GAHCHO KUÉ PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PLAIN LANGUAGE SUMMARY

November 2012 **11-1365-1012**

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INTRODUCTION

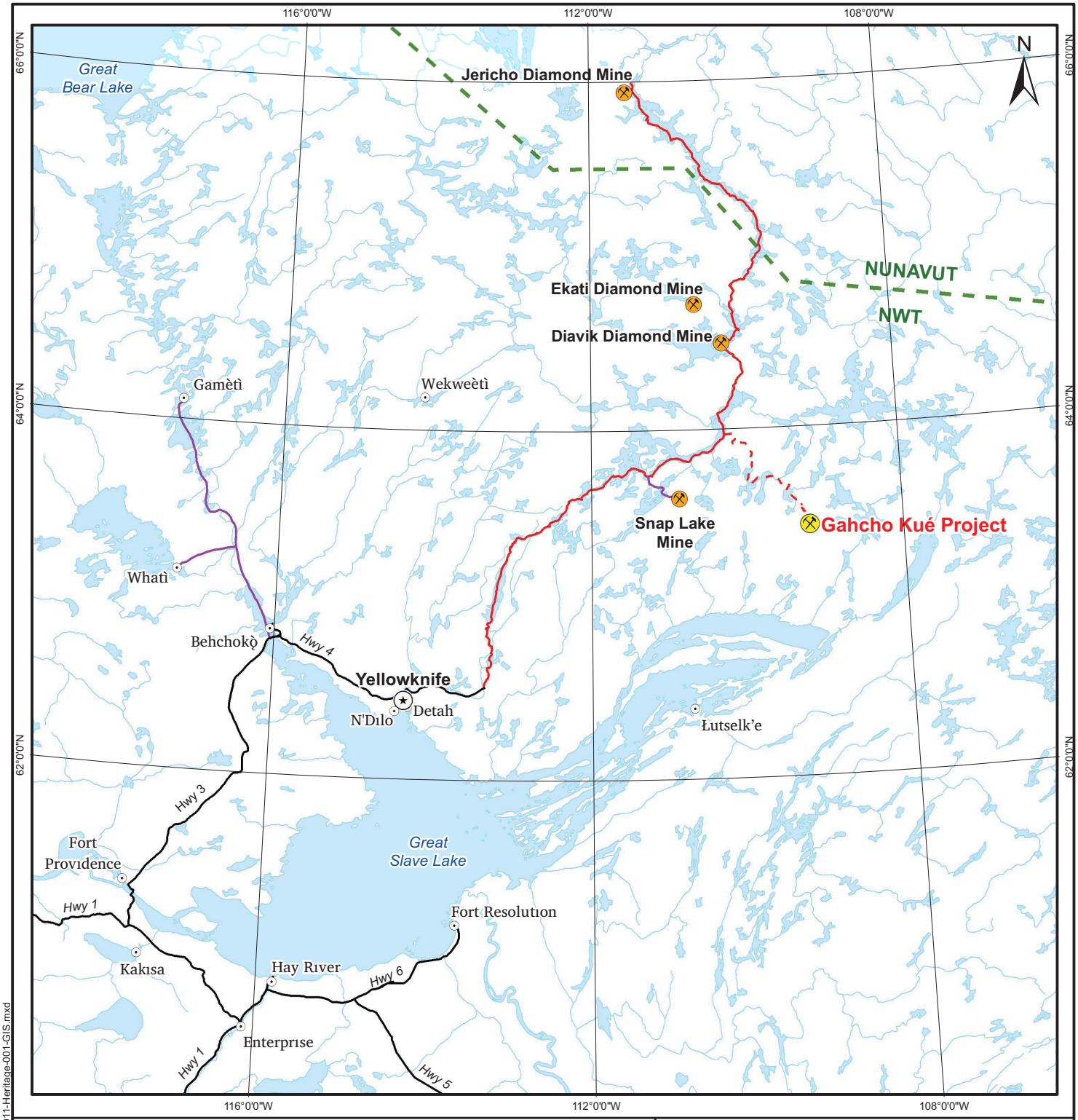
De Beers Canada Inc. (De Beers) is proposing to build the Gahcho Kué Project (Project), a diamond mine, about 280 kilometres (km) northeast of Yellowknife, Northwest Territories, and about 140 km northeast of the nearest Dene community, Łutselk'e. It will be De Beers' third mine in Canada. The others are the Snap Lake Mine in the Northwest Territories, and the Victor Project in northern Ontario. Two other diamond mines are operating in the Northwest Territories – Diavik Diamond Mine and Ekati Diamond Mine (Figure 1).

The Project is located in the watershed of Kennady Lake, a small headwater lake within the Lockhart River system. Kennady Lake discharges to the north, via a series of small lakes, into Kirk Lake and then into Aylmer Lake. Aylmer Lake is located on the main stem of the Lockhart River about midway along its length. The Lockhart River system drains into the north-eastern arm of Great Slave Lake (Figure 2).

The Project will take about two years to build, which will include time for dewatering part of Kennady Lake so that workers can get access to the ore that lies under the lake. Ore will be mined for about 11 years from three separate pits. When the diamond-bearing ore is exhausted, the Project will be decommissioned. The facilities will be dismantled and taken away or disposed of in the mine rock piles, and Kennady Lake will be refilled with water. It will take about eight to sixteen years for Kennady Lake to return to its natural water level after the facilities have been decommissioned.

REGULATORY STATUS

To develop the Project, De Beers must obtain a number of permits and licences from the Government of Northwest Territories and the Government of Canada. Before making a decision about whether to issue these licences and permits, the governments require that De Beers provide them with information about the Project, and about what the environmental effects of the Project might be. The Environmental Impact Statement is the document that contains that information.



LEGEND

- Gahcho Kué Project
- Existing Mine
- Territorial Capital
- Populated Place
- Highway
- Existing Winter Road
- Tibbitt-to-Contwoyto Winter Road
- Winter Access Road
- Watercourse
- Waterbody
- Territorial/Provincial Boundary

NOTES
Source: Figure 1.1-1 in De Beers 2010
Base data source: The Atlas of Canada

GAHCHO KUÉ PROJECT

Location of the Gahcho Kué Project

PROJECTION: Canadian Lambert Conf. Conic	DATUM: NAD83	
Scale: 1:3,500,000 (50 25 0 50 Kilometres)		
FILE No: B2012-Heritage-001-GIS		DATE: February 7, 2012
JOB NO: 11-1365-0012	REVISION NO: 8	
OFFICE: GOLD-CAL	DRAWN: JH	CHECK:

De Beers Canada

Figure 1

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600000 650000

7150000 7100000 7050000 7000000

N

Lockhart River

Aylmer Lake

Lockhart River

Clinton Colden Lake

Back Lake

Kirk Lake

Murdock Lake

Fletcher Lake

410

N11

Kennady Lake

Gahcho Kué Project

Walmsley Lake

Lockhart River

Artillery Lake

600000 650000

LEGEND

- Gahcho Kué Project
- Winter Access Road
- Watercourse
- Waterbody
- Drainage Direction

NOTES

Base data source: National Topographic Base Data (NTDB) 1:250,000

GAHCHO KUÉ PROJECT

Major Waterbodies Downstream of Kennady Lake

PROJECTION: UTM Zone 12	DATUM: NAD83	
Scale: 1:500,000 (0 2.5 5 10 Kilometres)		DE BEERS CANADA
FILE No: P-Other-046-GIS		DATE: December 14, 2010
JOB NO: 09-1365-1004	REVISION NO: 1	Figure 2
OFFICE: GOLD-CAL	DRAWN: CW / CHECK: AL	

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The Mackenzie Valley Impact Review Board held a number of workshops and hearings in Yellowknife, Detah, Łutselk'e, Fort Resolution, and Behchokǫ̀ to find out what people wanted to know about the Project, and what potential environmental effects concerned them the most. It then used this input to provide instructions to De Beers about the information that was to be provided in the Environmental Impact Statement.

The Environmental Impact Statement was submitted in December 2010 and examined by the Gahcho Kué Environmental Impact Review Panel. The Panel is an independent body established by the Mackenzie Valley Environmental Impact Review Board. The Panel requested revisions, which were submitted in May and July 2011 as updates to the Environmental Impact Statement. A supplement to the Environmental Impact Statement was submitted in April 2012 to describe mitigation of the Fine Processed Kimberlite Containment Facility and resulting changes to the assessment within the Environmental Impact Statement; the mitigation was required to reduce long-term phosphorus loadings from the facility.

The Gahcho Kué Environmental Impact Review Panel will consider the information presented in the 2010 Environmental Impact Statement, 2011 update and 2012 supplement, as well as information and opinions provided by people who make presentations and ask questions at public hearings. After it has considered all this input, the Panel will make a recommendation to the governments about whether the Project should be allowed to proceed and, if so, under what conditions.

PLAIN LANGUAGE SUMMARY

This document is a Plain Language Summary of the Environmental Impact Statement, and includes revisions to reflect changes associated with the 2011 update and 2012 supplement. It is much shorter than the Environmental Impact Statement (which is approximately 11,000 pages, including appendices). Therefore, this Plain Language Summary focuses on a limited number of topics, and readers are encouraged to review the full Environmental Impact Statement, 2011 update, and 2012 supplement, if they wish a more complete description of the Project and its potential effects. These three documents can be accessed at the Mackenzie Valley Environmental Impact Review Board web page (http://www.reviewboard.ca/) by searching the public registry.

ENVIRONMENTAL AND SOCIO-ECONOMIC CONTEXT

The Project will be located at Kennady Lake, which is one of thousands of small interconnected lakes in the area. It is near the transition between the boreal forest and the northern tundra. Because the Project will involve draining portions of Kennady Lake, the water environment is particularly important for the Project (Photo 1). Also, because caribou are of special concern to northern people, it is important to understand how caribou use the area. The Project will employ many people and will influence socio-economic conditions.

Photo 1 **Kimberlites at Kennady Lake**

WATER, LAKES AND FISH

Waterbodies

Kennady Lake is a small headwater lake within the Lockhart River system which receives water from numerous small unnamed lakes which are situated upstream. Water then drains northward from Kennady Lake, through a number of small, interconnected lakes and streams, referred to as the interlake system. This system drains into Lake 410, then into Kirk Lake. From there, water flows into Aylmer Lake which is located on the main stem of the Lockhart River about midway along its length (Figure 2). The Lockhart River system drains into the north-eastern arm of Great Slave Lake.

Kennady Lake is about 8.15 square kilometres (km^2) in surface area. At its deepest, it is 17.7 metres (m) deep, although most of the lake is much shallower. The amount of flow out of Kennady Lake over the open water season varies widely, with daily flows in June being about 10 times more than the daily flows in May. Kennady Lake is quite small compared to other lakes in the watershed, such as Lake 410 and Kirk Lake. As a result, the amount of water flowing from Kennady Lake does not have a big effect on downstream lakes such as Lake 410, Kirk Lake, Aylmer Lake, and Great Slave Lake.

Surface Water Quality

The water quality in Kennady Lake is about the same as the water quality in neighbouring waterbodies. Concentrations of total dissolved solids (TDS) and total suspended solids (TSS) tend to be low during both under-ice and open water conditions. Total dissolved solids are an indication of how hard or soft water is (soft water has low dissolved solids). Low suspended solids generally means that water is clear.

Nitrogen and phosphorous are nutrients. Low levels of these nutrients in Kennady Lake and other lakes in the area result in low biological productivity, which means that not much grows in the lakes, and there are few fish.

There are metals in the water in lakes and streams, which are naturally absorbed from rocks and soils in the watershed. Water quality guidelines have been established to identify levels of metals that may be a concern to aquatic life. The guidelines are highly conservative, meaning they are very protective of aquatic life, and concentrations in water of total metals higher than the guidelines does not necessarily indicate a problem because local plants and animals adapt to

naturally occurring levels. Levels of metals in Kennady Lake are similar to the levels in other lakes in the area. Metals that have been observed in these lakes before the mine is constructed and have concentrations in excess of water quality guidelines include aluminum, antimony, cadmium, chromium, copper, iron, manganese, mercury, selenium, silver, and zinc.

Fish

Kennady Lake provides habitat for a variety of fish species. Between 1996 and 2005, eight types of fish were captured in Kennady Lake: Arctic grayling, burbot, lake chub, lake trout, ninespine stickleback, northern pike, round whitefish and slimy sculpin. In addition to these species, cisco, longnose sucker, and white sucker were found in neighbouring lakes.

CARIBOU AND OTHER WILDLIFE

The Bathurst, Ahiak (Queen Maud), and Beverly caribou herds travel through the Kennady Lake area during the northern and post-calving migrations. The home ranges of these herds span from 282,000 km^2 to 345,000 km^2. Kennady Lake (8.15 km^2) makes up about 0.003 percent (%) of this home range area.

A number of other wildlife species occur in the region, including barren-ground grizzly bears, wolves, red foxes, wolverines, muskoxen, moose, upland breeding birds, waterfowl, and raptors. Muskoxen occur mostly on Banks and Northwest Victoria Island, but continue to re-colonize the southern portions of their historic range. During aerial surveys of caribou between 1995 and 2005 in the region, small groups of muskoxen and individual moose were also observed.

Information from people who use the land indicates that 35 bird species inhabit the Project area, 18 of which are edible. During surveys for the Project, 10 raptor species; 28 species of songbirds, shorebirds, and ptarmigan; 22 waterbird species, and ravens were observed.

HUMAN ENVIRONMENT

The economy of the Northwest Territories is based on primary resource extraction. Fur trade posts were the foundation for non-native settlement, and other sectors such as whaling, fishing, and forestry have also played a role in the Northwest Territories' economy. The oil and gas sector has been an important economic contributor, with the first well drilled by Imperial Oil in Norman Wells in 1920. Mining has had a major influence in the Northwest Territories ever since

prospectors arrived in the 1890s, with gold, uranium, radium, and silver mined in the region.

Since the discovery of kimberlite in 1991, exploration and development of diamond mines have been important influences on the socioeconomic environment of Northwest Territories. A focus of the operations of these diamond mines has been to provide employment and business opportunities for northerners and local communities. The Diavik, Ekati, and Snap Lake diamond mines will meet the halfway mark of their expected mine life before 2015 followed by five to 10 years of gradual decline.

Population

About 43,500 people live in the Northwest Territories. Half of the Northwest Territories population is Aboriginal, with about 80% living in smaller communities. Over 70% of the non-Aboriginal population in the Northwest Territories live in Yellowknife, which has a population of almost 20,000.

The population of Northwest Territories is relatively mobile, as people move between communities in search of jobs and a better standard of living. More people tend to leave the Northwest Territories than migrate into the Northwest Territories. They are in search of economic opportunities and lower living costs. Most people who move to the Northwest Territories come for economic opportunities and they are likely to be youths in their 20s and 30s, with slightly more men than women. Within the Northwest Territories, people tend to move from smaller communities to Yellowknife, in search of better economic opportunities, better access to education, relatively lower costs of living and a lessened sense of isolation.

Employment and Economy

The Northwest Territories' labour market conditions remain fairly strong. Several large projects are scheduled over the next few years that will continue to demand skilled workers, including the Deh Cho Bridge, Northwest Territories Affordable Housing Initiative, and the proposed Taltson Hydroelectric Expansion Project. Unemployment rates have decreased considerably since 1998 when diamond mining began, especially among Aboriginal communities.

The Northwest Territories' economy has grown substantially since 1999, although it slowed considerably after 2008. Gross Domestic Product (GDP) grew from $2.2 billion in 2003 to $3.7 billion in 2008. From 2000 to 2008, the government's total revenues grew from $823 million to $1.47 billion. Over their

lifespans, the existing diamond mines are estimated to collectively generate over $10 billion in royalties and taxes for the Northwest Territories.

Overall, existing businesses have expanded, new ones have been created, and viable Aboriginal development corporations have emerged. This growth has furthered the size and extent of economic benefits flowing from the diamond industry.

Education and Skills

The education and skill levels of Northwest Territories residents have greatly improved over the past 10 to 15 years. Secondary schools are now in nearly all of the communities, mining and trades training has increasing enrolments, and numbers of scholarships have increased. From 1986 to 2006 the total number of Aboriginal high school graduates in the Northwest Territories increased almost fourfold. Still, while high school graduation rates are improving, particularly in Yellowknife, in some of the smaller communities, high school student enrolment and graduation rates have not much improved over the last few years.

Well-being

Conditions of health and well-being include the physical and mental states of people within a community, Overall well-being is a combination of a number of factors such as individual, family, and community well-being. Health and well-being indicators includes premature death rates, disease and illness, diet and nutrition, behaviour and lifestyle choices, mental health, community involvement, and leisure and recreation. These are closely linked to factors such as employment, income, education, domestic conditions, and family and community support.

As an example, good nutrition plays an important role in reducing health risks and traditional country foods are an important part of a healthy diet and provide benefits not found in other food sources. In some communities over 75% of households eat country foods.

Government statistics show that the premature death rate in the NWT has declined since the 1990s, although the rate is still higher than in other provinces. Respiratory diseases are a major contributing cause of death in the NWT. These include respiratory viruses, tuberculosis, lung cancer, and other related diseases.

Other well-being factors such as life-style choices have shown both positive and negative trends in the NWT. For example, the overall decrease in teenage pregnancies can be attributed to increased access to reproductive health services and information, and improved economic conditions. However, sexually transmitted disease rates are much higher compared to the rest of Canada and are often the highest in small remote Aboriginal communities. Aboriginal communities are also affected by Fetal Alcohol Spectrum Disorder which can occur when women drink during pregnancy, with the incidence rate in some communities as high as 16%.

Mental health issues can include alcohol or drug-related disorders, depression, eating disorders, stress, schizophrenia, and mood disorders such as bi-polar illness. Between 1999 and 2002, there was a decrease in patient intakes in NWT hospitals for the treatment of mental illnesses. However, the NWT average rate of suicide between 1999 and 2003 was 2.6 people per 10,000, which was twice the 2001 national average and residents of smaller communities had higher rates of suicide than larger centers like Yellowknife.

Volunteering can create and develop healthy social networks that benefit communities and foster individual well-being. In the NWT 51% of residents over the age of 15 participated in some type of volunteer activity in 2004. An estimated two-thirds of volunteer organizations in 2004 in the NWT involved Aboriginal volunteers, comprising about one third (35%) of the total volunteer sector.

Other factors that contribute to the current well-being of individuals and communities includes participation rates in physical and cultural activities, and community health and safety factors like accidents, addictions and substance abuse, alcohol use, gambling, crime, gangs, family violence and other types of abuse, poverty, and homelessness. With a growing labour force during the last decade, and an increasing number of transient workers and larger disposable incomes, the Northwest Territories has seen increased crime rates. Substance abuse, gambling, and other addictions also continue to increase in the Northwest Territories. Overall, heavy drinking has declined in recent years, particularly among Aboriginal people.

Culture

Concern for changes to the traditional way of life have been identified since environmental assessment processes were introduced in the 1970s. The use of Aboriginal languages is in decline overall in the Northwest Territories, but Aboriginal language loss is slowing and may actually be increasing in use in

certain regions, at least as a second language. Most kindergarten through grade nine students in the Northwest Territories have access to Aboriginal language programs.

Hunting and fishing did not decline across the Northwest Territories from 2002 to 2009, and in some communities may have actually increased. The reliance on hunting and fishing as a source of food has decreased with the growth of the broader economy in the Northwest Territories and greater access to store-supplied goods.

PROJECT DESCRIPTION

OVERVIEW

If De Beers receives the necessary approvals, the Project, a diamond mine, will be built at Kennady Lake. The Project will take about two years to build, which will include dewatering part of Kennady Lake so that workers can get access to the ore that lies under the lake.

The Project will then operate for about 11 years as three separate pits are dug, and diamonds extracted from the ore. One of the pits will be backfilled with processed kimberlite and mine rock, while another pit will be partly backfilled with processed kimberlite by the time mining is finished. When the diamond-bearing ore is exhausted, the Project will be decommissioned. The facilities will be dismantled and taken away or disposed of in the mine rock piles, and Kennady Lake will be refilled with water. It will take about eight to sixteen years for Kennady Lake to return to its natural water level.

MINE SUPPORT FACILITIES

To provide support to the mining operations, a number of facilities will be required at the plant site (Figures 3 and 4).

Living accommodations: Workers will stay in a camp that will be large enough for 432 people during construction, when two workers will share a room. During operations, when each worker will have their own room, the camp will be large enough for 216 people. It will include washroom and shower facilities, dining and kitchen areas, food storage, and recreational facilities. The camp will have an incinerator, potable water supply, fire water supply and sewage treatment plant.

Administration office: An administration office will be part of the camp complex. It will include a construction office, medical clinic, computing and communication network and lunch rooms.

Maintenance complex and warehouse: Mining equipment will be serviced in the maintenance complex. A warehouse will also be located in this complex.

Power system: Five 2,825 kilowatt diesel-powered generators will provide electricity and heating for the site. During normal operations, three generators will be supplying power.

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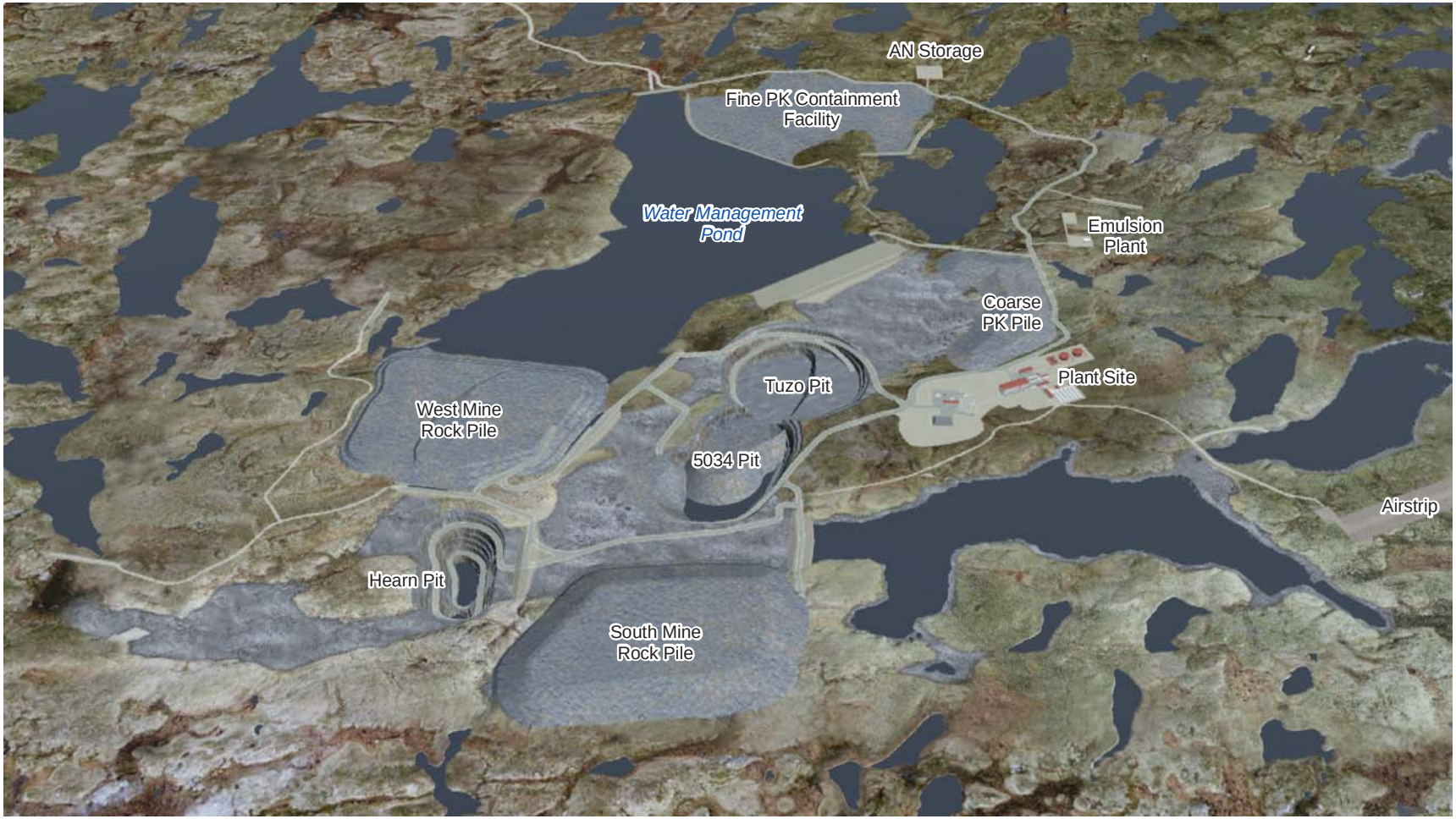

GAHCHO KUÉ PROJECT

Mine Layout

PROJECTION: N/A	DATUM: N/A	
NOT TO SCALE		
FILE No: P2011-Other-001-GIS		DATE: March 21, 2012
JOB NO: 11-1365-0001	REVISION NO: 2	
OFFICE: GOLD-CAL	DRAWN: CW / CHECK: JF	**Figure 3**

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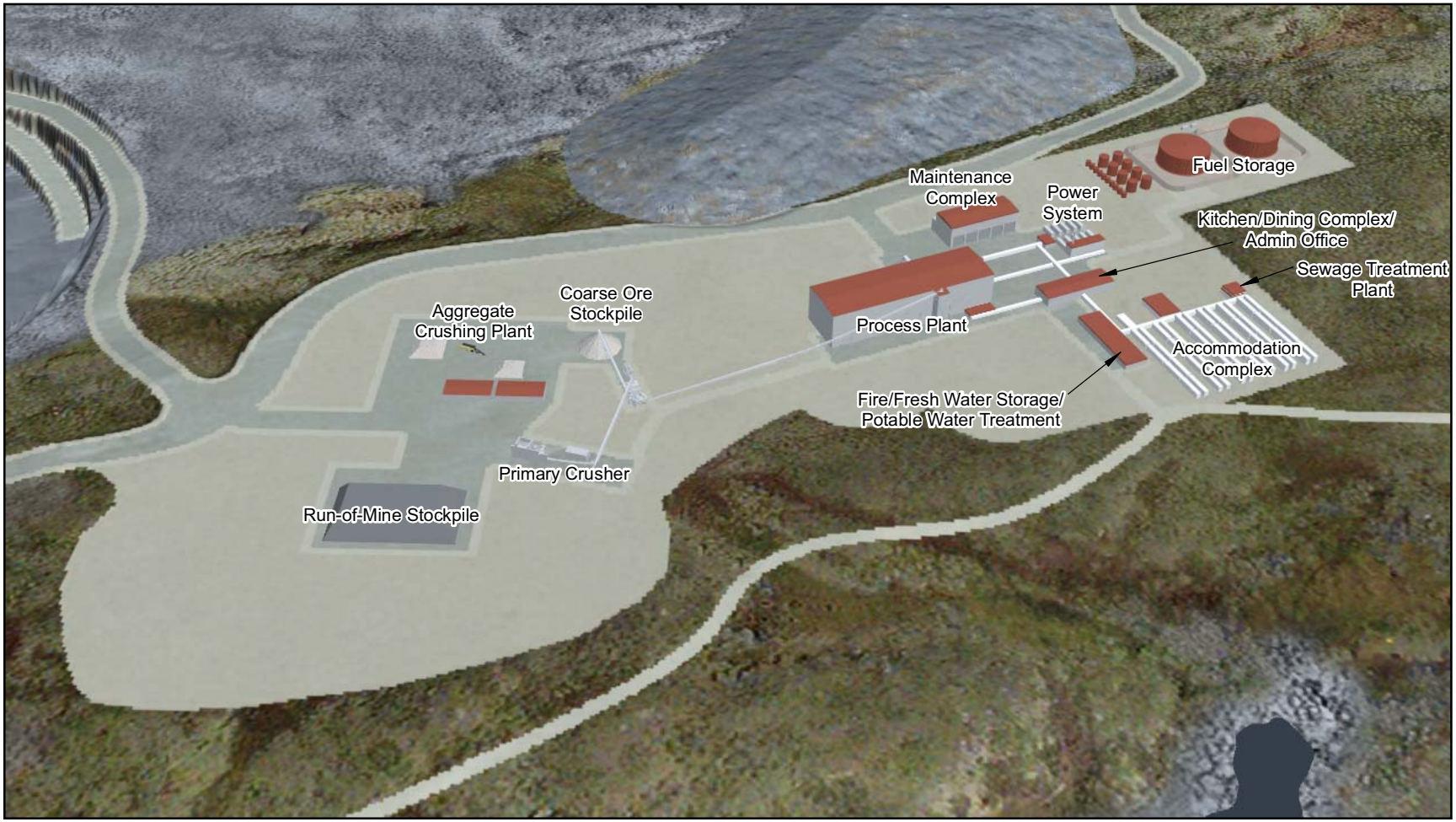

GAHCHO KUÉ PROJECT

Plant Site Layout

PROJECTION: N/A	DATUM: N/A	DE BEERS CANADA
NOT TO SCALE		
FILE No: P-Other-002-GIS		DATE: December 16, 2010
JOB NO: 09-1365-1004	REVISION NO: 1	Figure 4
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Fuel storage: Oil, fuel and aircraft de-icing fluid will be stored in an area that is surrounded by dykes and lined with a material that will prevent leaks. In addition to a number of very large fuel tanks, it will also contain smaller tanks for engine oil, transmission/hydraulic oil, glycol/coolant, waste oil and waste coolant.

Explosive storage: Explosives and other blasting material will be stored and manufactured in buildings and on storage pads located north of the main plant site.

Site roads: Service roads will be located throughout the site. Most of these roads will be 10 m wide, although some will be narrower. In addition, there will be other roads which will be used by large haul trucks and loaders to transport rock from the open pits. As much as possible, mine haul trucks carrying ore or mine rock will be kept to the west side of the site, away from the accommodations complex and potential pedestrian and airstrip traffic.

Airstrip: An airstrip will be built about 1 km southeast of the plant site. The permanent site airstrip will be 1,620 m long and designed to accommodate a wide range of aircraft. Aviation fuel will be stored in tanks with secondary containment and in sealed drums situated inside a lined berm. Before the permanent airstrip is established, aircraft will land on an ice airstrip located on Kennady Lake.

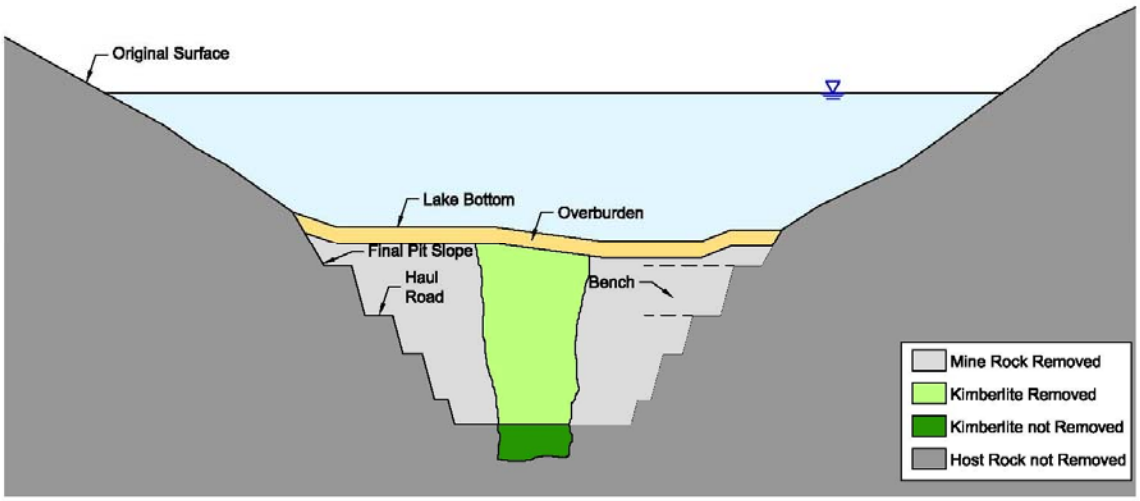
Winter Access Road: A 120-km Winter Access Road will link the Project to the existing Tibbitt-to-Contwoyto Winter Road (Figure 1). Each winter the Winter Access Road will be constructed from km 271 at MacKay Lake, just north of Lake of the Enemy to the Project site. It will follow the route used to access the existing exploration camp. During construction about 1,500 to 2,000 trucks per year will use the winter road for a 10-week period every winter (approximately January through March). This will drop to about 1,000 to 1,200 trucks per year during operations, and about 110 to 200 trucks per year during closure. Trucks will be hauling B-trains of fuel, loads of ammonium nitrate prills, and loads of miscellaneous freight.

STEPS IN THE DIAMOND PRODUCTION PROCESS

Step One: Expose the Kimberlite

The first step in mining diamonds is to get access to kimberlite, which is the type of rock where diamonds are found. At Kennady Lake, three separate kimberlite deposits which contain enough diamonds to be worth mining at this time are located beneath Kennady Lake. These three deposits are named 5034, Hearne, and Tuzo (Photo 1). To get access to the deposits, parts of Kennady Lake will be dewatered. When the lake bed is exposed, heavy earth-moving machinery will be used to dig a large, open pit around each ore body. The first layer of rock that will be removed is called overburden. It does not contain kimberlite or diamonds and must be hauled away. When the overburden has been removed, the kimberlite will be exposed (Figure 5).

Figure 5 Typical Open Pit Diamond Mine Materials in Cross Section



Step Two: Remove the Kimberlite

The open pits will extend over a fairly large area on the surface because the pit walls need to be sloped so they do not collapse. The pit walls will be a series of horizontal benches blasted into the rock. In each pit, a road for haul trucks and heavy equipment will be built like a ramp spiralling downwards around the perimeter of the pit. The 5034 Pit and Tuzo Pit are expected to be about 305 m deep, while the Hearne Pit will likely be 205 m deep.

When the kimberlite is exposed, holes will be drilled into the rock and filled with explosives. After blasting, the broken rock will be loaded into haul trucks and removed from the pit. The kimberlite will be trucked to the ore stockpile at the processing plant, and the mine rock will be hauled away and placed in its final location or used in construction and reclamation.

The ore bodies will be mined one after the other, beginning with 5034, followed by Hearne and then Tuzo. After the kimberlite has been removed from the 5034 and Hearne deposits, the pits that have been left will start to be backfilled. Mine rock that has been dug from the Tuzo Pit will be dumped into the 5034 Pit, and processed kimberlite from the processing plant will be used to partly fill the 5034 and Hearne Pits.

Step Three: Crush the Kimberlite

The haul trucks will dump the broken kimberlite rock into a stockpile located next to the processing plant. From this stockpile, the ore will be screened to remove over-sized pieces, which will be broken down further into smaller pieces and put in with the ore. The ore will be crushed into pieces between 1.0 and 28 mm. This crushed ore will then be moved to the processing plant on a conveyor. In the processing plant, the crushed ore will be passed over a number of screens to be washed.

Step Four: Separate the Diamonds from the Kimberlite

Diamonds are heavier than kimberlite. The screened ore will be mixed with ferrosilicon and water and spun in a cyclone where centrifugal force will separate out the particles that contain diamonds from the particles that do not. The heavier particles will be sent to the diamond recovery plant.

In the diamond recovery plant, x-ray machines and a grease diamond recovery system in a secure facility will be used to separate the diamonds from the kimberlite rock.

Step Five: Sort, Ship and Sell the Diamonds

The diamonds will be collected and flown from the Project site to an existing sorting facility in Yellowknife where they will be weighed, sized, and cleaned. De Beers has agreed to make 10% of its rough diamonds, by value, from the Project available to manufacturers approved by the Government of the Northwest

Territories and by De Beers. The remainder of the diamonds will be sold internationally.

PROJECT SCHEDULE

Once De Beers has obtained the approvals, it will take two years to construct the mine and bring it into operation. During the construction period the Project infrastructure will be installed and part of Kennady Lake will be dewatered. After the water above the ore bodies has been pumped out, the overburden will be removed and mining will begin.

The construction period will be followed by an eleven-year operational period (Year 1 to 11) during which the kimberlite will be mined and processed. Mining will begin in the 5034 Pit during years 1 through 3. In year 4, mining in the Hearne Pit will begin. By year 5, the Tuzo Pit will have been brought into production and all three pits will be active for a short time. Mining will be completed in the 5034 Pit by year 5, and by year 8, the Tuzo Pit will be the only one in operation. Mining is expected to end in Year 11. However, if additional ore with sufficient diamond content is identified, mining may continue.

Within two years after mining has been completed, most of the site infrastructure will have been removed and the remaining mine rock and processed kimberlite containment areas will have been covered with coarse processed kimberlite and rock that does not cause acid rock drainage.

Lake refilling and reclamation will continue from Year 12 onward until Kennady Lake is refilled. Flooding the pits and returning Kennady Lake to its original lake level is expected to take about eight to sixteen years after the end of operations. All remaining site infrastructure (e.g., airstrip and camp) will be removed after the water level in Kennady Lake has been restored.

The Project site will be monitored until the Project site and Kennady Lake meet all regulatory conditions.

The following visualization images have been created to show the various stages of development for the project (Photos 2 to 6). The first image depicts Kennady Lake before construction begins and the last image depicts Kennady Lake once the closure work is finished and the lake is re-filled.

Photo 2 Pre-construction Image of Kennady Lake

Photo 3 Construction Image Depicting Dyke and Facility Construction, and Lake De-watering

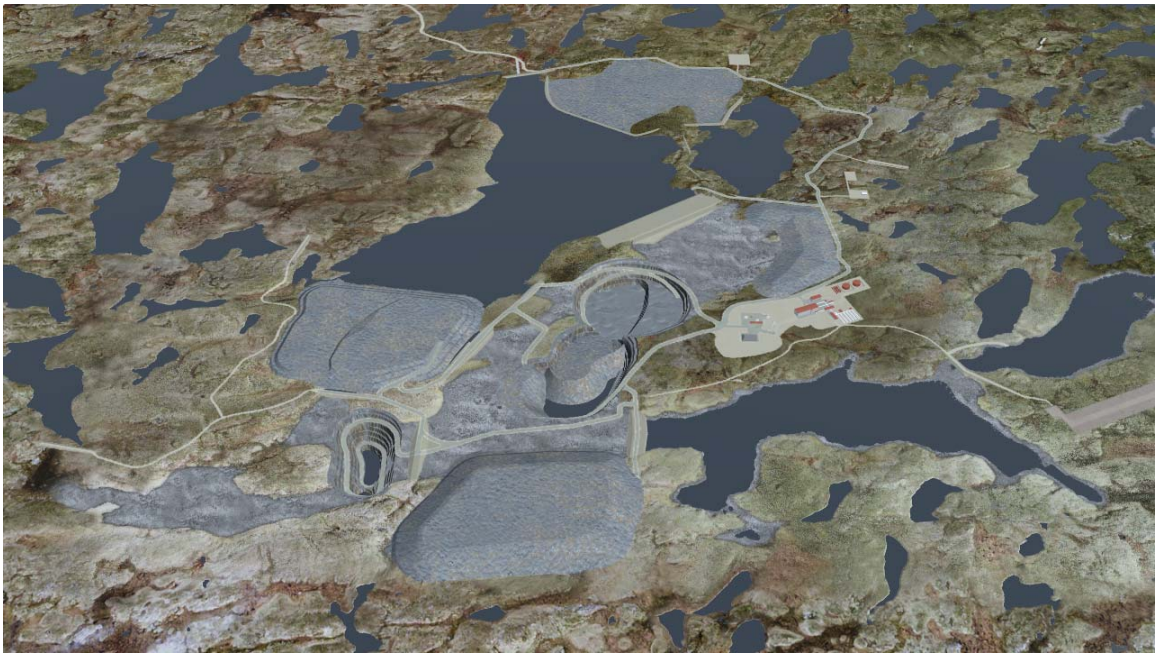


Photo 4 Operations Image Showing Full Extent of Development

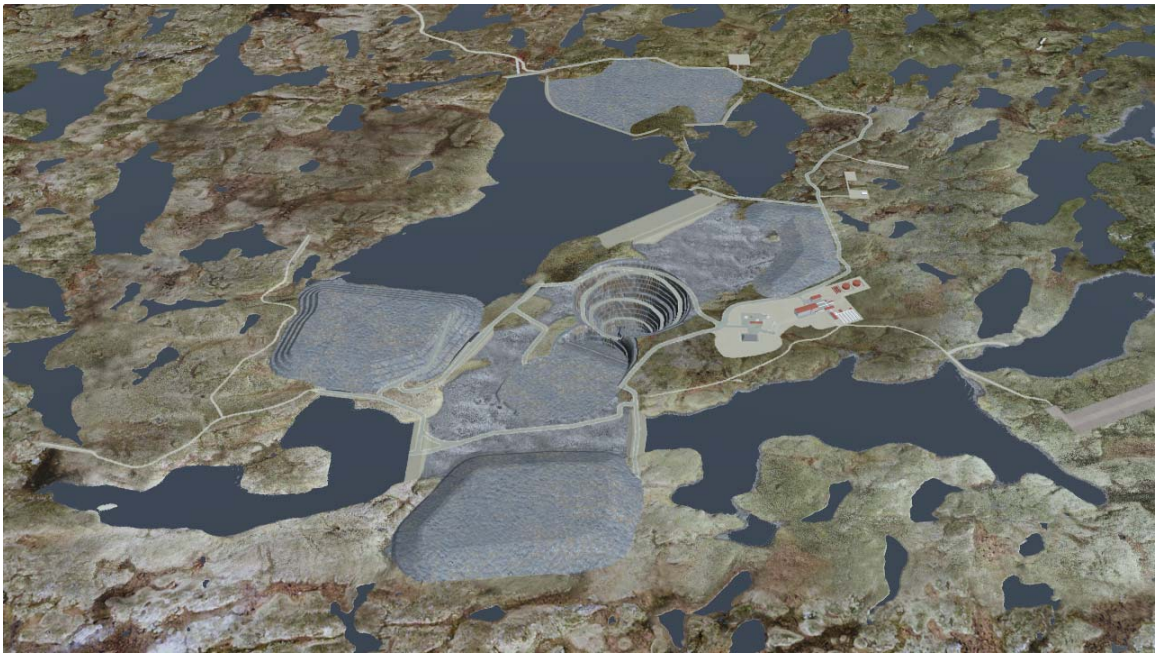


Photo 5 End of Mining Image Showing Pit Back Filling and Flooding and Closure of Several Areas

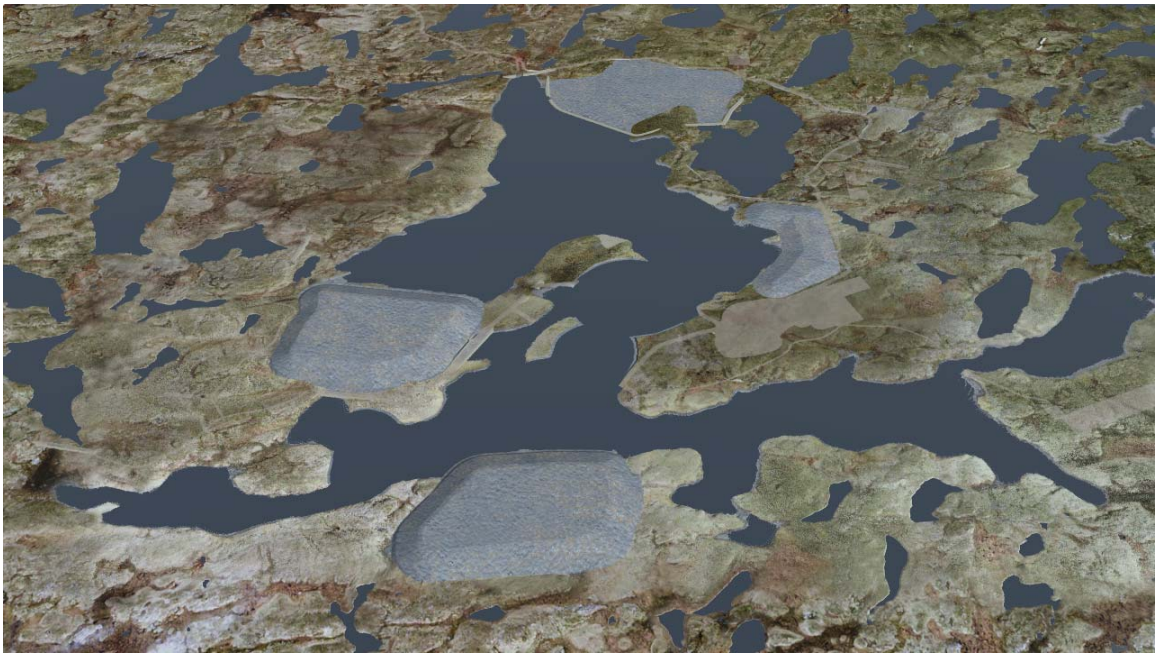


Photo 6 Closure Image Showing the Re-filled Kennady Lake

SOLID WASTE MANAGEMENT

Many forms of solid waste will be produced during the Project.

- In the mining process, large volumes of rock will be produced when the overburden is stripped to expose the ore bodies, and rock (primarily granite and kimberlite that does not contain diamonds) is excavated from the open-pit mines.
- When the diamonds are removed from the kimberlite in the processing plant, large volumes of processed kimberlite will be produced.
- General domestic, industrial, and hazardous waste will be produced as part of normal Project operations.

Mine Wastes

Overburden

The ore bodies lie beneath a layer of lake-bottom sediment and till. This overburden, which must be removed before mining, will be used on the Project site to construct the dykes and dams within Kennady Lake. It will also be used to

regrade the exposed lakebed to direct surface runoff and to cover any piles of mine rock which may contain minerals that could make water it comes into contact with more acidic (called acid rock drainage). If there is any extra overburden which is not required for these purposes, it will be deposited in the mine rock piles.

Mine Rock

Mine rock includes the excavated bedrock surrounding the kimberlite deposits and kimberlite which does not contain diamonds. Some mine rock will be used to construct roads, dykes, and dams, as well as to cover the Fine Processed Kimberlite Containment Facility once it is full and the Coarse Processed Kimberlite Pile. However, most of the mine rock will be placed in one of two mine rock piles (South Mine Rock Pile and West Mine Rock Pile) and the mined-out 5034 Pit. The South Mine Rock Pile will be about 80 m high, and the West Mine Rock Pile will be about 94 m high.

Some of the mine rock and barren kimberlite could cause acid rock drainage. To isolate this potentially acid-generating rock from water, it will be covered by rock that does not generate acid, or placed into mined-out pits.

Waste from the Processing Plant

Processed Kimberlite

Processed kimberlite is the material that remains after the diamonds have been removed from the kimberlite during processing. The processed kimberlite is handled in different ways, depending on the size of the kimberlite particles.

- Coarse processed kimberlite and processed kimberlite “grits” are particles that range in size between 0.25 mm and 6 mm. Some coarse processed kimberlite will be used to cover the Fine Processed Kimberlite Containment Facility. The remainder of this material will be hauled to the Coarse Processed Kimberlite Pile or disposed in the 5034 Pit and the mine rock piles along with mine rock. The Coarse Processed Kimberlite Pile will be about 30 m high.
- Fine processed kimberlite is smaller than 0.25 mm. Excess water in this material will be removed in a thickener. The fine processed kimberlite will then be pumped by pipeline to the Fine Processed Kimberlite Containment Facility for the first 5 years, after which it will be placed into the 5034 Pit, followed by the Hearne Pit.

Process Water

The water used in the processing plant will be re-circulated and recycled as much as possible. Some water will be lost to the process when it is incorporated in the processed kimberlite that is sent to the Coarse Processed Kimberlite Pile and Fine Processed Kimberlite Containment Facility. Additional water, primarily from the Water Management Pond, will be required to replace the water lost to the processed kimberlite waste streams.

Process Materials and Chemicals

Diamond processing uses a limited number of chemicals and so there will be a limited amount of waste process materials and chemicals.

Ferrosilicon is an inert iron/glass powder which is used to separate diamond-bearing material from waste kimberlite. While the ferrosilicon will be recycled back into the process, each day a small amount will not be recycled and will enter into the process kimberlite waste stream and will end up in the Coarse Processed Kimberlite Pile and the Fine Processed Kimberlite Containment Facility. The Ferrosilicon is added continuously to the process to make up for the amounts not recycled.

Flocculent will be used to assist settling and thicken the fine processed kimberlite waste stream, which will be pumped as a slurry to the Fine Processed Kimberlite Containment Facility or mined-out pits.

Grease and solvents used in the diamond recovery process on-site will be recycled as much as possible, but it is expected that there will be losses. When wastes cannot be recycled, they will be recovered, stored in appropriate containers, and removed from site for appropriate disposal.

General Solid Waste

In addition to the mine rock from the mining operation, and processing plant wastes, other solid waste will be produced at the Project. This waste includes food waste, inert bulk waste, and hazardous waste. Some liquids such as waste oil and glycol are also included. These wastes will be disposed of in different ways, as appropriate. Some will be incinerated (e.g., food wastes), some will be sealed into steel or plastic drums and shipped off-site for disposal or recycling (e.g., hazardous materials), others will be placed in the site landfill which will be located in the mine rock piles or the Fine Processed Kimberlite Containment Facility.

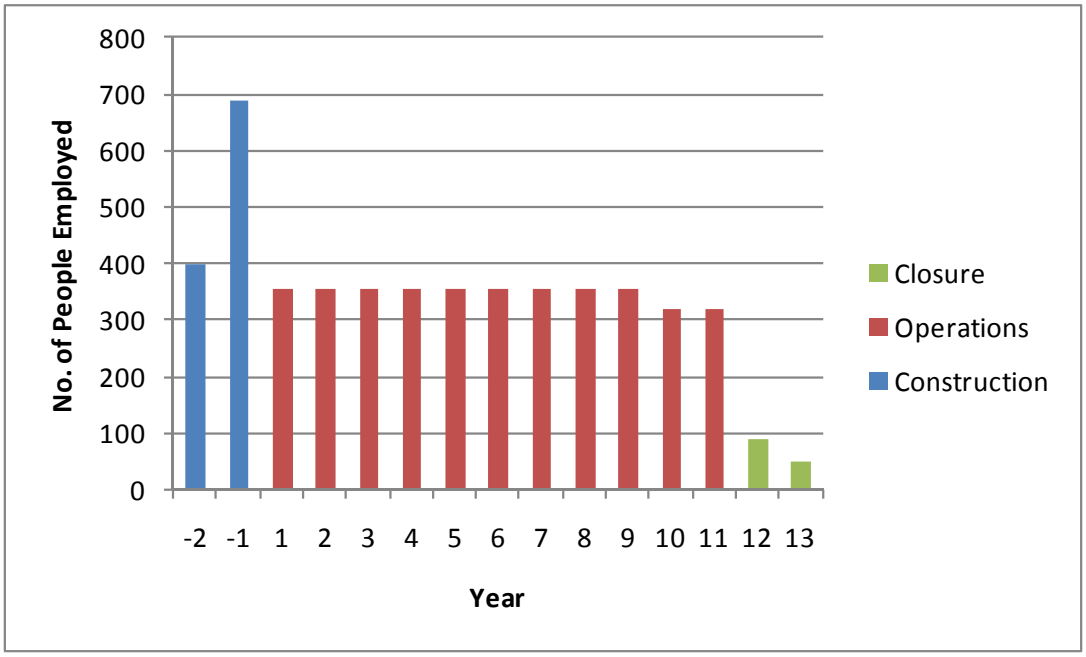
A modular sewage treatment system to handle a peak load of 432 people will be used to treat domestic wastewater generated in the accommodations complex. Treated effluent will initially be discharged to Water Management Pond and later, during operations, added to the fine processed kimberlite slurry pipeline. Sewage sludge will be dewatered and land filled on-site.

HUMAN RESOURCES

Employment

De Beers expects the construction workforce for the Project will be about 400 Full Time Equivalents (FTEs; one FTE is the number of hours worked that add up to one full-time employee) in the first year of site construction, growing to 690 FTEs in the second year. This peak employment includes people who are working both on-site and off-site. The number of people on-site is limited by the 432-person maximum capacity of the camp.

Total Employment by Year during Construction, Operations and Closure



The operating mine life is expected to last 11 years. The total workforce will average 372 FTEs during operations with less than half this number on-site at one time due to rotational work schedule and some Yellowknife-based employees.

When the kimberlite ore has been exhausted, fewer than 100 FTEs will be required to complete the mine closure activities, with fewer staff required in Year 13 than Year 12. For about eight to sixteen years after the end of mining operations, about 20 FTEs will be required to operate the pumps that will refill Kennady Lake, as well as meet ongoing monitoring requirements.

Administration

For the Project, De Beers will build upon, and be consistent with, the human resource strategies, policies, plans, and procedures of the Snap Lake Mine.

Human resources for the Project will be managed from the De Beers Canada Inc. Yellowknife Office. These people support both the Snap Lake Mine and the Gahcho Kué Advanced Exploration Project. They include two Community Liaison Coordinators who work with communities to facilitate involvement in De Beers Northwest Territories Projects. One position is staffed with a Chipewyan-speaking employee and the other with an employee who speaks Tłı̨chǫ. In addition, there is a Manager responsible for business development who works with Northwest Territories businesses to assist with increasing employment and business opportunities.

Workforce Schedule and Mobilization

Before construction begins, De Beers will determine the rotation schedule that will attract the skilled labour it needs to complete the construction of the mine. Work rotations and shifts will be planned accordingly. During operations, most of the workforce will work 12-hour shifts in a two weeks on and two weeks off rotation. Traditional pursuits of Aboriginal employees will be accommodated within work schedules in balance with the operational requirements of the Project. De Beers will provide employees with return air transportation between the Project and designated pick-up points in Northwest Territories communities.

On-site Services and Facilities for Workers

During the construction of the Project, the camp will include the necessary facilities to sustain the workforce at the site. The existing exploration camp will serve as the starter and overflow camp for initial construction. Temporarily, two-per-room shared accommodation will be provided to crews during the construction phase. During operations, staffing levels will allow for individual occupancy rooms.

Eating and sleeping areas will be non-smoking for all workers. Food services will include country foods when available. Recreational facilities will be provided in the camp. De Beers has implemented a Dry Site Policy for the Project, which requires the worksite and workers to be drug- and alcohol-free. De Beers practices has zero tolerance towards harassment, fighting, or bullying on-site. Workers will not be allowed to hunt or fish while at the site at any time during the life of the Project. No personal firearms will be allowed on-site at any time during the life of Project.

Medical personnel will be on-site and available to provide medical aid 24 hours a day, seven days a week. Medical emergencies will be evacuated to Yellowknife.

Staffing

The key elements of De Beers' approach to employment include recruiting and training that maximizes employment opportunities available to local residents, particularly Aboriginal people. It also works with local schools, Aurora College and other post-secondary education institutions to establish work experience and job placement programs.

Retaining and supporting northern Aboriginals is important to De Beers. De Beers wants to ensure that these employees have the opportunity to grow, develop, and progress in their jobs and careers. To help with this, a range of training, counselling, family support, mentoring, and performance incentives will be provided for staff. These include programs to support and encourage the participation of women on an equal basis with men in all aspects of work related to the Project.

De Beers has developed a specific training approach for its northern operations. The focus is on recruiting and developing a northern workforce, with particular interest in people from Aboriginal communities. This includes orientation training for new hires, money management coaching, and support to community literacy programs. Mentoring programs, internal promotion policies, and apprenticeship positions particularly for Aboriginal northerners are part of this approach.

De Beers will encourage the use of Aboriginal languages at the Project site when it does not compromise health and safety, and will collaborate with Aboriginal communities to incorporate cultural value systems in training programs.

Contracting and Procurement

Policies intended to increase business and value-added opportunities for Northwest Territories businesses were established for the Snap Lake Mine. Wherever feasible and consistent with sound procurement management, these will be continued for the Gahcho Kué Project. De Beers will continue to use a competitive evaluation and adjudication system for procurement tendering of goods and services. The type of evaluation will vary with the nature, criticality, complexity and value of the purchase and will include such evaluation criteria, but not limited to: price competitiveness and stability, support, reputation, quality and NWT and Aboriginal content. Special emphasis and priority will be placed on NWT and Aboriginal content that involves contracting businesses and procuring services in Tłı̨chǫ Communities, N'Dilo, Detah, Yellowknife, and Łutselk'e. The next level of priority will be to obtain services from other Northwest Territories businesses, industry and business associations; and, finally, other Canadian businesses.

WATER MANAGEMENT

Water management is a key component of the Project because the diamond-bearing kimberlite pipes are located mainly under Kennady Lake. The primary objective for water management for the Project is to isolate the active mine area within the Project footprint from the surrounding environment. To meet this objective, two goals must be achieved:

- water must be prevented from flowing into the active mine area; and
- water within the Project footprint must be captured and only discharged into surrounding watersheds if it meets the water quality conditions that will be stipulated in permits and licences.

Dyke Construction and Dewatering

During the Project, Kennady Lake will be changed. Dykes will be built to prevent water from flowing either into or out of the lake. A number of dykes will be built within the lake to manage the water during operations and to confine mine water in the Water Management Pond. Some of the dykes will be built in the early construction stages, and others will be built as the project progresses.

About two years before mining begins, water from Kennady Lake will be pumped into Lake N11 and through the natural outlet of Kennady Lake. This will lower the water level in the lake, which will allow some dykes to be built to divide the lake

into two areas. The northern part of Kennady Lake will ultimately be used as the project's Water Management Pond, and the southern half will be dewatered completely so that the kimberlite ore lying underneath the lake's bed can be mined. When water levels drop to the point that lake bottom sediment is stirred up and becomes suspended in the water, the pumped water will be stored in the Water Management Pond until the sediment settles out and the water is clean enough to release.

Area 1 is the A watershed, which includes Lakes A1, A2, A3, and A9, and naturally drains into Kennady Lake in the northeast corner. During the mine operation, Area 1 will be isolated from Kennady Lake and the Fine Processed Kimberlite Containment Facility through the construction of three berms and a permanent dyke. Natural watershed flows through the A watershed will be managed by a pipeline into Lake J1b, which flows into Area 8 or by overflow into the Water Management Pond.

Water Management During Operations

Water Management Pond

Part of Kennady Lake will be separated from the rest of the lake and used as a Water Management Pond where water that may be changed by the Project will be stored. It is expected that water quality in the Water Management Pond from time to time will be clean enough to pump into Lake N11 during the early years of operations. Water in the Water Management Pond will be monitored, and if it is determined that the water quality does not meet the conditions that will be stipulated in permits and licences, then it will not be pumped into Lake N11.

Water within the footprint will be controlled and managed. The only outflow from the Project footprint will be licensed discharges that are monitored.

Managing Groundwater from Open Pits

During operations, groundwater will flow into the open pits. This water is naturally high in total dissolved solids and so cannot be directly discharged out of the active mine site. This water will be used in the process plant, or collected on-site until it can be pumped to a mined-out pit.

Water to the Processing Plant

Water will be supplied to the processing plant from the Water Management Pond, or from runoff water that has collected in mined-out pits.

Site Runoff Control

All disturbance activities for the Project, with minor exceptions, will be contained within the active mine site. Almost all site runoff, including runoff from mine rock piles, the Fine Processed Kimberlite Containment Facility and the Coarse Processed Kimberlite Pile, will flow naturally into the dewatered areas of Kennady Lake that will act as collection ponds for storage of water. Runoff will be collected in various dyked areas of Kennady Lake and, at later stages of the Project, pumped into mined-out pits.

Water Management for Closure and Reclamation

By using dykes to divide Kennady Lake into a number of separate areas, some areas of the lake can be allowed to refill to natural water levels while other areas are still being used for mining. This will shorten the length of time it takes for water levels throughout Kennady Lake to be completely restored. For example, the Hearne Pit will be filled with water before mining has finished in other pits. When mining is completed in the Tuzo Pit, water from some of the water storage areas will be allowed to flow into the pit.

After the planned within-lake reclamation activity has been completed, such as the construction of the fish compensation habitat and the decommissioning of any facilities within the lakebed, the refilling process of the remainder of Kennady Lake will begin. Water will be pumped from Lake N11 into Kennady Lake. It will likely take about eight to sixteen years for water from Lake N11 along with natural runoff to restore the water level of Kennady Lake back to what it was before the Project.

As water levels throughout the separate sections of the lake are restored, most of the dykes that divert water away from Kennady Lake or separate sections of Kennady Lake will be breached or lowered so that fish and water can move through the lake. Natural channels will be protected from erosion by placing erosion-protection materials along flow paths.

CLOSURE AND RECLAMATION

Objectives

The Project has been designed and will be implemented according to two important concepts:

- "progressive reclamation", which means that areas that have been disturbed will be reclaimed as soon as they are no longer required; and
- "design for closure", which means the Project was designed so that when the mining is finished, the site will be reclaimed to a condition that is similar to nearby undisturbed habitats, and the final landscape will be aesthetically pleasing.

The overall goal of the reclamation plan is to minimize the lasting environmental impacts of operations to the extent practical and to allow disturbed areas to return to productive fish and wildlife habitat as quickly as possible.

Key Closure and Reclamation Activities

While mining is underway, soil and sediments that can be used in reclamation will be salvaged. The Fine Processed Kimberlite Containment Facility, Coarse Process Kimberlite Pile and the mine rock piles will be reclaimed as the Project proceeds, and the 5034 Pit will be backfilled and the Hearne Pit partially backfilled.

At the end of operations:

- all potentially hazardous materials will be removed from site;
- equipment and materials suitable for recycling or salvage will be shipped to appropriate disposal, recycling, or salvage facilities (most likely in Edmonton or Hay River) on the next available winter road;
- all buildings and related structures, including above-ground concrete footings and foundations will be removed or buried in the landfill in the mine rock pile;
- any contaminated soils will be excavated and either permanently encapsulated in a secure area, treated on-site to an acceptable standard, or stored in appropriate sealed containers and shipped off-site for disposal;
- fish habitat will be restored and new habitat created; and

- dykes within Kennady Lake will be breached and/or lowered, and the lake will be refilled.

The two mine rock piles will remain as features on the landscape. The South Mine Rock Pile will be about 80 m high, and the West Mine Rock Pile will be somewhat higher at 94 m. The side slopes will be constructed so they are stable and landslides do not occur. At least 2 m of mine rock that does not produce acidic drainage will cover the other rock in the piles so that the potential for acid-generating drainage is minimized.

The Fine Processed Kimberlite Containment Facility will be covered with a layer of coarse processed kimberlite to prevent the fine processed kimberlite from being windblown, and about 1 m of non acid-generating mine rock will placed over this. The Coarse Processed Kimberlite Pile will be shaped and covered with at least 1 m of mine rock to limit surface erosion.

The Tuzo Pit, which is the last pit to be mined, will not be backfilled with material and will be about 305 m deep. The pit will be allowed to flood following the completion of the operations phase. The Hearne Pit will be partially filled with fine processed kimberlite, the top surface of which (after settling) will be about 100 m below the original lakebed. The 5034 Pit will be filled with mine rock and processed kimberlite.

The entire area will be stabilized and contoured to blend with the surrounding landscape. Re-vegetation is difficult in environments like the area around Kennady Lake. The knowledge gained from research reclamation at the other northern diamond mines will be used to develop a re-vegetation plan for the Project site. The objective will be to create a landscape that encourages local plant species to grow on the site.

De Beers will continue to monitor conditions over time to evaluate the success of the Closure and Reclamation Plan and, using adaptive management and newer proven methods as available, will adjust the plan if necessary.

ENVIRONMENTAL EFFECTS

The active mine area will be confined to a small footprint (1,153 ha, which includes 794 ha of mine and infrastructure that will directly affect terrestrial and aquatic resources. Much of this will be within an area currently occupied by Kennady Lake. As a result, it will have a limited effect on air, soils, vegetation and wildlife. Because the Project will require Kennady Lake to be dewatered for the duration of the Project, effects to the aquatic environment are important considerations. Caribou have been identified as the most important concern related to the terrestrial environment by the communities.

CARIBOU

The Importance of Caribou

As long as humans and caribou have co-existed, it is likely that humans have hunted caribou. Caribou are important to the culture of Aboriginal peoples and other residents of the Northwest Territories. They are a critical component of the diet of many northerners, and they are the most important resource harvested by Aboriginal groups with traditional lands near the Project.

The Project's potential to affect caribou is likely the biggest concern that people have about the Project. People are particularly concerned because several herds of barren-ground caribou in the Northwest Territories and Nunavut have declined over the past 5 to 10 years.

Factors Influencing Caribou

Caribou are migratory, each year travelling from their wintering grounds in the boreal forest northwards to calving grounds near the Arctic coast, and returning to the wintering grounds in the fall. They use different areas for a variety of reasons, such as where food can be found, where it is easiest for them to travel, where they can get relief from insects, and where they can escape predators.

The size of barren-ground caribou herds goes up and down in cycles. In a person's lifetime, there are usually one or two cycles of high caribou numbers followed by low caribou numbers. Climatic patterns, summer and winter range quality, and fire frequency and intensity are likely important reasons for why this happens. The size of caribou herds across the arctic has declined recently, even for herds that have ranges where there is little human development.

Because caribou move long distances during their annual migration between wintering areas and calving grounds, they can encounter a number of human developments such as communities, outfitter camps and lodges, operating mines, and exploration camps. Developments can affect caribou by taking up space because caribou cannot forage, rest or travel properly through developed sites. A caribou may also be reluctant to be near a development, and may be nervous and not feed normally when it is close to human activity. It may use up energy if it is disturbed and runs away from a project area.

There are a number of other factors that also affect caribou populations, such as:

- The amount and quality of food that is available on both summer and winter ranges can affect animal survival, as well as the number and health of calves that are born.
- Snow conditions, such as depth and hardness, can affect how much energy it takes caribou to move, and how easy it is for them to get to food.
- Weather events such as late spring snowfall or late snowmelt can affect a caribou's access to food. This can influence how big calves are when they are born, and how much milk a cow can produce to nurse her calf.
- Biting insects can affect a cow's ability to nurse her calf, as well as affect the ability of all caribou to eat, rest, and store fat for the winter.
- The number of animals that are taken in the traditional harvest, as well as from hunting by non-Aboriginal residents and non-residents.

Caribou and the Gahcho Kué Project

Most of the caribou near the Project are from the Bathurst herd, although the ranges of the Ahiak (Queen Maud) and the Beverly herds also overlap with the Project site (Figure 6). The Bathurst herd typically ranges over an area that extends from Bathurst Inlet to the northern boreal forest. The Bathurst herd is at a low point within its natural population cycle, having dropped from approximately 203,000 to 55,600 breeding females between 1986 and 2006. The total herd size was approximately 472,000 caribou in 1986 and 128,000 caribou in 2006. The last census completed in June 2009 indicated that the herd is near 31,900 animals.

LEGEND

- Gahcho Kué Project
- Existing Mine
- Territorial Capital
- Populated Place
- Highway
- Existing Winter Road
- Tibbitt to Contwoyto Winter Road
- Winter Access Road
- Watercourse
- Waterbody
- Territorial/Provincial Boundary
- Treeline
- Ahiak Caribou Herd Study Area
- Bathurst Caribou Herd Study Area
- Beverly Caribou Herd Study Area
- Regional Study Area

NOTES

Base data source: The Atlas of Canada; Derived from GNWT - ENR Data

GAHCHO KUÉ PROJECT

Annual Range of the Bathurst, Ahiak, and Beverly Caribou Herds

PROJECTION: Canadian Lambert Conf. Conic	DATUM: NAD83	
Scale: 1:8,000,000 (100 50 0 100 Kilometres)		
FILE No: KLOI-07-030-GIS		DATE: December 13, 2010
JOB NO: 09-1365-1004	REVISION NO: 3	
OFFICE: GOLD-SAS	DRAWN: ANK / CHECK: JV	Figure 6

G:\2009\1365\09-1365-1004 De Beers Gahcho Kue EA Support\GIS\maps\KLOI\KLOI-07-030-GIS.mxd

Caribou may be in the area near the Project during all seasons of the year except during June when they are on the calving grounds north of the Project. The number of caribou that have been counted in the area around the Project varies widely from year-to-year during the northern migration and in the summer.

The Project is expected to have the same types of effects on caribou as the other diamond mines in the Northwest Territories. Caribou will not be able to use about 400 hectares of land as a result of the Project, and may not use the area within about 15 km of the Project as much as they would if the Project were not there. The loss of habitat will be a very small area compared to the amount of existing caribou habitat.

Traffic associated along the Tibbitt-to-Contwoyto Winter Road (from Tibbitt Lake to MacKay Lake) and the Winter Access Road to the Project could affect the behaviour and movement of caribou along the road during the 8 to 12 week period every year when the road is being used. There will be more traffic during the construction period than later during operations. When the Project has been completed, the piles of rock and processed kimberlite material left over from the mining operation will be a permanent loss of caribou habitat, covering about 270 ha.

The Project is not expected to cause enough disturbance to caribou to make a noticeable difference to a female's ability to produce a healthy calf. Effects from the mine will be limited and unlikely to be a major contributing factor to changes in the abundance and distribution of the caribou herds. Changes in water, soils, and plants from the Project will not affect the health of caribou, or the health of people that eat caribou.

WATER QUALITY AND FISH IN KENNADY LAKE

Background

Because the kimberlite ore where the diamonds are found is located beneath the bed of Kennady Lake, De Beers proposes to drain parts of the lake so that it can mine the ore. When mining is finished, Kennady Lake will be refilled. Because the Project will be making changes to Kennady Lake, and Kennady Lake will also receive water that comes into contact with the Project, water quality and fish in Kennady Lake is an important issue.

Water Flow Management in Kennady Lake

A series of dykes and diversion channels will be built in and around Kennady Lake. Some dykes will be used to divert water that naturally runs into Kennady Lake into other lakes. Other dykes will block off areas that will be mined so they can be dewatered and pits dug to get to the ore. Some dykes will create a separate, smaller area in Kennady Lake where water that is not ready to be released into the environment will be managed. This separate area will be called the Water Management Pond.

When these dykes are built, there will be some changes to streams and lakes around Kennady Lake. Natural streams immediately downstream of some dykes will be dry while flows in other streams will increase. Some nearby lakes will be flooded, getting deeper and larger in area. The water levels these lakes will increase between 0.8 m and 2.8 m. If the shorelines begin to erode and cause high sediment levels in the lake water from wave action, actions will be taken to protect the shoreline.

During mining operations, all the mine rock and processed kimberlite mine rock piles will be placed in a particular way so that any water that drains from them will be captured. This water will either be used in the processing operations, or captured in the Water Management Pond where it will be stored until it is clean enough to be released.

When the mining is finished, the natural drainage systems in the Kennady Lake watershed will be restored to what they were before the Project, and Kennady Lake will be refilled. It will take about 8 to 16 years for the water level in Kennady Lake to return to what it was before the Project. Once the water levels throughout the various dyked areas of Kennady Lake are the same, some of the dykes will be removed or lowered so that natural water flows and fish movement through Kennady Lake will return to what it was before the Project. Some dykes will remain in part to become new fish habitat in the refilled lake.

After the Project is finished, Kennady Lake will be about 12% smaller than it was before the Project began. This is because some of the mine rock piles and processed kimberlite piles will have been built on sites that had previously been part of the Kennady Lake lakebed.

Water Quality Management in Kennady Lake

The Project will release substances into the air (called air emissions) as a result of activities such as the processing plant, vehicle exhausts and dust. These substances will settle directly into the water, and onto land where they may be washed into the lakes and streams by snowmelt or runoff. The concentrations of some metals were identified as potentially being above water quality guidelines in some small lakes right near the Project area. When evaluated, the potential for effects to aquatic health from the dust and metals reaching in the lakes was determined to be low.

During the time when parts of Kennady Lake will be pumped dry, three deep pits will be dug in the exposed lake bed so that the ore can be removed. Over the course of the mining, one of the pits – the 5034 Pit – will be almost completely refilled with mine rock and processed kimberlite. Another one of the pits – the Hearne Pit – will be partially refilled with processed kimberlite, and then filled with water. The remaining pit – the Tuzo Pit – will be left unfilled. Some of the water that had been collected during mining operations will be pumped into the pit. In addition, groundwater, which is water that seeps through rock layers beneath the ground surface, will also collect in the pit. This water will have high levels of total dissolved solids and will be somewhat heavier than the freshwater from surface runoff. When Kennady Lake is refilled, this pit and Hearne Pit will be an especially-deep part of Kennady Lake. Because of the depth of these pits – about 305 m for Tuzo Pit and about 100 m for Hearne Pit deeper than the rest of the lake bottom -- and the cone shape of these pits, the deep water in them will not circulate and mix with the water in the upper parts of the lake.

Computer models were used to determine how the Project could affect water quality in Kennady Lake during and after the life of the Project. Project activities such as pumping water from the lake, exposing the lake bed, mining the pits, changing the drainage patterns of the lake, processing the mined ore, depositing mine rock and processed kimberlite in the lake, and refilling the lake were examined to determine how water quality could be affected. The model considered the water quality of the lake before the Project, which included natural levels of minerals, nutrients and metals in the lake, and estimated the changes to these substances due to the Project. The model was also used to identify potentially harmful substances in the water of Kennady Lake due to the Project.

Minerals, like salts, in Kennady Lake will increase for some time. However, the change in the minerals is not expected to affect fish or other animals that live in the lake.

Phosphorous and nitrogen concentrations in Kennady Lake are predicted to increase during operations but decrease during closure to levels slightly above or at current background concentrations, respectively. Mitigation applied to the Fine Processed Kimberlite Containment Facility (i.e., a reduction in size from that in the 2010 Environmental Impact Statement)is expected to limit phosphorus level increases in Kennady Lake over the long term.

Metals, such as chromium, iron, nickel, zinc, copper, and lead, occur naturally in water, and are also released from mine rock and processed kimberlite. Water quality guidelines have been established to identify levels which may present a concern to aquatic life. After the Project has been completed and water flows in Kennady Lake are restored, only concentrations of cadmium and copper in the water in some areas of Kennady Lake could be higher than those water quality guidelines; however, baseline concentrations of these compounds are also above the guidelines. As will be discussed below, these metals are not expected to harm the aquatic life in Kennady Lake.

Effects to Aquatic Health in Kennady Lake

Changes to water quality could potentially affect the health of fish and other aquatic organisms such as phytoplankton and algae. From the water quality assessment, only copper was identified as having the potential to have concentrations after closure that exceeded the chronic effects benchmarks. Chronic effect benchmarks are considered to be levels where the long-term health of some aquatic plants and animals may be affected if the amount a particular substance is above a certain amount in the water.

Copper is not expected to harm the aquatic life in Kennady Lake. Copper concentrations predicted in Kennady Lake are only slightly above the chronic effects benchmark. As well, copper is not expected to harm the aquatic life in Kennady Lake because other substances that are present in the water make it difficult for organisms to absorb, and copper concentrations are already naturally high in Kennady Lake sediments.

Fish and Fish Habitat in Kennady Lake

Construction and Operations

A number of species of fish live in Kennady Lake and its watershed, including lake trout, round whitefish, Arctic grayling, northern pike, burbot, lake chub, slimy sculpin, and ninespine stickleback.

Fish habitat in a large portion of Kennady Lake will be lost for the duration the life of the mine. Water will be drained from a large portion the lake to expose the ore bodies that lie beneath the lakebed, and to provide space for the mining operation. Before the water is pumped from the lake, fish would be salvaged (removed from the lake).

About 431 ha of lake area will be dewatered (or partially dewatered), but not otherwise changed, during Project operations. This habitat will be restored when the lake is refilled at Project closure. About 81 ha of lake area will be dewatered and physically changed by the mining operations before being re-submerged when Kennady Lake is refilled. This is habitat area that will be covered by dykes and mine pits during mining operations, but will be restored when the lake is refilled.

The most downstream area of Kennady Lake is a long, narrow, and shallow basin attached to the lake outlet stream. It is about 4 km long, typically less than 500 m wide, and generally less than 4 m deep. It will be separated from the rest of the lake and the active mining area by a dyke. This area is unlike the deeper basins that make up the rest of Kennady Lake. The fish community in this area will likely change because fish will be not be able to access areas of the lake where mining is occurring for wintering or relief from higher summer water temperatures. However, northern pike, Arctic grayling and burbot, as well as smaller fish species, will likely continue to be present in this basin.

Project Closure

When the mine has been closed, Kennady Lake will be refilled. This will take about eight to sixteen years. The dykes will then be breached or lowered, and fish and water movement between the waterbodies will be restored to the way they were before the Project.

The aquatic habitat may be different than before the Project as there will be physical changes that occur and the water chemistry may be different and may have more nutrients. The lake may be more productive from the increased nutrient concentrations above background, which may increase the size and numbers of fish in the lake.

The Project will result in the permanent loss of almost 163 ha of lake area because mine rock and processed kimberlite piles will have been placed on areas of lake bed. De Beers is currently developing a plan that will compensate for this loss of fish habitat. This plan will be developed in consultation with DFO and other regulatory agencies.

EFFECTS ON WATER AND FISH BEYOND KENNADY LAKE

Kennady Lake is located near the top of the Lockhart River system. It drains to the north about 70 km, via a series of small lakes, into Kirk Lake and then into Aylmer Lake. Aylmer Lake is located on the mainstream of the Lockhart River, about midway along its length. The Lockhart River system drains into the East Arm of Great Slave Lake (Figure 2).

The most significant water-related activities that will take place during the operation of the Project will be the dewatering of a large portion of Kennady Lake and the subsequent re-filling of the lake. There are three main concerns about the effects that the Project might have on water downstream of Kennady Lake:

- the effect of flows in downstream lakes and streams while water is being pumped out of Kennady Lake;
- the effect of reduced flows on downstream lakes and streams while water is being diverted away from Kennady Lake when it is being prepared for construction and through the operating period, and when Kennady Lake is being refilled; and
- the possibility that the Project will release substances into downstream lakes and streams that may affect fish and other aquatic life.

In addition, dykes will be built that will isolate parts of Kennady Lake where active mining is occurring from inflows from upstream lakes. This will divert water into different lakes which could affect water levels, as well as isolate fish populations that move between lakes.

These effects and how the Project will minimize them are discussed in the next few sections.

High Flows

Flows into the watersheds immediately downstream of Kennady Lake will be increased when water is pumped from Kennady Lake. When the lake is being dewatered, flows will be held at the natural high flow at the outlet of the lake for the whole summer. These higher flows will directly affect the lakes and streams downstream of Kennady Lake (the interlakes).

These higher flows in downstream streams will not be strong enough to change the habitat downstream of Kennady Lake or affect the fish that use these streams for spawning and rearing. Because the rise and fall of stream levels will be gradual when the pumping is started or stopped, fish will not be either flushed out, or stranded.

Pumping will also affect Lake N11, which will receive water pumped out of Kennady Lake. The volume of water pumped into Lake N11 will be controlled so that stream flows downstream of Lake N11 are within levels that would naturally occur about once every two years. This will prevent erosion of streams downstream of Lake N11, and will result in only very small changes in downstream lakes. The changes to water flows will likely have only a minor, or no effect, on Arctic grayling in a the streams closest to Lake N11. The higher summer flows may provide more opportunity for fish to move upstream, but this is not expected to have a negative effect on fish populations. Stream flow out of Lake N11 will change gradually when the pumping begins or shuts down, which will prevent fish from being flushed or stranded.

Changes in streamflows and water levels will not be noticeable by the time they reach Kirk Lake because they will be small compared to water flowing from other streams and lakes.

Low Flows

The total annual outflow from the natural outlet of Kennady Lake during operations and closure will decrease to about 32% and 26%, respectively, of the outflow prior to the Project. Even so, flows downstream of Kennady Lake will continue to permit adult Arctic grayling to access spawning habitat in streams, but likely not every year, or for shorter periods within spawning years, when compared to natural conditions. A mitigation plan is being developed that would result in more water flow downstream of Kennady during the active mine life on a regular basis to allow Arctic grayling to access spawning areas during operations and closure.

During the operations and closure period, water flows downstream of Kennady Lake will be reduced for a period of about 20 years while surface water is being captured to refill Kennady Lake and water is being pumped from Lake N11 into Kennady Lake. The amount of water that will be diverted from Lake N11 is based on criteria that have been designed to minimize potential effects to Lake N11 and lakes and streams downstream of Lake N11. It could take 27 years to refill Kennady Lake without pumping water from Lake N11.

Pumping water from Lake N11 into Kennady Lake will reduce flows in the stream that flows out of Lake N11, but the change is small and is not expected to have a measurable effect to fish populations upstream or downstream of the lake itself.

Water levels of lakes located downstream of Kennady Lake will also be affected by reduced flows during operations and closure, but the changes are predicted to be small. The effect of water level changes in these lakes to fish habitat is expected to be minor. The mitigation plan being developed to provide more water flowing out of Kennady Lake to support Arctic grayling spawning downstream will also benefit lake levels and result in lake habitat similar to natural conditions.

Downstream effects during closure will extend at most to the inflow to Lake 410 because Kennady Lake represents a small proportion of the total runoff to Lake 410. As a result, the effects on stream flows downstream of Lake 410 during the refill period are expected to be negligible.

Upstream Effects of Water Diversion

Dykes will be built to prevent runoff from upstream lakes and streams from entering Kennady Lake during Project construction and operations. This will result in some changes to how water flows between the small lakes and streams near Kennady Lake. This may result in local changes to fish habitat as water levels are increased in some waterbodies, and decreased in others. To prevent fish in upstream watersheds that are blocked from Kennady Lake from being isolated in areas they cannot overwinter, access for fish migration will be provided along natural or modified flow paths to allow fish movement into other lakes through new channels.

Downstream Water Quality and Aquatic Health

Pumping water from Kennady Lake into Lake N11 is expected to have little effect on water quality in Lake N11 and in downstream waterbodies. To begin with, the water in Kennady Lake will be clear, but as the water levels in Kennady Lake drop it will start to pick up lake bottom sediment. At that point, the water will be pumped into the Water Management Pond and not released into Lake N11 until the sediment settles out.

There will be some effects on water quality in the downstream waterbodies from the Project construction and operations. There may also be a slight increase in minerals. This change will be quite small because groundwater from the pits, which contains high levels of total dissolved solids, will not be directly released

downstream. There will be marginal increases in trace metals, and concentrations of cadmium may be higher than the water quality guideline established to protect aquatic life, but still below the drinking water quality guideline.

After closure, water flowing from Kennady Lake to downstream lakes and streams will have a higher concentration of phosphorus than before the Project. The streams may be more productive from the increased nutrients, which may increase the size and numbers of fish.

Long-term Effects on Downstream Aquatic Environment

After refilling of Kennady Lake, hydrology in downstream surface waters are expected to return to close to pre-development conditions. Changes to water quality are expected and may result in more productivity. After the lake is refilled and the dykes are removed, flow from Kennady Lake will be slightly higher than before the Project; the annual outflow will be about 3% higher than existing baseline outflow. This occurs because of the reductions in the size of Kennady Lake and the amount of run-off from an increased area of land flowing into Kennady Lake.

The quality of water in Kennady Lake, released from Kennady Lake to Lake N11 and in the downstream waterbodies will be monitored to verify predictions and to identify any unforeseen events that may need to be dealt with through adaptive management.

SOCIO-ECONOMIC EFFECTS

LONG-TERM SOCIAL, CULTURAL AND ECONOMIC EFFECTS

Jobs and Income

Over the past decade, the Northwest Territories economy has been driven by non-renewable resource development, including diamond mining. Recent changes in demographics, and growth in construction, manufacturing (diamonds), transportation, retail, and many public services can be attributed to the expansion in diamond mining and mineral exploration.

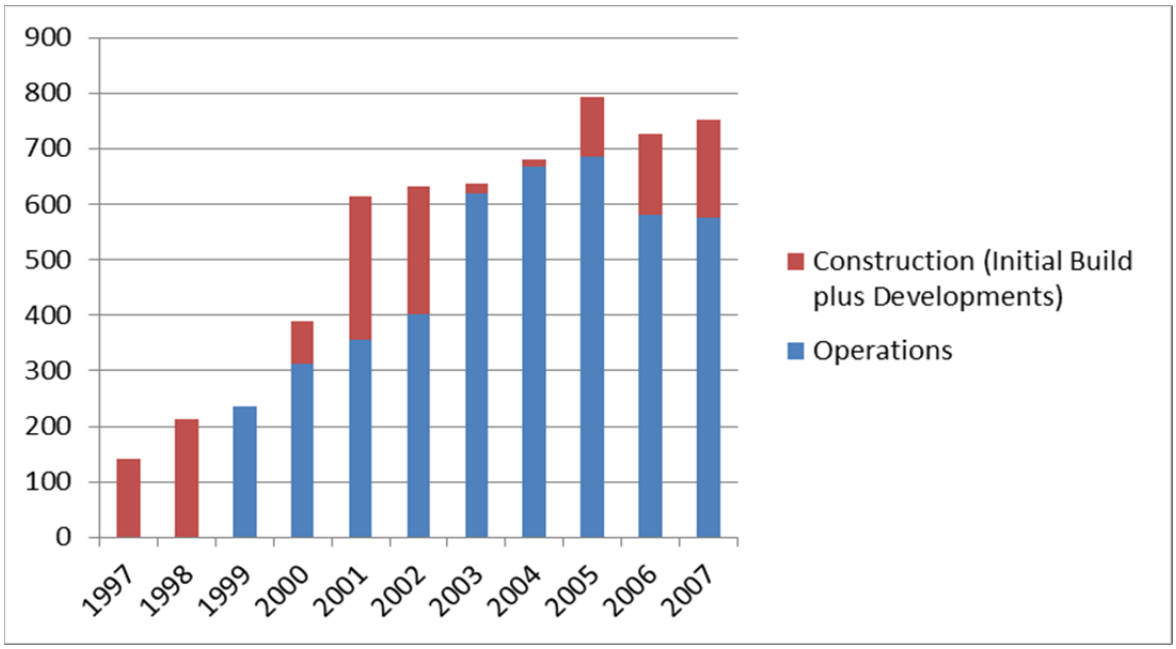
The unemployment rate in the Northwest Territories has declined from 14% in 1999 to a low of 5% from 2005 to 2007. By May 2010, the Northwest Territories unemployment rate had increased to 7.3%, which was still below the Canadian levels of 8.3%.

The communities most linked with diamond mining are also transforming. The middle class is increasing, as more household incomes annually exceed $30,000 and a growing number of household incomes surpass $60,000 annually.

The employment rate of male and female workers has been roughly consistent in recent years. Overall, the employment rate discrepancy between males and females has declined, from about a 9% difference in 1989 to under 3% in 2009. In 2009, the employment rate was 68% and 65%, for males and females, respectively.

The diamond mines have had a substantial influence on Aboriginal employment. At its peak, the Northwest Territories diamond industry brought almost 800 person-years of employment to Aboriginal people.

Aboriginal Employment at the Northwest Territories Diamond Mines, 1997 to 2007



De Beers expects the construction workforce for the Project will be about 400 Full Time Equivalents (FTEs; one FTE is the number of hours worked that add up to one full-time employee) in the first year of site construction, growing to 690 FTEs in the second year. Direct employment will drop to about 372 FTEs during the 11 years of operation. The number of positions filled by Northwest Territories residents will depend on market conditions, which are expected to change over the life of the mine.

The Project is expected to have a positive influence on employment through the next two decades; and therefore, will reduce the rate of unemployment.

Labour Supply

The Project comes at a time when the operations of existing mining operations at other diamond mines will begin to slow down. For some people, the Project will extend current employment and income opportunities for over 15 years.

The Project is not likely to result in changes to in-migration patterns. Rather, it will likely employ residents who might otherwise migrate outside of the Northwest Territories after the other mines close.

Inflation

The cost of living is high in the Northwest Territories, so there is particular concern that the addition of a new project could drive inflation. However, it is unlikely that the Project will cause this effect. Over the past decade, while the previous diamond mining operations were in operation, the rate of inflation in the Northwest Territories actually lagged behind the rate of inflation in the rest of Canada.

Local Business

The effect of the Project on the Northwest Territories business sector is linked to whether these existing businesses have the capacity to service another mine, or respond to increases in expenditures made by people employed at the mine. In the past decade, Northwest Territories businesses have established operations that can accommodate new business opportunities. Businesses do not anticipate having any issues with gaining and retaining employees as they draw on a different part of the labour force compared to the mining industry and require a different set of skills.

Government Revenues

The Project has the potential to stimulate considerable economic activity in the Northwest Territories. Government revenues will benefit from both direct and indirect taxes. During the construction phase, taxes paid directly in the Northwest Territories will be approximately $19.3 million, about $9.6 million per year. Indirect revenues will amount to $3.4 billion or about $1.7 billion per year.

Revenues during the operations phase are even greater. Over the life of the operating mine an estimated $792 million or an annual average of $72 million will be paid in the Northwest Territories by businesses and individuals benefitting from the project. Indirect taxes on production, less any subsidies paid out, will total $4.8 million collected from activities within the Northwest Territories.

FAMILY AND COMMUNITY COHESION

During environmental assessment scoping sessions, the people present expressed the concern that the Project would impact family and community cohesion. Cohesion is the act of working together, sharing values and challenges, and developing a mutual sense of trust and reciprocity among community members.

The rotational work schedule was identified as a potential issue for family and community cohesion. The rotational work schedule for Project operations will bring workers to the site for two weeks, then return them to home communities for two weeks. This is the same rotation pattern that has been used by the diamond mines since 1998. In government surveys, employees of existing mines have indicated that they have adjusted to the rotation and that participation in the wage economy has allowed them to pursue activities on the land such as hunting and fishing, which they might not have been able to do without wage employment. A similar result can be expected for employees at the Project.

By all standard measures, family and community cohesion is improving. Income is increasing; economic security is improving, divorce is unchanged or declining, participation in traditional harvests by mine employees is possibly greater than by those not employed by the mines, and there is improved access to traditional language education in schools. The Project can be expected to contribute to these successes in the same manner as the existing diamond mines.

The communities in the local study area are showing improvement in many indicators that have been used to measure cohesion. Overall, the findings of the assessment indicate that the residual impact from the Project on family and community cohesion is predicted to be not significant.

SOCIAL DISPARITY WITHIN AND BETWEEN COMMUNITIES

Social disparity – the situation where there is a distinction between those who “have” and those who “have not” – is a concern in communities throughout Canada.

In the Northwest Territories, there has been a considerable distribution of the benefits of diamond mining across communities, albeit not all have benefitted equally. The real challenge is to identify what prevents some communities from participating fully in the emerging economy, including increased employment

opportunities. Those that have benefited the least are those with still less than high school completion.

Mining projects have reduced community disparity through the employment of people who previously might have been difficult to employ. The notable barrier to employment for many individuals is the requirement to having achieved an academic level of Grade 12. The current Northwest Territories economy has created a productive role for people with limited formal skills and/or education. It has also brought employment to people living in small and remote communities without any active market in which they might generate economic activity on their own. The social problems between and within communities are rooted, in part, in the disparity of participation in the wage economy.

MONITORING AND FOLLOW-UP

Once the necessary permits and licences are issued and construction of the Project commences, a number of inspection and monitoring programs will be implemented.

Compliance inspection will verify that Project components are built to approved design standards and that environmental design features and mitigation are incorporated. As each component of the Project is built, constructed features will be inspected to show that they comply with standard protocols, and that any variance from standard protocols has been completed with regulatory permission (as appropriate). Compliance monitoring will extend throughout the life of the Project.

Follow-up monitoring activities are expected to include water sampling in and around the Project site to confirm the accuracy of the predictions used to complete the effects assessment.

Environmental monitoring programs will include a Surveillance Network Program (SNP) that focuses primarily on the active mine area and broader site as well as a more broadly focused Aquatic Effects Monitoring Program (AEMP). The scope of these programs will be developed in consultation with regulators and interested parties. It is anticipated that the AEMP will include water flow, water quality and sediment quality components, along with components focused on algae and aquatic invertebrates communities, fish, and fish habitat.

The scope of the AEMP is expected to change over the life of the Project. In particular, monitoring in surrounding watersheds as part of the downstream monitoring program is expected to decline when operations cease.

The assessment of data and information collected during the monitoring programs will be compiled into annual aquatics monitoring reports that will be submitted to the Mackenzie Valley Land and Water Board for review by the appropriate parties.