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# FAR NORTH



THE NORTHERN MINER  
Oct. 27-Nov. 2, 2006

Pages B1-B8

## More reward than risk at Kutcho Creek

BY VIVIAN DANIELSON

### SITE VISIT

DEASE LAKE, B.C. — The Kutcho Creek volcanogenic massive sulphide (VMS) project located 100 km east of this Northern community made it to prefeasibility in the mid-1980s, only to be put on the back burner by two senior companies that saw more risk than reward based on the (then) prevailing view that copper would sell below US\$1 per lb. for many years to come.

Fast-forward 20 years and current owner **Western Keltic Mines** (WKM-V, WLKTF-O) sees much more reward than risk, even based on the most conservative projections for copper prices going forward. Earlier this year, the company's board gave the go-ahead to complete permitting and a bankable feasibility  
See **KUTCHO**, Page B3

## Gahcho Kué on path to production in 2012

### WILL BE DE BEERS' THIRD DIAMOND MINE IN CANADA

BY ROB ROBERTSON

With the Snap Lake underground mine in the Northwest Territories and the Victor open-pit operation in northern Ontario already under construction, **De Beers**, the world's leading diamond player, is looking to build a third diamond mine, at Gahcho Kué in the N.W.T.

As proposed, Gahcho Kué will be an open-pit mine, producing 3 million carats of diamonds annually over a life of 15 years to generate \$342 million in annual revenue. In the mine plan, three pipes are modelled to contain 30 million tonnes of kimberlite minable by open pit averaging 1.48 carats per tonne, equal to 44.4 million carats at a value of US\$70-US\$77 per carat.

Operating costs are pegged at \$65 per tonne. The waste-to-ore stripping ratio over the mine's life is 10.6:1. The project carries an

See **GAHCHO KUÉ**, Page B6

## Polyus Gold plans ambitious expansion

RUSSIA'S BIGGEST GOLD MINER AIMS TO BECOME TOP-5 WORLD PRODUCER



Polyus Gold's flagship open-pit Olympiada gold mine, 600 km north of the city of Krasnoyarsk in Siberia. Norilsk Nickel acquired Polyus as a subsidiary in 2002, and in March of this year Polyus was relaunched as a public company.

BY SARAH HURST  
SPECIAL TO THE NORTHERN MINER

ANCHORAGE, ALASKA — Apparently at least one Russian oligarch isn't too worried about being forced out of the country or arrested. Vladimir Potanin is so confident of his position that he's hosting the Russian version of reality TV show *The Apprentice*, called *Kandidat*. If Potanin has managed to trump his rivals, it's partly down to political savvy (he's a member of President Vladimir Putin's newly formed Public Chamber) and also thanks to his ownership of mining giant **Norilsk Nickel** (NILSY-O, MNOD-L).

Potanin and his business partner, Mikhail Prokhorov, have big plans for Norilsk spinoff **Polyus Gold** (OPYGY-O). The two men are tied as 89th-richest in the world, worth an estimated \$6.4 billion each, according to Forbes magazine's 2006 list, and they are hoping that their gold projects will make them even richer. Polyus's board of directors rolled out an ambitious strategy in mid-September that would make the company a top-five global gold producer by 2015, with annual output of at least 3.9 million oz. Polyus produced 1.1 million oz. gold in 2005.

The Moscow-based company is already the largest gold mining company in Russia, representing

20% of the gold produced in that country. It dwarfs foreign upstarts like **Highland Gold**, (HGHGF-O, HGM-L), **Peter Hambro Mining** (POGNY-O, POG-L) and **Bema Gold** (BGO-T, BGO-N, BAU-L).

At the Denver Gold Forum in Sep-

tember, Polyus CEO Evgueni Ivanov was also keen to emphasize that Polyus is not lacking in experience.

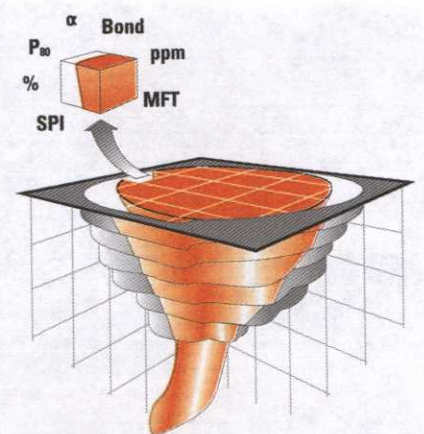
"Although we are quite new to the market as a publicly traded company, we're quite old as a private company, with a track record

of gold mining, discoveries and construction of mills in Russia in different regions for twenty-five years," Ivanov said.

Polyus was founded in 1980 as a co-operative of miners by Hazret  
See **POLYUS**, Page B2

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## Polyus Gold

**POLYUS**, From Page B1

Sovmen, who was appointed by the government to develop gold mining in Siberia's Krasnoyarsk region. Sovmen is now president of the Republic of Adygeya in southwestern Russia. Under his watch, Polyus developed its flagship operation, the open-pit Olympiada mine, 600 km north of the city of Krasnoyarsk. Norilsk Nickel acquired Polyus as a subsidiary in 2002, and in March 2006 Polyus was relaunched as a public company.

Polyus owns six of Russia's 10 largest gold deposits, according to the Russian government's own estimates of their size. The largest deposit in the country, containing an estimated 33.1 million oz. gold, is Sukhoi Log in the Irkutsk region of Siberia. The Russian government owns Sukhoi Log and has not held an auction for the licence to develop it, although there have been behind-the-scenes talks between the Kremlin and Norilsk Nickel in the past few years. The Ministry of Natural Resources' Central Exploration and Research Institute for Non-Ferrous and Precious Metals (TsNIGRI) contracted with Polyus in September

to perform exploration drilling at Sukhoi Log and produce a new valuation of the deposit.

Russia's second-largest gold deposit is Nezhdaninskoye, in the Republic of Sakha (also known as Yakutia), a far northeastern region best known in the mining industry for its diamonds. Sakha-based mining company **Alrosa** sold Yakutskaya Mining to Polyus in September 2005. Yakutskaya Mining owned 50% of Nezhdaninskoye's licence-holder, **Yuzhno-Verkhoyanskaya Mining**, in partnership with London-based **Celtic Resources** (CER-L) (20%) and two offshore companies from the British Virgin Islands. Celtic initiated lawsuits to defend its interest in Nezhdaninskoye, but in February 2006 agreed to drop its claims in return for a cash payment of US\$80 million.

Nezhdaninskoye contains an estimated 15.3 million oz. gold, according to the Russian government. Polyus inherited a scoping study for Nezhdaninskoye from Alrosa, which the company is not too happy about, and part of its plan for the next decade is to reassess the concept of how to mine



Some of the 120-member fleet of Caterpillar and Komatsu heavy trucks at Olympiada.

POLYUS GOLD

"this terrific deposit," Ivanov said in Denver.

Polyus also recently acquired Russia's 10th-largest gold deposit, Kuranakh, from Alrosa. Kuranakh is in the Republic of Sakha and

contains an estimated 3.7 million oz. gold.

Despite the acquisitions, most of the increases in Polyus's gold reserves are coming from exploration, according to Ivanov. The company

had 13.3 million oz. gold in reserves at the beginning of last year and ended the year with 25.1 million oz., he said. The largest contributor to the exploration success was the discovery of the Blagodatnoye deposit in Krasnoyarsk region, described by Ivanov as the largest gold discovery in Russia in the past decade. Blagodatnoye is Russia's seventh-largest gold deposit, containing an estimated 7.2 million oz. It is only 26 km from Olympiada and will share much of that mine's infrastructure, such as repair shops and the workers' camp.

"Exploration is something that we consider to be a very important activity of the company," Ivanov said, adding that over the next few years the company will spend US\$368 million on exploration.

"The business rationale for spending so much money on exploration is our belief that Russia is the country to spend exploration money today, we have a proven record of discoveries, exploration costs at Blagodatnoye were less than one dollar per ounce of reserves, and we expect to increase the reserves of the company in the next five years by fifty-eight million ounces of gold."

A further increase in reserves is expected from the exploration project at the Natalka deposit in the northeastern Magadan region, where Polyus has spent US\$65 million since 2004. Natalka will undergo an international audit next year and Polyus will then be able to make the re-valuation public. The deposit is currently Russia's sixth-largest, containing an estimated 7.9 million oz. gold.

Natalka is "an extremely huge project," Ivanov said. It will cost Polyus around US\$1.5 billion to develop and should be the largest contributor to the company's output by 2015. Polyus hopes that the Russian government will include Natalka in its investment fund program that provides financing for road construction and power supplies in remote regions. That could save the company up to US\$100 million in capital costs. Total capital costs for all of Polyus's projects are expected to reach US\$3.4 billion by 2015.

All of the regions where Polyus is active have extremely cold climates, and as a consequence the company has developed an in-house, bio-oxidation technology for its mills that is efficient at air temperatures of minus 35° to minus 40° Celsius. A new mill to be built at Olympiada in 2007 will use this technology.

— The author is a freelance writer based in Anchorage, Alaska.

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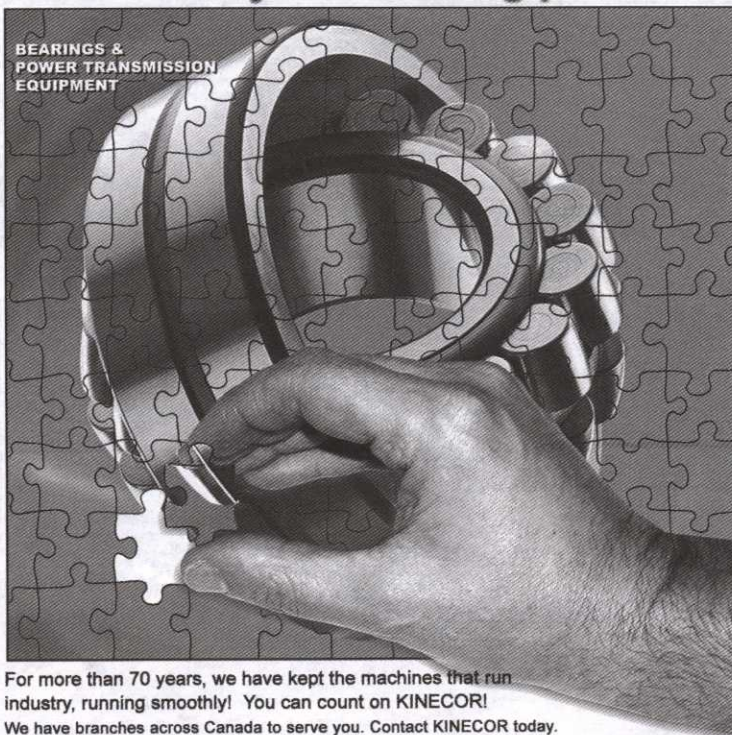
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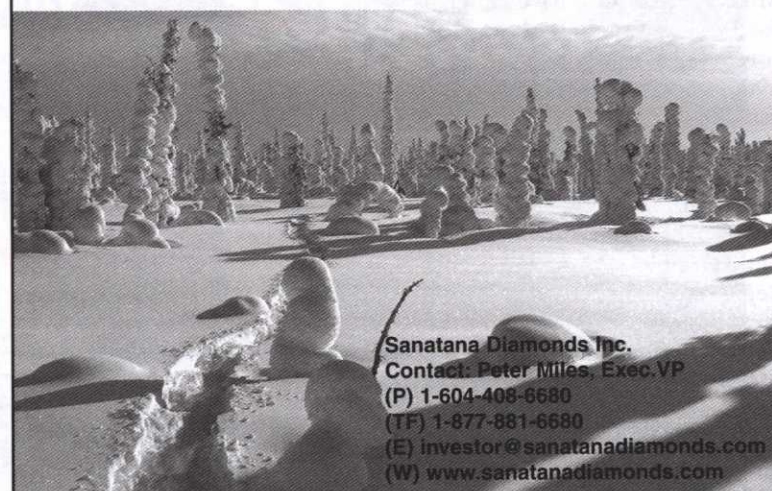


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## More reward than risk



BY VIVIAN DANIELSON

Brian Butterworth (far right), vice-president of business development with Western Keltic Mines, showcases core from the Kutcho Creek massive sulphide project.

**KUTCHO**, From Page B1  
study for a mine capable of producing 60 million lbs. copper and 75 million lbs. zinc each year at an annual throughput rate of 1.5 million tonnes. A prefeasibility study is expected within the next few months, followed by the final feasibility study by year-end 2007.

Kutcho Creek ranks as one of the most advanced undeveloped deposits of its type in Canada, yet has a low profile relative to other nearby projects, partly because of many years of inactivity and its remote location. But as Western Keltic management pointed out during a recent visit, systematic work programs conducted over the past few years have confirmed favourable attributes that more than compensate for the lack of infrastructure.

"The key to this project is a deposit grading about two per cent copper that is open-pittable," said Peter Holbek, vice-president of exploration. "We also wanted to increase resources to a higher threshold, which we've achieved through our recent drilling programs."

Since acquiring Kutcho Creek in March 2004, Western Keltic has boosted resources from about 13.5 million tonnes to 20 million tonnes within three massive sul-

phide deposits. These deposits occur within a 4-km-long, gently plunging linear trend within a portion of the regional-scale Kutcho Formation. The VMS deposits are of the Kuroko-type, with mineralization related to felsic volcanism in an island-arc or back-arc tectonic setting.

The updated 2006 resource estimate was used to develop a conceptual development model for a combined open-pit and underground mine capable of delivering 3,800 tonnes per day to a conventional process plant over at least a 15-year mine life.

Kutcho, the largest and most advanced deposit, hosts an open-pittable resource of 14.2 million tonnes grading 1.86% copper, 2.44% zinc, 33 grams silver and 0.4 gram gold per tonne. The deposit outcrops on surface and has the advantage of a high-grade core that could be developed into a potential starter pit.

### Predictable geology

While VMS deposits typically require tight-spaced drilling to trace and define resources, particularly in Archean environments, this is less the case at Kutcho Creek. The geology is more predictable as the deposits aren't metamorphosed or broken up by folding and faulting, resulting in exceptional continuity

claims were allowed to lapse when other partners declined to continue exploration.

The project was revived in 1972 when a subsidiary of **Sumitomo Metal Mining** of Japan staked claims overlying the western part of the main Kutcho deposit. Imperial Oil returned to the region and the two groups worked co-operatively but independently until they eventually joined forces in the early 1980s. By this point, the VMS model was much better understood, which helped guide ongoing exploration efforts.

A prefeasibility study completed by Wright Engineers in 1985 indi-

cated an 11% internal rate of return at a copper price of US95¢ per lb., but with long-term price predictions at or below that level, the partners opted to put the project on hold pending further exploration results.

Kutcho Creek changed hands several times after Esso Minerals decided to exit the mining business, but in every case the new owners were major companies that had other priorities. Even so, work during the 1970s and early 1980s defined three sulphide deposits or lenses along a gently plunging, east-west-oriented, linear trend.

The near-surface Kutcho deposit

is the largest and best defined to date. The middle deposit, **Sumac West**, is large but lower-grade and sparsely drilled. Esso West is the most westerly of the three deposits, and occurs 3.5 km along strike from the Kutcho deposit and at a depth of about 400 metres below surface.

Holbek, who has been involved with the project intermittently almost since discovery, believes that the **Kutcho Formation** hosting the known deposits still has good exploration potential.

"Most VMS deposits end up much larger than they started," he explains. "We don't see much potential for

See **KUTCHO**, Page B4

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## Québec exploration 2006

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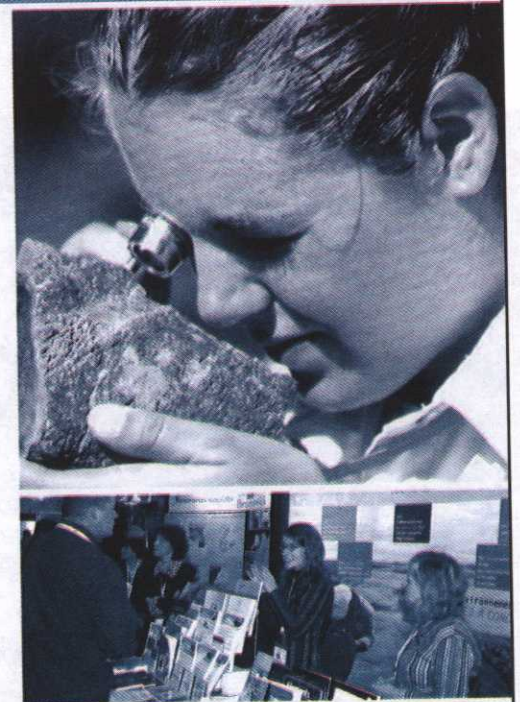
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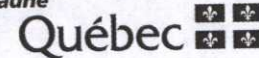
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*'The new permitting process in Northern Canada was designed to give Northerners a greater say in resource development, instead of leaving the important decisions to bureaucrats in Ottawa. Local people have a better understanding of local issues.'*

— JOHN MCCONNELL,  
PRESIDENT AND CEO OF WESTERN KELTIC

phide deposits. These deposits occur within a 4-km-long, gently plunging linear trend within a portion of the regional-scale Kutcho Formation. The VMS deposits are of the Kuroko-type, with mineralization related to felsic volcanism in an island-arc or back-arc tectonic setting.

The updated 2006 resource estimate was used to develop a conceptual development model for a combined open-pit and underground mine capable of delivering 3,800 tonnes per day to a conventional process plant over at least a 15-year mine life.

Kutcho, the largest and most ad-

and a high level of confidence for the total resource.

"There aren't many VMS deposits in the world left in their original state," Holbek says, adding that it's possible to see the deposition and layered textures. Another favourable factor is that the higher grades tend to occur close to surface, allowing for faster payback of capital costs.

Kutcho Creek was discovered at a time when the VMS model was barely understood at all. The first discovery was made in 1968 by an exploration joint venture operated by Imperial Oil, which later became Esso Minerals Canada. The



## More reward than risk

**KUTCHO**, From Page B3  
 another surface deposit . . . We've done enough geophysics to know that, but a number of potential targets have been identified that warrant follow-up exploration."

Another priority is to expand the Esso West deposit, which is open in several directions and is believed to have good potential to expand resources that would improve project economics. The first goal is to place the near-surface Kutcho deposit into production as soon as possible using low-cost, open-pit mining techniques, while continuing to explore for new deposits, as well as extensions of known deposits and zones at depth and along strike.

### Progressive Management

Western Keltic's plans to advance Kutcho Creek to production were given a kick-start earlier this year when **John McConnell** was appointed president and CEO with a mandate to complete mine permitting and a bankable feasibility study.

McConnell left a senior post with De Beers Canada to take the posi-

tion, and brought to the company more than 30 years of experience in Canadian mine development and operations. Most recently, he was vice-president of N.W.T. (Northwest Territories) projects for **De Beers**, where he supervised development of the 3,000-tonne-per-day Snap Lake underground diamond mine, from permitting through to construction. He also has extensive experience in base metals, gained at the Nanisivik and Caribou mines in Northern and Eastern Canada, respectively.

Months after taking the helm of Western Keltic, McConnell lured away a number of key executives involved in the Snap Lake project, including individuals directly involved in the permitting process. The list includes John Goyman, vice-president of construction and operations, and Robin Johnstone, vice-president of environmental and government affairs, among others.

**Brian Butterworth**, vice-president of business development, says this in-house expertise in permitting, consultation, mine develop-



Western Keltic Mines' vice-president of exploration, Peter Holbek (centre, yellow), explains the geology of the Kutcho Creek massive sulphide project during a site visit to Dease Lake, northern B.C.

BY VIVIAN DANIELSON

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ment and operations provides Western Keltic with "a strategic and competitive advantage in the junior mining sector," particularly as the company continues the environmental assessment (EAP) and permitting process for Kutcho Creek.

Western Keltic formally entered the EAP process in August 2005, and began meeting with stakeholders that fall. So far at least, the project hasn't attracted the attention of native groups opposed to mine development in northwestern British Columbia. Even so, the company is mindful that several higher-profile projects in the general region have encountered native opposition, which in some cases has interrupted or even stalled proposed programs in the 2006 summer season.

Western Keltic has adopted a two-pronged approach to advancing Kutcho Creek, focused on both the technical aspects of the proposed operation and the permitting and environmental issues.

### Permitting process

As McConnell sees it, companies looking to develop projects in environmentally sensitive regions or lands claimed by native groups as traditional territory should be prepared to "do things differently" than in the past. He has extensive experience doing just that at the Snap Lake diamond mine project, and is one of the few mining executives with positive things to say about the N.W.T. permitting process and its lead agency, the MacKenzie Valley Environmental Impact Review Board.

"The new permitting process in Northern Canada was designed to give Northerners a greater say in resource development, instead of leaving the important decisions to bureaucrats in Ottawa. Local people have a better understanding of local issues," McConnell says.

"Some people may not like the changes, and there may be some growing pains along the way, but I think Northerners over the long term will be more supportive of developments in which they have some say."

Western Keltic has retained Rescan Tahltan Environmental Consultants, a firm owned 50% by the Tahltan Nation Development Corp. to provide environmental and base-line studies, prepare the

See **KUTCHO**, Page B5



## AngloGold cements new Russian alliance

**AngloGold Ashanti** (AU-N, AGD-L, ANANO-J) has concluded a deal with Russian gold producer **Poly-metal** for a strategic alliance in gold exploration in the Russian Federation, which has left one London-listed junior to go it alone and given another a fatter wallet for its own use.

Under the agreement, Polymetal and AngloGold divide Russia into three parts; in seven specified areas of eastern Russia (Sverdlovsk, Khabarovsk, Magadan, Chukotka, Koryakia, Kamchatka and Irkutsk) each company will have a free hand to work on any project; everywhere else east of the Ural Mountains the two companies will operate exclusively through their alliance; and west of the Urals the alliance will have a right of first refusal on any project one of the partners enters

### More reward

**KUTCHO**, From Page B4 environmental assessment required for the project, and support the company's application for permits to develop the mine.

Butterworth says the overall footprint at Kutcho Creek will be small and compact, with the existing road corridor minimizing impacts on the environment. The project is currently serviced by an on-site airstrip. A pre-existing tote road connects the site to Dease Lake, but would require upgrading for production purposes. Diesel-generated power is viewed as the most likely option for the high-grade project.

Unlike some mineral projects in northwestern B.C., the terrain at Kutcho Creek is moderate and characterized by rolling hills rather than rugged mountains. Sufficient space exists on the valley floor for the proposed milling facilities and storage of tailings.

The prefeasibility study, expected to be in hand by year-end, will determine the optimal layout for the proposed mine and mill facilities, and will also include an updated resource estimate along with capital and operating cost estimates.

The existing resources contain an estimated 850 million lbs. copper and 1.2 billion lbs. zinc. Initial production in the first seven years is estimated at 60 million lbs. copper and 75 million lbs. zinc, along with silver and gold credits.

The prefeasibility study will also detail the process design based on recent metallurgical test work, which has shown a marked improvement in both copper recovery and concentrate grade from previous work.

The proposed process consists of bulk flotation at a primary grind of 75 microns to produce a copper-zinc bulk concentrate, with copper and zinc separation carried out after regrinding to about 20-micron size and using conventional flotation technologies.

Results show that 90.7% of the copper can be recovered to a copper concentrate grading 31.8% copper, 4.3% zinc, 325 grams silver per tonne and 3.5 grams gold, and 76.8% zinc recovery to a zinc concentrate grading 55.4% zinc and 0.8% copper, with neither concentrate containing penalty elements.

Concentrates would most likely be trucked to the port of Stewart, B.C., for shipment to Asian smelters, with trucks back-hauling fuel and supplies as required for the mining operation.

into with a third party.

Polymetal brings two gold projects to the table, the Aprelkovsko-Peshkovski project in the Chita region and the Anenskoye project in the Krasnoyarsk region. AngloGold will contribute two projects it has just bought from London-listed **Trans-Siberian Gold** (TSG-L).

Trans Siberian is selling Anglo the Veduga and Bogunay projects in the Krasnoyarsk region. Veduga, currently at the prefeasibility stage, has a measured and indicated resource of 11.8 million tonnes grading 5.4 grams gold per tonne and an inferred resource of 4.9 million tonnes grading 4.8 grams. Bogunay, an old producing mine, has a 1940s-era resource estimate of around 1 million tonnes at 8.5 grams gold per tonne.

Trans Siberian gets US\$40 million for the two projects, which it plans to use to develop the Asacha mine in the Kamchatka region. Asacha, which has 694,000 tonnes

grading 23.3 grams gold and 45.4 grams silver per tonne in the measured and indicated category, is slated to produce 100,000 oz. gold and 180,000 oz. silver annually once it is in production. Feasibility work there continues to examine open-pit and ramp-access underground development.

Anglo will also fund a US\$900,000 geophysical program at Verduga and Bogunay, which Trans Siberian had previously committed to do, and has extended a technical co-operation agreement (under which AngloGold boffins Glen Koropchuk and Solly van der Wath are seconded to Trans Siberian) to the end of 2009.

The new arrangement with Polymetal jilts **Eurasia Mining** (EUA-L), whose strategic agreement with AngloGold in the Chita and Buryatia regions will be dropped to conform to the new alliance. Eurasia, however, got US\$1 million in exploration work on its properties out of the alliance.

**VANCOUVER — Full Metal Minerals'** (FMM-V, FLMTF-O) initial drill hole on the LWM prospect at its 40 Mile property in eastern Alaska has intersected a near-surface interval of silver-rich massive sulphide mineralization.

Vertical hole LWM06-01 returned 12.1 metres (from 30.2 metres depth) grading 110.9 grams silver per tonne, 11.6% zinc and 4% lead, including a 6.6-metre interval of 200.8 grams silver, 19.3% zinc and 7.2% lead. A 3.3-metre section returned in excess of 30% zinc.

Mineralization occurs in a coarse-grained and banded section of massive sulphides (pyrite, chalcopyrite, sphalerite and galena) hosted in a brecciated and silicified argillite. The massive sulphide body is interpreted as gently dipping and exhibits some upper-level oxidation due to its proximity to surface.

Results are pending for two additional drill holes Full Metal has completed on the new discovery at

LWM. A more extensive drill program is planned for May 2007.

The company also recently completed several drill holes (results pending) at the Fish prospect located about 6 km east of LWM. Drilling tested a 15- to 23-metre thick gossanous zone interpreted as an intensely weathered section of semi-massive to massive sulphides. The Fish-area gossan alteration has been traced along 1,500 metres of strike and about 250 metres down-dip with numerous historical grab samples returning high-grade zinc mineralization with lead and silver values.

The company can earn 100% of the mineral rights to the 40 Mile land package, comprising more than 3,280-sq.-km, from the Alaskan Native Regional group Doyon for cash payments of US\$325,000, annual scholarship donations of US\$10,000 and total exploration spending of US\$3.85 million over six years. The native corporation also retains a production royalty.



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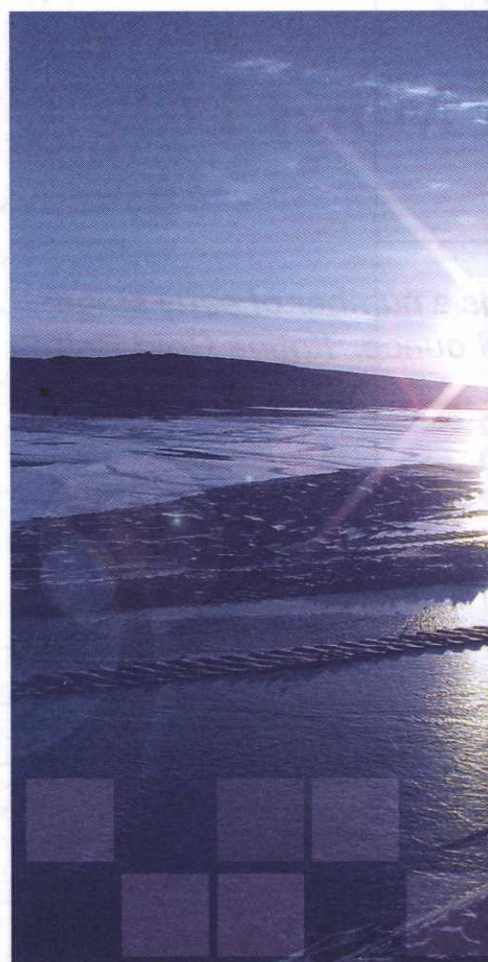
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# Gahcho Kué on path to production in 2012

**GAHCHO KUÉ**, From Page B1  
estimated price tag of \$825-\$960 million and will have ongoing annual operating costs of \$135 million.

De Beers completed a technical study in June 2005 at a cost of \$25 million. The study was conducted to a high level of technical confidence but could not be published as a prefeasibility study under National Instrument 43-101 because a significant portion of the resources remain in the inferred category, reports **Mountain Province Diamonds** (MPV-T, MDM-X), a carried partner in the joint venture.

The study assessed the project's economic potential based on indicated kimberlite resources measuring 14.4 million tonnes grading 1.64 carats per tonne and inferred resources totalling 17 million tonnes of 1.35 carats.

In its 2006 annual review, Mountain Province wrote that the expected profitability of the project warranted proceeding to the next phase.

In July 2005, De Beers approved \$38.5 million in funding to take the project through advanced evaluation and permitting. The goals of

*The kimberlites will be mined in sequence, the first being 5034, followed by Hearne and Tuzo. Waste rock material that is removed as the pits are developed will be used to build dykes, roads and containment areas.*

the program, which will be completed at the end of 2007, are to: upgrade the diamond resources to the indicated category; collect sufficient data to support a definitive feasibility study; establish the potential upside of the project; gather

critical data required for final mine design; and secure construction and operating permits for the Gahcho Kué mine.

During the 2006 drilling campaign, which was carried out this past winter and summer, De Beers

completed 31 core holes to further delineate the 5034 North lobe and Tuzo pipe, and for pit design and civil engineering purposes. A planned large-diameter drill program was shelved last winter after the drilling contractor had problems setting up the holes. Further drilling is being considered for the first quarter of 2007.

De Beers began the permitting process in November 2005, filing applications with the Mackenzie Valley Land and Water Board for land and water use licences to build and operate a mine at Gahcho Kué. The permitting process is expected to take anywhere from 24 to 36 months, which would put the project on a timeframe for startup in 2011 and full production in 2012. In June, the project was referred to an environmental impact review. De Beers responded by filing an application for a judicial review of the referral. Once the judicial review is complete, the priority will be to move through the permitting process in an efficient and timely manner.

### The project

Gahcho Kué is about 20 km above the tree line, at the headwaters of the Lockhart River drainage system in the high Sub-Arctic tundra region, 300 km northeast of Yellowknife, N.W.T. It's south of Lac de Gras, where both the Ekati and Diavik diamond mines are located, and 80 km southeast of Snap Lake. The property is in the declared traditional use area of the Lutsel Ke' Dene and an area of interest for the Tlicho, Yellowknife Dene, Fort Resolution Dene and North Slave Metis.

Like the other diamond mines, the site is remote and accessible by air only, except in the winter, when it can be reached by an ice road typically open in February and March. The winter road to Gahcho Kué is a 120-km spur road off the main road between Yellowknife and Lac de Gras.

Unlike its other Canadian projects, De Beers is not the sole owner of Gahcho Kué. While it is the project operator, the company currently owns 51%. By producing a bankable feasibility study, it can boost its interest to 55%, and by also funding the mine's construction, De Beers will have earned a 60% stake. At that time, Mountain Province will hold 36% and **Camphor Ventures** (CFV-V, CMVIF-O) will own the remaining 4%. Mountain Province also owns a 33.5% position in Camphor.

The project centres on the Kennady Lake cluster, which comprises four main kimberlite pipes, including 5034, Hearne, Tuzo and Tesla. The mine plan incorporates only the first three pipes; the Tesla pipe, the smallest of the bodies, is considered too low-grade, based on early mini-bulk sample work. The pipes are steep-sided and mainly occur under the southern portion of Kennady Lake, which is about 8 metres deep, on average. One of thousands of small lakes in the arctic barrens, Kennady Lake is about 4 km long and irregular in shape.

The 5034 kimberlite has a very complex plan view shape and sub-surface structure, with irregular pipe walls and an overall surface area of 1.7 hectares. The surface expression of the pipe measures 120 by 180 metres. It was discovered by Mountain Province and Camphor in 1995 while drilling the head of a prominent kimberlite indicator mineral train in the Kennady Lake

See **GAHCHO KUÉ**, Page B7

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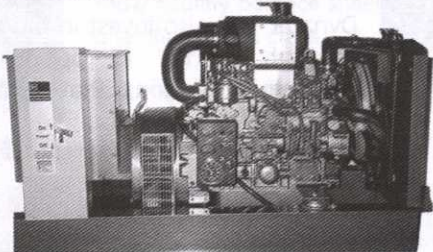
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## Gahcho Kué on path to production in 2012

**GAHCHO KUÉ**, From Page B6

area near the southeast corner of the AK property. The new discovery was subsequently tested by more than 104 holes in 1996 under the direction of the project's then-consultant Canamera Geological. A mini-bulk sample of 104 tonnes collected from 42 of the holes showed an implied grade of 2.48 carats per tonne, giving an early indication of the pipe's potential.

The 5034 pipe is subdivided into four lobes based on internal geology. While most of the pipe is overlain by the shallow waters of Kennady Lake, the north lobe extends partly under land and is covered by 80 metres of country rock. As currently defined by De Beers, 5034 contains 8.7 million tonnes of indicated resources grading 1.6 carats per tonne, plus inferred resources of 4.9 million tonnes averaging 1.7 carats per tonne, for a total of 22.3 million carats worth an estimated US\$82-US\$90 based on 2005 valuation and modelling.

De Beers optioned the AK-CJ properties in early 1997 and immediately flew a detailed helicopter-borne magnetic and electromagnetic survey over the southern portion of the claim group. During the 1997 exploration season, De Beers discovered three new kimberlite pipes, Tesla, Tuzo and Hearne — all in a 1-km radius of 5034 and all significantly diamond-bearing. De Beers has since invested \$92 million in the Gahcho Kué project and the AK property.

Tuzo has a circular plan view shape, with surface area of 1.2 hectares. It appears to expand at depth. The pipe contains a 10.6-million-tonne inferred resource averaging 1.15 carats per tonne, equal to 12.2 million carats at US\$57 a pop.

Hearne consists of two bodies that may be connected. Hearne South, the smaller of the two, is a roughly circular pipe, while Hearne North is a narrow, elongate body. The surface area of the two bodies is 1.3 hectares. The pipes' indicated resources stand at 5.7 million tonnes grading 1.7 carats per tonne, with another 1.6 million tonnes of inferred averaging a grade of 1.53 carats, for a total of 12 million carats worth US\$70 each.

### Water issues

In order to mine the pipes by open-pit methods, De Beers is proposing to lower the lake's water level to expose natural land features and thereby limit the number of water-retaining dykes it will need to build. The first dyke (dyke A) will be built across a small arm of Kennady Lake where the water reaches a depth of about 1 metre, isolating the eastern portion. The western part, which will comprise roughly two-thirds of the lake, will be lowered as required for mine development. The 75-metre-long dyke will form a causeway that will be used to access the airstrip.

Lowering the water level will begin in the first year of construction and take two summer seasons to complete. Using pump barges, the water will be gradually pumped and redirected to the watershed north of the lake and to natural lake outflows east of the lake. The water quality will be carefully monitored. A water treatment plant will be installed in the second year to ensure the water is clean of any built-up sediment.

Only the small areas around the three pipes will be completely drained. The lowered water level in the balance of the lake will be main-



This past winter's shortened ice road season in the Arctic delayed the transport of large items, and forced De Beers to fly others in at Gahcho Kue at a higher cost. Here a 24-wheeler hauls a 200-tonne payload compartment of a much larger truck across a winter road to the Diavik diamond mine, 300 km northeast of Yellowknife, N.W.T. Diavik Diamond Mines is owned 40% by Aber Diamond Mines, with the remainder held by Rio Tinto.

tained through the life of the mine.

The kimberlites will be mined in sequence, the first being 5034, followed by Hearne and Tuzo. Waste rock material that is removed as the pits are developed

will be used to build dykes, roads and containment areas.

In the first year of construction, the waste rock covering the on-land part of the 5034 pit will be used for construction. By the third year, the

portion of the pit that was under the lake will be pre-stripped and any rock not required for construction will be stored in the waste rock pile. It will take roughly eight years to mine out 5034.

Mining of the Hearne kimberlite pipe will start in year seven of operations and last for about six years. Once the 5034 has been mined out, waste rock from the Hearne pit will be mixed with processed kimberlite tailings and be used to backfill 5034 in year 10 of operation, the same year that pre-stripping starts on the Tuzo pipe. Waste rock from Tuzo will be used to backfill 5034 and Hearne. The Tuzo pit will be mined for six years. Should it prove economically attractive, De Beers may begin underground mining from the bottom of the Tuzo pit.

"The mine plan has been designed to optimize closure and progressive reclamation," states a De Beers information guide. "By mining the pits in sequence and using the waste rock to fill in the pits, we are able to reduce the surface space required for waste rock. Our goal is to include all needed services in as small a footprint as possible, so we minimize disturbance to the land in the area."

Land disturbance will be confined to an area of under 12 sq. km

See **GAHCHO KUÉ**, Page B8

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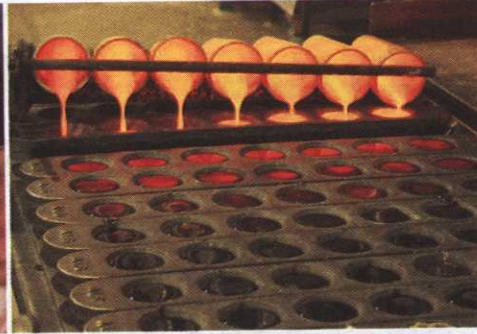
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# Zinc recycling in the North

Doubtless helped by the price of zinc, two former Arctic zinc producers, both operated by Cominco, are getting second looks by junior explorers bent on showing that resources left behind when the mines were closed are economically feasible.



BY JAMES WHYTE

London-based explorer **Angus & Ross** (AGU-L) has one new discovery and one showing-turned-resource at the Black Angel property in western Greenland, where Cominco — now **Teck Cominco** (TCK.B-T, TCK-N) — mined between 1973 and 1990.

Angus & Ross's new discovery is the South Lakes Glacier zone, a stratabound lead-zinc deposit uncovered by glacial retreat. That Cominco missed it doesn't reflect badly on the former owners, who would have had to melt 60 metres of ice to find the surface showings. Time has given Angus & Ross substantially better access.

This past field season, drill holes over a 500-metre strike length established that the new zone extends to 170 metres vertical depth, over

core lengths of 1 to 3 metres. Zinc grades were mostly 4% to 12% and lead grades 2% to 8%, with 10 to 30 grams silver.

Later drilling has confirmed earlier results, as well as revealing a couple of wide intersections. A 6.5-metre interval near the southwestern end of the zone averaged 6.1% zinc and 2.6% lead, with 49 grams silver per tonne, and a 6.3-metre interval near the middle of the zone ran 8.8% zinc and 3% lead, with 29 grams silver per tonne.

It also appears that the zone may have zinc-rich subzones; a narrow 0.3-metre intersection in the west-central part of the deposit had negligible lead and only 2 grams silver, but ran 25% zinc.

The showing-turned-resource is at Ark, which Cominco discovered in the 1980s but never developed. Ark is about 7.5 metres wide at its thickest, with zinc grades around 5% to 7% and lead grades from 0.3% to just over 4%. Silver grades are low.

The topography around Black

Angel fits the old phrase about Greenland's icy mountains; the old mine hauled ore via an aerial tramway from an adit in the side of a mountain — at 600 metres elevation — down to the port at Maarmorilik. The tramway is now gone, but for vehicle access there is a 6-km tunnel from Maarmorilik up to a portal at plateau level. The company is getting quotes on construction of a system of surface roads up on the plateau.

Prefeasibility work this year established that the remnant resource in the Black Angel mine itself amounted to 2.2 million tonnes grading 9.7% zinc and 3% lead. Early costing exercises concluded that production from the remnant resource would be economic at prices of US\$1,950 per tonne for zinc and US\$1,100 per tonne for lead. Consultants for the company also concluded that disposing of tailings as a paste fill in empty stopes will allow a new operator to remove at least 80% of the remnant resource safely.

The field season is now over, but Angus & Ross expects to have a revised resource estimate from its

consultants, Wardell Armstrong International, in November.

At Pine Point on the south shore of Great Slave Lake in the Northwest Territories, **Tamerlane Ventures** (TAM-V, TMLVF-O) is working on the R-190 deposit, the highest-grade of the resources left on the old Pine Point property. Cominco's mining holdings had all lapsed by 2001, and former Royal Oak Mines executives Ross Burns and Margaret Kent, now president and chairman of Tamerlane, picked up a 38-claim block plus eight claims held by Pine Point Mines to put together a 222-sq.-km land package. Tamerlane met work commitments of \$1.25 million to earn a 60% interest and bought out its executives for another \$1 million to get full control of the project. Burns and Kent retain a 3% net smelter return.

There is no current resource on the R-190 deposit, which is only to say that old resource estimates do not comply with current securities regulations. The historical figure is 1 million tonnes grading 12.1% zinc and 6.3% lead.

The project is well under way, with environmental assessment

under review by the territorial government and with mine design already largely specified. Tamerlane is looking into freeze-ring technology — drill holes with pipes containing a refrigerant, forming a cut-off wall around the mine — to limit water infiltration, which had plagued earlier operations and ultimately forced early closure of the mine in the late 1980s.

Another planned innovation is a dense-medium separation plant, to process fine mineralization (a crushed fraction below 0.6 mm in size). Early testing is under way.

## Gahcho Kué

**GAHCHO KUÉ**, From Page B7 and reclaimed when no longer in use. Wildlife will be given the right-of-way and hazards will be minimized; fish habitat loss will be compensated.

The kimberlite treatment plant will be designed to process 2.1 million tonnes of ore annually (or 5,750 tonnes per day). The processed kimberlite tailings will be stored on-land in containment areas until year 10 when it will be directed to the mined-out pits.

De Beers will need 250 workers to operate the mine and 600 through construction. In the second year of construction, about 400 permanent positions will be created, with over half of that number on-site at any one time. To support the mining and processing operations, buildings and services will include: accommodations, power, telecommunications, water treatment, waste disposal, roads, fuel storage, supplies storage and more.

De Beers has been mining and marketing diamonds for more than 100 years. The company is now building on that knowledge here in Canada. Snap Lake will be the company's first-ever diamond mine outside of southern Africa.

A proposed 3,150-tonne-per-day (1.1 million tonnes per year) underground operation at Snap Lake is expected to produce 1.5 million carats annually over a life of at least 22 years. Movable ore reserves are estimated at 18.3 million tonnes grading 1.46 carats per tonne, equal to 26.7 million carats at a revised value of US\$144 per carat. Snap Lake remains on track for commissioning, as planned, in late 2007.

The Victor project in the James Bay Lowlands of northern Ontario calls for the development of a 7,000-tonne-per-day (2.5 million tonnes annually) open-pit mine and on-site kimberlite processing plant. Movable reserves are estimated at 27.4 million tonnes averaging 0.23 carat per tonne, or about 6.3 million carats. The operation will produce as much as 630,000 carats annually over a 12- to 13-year life. It's on track for start-up in late 2008.

Together, the Snap Lake and Victor mines were originally estimated to cost \$1.6 billion in all. De Beers' board recently approved some \$400 million in additional spending to bring the two projects into production on schedule.

De Beers blames the increase in project costs on: higher fuel, material and labour costs in the highly competitive, booming Canadian natural resource industry; technological and construction challenges; and the impact of this year's shortened winter ice road season in the Arctic — which delayed the transport of large items, and forced the company to fly others in at a higher cost.



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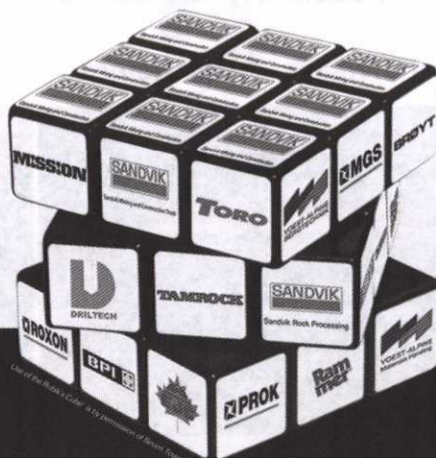
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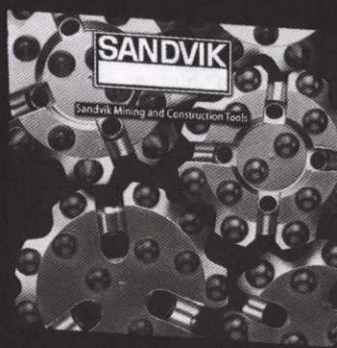
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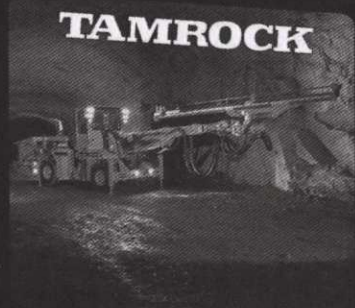
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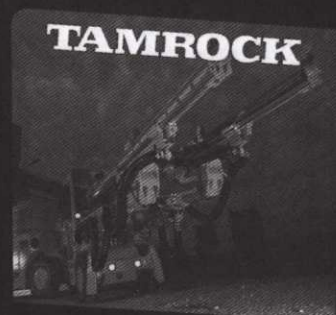
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