



Guy Quenneville/NL photo

To access the mine's reserves underground, the Diavik Diamond Mine partners constructed approximately 20 km of underground tunnels.

Diavik goes underground

\$800 million investment requires construction of tunnels, new on-site infrastructure

by Guy Quenneville
Northern News Services
NWT

The Diavik Diamond Mine officially began underground commercial production on March 25, thanks to a massive

\$800 million capital investment.

Diavik's owners, Rio Tinto and Harry Winston, first announced plans to go underground in 2007, later hiring Kitikmeot Corp. subsidiary

Kitikmeot Cementation and Mining to conduct the underground construction.

Despite some delays caused by the scaling back of contract staff due to the global economic crisis and a reduced demand for diamonds worldwide, underground construction wrapped up late last year.

"In mid-2009, construction of the underground was well advanced," said Doug Ashbury, spokesperson for Diavik Diamond Mines Inc. (DDMI).

"By mid-2009, as underground mine construction moved nearer to comple-

tion, we began the transition or 'handover' from the construction contractor to DDMI. This handover included transitioning our Diavik underground construction related staff to be included in our operations group," said Ashbury.

While Diavik has no specific numbers on how much of its budget for 2009 went to

completing the underground workings, total capital and operating expenses for the year were \$431.8 million.

"We report operations and construction costs together," said Ashbury. "In total, two-thirds of our total spending

for all our work in 2009, some \$288 million, was Northern."

As the underground mine's price tag suggests, constructing it required a lot of work.

To ready itself for underground mining, Diavik needed to add 20 kilometres of tunnels, which in turn required other facilities to be built: rescue bays, washrooms, ventilation systems, repair shops, raises (vertical tunnels) for

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fact FILE

Diavik by the numbers

Location: 300 km northeast of Yellowknife
Owners: Rio Tinto (60 per cent) and Harry Winston Diamond Corporation (40 percent)
Operator: Diavik Diamond Mines Inc.
Started production in: 2003
Carats produced so far: over 50 million
Carats produced in 2009: 5.6 million
Reserves (as estimated in 2008): 62 million carats
Cumulative capital and operations spending for entire mine: \$4.5 billion
Cumulative spending with Northern companies: more than \$3 billion
Cumulative spending with Northern aboriginal companies: almost \$2 billion
Cost of the original mine: \$1.3 billion
Cost of the underground mine: \$800 million
Approximate length of underground tunnels: 20 km
Number of direct workers in 2009: 810
Expected peak direct workforce between now and 2012: 1,200
Expected direct workforce after 2012: 800 to 900
Mine life: expected to go past 2020

Source: Diavik Diamond Mines



photo courtesy of Diavik Diamond Mines Inc.

Going underground required Diavik to make some additions to its on-surface infrastructure, too, such as doubling its electrical power capacity.

Plenty of power and pumping water

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ventilation and water removal, and storage areas.

Building an underground mine also requires new or added infrastructure on the surface, including a new crusher and paste backfill plant. The mine also had to double its water treatment plant capacity, add accommodations and a mine dry building, which includes change rooms.

"Powerhouse number one has five 4.4 megawatt diesel generators and four smaller stand-by gensets as backup, but not all the larger gensets run at once. Scheduling keeps one in reserve and one on regular maintenance," said Ashbury.

"Powerhouse number two has two 4.4s, two 3.3s, and room for two more 4.4s. Again, not all of these would be operating at one time. So overall, we've essentially doubled our power generating capacity."

Treating more water

The capacity of the water treatment plant was likewise doubled, he added.

"When designing the underground mine, projected peak water inflow volumes underground were expected to double the existing water treatment volumes from surface operations, so the water treatment plant expansion was designed and built with this in mind. The plant, which removes silt, can now treat up to 90,000 cubic metres of water per day," said Ashbury.

The possibility of water leaks underground meant the underground mine had to design a system to pump water out – one of the more challenging aspects of the design, said Ashbury.

"One of our biggest challenges is the fact that the underground mine is under a lake. Although the area directly above the underground mine is the open pits, keep in mind the natural structures within the rock extend out to the lake waters.

"So when we excavate tunnels underground, we have some water which enters those tunnels and we need to pump that water to surface. Water inflows in an underground mine are not unusual. For our needs, we've constructed a very sophisticated water removal system."

From now until 2012, Diavik will operate as both an open pit and underground mine.

Last November, the company announced it was hiring an additional 150 people for underground production.

"Our underground teams have worked hard to have everything ready for what will be our next phase of operations," said Kim Truter, president and CEO of Diavik

Diamond Mines Inc.

The Diavik mine began commercial production in January 2003 and is expected to continue operations past 2020.

Going underground meant Diavik had to construct supporting surface infrastructure, too, including this paste backfill plant.

photo courtesy of Diavik Diamond Mines Inc.



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