct mine jobs.
- persons moving to the territory to fill one-half the Snap Lake direct mine jobs during the operations phase

M5. Comparing NWT regional labour demand and supply

Cumulative NWT labour demand for the three mines and the associated NWT regional labour supply were compared for both total and direct jobs for the period 2004 through 2011.

This comparison was done at the total NWT level, as well as for the Snap Lake community groupings. Specifically for community groupings, labour demand was compared to supply for the Snap Lake primary communities, for those communities combined with the employment catchment communities, and for both community groupings combined with the planned in-migration to fill half the Snap Lake operations phase direct jobs.

ISSUE 5

The MVEIRB raised the observation that the amount of labour income and the number of persons employed reported on Table 5.3.-2 for the induced impacts of the proposed project on the NWT economy do not appear to be consistent. De Beers Canada Mining Inc undertook a commitment to examine the issue once the new 1999 Statistics Canada interprovincial input-out (I/O) model, which provides NWT and Nunavut information separately become available in January 2003.

Results Of Analysis Of The 1999 Input-Output Model

Statistics Canada has released the individual 1999 I/O tables for the NWT and Nunavut. The 1999 tables represent a more complete, and robust, allocation of industry commodity detail between the two territories. The original EAR submission by De Beers Canada Mining Inc included the I/O information based on the 1996 I/O tables, which were manually split by the NWT Bureau of Statistics. The "splitting" process was constrained by the limited non-confidential information available to the Bureau at that time.

To allocated industry commodity detail separate information for the two territories was required. Separate information prior to the 1999 release was limited. Separate Nunavut information after March 1999 was in many cases deemed confidential by Statistics Canada and as such not available at that time. The splitting and allocation method was largely based on non-confidential information (i.e. labour force employee information; wages and salary information; and, industry specific information.

As such, it was noted in earlier IR responses that there was likely an underestimate of induced employment. Given the likely underestimate it resulted in a higher than expected induced average wage. However, it should be noted that from an overall economic impact perspective, the change is not significant.

The results of the analysis of new 1999 Statistics Canada interprovincial input-out (I/O) model are presented in Table 1 and Table 2. Table 1 shows the revised ratios of induced labour income per job to indirect labour income per job are consistent to what would normally be expected. Table 2 presents the adjustment (including explanatory notes) to induced employment estimates during the construction, operations and closure stages.

Table 1 Ratios of Induced Labour Income per Job to Indirect Labour Income per Job

	Construction	Operations	Closure
Original	0.91	1.32	1.49
Updated	0.83	0.89	0.75

The ratios identified as "Original" refer to the input-output (IO) simulation results based on the 1996 IO tables, which were modified by the NWT Bureau of Statistics to present the Northwest Territories separate from Nunavut. These ratio results were presented in table 2 (page 8) of the document *De Beers Snap Lake Diamond Project: Outstanding Issues From The Technical Sessions*.

The ratios identified as "Updated" refer to the IO simulation results based on the 1999 IO tables, released by Statistics Canada in November 2002, which present the Northwest Territories separate from Nunavut.

Each ratio is a function of four variables: indirect labour income and employment, and induced labour income and employment.

Table 2 Adjustment to Induced Employment Estimates

	Construction	Operations	Closure
1999 Model Ratio	240	250	60
1999 Model Induced 'Average Wage'	340	260	50
Mean Estimate	290	255	55

The "1999 Model Ratio" results are derived by constraining the induced and indirect labour income and employment results from table 5.3-1 of the Environmental Assessment Report (EAR) to equal the "Updated" ratio. Of the four potential variables, only induced employment is allowed to change to arrive at the "Updated" ratio result. This revised estimate of induced employment is only one of many possible outcomes since there are an infinite number of permutations of the four variables to arrive at the desired ratio.

The "1999 Model Induced 'Average Wage'" results are derived by dividing induced labour income by the 'average wage' amount from the IO simulation results based on the 1999 IO tables. This method produces a much more discrete range of possible outcomes – i.e., only one.

The "Mean Estimate" is the simple average of the two results.

Professional Judgment With Respect To Level Of Uncertainty:

Economic modeling, while having valid and prescribed methods, has inherent limitations not unlike any attempt to model dynamic situations. Fundamentally, it is recognized and accepted within the field of economics and mathematics that while inherently useful for analysis and input into decision making, economic models cannot purport to provide a complete and absolute measure of economic impact. These limitations are found in all economic impact methodologies, which are recognized as: (a) all Input-Output (IO) models and their derived multipliers are static and do not necessarily reflect the limits of productive capacity with a given economy; (b) IO models build on industry averages for use of technology, capital and associated input costs. As such, actual industry experiences can vary.

The analysts are confident that the Input-Output modeling methodology and the resulting estimated impacts are reasonable within the assumptions and limitations outlined above and in the EAR.