

CENTRAL REGION

By Bob Lane, PGeo
Regional Geologist, Prince George

SUMMARY AND TRENDS

Mineral exploration activity in the Central Region reached its highest level since 1989. High precious and base metal commodity prices, strong demand for minerals and a buoyant investment climate enabled many companies to raise new capital for exploration, deposit appraisal and development. As a result, exploration expenditures doubled to an estimated \$33 million (Figure 3-1) and the amount of exploration drilling increased by more than 75%, to approximately 160 000 metres (Figure 3-2). In all, there were 38 major exploration projects, 19 more than in 2003.

Operating mines, major exploration projects and smaller exploration projects with regional significance are shown on Figure 3-3. Forecast production for mines in the Central region is listed in Table 3-1.

The Kemess South open pit gold-copper mine was the only major operating mine in the region at the start of the year. The 50 000 tonnes per day mine operated smoothly and because of high copper prices was able to dramatically reduce its mining cost per ounce of gold. The strong base metal markets also provided the opportunity for the Gibraltar porphyry copper-molybdenum mine to reopen in October, after a six-year hiatus. Reactivation of two other idle mines in the Cariboo, the Mount Polley copper-gold mine and the QR gold mine, are planned for early to middle 2005.

There were 38 major exploration projects conducted (i.e., those which involved mechanical disturbance and expenditures in excess of \$100 000) in the Central Region in 2004. Seventeen major programs evaluated gold-enriched porphyry copper systems, ten programs explored epithermal or mesothermal gold deposits, two projects targeted copper-molybdenum mineralization, and three others targeted auriferous skarn mineralization. One program focused on massive sulphide deposits, one on platinum group elements and another on a volcanic redbed copper deposit.

Exploration in the Central Region focused on areas with known potential for bulk tonnage porphyry copper-gold+/-molybdenum mineralization. Activity was principally within rocks of the Quesnel Terrane, a northwest trending sequence of volcanic island arc rocks that extend the length of the region. Exploration outside

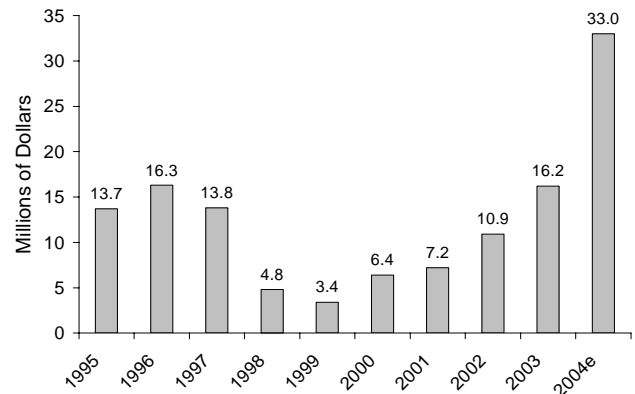


Figure 3-1. Annual Exploration Expenditures, Central Region (Expenditures for 1995–2003 are for the Northeast and Central regions combined).

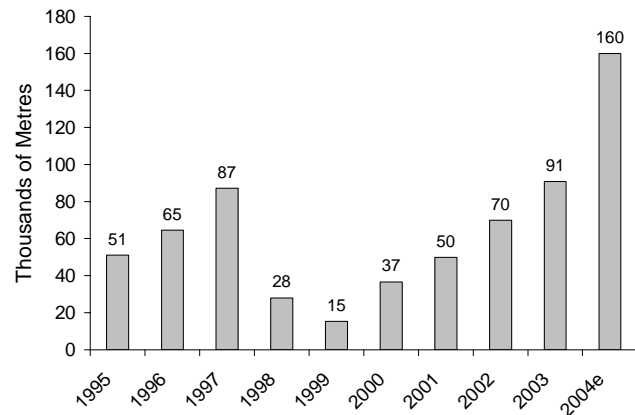


Figure 3-2. Annual Exploration Drilling, Central Region (Drilling totals for 1995–2003 are for the Northeast and Central regions combined).

of the Quesnel Terrane focused mainly on epithermal and mesothermal gold targets.

Exploration drilling programs in the Toadoggonne camp tested porphyry gold-copper deposits and epithermal gold-silver systems associated with the Early Jurassic Black Lake suite of intrusions.

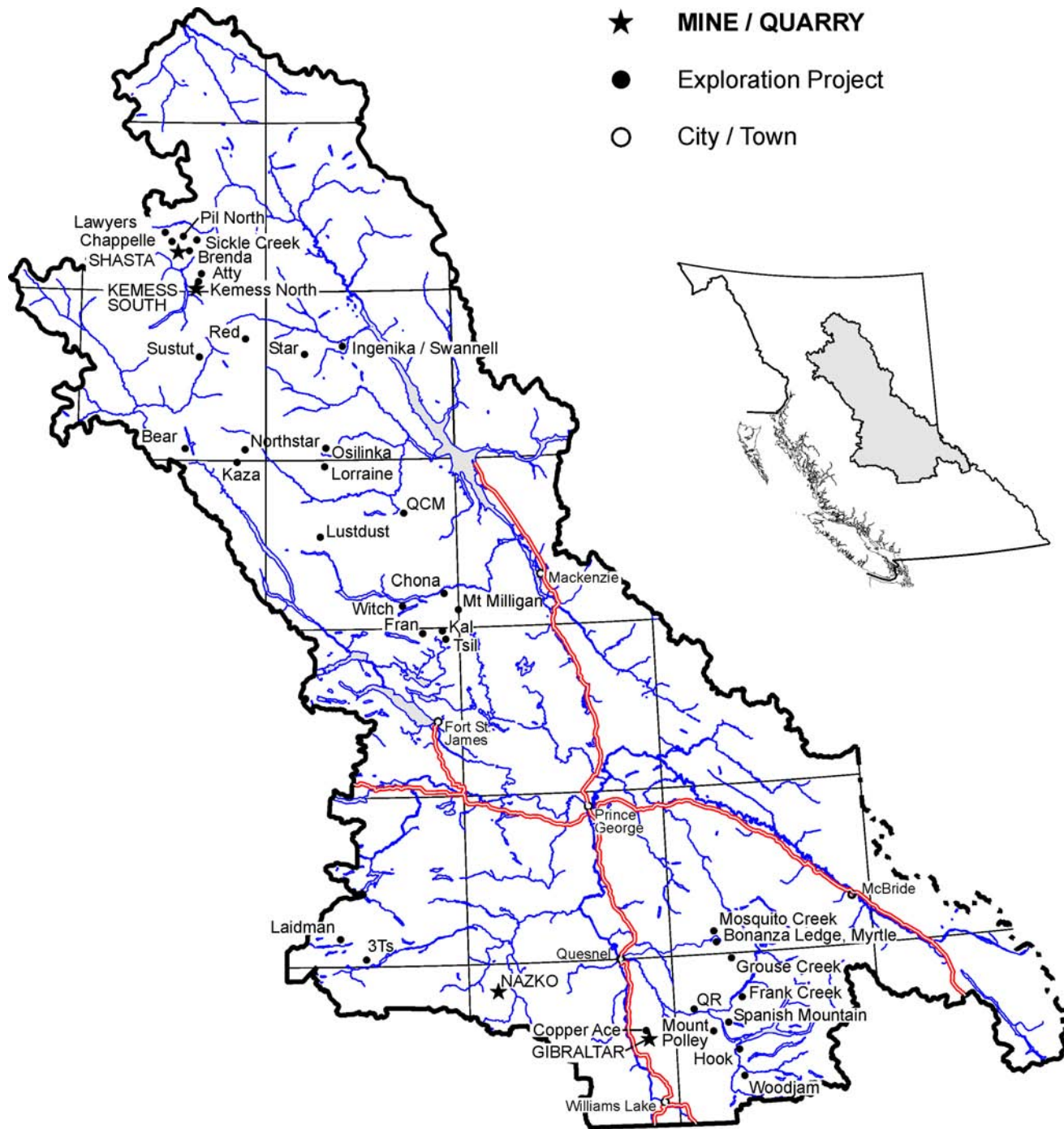


Figure 3-3 Operating mines, major exploration programs and selected smaller exploration projects in the Central Region.

In the Central Omineca Mountains, drilling targeted promising porphyry copper-gold+/-molybdenum prospects (*i.e.*, Lorraine-Jajay), some of which had not been explored for many years (*e.g.*, Bear and Cat Mountain), and two interesting gold-bearing skarn systems (*i.e.*, Kaza and Lustdust).

Activity in the Nation Lakes area picked up dramatically as numerous companies reviewed existing data and staked ground prospective for bulk tonnage copper-gold mineralization. The exploration programs that followed were generally of a grassroots nature, and

TABLE 3-1. PRODUCTION AND RESERVES FOR OPERATING MINES, CENTRAL REGION

Mine	Operator	Deposit Type / Commodity	Forecast Production in 2004 (tonnes or kilograms)	Proven and Probable Reserves (at Jan. 1, 2004)
Metals				
Gibraltar	Taseko Mines Ltd / Ledcor Mining Ltd	Calc-alkalic porphyry Cu-Mo	7000 t Cu, 34 t Mo	Sulphide: 163.5 million tonnes grading 0.313% Cu & 0.010% Mo; Oxide: 16.5 million tonnes grading 0.148% Acid Soluble Cu
Kemess South	Kemess Mines Ltd (Northgate Minerals Corp)	Calc-alkalic porphyry Au-Cu	9300 kg Au, 34 000 t Cu	91.7 million tonnes grading 0.699 g/t Au & 0.227% Cu; Kemess North (Probable) 414 million tonnes grading 0.31 g/t Au & 0.16% Cu
Shasta	Sable Resources Ltd	Epithermal Vein Au-Ag	80 kg Au (Au equivalent)	n/a
Industrial Minerals				
Giscome	Pacific Lime Products Ltd	Limestone		
Nazko	Canada Pumice Corporation (Crystal Graphite Corporation)	Lava rock		

included bedrock mapping, line-cutting, grid-based soil geochemical sampling, and magnetic and IP surveys. However, limited diamond drilling proceeded on some of the new ground as well as on some well-established deposits, including the Mt. Milligan property.

In the Nechako Plateau, an impressive deep-drill intersection and the discovery of several new veins on the 3Ts epithermal gold-silver vein property led to an expanded diamond drilling program.

Exploration activity in the Cariboo continued to increase during 2004 with bulk tonnage porphyry targets attracting most of the attention. Imperial Metals Corporation continued to produce exciting results from its exploration drilling program on the Northeast zone, which enabled the company to establish a mineable reserve for the new deposit. At the Woodjam property, drilling intersected a long interval of promising bulk tonnage gold-copper mineralization which increased interest in the economic potential of that area. These very encouraging exploration results coupled with data from a Rocks to Riches funded helicopter-borne multiparameter geophysical survey encouraged new staking activity in the Cariboo and attracted several new companies. In the Wells-Barkerville gold belt, the level of exploration for gold-bearing mesothermal quartz vein and auriferous pyrite replacement mineralization, was maintained. There were several key projects, including the completion of a 10 000 tonne underground bulk sample program on the

Bonanza Ledge high-grade gold deposit on the Cariboo Gold Quartz property.

An administrative change has divided the former Northeast-Central region into a Central Region and a Northeast Region. The new Central Region includes a broad area that extends northward from about 150 Mile House to the Omineca Mountains and includes parts of the Interior Plateau and Gataga-Kechika Trough areas. The Northeast Region encompasses the northeast quadrant of the province and includes the Peace River Coalfields. Activity in the Northeast Region is presented in a separate report.

MINES AND QUARRIES

The **Kemess South** (Minfile 094E 094) gold-copper mine, located in the Toodoggone region about 300 km northwest of Mackenzie, is owned and operated by Northgate Minerals Corporation (formerly Northgate Exploration Ltd). The 50 000 tonne per day open pit mine has been in operation since 1998 and currently employs close to 400 workers. For the first three quarters of 2004 daily mill throughput averaged 50 340 tonnes per day. Metal production for the first nine months of 2004 totaled 6494 kg of gold and 2689 tonnes of copper from milling 14.5 million tonnes of ore. Production for calendar 2004 is expected to reach approximately 9300 kg of gold and 34 000 tonnes of copper. Proven reserves at

TABLE 3-2. MAJOR EXPLORATION PROJECTS, CENTRAL REGION

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
3Ts	Southern Rio Resources Ltd	093F 055, 068	Au-Ag	Epithermal vein	G; P; OB; DD (4860 m)
Atty	Finlay Minerals Ltd	094E 119, 022	Cu-Au	Calc-alkalic Porphyry	G; IP; MG; DD (1653 m)
Bear	Imperial Metals Corporation	094D 068	Cu-Mo	Calc-alkalic Porphyry	G; DD (1704 m)
Brenda	Northgate Minerals Corporation	094E 147	Au-Cu	Calc-alkalic Porphyry	A; DD (1446 m)
Cariboo Gold Quartz (incl. Bonanza Ledge)	International Wayside Gold Mines Ltd	093H 019	Au	Replacement, Mesothermal Vein	A; G; TR; DD (14,142 m); BU (10,000 t); CD; GT; PF; EN
Chappelle (Baker mine area)	Sable Resources Ltd	094E 026	Au-Ag	Epithermal Vein	IP; DD (949 m)
Chona	Amarc Resources Ltd	(93N/01, 08)	Cu-Au	Alkalic Porphyry	IP; DD (~3000 m planned)
Copper Ace	Bell Resources Ltd	093B 061, 062	Cu-Mo	Calc-alkalic Porphyry	G; DD (1497 m)
Fran	Yankee Hat Industries Corp	093N 207	Au-Cu	Alkalic Porphyry	G; GC; AB-MG/RD
Frank Creek, SCR, Ace	Barker Minerals Ltd	093A 142, 143, 153	Cu-Zn-Pb-Au-Ag	VMS; Mesothermal Vein	G; GC; GP (Titan); TR; DD (1881 m)
Golden Cariboo (Cariboo Hudson, Craze, Ham)	Golden Cariboo Resources Ltd	093A 071, 090, 091, 093	Au	Replacement; Mesothermal Vein	G; GC; MG; SP; TR; DD (1259 m)
Hook	Amarc Resources Ltd	(93A/06)	Cu-Au	Alkalic Porphyry	IP; MG; GC; DD (~200 m)
Ingenika - Swannell	Cross Lake Minerals Ltd	094C 002-005, 086	Zn-Pb-Ag	Manto	G; 3D-IP; MG
Kal	Amarc Resources Ltd	(93K/16)	Cu-Au	Alkalic Porphyry	IP; DD (800 m planned)
Kaza	Northern Hemisphere Development Corp	093M 111	Cu-Au	Skarn	A; TR; DD (1077 m)
Kemess North & area	Northgate Minerals Corporation	094E 021	Au-Cu	Calc-alkalic Porphyry	G; GC; IP; TR; DD (7561 m); GT; CD; EN; FS
Kemess South	Northgate Minerals Corporation	094E 094	Au-Cu	Calc-alkalic Porphyry	DD (7307 m)
Lawyers	Bishop Gold Inc	094E 068	Au-Ag	Epithermal vein	A; GC; MG; VLF; TR
Lorraine-Jajay	Eastfield Resources Ltd	093N 002, 066, 224	Cu-Au	Alkalic Porphyry	A; G; GC; IP; DD (4439 m)
Lustdust	Alpha Gold Corp	093N 009	Au-Ag-Cu-Zn-Pb	Skarn; Manto; Mesothermal Vein	GC; DD (6010 m)
Mosquito Creek Gold	Island Mountain Gold Mines Ltd	093H 010	Au	Replacement; Mesothermal Vein	GC; TR; DD (859 m)
Mount Polley - Mine Lease	Imperial Metals Corporation	093A 008	Cu-Au-Ag	Alkalic Porphyry	DD (5981 m) on Bell pit; DD (10,456 m) on Springer zone
Mount Polley - Northeast Zone	Imperial Metals Corporation	093A 164	Cu-Au-Ag	Alkalic Porphyry	G; TR; IP; DD (~50,000 m); MS; FS; EN; R
Mt. Milligan	Placer Dome Inc	093N 191, 194	Au-Cu	Alkalic Porphyry	G; DD (2200 m); MT; FS
Myrtle	International Wayside Gold Mines Ltd	093H 025	Au	Mesothermal Vein	TR; DD (861 m)

TABLE 3-2. CONTINUED

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program
Northstar (Fred)	Northern Hemisphere Development Corp	094D 032	Cu	Volcanic Redbed Copper	A; TR; DD (~1000 m)
Osilinka (Cat)	Lysander Minerals Corporation	094C 069	Au-Cu	Alkalic Porphyry	A; G; TR; DD (1157 m)
Pil North	Finlay Minerals Ltd	094E 029, 083, 213, 216	Au-Cu	Calc-alkalic Porphyry	A; G; GC; IP; TR; DD (6168 m)
QCM	Canadian Gold Hunter Corp	093N 200	Au	Mesothermal Vein	IP; TR; DD (1190 m)
QR	Cross Lake Minerals Ltd	093A 121	Au	Skarn	G; DD (~4000 m); PF; FS
Red	Gitennes Exploration Inc	094D 034	Au-Cu	Calc-alkalic Porphyry	G; GC; IP; DD (449 m)
Shasta	Sable Resources Ltd	094E 050	Au-Ag	Epithermal Vein	DD (1075 m)
Sickle Creek	Stealth Minerals Ltd	094E 237	Au-Ag; Cu-Au	Epithermal Vein; Porphyry	G; P; GC; IP; DD (3870 m)
Spanish Mountain	Skygold Ventures Ltd / Wildrose Resources Ltd	093A 043	Au	Mesothermal Vein	G; TR; GC; RC (~2500 m)
Star	Minterra Resources Corp	094C 090	Cu-PGE	Magmatic	DD (1044 m)
Tsil	Amarc Resources Ltd	(93K/16)	Cu-Au	Alkalic Porphyry	IP; DD (800 m planned)
Witch	Amarc Resources Ltd	093N 084, 164	Au-Cu	Alkalic Porphyry	IP; DD (2000 m planned)
Woodjam	Fjordland Exploration Inc / Wildrose Resources Ltd	093A 078, 124	Au-Cu	Alkalic Porphyry	G; DD (~3500 m)

Kemess South as of December 31, 2003, stood at 91.7 million tonnes grading 0.699 g/t Au and 0.227% Cu.

The deposit occurs within the Early Jurassic Maple Leaf pluton, a gently southeast-dipping body of quartz monzonite that has a faulted basal contact and is overlain by epiclastic rocks of the Toodoggone formation. Approximately 80% of the deposit is hypogene ore with the remainder being either supergene, leached cap or material that is transitional between hypogene and supergene ore. In 2004, exploration and infill drilling on the margin of the pit resulted in the addition of 11.8 million tonnes of ore grade material being added to the reserve base of the Kemess South deposit. Existing reserves will provide mill feed until 2008, but the mine life of the operation could be extended to 2020 if the Kemess North deposit is put into production. A full feasibility was completed on the Kemess North gold-copper deposit and the project formally entered the harmonized federal-provincial environmental assessment

process. The estimated capital cost of the project has been revised upwards to US\$190 million.

The **Gibraltar** (Minfile 093B 006, 007, 011-013, 051) open pit copper-molybdenum mine (Figure 3-4), located near McLeese Lake, reopened in October after being on care-and-maintenance since 1998. Taseko Mines Ltd owns the mine and developed a joint venture partnership between its wholly owned subsidiary, Gibraltar Mines Ltd, and operator Ledcor Mining Ltd. The Gibraltar deposits, of which there are at least seven, occur within 'Mine Phase' tonalite, part of the Late Triassic Granite Mountain batholith. The batholith intrudes Cache Creek Group rocks between the Pinchi and Fraser River fault systems. The 12-year mine plan includes development of the Pollyanna stage IV pit, followed by mining of the Granite Lake pit (stages III and IV), the Pollyanna-Gibraltar East Connector zone and the 98 Oxide zone. Stripping of waste rock from the Pollyanna stage IV pit began in the summer and refitting of the 35 000 tonne per day mill was completed in early



Figure 3-4. Development of the Pollyanna stage IV pit at Gibraltar copper-molybdenum mine

October and continuous milling operations commenced on October 7, 2004. A new cable shovel and five new haul trucks were purchased to work with the existing equipment in the Pollyanna pit. Anticipated annual production is 32 000 tonnes of copper and more than 400 tonnes of molybdenum. The capital cost of the restart was approximately US\$50 million. The mine, which directly employs about 270 workers, is a tremendous boost to the economy of central Cariboo and in particular the William's Lake area. Sulphide and oxide reserves are listed in Table 3-1.

The **Shasta** (Minfile 094E 050) mine, a small intermittent gold and silver producer north of the Kemess mine, is owned and operated by Sable Resources Ltd. Underground workings and a narrow open pit are developed on a quartz-calcite epithermal vein and vein breccia system that cuts quartz phyric dacite ash-flow tuffs of the Toodogone formation. In 2004, diamond drilling of JM and Creek zones produced a number of bonanza-grade intersections, including 4.57 metres grading 18.19 g/t Au and 845 g/t Ag in hole 04-01, within wider, lower grade mineralized intervals. Close-spaced drilling of the latter zone helped define a small tonnage of epithermal gold-silver ore that was accessed by the development of a small open cut (Figure 3-5). Approximately 10 000 tonnes of ore was extracted and trucked to the nearby Baker mill for processing. A workforce of ten included two workers from the village of Tsay Keh.

Canada Pumice Corporation produced and sold approximately 15 000 cubic metres of screened and sized tephra from its **Nazko** (Minfile 093B 060) quarry west of Quesnel. The principal uses of the material are as a lightweight aggregate ("Tephralite"TM) in masonry concrete products, various geotechnical applications and landscaping. Other products include Anti-Slip®, a fine granular product and growing and filtration media. During the year the company merged with Crystal Graphite Corporation and worked towards expanding the markets for its lava rock products both locally and abroad. Construction of a bagging plant in Quesnel is planned for 2005.



Figure 3-5. Stripping waste rock from the Creek zone open cut, Shasta gold-silver mine.

PLACER OPERATIONS

The level of placer activity in 2004, as in the past few years, was quite low. Strong precious metal prices were offset by a higher Canadian dollar and higher fuel prices. The majority of small-scale or recreational placer operations were in the traditional gold producing drainages in the Wells-Barkerville, Likely, Hixon and Omineca placer camps. There were relatively few major programs; the largest program was in the Slate Creek area near the village of Manson Creek.

EXPLORATION SUMMARY

TOODOGONE CAMP

Northgate Minerals Corporation continued to explore the large tenure block which encloses its operating Kemess South gold-copper mine. The company's **Kemess North** (Minfile 094E 021) porphyry gold-copper deposit, located 5.5 km north, is progressing through a joint federal-provincial panel review. A decision to award the project an Environmental Assessment Certificate is anticipated for 2005. Work in 2004 included exploration, infill, geotechnical and condemnation drilling and environmental studies. The 'mineable resource' for the Kemess North deposit is 414 million tonnes grading 0.31 g/t Au and 0.16% Cu. The proposed development schedule outlines infrastructure development in 2005, pre-stripping of the deposit in 2006 with mining of ore commencing by late 2006. The Kemess North and Kemess South deposits would be mined concurrently until reserves at Kemess South are exhausted (2009). Mining at Kemess North would continue to 2020. The estimated capital cost of the project is \$190 million.

Northgate also drilled several other targets in the vicinity of the Kemess North deposit. Seven holes were drilled into the Nugget porphyry gold-copper zone in an attempt to expand on encouraging near-surface mineralization intersected in 2003 (hole KN-03-12 intersected 419 m averaging 0.38 g/t Au and 0.13% Cu that began at a depth of just 24 metres). The Kemess Centre porphyry gold-copper prospect, Duncan Ridge polymetallic skarn target and Hilda structurally-hosted gold occurrence were also drilled with mixed results. The Bear claim group covers a 70 km² area immediately south and adjoining the Kemess South property. Approximately 64 line-kilometres of IP were completed over the claims. Follow-up diamond drilling is expected in 2005.

Northgate Minerals Corporation completed a five-hole drill program on the **Brenda** (Minfile 094E 147) porphyry gold-copper property, located 25 km northwest of the Kemess mine. Andesite lavas of the Takla Group underlie the property. Mineralization occurs primarily in propylitically altered andesite and is associated with quartz-magnetite veinlets and stockwork zones. A swarm of pale pink, unaltered monzonite dikes cut mineralization. Northgate optioned the property from Canasil Resources Inc in 2002, and since that time has drilled 14 holes totaling 4580 m. The work focused mainly on the White Pass zone, a prospective area marked by intense alunite(?) alteration. The best assay of the three-year program was encountered in drill hole BR-03-07 that intersected 161.6 metres averaging 0.565 g/t Au and 0.079% Cu. After review of the 2004 data, Northgate returned the property to the vendor.

Finlay Minerals Ltd developed road access to its **Pil North** property (Minfile 094E 029, 083, 213 & 216), centered approximately 35 km north of the Kemess mine. Work included a 26-hole diamond drilling program (Figure 3-6). The property is underlain predominantly by monzonite and quartz monzonite phases of the Black Lake Intrusive Suite and andesitic volcanic rocks of the Toodogone formation. The Pillar fault, a northwest-trending regional structure, dissects the property. Earlier



Figure 3-6. Examining core at the **Pil North** exploration camp.

exploration by Finlay Minerals outlined a 4 kilometre-long IP chargeability high that coincides with a number of gold-copper or multi-element geochemical anomalies. Some of the gold-copper anomalies correspond with strong propylitic and phyllic altered rocks and are regarded as targets for porphyry mineralization (e.g. Northwest, Central-Milky Creek and Northeast zones). In some cases anomalies with a polymetallic signature correspond with quartz+/-barite+/-sulphide veins (i.e. WG zone). The best drill intersection was encountered in hole PN-04-09 that graded 0.128% Cu over 57.95 metres. Elsewhere on the property, grab samples of siliceous breccia from the north-northwest trending Atlas zone and nearby Atlas East zone produced assays up to 3.22 g/t Au and 80.6 g/t Ag.

On its **Atty** property, located immediately north of the Kemess North deposit, Finlay drilled seven holes to test a coincident IP chargeability and gold-copper geochemical anomaly coupled with a pronounced magnetic high. The drilling intersected breccia comprised of angular clasts of augite phyric basalt (Takla Group) cemented by magnetite, pyrite, minor silica and later carbonate. No assays had been released at the time of writing.

Stealth Minerals Ltd carried out an extensive exploration program focused mainly on the northern half of its Pine property, now referred to as the Sickle Creek project. The property is located in the Finlay River area north of the Kemess mine. Last year's prospecting program discovered the **Sickle-Griz** (Minfile 094E 237) epithermal vein system, an impressive set (the 570A to 570E veins) of parallel banded quartz-calcite-sulphide veins. The veins trend at about 155° and dip 65° to the west and cut grey-green andesite lavas that correlate with the Metsantan member of the Toodogone formation (Diakow, pers. comm., 2004). Several of the most prominent veins (570A and 570B) reach widths of up to 12 metres and are exposed over a continuous strike length of more than 100 metres (Figure 3-7). However, the vein system has been traced in outcrop discontinuously over a



Figure 3-7. Banded quartz-carbonate-sulphide 570A vein, **Sickle Creek** property.

length of more than three kilometres. In 2004, this new prospect was the subject of a 23-hole diamond drilling program. Most of the holes intersected one or more veins and produced encouraging intersections, particularly from the footwall portions of the veins where sulphides appear in notably higher concentrations. For example, hole SG04-04 intersected 4.1 metres grading 6.38 g/t Au and 55 g/t Ag. Galena, sphalerite, tetrahedrite, chalcopyrite and pyrite occur as fine disseminations, patchy aggregates and semi-massive to massive bands up to several centimeters wide in a gangue of white sparry calcite, milky to grey quartz, chalcedony, minor amethyst and lesser adularia.

Stealth continued its regional prospecting program in 2004 and examined eleven properties in all. Two promising bulk tonnage copper-gold porphyry prospects were discovered north of the Sickie-Griz veins. The **Sofia** (Minfile 094E 238) porphyry gold-copper showing is on the west bank of the Toodoggone River, 2.7 kilometers west of the mouth of Jock Creek. The showing consists of sheeted magnetite veinlets and later quartz-magnetite-sulphide stockwork, enveloped by K-feldspar alteration and hosted by medium to coarse-grained monzonite and andesite flows. Grab samples assayed up to 0.22 g/t Au and up to 0.05% Cu. The **Alexandra** porphyry prospect is centred on a ridge 3.3 kilometres west-southwest of the confluence of Jock Creek and Toodoggone River. The showing consists of intensely bleached, clay-altered andesitic volcanic rock cut by quartz-magnetite stringers. The alteration zone covers an 800 by 250 metre area and is coincident with elevated gold, copper and silver values in soil. The showing lies within about 300 metres of monzonite that is outcropping in Jock Creek, and also downslope to the north and east of the ridge. Exploration south of the Finlay River on the **Fog-Mess** property identified two sheeted epithermal gold-silver vein systems that warrant further evaluation.

Sable Resources Ltd drilled two targets on its **Chappelle** (Minfile 094E 026) property that encompasses the Baker mining lease. Five holes were drilled on the North Quartz zone, an epithermal vein target, and three holes tested the Black Gossan zone, a large area of oxidized pyritic andesite of the Takla Group, that may be indicative of a buried porphyry system.

Bishop Gold Inc completed a large trenching program on the former **Lawyers** (Minfile 094E 066) epithermal gold-silver property. The company focused its program on the plateau west of the Cliff Creek portal where prospecting in 2003 located high-grade gold-silver vein float. Trenching exposed four zones of epithermal quartz veining, brecciation and silicification, one to ten metres wide, over a northwest-trending strike length of about 400 metres. Results from chip sampling include 1.5 metres grading 5.71 g/t Au and 65.8 g/t Ag.

OMINECA MOUNTAINS

Northgate Minerals Corporation purchased the **Sustut** (Minfile 094D 063) volcanic redbed copper property, located 40 km south of the Kemess South mine, from Doublestar Resources Ltd. The company is investigating mining plans for the remote deposit and the feasibility of trucking crushed ore to the Kemess mill for processing. Reserves for the Southeast zone, a gently inclined tabular ore body, total 5.2 million tonnes grading 1.87% Cu and 6.11 g/t Ag (at a 0.8% Cu cut-off).

The **Red** (Minfile 094D 034) porphyry copper-gold prospect, located 40 km south-southeast of the Kemess mine, was explored by Gitennes Exploration Inc. The company completed 20 line-kilometres of IP on the property that is underlain by intermediate volcanic rock of the Takla Group and an Early Jurassic diorite intrusion. Two holes were drilled into a strong IP chargeability zone which coincides with a 450 by 2400 metre copper geochemical anomaly. Hole R04-14 intersected multiple intervals of copper-gold mineralization throughout its length including 24.23 metres grading 0.19% Cu and 0.12 g/t Au.

To the east in the Finlay Ranges south of Ingenika River, Bard Ventures Ltd and Cross Lake Minerals Ltd pursued carbonate-hosted silver-zinc-lead mineralization on the **Ingenika-Swannell** (Minfile 094C 002- 005, 086) and **Wasi Creek** (Par; Minfile 094C 024) properties. The joint-venture completed more than 80 line-kilometers of IP on several grids on the Ingenika-Swannell property and conducted mapping, prospecting and soil sampling on the Wasi Creek property. Drilling is anticipated during the 2005 field season.

Minterra Resource Corp drilled eight holes on the **Star** magmatic copper-PGE prospect. The property is about 100 kilometres north of Germansen Landing in the Lay Range and is underlain by phases of the Polaris Ultramafic Complex. Elevated levels of platinum and palladium are associated with interstitial chalcopyrite and pyrrhotite within gently dipping layers of olivine clinopyroxenite and pyroxenite.

Wildrose Resources Ltd and partner MaxTech Ventures Ltd completed an airborne magnetic and radiometric survey over its **Carruthers Pass** (Minfile 094D 172) volcanogenic massive sulphide prospect, located 160 kilometres north of Smithers. The program produced very encouraging assay results. The five-hole helicopter-supported drill program intersected broad intervals of pyrite-chalcopyrite-molybdenite mineralization in quartz veins and stockwork within potassically altered, Eocene quartz monzonite porphyry. A 295.5-metre intercept in hole BD04-18 averaged 0.059% Mo and 0.27% Cu.

Northern Hemisphere Development Corp completed a modest diamond drilling program on its **Kaza** (Minfile 093M 111) copper-gold-silver skarn property, located 30 kilometres due north of Takla Lake. Drilling targeted the

Hornblende and Main Trend zones where calcsilicate skarn mineralization is mainly developed along the contact between andesite flows of the Telkwa formation and monzonitic dikes. Hole KZ04-01 intersected 4.8 metres grading 0.246% Cu, 2.4 g/t Ag and 0.30 g/t Au. Drilling by Northern Hemisphere on its adjoining **Northstar** (Minfile 094D 032) property intersected disseminated and fracture-controlled bornite and chalcocite in feldspar phyric flows, tuffs, and related sediments of the Takla Group. Hole NS-04-02 intersected 138.3 metres grading 0.55% Cu.

Eastfield Resources Ltd completed more than 4400 metres of drilling in 24 holes at the **Lorraine-Jajay** (Minfile 093N 002, 066, 224) alkalic porphyry copper-gold property, in the Swannell Ranges northwest of Germansen Landing. The work outlined a continuous 4-kilometre long northwest trending zone of mineralization that includes the previously identified Upper Main, Lower Main, Bishop and Weber prospects. The zone is at least 2 kilometers in width and corresponds in part with a weak to moderate IP chargeability anomaly. Typical mineralization is comprised of disseminated chalcopyrite and lesser bornite in syenitic and biotite pyroxenite phases of the Early Jurassic Hogem Intrusive Suite. Hole 04-80-A, drilled near the Bishop zone, intersected 88.39 metres grading 0.51% Cu and 0.15 g/t Au. The company is planning to resume drilling in 2005.

Just to the north on Cat Mountain, Lysander Minerals Corporation explored the **Osilinka** (Cat Mountain; Minfile 094C 069) porphyry gold-copper prospect. The property straddles the contact between monzonitic intrusions of the Hogem Intrusive Suite and andesitic volcanics of the Takla Group. In 2004, two diamond drill holes, each more than 540 metres in length, were drilled to confirm information obtained by other workers in 1989 and the early 1990s. Previous exploration identified a well-mineralized gold-copper system associated with magnetite stringers within sheared and propylitically altered augite phyric flows near the intrusive contact (i.e., drill hole C94-1 intersected 99.66 metres averaging 1.37 g/t Au and 0.15% Cu). Drill hole 04-8 intersected magnetite-rich, potassically altered volcanic breccia that graded 0.14% Cu and 1.24 g/t Au over 39.0 metres.

Alpha Gold Corp drilled skarn and manto targets on its **Lustdust** (Minfile 093N 009) polymetallic prospect, located 210 kilometres north-northwest of Prince George. The property is underlain by deformed oceanic rocks of the Cache Creek Terrane and is just west of the Pinchi fault zone. The Eocene Glover stock, an elongate body of monzonite and related feldspar megacrystic dikes and sills, is genetically and spatially related to the mineralization. Most of the drilling focused on the Canyon and Canyon Extension polymetallic skarn zones. Results from the 2004 program have not yet been released.

The **QCM** bulk tonnage gold property, centred seven kilometers northwest of the village of Manson Creek, was evaluated by Canadian Gold Hunter Corp. The property

includes the **QCM** (Minfile 093N 200), **Motherlode** (Minfile 093N 024) and **AJ** (Minfile 093N 136) occurrences. Previous exploration by Anaconda Canada Exploration Ltd established that anomalous gold values were associated with pervasively carbonate-altered wackes and tuffaceous sedimentary rocks of the Slate Creek Succession (Takla Group). The altered rocks contain up to 10% cubic pyrite and abundant ankerite and are cut by a network of narrow quartz stringers. Canadian Gold Hunter completed a 34 line-kilometre Induced Polarization survey that outlined a north-northwest trending zone with low chargeability and high resistivity characteristics. Five diamond drill holes tested a 375-metre strike length of the coincident anomaly. Three of the five holes drilled in 2004 intersected low grade gold mineralization over broad intervals (i.e. 141 metres grading 0.8 g/t Au) and, locally, narrow high-grade zones (i.e. 1.5 metres grading 173 g/t Au).

Placer Dome Inc re-visited its **Mt. Milligan** (Minfile 093N 191, 194) porphyry gold-copper deposit, 85 kilometres northeast of Fort St. James, and drilled a dozen HQ bore holes to provide core for metallurgical testing. The Main and Southern Star zones comprise the deposit and collectively have a measured and indicated resource of 408 million tonnes grading 0.18% Cu and 0.4 g/t Au. The Mt. Milligan deposits occur within porphyritic monzonite of the Early Jurassic MBX and Southern Star stocks and the enclosing permeable intermediate volcanic rocks of the Witch Lake formation (Takla Group). Most of the copper and gold mineralization at Mt. Milligan has an affinity with a biotite-rich subzone of the strongly potassically altered core of the deposit. The potassic core is enveloped by widespread propylitic alteration comprised of epidote, chlorite, albite, calcite and pyrite. Placer Dome plans to complete a full feasibility study on the project in 2005.

Serengeti Resources Inc acquired five properties with bulk tonnage potential in the Mt. Milligan to Kemess belt of the Quesnel Terrane. The most advanced of these is the **Choo** (Mitzi; Minfile 093N 096, 218) property, 25 kilometres west of the Mt. Milligan deposit, where previous shallow drilling of a 2100 metre by 700 metre IP anomaly produced indications of a well-mineralized porphyry system.

Amarc Resources Ltd staked a large area east of Chuchi Lake called the **Chona** property and employed several line-cutting and IP crews on the claims. Drilling of high priority targets was expected to commence in December. The company also staked and explored several other claim groups in the area including the **Kalder, M3, M4, M5, Tsil** and **Witch** (Minfile 093N 084, 164, 219) properties. Reconnaissance drilling was conducted on Kalder and Tsil under a joint venture agreement with Rockwell Ventures Inc. Results from the programs are not yet available.

The **Fran** (Minfile 093N 207) porphyry gold-copper property, located near the east end of Inzana Lake, about 70 km north of Fort St. James, was explored by Yankee

Hat Industries Corp. The property covers a high-level porphyry system that is associated with an Early Jurassic granodiorite to quartz diorite stock and hornfelsed volcanics and cherty argillites of the Inzana Lake succession (Takla Group). Yankee Hat completed a property-scale program that included silt, soil and rock geochemical sampling, geological mapping and a low-level airborne magnetic and radiometric survey. Soil sampling outlined two >100 ppb gold, east to southeast trending anomalous zones that measure about 3 by 2.5 kilometres. Previous drilling conducted by Navasota Resources Ltd in 2001 and 2002 intersected numerous vein and structural zones, particularly at intrusion-hornfels contacts, that produced multi-gram gold grades.

NECHAKO PLATEAU

The 3Ts property (Minfile 093F 055, 068) of Southern Rio Resources Ltd encompasses a northerly-trending, low sulphidation epithermal gold-silver quartz vein system. Multiple discrete quartz-dominated veins cut variably welded rhyolite flows of the Early Jurassic Naglico formation. A Late Cretaceous flat-lying microdiorite sill cuts the veins. Systematic diamond drilling has established resources, compliant with National Instrument 43-101, for a portion of the Tommy and Ted veins above the sill. The drill indicated resource for an 800-metre long section of the Tommy vein is 552 500 tonnes grading 6.82 g/t Au and 60.9 g/t Ag. The drill indicated resource for a 350-metre long section the Ted vein is 273 800 tonnes grading 2.0 g/t Au and 133 g/t Ag.

A deep hole drilled to intersect the Tommy vein beneath the sill cut 11.31 metres of the vein that grades 8.83 g/t Au and 62.6 g/t Ag. This is the highest grade intersection encountered below the sill so far. Diamond drilling up ice from the Ringer boulder anomaly discovered the narrow Hidden and H-East veins. Prospecting identified the new Taken Ridge float anomaly. Exploration is expected to include follow-up work on the Ringer and Taken Ridge anomalies and drilling of the Tommy and Ted veins along strike and at depth beneath the sill.

Bard Ventures Ltd completed a three-hole diamond drill program on the **Laidman** (Minfile 093F 067) gold prospect south of Vanderhoof. Drilling targeted two high-level IP chargeability anomalies that are coincident with an elevated gold geochemical anomaly and with areas of quartz-pyrite stockworks within quartz monzonite of the Cretaceous Capoose Batholith. Results were not released, however, and the property was returned to the vendor.

CARIBOO

Imperial Metals Corporation conducted the largest exploration program in the Central Region on its **Mount Polley** (Minfile 093A 008) property, southwest of Likely. The **Northeast** (Minfile 093A 164) zone, an alkalic copper-gold-silver porphyry deposit that Imperial discovered in August, 2003, is less than two kilometres from the company's idle Mount Polley mine (Figure 3-8). An expanded diamond drilling program continued to intersect impressive intervals of chalcopyrite and bornite mineralization within 'crackled' to brecciated intensely K-feldspar altered monzonite and plagioclase porphyry, phases of the Early Jurassic Polley stock. The work identified a structurally offset extension of the deposit and lengthened the overall northwest strike of the zone to more than 500 metres. In August, 2004, Imperial released a mineral reserve (NI 43-101 compliant) for the Northeast zone of 6.2 million tonnes grading 0.978% Cu, 0.324 g/t Au and 6.978 g/t Ag. The calculation was based on information obtained up to July, but drilling continued to evaluate the zone up until mid-December, producing significantly more data for a revision to the initial reserve figure. Drilling identified a normal fault that drops the northwest extension of the zone from surface to a depth of about 200 metres. Intersections from this deeper part of the deposit include 227.3 metres in hole WB04-102 that graded 1.11% Cu, 0.41 g/t Au and 7.52 g/t Ag.



Figure 3-8. Pat McAndless, VP of Exploration for Imperial Metals Corporation and Tom Schroeter, Senior Regional Geologist for the B.C. Ministry of Energy and Mines, examining core from the **Northeast** zone.

Late in the year Imperial announced that it will reopen the 20 000 tonne per day Mount Polley copper-gold mine in the first quarter of 2005. The Northeast zone, which will be called the Wight Pit when developed, is an integral part of the mine restart. The mine last operated from 1997 to 2001 producing approximately 60 800 tonnes (134 million lbs) of copper and 11 517 kilograms (370,300 oz) of gold. Deep drilling on the mine lease of the Springer zone and the partly mined Bell pit produced

many well-mineralized intersections (e.g. 68.6 metres grading 0.86% Cu and 0.67 g/t Au in hole BD04-05). The recognition of this deeper mineralization enhances the overall resource of the property and may lead to expanded pit development. The present reserve base for the three zones (Bell, Springer and Northeast) is 40.7 million tonnes grading 0.432% Cu and 0.309 g/t Au.

Cross Lake Minerals Ltd purchased the dormant **QR** gold mine (Minfile 093A 121), located 58 kilometres southeast of Quesnel, from Kinross Gold Corporation in April, 2004. The company also completed a pre-feasibility study that supports reopening the 800 tonne per day operation. The study identified the need for stringing approximately 29 kilometres of three-phase power line from the Gavin Lake sub-station to the minesite. Mineralization at QR occurs primarily in pyritic, propylitically altered basaltic fragmental volcanics of the Late Triassic Nicola Group peripheral to an Early Jurassic diorite stock. Kinross operated the mine from 1995 to 1998 producing 3733 kilograms (120,030 oz) of gold from open pit mining of the Main and West zones and underground development of the Midwest zone. The remaining on-site resource is contained mainly in the Northwest, West and Midwest zones and totals an estimated 903 510 tonnes grading 3.1 g/t Au.

Exploration in 2004 focused on the partly mined Midwest deposit and the North zone, a faulted extension of the mined Main zone. A seven-hole drill program on the Midwest deposit successfully intersected a deeper projection of the zone and yielded some encouraging assays that may lead to an expansion of the deposit. For instance, hole CL-04-39 intersected 6.4 metres grading 5.20 g/t Au within a 24.1 metre interval grading 3.10 g/t Au. Drilling by Cross Lake and others has intersected the North zone over a strike length of more than 1000 metres, but at depths of between 200 and 400 metres. The company plans to develop a decline next year in order to conduct detailed deposit appraisal drilling of the zone, a target that has the potential to significantly add to the resource base of the property.

Copper Ridge Resources optioned its **Copper Ace** property, immediately north of the Gibraltar mine, to Bell Resources Corporation. Bell drilled eight holes to test the Bysouth prospect (Minfile 093B 061) and one hole to evaluate a nearby magnetic anomaly within altered quartz diorite of the Granite Mountain batholith.

Skygold Ventures Ltd and Wildrose Resources Ltd completed a trenching and reverse circulation drilling program (Figure 3-9) within a coincident gold geochemical and Induced Polarization chargeability anomaly on the **Spanish Mountain** (Minfile 093A 043) mesothermal gold prospect east of Likely. The property is prospective for both bonanza-grade veins and bulk tonnage stockwork mineralization. The anomaly is about 1500 metres long and follows a northwesterly trend that includes the LE zone that Imperial Metals Corporation test-mined in 2000. The anomaly coincides with pyrite and quartz- pyrite veins, stringers and stockworks within



*Figure 3-9. Reverse circulation drilling on the **Spanish Mountain** gold property.*

phyllitic black shales and dark grey siltstones of the basal Nicola Group (Takla equivalent). Trenching identified higher grade gold mineralization that follows a trend of 030 degrees, crosscutting the broader zone of lower grade mineralization. Highlights of the trenching program include a 23-metre interval in trench TR-29 that grades 2.68 g/t Au. The best assay from the first 16 of 34 holes drilled in 2004 came from hole 216 that intersected 57.8 metres grading 1.11 g/t Au.

Fjordland Exploration Inc and Wildrose Resources Ltd produced an exciting intersection in the first hole of their 2004 drill program on the **Woodjam** (Minfile 093A 078) gold-enriched alkalic porphyry prospect, south of Horsefly. Mineralization at Woodjam is associated with a subvolcanic quartz monzonite intrusion, part of the Early Jurassic Takomkane batholith, in proximity to intermediate flows of the Nicola Group. Diamond drillhole 04-32 tested the depth extent of gold-copper mineralization on the Megabuck Zone and intersected 361.2 metres grading 0.84 g/t Au and 0.12% Cu (including 274.9 metres grading 1.03 g/t Au and 0.14% Cu). During followup drilling the hole was extended and the revised intersection is 378.0 metres averaging 0.81 g/t Au and 0.12% Cu. This impressive drill intersection led to an expanded program and additional investment in the

project by Imperial Metals. Follow-up drilling took place on 50-metre step-outs from hole 04-32 and additional bulk tonnage gold-copper intersections were encountered, including 233.2 metres averaging 1.01 g/t Au and 0.14% Cu in hole 04-37. The impressive grades and continuity of mineralization found at Woodjam have contributed significantly to the renewed level of interest in the southern Quesnel Trough.

Barker Minerals Ltd conducted a "Titan" geophysical survey over part of its **Frank Creek** (Minfile 093A 152) volcanogenic massive sulphide (VMS) prospect located southeast of Cariboo Lake. Results from this survey, coupled with information from earlier surveys by the company, provided trenching and drilling targets that were tested late in 2004. Trenching exposed a zone of polymetallic, base metal sulphide mineralization in stringers and semimassive bands within metasedimentary rocks of the Paleozoic Snowshoe Group. Assays of grab samples typically graded in excess of 1% copper with anomalous silver, zinc and lead. The company also discovered stringer and semi-massive to massive sulphide showings on its SCR and Rollie Creek prospects in the Cariboo Lake area.

At Wells, International Wayside Gold Mines Ltd extracted a 10 000 tonne underground bulk sample on the high-grade gold Bonanza Ledge zone at its **Cariboo Gold Quartz** property (Minfile 093H 019). The mineralized zone is up to 30 metres across and occurs within an overturned, northeast dipping sequence of metamorphosed turbidites, carbonates and tuffaceous rocks of the Paleozoic Snowshoe Group. Bonanza Ledge mineralization consists of multiple semi-massive to massive bands of fine to medium-grained pyrite that has preferentially replaced the carbonate layers within laminated, tan-coloured muscovite-rich phyllite. Ore was stockpiled prior to being trucked to the Imperial Metals Mount Polley mill for processing. The head grade of the bulk sample was approximately 23 g/t Au.

The company also continued to drill the Bonanza Ledge zone from an underground exploration drift and from surface using a tightly-spaced pattern. In all more than 14 000 metres of drilling was completed on the Bonanza Ledge trend. International Wayside intends to apply for a Mines Act permit to develop a small open pit mine on the remainder of the deposit. Resource figures (using a cut-off grade of 0.7 g/t Au) for both Bonanza Ledge and for the BC Vein were released by the company late in 2002. The indicated resource for the Bonanza Ledge zone was 337 500 tonnes grading 8.12 g/t Au. The indicated resource for the BC vein, a massive quartz±carbonate±pyrite vein, on the hanging wall of the Bonanza Ledge zone, was 296 000 tonnes grading 5.31 g/t Au.

International Wayside also drilled 5 holes on the **Myrtle** (Minfile 093H 025) property, immediately northeast of Bonanza Ledge. The target on Myrtle is a series of auriferous quartz-pyrite veins that are orthogonal to the northwest trending BC vein. Assays from the 2004

program have not been released, but drilling in 2002 by the company was encouraging (e.g. 17.68 metres grading 9.12 g/t Au).

Golden Cariboo Resources Ltd explored three gold targets south of Barkerville near the confluence of Peter's Gulch and Cunningham Creek on its Golden Cariboo project. The area is underlain by metasedimentary rocks of the Paleozoic Snowshow Group. Two drillholes tested an area of the **Cariboo Hudson** (Minfile 093A 071) property for bonanza-grade mesothermal veins; three holes were drilled on the **Craze** (Nugget Mountain; Minfile 093A 090) property to intersect the down dip projection of a carbonate-hosted massive sulphide prospect called the A zone; and four drillholes evaluated the **Ham** claims for 'Bonanza Ledge-type' replacement mineralization. Drilling was completed late in the year and assay results are not expected until early in the new year.

About 1.5 kilometres west of Wells near the former **Mosquito Creek Gold** mine (Minfile 093H 010), Island Mountain Gold Mines Ltd completed a modest diamond drilling program on the Fender Bender zone where trenching and drilling encountered high-grade gold mineralization in both replacement lenses and mesothermal veins. For example, hole IGM03-15 intersected an auriferous quartz vein grading 15.9 g/t Au over 2.5 metres. Much of the work focused on areas underlain by 'Bonanza Ledge' stratigraphy, structurally below the property's 'Mine Trend' where mining of carbonate-hosted replacement mineralization took place at the Island Mountain, Aurum and Mosquito Creek Gold mines.

OUTLOOK FOR 2005

Dramatically higher precious metal and base metal prices are expected to continue to drive grassroots and advanced exploration for both high-grade and bulk tonnage deposits throughout the Central Region. Two metal mines, Mount Polley and QR, are expected to reopen.

The level of placer gold testing and mining will likely increase in each of the region's traditional placer camps.

ACKNOWLEDGMENTS

The author gratefully acknowledges the many contributions provided by mine staff, exploration geologists and prospectors working throughout the region. Without their cooperation compilation of this report would not be possible. The manuscript benefited from editorial comments provided by Ken MacDonald and Brian Grant.