Rio Tinto

Diavik Diamond Mine Fact Book

The Diavik Diamond Mine

Diavik, Canada's largest diamond mine is located 300 kilometres northeast of Yellowknife, capital of Canada's Northwest Territories.

The world-class mine is operated by Diavik Diamond Mines Inc., part of the Rio Tinto group of companies. Rio Tinto is one of the world's leading mining and exploration companies.

Diavik's reserves are contained in three diamond ore bodies, called kimberlite pipes. The pipes, A154 North, A154 South, and A418, are small compared to the world average, but contain a higher than average content of attractive, high quality, and readily marketable diamonds.

All three pipes were located beneath the waters of Lac de Gras, just offshore of East Island.

After a successful commissioning, and construction on budget and several months ahead of schedule, the Diavik Diamond Mine commenced production in 2003. In November 2008, Diavik's production surpassed 50 million carats of rough diamonds.

Total mine life remains 16 to 22 years, as projected in the 1999 feasibility studies.

Since the 1990s, the mine plan has included open-pit and underground mining methods. In 2007, the major underground mine construction funding was announced by owners Rio Tinto and Harry Winston Diamond Corp. Diavik's future is underground and this phase of the mine, due to begin in 2009, secures Diavik's future to beyond 2020.

To open-pit mine the ore bodies, Diavik has constructed two dikes to allow the overlying waters to be removed temporarily. The first dike, which encircles the A154 North and A154 South pipes, was completed in 2002. Also in 2002, virtually all the physical plant was completed.

All the physical plant is located on East Island and includes a kimberlite processing plant, accommodation complex, maintenance shop, diesel fuel storage tanks, boiler house, sewage treatment plant, water treatment plant, and power house. Elevated arctic corridors carry services and provide enclosed walkways connecting buildings.

The second dike, the A418 dike, which encircles the A418 pipe, was completed in 2007. In 2008, work crews continued to prepare the new A418 pit, with the first A418 ore being mined mid-year.

Also in 2008, construction of the underground mine and related surface works was well advanced.

Remote location

The Diavik Diamond Mine is located on a 20 square kilometre island in Lac de Gras, approximately 300 kilometres by air northeast of Yellowknife, the capital of Canada's Northwest Territories. The area is remote, and major freight must be trucked over a seasonal winter road from Yellowknife. Worker access is by aircraft to Diavik's private airstrip.

Latitude: 64° 30' 41"
Longitude: 110° 17' 23"
Elevation: 416 metres above sea level

The Diavik Diamond Mine is located:
- 100 km north of the Treeline
- 210 km south of Arctic Circle
- 350 km south of Arctic Ocean
- 2,850 km south of the North Pole

Quick facts

- Reserves – 21.9 million tonnes at 3.5 carats/tonne (Rio Tinto 2007 Annual Report)
- Three ore bodies – A154 South, A154 North, and A418
- Ore production – approximately 2 million tonnes annually
- 2008 diamond production – approximately 9 million carats
- Total mine life – 16 to 22 years (currently in year 7)
- Total operations and construction spending 2003 through 2008 – approximately C $4 billion (73% northern)
- Total employment – approximately 800 (67% northern)
- Mine footprint – 9 square kilometres

Mine ownership

The Diavik Diamond Mine is an unincorporated joint venture between Diavik Diamond Mines Inc. (60%) and Harry Winston Diamond Mines Ltd. (40%). Both companies are headquartered in Yellowknife, Canada. Diavik Diamond Mines Inc. is a wholly-owned subsidiary of Rio Tinto plc of London, England, and Harry Winston Diamond Mines Ltd. is wholly-owned by Harry Winston Diamond Corporation of Toronto, Canada.

Milestones and recognitions

1991-1992	Aber stakes mineral claims.
Mar. 1992	Exploration begins.
June 1992	Aber Resources forms joint venture with Rio Tinto company Kennecott Canada Exploration.
1994-1995	Pipes A21, A154 South, A154 North and A418 are discovered.
Feb. 1996	75-person exploration camp is erected on site to conduct underground bulk sampling.
July 1996	5,900 metric tonne bulk sampling of A418 and A154 South pipes is completed.
Dec. 1996	Diavik Diamond Mines Inc. is created, with head office in Yellowknife.
Mar. 1997	Bulk sample is transported over the winter road to Yellowknife for processing. Approximately 21,000 carats of diamonds are recovered.
June 1997	Environmental baseline studies are completed.
Sept. 1997	Pre-feasibility study is completed.
Mar. 1998	Project description is submitted to federal government triggering formal environmental assessment review under the Canadian Environmental Assessment Act.
Sept. 1998	Environmental Assessment Report is submitted and Comprehensive Public Involvement Plan initiated.
Nov. 1999	Federal government approves project for permitting and licensing.
Dec. 2000	Regulatory and investor approvals to build the mine.
July 2002	A154 dike complete and dewatering commences.
Nov. 2002	Construction team reaches 1 million safe hours.
Dec. 2002	Mine construction virtually complete.
Jan. 2003	Start of diamond production.
May 2003	1.9 million hours without a lost time injury.
May 2003	A154 dike receives NAPEGG Professional Engineering Award of Merit.
May 2003	A154 dike receives Canadian Council of Professional Engineers' National Award.
July 2003	Diavik Diamond Mine official opening ceremony.
May 2004	1st John T. Ryan safety award.
Jan. 2005	Progressive Aboriginal Relations Gold designation.
Jan. 2005	Environmental Management System and Product Splitting Facility achieve international ISO certifications.
Mar. 2005	PDAC E3 award.
May 2005	2nd John T. Ryan safety award.
June 2005	NAPEGG civic award.
Sept 2005	Conference Board of Canada workplace literacy award.
Jan. 2006	Spending with Aboriginal business surpasses $1 billion.
Jan. 2007	A418 dike complete.
April 2007	Arctic Energy Alliance 2006 energy efficiency award.
Sept. 2007	MAC community outreach, processed kimberlite management and crisis management planning recognition.
Sept. 2007	Water licence renewal federally approved after Wek'eezhii Land and Water Board recommendation.
Nov. 2007	Rio Tinto and Harry Winston (formerly Aber) announce major underground mine construction funding.
April 2008	3rd John T. Ryan safety award.
June 2008	First A418 ore mined and processed.
Nov. 2008	Diamond production surpasses 50 million carats.

Diavik's future lies underground

Diavik is at a major milestone in its mine life. Between now and 2012, we will change from an open-pit mine to an all underground mine.

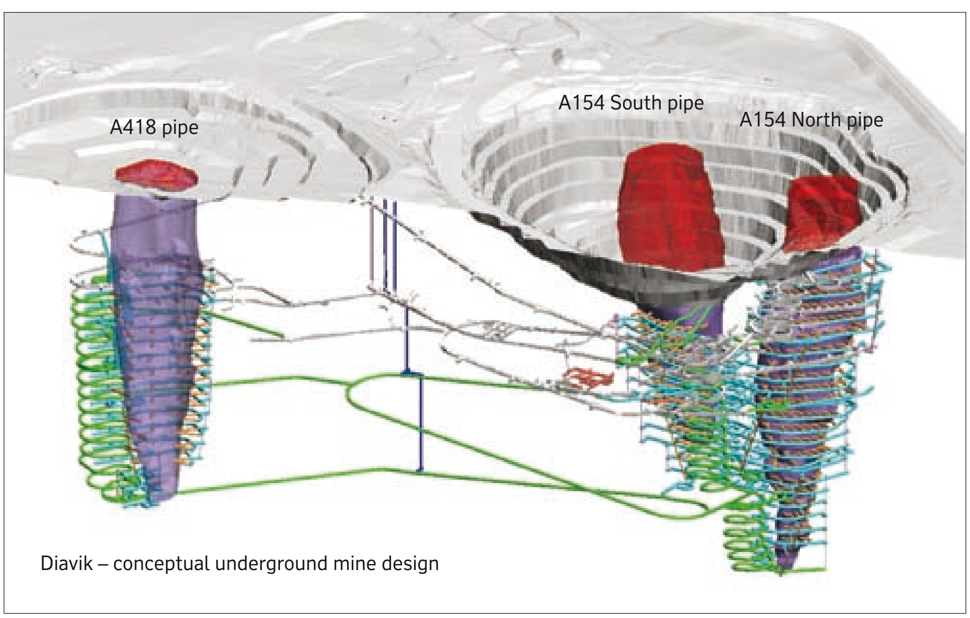
A significant investment of nearly US $800 million by our owners, Rio Tinto and Harry Winston Diamond Corporation, to build the underground mine, shows the confidence in our continued success.

Throughout the transition, safety will continue to be our highest value. We will also maintain our high standards of environmental protection and our commitment to create significant local socio-economic benefits. These commitments will not change.

However, we will need to change our business for a different kind of mining. This essentially new business will require different mining methods, skills, equipment, and additional supporting infrastructure. For a short time, we will operate our open-pit and underground mines concurrently.

By making this transition to underground, we are doing what we have always said we would do. Going underground assures our future and means we will deliver a mine life of 16 to 22 years – the mine life we projected back in the 1990s, before construction began.

Working hard to create a smooth and efficient transition will guarantee our continued success as a leading Canadian mining operation.



Diavik – conceptual underground mine design

Diavik's open-pit and underground mining operations will differ greatly. Top are Diavik's two operating open pits with the two dikes allowing access to the three kimberlite ore bodies. Left, is a computer generated illustration showing the development needed to underground mine the pipes. Clearly, the underground mine design is very complex, requiring many kilometres of tunnels and significant support infrastructure.

- mined ore
- remaining ore
- ramps constructed
- future development

Our business will need to change

Going underground will affect every part of what we do at Diavik.

Our underground mining work will be more complex than our open-pit mining.

To prepare for underground mining we need to construct approximately 20 kilometres of tunnels. With the tunnels, rescue bays, washrooms, ventilation systems, repair shops, raises (vertical tunnels) for ventilation and water removal, and storage areas will also need constructing.

On surface we will need to construct new crusher and paste backfill plants. We must also double our water treatment plant capacity, and add accommodations and a mine dry building which includes change rooms.

To support mining, we will also heat and blow fresh ventilation air underground. We will make paste backfill by grinding rock and mixing it with cement to fill in mined out areas. This means we will need to double our electrical power capacity.

More fuel and cement will need to be purchased and stored, and our ice road shipments will increase as we transport the additional supplies required.

Another change is the fact that mining underground will require that we move significantly less waste rock than in open-pit mining.

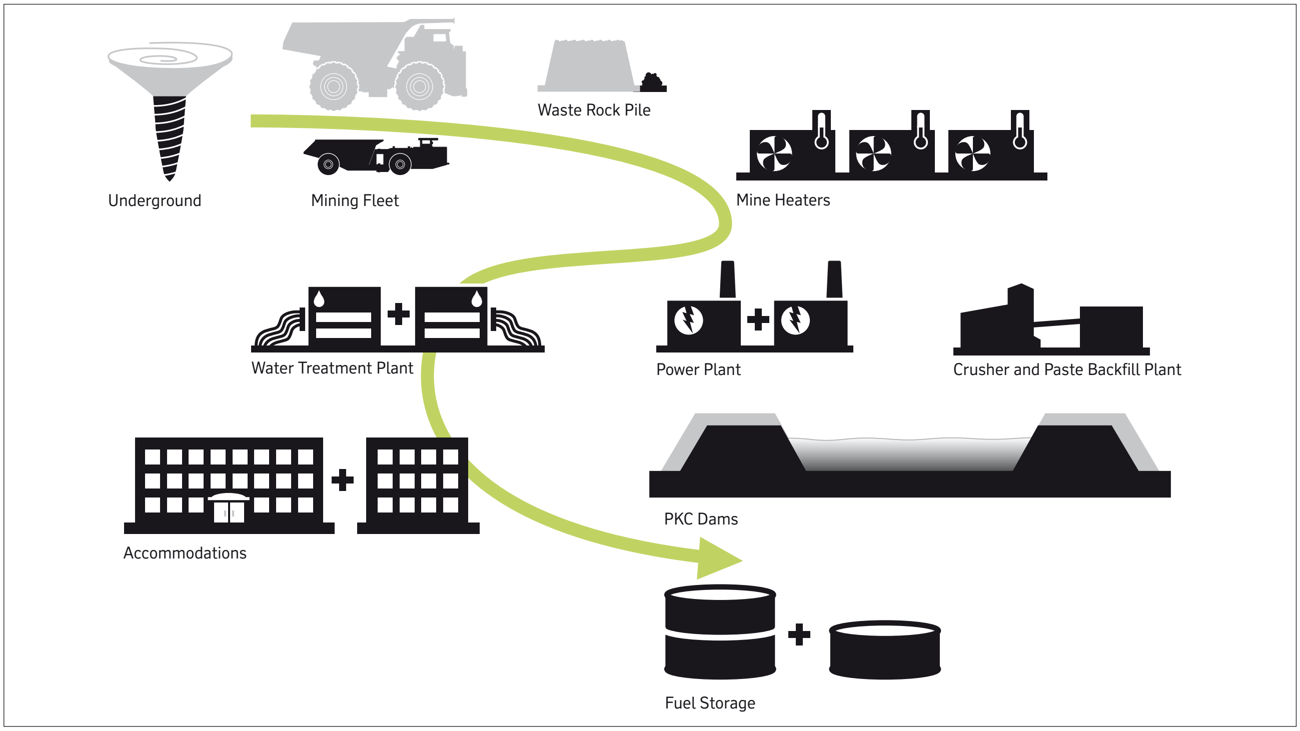
Clearly, underground mining costs more. Combine this with lower annual diamond production and it means we must find new and different ways to work smart and efficiently. Doing so will mean continued success.

To underground mine the ore, scheduled to begin in 2009, Diavik will need to construct several kilometres of tunnels such as the one pictured above. With the underground workings, surface works, including one of the world's most complex paste plants, top, will be required. Centre is the mine's new power house expansion, which will double electrical power generating capacity. Heat recovery units double the efficiency of the diesel gensets.

Underground means changes

For the transition from open-pit to underground mining we will:

- Need several dozen pieces of new mining equipment
- Be moving primarily ore and virtually no waste rock
- Require heaters to warm the fresh air we pump underground
- Build crusher and paste backfill plants
- Increase our power plant
- Double water treatment capacity
- Add accommodations for short-term needs when we will be operating both open-pit and underground mines
- Raise the processed kimberlite containment dam to increase capacity
- Increase our fuel storage capacity



Safest methods more complex

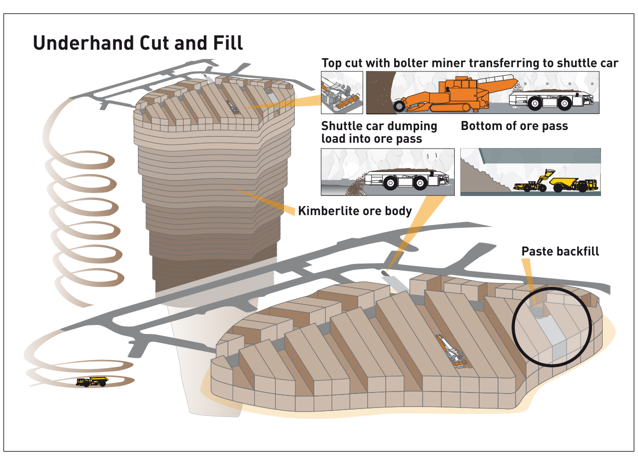
At Diavik, we want to make sure we mine our kimberlite ore the safest way we can.

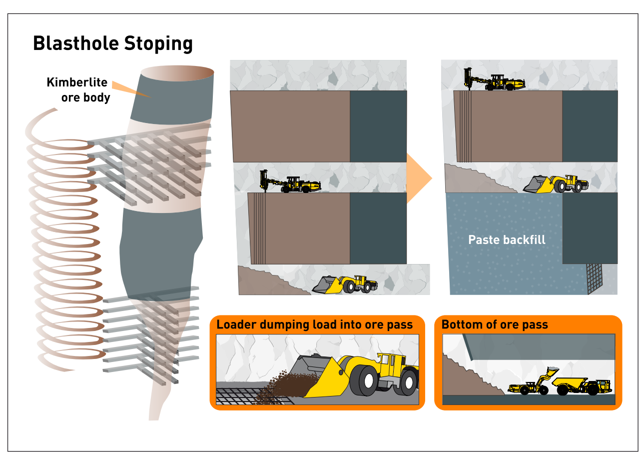
Our engineers have studied the ore bodies and surrounding rock and have chosen the safest and best methods for the conditions and challenges we face.

Two different underground mining methods known as underhand cut and fill, and blasthole stoping will be used.

For the cut and fill method we will use mining machines that remove the ore in long panels. In blasthole stoping, drills and explosives will be used to break down the ore in taller panels.

In both methods, the ore will then be transported to a vertical tunnel, or ore pass, from where it will be loaded into haul trucks which transport it to surface. Mined out areas, the cuts or tunnels, and the voids known as stopes, will be backfilled with cemented paste or crushed waste rock.





Regional environment

The gently rolling tundra surrounding the Diavik Diamond Mine, commonly called the Barren Lands because of its lack of trees, consists of numerous lakes, bedrock outcrops, glacially deposited boulder fields, till, and eskers. There is very little soil and the area is within the continuous permafrost zone.

Over 80 bird species, among them raptors, shorebirds, seabirds and waterfowl, visit the region in summer. There are 16 mammal species, including grizzly bear, wolf, caribou, fox, and wolverine.

Vegetation cover in the region is typical of the Barren Lands and includes dwarf birch, northern Labrador tea, blueberry and mountain cranberry species, with willow, sphagnum moss, and sedge tussocks dominating the low-lying wet areas.

Winter road
Key to operating a mine in Canada's remote wilderness is a private ice road, open for approximately 10 weeks each winter. In operation for over 25 years, the 600 kilometre long seasonal road is constructed annually for essential resupply. Seventy per cent of the road is ice, built over frozen lakes.

Travel time for the 353 kilometres to Diavik can be 19 hours for heavy loads, with speeds and frequency of trucks carefully controlled to protect the ice.

In 2008, Diavik shipped 4,174 loads north (8,366 all users) and backhauled 100 loads.

Officially called the Tibbitt to Contwoyto Winter Road, it is a joint venture managed by Diavik Diamond Mines Inc. and BHP Billiton Diamonds Inc.

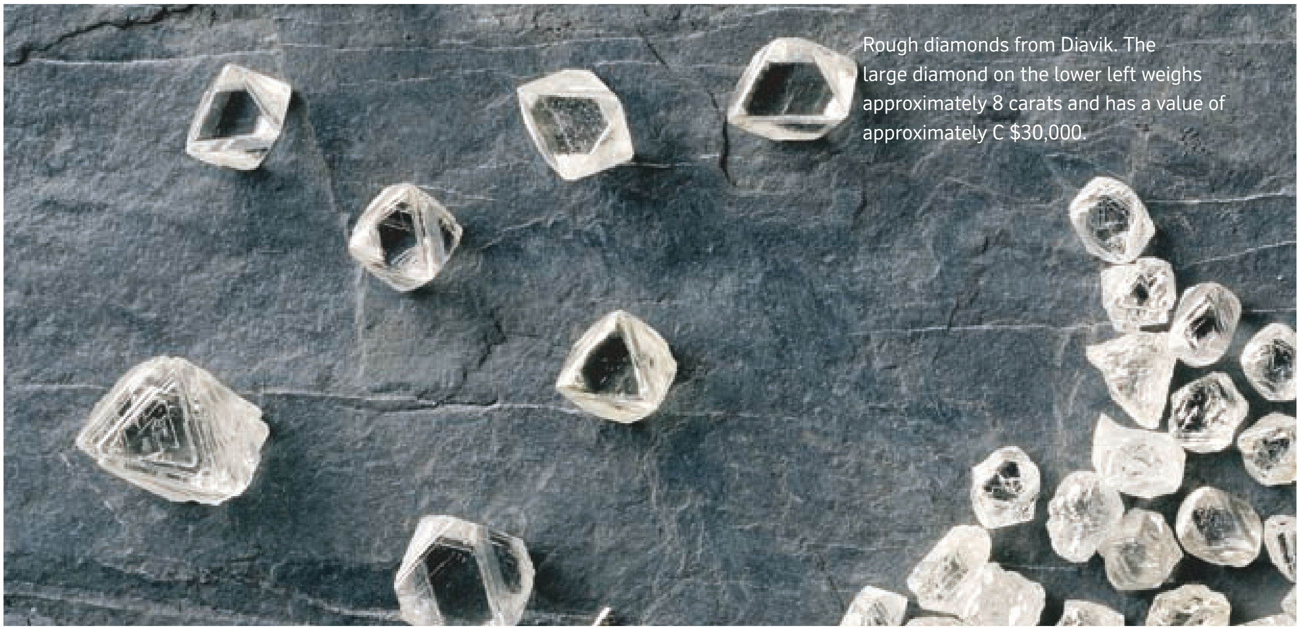
Climate
Temperatures at the Diavik Diamond Mine are cool, with an average temperature in July of 10° C and -31° C in January. Average wind speeds are about 20 kilometres per hour, with many calm days. As the area receives less than 300 millimetres of precipitation annually (most of it from winter snow), it can be considered to be semi-desert.

There are major changes in daylight hours from 22 hours in June to two hours in December.

	Sunrise	Sunset
March 20	07:30	19:30 – Spring Equinox
June 21	01:38	23:08 – Summer Solstice
September 20	06:12	18:12 – Autumn Equinox
December 21	11:22	13:52 – Winter Solstice

The winter road – the world's longest 'school zone' – is constructed, operated, and monitored in a safe and environmentally responsible manner. To build thickness, work crews flood the ice surface.

World-class diamonds



Rough diamonds from Diavik. The large diamond on the lower left weighs approximately 8 carats and has a value of approximately C $30,000.

Marketing

Diavik diamonds offer a commercially desirable range of good colour, gem quality, rough diamonds.

Most of the value of the production lies in white stones of one carat and larger, of good commercial clarity and shape. The breadth of Diavik's product profile means that most of the world's established diamond polishing centres would be interested in receiving a share of Diavik diamonds.

Under the Diavik joint venture agreement, each partner retains the right to receive and market its share of all diamonds produced. Diavik Diamond Mines Inc.'s 60 per cent share of diamonds are marketed through sister company Rio Tinto Diamonds in Antwerp, Belgium. Harry Winston markets a substantial portion of its 40 per cent share of diamonds to the global rough diamond market through subsidiaries located internationally.

Exploration

Using numerous exploration methods, Diavik continues to explore its large claim block in search of new potential targets for further study.

The 2008 exploration program was marked by increased activity, with the primary focus on drill sampling and delineating some older kimberlite discoveries. A total of 15 different bodies were drill tested up to a distance of 50 kms from the Diavik mine site.

Additionally, over 7,100 metres of diamond drill core was collected and 10,257 line-kilometres of airborne magnetics and electromagnetics were flown. Detailed ground geophysics were collected over targets in both the winter/spring and summer seasons, and during further ground follow-up work, approximately 350 till samples were collected.

In 2008, two new kimberlites were discovered, bringing the property total to 70.

Geology

Diavik's ore bodies are called kimberlite pipes, the roots of relatively young volcanoes dated at approximately 55 million years old. The surrounding host rocks are ancient Precambrian granites and metamorphosed sedimentary rocks that are approximately 2.7 billion years old.

Diavik uses airborne geophysics to collect electromagnetic and magnetic data in the search for new kimberlite bodies.

Mine infrastructure

Process plant
Three modules make up the Diavik process plant – a small run-of-mine building, connected to the main Dense Medium Separation (DMS) plant, which connects to a smaller recovery building that removes the diamonds from the host kimberlite rock. The process plant is one of the largest buildings in the North, standing 35 metres high (11 stories), 40 metres wide, and 152 metres long.

Ore processing
Diavik processes up to 2 million tonnes of ore annually. Diamond ore processing does not require chemicals to separate the diamonds from the kimberlite host rock. Rather, processing uses gravity-based methods, which rely on the diamonds' heavier weight to separate them from much of the waste kimberlite.

The diamond-bearing kimberlite ore is trucked to a storage area outside of the process plant.

A primary sizer reduces the ore before it enters the process plant. There it is mixed with water and crushed to less than 30 millimetres. The ore is then conveyed to the dense medium separation circuit where a fine grained, heavy and magnetic ferro-silicon (FeSi) sand is added to the crushed ore and water mixture. The FeSi magnifies the gravity effect and enhances diamond and other heavy mineral separation. A large magnet recovers the FeSi, which is recycled. Water is also recycled.

The less dense waste kimberlite fraction is directed to the Processed Kimberlite Containment (PKC) area for permanent storage. The heavy mineral concentrate (containing diamonds, garnet, diopside, olivine, and spinel) is conveyed to the recovery circuit.

In the recovery building, the diamonds are separated from the waste heavy minerals using X-rays to trigger a unique characteristic of diamonds. Diamonds glow under this kind of light, and photo-electric sensors direct strategically placed air blasts to blow the diamonds off the conveyor belt into diamond collection receptacles. Waste minerals are reprocessed and directed to the PKC. The diamonds are then shipped to the Diavik product splitting facility in Yellowknife where they are cleaned using chemicals, divided 60/40 between the joint venture partners, and undergo evaluation for government royalty purposes.

Processed kimberlite containment
Despite being a high grade deposit, the diamonds represent approximately one part per million of the host kimberlite rock. Once this small fraction of diamonds is removed, the remaining kimberlite is placed in the Processed Kimberlite Containment area (PKC). Constructed in a natural valley in the centre of East Island, the PKC is bounded by dams. At the completion of mining, this PKC area will be approximately 1 kilometre long and 1.3 kilometres wide, and contain up to 40 metres of processed kimberlite. The PKC will be covered with waste rock to seal it safely forever.

Accommodations
The permanent accommodation complex was built in several stages. The dormitory units were prefabricated in Alberta as a training program under a northern Aboriginal joint venture. A total of 156 modules were constructed and trucked to site, where they were placed into the four wings. Each wing has three floors. Each floor has a laundry facility. Rooms contain a single bed, a desk and chair, closet space, cable TV, telephone, Internet, and bathroom. Each room is single occupancy and, for workers on two week rotations, is shared with an employee on shift rotation. In June 2004, a 69-room expansion was completed, bringing accommodation capacity to 330. The accommodations core complex was built on site under a separate northern contract. It houses security offices, cafeteria, and recreational facilities, including a gymnasium with running track, and a squash court.

Administration/maintenance complex

The Administration/Maintenance complex includes offices for Diavik staff as well as warehouse space. This building is 25 metres high, 127 metres long, and 60 metres wide, and is complete with 10 bays and in-floor heating. The height of the building allows Diavik's large haul trucks to raise their boxes for maintenance.

Fuel tanks

There are six 18 million-litre diesel fuel tanks at the Diavik site, which provide fuel for mobile equipment, for diesel power generators, and for heating.

Power plant

The power plant building houses five Caterpillar 3616 diesel engines coupled to generators, each capable of producing 4.4 megawatts, and four Caterpillar 3512s, each capable of producing 1.25 megawatts. Three of the larger engines will run at any one time, with one held in reserve and one on maintenance. Waste heat is recovered and is used to heat Diavik's plant site buildings, raising the total energy efficiency of the power system to over 80 per cent. In 2006, work commenced on increasing power generation capacity for the coming underground work. The new power plant houses four new generators, with space for two more.

Boiler plant

The boiler plant houses three Cleaver Brooks firetube boilers, each rated at 7,000 kilowatts. The boilers are held in reserve and, when needed, supply additional heat. The boilers use a 60:40 glycol/water mix, which is pumped through the system at a rate of 84 litres per second. The temperature of the glycol mix leaving the plant is 90° C and it returns at 70° C.

Airstrip

At 1,600 metres long, the airstrip is capable of accepting Boeing 737 jet service and Hercules transport aircraft. A host of smaller aircraft bring freight and workers to and from a number of northern communities.

Arctic corridors

Twenty prefabricated metal modules are connected to link the major buildings. These arctic corridors carry all utilities, including drinking and heating water, a separate water sprinkler line, sewage, power, and communications. The corridors also provide heated, well-lit walkways for workers going to and from work at the plant site.

Below, Diavik's Terex shovel loads a haul truck in the mine's open pit. The 520 tonne shovel was cut into pieces and helicoptered to site as part of Diavik's 2006 airlift program after the mild winter resulted in an abbreviated ice road season. Right, elevated walkways, known as arctic corridors, connect all major buildings.

Underground at Diavik a bolter operator attaches screen in one of the tunnels.

Drinking water

Drinking water is pumped from Lac de Gras and is treated with chlorine.

Sewage treatment

Diavik constructed a state-of-the-art sewage treatment facility to treat domestic sewage. This treatment plant utilizes advanced biological treatment as well as an alum and filtration system to remove phosphorus.

Electrical system

Power is carried throughout the plant site through the arctic corridors and, elsewhere on the site, along lines supported by over 200 telephone poles. Power lines carry 13,800 kV.

Communications system

Voice and data communications at site is conducted with Internet protocol (IP) technology and is connected by satellite to Yellowknife. The telephone system uses Voice over IP and is based on equipment that also supports the data network. Network connections between buildings are through fibre optical cabling, while wiring within each building uses Cat 5e copper cabling for computers and telephones. In 2008, Diavik completed a terrestrial microwave communications system between the mine site and Yellowknife.

Open-pit mining equipment

3 – Drilltech D75EXs
1 – Drilltech D90Ks
1 – Atlas Copco ROC L8
1 – LeTourneau L1400 (20m^3 bucket)
1 – Caterpillar 988
5 – Komatsu WAs
2 – Komatsu PC600s
1 – Terex RH200 (21m^3 bucket)
1 – Hitachi EX 3600 (20m^3 bucket)
1 – Hitachi EX 1900 (12m^3 bucket)
1 – Hitachi 1200
1 – Caterpillar 5130
11 – Komatsu 830E (218 tonnes)
8 – Komatsu HD785 (90 tonnes)
8 – dozers
4 – graders
4 – cranes
1 – packer
1 – float truck

Various other pieces of service equipment, including bobcats and forklifts.

Underground mining equipment

1 – Sandvik AHM105 roadheader
(continuous miner with a rotating cutter head)
1 – Sandvik ABM25 bolter miner
(continuous miner with a rotating drum, also bolts sidewalls)
3 – Phillips shuttle cars
5 – Atlas Copco boom drills
5 – Atlas Copco bolters
1 – Cubex orion drill
1 – Atlas Copco simba drill
7 – Atlas Copco scoop trams
9 – Atlas Copco mine trucks (36 to 60 tons)
8 – Marcotte cassettes
(portable units for explosives, grout, lubes, etc.)
3 – Marcotte cassette carriers
1 – Atlas Copco fuel cassette
26 – Toyota trucks
(personnel carriers, service vehicles)
2 – boom trucks

Various other equipment, including a bobcat, concrete pump, welder/generator, and excavator.

Dikes

Large water retention structures, called dikes, were built to hold back the waters of Lac de Gras so Diavik can safely mine the kimberlite pipes located just off shore of East Island.

For dike construction, three different sizes of rock were required. The lake side of the dike is large, run of quarry size rock. The central part of the dike is 50 millimetre minus. The pit side of the dike is 200 millimetre minus crushed rock.

The water barrier is made up of three components, a flexible concrete cut-off wall, overlapping jetgrout columns (between the base of the cut-off wall and bedrock), and pressure-grouted bedrock underneath the cut-off wall. The massive rock dike provides the strength to support the cut-off wall. A water piping system collects the small amounts of seepage expected.

Within the dike, several hundred sensors measure temperature (thermistors), pressure (piezometers), and movement (inclinometers, extensometers, survey pins). Thermosyphons (refrigeration systems), installed where the dike crosses islands in the lake, keep the permafrost boundary frozen. They operate in passive mode in winter, and are switched to active refrigeration mode in summer.

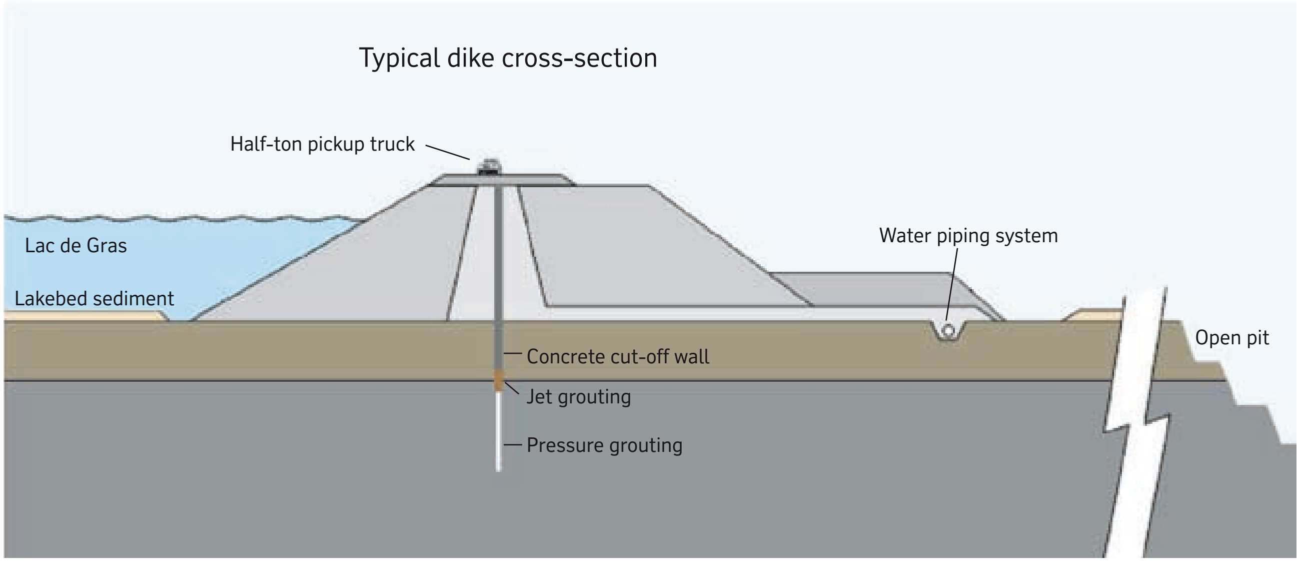
A154 dike

The first water diversion structure, the A154 dike, was made water tight in July 2002.

Draining of the water in the mining area began shortly after, and was completed three months later. Pre-stripping of the lakebed sediment and glacial till began as the water level was lowered.

The A154 dike:
- 3.9 kilometres long
- maximum water depth of 25 metres
- 3.5 million tonnes rockfill

By summer 2008, the A154 pit, upper right, had reached approximately 250 metres below lake level. South of the A154 pit, the new A418 pit takes shape. The A418 dike was completed in January 2007.



In 2006, clean, clear water from within the A418 pool was pumped over the dike into Lac de Gras, left. As the pool lowered, silty water was pumped on land for storage. Silt was then removed in the water treatment plant, with water returned to the lake.

The new A418 dike

The A418 dike, completed in January 2007, joins the existing A154 dike and East Island. Construction methods were the same as those used in the award-winning A154 dike – various sizes of rockfill, a central concrete cut-off-wall, grout, and monitoring instrumentation.

The smaller, 1.3 kilometre long A418 dike required approximately 1.1 million tonnes of rockfill and is built in water up to 32 metres deep. A significant crushing facility prepared much of the rock before placement using rock from the A154 open pit.

The rockfill portion of the dike was completed in 2005, and the dike was made watertight in 2006.

Fish within the embankment were returned to Lac de Gras and silty water was treated prior to return to the lake. Prestripping to prepare the A418 open pit began in late 2006.

During A418 pit development, crews began accessing diluted mud-rich, low-grade A418 ore in mid-2008. In summer 2008, Diavik was mining ore from all three kimberlite pipes.

Environment

Environmental management system

Diavik's key tool in meeting its commitments to protect the environment is its environmental management system, which is designed to:

- manage activities to protect the environment
- ensure employees are properly trained
- anticipate and avoid environmental problems
- ensure regulatory compliance and due diligence
- ensure consistency with corporate environmental policy

The environmental management system is designed to be simple, understandable, easy to implement, and adaptable. It is certified to internationally acknowledged ISO 14001:2004 standard for environmental management systems.

Two key elements of Diavik's environmental management system are protection of caribou and other wildlife, and protection of water and fish habitat.

Diavik's water treatment plant is capable of treating up to 45,000 cubic metres of water per day.

Protecting caribou

A small portion of the Bathurst caribou herd passes through the Lac de Gras region during spring and fall migrations.

To protect caribou migrating near the Diavik Diamond Mine, caribou advisory signs are posted on all haul roads. Caribou, and other wildlife, have the right of way. Diavik's environmental team also conducts routine caribou monitoring.

Protecting water

The Diavik Diamond Mine is built on a large island in Lac de Gras. For thousands of years, rain and snowmelt have annually washed the island into the surrounding lake. To prevent similar washing of the Diavik mine site into the lake, Diavik has constructed a water collection system around the island.

Through a system of sumps, piping, storage ponds, and reservoirs, Diavik collects run-off water, which can be reused in processing or cleaned in the water treatment plant, before being released back into Lac de Gras.

The North Inlet water storage reservoir has a holding capacity of 4 million cubic metres. It is the main repository for all mine water and all spring and rain run-off collected around the island.

The water treatment plant is a key component of Diavik's water management system. The plant treats silty water generated during construction and mining operations as well as run-off water collected at site.

The water treatment plant has successfully cleaned and returned silty water generated during the A154 and A418 dike developments.

Right, as part of water quality monitoring, water samples are collected from Lac de Gras, then filtered to collect suspended solids for testing. Below, part of the Bathurst caribou herd migrates through the Lac de Gras area twice yearly.

Photo courtesy EMAB

Lac de Gras

Lac de Gras was originally called Ekati by local Aboriginal people, who named the lake after the quartz veining in the rock which resembles caribou fat.

The average depth of Lac de Gras is 12 metres, with a maximum depth of 56 metres. As an arctic lake, it is cold year round, with temperatures ranging from 0° C to 4° C in winter and 4° C to 21° C in summer.

Prior to beginning construction of the Diavik Diamond Mine, a variety of surveys of Lac de Gras were performed. Typical of arctic lakes, aquatic productivity in Lac de Gras is low. This is the natural result of relatively low concentrations of nutrients, low light levels during winter months, extended periods of ice cover and low water temperatures.

The water quality is nearly that of distilled water. Lake trout, cisco, round whitefish, arctic grayling, burbot, longnose sucker, and slimy sculpin are among the fish species found in Lac de Gras.

Lac de Gras freezes in October, and spring breakup is in July. The average ice thickness is 1.5 metres.

Temporarily using the water

The outside of the A154 dike has been designed as fish habitat. In addition, during mining operations, Diavik is building fish habitat in the form of rock shoals between the dike toe and the open-pit rim.

Diavik will temporarily use less than 0.5 per cent of the area of Lac de Gras for mining.

On mine closure, the area will be flooded and the dikes will then be breached to return them as islands in Lac de Gras.

Progressive reclamation

By reclaiming throughout the mine life, Diavik will help prepare the site for eventual closure. Contouring country rock piles, to create smooth hills that allow caribou to safely move through the area, is just one example.

Another example is the creation of new fish habitat in Lac de Gras around mining areas. The placing of rock for new fish habitat continues and, as result, there will be no net loss of fish habitat as a result of the mine.

Waste management

To protect the environment and limit contact with animals, Diavik has a thorough and strict waste management program. Waste is separated by type for proper disposal or storage. There are two areas on site, the fenced and gated waste transfer area and the landfill area within the waste rock pile.

In the waste transfer area, food waste and clean materials are incinerated or burned, contaminated soils are managed, and hazardous waste is stored for shipping off site for recycling and disposal. The area is also used for sewage treatment plant solids disposal.

The landfill with the rockpile is a permanent storage area for all inert materials such as scarp metal, plastics, and rubber. Both areas are inspected regularly to ensure proper waste disposal.

Our commitments

Safety is our core value

Diavik's commitment to a safe workplace includes stringent standards, educating workers, reviewing systems and programs, setting continuous improvement targets, and measuring performance.

Diavik's workforce of approximately 800 people achieved an outstanding safety record in 2007 and, as a result, was awarded a prestigious John T. Ryan safety trophy. Diavik has received three John T. Ryan regional safety trophies in its first five years of operation. Diavik's 2007 all incident frequency rate, which includes medical treatments and lost time injuries, was 1.01. The 2007 lost time injury rate was 0.43. For 2008, Diavik's all incident frequency rate and lost time injury rates were 0.98 and 0.49 respectively.

These rates are industry standards based on number of incidents x 200,000 hours ÷ total hours worked. In 2008, Diavik had 11 lost time injuries and 11 medical treatments during 4.5 million hours worked.

At Diavik, a lost time injury is considered to have occurred when a worker is unable to return to his or her normal work duties for their next shift as a result of a work-related injury.

Each year, Diavik's mine rescue team, comprised of members of the Diavik emergency response team, competes in Workers' Safety and Compensation Commission sponsored Mine Rescue Competition.

Diavik's commitments include support of eight to 18 apprentices at the mine. In 2008, there were 19 apprentices working toward their journeyperson accreditations – all northern and approximately half Aboriginal. Since 2003, 14 northerners have achieved journeyperson status at Diavik.

Social and economic goals

Diavik is committed to providing significant training, employment, and business opportunities to the Northwest Territories and the West Kitikmeot region of Nunavut. These commitments have been formalized through the Diavik Socio-economic Monitoring Agreement concluded in 1999, and in individual Participation Agreements concluded with five Aboriginal groups – the Tlicho Government, Yellowknives Dene First Nation, the North Slave Metis Alliance, the Kitikmeot Inuit Association, and the Lutsel K'e Dene First Nation.

During operations, Diavik has committed to 66 per cent northern employment and 40 per cent Aboriginal employment. For 2007, Diavik's total operations workforce averaged 785, of which 524, or 67 per cent, were northern; of these, approximately half (257) were Aboriginal. Diavik is contracting out approximately half of its workforce to local firms, of which the majority are Aboriginal. Diavik has also committed to purchasing 70 per cent of goods and services from northern companies. In 2007, 72 per cent of operations and construction spending was northern.

Early in 2006, Diavik's total spending with local northern Aboriginal business reached a milestone. After just six years, including the mine's three year construction phase and three years of operations, spending with Aboriginal business surpassed $1 billion. Diavik is one of only three Canadian companies to have achieved this milestone.

Total cumulative spending with northern business is approximately $3 billion, or over 70 per cent of total spending for all construction and operations since 2000.

A series of regulatory requirements, as well as an Environmental Agreement between Diavik, Aboriginal groups and federal and territorial governments, concluded in March 2000, formalize Diavik's commitments to protecting the environment.

Diavik formally involves communities in monitoring and in an advisory capacity through the Environmental Monitoring Advisory Board created under the Environmental Agreement, the Diavik Communities Advisory Board under the Socio-economic Monitoring Agreement, and implementation committees under the Participation Agreements.

Photo courtesy EMAB

The Diavik Environmental Monitoring Advisory Board conducts fish palatability studies, and caribou and water monitoring workshops at a seasonal community camp near the mine.

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January 2009