

# The Oyu Tolgoi Decade

A future found in the waiting Gobi

IVANHOE

M I N E S

NEW HORIZONS







#### 1. OYU TOLGOI PROJECT, MONGOLIA

First phase of copper-gold-silver mining complex expected to begin initial production in 2012; commercial production scheduled in 2013; plus ongoing development of phase-two underground mine and exploration.  
(*Oyu Tolgoi LLC, 66%-owned by Ivanhoe Mines.*)

#### 2. OVOOT TOLGOI MINE, MONGOLIA

Expanding production of thermal and coking coal and exports to China, with continuing development and exploration.  
(*SouthGobi Resources, 58%-owned by Ivanhoe Mines.*)

#### 3. KYZYL GOLD PROJECT, KAZAKHSTAN

Development of established gold resources proceeding, with ongoing delineation and exploration.  
(*Altynalmas Gold, 50%-owned by Ivanhoe Mines.*)

#### 4. OSBORNE MINE, CLONCURRY PROJECT, AUSTRALIA

First production of copper and gold from Osborne Mine complex in March 2012; development advancing on copper-gold and molybdenum-rhenium discoveries; plus ongoing exploration of extensive tenements.  
(*Ivanhoe Australia, 59%-owned by Ivanhoe Mines.*)

#### 5. TENNANT CREEK, AUSTRALIA

Regional and ongoing exploration on major, established gold field.  
(*51% earn-in joint-venture interest held by Ivanhoe Australia, which is 59%-owned by Ivanhoe Mines.*)

#### 6. ONGOING COPPER AND GOLD EXPLORATION

Exploration programs directed toward discoveries of porphyry copper-gold and epithermal gold deposits in Indonesia, the Philippines and Mongolia.

## Across generations: resources and responsibilities



Geophysicist **Samand Sanjdorj**, one of the pioneer discoverers and a 15-year Oyu Tolgoi veteran, joined the BHP exploration team in 1997, signed on with Ivanhoe Mines in 2000 and today is Vice-President of Oyu Tolgoi Operations for Oyu Tolgoi LLC.



In 2011, **SouthGobi Resources** donated a kindergarten to the township of Gurvantes, covering schooling for 100 children provided by 10 teachers and staff, as part of the company's ongoing commitment to helping to sustain communities through local partnerships.

Separate company and project websites contain details of corporate citizenship initiatives.



**Paula Kilby**, a development geologist with Ivanhoe Australia, is part of a team that has brought success to the company's strategy of achieving growth through exploration discoveries on its tenements in northwestern Queensland.



# Oyu Tolgoi

IVN: NYSE,  
TSX & NASDAQ

Mongolia

[www.IvanhoeMines.com](http://www.IvanhoeMines.com)

[www.OT.mn](http://www.OT.mn)

## Counting down to start-up

Beginning with the first major gold and copper discovery in 2001, The Oyu Tolgoi Decade included a succession of discoveries, six years of development works and 18 months of construction on a scale unprecedented in Mongolia's history. Now all stakeholders in the Oyu Tolgoi Project are counting down to the scheduled start-up of the mining complex in 2012.

For Mongolians, who revere their history makers while also anticipating their nation's heralded future as one of the world's great centres of mineral production, Oyu Tolgoi has come to be widely seen as a symbol of economic opportunity and proud achievement. The emerging nation, which believed it could, now is showing the world that indeed it can – with the support of international capital, experience, technology and manufacturing might.

Oyu Tolgoi is Act One. The Oyu Tolgoi Decade has challenged Mongolia and investors. It has brought changes. Old ideas are showing that they can adapt to different thinking. A new era is finding its footing.

Oyu Tolgoi is delivering on its promises. The Government of Mongolia, on behalf of the people, is a full, participating partner, with a 34% ownership interest through a long-term investment agreement with Ivanhoe Mines that will deliver an estimated 55% share of the mine's projected cashflows to the government. The agreement also will ensure that Mongolian citizens hold at least 90% of all jobs during Oyu Tolgoi's operations, which some suggest could extend over 100 years. Oyu Tolgoi is spending US\$85 million over five years for education and training programs to help Mongolians fill the vacancies.

The first phase of Oyu Tolgoi's development is on track to begin initial production of copper, gold and silver concentrate in the third quarter of 2012. The project, managed by Rio Tinto since 2010, plans to build up to commercial production in the first half of 2013. Oyu Tolgoi will set about fulfilling its destiny as one of the world's largest porphyry copper-gold mines. And during the coming decade, Mongolia and Oyu Tolgoi will become even more familiar on global mining's centre stage.

Operator **U. Erdenetsogt** (left) and rigger **P. Batzaya**, members of the open-pit construction crew.



## Big dig uncovering open-pit ore

An open-pit mine will supply initial ore for the first phase of Oyu Tolgoi's development. The pit is being excavated on the Southern Oyu deposits, which include Southwest Oyu – Ivanhoe Mines' first major discovery, in 2001. Overburden is being stripped away to expose ore at the top of the gold-copper deposit (pictured below). Ore from the open pit will be used in pre-commissioning of the adjacent primary crusher, overland conveyor and coarse-ore storage systems in April 2012.

The Oyu Tolgoi Project has assembled and is commissioning the first of two high-performance, electric rope shovels (pictured above) that will operate in the open pit. The shovel, capable of scooping up 100 tonnes of ore, or 56 cubic metres, at a time, can mine a total of 30 million tonnes a year. Two smaller, diesel hydraulic shovels are part of the pre-stripping fleet.



**COVER:** Advanced construction of key elements of the first phase of the Oyu Tolgoi mining complex in southern Mongolia in early 2012. Foreground: excavation to remove overburden at the open-pit mine. Background, from left: concentrate storage building; concentrator; pebble crusher; coarse-ore storage and conveyor from the primary crusher; and headframe over Shaft #2.



# Oyu processing complex Tolgoi



Mechanics B. Bat-erdene (left) and B. Chinзориг are among the 6,550 Mongolians who were employed at the Oyu Tolgoi site at the end of 2011; an additional 3,600 Mongolians were participating in off-site training programs.

The construction workforce peaked at 14,760 in October 2011, when it was racking up 130,000 person-hours a day on the job.

In the concentrator, the process of producing copper, gold and silver concentrate begins when crushed ore is fed into the two giant, 11.6-metre-diameter (38-foot) semi-autogenous grinding mills (far right). After further grinding in the four ball mills, a slurry of pulverized ore and water is piped to the bank of flotation cells (centre) and thickeners to produce a concentrate that, after drying, is bagged and shipped to smelters. The concentrator will handle 100,000 tonnes of ore each day during phase-one production.





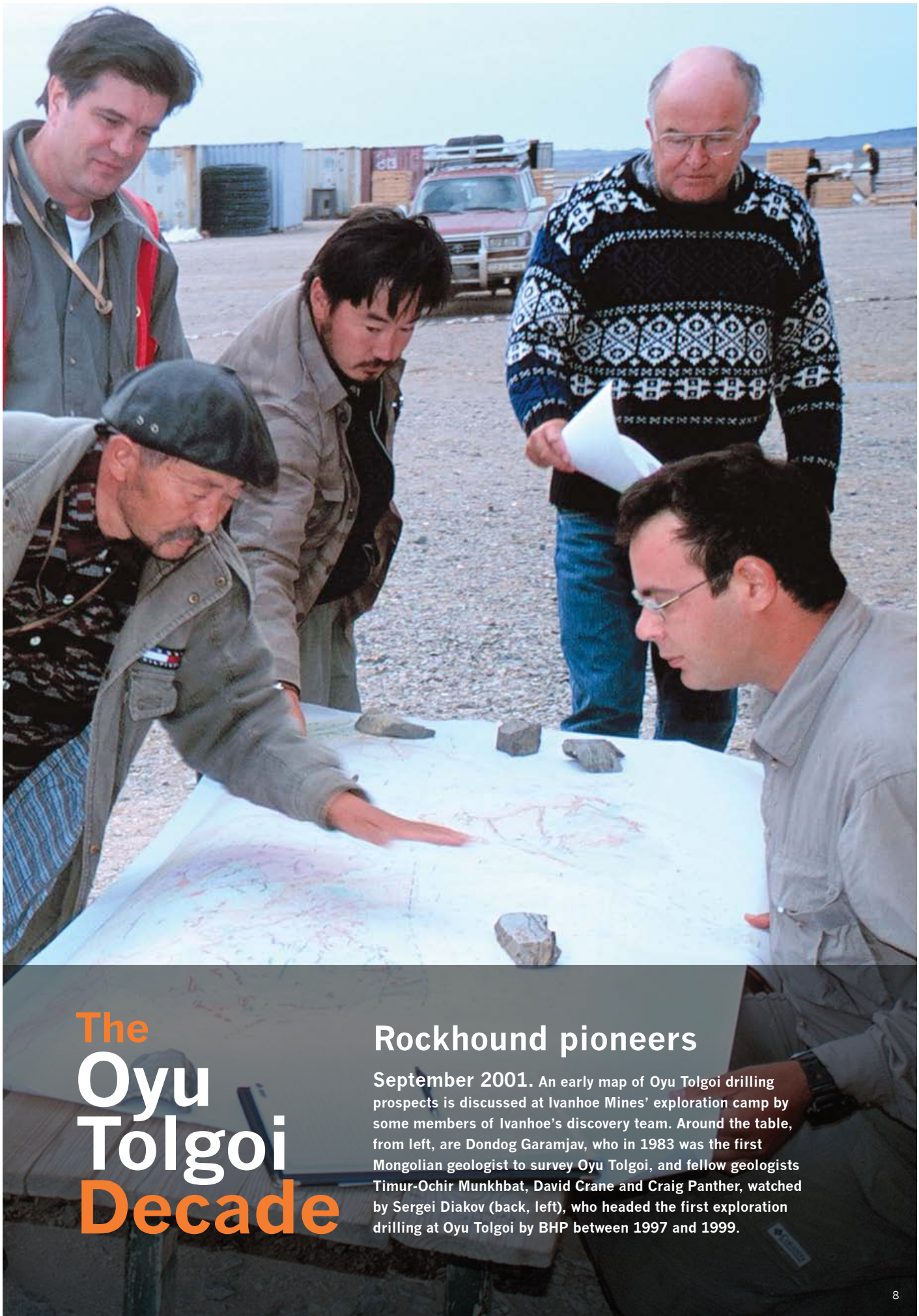


# Oyu Tolgoi

LEFT. One of the key items of infrastructure is the overland conveyor, which will maintain the supply of ore from the open-pit mine to the concentrator complex. The 2.4-kilometre-long (1.5-mile) conveyor links the primary crusher (upper right), adjacent to the open pit, to the vast, coarse-ore storage building.

ABOVE. The 31-storey (97-metre) headframe being built over Shaft #2 will tower over the original Shaft #1 headframe (far right), which has been in operation since 2006. Shaft #2, 10 metres in diameter, will be part of the phase-two underground mine that will boost production to up to 160,000 tonnes of ore a day.

BELOW. Development of the underground mine is continuing 1,300 metres below the Gobi Desert. Another 6,460 metres of access tunnels were excavated in 2011, pushing the total to 10,241 metres since 2008 – with another 28,000 metres still to be completed before 2016, when underground mining is scheduled to begin.



## The Oyu Tolgoi Decade

### Rockhound pioneers

September 2001. An early map of Oyu Tolgoi drilling prospects is discussed at Ivanhoe Mines' exploration camp by some members of Ivanhoe's discovery team. Around the table, from left, are Dondog Garamjav, who in 1983 was the first Mongolian geologist to survey Oyu Tolgoi, and fellow geologists Timur-Ochir Munkhbat, David Crane and Craig Panther, watched by Sergei Diakov (back, left), who headed the first exploration drilling at Oyu Tolgoi by BHP between 1997 and 1999.

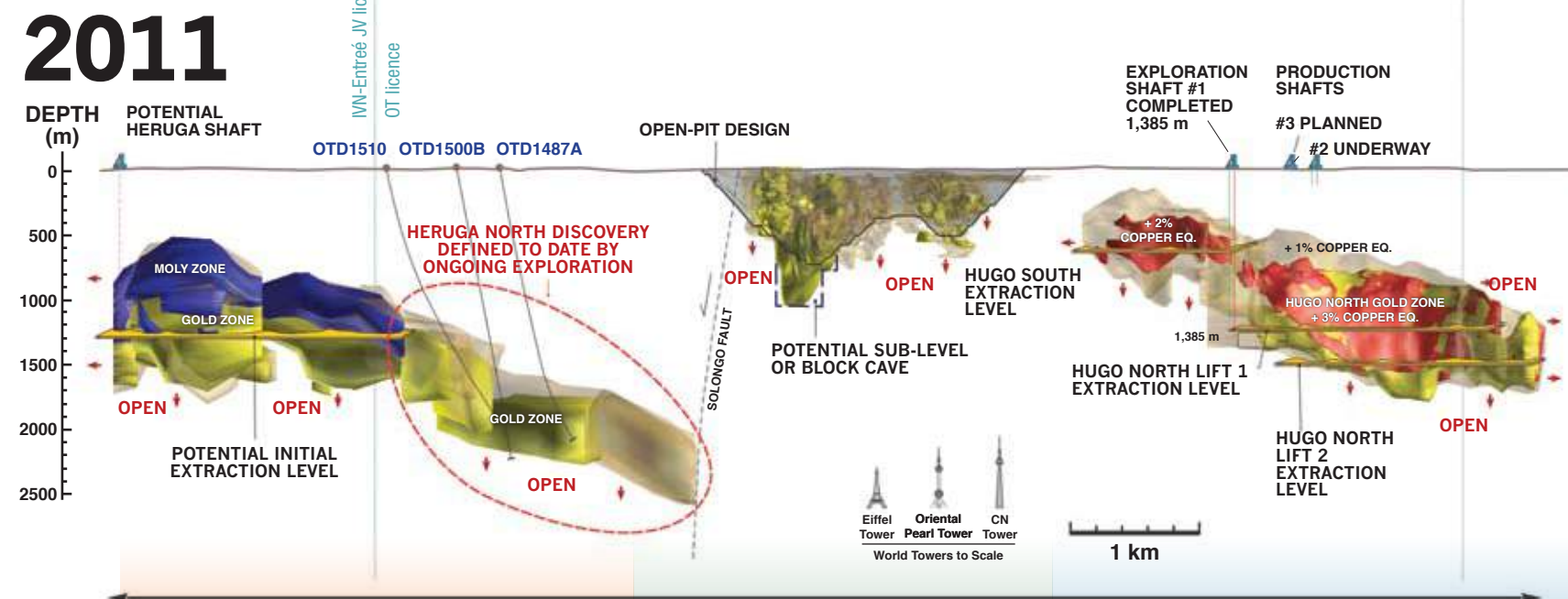
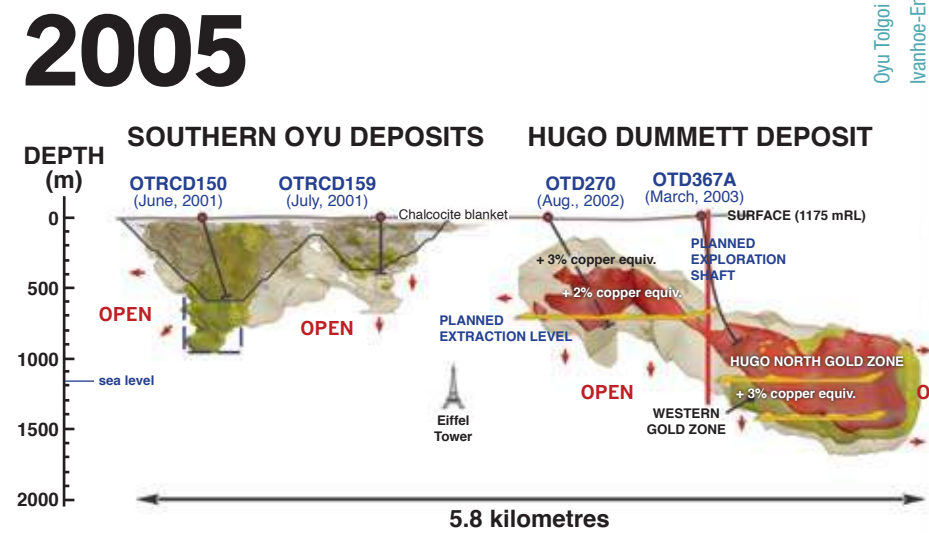
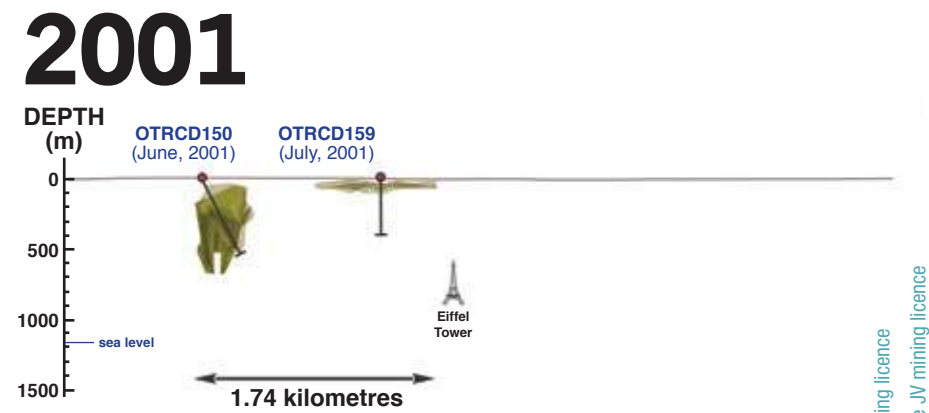


**1 million metres  
(621 miles) of drilling  
– and counting**

**June 2001.** The dawn of Ivanhoe Mines' discoveries arrived when the company's deep exploration hole #150 was drilled 590 metres into the Southwest Oyu Zone – and hit a major, gold-rich deposit beneath Mongolia's Gobi Desert at Oyu Tolgoi (Turquoise Hill).

The discovery finally answered a five-year-old geological question by demonstrating, for the first time, that the South Gobi Region indeed was highly prospective for very large porphyry deposits that could support world-scale mining.

Over the ensuing decade, Ivanhoe's massive drilling campaign succeeded in discovering Oyu Tolgoi's remarkable chain of copper, gold, silver and molybdenum deposits. By the end of 2011, a total of one million metres (621 miles) had been drilled in 2,362 exploration holes since May 2000. The Oyu Tolgoi deposits contain an estimated 81 billion pounds of copper and 46 million ounces of gold in Measured & Indicated, plus Inferred, resources.



**Future Phase**  
Underground Block-Cave Mine  
HERUGA DEPOSIT

**Phase 1**  
Open-Pit Mine  
**SOUTHERN OYU DEPOSITS**  
Production set for 2012

**Phase 2**  
Underground Block-Cave Mine  
HUGO DUMMETT DEPOSIT  
Production projected in 2016

## Discoverers & builders

**March 2004.** The achievements of the Ivanhoe Mines geological team were recognized by North America's largest industry organization, the Prospectors and Developers Association of Canada, which declared the Hugo Dummett Deposit the world's most significant mineral discovery in 2003.



October 2002: Camp gateway.

The Hugo Dummett discovery firmly established Oyu Tolgoi as a global super-giant storehouse of porphyry mineralization.

**January 2008.** The Oyu Tolgoi mining team celebrated the completion of Shaft #1 to a final depth of 1,385 metres – the deepest underground shaft ever excavated in Mongolia. By the end of 2011, a 10,241-metre-long (6.4-mile) web of development tunnels reached out from Shaft #1's 1,300-metre level to the Hugo Dummett high-grade copper and gold deposit.

**October 2005.** Drilling had established that the Hugo Dummett Deposit contained the world's highest-grade porphyry copper discovery. Planning for an underground block-cave mine at the deposit was well underway – and so was construction of the headframe for the sinking of the 6.7-metre-diameter Shaft #1 to provide working access for mine development.

**September 2003.** By mid-2003, drilling had discovered resources totalling 38 billion tonnes of copper and 21 million ounces of gold. At the peak of exploration, Oyu Tolgoi's fleet of 21 rigs was producing more than 1,000 metres of drill core every day.







# SouthGobi Resources

SGQ: TSX  
& 1878: HK  
Mongolia

[www.SouthGobi.com](http://www.SouthGobi.com)

## Ovoot Tolgoi mine a growing supplier to China

SouthGobi's flagship Ovoot Tolgoi Mine (pictured above), located in southern Mongolia approximately 40 kilometres north of the border with China, is continuing to benefit from China's demand for quality coal. As mines develop in Mongolia, and new roads and railways are built to deliver coal to industrial consumers in China, coking coal imports from Mongolia have soared and now far outstrip China's imports from all other coal-producing nations.

Ovoot Tolgoi, now in its fourth year of operation, reported record annual production in 2011 of 4.5 million tonnes – a 63% increase over 2010 and reflecting the continuing, successful ramp-up of operations. The company is targeting to double its production at Ovoot Tolgoi by 2015. Coal sales in 2011 also hit a record level of 4.0 million tonnes, 58% higher than in 2010.

As part of its long-range strategy to develop key infrastructure to support its coal projects, SouthGobi and consortium partner, NTB LLC, plan to begin work in 2012 on a paved highway between the Ovoot Tolgoi complex and the Mongolia-China border that will be capable of transporting more than 20 million tonnes of coal a year.

In February 2012, SouthGobi successfully commissioned a new dry-coal handling facility to crush, sort and blend its coal products for greater overall quality and consistency. It will enable the company to capture more value than is obtained through sales of raw coal. An agreement to wet-wash and upgrade a portion of Ovoot Tolgoi's coal at a new plant in China, approximately 50 kilometres from the mine, is expected to add further value to SouthGobi's products in 2012.

Following a successful exploration program in 2011, SouthGobi announced an increase in resources at the Ovoot Tolgoi Mine and an associated underground deposit in March 2012. The Measured & Indicated resources now stand at 302 million tonnes, a gain of 14%, with an additional Inferred resource of 86 million tonnes.

SouthGobi received a mining licence in 2011 for its Soumber Deposit, and is advancing its mine development planning. Ongoing exploration has increased Soumber's Measured & Indicated resources to 137 million tonnes, a gain of 124%, accompanied by a 27% increase in Inferred resources to 83 million tonnes.



# Ivanhoe Australia

IVA: ASX & TSX  
Australia

[www.IvanhoeAustralia.com](http://www.IvanhoeAustralia.com)

## Refurbished Osborne Mine producing copper and gold

In March 2012, Ivanhoe Australia made its long-anticipated graduation from a company that had built a reputation on exploration successes to officially become a miner with significant inaugural gold and copper production.

The Osborne Copper Gold Project (pictured above), in northwestern Queensland's historic Cloncurry mining district, has been returned to production under Ivanhoe Australia's ownership. The first shipments of copper-gold concentrate, produced from ore from the Osborne and Kulthor underground mines, were trucked to the regional seaport at Townsville on March 7, 2012, for export to international smelters. Ivanhoe Australia launched a year-long, A\$30 million program to refurbish the existing plant and develop the underground resources after it acquired the assets in 2010.

The Osborne plant is expected to process up to two million tonnes of ore in 2013. Annual production is expected to average 21,000 tonnes of copper and 34,000 ounces of gold in concentrate for up to 20 years, with ore also being supplied from other deposits on Ivanhoe Australia's tenements.



Flotation roughers in Osborne processing plant



Stockpile of copper-gold concentrate

During 2011, Ivanhoe Australia completed the first phase of the mine access decline, including more than 1,700 metres of tunneling, at its Merlin Project. The company is developing what has been confirmed to be the world's highest-grade molybdenum and rhenium deposit, which has the potential to produce more than 5,000 tonnes of molybdenum and seven tonnes of rhenium per year for an initial 10 years.

Mount Elliott, Ivanhoe Australia's flagship project, is recognized as one of the largest copper-gold mineralized systems ever discovered in Australia, with the potential to provide the company with a long-life production base.



# Altynalmas Gold

## Kazakhstan



### New resources and treatment process advance Kyzyl Gold plans

Altynalmas Gold announced in February 2012 that an independent feasibility study of its privately held Kyzyl Gold Project in northeastern Kazakhstan confirmed an 18% increase in the Indicated mineral resource, which now totals an estimated 7.3 million ounces of gold, plus an additional 3.0 million ounces of gold in an Inferred resource. The study's estimated Mineral Reserve of 5.7 million ounces of gold, contained within the Indicated resource, was based on an underground mining operation producing an average of 337,000 ounces of gold per year during an initial mine life of up to 15 years.

Altynalmas is advancing development of the Kyzyl Gold Project, which contains the Bakyrchik and Bolshevik gold deposits and a number of satellite deposits. Plans involve re-development of the Bakyrchik underground mine; construction of a new processing plant, incorporating fluidized-bed ore-roasting technology; and supporting mine infrastructure.

The study also reported the successful testing (inset picture) of a metallurgical process that recovers at least 88% of contained gold and the development of an innovative and proprietary ore treatment process that produces an environmentally stable, iron arsenate mineral by-product that meets international environmental standards. Altynalmas has provisionally applied to patent the technology in the U.S. and Kazakhstan.

Exploration drilling in 2011 totalled 84,552 metres, mostly on Bakyrchik Mining Licence #737. A further 40,000 metres of drilling are planned in 2012.

## Corporate list December 2011

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