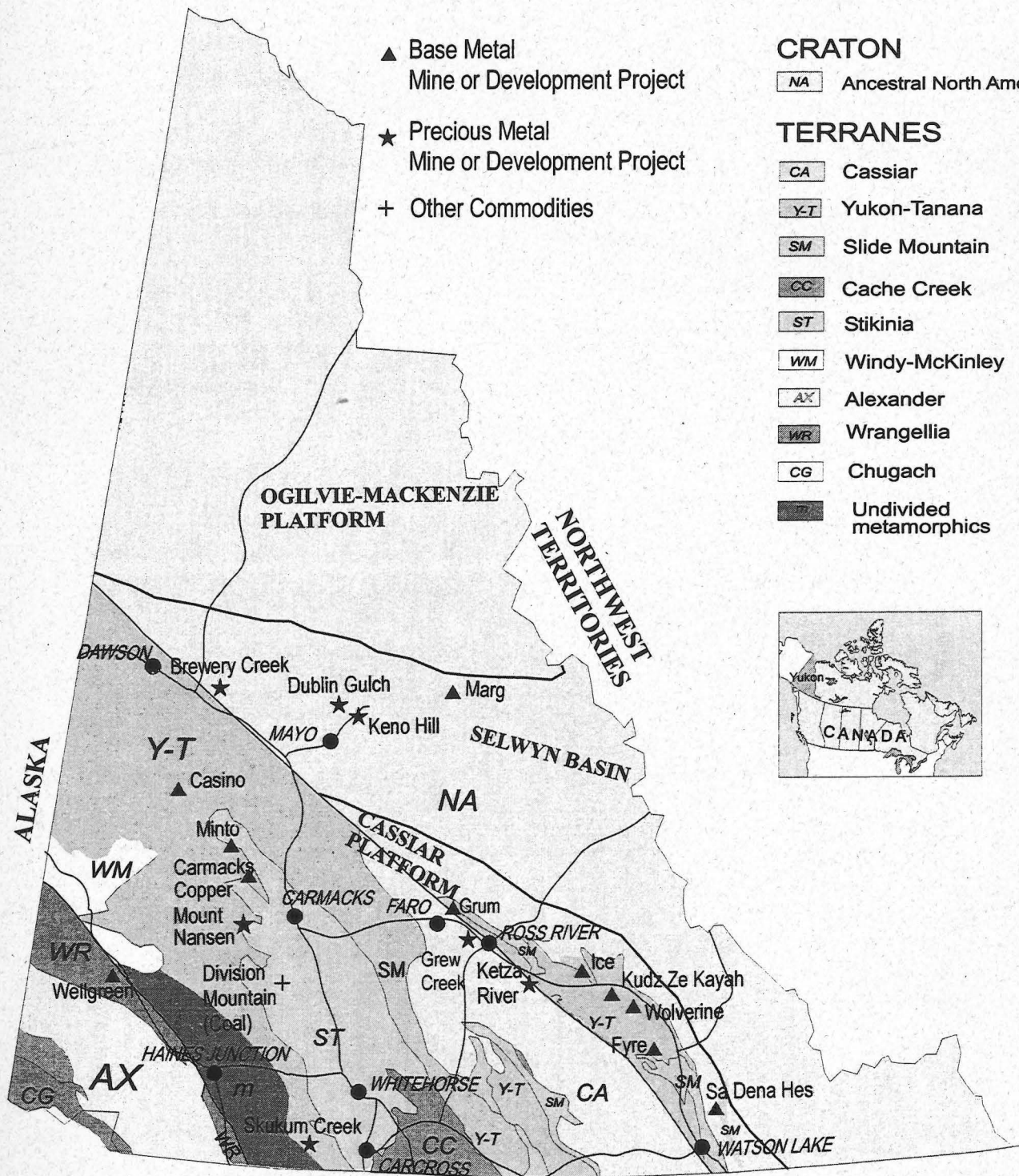
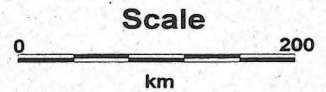


# YUKON MINERAL PROPERTY UPDATE



Prepared by: Mineral Resources Branch  
 Department of Economic Development  
 Government of the Yukon

Last Revised: April 30, 1998



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## CONTACTS

(The area code for the Yukon is 867)

### Department of Economic Development - Yukon Government

**Mailing Address:** Suite 400-211 Main Street  
Box 2703, Whitehorse, Yukon  
Y1A 2C6

**Department Phone 667-5466**  
**Department Fax 667-8601**

		<u>e-mail</u>	<u>Phone</u>
Trevor Harding	Minister	gordon.voogd@gov.yk.ca	667-8416
Maurice Albert	Deputy Minister	malbert@gov.yk.ca	667-5417
Jesse Duke	Mining Facilitator	jesse.duke@gov.yk.ca	667-3422
Lori Walton	Sr. Min. Development Advisor	lori.walton@gov.yk.ca	667-5462
Mary Hagerman	Secretary, Deputy Minister	mary.hagerman@gov.yk.ca	667-5417
Judith Balzor	Secretary, Mining Facilitator	judith.balzor@gov.yk.ca	667-3011
Dianne Carruthers	Marketing Coordinator	dianne.carruthers@gov.yk.ca	667-8085

### Yukon Geology Program

**Mineral Resources Branch - Economic Development, Yukon Government**

**Mailing Address:** 2099-2nd Ave.  
Box 2703, Whitehorse, Yukon  
Y1A 2C6

**Phone 667-8508 (Reception and Information)**  
**Fax 393-6232**

		<u>e-mail</u>	<u>Phone</u>
Grant Abbott	A/Chief Geologist E&GS DIAND	grant.abbott@gov.yk.ca	667-8510
Shirley Abercrombie	Manager, Mineral Resources	sabercro@gov.yk.ca	667-3438
Ken Galambos	Mineral Development Geologist	ken.galambos@gov.yk.ca	667-5996
Craig Hart	Project Geologist	craig.hart@gov.yk.ca	667-8519
Daniele Heon	Mineral Assessment Geologist	daniele.heon@gov.yk.ca	667-5398
Grant Lowey	Placer Geologist	grant.lowey@gov.yk.ca	667-8511
Don Murphy	Senior Project Geologist	don.murphy@gov.yk.ca	667-8516
Charlie Roots	GSC Staff Geologist	croots@gov.yk.ca	667-8513
Will VanRanden	Geologist Draftsperson/Tech	will.vanranden@gov.yk.ca	667-8520

### Department of Indian Affairs and Northern Development

**Exploration and Geological Services Division**

**Mailing Address:** 345-300 Main Street  
Whitehorse, Yukon  
Y1A 2B5

**Phone 667-3201**  
**Fax 667-3198**

		<u>e-mail</u>	<u>Phone</u>
Michael Burke	Staff Geologist	burkem@inac.gc.ca	667-3202
Robert Deklerk	Minfile Geologist	deklerkr@inac.gc.ca	667-3205
Julie Hunt	Mineral Deposits Geologist	huntj@inac.gc.ca	667-3829
William LeBarge	Placer Geologist	lebargeb@inac.gc.ca	667-3134
Ali Wagner	Sales Manager	wagnera@inac.gc.ca	667-3201

### Other Useful Contacts

Whitehorse Mining Recorders Office (Claim Sheets, Mining Legislation Information)	667-3190
Publications Desk (DIAND)	667-3266
Topographical Map Sales (Jim's Toy and Gift)	667-2606
Yukon Prospectors Association	668-7985
Klondike Placer Miners Association	667-2267
Yukon Chamber of Mines	ycmines@polarcom.com 667-2090

## **Mineral Resources Branch Services**

The Mineral Resources Branch of the Department of Economic Development provides the following services to the exploration and mining community;

- administers, in partnership with DIAND, the Yukon Geology Program
- maintains an extensive database of Yukon mining and exploration projects
- provides funding to individuals, partnerships and junior mining companies through the Yukon Mining Incentives Program
- provides information to potential investors on Yukon's mineral potential and mining investment opportunities
- assists exploration and mining companies through the regulatory process by providing advice on contacts, processes and timing requirements
- disseminates information about Yukon's exploration and mining industry and the work of the Yukon Geology Program by attending trade shows and mining conferences
- provides technical expertise on behalf of the Yukon Government on regulatory review committees and working groups

If you want to find out more about Yukon's mineral resources, please free to call Jesse Duke, Yukon's Mining Facilitator at (867)667-3422.

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## **YUKON MINERAL PROPERTY UPDATE**

The information in the Mineral Property Update was compiled by the Department of Economic Development, Mineral Resources Branch. Data was obtained from press releases, Yukon Minfile, mining company websites, property production records, Initial Environmental Evaluations and from information graciously supplied by property owners. In some instances, employment and power requirement figures were not available and estimates were used. Please let us know of any errors or omissions - although the Department of Economic Development cannot take responsibility for the accuracy of the data provided from public sources, we would like for this document to be as up-to-date as possible.

## **"The potential for new placer discoveries in the Yukon remains high"**

**(from a paper by William LeBarge, Placer Geologist, Yukon Geology Program)**

The first placer miners in the Yukon were Indians who recovered native copper nuggets from the White River area in southwestern Yukon. After 1850, prospectors and explorers began to report fine gold on river bars and coarse gold in the Fortymile and Sixtymile Rivers. On August 17, 1896, discovery of nugget gold on Bonanza Creek set off the Klondike gold rush.

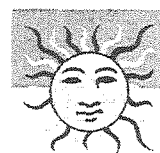
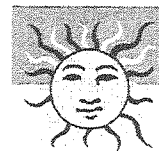
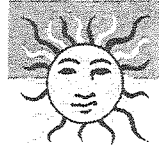
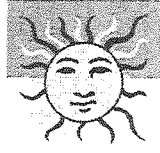
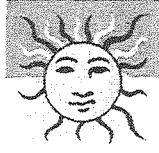
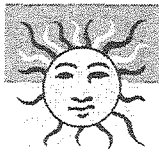
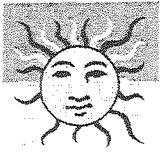
Placer mining is still an important sector in Yukon's economy; in fact, placer mining has contributed to the Yukon economy for over 100 years and continues to do so. In 1996, a total of 109,000 ounces of placer gold valued at \$46 million were produced from 171 placer mines. Most of the placer operations are small and family-run.

Placer gold is getting more difficult to find as reserves in traditional placer mining areas decline. Most placer gold exploration and mining is concentrated in unglaciated areas of the Yukon; by expanding our knowledge of placer gold deposits and applying it to other areas, we may be able to discover new sources of placer gold in different geological settings.

Many people living outside the Yukon would like to find out more about placer mining. Besides the difficulty in actually finding gold, there are various rules and regulations to become familiar with. Please call one of the contacts below to provide you with a general summary of the history of placer mining in the Yukon, an overview of the geological setting of placer gold deposits and some of the factors you must consider when mining for gold.

The staff at the Yukon Geology Program or the Mineral Resources Branch at DIAND can provide you with information and advice regarding placer mining in the Yukon. Publications on placer mining in the Yukon are available through the Publications Desk for the Yukon Geology Program. Some initial contact numbers are given below (note Yukon's area code is 867):

Klondike Placer Miners Association	P.O. Box 4427 3151-3 <sup>rd</sup> Ave Whitehorse, Yukon Y1A 3T5	667-2267	668-7127
William Lebarge	Placer Geologist Yukon Geology Program	667-3134	667-3198
Grant Lowey	Placer Geologist Yukon Geology Program	667-8511	393-6232
Whitehorse Mining Recorder (DIAND) - Placer claim maps	102-300 Main Street Whitehorse, Yukon Y1A 2B5	667-3190	667-3267
Placer Section Mineral Development (DIAND)	325-300 Main Street Whitehorse, Yukon Y1A 2B5	667-3211	667-3193
Publications Desk (located at the Whitehorse Mining Recorders Office)	102-300 Main Street Whitehorse, Yukon Y1A 2B5	667-3266	667-3267



# YUKON MINING FACTS

# *A Bright Future*

(Figures are from 1997, except where noted)

**Population:** 33,390

**Area:** 483,450 square kilometres

**Major Industries:** Mining, Tourism, Construction

**GDP:** \$841 million (revised estimate)

**Total Value of Yukon Mineral Production:** \$231 million

**Expenditures on Mine development:** \$23 million

**Placer Gold Production:** \$42 million

**Gold Production:** 116,000 crude oz.

**New Claims Staked:** 9,628

**Number of Placer Mines in the Yukon:** 183

**Total Crude Ounces of Gold Produced:** 116,000

**Mineral Exploration & Development:** \$90 million

**Tourism Expenditures:** (1996) \$124 million

**Renewable Resource Production:** \$16.9 million

**Retail Trade:** \$300.4 million

**Average Weekly Wage:** \$707.39

**Minimum Wage:** \$7.06/hour

**Value of Real Estate transactions:** \$110.5 million

**Average House Price (Whitehorse):** \$138,000

**Commercial Lot Price:** \$34 a square foot

**Power Rates:** First 1,000 kilowatt, 9.86 cents/kW.h: over 1,000 kilowatt hours, 10.87 cents/kW.h **Industrial Rate:** Cost of service approximately 7.3 cents/kW.h

**Property Taxes (Whitehorse):** Residential: 1.275% of assessed value.

Non residential: 1.411% of assessed value

**Corporate Taxes:** 15 per cent of taxable income, 2.5 per cent for manufacturing companies, special tax credit of 30 per cent on manufacturing investments

**Personal Income Tax:** 50 per cent of the basic federal tax

**Sales Tax:** No territorial tax, 7% federal Goods and Services Tax

**Chambers:** Yukon Chamber of Mines, 3131 3<sup>rd</sup> Ave., PO Box 4427

Whitehorse, Yukon, Canada Y1A 3T5 Phone (867) 667 2090/Fax (867) 668 7127

# INVEST IN THE YUKON

Contact: *Jesse Duke, Mining Facilitator*

*Economic Development, Yukon Government*

*PO Box 2703, Whitehorse, Yukon, Canada Y1A 2C6*

*Telephone: (867) 667 3422 Fax (867) 667 8601*

*email: jesse.duke@gov.yk.ca*

# STAGES OF MINING

## Yukon Projects

Permitting Process Stages

Environmental Baseline Studies

Permitting Process Begins.

Company Submits Project Overview

Company Submits Initial Environmental Evaluation (IEE)

Water License Application

Water License Received

### REGIONAL EXPLORATION

- Prospecting
- Regional surveys

- Finlayson Lake area
- McQuesten Intrusive Belt (Mayo to Dawson area)
- Dawson Range Cu/Au belt

### PRELIMINARY EXPLORATION

- Discovery of Mineralization
- Delineation of Mineral Zone
- Magnitude of Deposit

- Faro-Grizzly (on hold)
- Division Mountain
- Grew Creek

### ADVANCED EXPLORATION

- Diamond Drilling
- Trenching

- Marg
- Ketza River
- Mt Skukum/Skukum Creek
- Wellgreen
- Wolverine Lake
- Fyre Lake

### PRELIMINARY FEASIBILITY STUDY

- ore reserves
- scale of operation
- development plan
- capital costs
- operating costs
- cash flow
- net present value

- Casino

### TEST MINING PROGRAM

- sink shaft
- obtain bulk sample
- test ore continuity
- identify U.G. problems

- Dublin Gulch
- Kudz Ze Kayah
- Carmacks Copper
- Sa Dena Hes (on hold)
- Tulsequah Chief

### FINAL FEASIBILITY

- similar to Preliminary but more detailed
- budget for operating and capital costs
- cash flow projection

- United Keno Hill

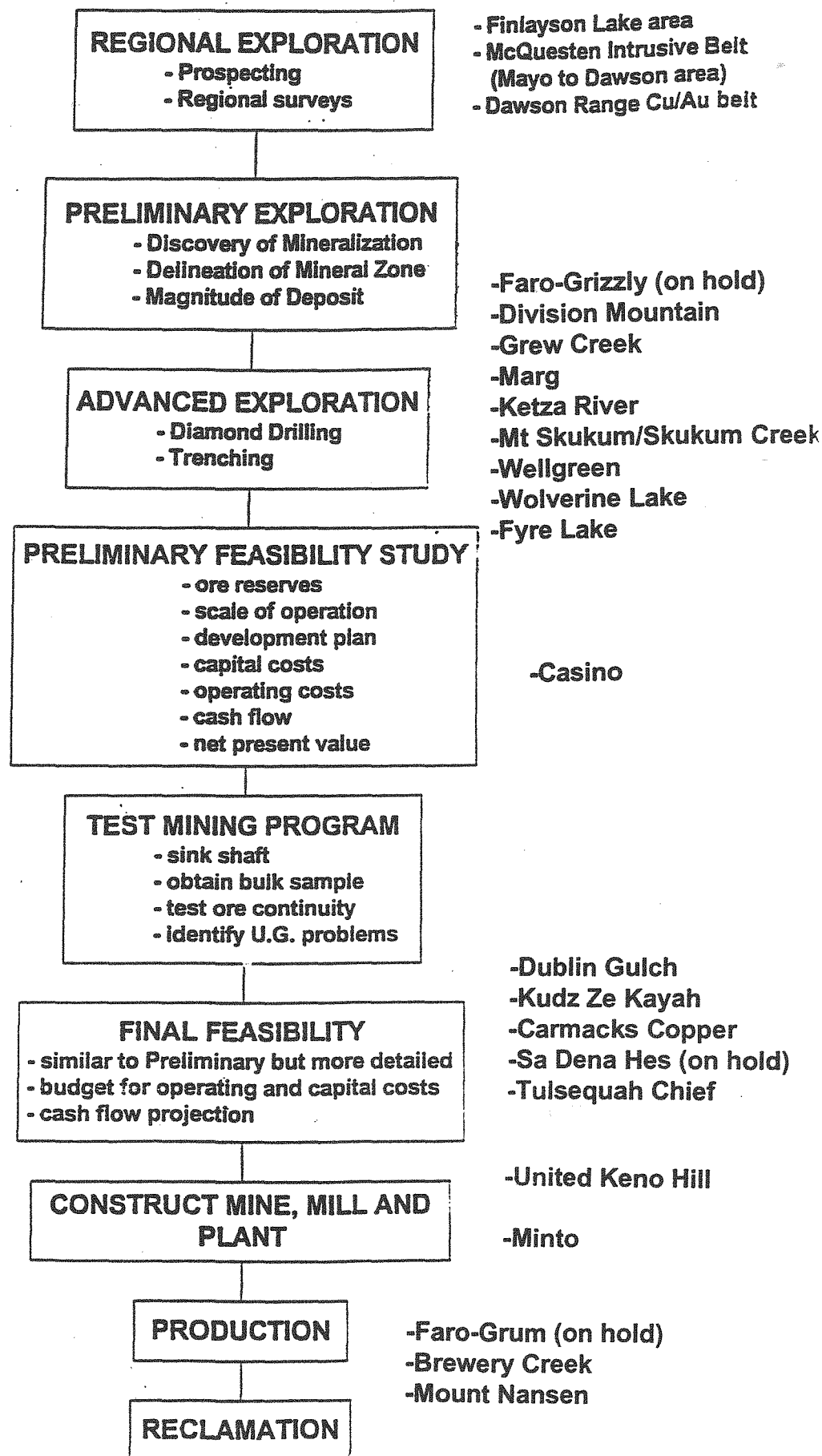
### CONSTRUCT MINE, MILL AND PLANT

- Minto

### PRODUCTION

- Faro-Grum (on hold)
- Brewery Creek
- Mount Nansen

### RECLAMATION

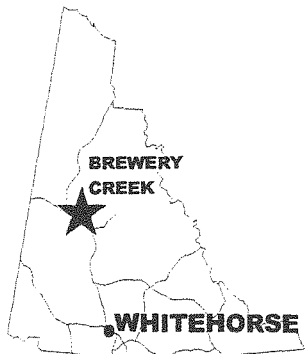


## YUKON'S TOP MINING PROJECTS: 1998

MINES	RESERVES	STATUS
<b>Brewery Creek</b> <i>Viceroy Resource Corporation</i>	Mineable Reserves 13,300,000 tonnes 1.44 grams/tonne gold	In production. 75,000 ounces of gold production expected in 1998. Aggressive exploration to increase reserves.
<b>Mount Nansen</b> <i>B.Y.G. Natural Resources</i>	Mineable Reserve 386,337 tonnes 75.09 grams/tonne silver 5.17 grams/tonne gold	In production. Over 50,000 ounces in gold production expected this year. Company actively building reserves and acquiring gold properties in Yukon.
<b>Keno Hill</b> <i>United Keno Hill Mines Ltd.</i>	Geological Resource 838,758 tonnes, 4.58% lead 3.76% zinc, 1022.06 grams/tonne silver	Reopening planned for late 1998. New water license in place. Financing is being secured.
<b>DEVELOPMENT PROJECTS</b>		
<b>Dublin Gulch</b> <i>New Millennium Mining Ltd.</i>	Mineable Reserve 47,500,000 tonnes 0.91 grams/tonne gold	Undergoing final stages of environmental assessment. Construction planned after Water License is secured.
<b>Minto</b> <i>Asarco Inc./Minto Explorations Ltd.</i>	Mineable Reserves 7,200,000 tonnes 2.13% copper 7.54 grams/tonne silver 0.51 grams/tonne gold	Water license is signed. Construction planned for 1998.
<b>Kudz Ze Kayah</b> <i>Cominco Ltd.</i>	Mineable Reserves 11,300,000 tonnes 0.93% copper, 1.52% lead 5.89% zinc, 133.0 grams/tonne silver, 1.34 grams/tonnes gold	Environmental screening report complete. Water license should be signed in 1998.
<b>Carmacks Copper</b> <i>Western Copper Holdings Ltd.</i>	Mineable Reserves 14,109,800 tonnes 1.01% copper 0.51 grams/tonne gold	Undergoing final phases of environmental assessment.
<b>Division Mountain Coal</b> <i>Cash Resources</i>	Geological Reserves: 45 million tonnes 2.42% residual moisture 28.45% ash, 25.79% volatiles 43.18% fixed carbon, 0.43% sulphur 5,216 kCal/kg (9,328 BTU/lb)	Additional reserve development, scoping and feasibility studies underway towards developing an export market and local power generation. Environmental assessment to begin next year.  Washability tests indicate an export quality product can be produced
<b>Wolverine</b> <i>Atna Resources Boliden Limited</i>	Geological Resource 6,237,000 tonnes 12.66% zinc, 1.33% copper 1.55% lead, 370.9 grams/tonne silver, 1.76 grams/tonne gold	Joint Venture partners are reviewing project.
<b>EXPLORATION PROJECTS</b>		
<b>Fyre Lake</b> <i>Columbia Gold Mines</i>	Preliminary resource of 15.4 million tonnes within which 8.2 million tonnes grade 2.1% copper, 0.11% cobalt, 0.73 g/t gold	Advanced exploration planned for 1998. Preliminary reserve estimate based on wide-spaced drill holes.
<b>Marg</b> <i>United Keno Hill Mines Ltd.</i>	6,092,000 tonnes 1.76% copper 2.46% lead 4.6% zinc 62.7 grams per tonne silver 1.00 grams per tonne gold	Feasibility study planned after the Keno Hill mine re-opens
<b>Mt. Skukum/Skukum Creek</b> <i>Omni Resources</i>	Mineable Reserves Rainbow Zone - 956,949 tonnes @ 6.3 g/t Au, 193.5 g/t Ag Kuhn Zone - 148,781 tonnes @ 8.78 g/t Au, 167.70 g/t Ag	Feasibility study planned for 1998.
<b>Wolf</b> <i>Atna Resources/YGC Resources</i>	Zn-Pb-Ag volcanogenic massive sulphide target	Delineation drilling planned for 1998.
<b>Taiga</b> <i>Blackstone Resources Glenhaven Resources</i>	Stratiform Ni-Zn-PGE target	Extensive drill program planned for 1998
<b>Wayne</b> <i>Viceroy Resource Corporation</i>	Gold bearing calc-silicate skarn target	Extensive drill program planned for 1998.



## BREWERY CREEK MINE



### Viceroy Resource Corporation

President: Paul Saxton

#### Corporate Headquarters

22<sup>nd</sup> Floor, Oceanic Plaza  
1066 West Hastings Street  
Vancouver, B.C., V6E 3X2  
Phone: (604) 688-9780  
Fax: (604) 682-3941

Email: [info@viceroyresource.com](mailto:info@viceroyresource.com)

#### Brewery Creek Mine

Bag 5040  
Dawson City, Yukon, Y0B 1G0  
Phone: (867) 993-6057  
Fax: (867) 993-5606

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

### Project Status

In Production

#### Location

57 km east of Dawson City

#### Ownership:

Viceroy Resource Corporation

#### Commodity:

Gold

#### Ore Type:

Oxide

#### Mineable Reserve:

13.3 million tonnes @ 1.44 g/t

#### Mining Method:

Open-Pit Heap Leach, carbon adsorption/desorption/recovery

#### Stripping Ratio:

1.2:1

#### Current Mine Life:

7.5 years

#### Recovery Rate:

78%

#### Production:

1997: 72,387 ounces of gold

1998: 85,000 ounces of gold (f)

#### Cash Costs Per Ounce

US \$200

#### Cash Cost Per Tonne:

US \$8.19

#### Employees:

143

#### Power:

2 MW, On Site Diesel

## HISTORY

Gold mineralization in the Brewery Creek area was discovered in 1987 by Noranda Exploration as a result of following up a regional geochemical anomaly identified in a survey funded by the Canada-Yukon Mineral Development Agreement. Follow-up exploration work including extensive geochemical and geophysical surveys, mapping, prospecting and 9,000 feet of reverse circulation and diamond drilling were carried out from 1988 to 1992. In 1992 Loki Gold Corporation acquired a 100% interest in the property and began mine development work. A total of \$17 million was spent on the property before the start of construction. Loki Gold's Class A Yukon Water License was signed on August 9, 1995 and construction began immediately. Loki Gold Corp and Baja Gold Inc. shareholders approved a merger with Viceroy Resource Corporation in May, 1996. Viceroy owns 100% of Brewery Creek. The first bar of gold was poured on November 15, 1996, and the mine reached full production in May, 1997. The Brewery Creek Mine is the largest lode gold mine ever constructed in the Yukon.

**PROJECT SUMMARY**

The Brewery Creek Mine covers 16,160 hectares located between 540 m and 1,225 m elevation, 55 km east of Dawson City, Yukon. It is a year-round heap leach operation with seasonal open-pit mining of 11,000 tonnes of ore per day, 2,000,000 tonnes between April and October each year. Heap leaching of the ore takes place throughout the year. Most gold production takes place during the third and fourth quarters. A total of 80 mine and maintenance personnel work 12 hour days, consisting of a 14 day on and seven day off rotation. Most employees reside at the mine camp, which has a permanent capacity of 124 rooms. The work force is 100% Yukon-based. A Socio-Economic agreement has been signed with the Tr'ondek Hwech'in First Nation which provides for employment, a scholarship fund, finder's fees and a framework for exploration and joint-venture activities on other First Nations land. It also provides for First Nations representation at technical, operational and environmental management meetings.

**GEOLOGY AND MINERALOGY**

Gold mineralization is structurally controlled and primarily contained in sedimentary and intrusive rocks in the hanging wall of reactivated thrust faults. The host rocks include porphyritic quartz monzonite, hornblende monzonite, interbedded sandstones and greywackes and fine-grained ash tuffs and pyroclastics. Gold primarily occurs as submicron size particles with arsenopyrite and pyrite as growth bands around larger sulphide grains.

A total of eight main oxide deposits were originally delineated at Brewery Creek. From east to west these are the Lucky, Golden, Kokanee, Fosters, Canadian, Moosehead, Blue and Pacific Deposits. Collectively, these deposits are referred to as the Reserve Trend. The Upper Fosters deposit is being mined first, to be followed by the Kokanee, Blue, Moosehead, Pacific and Lucky deposits.

**ORE CHARACTERISTICS**

Gold production at the Brewery Creek Mine comes largely from oxide ore and minor amounts of transition (mixed oxide/sulphide) ore. Since most of the gold is concentrated in the outer rim, limited oxidation is required to liberate it from the sulphide minerals. Sulphide mineralization generally lies down-dip from known oxide reserves and is refractory. Initial work indicates that the sulphide ore may be amenable to bio-oxidation with gold recoveries in the range of 90%.

**INFRASTRUCTURE**

The mine facility consists of a large permanent heap leach pad, an adsorption, desorption and gold recovery (ADR) plant, process and overflow ponds and ancillary facilities, including a power plant, water supply systems, mine service buildings and an assay laboratory. Mine service buildings include a two bay maintenance shop, mine offices, warehouse and cold storage and ambulance garage.

The leach pad is divided into 10 discrete cells, each nominally 83 metres wide and 462 metres long, which provides the ability to apply solution to one cell while simultaneously washing and detoxifying ore in other cells. The current pad layout provides space to accommodate 18,000,000 tonnes of stacked, run of mine ore. The pad capacity is expandable. The design of the pregnant solution ponds is conventional.

A multiple-layer liner system has been installed under the heap to collect process solution and direct it to the recovery plant, as well as to prevent leakage to the environment. Of prime concern, because of the severe winter conditions is the possible loss of solution to the ponds and subsequent freezing of the drip emitter system during an equipment failure. Temperatures have dipped to as low as -43.5 degrees C. To prevent this, the following features were incorporated into the design:

- Ore under leach is covered with a layer, or frost cover, of ore to act as an insulator
- All outside piping is insulated and heat traced
- Waste heat from the diesel generator engines is used to heat the outgoing barren solutions
- A waste oil-fired heat exchange is used to heat circulating solutions.

Ore processing employs a sodium cyanide, heap leach of run-of-mine gold ore. Gold recovery from pregnant leach solutions is by activated carbon adsorption and pressurized caustic solution desorption followed by electrowinning onto steel wool and on-site smelting to gold bullion.

**PRODUCTION**

A total of 2,100,000 tonnes of ore were mined in 1997, along with 3,600,000 tonnes of waste at a stripping ratio of 1.71 to 1. A total of 2,000,000 tonnes of ore with an average grade of 1.87 grams gold/tonne were delivered to the leach pad, exceeding the original budgeted grade of 1.52 grams/tonne. Production in 1997 came from the Kokanee and Golden Pits. A total of 72,387 ounces of gold during 1997 were produced, with 66,545 ounces produced at a cash operating cost of US \$184 per ounce after full production was achieved in May 1997. The mine has produced a total of 82,562 ounces of gold since the operation began in late 1996.

The Brewery Creek Mine is forecast to produce 77,500 ounces of gold at a cash operating cost of US \$200 per ounce in 1998 with mining scheduled to resume in April, 1998. Beyond 1998, the mine is forecast to produce an estimated 75,000 ounces of gold annually at a similar cash cost. Mine reclamation costs are estimated at Cdn. \$6,000,000 (\$0.30 per tonne of ore is being set aside to cover these costs).

**ENVIRONMENTAL CONSIDERATIONS AND RECLAMATION**

A full environmental review, including baseline studies, heritage and archaeological investigations and an estimate of socioeconomic impacts was completed for the Brewery Creek Mine. The following environmental design considerations were included:

- layout of the plant, facilities and roads to minimize adverse visual impacts
- disposal of over 70% of mine waste in the spent pits
- a multi-layer liner system, installed under the leach pad to prevent leakage to the environment and to direct collected process solution to the recovery plant
- a leak detection system to act as a further safeguard against leakage
- double lining of process ponds with polyethylene, including two overflow solutions, on pregnant and one barren
- equipping process ponds with internal leak detection systems.

Monitoring of wildlife and air and water quality is ongoing during mine operations.

Post-mining reclamation, estimated at \$8.7 million will be extensive. Final effluent solution will be treated to destroy residual cyanide. Large portions of the heap-leach area will be covered with growth material and revegetation programs undertaken. All buildings and surface structures will be removed or buried, leaving the area as close to its original state as possible.

**EXPLORATION**

In 1997, Viceroy Resource Corporation added 483,000 ounces of gold (based on visual estimates, at least 50% of the resource is considered oxide mineralization) to the geologic resource at the Lucky, Bohemian, Classic and North Slope Zones:

**Lucky Zone**

Drilling in 1997 adjacent to the Lucky Zone added a resource of 1,700,000 tonnes grading 2.63 grams gold/tonne (0.09 oz/t).

In the Lucky and East Big Rock Zones drilling also intercepted mineralized faults that may represent sulphide feeder zones.

**Bohemian Zone**

A new oxide resource of 364,000 tonnes grading 0.52 grams gold/tonne was defined at the Bohemian Zone in 1997.

**Classic Zone**

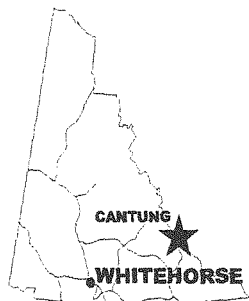
A new oxide resource of 10,900,000 tonnes grading 0.52 grams gold/tonne was defined at the Classic Zone in 1997.

**North Slope Zone**

At the North Slope Zone, a new sediment-hosted resource of 2,200,000 tonnes grading 2.01 grams gold/tonne was defined in 1997.

Exploration in 1998 will focus on expanding oxide resources and further testing of the sulphide potential on the property.

Viceroy Resource Corporation also carried out an aggressive 1997 exploration program off the Brewery Mine property, which resulted in the staking or acquisition of nine claim blocks, including the McQuesten and Sprogge projects. Significant programs are planned for 1998 on these properties. In addition, Viceroy is also carrying out a Yukon reconnaissance program, which will continue in 1998. The Socio-Economic Accord with the Tr'ondek Hwech'in First Nation, which was signed in September, 1997, includes terms for exploration of Tr'ondek Hwech'in First Nation settlement land which covers structural extensions of the Brewery Creek deposits.

**CANTUNG PROPERTY****North American Tungsten Ltd.**

President: Stephen Leahy

*Corporate Headquarters*  
 #11 - 1155 Melville St.  
 Vancouver, B.C., V6E 4C4  
 Phone: (604) 682-1333  
 Fax: (604) 682-1324  
 Toll Free: 1-800-478-5550  
 Email: info@westpac.bc.ca

www.westpac.bc.ca

**Location**

300 km north of Watson Lake

**Ownership:**

North American Tungsten Ltd.

**Commodity:**

Tungsten

**Ore Type:**

Oxide

**Mineable Reserve:**

1.270 million tonnes

Tungsten 1.2%

**Mining Method:**

Underground

**Mine Life:**

Closed

**Project Status**

New Owner

**HISTORY**

The Cantung deposit was first discovered in 1954 by A Berglund for Northwestern Exploration Ltd. The property was staked in 1955 and drilled in 1956. When the claims lapsed in November, 1958, the property was restaked by the Mackenzie Syndicate (Leitch, Highland Belt, Area Exploration Ltd., Dome Minerals Ltd., Ventures Ltd. and Lake Expanse Gold Minerals Ltd.), which formed a new company, Canada Tungsten Mining Corporation Ltd. (Cantung) and drilled 11 holes in 1959 and 41 holes in 1960. Falconbridge, Amax and Dome financed production, which commenced in November, 1962. Production was suspended for a year in 1963-64 because of low metal prices, and was interrupted in 1967 by a mill fire. Falconbridge sold its interest in 1966 and Dome sold its interest in about 1985.

A new deposit, the E-zone, was discovered with four deep surface holes in 1971 and explored with an additional 8 surface holes, a 1250 m adit and detailed underground drilling in 1972-1973. Open pit mining of the original Cantung orebody was completed in September 1973 and milling began on underground ore from the E Zone during the first half of 1974.

An expansion of mill capacity to 1000 tpd was completed in mid-1979 but production was halted by a strike from November, 1980 to May 1981. The mine was closed most of 1983 because of low metal prices and then operated at half capacity until May 1986 when it closed indefinitely due to low tungsten prices and a labor dispute. In 1985, Amax transferred all of its tungsten assets, including the Mactung deposit, to Canada Tungsten Inc. but retained majority control. Canada Tungsten Inc. and Aur Resources Ltd. merged in 1996. In 1997 North America Tungsten acquired 100% interest in both the Cantung and Mactung deposits.

**PROJECT SUMMARY**

The Cantung Mine and Minesite is located 300 km north of Watson Lake Yukon along the Nahanni Range Road. Although the mine is situated in the Northwest Territories, the town of Watson Lake, Yukon was the staging area for trucking the tungsten ore and for supplying the minesite.

**GEOLOGY, MINERALIZATION and ORE RESERVES**

The Cantung deposit is one of several tungsten skarn deposits, including Mactung, located along the eastern margin of the Selwyn Basin. Tungsten mineralization is associated with scheelite-bearing skarn within contact metamorphosed and metasomatized Lower Paleozoic carbonate rocks.

The original tungsten orebody was a lens 180 m long, 90 m wide and 25 m thick that developed in the overturned limb of a tight syncline. It is situated about 300 m vertically above the intrusive contact, within a particularly clean, massive lower Cambrian limestone which has only been found near the mine. Reserves in the original Cantung deposit were originally calculated at 1.18 million tons grading 2.47% WO<sub>3</sub> and 0.45% Cu. The main Cantung deposit was underlain by the Chert zone, which contained 3.5 million tons grading 0.65% WO<sub>3</sub>. Total production from the pit was about 1.66 million tons grading about 1.75% WO<sub>3</sub> (which included some chert ore).

The E deposit, situated about 550 m north and 300 m lower than the original deposit, occurs along a flat-lying intrusive contact within the same limestone horizon. Original reserves in the E-Zone were about 4 million tons grading 1.6% WO<sub>3</sub> and 0.22% Cu, which made it, at the time, the largest tungsten deposit being mined in the free world. An extension was discovered about 150 m west in 1984, from which intersections on the first 5 holes ranged from 1.2 to 3.0% WO<sub>3</sub>, across thicknesses of 1 to 16 m.

Both the Cantung and E deposits consist of pyrrhotite, scheelite and chalcopyrite in a diopside skarn. Scheelite and skarn show a direct relationship. Minor constituents include garnet, epidote, actinolite and sphalerite.

Up to its shutdown in 1986, the Cantung mine produced about 31,185 tons of tungsten metal, or about 85% of Canadian production to date. At its peak, the mine produced 1,200 tonnes of ore per day, six days per week. Remaining ore reserves are in the E deposit, and are given as 1.27 million tonnes (1.4 million tonnes) grading 1.2% tungsten over a three year mine life at 1100 tonnes per day.

Promising exploration targets on the 318 group include a scheelite-bearing, pyrrhotite-rich diopside skarn within a hornfelsed lower Cambrian argillite about 2 km southwest of the townsite. One of the 1979 holes returned 1.04% WO<sub>3</sub> across 4 m.

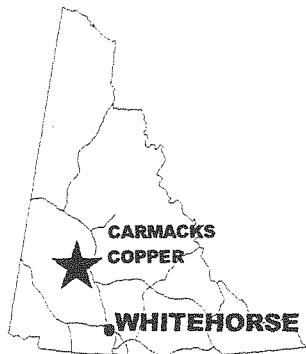
**PRODUCTION AND DEVELOPMENT PLANS**

North American Tungsten Ltd. is a Canadian public company whose assets include the Cantung Mine, the Mactung deposit and the Hemerdon Mine in England; which together comprise about 15% of the Western world's known tungsten reserves. The company plans to take advantage of its proprietary and patented technology to process tungsten ore. The process, called Gas Sparging Technology, was originally developed and patented by the U.S. Bureau of Mines. North American Tungsten has further developed the Gas Sparging technology which will reduce tungsten ore processing costs by 50% and virtually eliminate the environmentally hazardous waste products traditionally associated with tungsten production.

North American Tungsten anticipates an increase in tungsten prices as excess supply from China, which has kept the price down for over ten years, is depleted.

North American Tungsten anticipates a six-month time period for start-up of the mine, at a cost of about \$1,000,000. A \$3,000,000 reclamation bond posted for Cantung Mine was included in the purchase of the Cantung property in addition to a 4% NSR to Aur Resources Inc. of which 1% on the Cantung Mine would be used to replace the \$3,000,000 bond.

## CARMACKS COPPER PROPERTY



### Western Copper Holdings Ltd.

President: Thomas Patton  
Chief Executive Officer: Dale Corman

*Corporate Headquarters*  
1650-1185 West Georgia Street  
Vancouver, B.C., V6E 4E6  
Phone: (604) 684-9497  
Fax: (604) 688-4670  
Email: [info@westerncopper.com](mailto:info@westerncopper.com)

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

### Project Status

Final permitting underway

### Location

28 km northwest of Carmacks, 120 km north of Whitehorse, Yukon

### Ownership:

Western Copper Holdings Limited

### Commodity:

Copper, Silver, Gold

### Ore Type:

Oxide

### Geological Reserve:

22.4 million tonnes grading 1.1% copper

### Mineable Reserve:

14,109,800 tonnes grading 0.99% copper and 0.51 grams/tonne gold

### Mining Method:

Open-Pit, solvent extraction electrowinning (SXEW)

### Mine Life:

8.5 years

### Capital Cost

C\$66 million

### Cash Costs Per Pound

C\$0.87/lb or US\$0.62/lb

### Copper Production per Year

31-32 million pounds of cathode copper

### Employees:

90

### Power:

7 MW, On Site Diesel or Grid Extension

## HISTORY

Copper was first discovered in the Carmacks Copper area in the late 1800's, but it wasn't until the late 1960's that the property was staked by G. Wing of Whitehorse. Subsequent exploration was carried out by the Dawson Range Joint Venture (Straus Exploration Inc., Great Plains Developments of Canada Ltd., Trojan Consolidated Minerals Ltd., and Molybdenum Corporation of America). Archer Cathro and Associates Limited acted as manager and earned the right to acquire abandoned properties. The G. Wing residual interest was acquired by A. Arsenault in 1971; the Arsenault interest is held under an Option Agreement to Archer Cathro and Associates Ltd. In 1989, the property including the rights to the Arsenault Option was optioned to Western Copper Holdings Ltd. who farmed-out a 50% interest to Thermal Exploration Co. Archer Cathro & Associates retain a 3.0% NSR royalty to a maximum of C\$2.5 million.

A total of 12,900 m (43,000 feet) of drilling in 80 diamond drill holes and 11 reverse circulation drill holes have been completed on the property, mostly in the No. 1 zone. In addition several kilometers of surface trenching has been carried out across the main deposit.

**PROJECT SUMMARY**

The Carmacks Copper project covers 1,000 hectares. Access is by a 35 km gravel road from Carmacks, which is 175 km north of Whitehorse. Access to tidewater and port facilities is available through the port of Skagway, Alaska. The project is expected to be a low cost producer of cathode copper, employing solvent extraction and electrowinning techniques to recover oxide copper from an open pit mineable reserve of 14,109,900 tonnes grading 0.99% copper. The mine operation will employ 90 people, the majority of whom will reside in the town of Carmacks. Western Copper Holdings Ltd. is negotiating an impact and benefit agreement with Little Salmon Carmacks First Nation. A favorable feasibility study has been completed and the design is being finalized ready for 1998 construction.

**GEOLOGY, MINERALOGY and ORE RESERVES**

The copper deposits are generally fault bounded and zoned mineralogically with copper oxide and copper carbonate minerals at surface and mixed oxides and sulphides at depth. Copper mineralization is primarily malachite with lesser azurite, cuprite, covellite and other copper minerals. There are fourteen mineralized zones on the property. The No. 1 zone is the best explored and has a geological resource of 22.4 million tonnes grading 1.1% copper and a significant gold credit. The No. 1 zone has been defined by trenching and drilling over a 700 m strike length and down dip for 450 m. The average width of the deposit is 34 m. An open pit mineable reserve of 14 million tonnes averaging 0.99% copper has been calculated and will be the basis for a production decision. The total geological resources at a cutoff grade of 0.20% is 20,715,596 tonnes at 0.98% copper. The open pit mineable reserve, diluted @ 10% is 14,109,800 tonnes averaging 1.01% total copper at a 0.35% total copper cutoff. The reserves are classified as proven plus probable.

**INFRASTRUCTURE**

The mine facility will consist of an ultimate leach pad, processing facilities, open pit and waste dump, water and power distribution services, propane storage and distribution, fire protection, diesel fuel storage, sewage treatment and communications, trailers for offices, changehouse, operations camp, gatehouse/first-aid, and pre-engineered buildings for warehouse/shops, laboratory, water supply and distribution pumphouses. Off-site infrastructure includes 13 km of property access road (the road has been cleared and surveyed), 45 km of 138 kV overhead transmission line and 10,000 tonnes of acid storage facilities at Skagway to accommodate ocean shipping schedules and transportation to site.

The process facilities, ultimate leach pad, open pit and waste dump will occupy an area of approximately 100 ha. Crushing and pad loading will only take place during 200 days of the year (late summer to early fall). Leaching of ore will be year round with solution heating during winter operation. Copper will be recovered from the oxide ore by sulfuric acid heap leaching of crushed minus 19 mm agglomerated ore. Pregnant leach solution (PLS) will be treated in a solvent extraction plant to purify and concentrate the weak leach solution to a more concentrated solution suitable for electrowinning. High purity copper cathodes will be produced in an electrowinning plant for shipment from the ice-free port of Skagway. A pilot test plant, partially funded under the Canada/Yukon Mineral Development Agreement, operated from Oct. 1993 to Feb. 1994 and produced positive test results. A 220 ton bulk sample was crushed and placed in a 25 foot high crib for leaching. The test confirmed that copper can be recovered by solvent extraction during the colder winter months.

The first phase of the leach pad area has been cleared to ensure permafrost is thawed and to clarify the foundation condition.

**PRODUCTION**

The open-pit mine plan calls for a stripping ratio of 425 tonnes to waste to 1 tonne ore. The project will treat on average 1,763,700 tonnes of oxide ore per year, to produce 14,310 tonnes of copper cathodes per year, at a recovery rate of 80%. Based on a mine life of 8.5 years, and a capital cost of C\$66 million, including contingencies, the project is expected to yield 31-32 million pounds of cathode copper per annum at an average operating cost of C\$0.87 or US\$0.62 per pound. Additional tests, based on the scoping study, are planned.



**CASINO PROPERTY**



**Great Basin Gold Ltd.**

President: Robert Dickinson  
 Chairman: Robert Hunter

*Corporate Headquarters*  
 #1020-800 West Pender Street  
 Vancouver, B.C., V6C 2V6  
 Phone: (604) 684-6365  
 Fax: (604) 684-8092  
 Toll Free: 1-800-667-2114  
 Email: info@hdgold.com

www.hdgold.com

**Project Status**

Prefeasibility complete,  
 company is looking for a  
 partner

**Location**  
 300 km northwest of Whitehorse

**Ownership:**  
 Great Basin Gold Ltd.

**Commodity:**  
 Copper, Gold, Molybdenum

**Ore Type:**  
 Oxide and Sulphide

**Geological Reserve:**  
 675 million tonnes  
 Copper 0.25%  
 Gold 0.48 grams/tonne  
 Molybdenum 0.02%

**Mineable Reserve:**  
 178.2 million tonnes  
 Copper 0.30%  
 Gold: 0.38 grams/tonne  
 Molybdenum 0.03%

**Mining Method:**  
 Open-Pit, conventional milling

**Stripping Ratio:**  
 1.06:1

**Mine Life:**  
 19 years

**Mill Feed:**  
 25,000 tonnes/day, 9.125 million tonnes/year

**Employees:**  
 500

**Power:**  
 38 MW, On Site Diesel

**HISTORY**

The Casino area has been explored for placer gold since 1912 and for silver-lead-zinc vein systems since the 1930's; however the bulk tonnage porphyry potential of the Casino property was not recognized until 1967, when a soil survey by Casino Silver Mines Ltd. returned widespread anomalous copper and molybdenum values. During the period 1967-1973 several property operators, including Brameda Resources Ltd., and Teck completed 18,023 m of drilling which confirmed a several hundred million ton gold-copper-molybdenum resource; however, gold was not systematically assayed for, and reserve calculations at the time did not reflect the gold content of the Casino deposit. The property became dormant for a number years until 1991 when Big Creek Resources Ltd. and Archer Cathro and Associates (1981) Ltd. optioned the property from Casino Silver Mines Ltd. (NPL) and began a 4,729 m large diameter drill program (21 holes) designed to evaluate the gold content of the property and to better define the copper and molybdenum grades. Pacific Sentinel Gold, through merger arrangements with Big Creek and Casino Silver, and by renegotiating the Archer Cathro management contract, acquired 100% interest in the property in 1991. They carried out a \$4.5 million program of delineation drilling (68,000 m in 215 holes), metallurgical, environmental and engineering studies in 1994. Although no exploration was carried

out on the property from 1995-1997, environmental baseline studies continued. In 1997, Pacific Sentinel Gold Corp. And Consolidated North Coast Industries Ltd. merged to become Great Basin Gold Ltd.

## **PROJECT SUMMARY**

The Casino project covers 132 sq. km. Access to tidewater and port facilities is available through the port of Skagway, Alaska. The project is expected to be one of the larger, higher grade bulk tonnage deposits in North America with the potential to produce copper, gold and molybdenum over a mine life in excess of 20 years. A prefeasibility metallurgical and mine planning program has been completed. The company now plans to advance the Casino project by assessing recently developed recovery and mill processes; investigating power, transportation and other government incentive programs; monitoring commodity price and foreign exchange rate movements; and introducing the project to major mining companies for financing and acquisition. Geotechnical, infrastructure, environmental and socio-economic programs have been completed. The permitting process is not yet underway.

### **GEOLOGY, MINERALOGY and ORE RESERVES**

The deposit is hosted by the Casino Complex, a suite of igneous intrusive rocks with an intense hydrothermal alteration overprint. The deposit area has not been glaciated. Mineralization is found in three different zones; an oxide leached zone, supergene zone, and hypogene zone. The uppermost zone is an oxide gold-bearing leached zone from which copper has been largely carried away by descending groundwater. The leached zone is underlain by a copper enriched supergene gold-copper zone where dissolved copper has been redeposited. Below the supergene zone is the hypogene zone, which contains primary gold and copper mineralization that has not been affected by surface weathering or supergene enrichment. The deposit measures 1100 m by 1600 m and is open to the north and east. Primary hypogene mineralization below the supergene zone has been drilled to a depth of 798 m and is open to depth within most areas.

The Casino deposit contains a mineable reserve of 178.2 million tonnes of supergene sulphide and hypogene sulphide ore at an average grade of 0.38 grams/tonne (0.011 oz/ton) gold, 0.30% copper and 0.028% molybdenum, based on a net smelter return cutoff value of C\$7.00/tonne. The mineable reserve contains 2.2 million ounces of gold, 540,000 tonnes (1200 million pounds) of copper and 50,000 tonnes (110,000 tonnes) of molybdenum. The geological resource is estimated at 675 million tonnes grading 0.24% copper, 0.48 grams/tonne gold and 0.02% molybdenum.

### **PRODUCTION**

The open-pit mine plan calls for the prestripping and stockpiling of 50.6 million tonnes of predominantly lower grade oxide material which will expose the sulphide ore for sustained mining. The overall waste to ore ratio will be 1.06:1 after prestripping is complete. Direct mining from the open pit will provide mill feed for 19 years to a 25,000 tonne per day (9.125 million tonnes/year) concentrator. During the course of mining 50.7 million tonnes of low grade sulphide material (0.187% copper, 0.222 grams gold/tonne and 0.010% molybdenum) will be stockpiled to provide an additional six years of mill feed after pit operations have ceased.

Extensive metallurgical testing of several possible process options for the mineral zones has now been completed. Conventional, low cost, flotation processing of supergene and hypogene sulphide ores is the optimum ore processing method for the Casino project. Conventional crushing, grinding and flotation of sulphide ore on average recovers 72% of gold, 80% of copper and 62% of molybdenum. Concentrates produced are a copper-gold concentrate grading 21% copper and 23.6 grams gold/tonne and a molybdenum concentrate expected to grade 53%.

Net smelter return (from 1995) is estimated at US\$14.85 based on US\$1.20/lb copper, US\$395/oz gold, US\$7/lb molybdenum, a 0.74 exchange rate and standard treatment and transport charges. Based on a 27,500 ton/day milling operation, annual output will average 48 million lb copper, 3.5 million lb molybdenum and 79,400 oz gold over the 19 year reserve life. Head grades during the first six years are expected to average 0.392% copper, 0.028% molybdenum and 0.45 g/t gold (0.013 oz gold), netting 63 million lb of copper and 98,000 oz of gold per year. Head grades during the 19 year life of the mine are calculated to average 0.30% copper, 0.376 g/t gold, and 0.028% molybdenum.

## DIVISION MOUNTAIN PROPERTY



### Cash Resources Ltd.

President: Robert Carne

*Corporate Headquarters*  
#1016 - 510 West Hastings St.  
Vancouver, B.C., V6B 1L8

Phone: (604) 683-1610  
Fax: (604) 688-2578

### Location

90 km north-northwest of Whitehorse, Yukon

### Ownership:

Cash Resources Ltd.

### Commodity:

High Volatile Bituminous B Coal

**Drill-Indicated Raw Coal Reserves (Oct. 31/97)**

54,700,000 tonnes

### Mining Method:

Open Pit, 365 days per year

### Processing Method:

Washing Plant, 365 days per year

### Power:

2 MW, Grid

### Project Status

Company is seeking partner

## HISTORY

Three coal seams were mapped by D.D. Cairnes of the Geological Survey of Canada in 1907. The seams are exposed in the Teslin Creek cut, 2 km north of Division Mountain; an additional coal occurrence was located by Cairnes near the base of the eastern flank of Red Ridge, approximately 5 km northwest of the Teslin Creek showings. In 1970, Arjay Kirker Resources Ltd. excavated seven pits in the vicinity of the Cairnes coal exposure, and sent the samples to Loring Laboratories Ltd. in Calgary for analysis. The coal was classified as low sulphur, high volatile bituminous, a rank suitable for thermal power generation. In 1972, Arjay Kirker completed a drill program.

The Division Mountain coal property is held under Territorial Coal Licences obtained by W4 Joint Venture in April 1990 and acquired by Cash Resources Ltd. in August, 1992. Cash Resources acquired three additional licenses in December, 1993. The 1993 field program, including linecutting, geophysics, hydrological surveys and diamond drilling, was funded by Cash Resources Ltd. and managed by Archer, Cathro & Associates (1981) Ltd. in 1994. Cash Resources completed an extensive trenching program and drilled 4054 m in 26 diamond drill holes.

A 2,000 metre, 8 hole, large diameter diamond drilling and excavator trenching program was completed in the spring of 1995. Environmental, archaeological and sociological studies are also being carried out. Exploration continued in 1996 and 1997.

**PROJECT SUMMARY**

The Division Mountain coal deposit is located only 20 km from the main electrical distribution grid for the Yukon and 280 km by highway from a deep sea port at Skagway, Alaska. Access into the property is by a 31 km 4WD drive leaving the Klondike Highway at Braeburn, Yukon. Cash Resources would like to increase the total coal reserve on the property to greater than 60 million tonnes. The coal at Division Mountain is similar to or better than the quality of most British Columbia export thermal coals. A number of senior Canadian and Asian coal companies have indicated that this is the threshold for capitalization of a 1.5 million tonne per year export facility at this location. Cash Resources has received strong expressions of interest in project participation from Asian coal consumers as well as Canadian and U.S. coal-fired power generators.

**GEOLOGY, EXPLORATION AND ORE RESERVES**

Exploration between 1993 and 1996 focused on a 5 sq. km area in the southwest corner of the 3150 sq km property where a drill indicated, open pittable reserve totalling 31.7 million tonnes of High Volatile Bituminous "B" coal was outlined with a strip ratio of 3.4 bank m<sup>3</sup>/tonne. The reserves are situated along the east limb of the northerly plunging Cairnes syncline. Washability tests showed that a quality export product could be readily produced averaging 1.9% moisture, 14.6% ash, 29.8% volatile matter, 55.6% fixed carbon, 0.5% sulphur with a calorific value of 6583 kcal/kg (11,756 Btu/lb).

Exploration in 1997 included 1667 metres of large diameter core drilling in ten holes. This work was carried out to test coal reserve potential of the south end of the Division Mountain Syncline, a poorly explored area about 1.5 km south of the Cairnes Syncline. The drilling outlined coal in a continuous basal seam up to 22 m thick with as many as five hanging wall seams (ranging between 1 and 10 m thick) over a strike length of 2.5 km. The coal dips 45 to 55 degrees to the southwest along the east limb of the Division Mountain syncline. The coal bearing sequence is project to wrap around the nose of the northerly-plunging fold. This area is untested and has high potential for a significant expansion of low strip ratio coal reserves.

An in-house reassessment of current drill-indicated raw coal reserves at Division Mountain was released in October, 1997; the total figure is 54.7 million tonnes, although coal quality analyses have not yet been announced for the 1997 drill hole samples.

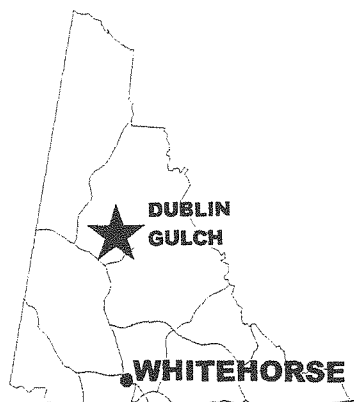
Cash Resources has been granted a 100% interest in an additional 18 coal exploration licenses giving the company exploration rights to a large area which contains a number of other coal occurrences associated with the same sedimentary units that host the Division Mountain coal.

**PRODUCTION PLANS**

Results of coal analysis suggests that Division Mountain coal is ideally suited for thermal power generation with characteristics comparable to Alberta High Volatile Bituminous coals used to generate over 90% of the power needs of that province. Raw analyses average 2.42% residual moisture, 28.45% ash content, 25.79% volatile matter, 43.18% fixed carbon and 0.43% sulphur with a calorific value of 5216 cal/g. The company has commissioned coal industry consultant D.G. Adamson of Edmonton, Alberta to carry out a scoping study of Division Mountain. The study will evaluate the project's competitiveness in Pacific Rim thermal coal markets as well as opportunities for supply to the rapidly expanding use of Pulverized Coal Injection (PCI) technology in Japanese and Korean steel industries. Cash Resources has started environmental studies required for development of the coal reserves with an associated 50 megawatt mine-mouth electrical generating facility using mine-run and waste coal.

Cash Resources has completed environmental baseline data collection and plans to initiate federal government environmental screening in early 1998.

## DUBLIN GULCH PROPERTY



### New Millennium Mining Ltd.

President: Stephen Stine

*Corporate Headquarters*  
Waterfront Centre  
200 Burrard St, 9<sup>th</sup> Floor  
Vancouver, B.C., V6C 3L6  
Phone: (604) 685-8382  
Fax: (604) 682-2060  
Email: nina@vancorp.com

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

### Project Status

Bankable feasibility study complete, permitting nearing completion

### Location

40 km north of Mayo, Yukon

### Ownership:

New Millennium Mining (100% owned by First Dynasty Mines)

### Commodity:

Gold, (tungsten)

### Ore Type:

Gold in quartz veins

### Geological Resource:

98.9 million tonnes

Gold 1.19 grams per tonne

### Mineable Reserve:

50.4 million tonnes

Gold 0.93 grams per tonne

### Mining Method:

Open Pit, 150 days per year

### Processing Method:

Heap Leach, 365 days per year

### Mine Life:

8 years

### Employees:

179

### Housing:

Camp

### Power:

4 MW, Grid or on-site diesel

## HISTORY

Placer gold was discovered in Haggart Creek below Dublin Gulch in 1895 and in the Dublin Gulch and the Klondike area in 1898. Scheelite was identified in the Dublin Gulch placers in 1904 and lode gold was discovered in 1907. The history of hardrock exploration in the Dublin Gulch area is complex. The ground was explored in 1970 by a subsidiary of Placer Dome Inc. primarily looking for lode gold deposits in the intrusive rocks. Queenstake Resources Ltd. acquired ground in the area in 1977 and optioned their holdings to Ivanhoe Goldfields Ltd. in 1991. Ivanhoe discovered the intrusive hosted porphyry gold deposit and granted an option to Amax Gold Inc. to earn a 50% interest in the Dublin Gulch property. Amax drilled 46 reverse circulation holes totaling 5,651 m in 1992, in addition to extensive rock and soil sampling, but decided to drop the option. Ivanhoe Goldfields drilled an additional ten reverse circulation holes (2078 m) during 1993 and carried out baseline environmental studies including hydrology, meteorology, water quality and wildlife monitoring. In 1994, Ivanhoe Goldfields Ltd., became a wholly owned subsidiary of First Dynasty Mines Ltd. In 1995, 24,400 m of drilling (151 holes), metallurgical testing, engineering and economic studies were carried out. In 1996, Ivanhoe Goldfields changed its name to New Millennium Mining Ltd. During 1994, the company completed 11,418 metres of reverse circulation and diamond drilling, 380 m of exploration trenching, 233 geotechnical testpits and 700 soil samples. A bankable feasibility study has been completed on the property, and project permitting has been initiated.

**PROJECT SUMMARY**

The Dublin Gulch Project is an advanced exploration project covering a low-grade, bulk tonnage intrusive hosted gold deposit located 40 km northeast of Mayo, Yukon. The property is accessible by an all-weather road. A bankable feasibility study has been completed and an Initial Environmental Evaluation report was submitted to the federal government in 1996. The company has invested more than US \$10 million bring the Dublin Gulch project to the development stage and has signed a framework agreement with the First Nation of NaCho Ny'a'k Dun and are negotiating an Impacts and Benefits Agreement.

**GEOLOGY, MINERALOGY and ORE RESERVES**

The deposit is hosted in and around the Cretaceous Dublin Gulch granodiorite stock. Mineralization is found in sheeted, low sulphide quartz veins containing gold and bismuth along the north side of the intrusion, scheelite skarn zones around the margins, and in auriferous quartz-arsenopyrite veins in the intrusion and in the host rocks. Gold occurs as native gold liberated in gangue or associated with bismuth minerals, with lesser amounts of gold contained in arsenopyrite.

The main ore zone is the Eagle, with an estimated resource of more than three million ounces of gold. Three other zones on the property, the Olive, Shamrock and Steiner Zones also contain similar gold mineralization.

The mineable reserve at Dublin Gulch (from the 1997 feasibility study) is 1,510,000 ounces gold out of a total estimated resource of 3,000,000 ounces of gold. The total mineable reserve (proven and probable) is 50.4 million tonnes at 0.93 g/tonne gold out of a total geological resource of 98.9 million tonnes grading 1.19 grams per tonne.

**PRODUCTION PLANS**

Although inferred reserves indicate that a large open-pit mine with well over 100 million tonnes may be possible, the current concept is to initially develop a higher grade core of approximately 50 million tonnes grading 1.19 grams/tonne gold or better.

Highlights from a bankable feasibility study completed by Rescan Engineering Ltd. include:

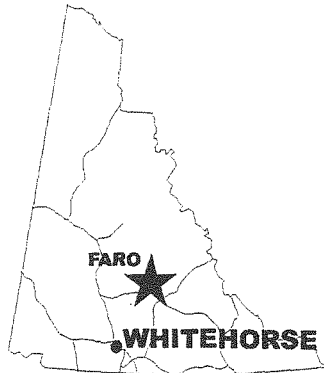
Gold recovery:	79.6%
Net Recoverable	1.2 million oz or 36,560 kg
Stripping ratio:	0.8:1 (waste to ore)
Throughput rate:	35,000 tonnes per day (seasonal)
Average annual production	135,000 ounces per year
Initial capital cost	US \$106.7 million
Average cash production cost	US \$221 per ounce (including reclamation)

It was suggested in the feasibility study that using a larger haul fleet, contract mining, optimizing the crushing/conveying circuits, optimizing the heap-leach pad construction and operation would improve the project economics, as well as increasing the mineable reserves.

The mine would consist of an open pit in the Eagle Zone mined at 20,000 tonnes per day producing 10,000 tonnes per day mine waste rock. Based on 50 million tonnes of reserve, the mine would have a life expectancy of approximately 10 years. Ore would be crushed and conveyed or trucked to a cyanide heap leach pad. Pregnant solution would be processed using an adsorption desorption gold recovery (ADR) method and the resulting gold collected would be poured into dore bars on site.

A 1997 agreement between First Dynasty Mines Ltd. and Cornucopia Resources Ltd. for Cornucopia to acquire new Millennium Mining was cancelled.

**FARO PROPERTY**



**GRUM DEPOSIT**

**Commodity:**  
Zinc, lead, silver, gold  
**Ore Type:**  
Sulphide  
**Geological Resource:**  
41,635,610 tonnes  
Lead 3.1%  
Zinc 4.95%  
Silver 51.48 grams per tonne  
Gold 0.80 grams per tonne  
**Mineable Reserve:**  
24,760,000 tonnes  
Lead 2.74%  
Zinc 4.54%  
Silver 46.00 grams per tonne  
Gold 0.87 grams per tonne

**GRIZZLY DEPOSIT**

**Commodity:**  
Lead, zinc, silver, gold  
**Ore Type:**  
Sulphide  
**Geological Resource:**  
21,356,000 tonnes  
Lead 5.54%  
Zinc 7.33%  
Silver 81.10 grams per tonne  
Gold 0.87 grams per tonne  
**Mining Method:**  
Will be underground

**Project Status**

Inactive

The Faro area lead-zinc deposits are located in the Anvil Mountain Range within the Selwyn Basin immediately northeast and adjacent to the Tintina Trench. The age of the stratigraphic sequence in the Anvil district ranges from late Precambrian to Permian. The sulphide deposits are located in a 150 m thick stratigraphic interval straddling the Mt. Mye formation and the Vangorda Formation contact. Mineralization is one of two types; massive sulphides and quartzose disseminated sulphides. The Cretaceous granodiorite-quartz monzonite Anvil batholith intruded and uplifted the sedimentary package.

There are five major lead-zinc deposits in the Vangorda plateau area. From northwest to southeast, they are Faro, Grum, Vangorda, Grizzly (formerly called the Dy deposit) and Swim. The status of each deposit is as follows:

- Vangorda: Mined Out
- Faro: Mined Out
- Grum: Open-pit mine, 4 to 5 years of reserves left
- Grizzly: Advanced exploration stage, would be mined by underground methods
- Swim: Undeveloped

**HISTORY**

Prospector Al Kulan discovered and staked the Vangorda lead-zinc deposit in 1953. The property was optioned to Prospector Airways, and subsequent diamond drilling between 1953 and 1955 was

carried out. Kerr-Addison Mines Limited eventually acquired Prospector Airways, but interest in the property waned for a number of years because of depressed metal prices, declining metal markets and the remoteness of the area.

In 1962, Kerr-Addison resumed exploration in the Vangorda plateau area, and the Swim lead-zinc deposit, 8 km southeast of Vangorda, was discovered in 1964. At the same time, Dynasty Explorations, under the direction of Dr. Aaro Aho, commenced a detailed exploration program on several claim groups in the Faro area in 1964 and discovered the Faro lead-zinc deposit in 1965. Cyprus Anvil, a joint venture between Cyprus Mines (60%) and Dynasty (40%) was formed in December, 1965 to develop the Faro deposit.

Anvil Mining Corporation (later Cyprus Anvil Mining Corporation) commenced open pit mining operations on the Faro lead-zinc deposit in late 1969 at rates of up to 10,000 per day. The mine was officially opened on January 28, 1970. The mine is open from 1969 to 1982.

In 1973, the Grum lead-zinc deposit is discovered by a joint venture between AEX Minerals and Kerr Addison while testing a gravity anomaly. Cyprus Anvil Mining Corporation purchased the Grum property in 1979.

Concentrate production from the Faro deposit was halted in 1982 because of falling metal prices, low productivity, high operating costs and the added burden of the debt load brought about by expansion. Between June, 1983 and October, 1984, some open pit waste stripping operations were carried out, but production ceased completely by the end of 1984.

The Anvil Range mineral assets of Cyprus Anvil, including the Grum and Grizzly deposits were acquired in November, 1985 by a predecessor partnership of Curragh Inc. Curragh resumed operations at the Faro mine in the spring of 1986 and made its first shipment of concentrates in June, 1986. In 1989 development of the Vangorda Plateau was begun with stripping of the Grum and Vangorda deposits. Ore removal commenced at the Vangorda pit and supplemented the mill feed. Ore removal from the Grum pit continued, but was not significant.

An extensive program of surface drilling was carried out on the Grum deposit by Curragh to delineate reserves and obtain samples for metallurgical testing in preparation for production and preparation of the Grum deposit for mining commenced in 1989.

In early 1990, an underground operation was initiated just southwest of the Faro Pit from a portal in the pit. This operation closed in October, 1992 after mining 1.8 million tonnes of ore.

In 1991, Curragh began stripping the Grum deposit. As of October, 1991, the total waste requiring stripping from Grum was 193.2 million tonnes for a stripping ratio of 6.70:1. The ore reserves in the Faro Pit were exhausted in August of 1992 and remnant ore was salvaged by early 1993.

In late 1992, sufficient stripping in the Grum open-pit had been done to expose the top of the Grum deposit and to extract some 15,000 tonnes of mineralization for testing in the Faro concentrator. After removing 21.4 million tonnes, Grum stripping was suspended in December, 1992.

All mining operations ceased in April 1993 due to low metal prices and Curragh was forced into receivership by its creditors.

Anvil Range Mining formed in 1994 to acquire the Faro properties from the Receiver for a purchase price of \$27 million. A 9-month \$75 million pre-stripping and mill refurbishment program was carried out. Anvil Range Mining began concentrate production from the Grum open-pit in August, 1995 and resumed production from the Vangorda open-pit in September, 1995. The first concentrates were shipped from Skagway to Asia and Europe in September, 1995. The mining operation achieved commercial production on November 1, 1995. By the end of 1996, the Vangorda pit was mined out, and mining operations were suspended because of low metal prices and other factors, including lower head grades, mechanical problems in the mill and lower metal recoveries which contributed to less than planned production. The mill continued to process low-grade stockpiles at 50% capacity until March 31, 1997.



On February, 1997, Anvil Range Mining Corp. announced the closing of a private placement of 4.1 million common shares for a total of \$9.4 million with Cominco. ARM also secured a \$15 million loan at 8.5% interest from its principal shareholder, Cominco, in July, 1997. The loan was advanced to ARM in two tranches.

Stripping of the Grum pit started on August, 1997. The mine re-opened at full production in November, 1997 and operated until January 16, 1998, when Anvil Range announced that it planned to file for court protection from creditors. On April 21, 1998 an interim receiver was appointed to review the companies assets.

## **HISTORICAL PRODUCTION**

When operating in 1989, the Faro operations supplied 3% of the western world's zinc and 5% of its lead concentrates, making Curragh Resources, the operator at that time, the sixth largest zinc producer in the world.

### **Anvil Range Mining Corporation**

Production for the 14 months ended December 31, 1996 was 345,700 tonnes of zinc concentrate and 186,000 tonnes of lead concentrate. From September 1995 to December 31, 1996, ARM loaded 25 ships for a total of 383,000 dry metric tonnes of zinc concentrates and 181,000 dry metric tonnes of lead concentrates. The concentrate tonnage equates to 566.9 million pounds of payable metal. To produce this amount of concentrate, 28.8 million tonnes of waste and 4.5 million tonnes of ore were moved. The mill processed 4.8 million tonnes of ore, at an average head grade of 5.14% for zinc and 3.04% for lead. Recoveries in the mill averaged 71.3% for zinc and 76.7% for lead.

Concentrates are dried to approximately 7% moisture before being loaded into specially designed shipping containers for trucking to the port of Skagway, Alaska. The lead and zinc concentrates are loaded separately into pots which have a capacity of 11-12 tonnes of concentrate. Four pots can be carried on a tractor-trailer unit. Concentrates are transferred to a storage building prior to loading onto vessels for shipment to smelters in Europe and Japan.

Power requirements for the Grum project, 22 MW, is provided from the Whitehorse-Aishihik-Faro grid.

The target recovery rates for the Grum open pit were 78% for zinc and 80% for lead.

Anvil Range investigated the feasibility of building a crushing and grinding unit adjacent to the Grum site and transporting the ground ore by slurry pipeline to the mill. They made significant improvements to the milling and concentrating facilities. Two 40 ft high column cells were added (the largest in the Western world), a Provox custom digital control system was installed, and improvements to the regrind circuit increased recovery.

### **RECLAMATION AND ENVIRONMENTAL**

In 1995, Anvil Range Mining filed the Initial Comprehensive Abandonment Plan with the Yukon Water Board. The plan is still under review. Anvil Range Mining accrued the cost of reclamation and closure monitoring at the rate of \$0.42 per tonne of mill feed.

To fund the closure and reclamation costs, Anvil Range Mining, after negotiating with DIAND, established a Reclamation Security Trust (RST). Payments to the RST are made under the provisions of a formula which is tied to the price of zinc, with a minimum quarterly payment of \$175,000 being required subject to available cash flow. The fund is managed by an independent trustee, who obtains independent investment counsel for investment decisions. There is a \$100 million cap on the fund.

### **Tailings**

In 1996, Anvil Range Mining also filed the Tailings Reprocessing Feasibility Study. There are over 50 million tonnes of flotation tailings that accumulated from the Faro mill operation from 1969 to 1992.

**GRIZZLY DEPOSIT**

The Grizzly deposit was discovered in 1976 by Cyprus Anvil Mining Company. For the next five years, CAMC drilled 52 holes and developed a preliminary interpretation and mineral inventory. Curragh Resources acquired the property in 1985 and, between 1989 and 1991, drilled an additional 21 holes. In 1991, three holes were drilled to test a fault in the Dy deposit, and five holes were drilled to test the path of a proposed decline. Ten holes were drilled through overburden to test the proposed portal site. The Dy deposit was re-named the Grizzly deposit in 1996.

The Grizzly deposit is similar to the other deposits in the Faro area. It is a multi-layered, polydeformed, sediment hosted sequence of exhalative, massive and disseminated pyritic sulphides.

There are two main mineralized horizons:

"A" Horizon - relatively lead enhanced

"B" horizon - relatively zinc enhanced

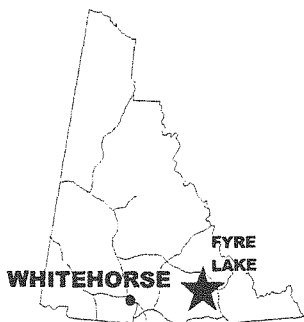
Collectively, the two horizons are referred to as the "AB" zone. The internal structure of the deposit is poorly understood, but the current thinking is that the structural complexity known to exist at Vangorda and Grum will be exhibited at Grizzly.

Geological reserves have been calculated by various parties at various times. The most recent determination, by Curragh, by means of a polygonal method, suggests that the Grizzly deposit has probable and possible reserves of 21.3 million tonnes grading 5.54% lead, 7.33% zinc, 81.1 g/t silver and 0.87 g/t gold using a 9% Pb + Zn cutoff grade.

The ore reserves lie between approximately 500 m and 850 m below the surface. Mining would be only by underground methods. Additional exploration is required before this deposit would be mined.

Anvil Range commissioned a pre-feasibility study in 1996 for the Grizzly project. It is estimated that the initial development and underground exploration phase will take 27 months, cost approximately \$26 million and include driving twin access ramps, drilling, metallurgical testing and a feasibility study. If a production decision results, shaft construction would take a further 34 months and cost an estimated \$52 million, plus an additional \$27 million for new and replacement mine equipment. It is estimated that at a production rate of 1.5 million tonnes of ore per year, the Grizzly mine's life would be 11.5 years, which could be extended by continued exploration.

## FYRE LAKE PROPERTY



### Columbia Gold Mines Ltd.

President: John Brock

*Corporate Headquarters*  
675 West Hastings Street  
15<sup>th</sup> FLOOR

Vancouver, B.C., V6B 1N2

Phone: (604) 687-4951

Fax: (604) 687-4991

Email: corpdev@columbiagold.com

www.columbiagold.com

### Location

160 km northwest of Watts Lake

### Ownership:

Columbia Gold Mines Ltd. has an 80% interest in the property. Welcome Opportunities has the other 20%

### Commodity:

Copper, Cobalt, Gold

### Ore Type:

Sulphide

### Drill-Indicated Reserves (preliminary

estimates based on wide-spaced drill-holes)

15.4 million tonnes, within which 8.2 million tonnes grade (using a 1% copper cut-off):

Copper	2.1%
Cobalt	0.11%
Gold	0.73% g/t

### Project Status

Reserve delineation  
ongoing

## HISTORY

Massive sulphide mineralization was first discovered on the property in 1960 by Cassiar Asbestos Corporation, and since then various companies, including Atlas Explorations (1966-67), Amax Potash Limited (1976), Welcome North Mines Ltd. (1980-81) and Placer Dome Explorations (1990-91), explored the area. A total of 23 shallow packsack (224 m) and 20 AX (1,423 m) drill holes were completed during this period.

In 1995 Columbia Gold optioned the core group of 411 claims from Welcome Opportunities Ltd. and, by 1997, had acquired 80% interest in the claims by spending \$6 million (\$3 million to earn 50% and an additional \$3 million to earn up to 80%). Upon a positive feasibility study, Welcome Opportunities may elect to either arrange all production financing and place the property into production, thereby increasing its interest to 55 percent with Columbia retaining a 45% joint venture interest, or Welcome may convert its interest to a 2 percent Net Smelter Return Royalty. Columbia Gold fully owns the remaining claims on the property. During 1996 and 1997 the company drilled 115 drill holes and has partially defined a copper-cobalt-gold resource. An economic scoping study has been completed and preliminary metallurgical tests have been carried out. A \$2.5 million exploration program is planned for 1998; the company is seeking a joint venture partner to help finance the work.

**PROJECT SUMMARY**

The Fyre Lake property is situated approximately 160 kilometres northwest of Watson Lake. It consists of claims covering 88 square kilometres in the Finlayson Lake district immediately east of Fire lake along the North River drainage. The property is 30 km southeast of the Wolverine project of Westmin Resources and Atna Resources.

**GEOLOGY, MINERALOGY and ORE RESERVES**

The Finlayson Lake District is underlain by a Late Paleozoic metamorphosed volcano-sedimentary assemblage of the Yukon-Tanana Terrane which is regionally bounded to the southwest by the Tintina Fault and to the northeast by the Finlayson Lake Fault Zone. Copper-cobalt-gold mineralization is hosted by a well deformed and moderately metamorphosed chlorite to quartz-chlorite schist sequence which is interpreted to be a succession of basic to intermediate flows with interbedded tuffs and volcanically-derived fine-grained sedimentary rocks belonging to the middle unit of the LMS. The chloritic schist sequence is overlain by a micaceous quartz schist unit which is in turn overlain by a thick sequence of phyllite of the upper metasedimentary sequence.

The Fyre Lake project covers over 9 km of favorable host rocks with several geochemical-geophysical targets indicative of volcanogenic massive sulphide mineralization. To date, the company has focused its attention to delineating the Kona deposit (23,200 m in 115 holes).

The Kona deposit to date consists of two parallel northwest trending zones of copper-cobalt and gold massive sulphide mineralization found in horizons with thickness from eight to 40 metres over a length of 1,500 m and width of 250 m. Massive sulphide mineralization in the Kona deposit consists of pyrite, chalcopyrite, pyrrhotite and sphalerite, while semi-massive sulphide mineralization consists of thinly-laminated pyrite, chalcopyrite +/- pyrrhotite within alternating laminae of very fine-grained siliceous chlorite schist. Banded and massive magnetite layers host trace to 10% sulphides, usually chalcopyrite, pyrite and rarely bornite.

During 1997, drilling at the Kona Deposit expanded mineralization to a drill-inferred length of 1,500 metres over an average width of 250 metres.

Preliminary estimates by Columbia Gold management show the Kona deposit to contain 15.4 million tonnes within which 8.2 million tonnes grades 2.1% copper, 0.11% cobalt and 0.73% g/t gold, using a 1.0% copper cut-off. At metal prices as of March, 1998, the resource has a gross metal value of C\$135/tonne. The size of the Kona deposit is unknown.

**PRODUCTION**

The company commissioned a preliminary resource estimate for the Kona deposit with the northwest portion of the deposit holding potential for open pit mining and the deeper southeastern extension being a prospective underground target.

Preliminary scoping by a major independent engineering firm indicates a 20 million tonne resource would be economic, half of which could be mined by open pit and half by underground methods. The study assumes a reserve of 10 million tonnes of open pit ore grading 2.0% copper, 0.7g/t gold and 0.12% cobalt and a further 10 million tonne reserve to be mined underground at a grade of 3.0% copper, 1.0 grams gold and 0.12% cobalt. The study was based on metal prices of US \$1.00 copper, US \$10.00 per pound cobalt and US \$365 per ounce gold. The deposit is presumed to be mined at a rate of 6,700 tonnes per day or 2.2 million tonnes per year. Open pit mining would yield 75 million pounds of copper, 3.5 million pounds of cobalt and 30,000 ounces of gold for the next five years of underground operation. The study projects operating costs of \$20 per tonne during the open-pit phase and \$36 per tonne during the underground phase. Initial capital costs are projected to be \$246 million, including \$85 million specifically for on-site treatment and recovery of cobalt. A further \$27 million would be required for underground mining operations.

Preliminary metallurgical testwork by Lakefield Research indicates the massive sulphide mineralization is amenable to a 2-stage standard flotation process, the first stage of which would involve the collection of a copper gold concentrate with recoveries estimated at 90% for copper and 70% for gold. Concentrate grades range from 21 to 23% copper and 10 to 15 grams gold per tonne. Tests suggest 50% to 75% of the cobalt is recoverable in a 2-stage pyrite concentrate.

## GREW CREEK PROPERTY



### Grew Creek Project

Contact Person:  
A. Carlos  
Whitehorse, Yukon

### Project Status

Available for Option

### Location

35 km W of Ross River

### Ownership:

A. Carlos

### Commodity:

Gold, Silver

### Ore Type:

Oxide

### Mineable Reserve:

261,000 tonnes

Silver: 38.20 grams per tonne

Gold: 13.99 grams per tonne

### Proposed Mining Method:

Open Pit, 365 days per year

### Processing Method:

Conventional Mill, Dore Bar, 365 days per year

### Power:

3 MW, On-site diesel generation

## HISTORY

The original Grew Creek claims were staked by Whitehorse prospector A. Carlos in 1984. The claims were optioned by Hudson's Bay Mining and Smelting, which carried out an extensive exploration program from 1984 to 1986, then dropped its option.

In 1987 the claims were optioned by Noranda, who subsequently signed a joint-venture agreement with Golden Nevada Resources and Brenda Mines. Results of the 1987 program triggered a flurry of claim-staking and exploration activity in the area. A large-scale exploration program continued in 1988. In 1989, Golden Nevada changed its name to Goldnev Resources and renegotiated the joint venture agreement giving it a 100% interest in the property.

In 1992, Wheaton River Minerals took an option to conduct an underground development program. This program was expected to confirm grade, continuity of mineralization and ground conditions, and would be an important step in preparing the deposit for production.

Wheaton River Minerals approached the Yukon Government for financial assistance in developing the Grew Creek orebody in April, 1992. The Department carried out a review of the information supplied by Wheaton River and there were several issues for which additional information and analysis was required in order to properly assess the near-term economic viability of the Grew Creek deposit and the potential life of the deposit. Wheaton Rivers' proposal for conducting underground exploration was not funded and they subsequently dropped their option.

YGC Resources Ltd. optioned the property in 1992. Wheaton River Minerals have sold the Ketz River mine assets and known reserves through Ketz River Holdings to YGC Resources. Ketz River Holdings is a 100% owned subsidiary of Wheaton River Minerals and was formed to cover the assets of the Ketz River Mine.

YGC completed a \$150,000 drilling program at Grew Creek in 1995 and a 17 diamond drill hole program in 1996. YGC terminated their option agreement with Mr. Carlos in January, 1997.

**PROJECT SUMMARY**

The Grew Creek property is located approximately 35 km west of Ross River and one kilometer from the Robert Campbell Highway and the Whitehorse Power Grid. The property consists of 332 claims and is owned by Mr. A. Carlos of Whitehorse.

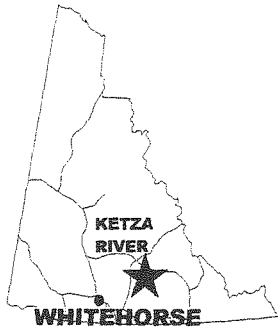
**GEOLOGY, MINERALOGY and ORE RESERVES**

Gold and silver mineralization of the Main Zone occurs in stockwork quartz veins and hydrothermal breccias. Mineable reserves are estimated to be 261,000 tonnes grading 13.99 gram/tonne gold and 38.2 grams/tonne silver.

**PRODUCTION PLANS**

YGC was proposing to mine the Grew Creek ore and truck it 98 kilometres to the Ketzka River mill for processing. The Ketzka River Mill is a 320 tonne per day carbon-in-pulp (CIP) milling complex. The Ketzka River Mine operated from 1988 to 1990 and produced 100,000 ounces of gold from oxide ore.

## KETZA RIVER PROPERTY



### YGC Resources

President: Graham Dickson

General Delivery  
Carmacks, Yukon  
Y0B 1C0

Phone: (867) 863-5913  
Fax: (867) 863-6028

### Location

50 km south of Ross River

### Ownership:

YGC Resources Ltd.

### Commodity:

Gold, Silver

### Ore Type:

Sulphide

### Mineable Reserve:

189,605 tonnes

Gold 11.31 grams per tonne

### Mining Method:

Undetermined

### Power:

3 MW, On Site Diesel

### Project Status

Drilling and exploration to find new zones and increase ore reserves.

## HISTORY

Exploration activity began in the Ketza River district in 1947 with the discovery of silver-lead veins on the nearby Iona property by Hudson Bay Mining and Smelting Company Limited. On the Ketza property to the west, gold was discovered in 1954 and 1955 by prospectors working for Conwest Exploration Company Limited. Conwest explored the Ketza River sulphide gold deposit with trenching and 59 drill holes from 1955 until 1960 and outlined 75,000 tonnes grading 12 g/t Au. Work completed by Conwest was conducted frequently under harsh conditions, often involving a two-day sled dog or packhorse trip to and from the site for supplies. Packhorses were also used for drill moves. Given a \$35 gold price and difficulties in working in this remote location, the project was mothballed.

The Ketza River Property was optioned by Pacific Trans-Ocean Resources in late 1983. Pacific Trans-Ocean and Canamax entered a joint venture agreement to explore and develop the property in early 1984, with Canamax the operating partner. After three years of aggressive exploration an oxide reserve totalling 495,800 tonnes at 18 grams gold per tonne was established. A sulphide reserve of equal size but lower grade was delineated. A production decision based solely on the oxide reserve, was approved early in 1987. Facilities for a 320 tonne-per-day mining and milling operation were constructed in 1987. The first gold bar was poured on April 28, 1988 and the mine was officially opened on July 21, 1988. In April 1989 Canamax Resources Inc. purchased Pacific Trans-Ocean's share of the property and became 100% owner of the Ketza River Mine.

The mine operated from July, 1988 until October, 1990 when the oxide reserves were depleted. The mine produced over 100,000 ounces of gold.

In 1992, Wheaton River Minerals Ltd. purchased the property and equipment of the former Ketza River Mine. Responsibility for all operations at the Ketza River site shifted to Wheaton River on August 24, 1992 with the formal closing of the agreement in late November, 1992. In August 1993, Wheaton River Minerals optioned the Shamrock zone of the Ketza River mine property to Hemlo Gold Mines. Wheaton River Minerals (WRM) formed Ketza River Holdings (KRH), a 100% owned subsidiary, to cover the assets of the Ketza River Mine. WRM sold KRH to YGC Resources Ltd. for shares.

In 1995 and 1996, YGC Resources Ltd. carried out an extensive exploration program including diamond drilling. In 1997, YGC Resources Ltd. concluded a deal with B.Y.G. Natural Resources where B.Y.G. purchased 16.5% of the issued and outstanding shares of YGC. they would receive 50% of future mine production.

## **PROJECT SUMMARY**

The Ketza Mine area is located 50 km south of Ross River, Yukon. The property consists of 322 quartz claims, fractions and leases covering approximately 6100 hectares.

### **GEOLOGY AND MINERALOGY**

A total of 100,000 ounces of gold was produced between April 1988 and November 1990.

The Ketza property currently has mineable gold reserves of 230,000 tonnes oxide and sulphide, grading 10.9 grams per tonne gold and possible reserves of 1,764,000 tonnes at 0.0915 ounces per ton gold.

### **INFRASTRUCTURE**

There is a 340 tonne-per-day CIP (Carbon-In-Leach) mill, supporting infrastructure and a camp on-site.

### **EXPLORATION AND DEVELOPMENT PLANS**

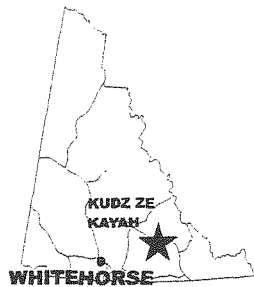
YGC conducted a diamond drilling program in 1995 during which additional oxide gold mineralization was identified. Exploration and a reinterpretation of the property geology at Ketza River led to the discovery of two new oxide zones, the Fork Zone and the McGiver Zone, and an extension to the B-Mag Zone. The company spent close to \$500,000 on the property during 1995.

YGC drilled 21 widely-spaced diamond drill holes on the Shamrock Zone during 1996. The holes were drilled over a strike length of 1,300 metres, across a width of 700 metres and over a vertical interval of 750 metres, with the objective of defining controls to gold mineralization within a large, coincident gold-in-soil, magnetic and visual colour anomaly. Assay results and observed styles of mineralization are consistent with YGC's exploration target of a bulk tonnage, low grade disseminated and stockwork deposit within a portion of the large anomalous area. An intensive program of prospecting and mapping was completed in 1996 to investigate a number of other gold geochemical and coincident geophysical anomalies on the Ketza property.

In 1997, B.Y.G. Natural Resource acquired 16.5% of YGC Resources. The agreement calls for the milling of Ketza ores at the Mt. Nansen mill for revenues to be shares 50/50 net of costs with B.Y.G. advancing pre-production costs. B.Y.G. has also acquired net smelter return royalties on the Ketza River property. In 1997, YGC Resources continued to explore the Ketza River property. Diamond drilling in the area of the McGiver, Nu and B-mag zones was directed towards demonstrating continuity between the zones. Drill hole KR-97-587 suggested a connecting mineralization between the Nu zone and McGiver, with an intersection of 6.1 m grading 16.3 g/t Au in oxide mineralization. Drilling also intersected a new zone of oxide mineralization named the McDood. Two intersections 100 m apart returned assays of 6.7 g/t Au over 4.7 m and 4.6 g/t Au over 5.8 m. The 1997 program was aimed at increasing oxide reserves on the former producing mine property in preparation for possible production in 1998. In 1997, YGC also conducted work on the Shamrock Zone, a bulk-tonnage low-grade gold target. The Shamrock Zone was tested with widely spaced drilling in 1996 which returned numerous intersections. The 1997 work included detailed mapping, sampling and re-logging of all core drilled by previous operators.



## KUDZ ZE KAYAH PROPERTY



### Cominco

500 - 200 Burrard St.  
Vancouver, B.C.  
V6C 3L7

Phone: (604) 682-0611  
Fax: (604) 844-2516

### Project Status

Final license approvals  
expected this year.

### Location

110 air km southeast of Ross River, Yukon

### Ownership:

Cominco Ltd.

### Commodity:

Copper, Lead, Zinc, Silver, Gold

### Ore Type:

Sulphide

### Mineable Reserve:

11.3 million tonnes

Copper 0.93%

Lead 1.52%

Zinc 5.89%

Silver 133.0 g/t

Gold 1.34 g/t

### Geological Reserve:

13 million tonnes

Copper 1.00%

Lead 1.30%

Zinc 5.50%

Silver 125 g/t

Gold 1.20 g/t

### Mining Method:

Open Pit, 365 days per year

### Processing Method:

Conventional mill, 365 days per year

### Mine Life:

11 years

## HISTORY

Cominco carried out a geochemical survey in 1977 in the Finlayson Lake area, but was too wide-spaced to reveal evidence of the ABM deposit. In 1992, Cominco returned to the area to follow-up on anomalous base metal stream silt samples which had been collected in 1988 by the GSC. In late 1993, quartz-sericite altered rhyolite rocks and a 15 cm piece of banded massive sulphide-magnetite float was noted, but the source of mineralization was not found until geophysical surveys revealed a major anomaly under the valley. The initial discovery hole was drilled in April 1994. A large regional airborne electromagnetic and magnetic survey was flown and a total of 8500 m in 52 diamond drill holes were completed in 1994 in a helicopter supported, low impact exploration program.

The 1995 exploration program included construction of a tote road from the Robert Campbell Highway (approximately 20 km), 15,000 metres of diamond drilling in 120 holes, sampling, and engineering and environmental activities. The purpose of the drilling was to define the ore reserve, assess mining methods and confirm the absence of important mineralization under possible locations for mill, tailings, and waste rock sites. Cominco spent \$3.5 million during 1995 on advanced exploration and \$800,000 on grassroots exploration. During 1996 and 1997, Cominco has been drill-testing targets outlined by airborne geophysics. Exploration work comprising geological

mapping, geochemistry and geophysics is ongoing. The company's 1997 exploration budget for the area was about \$2 million compared with \$4.2 million in 1996.

## **PROJECT SUMMARY**

The Kudz Ze Kayah property, host of the ABM mineral deposit, is owned by Cominco Ltd. and located 110 air km southeast of Ross River, Yukon. The gently-dipping sheet-like ABM deposit lies below a U-shaped valley, covered by 2 to 10 metres of glacial overburden. An unnamed north-flowing tributary to Finlayson Creek, locally called "Geona Creek" drains beaver ponds which in part overlie the deposit. Finlayson Creek drains into the Finlayson River which forms part of the Upper Liard system draining to the Beaufort Sea.

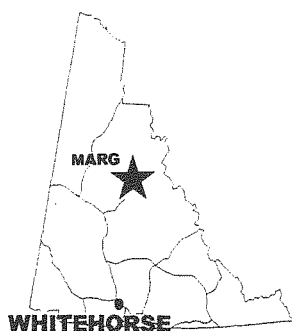
Cominco has spent a total of \$11 million to find and delineate the ABM deposit and take it to the feasibility stage. Cominco and the Ross River Dena Development Corp. signed a socio-economic participation agreement in May, 1995. A management advisory committee comprising representatives from Cominco and the Ross River Kaska Dena will be established to implement the terms of the agreement, which covers contracting opportunities, employment, training, temporary land use interruption and environmental management with respect to the Kudz Ze Kayah project. Project environmental permitting began in 1996 with the submission of environmental assessment documentation.

### **GEOLOGY, MINERALOGY and ORE RESERVES**

The ABM deposit is hosted by a thick sequence of Devonian-Mississippian-age felsic volcanic pyroclastics comprising quartz and feldspar crystal tuffs, fine lapilli ash tuffs, and ash tuffs with lesser rhyolite flows or sills. Immediately above the deposit are felsic pyroclastics which are intensely deformed and altered to quartz-muscovite-carbonate schists containing fine pyrite and quartz veinlets.

Exploration work in 1994 delineated the approximate extent of the ABM deposit, roughly estimated to contain 13 million tonnes grading 1.0% copper, 1.3% lead, 5.5% zinc, 125 g/t silver and 1.2 g/t gold. This estimate was based on 50 holes drilled on 100 m centres. By the end of 1996, a total of 139 drill holes had outlined a mineable open-pit reserve of 11.3 million tonnes grading 5.9% zinc, 1.5% lead and 0.9% copper, plus 1.3 grams gold and 133 grams silver per tonne, based on 50 m spacings, and in some cases, 25 m spacings.

In 1995, construction of a tote road from the Robert Campbell Highway was carried out in addition to diamond drilling, sampling and engineering and environmental studies. A 50 person camp was constructed on site. Project permitting began in 1996, with the submission of environmental assessment documentation. Preliminary plans call for a mine/concentrator operation producing about 175,000 tonnes per year of lead, zinc and copper concentrate over a 10-12 year period.

**MARG PROPERTY****United Keno Hill Mines Ltd.**

Chairman: Stephen Powell

**Corporate Headquarters**

National Bank Building  
#1702, 150 York Street  
Toronto, Ontario  
M5H 3S5

Phone: (416) 955-9085

Fax: (416) 955-9459

**Elsa Mine**

Elsa, Yukon  
Y0B 1J0

Phone (867) 995-2600

Fax (867) 995-2740

**Location**

42 km northeast of Keno City

**Ownership:**

United Keno Hill Mines Ltd.

**Commodity:**

Copper, lead, zinc, silver, gold

**Ore Type:**

Sulphide

**Geological Resource:**

6,092,000 million tonnes

Copper 1.76%

Lead 2.46%

Zinc 4.6%

Silver 62.7 grams per tonne

Gold 1.0 grams/tonne

**Mining Method:**

Not determined

**Processing Method:**

Conventional Milling

**Project Status**

Feasibility study planned.

**HISTORY**

The Marg property was first staked by Canadian Superior Exploration Ltd. in 1965 on a GSC stream sediment anomaly and explored with soil sampling, mapping, and hand trenching in 1965 and 1966 in a joint venture with United Keno Hill Mines Limited. Canadian Superior performed additional trenching and detailed geochemistry in 1967.

The property was restaked as Flash in July 1977 by Mountaineer Mines Limited and Welcome North Mines Limited and as Tudl in 1982 by ZX Joint Venture (Chevron, SMD Mining and Enterprise Exploration Limited), who explored with mapping, geochem sampling and trenching in 1982 and 1984. In 1986, All North Resources Ltd. optioned a 66-2/3% interest in the property and performed soil sampling, hand trenching and VLF, mag, Max-Min and IP surveys. The remaining 33-1/3% interest is held by SMD Mining which changed its name to Cameco in 1989.

NDU Resources Ltd. bought the All-North interest in 1987. NDU delineated volcanogenic massive sulphide lenses on the property and advanced the property through diamond drilling. NDU Resources Ltd. was merged with United Keno Hill Mines in April, 1998.

**PROJECT SUMMARY**

The Marg property is located 42 km northeast of Keno City and, until recently was owned by NDU Resources Ltd. NDU Resources Ltd. merged with United Keno Hill Mines Ltd., in April, 1998. NDU Resources conducted a large diamond drilling program on the property from 1987 until 1990. No exploration was conducted on the property from 1991 until 1995.

**GEOLOGY, MINERALOGY and ORE RESERVES**

The Marg deposit consists of four stacked massive sulphide lenses hosted by Devono-Mississippian felsic metavolcanic rocks. From bottom to top, the sulphide lenses are designated A, B, C and D, with the upper, or "D" Zone being the most continuous, and also the thickest (up to 23 m). The sulphide lenses strike east-northeast, dip southeast, and are elongated in a downdip direction. Along strike, they grade into massive carbonate. The lenses average 6.1 m in thickness, but can be up to 23 m thick.

**EXPLORATION AND PRODUCTION PLANS**

The All-North interest was sold to NDU Resources Ltd. in 1987, who staked additional claims and explored by prospecting, mapping, Max-Min and pulse-EM surveys, airstrip construction, road building and 6037.5 m of diamond drilling (33 holes in 1988). Exploration in 1989 consisted of mapping, VLF, mag and pulse-EM geochem surveys and 5 drill holes. NDU added more Marg claims in 1990 and drilled 10 holes totalling 4119.4 m.

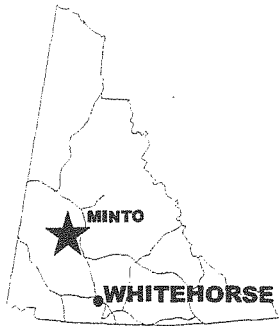
NDU conducted an exploration and 26 hole drilling program on the property during 1996. Two drills were working on the property. One drill extended reserves on the D horizon and underlying A, B, and C horizons. The second drill explored targets elsewhere on the property.

Diamond drilling in 1996 more than doubled the area of previously defined mineralization. The results demonstrate remarkable lateral continuity over a 1,200 metre strike length and up to 700 m down dip.

Surface exploration drilling consisting of 7 holes was completed in early August, 1997. Core samples have been sent for metallurgical testing.

Drill-indicated reserves as of December, 1997 for the Marg were 6,092,000 tons at an average grade of 1.76% copper, 2.46% lead, 4.6% zinc, 0.29 ounces per ton gold and 1.8 ounces per ton silver. The nearby Blende deposit hosts a drill-indicated resource of 21,495,000 tons of open pit material with an average grade of 3.04% zinc, 2.79% lead and 1.6 ounces per ton silver.

NDU Resources and United Keno Hill Mines merged in April, 1998. Their respective properties were consolidated. Plans call for a resumption of production at United Keno Hill's Elsa silver mine at an average rate of 500 tons per day. First year production is forecast at approximately 6 million ounces of silver at an average cost of approximately US \$3.00 per ounce. Once production has been resumed, initial activities will concentrate on the further expansion of the mineral resources at Elsa, and then on establishing the feasibility of the Marg deposit. The economics of a new 2500 to 3000 tons per day mill to be constructed at Elsa will be looked at.

**MINTO PROPERTY****Minto Explorations Ltd.**

President: Lutz Klingmann

Corporate Headquarters  
6411 Imperial Avenue  
West Vancouver, B.C. V7W 2J5Phone: (604) 921-7570  
Fax: (604) 921-9446**Project Status**Production expected in  
1999.**Location**

240 km northwest of Whitehorse, Yukon

**Ownership:**

Minto Explorations Ltd., Asarco Inc.

**Commodities:**

Copper, Silver, Gold

**Ore Type:**

Sulphide

**Mineable Reserves:**

7,166,880 million tonnes

Copper 1.76%

Silver 7.54 g/t

Gold 0.51 g/t

**Geological Reserves:**

7,980,000 tonnes

Copper 1.76%

Silver 7.54 g/t

Gold 0.51 g/t

**Mining Method:**

Open Pit and Underground, 360 days per year

**Mine Life:**

13 years

**Employees:**

76

**Power:**

2 MW, Diesel Generation on Yukon River

**HISTORY**

Anomalous copper concentrations were first detected during a program of stream sediment sampling in the Minto area in 1970. The MINTO claim group was staked by Asarco Inc./Silver Standard Mines Ltd. (The Dawson Range Syndicate) in 1971. The DEF claim group was staked to the north of and adjoining the MINTO claim group by an exploration consortium managed by United Keno Hill Mines Ltd., also in 1971. Both properties were explored from 1972 to 1974. The first significant drill intersection was made in July 1973 and subsequent extensive diamond drilling outlined an ore deposit which is divided into approximately equal parts by the common claim boundary. A feasibility study was completed under the joint direction of Asarco Inc. and United Keno Hill Mines Ltd. in 1976, but the project did not proceed at that time due to poor indicated financial returns. Further drilling programs were conducted in 1984 and 1985 by United Keno Hill Mines.

Minto Explorations Ltd. was incorporated in April 1993 specifically for the acquisition of the Minto property interests held by Asarco Inc. and Teck Corp. (the MINTO claims and leases) and by Falconbridge Limited (the DEF claims and leases) and for the further exploration and development of the Minto property. Teck Corp. and Asarco each sold their interest in the MINTO claims to Minto Explorations for shares in the company, and provided initial working capital of \$375,000 by purchasing further shares. An agreement was signed with Falconbridge Ltd. for the acquisition of the DEF claims and leases on June 9, 1993. The essence of the agreement is that a cash payment of \$1 million will be made to Falconbridge Ltd. after a production decision has been made and project financing secured. The agreement has a term of 30 months.

The 1995 exploration program included a 425 metre diamond drilling program which tested the western edge of the property, a 147 m condemnation hole drilled north of the proposed mill location, and drilling and sampling to determine geotechnical parameters for the final design of the tailings dam. No new mineral zones were identified by this program. A recent detailed interpretation of 1993 magnetic data identified six exploration targets in areas on the property that had not been previously explored. An access road from the barge landing at the Yukon River to the minesite was also completed.

The 1996 program included mill and site preparation, and shipment of some mill equipment to the site. In 1997, Minto continued road construction and site preparation.

## **PROJECT SUMMARY**

Minto Explorations Ltd. is proposing to develop the Minto Property located approximately 240 km northwest of Whitehorse, Yukon, on the west side of the Yukon River. The orebody is located in the upper reaches of the Minto Creek watershed, approximately 10 km upstream of the Yukon River confluence, at an elevation 2,660 to 2,900 ft. Access is by barge across the Yukon River from Minto Landing then via road.

The Minto project will employ 76 people. Approximately 70% of the positions are expected to be filled by residents of Whitehorse, 15% by residents of Carmacks/Little Salmon Carmacks First Nation, 10% by residents of Pelly Crossing/Selkirk First Nation and 5% by residents of Faro. The Minto Project is situated on traditional Selkirk First Nation Land. Considerable consultation has taken place to ensure that their needs and concerns are addressed. A socio-economic agreement with Selkirk has been completed, final signature is pending. Equal opportunity will be available for employment and business opportunities with the Minto Mine. Minto Explorations Ltd. will provide training opportunities to all First Nation peoples (Selkirk First Nation, Little Salmon Carmacks First Nation, etc.) seeking employment with the mine.

Minto Explorations Ltd. announced in March, 1998, that due to delays in licensing and current low copper prices, start-up of operations is now expected early in the year 2000. Construction of the 28.8 km access road to the site was completed in 1997 and the sites for the permanent camp and the mill were excavated. Various roads on site, including the pit perimeter road were constructed. Two used grinding mills were purchased in the United States, dismantled and shipped to the Yukon and across the Yukon River. The two mill motors are currently being overhauled.

### **GEOLOGY, MINERALOGY and ORE RESERVES**

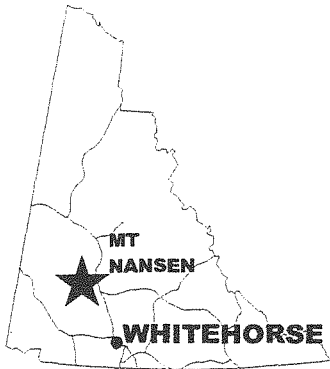
The Minto deposit is hosted in a flat-lying, tabular zone of foliated biotite granodiorite and quartzofeldspathic gneisses enclosed in a Klotassin granodiorite. The main ore zone is 335 m long, 247 m wide and 6 to 61 m thick, with an average width of 30 m. The principal ore minerals are chalcopyrite and bornite in variable proportions with significant gold and silver values.

The in-situ geological reserve for the deposit above a cut-off grade of 0.50% copper is 8,810,000 tonnes with 1.73% copper, 0.48 g/t gold and 7.5 g/t silver. The reserve contains 336 million pounds of copper, 140,500 ounces of gold and 2.176 million ounces of silver.

### **PRODUCTION**

The proposed Minto Project would entail an open pit and underground operation, waste rock stockpiles, a tailings storage facility, ore crushing facilities and a conventional copper flotation mill. These facilities will occupy an area of approximately 141 ha. The mill will be designed to process 1,360 tonnes ore per day for 350 days per year (476,000 tonnes per year). Ore will be treated by conventional flotation to produce copper concentrate containing from 33% to 38% copper. The tailings impoundment will be located within the Minto Creek valley, approximately 850 m east of the mill and has a capacity of 9,979,200 tonnes. Concentrate will be trucked on a daily basis to Skagway then on to the rail head at Fort Nelson to port facilities in British Columbia. To bring the Minto deposit into production, Minto Explorations Ltd. signed a joint venture agreement with Asarco Inc., where Asarco Inc. will acquire 70% interest in the project in consideration for providing up to US \$25 million for project development. Minto Explorations Ltd. will retain a 30% interest in the project and will be the operator.

## MOUNT NANSEN PROPERTY



### B.Y.G. Natural Resources Inc.

President: Graham Dickson

*Corporate Headquarters*  
General Delivery  
Carmacks, Yukon  
Y0B 1C0

Phone: (867) 863-5913  
Fax: (867) 863-6028  
Email: feedback@byg.ca

www.byg.ca

### Project Status

In Production

### Location

60 km west of Carmacks

### Ownership:

B.Y.G. Natural Resources Inc.

### Commodity:

Gold, Silver

### Ore Type:

Sulphide

### Geological Resource:

1,077,826 tonnes

Silver 166.92 grams per tonne

Gold 7.64 grams per tonne

### Mineable Reserve:

367,337 tonnes

Silver 75.09 grams per tonne

Gold 5.17 grams per tonne

### Mining Method:

Open Pit and Underground, 365 days per year

### Processing Method:

Conventional Mill, 365 days per year

### Mine Life:

3 years

### Employees:

65

### Power:

2 MW, On-site diesel generation

## HISTORY

Placer gold was originally discovered on Nansen Creek in 1899. The first recorded lode gold discovery on the current Mt. Nansen property was made by prospectors Brown and McDade in 1943.

The first underground work was conducted on the Brown-McDade zone in 1947 by the Spud Huestis Syndicate. After a few years of mine development, mapping, surface trenching and sampling, the property remained inactive until 1962 when the Mt. Nansen Syndicate acquired the Brown-McDade, Webber and Huestis deposits and conducted additional exploration. Mt. Nansen Mines Ltd. was acquired by Peso Silver Mines Ltd. which conducted exploration over the next three years on all three deposits. A 270 tonne per day floatation mill was constructed during 1967-68. A total of 14,500 tonnes of development muck produced during 1967-68 had an estimated average grade of 7.8 g/t Au and 162 g/t Ag, while mill feed of 5,236 tonnes produced from stopes during 1969 had an estimated average grade of 11.7 g/t Au and 282 g/t Ag. Low gold recovery rates, estimated at 60-65% led to the mine closure in April, 1969. In late 1975, a total of 5,450 tonnes at an estimated grade of 16.8 g/t Au and 248.8 g/t Ag was produced from the Huestis deposit and processed during May, 1976, but the mine once again shut down shortly after. As of 1976, over 4,572 metres of underground development was been completed on the three veins. Approximately 22,680 tonnes of ore was treated in the flotation mill in

1975 and 1976.

B.Y.G. Natural Resources Inc. (BYG) acquired the properties and combined them with additional claims to form the current property in 1984. BYG and Chevron Minerals Ltd. carried out an exploration program from 1985 to 1987. Over \$5 million was expended on geological mapping, geochemical and geophysical surveys, trenching, 2,605 m of diamond drilling (41 holes) and 1,283 m of rotary percussion drilling (17 holes). During 1988, B.Y.G. continued exploring on its own by carrying out surface trenching and 85 holes (5,397 m) of diamond drilling. A previously unrecognized near-surface oxide zone was discovered and the underground sulphide reserves were expanded. Metallurgical testing, mill flow sheet designs, tailings disposal and environmental impacts were studied at this time.

BYG currently owns 100% of the Mount Nansen project, subject to royalties.

Between 1994 and 1997 B.Y.G. conducted exploration consisting of diamond drilling on the Brown-McDade and Flex (990 m - 12 holes in 1994), Flex and Huestis (1,490 meters - 21 holes in 1995), Webber and Flex (780 m - 10 holes in 1996) and Vince Vein (745 m - 9 holes in 1997). During 1997, a program of overburden stripping and excavator trenching was completed on the Flex zone.

## **PROJECT SUMMARY**

The Mt. Nansen Mine is located 60 km west of the village of Carmacks, Yukon and is accessible by a gravel road from Carmacks to the minesite. The property consists of 257 mining claims and 30 mining leases covering an area of 53 square kilometers. There are another 524 mining claims owned by BYG immediately surrounding the main Mt. Nansen property. Mount Nansen is an open-pit mine with a three year mine life based on reserves from the Brown-McDade zone. The mine life is expected to be extended by the discovery of additional oxide ore reserves in the Webber and Flex zones and also if viable metallurgical processes are developed for potential sulphide ore on the property.

### **GEOLOGY, MINERALOGY and ORE RESERVES**

The Mount Nansen district is underlain by metamorphosed intrusive, sedimentary and volcanic rocks of the Yukon Tanana Terrane. These rocks are intruded by Early Cretaceous felsic plutonic rocks and overlain by Mid-Cretaceous Mount Nansen mafic to intermediate volcanic rocks and related sub-volcanic feldspar porphyry dykes and plugs.

The Mt. Nansen property is host to four distinct gold deposits; Brown-McDade, Webber, Huestis and the Flex Zone. The zones are situated in a series of anastomosing veins in northwesterly trending faults or shear zones. The gold and silver mineralized structures consist of fault-shear-hosted veins and associated clay-rich and bleached alteration zones. The veins occur in a 2.5 km wide corridor which has been traced over a strike length of 15 km. Clay-rich leach zones near the surface which are underlain by blankets or lenses of gold-rich supergene ores.

#### *Brown-McDade Zone*

The Brown-McDade Zone lies at the southeasterly end of the belt. It is 55 m long by 200 m wide and consists of quartz veins and associated feldspar porphyry dykes. The oxide ore of the Brown-McDade is currently being mined by a small open pit. A mineable open pit reserve of 110,000 tonnes grading 12.33 g/t gold and 78 g/t silver has been outlined in the proposed open pit, with an additional 80,000 tonnes of low grade mineralization. Underground resources are estimated at 222,000 tonnes grading 6.8 g/t gold and 57.0 g/t silver below the planned open pit.

#### *Webber Zone*

A diluted oxide reserve of 102,500 tonnes grading 7.83 g/t gold and 466.4 g/t silver in the Webber deposit has been established from extensive trenching, drilling and underground development.

#### *Huestis Vein*

Mineable sulphide reserves of 148,600 tonnes grading 11.75 g/t gold and 79.7 g/t silver have been defined on the Huestis vein by trenching, diamond drilling and detailed underground sampling. The ore is sulphide-rich and refractory.



The total mineral inventory for the Mt. Nansen property, including the Brown-McDade, Webber, Heustis and Flex zones, along with the dumps and the tailings, is 1,009,403 tonnes grading 7.38 g/t gold and 148 g/t silver. The mineable reserve is estimated to 648,370 tonnes grading 6.67 g/t gold and 132 g/t silver. The mineable reserve is comprised of ore from the Brown-McDade and the Webber deposits as well as the dumps and tailings. The Flex Zone will provide feed for the Mt. Nansen mill after depletion of the Brown McDade Zone.

There is a geological sulphide reserve on the property of 599,247 tonnes grading 8.88 grams/tonne gold and 190 grams/tonne silver.

**PRODUCTION**

The initial capacity of the mill is 700 tonnes per day.

Gold production from surface oxide ores commenced during the week of October 18, 1996 and the company poured the first bar of gold on November 23, 1996. Commercial production began on January 1, 1997. The mill was established to process 700 tonnes per day; intended yearly production is 50,000 ounces of gold. The gold is sold through Gerald Metals Inc. At present, proven gold reserves will support production of 150,000 ounces of gold.

In January, 1997, the company produced 2,700 troy oz of gold and 13,000 troy oz of silver. Ore throughput increased to 450 tonnes per day which is 64% of design capacity. Recoveries averaged 88% and the head grade averaged 0.235 oz equivalent gold per tonne.

The unanticipated presence of clay-alteration minerals in the ore forced the daily milling rate down to less than 325 tonnes during the first nine months of operations. The problem was solved by stalling a semi-autogenous grinding mill (SAG). Also, record rainfall aggravated existing difficulties milling the gold-rich, clay altered ores and restricted capacity to 36%. The SAF mill was operational by the end of August, 1997. During July and August, 1997, the mill operated largely on stockpiled ores leaving the high grade open pit clay altered ores to be mined and processed when the SAG mill became operational.

**Total Production - First Six Months of 1997**

Total Ore Milled	54,200 tonnes	Ore Milled per Day (tonnes)	299	Gold Grade (grams/tonne)	9.10
Recovery	90%	Gold Produced (troy ounces)	14,260	Silver Grade (grams/tonne)	74.51
Silver Grade (grams/tonne)	74.51	Silver Recovery	50%	Cost Per Troy Ounce	\$195

Unseasonably heavy rainfall created a water imbalance problem in late 1997. There was inadequate provision for run-off of the rainfall, which led to an environmental discharge danger. BYG engineered a water treatment system in the spring of 1997 by transporting facilities from the Canamax mine controlled by YGC. The treatment facility enabled the company to meet water quality discharge levels.

The mine re-started production at the end of January, 1998 and delivered its first gold and silver for sale in April, 1998. At first, production was limited to 50% of the mill's 700 tonne-per-day capacity, then installation of new pumping facilities allowed the mill to operate at full capacity. B.Y.G. estimates that it will be able to produce gold at an operational cost of \$160 per ounce.

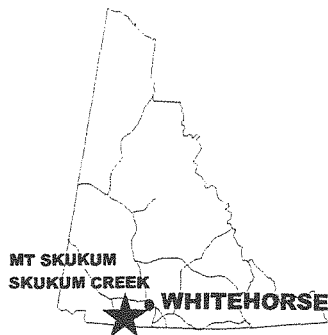
B.Y.G. is looking at building a custom milling pressure oxidation plant to process sulphidic ores from its Mt. Nansen mine, and also from other properties in the Yukon, including the Wheaton River area.

The company downsized in 1998; its sole operating office is at the minesite and the work force was cut from 104 to 58 people.

B.Y.G. Natural Resources plans to undertake major exploration and drilling programs, starting in April, 1998, to delineate additional oxide ore reserves on the Mt. Nansen mine property, particularly on the nearby Flex zone, which may provide the next mill feed after the Brown-McDade open pit is exhausted.

A socio-economic agreement between B.Y.G. and Little Salmon Carmacks First Nation was signed in May, 1996. This agreement provides the framework for a partnership on several proposed ventures in the area.

## MT SKUKUM/SKUKUM CREEK PROPERTY



### Omni Resources

#910-700 West Pender St.  
Vancouver, B.C.  
V6C 1G8

Phone: (604) 688-6477  
Fax: (604) 688-9530

### Project Status

Reserve delineation  
ongoing

### Location

40 km W of Carcross

### Ownership:

Omni Resources, Arkona Resources, Trumpeter  
Yukon Gold

### Commodity:

Gold, Silver

### Ore Type:

Mt. Skukum                      Oxide  
Skukum Creek                  Sulphide

### Mineable Reserve (Nov/97):

Rainbow Zone - Skukum Creek  
956,949 tonnes

Silver                      193.5 g/t

Gold                        6.3 g/t

### Kuhn Zone - Skukum Creek

148,781 tonnes

Silver                      167.70 g/t

Gold                        8.78 g/t

### Mining Method:

Underground, 365 days per year

### Mine Life

4 years

### Processing Method:

Conventional Mill, 365 days per year

### Employees:

80

### Power:

3 MW, On-site Diesel generation

## HISTORY

The Wheaton River area first received attention in the early 1890's when prospectors discovered gold-bearing quartz-stibnite veins. With the completion of the White Pass and the Yukon Route Railroad in 1903, the area became more accessible to prospecting and numerous other gold and silver occurrences were located between that year and 1906. Stibnite mineralization was discovered approximately 14 km east of Mount Skukum at Goddell Gully in 1909 and gold-silver mineralization was discovered on the southeast side of Skukum Creek approximately 7 km southeast of Mount Skukum in 1922.

Exploration activity slowed with the beginning of World War One and did not resume until the 1960's when activity increased and stibnite veins in the Goddell Gully, Wheaton River and Skukum Creek areas were re-examined. During the 1970's, most of the exploration activity in the Wheaton River District was

carried out in search of copper, molybdenum and uranium.

Exploration activity peaked in the Wheaton River District in 1981 due to an increase in the price of gold and the discovery of gold-bearing quartz-carbonate veins in the Mount Skukum volcanic complex by AGIP. The project became the site of the Mount Skukum Gold Mine which mined 223,439 tons of ore and recovered 77,796 ounces of gold by underground methods from 1986 to 1988. In 1985, Omni Resources Inc. reported geological reserves of 745,000 tonnes grading 7.9 g/t gold and 305 g/t silver on their Skukum Creek property. From 1985 to 1988, Berglynn Resources Inc. carried out an exploration program on their Goddell Gully property located at the southeast corner of the Mount Skukum Property and adjoining ground held by Omni Resources Inc. This program led to the intersection of high-grade gold mineralization in drill core. The Omni, Berglynn and Mount Skukum Gold Mine properties were dormant from 1989 to the mid-1990's.

Omni Resources completed a drill program on the Goddell Gold project in 1995. The five hole, 2820 m diamond drill program confirmed a large, well-mineralized shear zone. The shear zone is open to extension in depth and length. Omni Resources completed a 620 meter decline in December, 1996 at the Goddell Shear. Underground crews have extended the decline by 600 feet to the east and established drill stations at 50 m intervals.

## **PROJECT SUMMARY**

The Mount Skukum and Skukum Creek deposits are located approximately 65 km southwest of Whitehorse at the termination of the Annie Lake Road. The Goddell Shear Zone, part of the Skukum Creek property, is under option from Arkona Resources Inc. and 276 Taurus Ventures. In April, 1996, Omni Resources entered into an agreement with Trumpeter Yukon Gold whereby Trumpeter would finance Omni through equity over one year to earn a 50% joint interest in Omni's holdings. Trumpeter Yukon Gold is a company controlled by B.Y.G. Natural Resources of Vancouver. The agreement further provides the opportunity for Trumpeter to enter into a 50/50 joint venture with Omni on the Mt. Skukum properties. In October, 1997, Omni Resources announced that they purchased a 100% interest in the RACA claim group which lie on strike and north of the Skukum Creek deposit.

### **MT. SKUKUM DEPOSIT**

Mineralization on the Mt. Skukum property consists of gold within epithermal quartz carbonate veins hosted in an Eocene volcanic caldera complex. Underground mine production began on the Main Cirque body in 1986 at a rate of 300 tonnes per day and continued until August, 1988 when that orebody was exhausted. Approximately 223,400 tons of ore was mined and 77,796 ounces of gold were recovered. The mineral processing facility remains on site and was a conventional Merrill-Crow crushing, grinding, cyanidation, zinc precipitation circuit with cyanide destruction using the Inco SO<sub>2</sub> system. It is estimated that about 98,885 tonnes of oxide ore grading 14.75 g/t gold remains at the Lake Zone. There has been no development on Mt. Skukum since 1989.

### **SKUKUM CREEK DEPOSIT**

The Skukum Creek property was originally staked in 1922 and obtained by Omni Resources in 1984. Exploration and development proceeded quickly on the property from 1985 to 1988. The program, financed largely through flow-through share funding, included more than 24,000 m of surface and underground diamond drilling and 2200 m of underground development on the 1300 and 1350 levels. The Skukum Creek orebody includes the Rainbow and Kuhn sulphide-rich veins which contain moderate gold and significant silver values. Several tries to bring the property into production have failed. The Goddell vein, part of the Skukum Creek property, was drilled in 1995 and 1996. The Omni-Trumpeter joint venture has spent \$3.7 million on exploring and developing the Goddell Shear Zone, which is under option from Arkona Resources Inc. and 276 Taurus Ventures. The strike length of the goddell shear is now over 1,100 feet and is still open to the east, west and at depth. Reserves in the Rainbow Zone have increased in and the company is driving a 100 crosscut from the existing adit. A final feasibility study is planned for 1998 for mining Omni's Skukum Creek deposit. Production rates are anticipated at 500-700 tons per day. BYG has acquired net smelter return royalties on the Mt. Skukum properties.

# SA DENA HES PROPERTY



**Cominco Ltd.**  
 500 - 200 Burrard St.  
 Vancouver, B.C.  
 V6C 3L7  
 Phone: (604) 682-0611  
 Fax : (604) 844-2516

**Project Status**  
 Mine is on care and maintenance

**Location**  
 50 km northeast of Watson Lake

**Ownership:**  
 Cominco Ltd. (50%), Teck (25%),  
 Korea Zinc (50%)

**Commodity:**  
 Lead, zinc, silver

**Ore Type:**  
 Sulphide

**Geological Resource:**  
 3.2 million tonnes  
 Lead 3.70%  
 Zinc 12.90%  
 Silver 57 grams per tonne

**Mineable Reserve:**  
 1.4 million tonnes  
 Lead 2.50%  
 Zinc 10.20%  
 Silver 44 grams per tonne

**Mining Method:**  
 Underground, 365 days per year

**Processing Method:**  
 Conventional Mill, 365 days per year

**Employees:**  
 100

**Power:**  
 6 MW, On-site Diesel generation

## HISTORY

Mineralization was discovered on the Sa Dena Hes property in 1962 by the Frances River Syndicate. The property was worked on at various times by Atlas Explorations, Cima Resources, and Canamax Resources. Curragh Resources (80%) and Hillsborough Resources Limited (20%) as joint venture partners acquired the property in 1989 from Canamax Resources. The Joint Venture spent a further \$5.3 million between April, 1989 and August, 1990 on a field program of geological exploration and diamond drilling. Following completion of the detailed geological assessment, the Joint Venture decided to proceed with construction of the project and work commenced in October, 1990.

In early 1991, a socio-economic agreement was signed by the Joint Venture, the Kaska Dena First Nation, the Town of Watson Lake and the Government of Yukon. The objective of the agreement was to ensure that business and employment opportunities were available to local residents on a preferential basis. In addition, there was an agreement between the Joint Venture and Kaska which extended to the Kaska business, employment, and training opportunities and an option to purchase a 10% interest in the mine.

The Sa Dena Hes mine began production in August, 1991 and ceased operations in December, 1992. Production was halted because of low metal prices. In September, 1993, the Ontario Court appointed

Coopers & Lybrand as the interim receiver acting for the Bank of Nova Scotia for the Sa Dena Hes and Stronsay (Cirque) assets.

The Sa Dena Hes and Stronsay (Cirque) lead-zinc properties were bought by Teck (25%), Cominco (25%), Korea Zinc (40%) and Samsung (10%) in December, 1993. The four partners paid an estimated \$43 million for the Sa Dena Hes and the Stronsay (Cirque) properties. There has been no production at Sa Dena Hes since closure in 1992.

## **PROJECT SUMMARY**

The Sa Dena Hes lead-zinc mine is located approximately 45 km north of Watson Lake. It is owned by Teck Resources (25%), Cominco (25%), and Korea Zinc (50%). The property covers approximately 5,600 hectares.

Production began at the Sa Dena Hes mine in August, 1991 and ceased operations in November, 1992 due to low zinc prices. During the fourteen months of operation the mine produced 607,500 tonnes of concentrate containing 374,400 tonnes of payable zinc and 290,200 tonnes of lead. Infrastructure on site includes the underground mine, ore handling facilities, a 1,500 tonne per day conventional mill, loadout facilities, tailings and reclamation system, shops, warehouse, security and first aid office, a 200 person camp, administration building, and a 6.2 MW power plant.

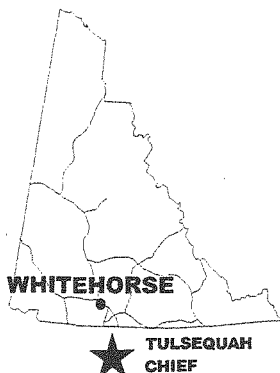
### **GEOLOGY, MINERALOGY and ORE RESERVES**

The mineable reserve on the property is estimated to be 1.4 million tonnes grading 2.5% lead, 10.2% zinc, and 44 g/t silver.

### **EXPLORATION AND PRODUCTION PLANS**

Cominco announced that in August, 1997 that Sa Dena Hes may open in the second quarter of 1998. Pre-operational work, including contract tenders for road upgrading and underground rehabilitation was initiated. Cominco, Teck and Korea zinc upgraded the mine's infrastructure and prepared for a mid-1998 start; however, the re-opening was cancelled in December, 1997 due to poor market conditions. At full production, the operation would produce 75,000 t/y zinc concentrates and 15,000 t/yr of lead concentrates. Output would be sold into Asian markets, with Korea Zinc the most likely smelter. In October, 1997, Cominco and the Liard First Nation signed a socio-economic participation agreement related to the Sa Dena Hes mine.

## TULSEQUAH CHIEF PROPERTY



### Redfern Resources Ltd.

900-999 West Hastings Street  
Vancouver, B.C.  
V6C 2W2

Phone: (604) 669-4775  
Fax: (604) 669-5330  
Email: redfern@interserv.com

[www.info-mine.com/redfern](http://www.info-mine.com/redfern)

### Project Status

Permitting complete

### Location

100 km south of Atlin, B.C.

### Ownership:

Redfern Resources Ltd.

### Commodities:

Copper, lead, zinc, gold, silver

### Ore Type:

Sulphide

### Geological Resource:

8,930,000 tonnes

Copper	1.31%
Lead	1.24%
Zinc	6.61%
Silver	107.56 g/t
Gold	2.53 g/t

### Mineable Reserve

Copper	1.27%
Lead	1.18%
Zinc	6.35%
Silver	100.91 g/t
Gold	2.42 g/t

### Mining Method:

Underground, 343 days per year

### Processing Method:

Conventional mill, 365 days per year

### Mine Life:

9 years  
Employees  
199

### Power:

12 MW, On-site diesel

## HISTORY

In 1923, W. Kirkham of Juneau, Alaska discovered the Tulsequah Chief deposit while prospecting in the Tulsequah River valley. The initial discovery of a highly mineralized showing located above the present 6500 level adit (400 m above sea level) initiated a wave of prospecting activity in the area. The ensuing years of intensive prospecting efforts culminated in the 1929 discovery of the Big Bull deposit some seven kilometers to the south. In the same year, discoveries were also made at the Sparling, Banker and Polaris-Taku deposits. The Tulsequah and Big Bull deposits were acquired by Cominco in 1946 and were put into production by 1951. For six years, both deposits were mined at an average rate of 482 tonnes/day. In 1957, Cominco was forced to close its operations with substantial reserves in place due to low metal prices. From 1957 until 1971, the mine site lay dormant and unexplored.

During operations in the 1950's, the Tulsequah Chief deposits were considered to be shear-zone

controlled. In 1971, re-examination of the local geology by Cominco geologists led to identification of volcanogenic massive sulphide (VMS) mineralization. Ten years passed before the next wave of exploration commenced. In 1981, 1:250,000 and 1:50,000 mapping was conducted. This work was followed in 1982 by airborne Dighem and Questor Input AEM geophysical surveys conducted by Cominco and Redfern Resources Ltd., respectively. The 1:50,000 mapping work was originally published in 1984 and then in 1987 it was further refined and re-published for Cominco.

In 1987, ongoing discussions between Cominco and Redfern led to an agreement whereby Redfern acquired the right to earn up to a 40% interest in the Tulsequah Chief deposits. Since that time, exploration has continued every year to date with concurrent negotiations resulting in Redfern's present 100% ownership of the property. Redfern has spent \$16.8 million on exploration, delineation drilling, metallurgical testing, environmental work, engineering design and feasibility studies on the property since 1987.

## **PROJECT SUMMARY**

The Tulsequah Chief project, 100% owned by Redfern Resources Ltd. (Redfern) is a former base and precious metal producing mine hosting copper, lead, zinc, gold and silver mineralization. The project site is located in the British Columbia Coastal Mountain Range near the Alaska border, some 64 km northeast of Juneau, Alaska. Access to the property is currently by helicopter or fixed wing from Atlin or Juneau. Redfern is proposing a 160 km access road to be constructed from the minesite to the existing road near Atlin and operated as a restricted access road under the B.C. Mining Right-of-Way Act. The project will employ about 200 people. The crews will be flown in from either Vancouver, Smithers or Whitehorse and reside in a mine camp. Power requirements are estimated at about 12 MW. Redfern has completed all environmental baseline studies begun in May, 1994. The Tulsequah Chief project has completed its environmental review and received approval from the B.C. government in early 1998. Redfern has selected, in conjunction with the Taku River Tlingit First Nation, an Aboriginal Liaison officer.

### **GEOLOGY, MINERALIZATION AND ORE RESERVES**

The Tulsequah Chief property is predominately underlain by folded, faulted and metamorphosed pre-Permian, volcano-dominated rocks of the Mount Eaton Group as well as intrusive rocks of the coast Plutonic Belt. The Tulsequah Chief property contains Kuroko-type volcanogenic massive sulphide deposits which are believed to have precipitated on the sea flow adjacent to fumaroles associated with felsic submarine volcanism. Sulphide mineralization consists of thin-banded to massive pyrite with lesser amounts of sphalerite, chalcopyrite and galena. The mineable ore reserve is estimated to contain 7.9 million tonnes grading 1.27% copper, 1.18% lead, 6.35% zinc, 2.42 g/t gold and 100.91 g/t silver.

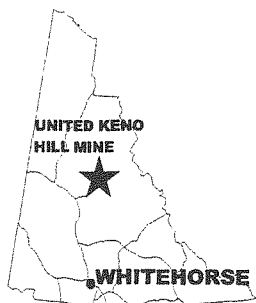
### **PRODUCTION PLANS**

Underground mine production is estimated at 2,466 tonnes per day over a 9 year mine life. The proposed milling plan involves gravity concentration within the grinding circuit, followed by differential flotation to recover free gold and to produce separate copper, lead and zinc concentrates. It is estimated that in full production, the mine will deliver 52,620 ounces of gold and 2,655,000 ounces of silver per year. Redfern Resources is proposing construction of a year-round 160 km access road to be constructed from the minesite to the existing road near Atlin, B.C. From here concentrate would be hauled to port facilities in Skagway Alaska. The access road would be operated as a restricted access road under the B.C. Mining Right-of-Way Act.

Redfern has been meeting with smelter representatives in Asia and North America seeking buyers for the copper and zinc concentrates from the Tulsequah project and concurrently have been reviewing options for project financing. Letters are in hand from smelters in Japan and Canada expressing an interest in buying 100% of the bulk copper-lead, plus precious metal concentrates. Proposals have been received from financial and banking groups with offers to provide assistance in arranging the \$155 million financing package required to place the Tulsequah project in production. Redfern is also conducting discussions with certain operating mining companies which have expressed an interest in participation, either through joint venturing or via corporate merger.



## UNITED KENO HILL PROPERTY



### United Keno Hill Mines Ltd.

Chairman: Stephen Powell

#### Corporate Headquarters

National Bank Building  
#1702, 150 York Street  
Toronto, Ontario  
M5H 3S5

Phone: (416)955-9085  
Fax: (416)955-9459

#### Elsa Mine

Elsa, Yukon  
YOB 1J0

Phone (867) 995-2600  
Fax (867) 995-2740

#### Location

Elsa, Yukon

#### Ownership:

United Keno Hill Mines Ltd.

#### Commodities:

Silver, lead

#### Ore Type:

Sulphide

#### Mineable Reserve:

415,000 tonnes

Lead: 7.50%

Zinc: 5.60%

Silver 1145 grams per tonne

#### Geological Resource:

944,000 tonnes

Lead 4.80%

Zinc 3.90%

Silver 930 grams per tonne

#### Mining Method:

Underground, 365 days per year

#### Processing Method:

Conventional mill, 365 days per year

#### Project Status

Re-opening planned for late 1998

## HISTORY

Silver and lead mineralization was first discovered on the property in 1903. Treadwell Yukon Company Limited acquired the better showings in the area and began shipping hand-cobbed ore in 1921. Treadwell mined the deposits from 1921 to 1941; a total of 1.5 billion grams of silver were produced during this time. In 1945, Frobisher Exploration Company Ltd. and Conwest Exploration Company Ltd. formed Keno Hill Mining Company Ltd. United Keno operated the mine from 1946 until 1988. A strike from September 1980 to May 1981 severely curtailed production. Low silver prices forced the mine to close from July, 1982 to August, 1983. In January 1989, the mine was closed due to low silver prices. From 1946 to 1988 about 5.08 billion grams of silver were produced from the Hector-Calumet, Galkeno, Bellekeno, Elsa, Keno (No. 3 & 9), Lucky Queen, Silver King, Sadie-Ladue and Husky Mines. In 1990, Archer, Cathro and Associates mined over 100 tonnes of high-grade ore from open pits on the Lucky Queen, Keno #3 and Keno #9 veins.

In July, 1990 BLM Mines Inc., a unit of Bharti Laamanen Mining Inc. of Sudbury, Ontario, purchased the 44.8% interest in United Keno Hill Mines Ltd. formerly held by Falconbridge Ltd. In 1991, Romith Investments and Stephen Powell each acquired directly or indirectly, 50% of the issued and outstanding common shares of BLM. In September, 1993, United Keno Hill retained mine engineers Watts, Griffis and McQuat Ltd. (WGM) of Toronto to undertake a complete review of its Elsa area properties, geological reserves and mine plans. A surface drilling program was completed in the Silver King, Husky SW and Bellekeno areas during the summer of 1994. From mid-October 1994 to April 1995 underground drilling and rehabilitation was conducted on the Bellekeno and Silver King

mines. A feasibility study on the property was completed in October, 1996 and a merger with NDU Resources was announced in 1997.

## **PROJECT SUMMARY**

The United Keno Hill silver vein deposits are located in Elsa, approximately 354 km north of Whitehorse. The property is owned by United Keno Hill Mines Limited and consists of several underground and open pit silver-lead-zinc mines in the Keno Hill-Galena Hill area. The Elsa operations have been in production since the initial discovery of silver in 1906. Between 1947 and 1989, United Keno Hill Mines produced 148 million ounces of silver, 482 million pounds of lead and 4 million pounds of cadmium from the Elsa operations.

### **GEOLOGY, MINERALIZATION AND ORE RESERVES**

More than 65 mineral deposits and prospects have been identified within the Keno Hill district. All of the mineable silver veins to date occur in an area 26 km long and 1 to 6.4 km wide. The deposits consist of mineralized vein faults 0.3 to 30 m wide in the Keno Hill quartzite. Underground mineable reserves, mostly in the Bellekeno and Silver King veins, stand at 415,000 tonnes grading 1145 g/t silver, 7.5% lead, and 5.6% zinc. Geological reserves are 944,000 tonnes grading 930 g/t silver, 4.8% lead and 3.9% zinc.

### **PRODUCTION PLANS**

United Keno Hill Mines Ltd. has been conducting surface and underground exploration with the goal of increasing existing reserves to support an initial five year mine life at a historic average grade of approximately 1300 grams/tonne silver. The company hired Watts, Griffis and McOuat Ltd. of Toronto to oversee the 1994-1995 exploration programs and to undertake a complete review of its Elsa area properties, geological reserves and mine plans. A surface drilling program was completed in the Silver King, Husky SW and Bellekeno areas during the summer of 1994. From mid-October 1994 to April 1995 an underground drilling (\$5 to \$8 million) and rehabilitation program was conducted on the Bellekeno and Silver King mines, which increased reserves at both mines. A Type B Water License from the Water Board was issued for this work. Water treatment facilities were constructed in the fall, 1994 for three of the mine sites, and the Bellekeno and Silver King mines are now substantially rehabilitated. New 5 kV lines and transformers provide a modern electrical system in each mine, and new compressors and re-engineered ventilation deliver the necessary underground working environment. The underground program was halted in April, 1995 to compile and assess the data and plan the next step.

In 1996, the company resumed the underground exploration and development program on the Bellekeno and Silver King Mines in an effort to increase reserves and establish mineable ore reserves. Environmental fieldwork and background data gathering also continued. The down-dip extension of the mineralized zones at the Bellekeno, Silver King and Husky Southwest Mines and continued environmental fieldwork and background data gathering.

Rescan Engineering completed a feasibility study on the property in October, 1996. The feasibility study supports the Company's view that it can reduce costs and increase efficiency. The effectiveness of the proposed mining methods and mine development strategies has been confirmed and the Feasibility Study suggests substantial improvement over historic operating costs and recoveries. United Keno Hill Mines adopted the recommendations of the feasibility study and, based on its conclusions, plans to implement a program of rehabilitation and development intended to permit the recommencement of commercial production from Elsa in 1998. In March, 1997, United Keno Hill Mines ceased work on the property pending raising capital.

A merger with NDU Resources was announced in late 1997. Under the terms of the merger, NDU and UKHM will merge their properties and resources to permit the resumption of silver mining at Elsa and the exploitation of NDU's Marg and Blende deposits.

In July, 1997, United Keno Hill Mines, NDU Resources Ltd., and Yukon Gold and Mineral Development Company entered into letters of intent respecting the reactivation of UKHM's mines and mill at Elsa, and the evaluation of the merits of a joint operation between UKHM and NDU involving a common milling facility and related infrastructure utilizing UKHM's present facilities at Elsa. The agreement with Yukon Gold and Mineral Development was terminated in December, 1997, leaving NDU

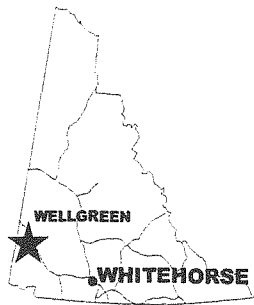
Resources and United Keno Hill Mines to complete their merger.

The Yukon Water Board issued a water license to United Keno Hill Mines in August, 1997. The water license has been signed by DIAND. The company is now attempting to raise the production capital necessary to complete surface rehabilitation and mine development. Endeavour Capital has been retained to secure those funds, which would allow production to resume after a preproduction period of four to six months.

NDU Resources and United Keno Hill Mines Ltd. plan to resume production at Elsa in 1998 at an average rate of 500 tons per day. First year production is forecast at approximately 6,000,000 ounces of silver at an average cost of approximately \$3.00 per ounce U.S. Once production has resumed, initial activities will concentrate on further expansion of the mineral resources at Elsa, and then on establishing the feasibility of the Marg deposit and the economics of a new 2500 to 3000 tons per day mill to be constructed at Elsa. Preproduction and working capital is estimated at \$15 million. A bus-in and out operation on a rotational schedule with on-site bunkhouse accommodation is contemplated.

The First Nation of Na-cho Nyak Dun have given conditional environmental approval to the draft operating and closure plans prepared by United Keno Hill Mines in connection with its plan to resume commercial production of silver from Elsa.

# WELLGREEN PROPERTY



**Northern Platinum Ltd.**

President: John Goran

Corporate Headquarters  
305-455 Granville Street  
Vancouver, B.C. V6C 1T1

Phone: (604) 687-6875  
Fax: (416) 687-6533

**Project Status**  
Underground exploration  
ongoing

**Location**  
125 km northwest of Haines Junction

**Ownership:**  
Northern Platinum Ltd.

**Commodities:**  
Copper, nickel, platinum, palladium

**Ore Type:**  
sulphide

**Geological Resource:**  
50,032,466 tonnes

Copper	0.35%
Nickel	0.36%
Platinum	0.54 grams per tonne
Palladium	0.34 grams per tonne

**Mining Method:**  
Open Pit, 365 days per year

**Processing Method:**  
Conventional mill, on-site smelter

**Mine Life:**  
12 years

**Power:**  
35 MW, Grid?

## HISTORY

The Wellgreen deposit was discovered in 1952 by the Yukon Mining Corporation Limited and optioned to Hudson Bay Mining and Smelting Ltd. Hudson Bay explored with 4,267 m of drifting and raising from 4 levels, 2 internal shafts and 19,815 m of surface and underground drilling from 1952 to 1955. The property was transferred in 1955 to Hudson-Yukon Mining Company Ltd. They conducted a Turam survey in 1968, drilled 762 m, prepared a feasibility study in 1969, and arranged a marketing agreement with Sumitomo in 1970. Due to underground problems, initial production from the 544 tonne/day mill was delayed from September 1971 to May, 1972, and was suspended in July, 1973 after treating only 171,652 tonnes. Total production was 33,853 tonnes of concentrate grading 7.4% nickel and 6.6% copper.

The property was optioned in June 1986 by the Kluane Joint Venture who carried out grid soil sampling, mapping, prospecting, bulldozer trenching and test geophysical surveys. Hudson-Yukon was purchased by Galactic Resources Ltd. in June 1986 and merged with All-North Resource Ltd. in November 1986. Additional soil sampling, bulldozer trenching, geophysical surveys, underground rehabilitation and 4,932 m of diamond drilling in 45 holes was carried out in 1987. In 1988, the 4250 level was rehabilitated and 34 underground holes were drilled totaling 5,500 m. On surface, bulldozer trenching and 37 holes totalling 6,073 m were drilled. Metallurgical tests and a preliminary feasibility study were carried out in 1988 and 1989.

J.P. Sheridan and Northern Platinum optioned the property in June 1994 from the owner All-North Resources. All-North Resources granted an option to earn an 80% interest to Sheridan in return for \$80,000 cash and a commitment to spend \$4 million on exploration by November 30, 2002.

Sheridan, in turn, assigned the option to Northern Platinum, retaining back-in rights for half of that company's interest at the feasibility stage. Sheridan is a director of Northern Platinum. Northern Platinum has been carrying out reserve evaluation drilling, underground sampling and exploration.

## **PROJECT SUMMARY**

The Wellgreen platinum group metal (PGM) rich, copper-nickel deposit is located in the southwestern Yukon, approximately 317 km northwest of Whitehorse and 125 northwest of the town of Haines Junction. The property consists of 91 claims held under a renewable 21 year mining lease which expires December 5, 1999. An intensive underground sampling program is now underway on the Wellgreen deposit during the winter of 1997/98. The goal of the program is to determine the grade and tonnage of massive sulphides which could quickly be extracted if a mining operation was to commence.

### **GEOLOGY, MINERALIZATION AND ORE RESERVES**

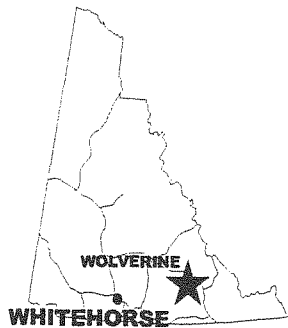
Mineralization on the Wellgreen property occurs within a variably serpentinized, 20 km long ultramafic body, known as the Quill Creek Complex, that intrudes Permian sedimentary and volcanic rocks. Three main zones of PGM enriched copper-nickel mineralization have been outlined on the Wellgreen property, the East zone, the West Zone and the North Zone. Proven and probable reserves are estimated to be 50.03 million tonnes grading 0.35% copper, 0.36% nickel, 0.54 grams/tonne platinum, and 0.34 grams/tonne palladium.

Northern Platinum did not conduct any exploration on the property during 1995. During the 1996 program, a total of 57 holes were drilled. The drill results confirmed previous tonnage and grade calculations, and several zones of higher grade material were indicated. A mining plant, complete with compressors, generators, office facilities, bunk house and cook house facilities has been established near the portal of the adit.

During the summer of 1997, drilling took place on the Linda claims, southeast of the Wellgreen deposit. Assays over 1.3 metres of massive sulphides returned average grades of 4.12% Ni, .89% Cu, .06 opt Pt and .043 opt Pd. The lower showing is disseminated to semi-massive sulphides over a width of twenty feet of broken rock ranging from 2.94% Cu and 3.02% Ni, with platinum and palladium assays as high as 0.13 opt Pt and 0.40 opt Pd. Drilling in the vicinity of the lower showing intersected sulphide mineralization of 0.175 % Cu and 0.187 % Ni over 20 feet.

### **PRODUCTION**

A 1989 preliminary feasibility report by Watts, Griffis and McQuat proposed: open pit mining at 10,000 tonnes per day (3.65 million tonnes per year) at an average stripping ratio of 3.5:1; processing by conventional mill producing a concentrate with approximately 15% combined copper and nickel as well as PGMs and the cobalt, gold and silver in the ore; and, a Noranda reactor type smelter to reduce the shipping cost. The smelter would produce a 40% copper-nickel matte on site. Capital costs were estimated at \$228 million and operating costs were thought to be about \$18.61 per tonne ore. The power requirements are expected to be about 35 MW and the project should employ 400 to 500 people.

**WOLVERINE PROPERTY****Boliden Limited**

VP Exploration: Bill Fisher  
 Corporate Headquarters  
 #1500, 181 Bay Street, Toronto  
 Ontario, M5J 2T3  
 Phone: (416) 364-2727  
 Fax: (416) 364-5484  
 E-mail: info@bolidenltd.com  
 www.boliden.se

**Atna Resources Ltd.**

President: Peter Delancey  
 #1550, 409 Granville Street  
 Vancouver, B.C., V6C 1T2  
 Phone: (604)684-2285  
 Fax: (604)684-8887  
 Toll Free: 1-800-789-ATNA  
 E-mail: info@atna.com  
 www.atna.com

**Location**

130 km southeast of Ross River

**Ownership:**

Joint Venture between Atna Resources Ltd. (40%) and Boliden (formerly Westmin) at 60%

**Commodities:**

Copper, lead, zinc, silver, gold

**Ore Type:**

Sulphide

**Geological (Drill-indicated) Reserves:**

6.237 million tonnes

Copper	1.33%
Lead	1.55%
Zinc	12.66%
Silver	370.9 g/t
Gold	1.76 g/t

**Project Status**

Reserve development underway

**HISTORY**

The property was originally staked as the Fetish claims in July, 1973 by Finlayson JV (Chevron Canada Limited, Union Oil Company of Canada Limited, and Marietta Resources Interation Limited), who conducted grid soil sampling, mapping and trenching later in the year and drilled 2 holes, performed more soil sampling and added more Fetish claims in August, 1974. The property was restaked as the Kink claims in September, 1982 by Archer, Cathro and Associates and optioned briefly to Esso Mineral Limited, who conducted airborne and geophysical surveys later in the year. In July, 1993 the property was restaked as the Foot 1-20 claims by Atna Resources who later added the Pak and Toe claims, explored with prospecting, geological mapping, and soil and silt geochemistry in September, 1993. The property was optioned by Westmin Resources Limited and a drill program in 1995 resulted in the discovery of the Wolverine deposit on the Foot claims. By the end of 1995, Westmin had earned a 60% interest in the project which then operated as a 60/40 joint venture with Westmin as operator. In 1998, Boliden Limited acquired the assets of Westmin Resources Limited. Discussions are underway between the joint venture partners as to the status of the drill program planned for 1998.

**PROJECT SUMMARY**

The Wolverine property is located approximately 130 km southeast of Ross River and 20 km east of Cominco's Kudzu Ze Kayah project. The volcanogenic massive sulphide deposit has a mineral resource of over 6 million tonnes of copper, lead, zinc, silver and gold. In 1996, an airstrip was constructed near the Wolverine deposit. Environmental, geotechnical and metallurgical work is continuing. Once the full size of the deposit is known, the joint venture partners will consider an underground program to test mining conditions and obtain bulk samples for metallurgical testwork. In May, 1997, metallurgical concerns regarding the selenium content in the sulphide minerals were reported. The selenium content is greater than what is normally treated by copper and zinc smelters.

Discussions with the Ross River Dena Development Corp have been initiated to enter into a socio-economic agreement with members of the local First Nation community.

**GEOLOGY, MINERALOGY and ORE RESERVES**

The Wolverine deposit is a high-grade volcanogenic massive sulphide (VMS) body. The deposit formed from volcanic related hydrothermal exhalations on the sea floor about 350 million years ago. The copper-lead-zinc-silver-gold mineralization is hosted within a thick sequence of felsic volcanic rocks interbedded with argillaceous and epiclastic sedimentary rocks of the Yukon Tanana Terrane. The main sulphide minerals in the deposit, in decreasing order of abundance are: pyrite, sphalerite, chalcopyrite and galena. Most of the silver occurs with argentian tetrahedrite, with the remainder occurring in galena and electrum.

The 1996 field program, which cost an estimated \$6 million, commenced with construction of an air strip near the Wolverine deposit. Drilling started in mid-March and was completed in October. The known Wolverine Zone was expanded to the northwest, the Lynx Zone was discovered, and regional work on the Fisher Zone and the Toe Claims was carried out. The 1996 drilling program significantly expanded the area of mineralization at Wolverine and brought the number of massive sulphide intersections from 15 in 1995 to 49 to the end of the 1996 program. The new Lynx Zone, which was discovered late in the season is open to the west, north and south. Systematic geological and geochemical evaluation of the numerous airborne geophysical targets on the remainder of the claims was also carried out in 1996.

During the 1997 program, the Sable Zone was discovered 1.6 km southeast of the Wolverine Zone by recognition of the footwall type alteration zone in a drill hole. Although no massive sulphides were intersected, significant alteration with chalcopyrite and pyrrhotite veins indicate that a massive sulphide deposit may be in close proximity.

Drilling in 1997 of the Wolverine deposit took place outside the margins of the deposit as outlined by the 1995 and 1996 drilling. Of the 22 successfully completed holes drilled in the Wolverine deposit during 1997, 19 intersected ore grade mineralization. In January, 1998 a new mineral resource estimate for Wolverine was released; 6,237,000 tonnes at a grade of 1.76 g/t Au, 370.9 g/t Ag, 1.33% Cu, 1.55% Pb and 12.66% Zn. Most of the tonnage (5.9 million tonnes) is in the main Wolverine and Lynx lenses. The mineral resource within these lenses is classified as indicated; 44% of the estimated tonnage occurs within 25 m from a drill intersection, 48% of the estimated tonnage occurs between 25 and 50 m from a drill intersection and 8% of the estimated tonnage occurs between 50 and 75 m from a drill intersection. The average thickness of 5.1 metres decreased slightly as a consequence of the 1997 drilling taking place largely on the edges of the lenses. The deposit is now effectively delimited along strike and down-dip to the edge of the Atna/Boliden claim block.