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EXPLORATION AND MINING IN BRITISH COLUMBIA 2013



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Regional Geologist Summaries
EXPLORATION AND MINING
in British Columbia 2013

EXPLORATION AND MINING IN THE OMINECA REGION, BRITISH COLUMBIA

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SUMMARY AND TRENDS

With China's economic growth slowing below expectations in the first quarter, there was a broad sell-off of copper, gold and other commodities that lowered spot metal prices and negatively affected stock values. Investor sensitivity to US monetary policy and economic recovery also led to a punctuated outflow of gold-backed exchange traded funds (ETFs). Gold price declined as much as 28% year-on-year, and copper declined up to 13%. The commodities super-cycle that had resulted in a linear rise of about \$500 M annually in BC mineral production value since 2003 (\$2900 M to \$7400 M in 2012) appeared to be flattening and reversing. Bear market conditions forced larger companies to rein in expenditures and defer spending on grassroots exploration; and challenging equity financing forced some recently active junior companies to relinquish options, report impairment charges, and write off projects altogether. Many companies were actively seeking more innovative means of financing to avoid equity dilution. More private equity and sovereign wealth funds were entering the market. Despite this adverse economic climate, some intermediate and junior companies with attractive projects and access to funding or existing cash flow were able to support significant exploration programs. Some exploration programs started midway or later in the field season as funding requirements were met. A top highlight for the year was the completion of the Mt. Milligan Mine construction project as the mine went into commercial production in October making it the first new greenfields metal mine in BC since the Max Molybdenum mine in 2007, and the Huckleberry and Kemess South mines in 1997.

The geology of the Omineca Region of BC lends itself to prospecting for a wide range of metals including magnesium, niobium, rare-earth elements (REE), molybdenum, nickel, copper, zinc, lead, silver and gold. However, the main focus of exploration in 2013 was copper, gold, silver and zinc. Deposit-types explored for included epithermal gold-silver in the Nechako Plateau and Toodoggone district; copper-gold porphyry in the Quesnel terrane and Toodoggone; and stratiform zinc-lead-silver within the Ancestral North American margin north of Williston Lake.

Total exploration expenditure for the region in 2013 was \$102.5 M with the main contribution coming from mine evaluation stage and advanced stage projects. This represented a 37% drop from the 2012 peak value.

Drilling at 80 332 m, roughly the same as in 2010, significantly dropped by 73% from the 2012 value. Grassroots and early stage projects combined increased by 8% from 2012 indicating a higher proportion of generative work in 2013. Mine evaluation increased by 56% as the Blackwater project proceeded to Final Feasibility. Exploration highlights included:

- Feasibility Studies commenced and completed for **Blackwater** (New Gold Inc), and completed for **Kemess Underground** (AuRico Gold Inc);
- commencement of Prefeasibility Studies at **Aley** (Taseko Mines Ltd);
- positive Preliminary Economic Assessments completed for **Decar** (Cliffs Natural Resources Exploration Canada Inc and First Point Minerals Corp), and for **Kwanika** (Serengeti Resources Inc);
- updated resource estimates for **Blackwater** (New Gold Inc) and **Decar** (Cliffs Natural Resources Exploration Canada Inc and First Point Minerals Corp);
- and drilling programs, here listed by targeted deposit-type:

Porphyry (copper-gold): **Brenda** (Canasil Resources Inc), **Captain** (Orestone Mining Corp), **Kemess East** (AuRico Gold Inc), **Takla-Rainbow** (Manado Gold Corp)

Low-sulfidation epithermal or vein (gold-silver): **3Ts** (Independence Gold Corp), **Aspen East** (Redhill Resources Corp), **Capoose** (New Gold Inc), **Fawnie Regional Program** (New Gold Inc), **JD** (Tower Resources Ltd)

SEDEX (zinc-lead-silver): **Akie** (Canada Zinc Metals Corp), **Cirque** (Teck Resources Ltd).

SUMMARY FIGURES AND TABLES

Figure 1 shows locations of mines and select exploration projects discussed in this report. Figure 2 provides an annual comparison of exploration expenditure over the last four years. Figure 3 sets out the approximate allocation of 2013 expenditures among Grassroots, Early stage, Advanced stage, and Mine Evaluation exploration in the region. Figure 4 compares annual drilling statistics over the last four years. Table 1 gives 2012 mine production tonnage, expected 2013 production, and

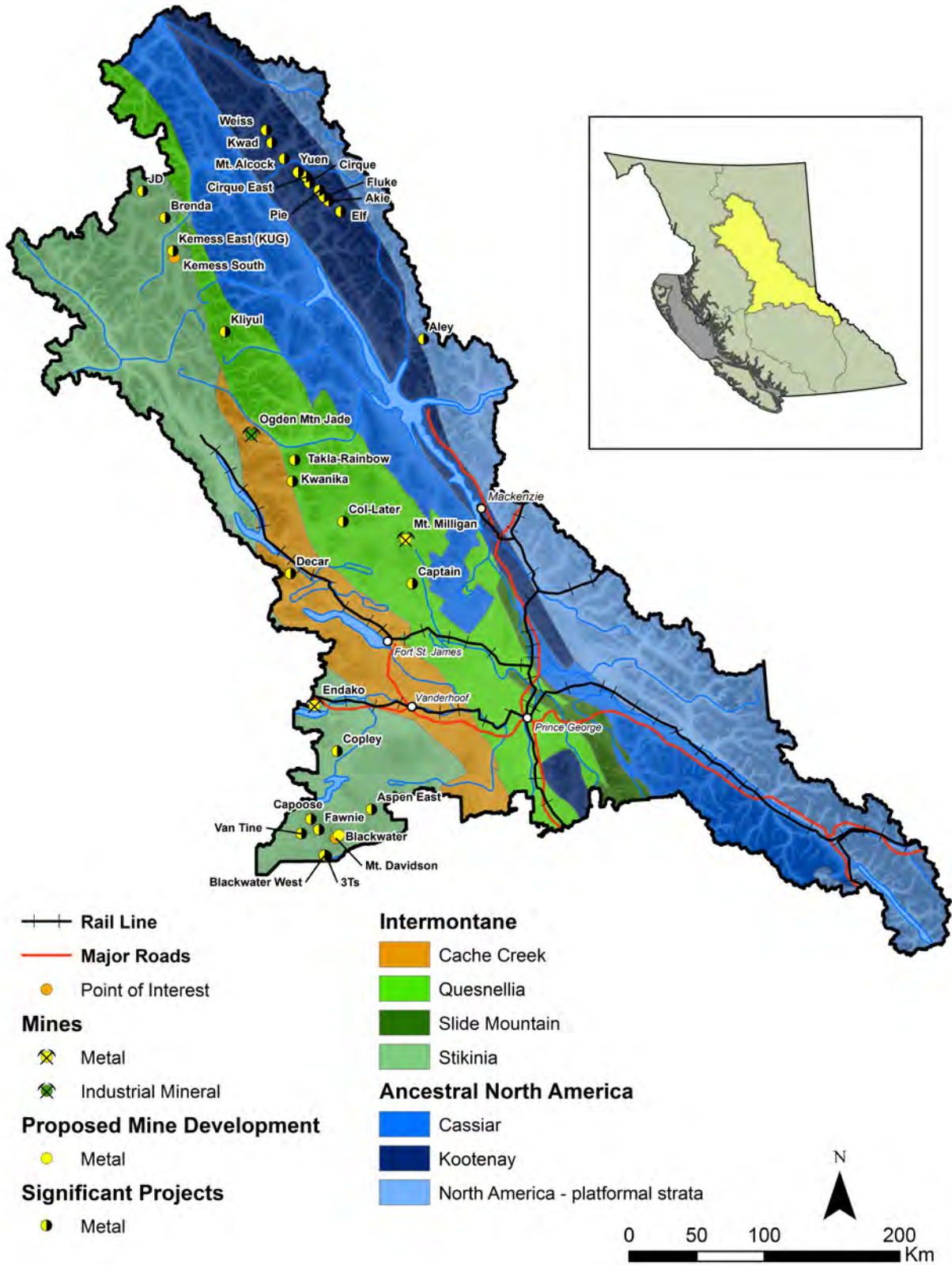


Figure 1. Mines and select exploration projects, Omineca Region, 2013.

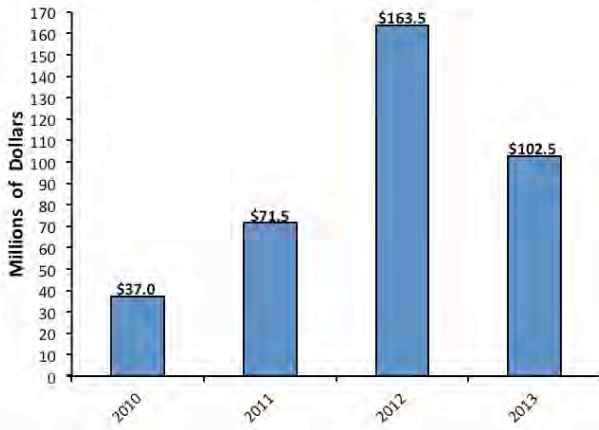


Figure 2. Annual exploration spending estimates in millions of dollars, Omineca Region (including four years data since the redefining of the boundary in 2010).

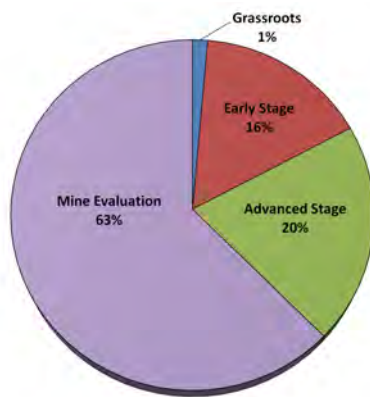


Figure 3. Exploration expenditures in 2012 by exploration stage (Grassroots: initial reconnaissance; Early stage: focused work on a target; Advanced stage: resource delineation, PEA and Prefeasibility; Mine Evaluation: focus on EA certificate, Feasibility studies, social license and government approval). Year-on-year, the Mine Evaluation stage proportionally increased by 56%. Grassroots and Early Stage combined increased by 8%.

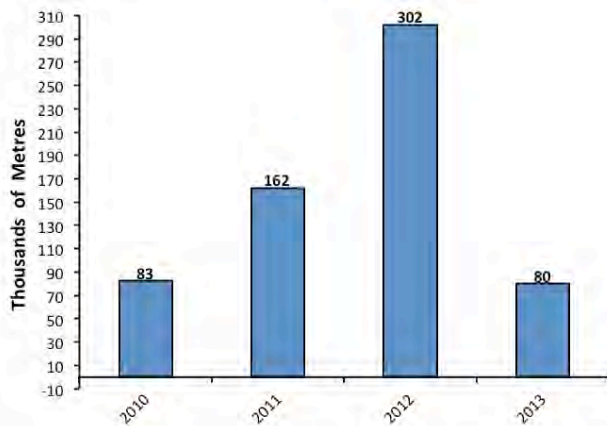


Figure 4. Annual exploration drilling estimates in thousands of metres, Omineca Region (including three years data since the redefining of the boundary in 2010).

reserves. Table 2 lists details of select exploration programs in 2013.

MINES AND QUARRIES

METAL MINES

Endako Mine

The challenging year of declining molybdenum prices and operational setbacks in 2012 for the **Endako Mine** (MINFILE 093K 006) of Thompson Creek Metals Co Inc (TCMC; operator and 75% owner) and Sojitz Corp (25% owner), 17 km west of Fraser Lake, continued to year-end with net losses reported for the quarter and year. TCMC took a \$530.5 M non-cash pre-tax write-down of its share of the Endako property, plant, equipment and development assets. In 2012, actual molybdenum production was 6.19 Mlbs at a cash cost per pound of \$15.42/lb. A total of \$78.4 M was spent on the Endako mill expansion in 2012. Work continued throughout Q4 and into 2013 to optimize plant operations, improve worker training programs, and implement a more aggressive maintenance program. Additionally, as a cash saving measure of \$2 M per month, mining focused on low grade stockpiles and six historic dumps, some of which were ore grade not included in reserves. An initial 2013 production guidance of 9.0 - 10.5 Mlbs at \$9.25 - \$10.75/lb reflected these improvements.

In addition to grade recovery challenges in processing oxidized stockpile material, in early 2013 tailings management issues were encountered where frozen water in the impoundment was preventing consistent return of water from Tailings Pond 1 (TP1) to the mill. This temporarily slowed production with only one ball mill running. Modifications were made to the piping of the tailings pond and other tailings management procedures were instituted to ensure sufficient water supply for future winter milling operation. A causeway was constructed to hold back slimes from TP3 and provide a deeper reclaim area for the barge in TP1. This slowed Q1 production and resulted in a lowering of the 2013 guidance to 7.5 - 8.5 Mlbs at a cash cost of \$10.75 - \$12.25/lb.

Other mine infrastructure issues in Q1 included a 2713 m tear in one of the primary conveyor belts possibly caused by waste steel in stockpiled material. The setback did not significantly impact production but resulted in some temporary layoffs during belt repair. In addition, a decision was made to shut down the roaster for an estimated 18 months for retrofitting due to lower than expected recoveries. In an effort to defer the maintenance expense, concentrate was being transported offsite to TCMC's Langeloth Metallurgical Facility near Pittsburgh PA to be roasted.

TABLE 1. MINE PRODUCTION AND RESERVES, OMINECA REGION, 2013

| Mine | Operator | MINFILE | Commodity | Deposit Type | Tonnes Mined (2012) | Tonnes Milled (2012) | Production (2012) | Production (2013) | Proven and Probable Reserves (Dec 31, 2012) | Measured and Indicated additional Resource (Dec 31, 2012) |
|----------------------------------|------------------------------|---------------|------------|----------------------------|------------------------|------------------------|------------------------------|---|---|---|
| Endako (75% share) | Thompson Creek Metals Co Inc | 093K 006 | Mo | porphyry | 7 569 549 tonnes | 12 357 163 tonnes | 2 808 000 kg (6 191 000 lbs) | 4 114 000 kg Mo (9 072 000 lbs) | 305.4 Mt at 0.046% Mo | 54.0 Mt at 0.038% Mo |
| Mt Milligan (commissioned in Q3) | Thompson Creek Metals Co Inc | 093N 191, 194 | Cu, Au, Ag | porphyry | N/A | N/A | N/A | 4.9 Mkg Cu, 656.3 kg Au, 1300 kg Ag (10.9 Mlbs Cu, 21.1 Koz Au, 41.8 K oz Ag) | 482.4 Mt at 0.39 g/t Au, 0.20% Cu | 224.3 Mt at 0.21 g/t Au, 0.15% Cu |
| Shasta | Sable Resources Ltd | 094E 050 | Au, Ag | Low-sulfidation epithermal | 10 000 - 20 000 tonnes | 10 000 - 20 000 tonnes | N/A | N/A | 5000 tonnes (estimate) | 20 000 tonnes (estimate) |

By June, mining had resumed in the southwest corner of the Denak West pit and northeast corner of the Endako pit, and both mined and stockpiled material was processed throughout the remainder of the year. Three benches mined in the Denak West pit hosted strong molybdenite veining and shear-hosted mineralization. Benches were also mined from the saddle zone between the Denak East and Endako pits to establish a more direct route to the in-pit crusher in preparation for return to mining along the Endako pit south wall. Mined stockpile areas included a dump southeast of the Endako pit, the Denak East in-pit low grade stockpile, and the higher grade (0.08% MoS₂) dump south of the Denak East Pit. An in-pit low grade stockpile was established near the in-pit crusher for readily accessible ore inventory. By end-June, an average 45 000 t/d was being milled with peak days of about 60 000 tonnes. For the first half of 2013 cash cost per pound produced was \$11.85 compared to \$18.51 in 2012, and by Q3 it was \$9.23/lb. Improvements to recovery continued, increasing from 55.4% to 68.2% year-on-year for the first half of 2013, with a target concentrate grade of 79% MoS₂. An average head grade of 0.07% MoS₂ was maintained throughout 2012 - 2013. Cut-off grade for resource and reserve is 0.042% MoS₂.

Mining plans include the development of a Super Pit by mining the saddle areas between the Endako, Denak East and Denak West pits; a step-back of the Endako pit; and the Northwest Extension zone pit. Reserves and additional resource are:

- 305.4 Mt at 0.046% Mo - containing 141.7 Mkg (312.4 Mlbs) Mo (Proven and Probable)
- 54.0 Mt at 0.038% Mo - containing 20.5 Mkg (45.2 Mlbs) Mo (Measured and Indicated).

Mine life is about 15 years. The \$650 M new mill, commissioned and ramped-up to commercial production in 2012, is designed to increase throughput levels by 77% from the previous 45 year-old mill to 52 000 t/d, increase yearly input levels up to 6.8 - 7.3 Mkg (15 - 16 Mlbs), and reduce operating costs. Expected recovery from the mill is 80%, with a final powder product of 91.5% MoO₃ (67% Mo) after roasting of concentrate. TCMC remains positive about the mid-to-long-term fundamentals of the market, being well-positioned to take advantage of a rally in molybdenum prices.

The Endako deposit is centrally located within the northwest trending Endako quartz monzonite at the southeastern edge of the François Lake Plutonic Suite. The François Lake Suite is a Middle-to-Late Jurassic component of the Endako Batholith which intruded a zone of crustal weakness in the Stikine and Cache Creek terranes from the Late Triassic to Middle Eocene. The Casey Alaskite phase to the north, contiguous with the Endako phase, is considered the potential mineralizer; and the E-W striking South Boundary fault appears to be an important controlling structure. The Late Jurassic orebody occurs as a series of en-echelon flat-lying ribbon-textured quartz-molybdenite veins that rotate clockwise in strike from 110° to 170° across the deposit

TABLE 2. SELECTED EXPLORATION PROJECTS, Omineca Region, 2013

| Property | Operator | MINFILE (BCGS Map) | Commodity | Deposit Type | Work Program |
|-----------------------|------------------------------|-------------------------------|------------------|--------------------------------------|---|
| 3Ts | Independence Gold Corp | 093F 055, 068 | Au, Ag | Low-sulfidation epithermal / vein | DD (7812 m), G, GC, MG, MS, P |
| Akie | Canada Zinc Metals Corp | 094F 031 | Zn, Pb, Ag | SEDEX | A, G, P, AB-EM (2795 line-km), DD (4855 m), GC (soil, hyd), EN MS, PF, EN |
| Aley | Taseko Mines Ltd | 094B 027 | Nb | Carbonatite-hosted | MS, PF, EN |
| Aspen East | Redhill Resources Corp | 093F 004, 059 | Au, Ag, Cu, Mo | Low-sulfidation epithermal, porphyry | DD (1785 m), GC (soil), P |
| Brenda | Canasil Resources Inc | 094E 147 | Au, Cu | Porphyry | DD (962 m) |
| Blackwater | New Gold Inc | 093F 037 | Au, Ag | Intermediate-sulfidation epithermal | CD, GD (20 000 m), EN, FS, MS |
| Blackwater West | RJK Explorations Ltd | (093F.015, 016, 005, 006) | Ag, Cu, Zn, Pb | Low-sulfidation epithermal | A, DD (1151 m), IP, MG |
| Capoose | New Gold Inc | 093F 040 | Ag, Au | Intermediate-sulfidation epithermal | A, DD (4200 m) |
| Captain | Orestone Mining Corp | 093J 026 | Cu, Au | Alkalic porphyry | A, DD (1554 m), MG (130 line-km) |
| Cirque | Teck Resources Ltd | 094F 008 | Zn, Pb, Ag | SEDEX | A, DD (2690 m), G, GC (soil) |
| Col-Later | Pacific Empire Minerals Corp | 093N 101 | Cu | Porphyry | A, G, GC (rock, soil), P, TR |
| Copley (and 2 X Fred) | Kootenay Silver Inc | 093F 070, (093F.089) | Au, Cu | Low-sulfidation epithermal | GC, GP, P |
| Decar | Cliffs Natural Resources Inc | 093K 039, 041, 072 | Ni | Ultramafic | EN, MS, PEA |

TABLE 2. CONT'D.

| Property | Operator | MINFILE (BCGS Map) | Commodity | Deposit Type | Work Program |
|---|------------------------------|--|----------------|---|--|
| Fawnie Regional (Capoose South, Van Tine, Van Tine South, Fawnie) | New Gold Inc | 093F 040, 043, 045, 050, 052, 053, 056 | Au, Ag | Low-sulfidation epithermal, porphyry, skarn | G, GC (soil, till), IP, MG, P RC (18 250 m) |
| JD | Tower Resources Ltd | 094E 171 | Au, Ag, Cu | Low-sulfidation epithermal, porphyry | DD (2140m), IP (11 line-km), MS |
| Kechika Regional - Northern (Mt. Alcock, Kwad, Weiss, Bear/Spa, Driftpile South, Saint, and Thro) | Canada Zinc Metals Corp | 094K 066, 068; 094F 003, 015, 021, 024, (094F.073, 094L.020) | Zn, Pb, Ag | SEDEX | G, GC (soil, hyd), AB-EM |
| Kechika Regional - Southern (Yuen, Cirque East, Pie, Fluke, Elf) | Teck Resources Ltd | 094F 009, 013, 023, 037 (094F.055) | Zn, Pb, Ag | SEDEX | AB-EM, GC (soil) |
| Kemess Underground / Kemess East | AuRico Gold Inc | 094E 021 (094E.007) | Cu, Au, Ag | Porphyry | A, DD (13 337 m), EN, G, GC (rock), P |
| Kliyul | Kiska Metals Corp | 094D 023 | Cu, Au | Porphyry | G, IP, MG, P |
| Kwanika | Serengeti Resources Inc | 093N 073 | Cu, Au, Ag, Mo | Porphyry | PEA |
| Ogden Mountain Jade | Green Mountain Gemstones Inc | 093N 165 | Nephrite | Ultramafic | A, G, DD, TR |
| Takla-Rainbow | Manado Gold Corp | 093N 082 | Au-Cu | Vein, porphyry | A, DD (1000 m) |

Work Program Abbreviations:

A = access (trail, road construction on claims); AB-EM = airborne electromagnetics; AB-MG = airborne magnetics; AB-RD = airborne radiometrics; BU (X tonnes) = bulk sample (weight in tonnes if known); CD = condemnation drilling; DD (Xm) = diamond drilling (totalling X metres); EN = environmental baseline studies/monitoring, remediation work; FS = Feasibility studies; G = geology, mapping, etc.; GC = geochemical sampling (rock, silt, soil, till, biogeochemical, hydrogeochemical etc.); GD = geotechnical drilling; GP = geophysics (general); IP (X line-km) = induced polarization (totalling X line-kilometres); MG = magnetics; MS = metallurgical studies; P = prospecting; PEA = Preliminary Economic Assessment, scoping study; PD = percussion drilling; PF = Prefeasibility studies; R = reclamation; RC = reverse circulation drilling; TR = trenching; TP = test pits.

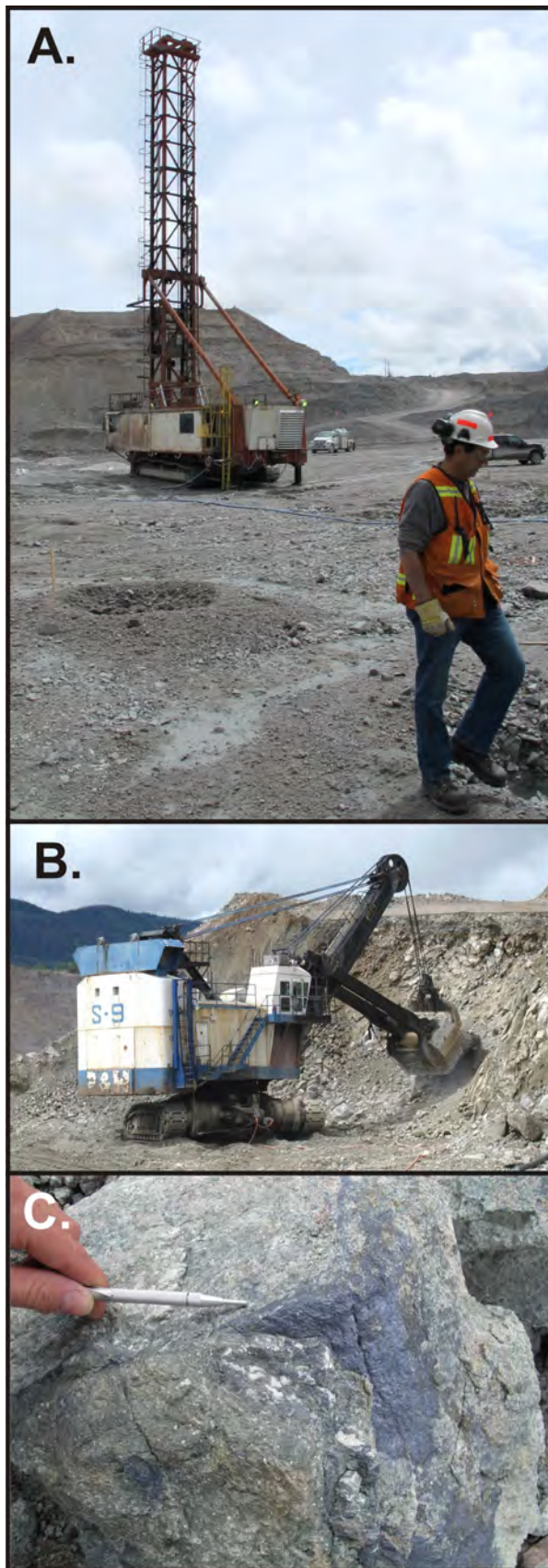


Figure 5. Endako Mine – **A.** Blast-hole drilling in West Denak pit; **B.** Mining in northeast corner of Endako Pit (grading 0.11% MoS₂); **C.** Molybdenite in Endako quartz monzonite, West Denak Pit.

from southeast to northwest. This change in orientation follows the Casey Alaskite contact to the north. Secondary vein structures are northeast striking. The combined orebody is about 4.8 x 0.75 km across the Endako, East Denak, West Denak, and Northwest Extension zones. Maximum depth is about 370 m.

Shasta Mine

Sable Resources Ltd placed their seasonal underground **Shasta Mine** (MINFILE 094E 050), 31 km northwest of past-producer Kemess South, and more regional **Toodoggone Gold/Silver** project on care and maintenance in 2013 as management investigated financing options. Production in 2012 between 10 000 - 20 000 tonnes generated \$1.27 M total revenue from sale of gold. Ore is processed 11 km from the mine site at the Baker Mill, which has an optimum feed rate of 180 - 200 t/d. Reserves are estimated at about 5000 tonnes, with an additional resource of 20 000 tonnes, enough to support about two more years of mining. An additional minimum 130 000 tonnes of historical resources are held nearby at the **Baker (Chapelle)** (MINFILE 094E 026) and **Mets** (MINFILE 094E 093) properties.

The Shasta property is underlain by upper Toodoggone Formation dacitic lapilli tuff and epiclastic rocks, and Takla Group andesites. A dacitic dome is situated east of the J1 fault and JM stope. Gold-silver mineralization occurs as argentite and electrum in calcite-rich stage-2 veins that cut across potassic alteration and quartz-rich veins of the preceding stage. Associated silicification has increased the competency of the rock, making it amenable to underground mining.

QUARRIES

Placer gold

Placer gold exploration and mining is a significant traditional and ongoing activity in the region. There were 49 notice-of-work (NOW) applications submitted to BC Energy and Mines for placer in 2013. From west to east and north to south these were located in three main general areas:

Manson Creek area:

- Kenny Creek, Kwanika Creek, Twenty Mile Creek, Germansen River, Jackfish Creek, Slate Creek, Manson River, Klawli Creek, Nation River;

Hwy 27 - 97 corridor:

- Sowchea Creek, Philip Creek, McLeod River;

Hixon area:

- Fraser River, Willow River, George Creek, tributary creeks of the Naver River, Ahbau Creek, Cottonwood River.

These sites are located near the regional contact of the Quesnel terrane (Late Triassic to Early Jurassic) with



Figure 6. Ken Wasylshsen placer gold – Wash plant, Philip Creek area.

the Slide Mountain (Late Devonian to Middle Permian) and Cariboo/Cassiar (Upper Proterozoic to Lower Cambrian) terranes along the Manson-McLeod Lake fault system, and farther west into the Quesnel terrane. There was also placer mining in the Toadoggone district, 22 km southeast of the Kemess South, on McConnell Creek which follows a fault separating the Quesnel and Cassiar terranes. Placer mining is generally conducted on abandoned benches and abandoned channels above the current level of streams, or in side valleys. Medium-scale operations use power machinery such as hydraulic excavators and backhoes to excavate pay dirt, which is then either trucked or directly dumped into a wash plant for processing. Wash plants generally comprise a grizzly, trommel or screening plant, sluice box and jigs to concentrate gold. As an example of advanced exploration techniques, Saville Resources Inc used Mobile Metal Ion (MMI) soil sampling to follow up a hammer seismic survey that outlined buried channels at the **Bar** property near Germansen River.

Historic government statistics show the percent of placer gold production to total gold shipments in BC has been recorded at 1% since 1998. Placer gold value has oscillated dramatically since about 1978 as gold market value increased to match dollar inflation. From 1978 to present the annual value of placer gold in BC has averaged about \$5 M, but since 2007 has averaged \$2 - \$3 M.

Placer gold exploration in the region targets Tertiary, and pre-Late Wisconsinian, paleochannel and paleofan deposits. Older (Tertiary) gravels are coarse pebble-cobble gravels that were deposited during cool-temperate non-glacial intervals and rest on older bedrock. These gravels incorporated lode gold from locally weathered bedrock and were then overlain by Wisconsin glacial drift. The glacial deposits were subsequently downcut by post-glacial watercourses. Paleochannel systems can have little relation to modern drainage patterns, and be controlled by major long-lived faults. Subglacial-type deposits are found on the leeward side of bedrock highs, in the basal portion of lodgement tills, in boulder pavements,

and narrow gravel-filled notches. Postglacial type deposits formed in proximal gravels from the reworking of subglacial and older gravels and are typically lower grade. In BC Energy and Mines Bulletin 89, Levson and Giles (1993) suggest narrow channels oriented oblique to glacier flow, and supporting thin overburden, are the best targets. In 2013, Travis Ferby and Holly Arnold of the BCGS released a compilation of micro- and macro-scale ice-flow indicators for the Interior Plateau of Central BC (Open File 2013-03) that could be useful in placer gold exploration.

Nephrite jade

Green Mountain Gemstones Inc were exploring and mining for nephrite (amphibole jade) at their **Ogden Mountain** property (MINFILE 093N 165), 184 km northwest of Fort St James. Three target areas were being re-assessed. In the original Camp Zone, test pitting and trenching followed up 2012 drilling that suggested an increase in jade quality from north to south in the area. Both placer and in situ mining techniques are employed at the operation. In the Far North area, nephrite blocks were gently mined using Nonex, a pyrotechnic device that uses low yield gas cartridges ignited with an electric charge. Later in the season focus switched to an in situ high grade nephrite lens at the Japanese-site target near the camp. Prospecting for nephrite boulders continued along Squackbird and Ogden Creeks. Both loose boulders and in situ prospects are tested by hand drill with BQ diameter (36.4 mm) core before mining. Wire saws may be used to decrease the size of blocks and boulders for transport to camp where large diamond saws are used to further reduce size. Boulders generally range between 1 - 15 tonnes toward a seasonal target of about 200 tonnes of rough nephrite. Colour, size, and structure are important features in determining nephrite value. Massive, clear and bright coloured blocks are best. Green, blue, black, and grey-white nephrite has been found on site. Actual jade shipped from the site in 2013 was about 100 tonnes as extra time was required for cutting and trimming.

The Ogden Mountain property is underlain by metamorphosed Trembleur ultramafic rocks and serpentinite melange of the Mississippian to Late Triassic Cache Creek Complex. These rocks are NNW trending, moderately dipping, and locally intercalated with massive white medium-grained calc-silicate rock (Simandl et al., 2000). In the Granite Zone, a granodiorite intrudes the sequence and may be equivalent to Early Cretaceous granodiorite mapped near John's Lake, 3 km to the southwest. A terrane-bounding fault lies 9 km to the northeast separating the Cache Creek and Quesnel terranes. Thrust faults separating the Trembleur ultramafics and Cache Creek Complex rocks cut across the property. The host rocks are strongly sheared and foliated. They appear to grade from serpentinite to nephrite to soapstone (talc schist) with close proximity to calc-silicate rock. Nephrite and soapstone are derived from an ultramafic protolith that has undergone

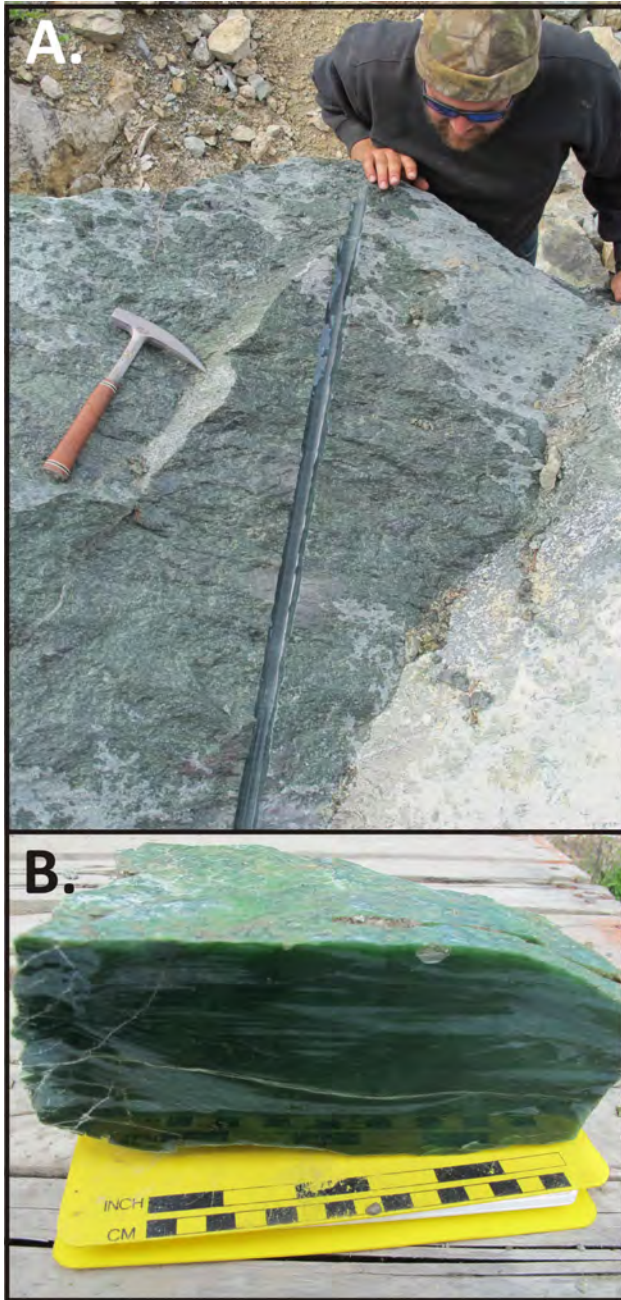


Figure 7. Ogden Mountain Jade – **A.** C- to C grade nephrite boulder in Far North area; **B.** High-grade Ogden Mountain nephrite.

dynamothermal metamorphism and metasomatic exchange in a subduction zone. A line of green altered peaks can be seen up the Axelgold Range, on strike to the northwest that represent this fossil subduction zone. The nephrite occurs as lenses that pinch and swell along the regional fabric, and locally have nodular “puddingstone” textures suggestive of boudins in tectonically stretched rock.

Green Mountain Gemstones Inc is the world’s largest supplier of nephrite jade. Approximately 90% of mined product is sold and exported to China where, depending

on its size on its size and grade, it is carved into statues and cabochons.

Sand and Gravel (Aggregate)

Sand and gravel (aggregate) are construction materials used extensively in commercial, industrial and public works, and are a main component of concrete. These deposits are typically found in river valleys; a limited number of locations contain materials that meet specifics of quantity and quality. There were 10 NOW applications registered by the Prince George MEM office in 2013 from mining, lumber and construction companies, and private individuals: From west to east, these included:

- Kenny Dam Quarry (Rio Tinto Alcan) near Fraser Lake;
- Hill Pit near Vanderhoof and Nechako River;
- MacKenzie Causeway Pit (Dunkley Lumber) near Mackenzie and Parsnip Reach
- Sloan Road Pit near Prince George and Nechako River
- Clyde Creek Pit near McBride and Upper Fraser River
- Horsey Creek Pit and King Creek Pit (N.V. Construction) near Dunster and Upper Fraser River
- Lakewest Pit 1 (Lakewest Enterprises Ltd.) near Valemount and Thompson River.

MINE DEVELOPMENT AND EVALUATION

MINE DEVELOPMENT

Mt. Milligan Mine

Despite significant challenges from low molybdenum price, high turnover of skilled labour, and rising cost of supplies, Thompson Creek Metals Co Inc (TCMC) stayed on schedule with construction of the **Mt. Milligan Mine** (MINFILE 093N 194), 145 km northwest of Prince George. Mine construction began in mid 2010 at an estimated capital cost of \$915 M. It became clear in 2012 that cost inflation would push the cost toward \$1500 M necessitating debt and tangible equity unit offerings and additional arrangements with private equity investment partner Royal Gold Inc. Royal Gold has a 52.25% a stake in production through investment of \$781.5 M in the project. Addition of a 450-person permanent residence estimated at \$45 M and planned for completion in 2014, brought the total estimated capital expenditure above \$1570 M.

In 2012, \$679.0 M was spent on mine construction. In 2013 there was \$390.5 M in capital expenditures to the end of September. This covered construction of the

Tailings Storage Facility (TSF), mine facilities, plant site earthworks, cement works, steel erection, open-pit development, mining equipment, engineering design costs, construction camp costs, permanent residence, and commissioning activities. Major installations included the SAG mill, two ball mills, lines of rougher and cleaner flotation cells, and the concentrate load-out bay. A 92 km power line (230 kV) from Kennedy Substation, 32 km southeast of Mackenzie, and an on-site substation was also completed. In December 2012, a second 7495 electric shovel was commissioned, and both shovels were stripping overburden from the first pit area. Eight 793 haul trucks were running of the 13 truck fleet planned for full-scale operations. Last work in 2012 included finishing the steel cladding on the concentrator to allow indoor work during winter months, a 400-m conveyor line from the primary crusher to the mill, the pebble crushing circuit, truck maintenance shop and administrative building.

Work in 2013 continued on the West Separator Berm (TSF), recycle ponds, pebble transfer tower, lining of ball mills, installing flotation tanks, power connectivity, and personnel began moving into the administrative building in May. The mine boasts the largest diameter gearless SAG mill on the continent at 40' (12.2 x 6.7 m), and the Metso primary crusher is the tallest in Canada at 110' (33.5 m). The crusher has a gabion wall and truck ramp constructed to the height of the crusher tower. The phased start-up began with first feed to the concentrator on August 16, 2013. Routine testing and commissioning of all equipment and process circuits followed. Production of saleable Cu-Au concentrate started in September totalling 1600 tonnes for the month at a throughput rate of 1500 - 2000 t/h from the first ball mill and flotation circuit. Concentrate began moving to the load-out facility in Mackenzie in late September. October developments included start-up of the second ball mill and processing circuit, and first rail shipment from Mackenzie to Vancouver. Commercial production of concentrate was planned for Q4 2013 at a rate of 2750 t/h. Start-up activities are expected to continue into Q1 2014 towards a steady commercial production rate of 60% design capacity mill throughput. The first ocean shipment of concentrate weighing 5530 wet tonnes left Vancouver in November. A Dedication Ceremony was held on October 8th to recognize the opening of the mine.

The mine is unique in that construction material for the TSF, processing plant foundations, primary crusher ramp and other features is sourced from clay-rich glacial till overburden occurring as natural eskers on site, and the non acid-generating (NAG) component of the open-pit waste rock. This eliminates the need for large waste rock storage facilities. The segregated TSF is designed to contain 438 Mm³ of material and will require 70 Mm³ of construction material. It is designed for closure by minimizing the project footprint and providing for zero surface effluent discharge during operations. All mine water is to be recycled by pumping from the TSF back to



Figure 8. Mt. Milligan Mine – **A.** Gabion wall of above-ground gyratory crusher tower; **B.** Phase 1 mining in MBX zone, 7495 electric shovel; **C.** Copper-gold ore near the brecciated monzonite/andesite contact in the MBX zone; **D.** Mine dispatch and mill centralized control area.

the processing plant. Potentially acid-generating (PAG) and oxidized waste rock will be delivered to the TSF

during operations and to the Main Zone pit when mining is complete. The embankments are being constructed by centreline method using a zoned earthfill-rockfill structure with compacted till core and filter zones. The core zone is keyed into low permeability till in the foundation. Material stored in the TSF will include NAG final rougher tailings (89%) and PAG cleaner tailing (11%) in a separate cell. The Pipeline Corridor Causway (PCC) cuts across the TSF and provides routing for scavenger and cleaner tailings pipelines as well as providing access for haul trucks to the North, Northeast, and Southeast Embankments. Secondary catchments have been contoured within the TSF for additional protection against tailings seepage. The final step in authorizing the deposition of tailings material in the TSF was received in January 2013, when the Department of Fisheries and Oceans approved the mine's fish habitat compensation plan as required by Environment Canada's Metal Mining Effluent regulations. The deepest part of the TSF will hold 85' (25.9 m) of tailings when mining is complete. Construction of the tailings dam will be ongoing with open-pit mining throughout the mine life as two linked operations. Approximately 70% of all equipment and materials will be assigned to TSF construction. Ten Mm³ of water required for mill start up was stored from snow melt and runoff of King Richard Creek and some catchment areas altered during mine construction. The entire mine operation has been concentrated into a

3 x 4 km area to minimize its footprint.

The mine is state-of-the-art using the GIS-enabled Caterpillar Minestar system, wherein the dispatcher oversees mining operations on-screen including blast-hole drilling progress, shovelling progress, tonnes moved per shift and per hour, fuel use, equipment alarms and health indicators. All mining equipment is Minestar equipped and tied to a GPS location. Drill and blast patterns are coded in the system. Shovels are equipped with radar systems that sense elevation of the deck being excavated to. Haul trucks are equipped with alarms, cameras and scales for measuring volumes and tonnages that can be monitored from dispatch. All mined material is georeferenced as to where it was mined from and where it will be placed. Block model interpolations from Minesight are also uploaded to the system. The dispatch control console for the mine is housed in the same area as the mill control console so that mine and mill operations are closely synchronized. Additional innovations being tested include a blast-hole sampling device fixed to the drill, and an X-wing programmable automated aircraft for surveying.

The Mt. Milligan mine is an open-pit operation with 60 000 t/d copper flotation concentrator. Ore will be crushed and temporarily stored in a blending pile, or more permanent stockpile. It will then be processed through the SAG mill and one of two ball mills until ground between 200 - 60 µm before proceeding to roughing flotation. In

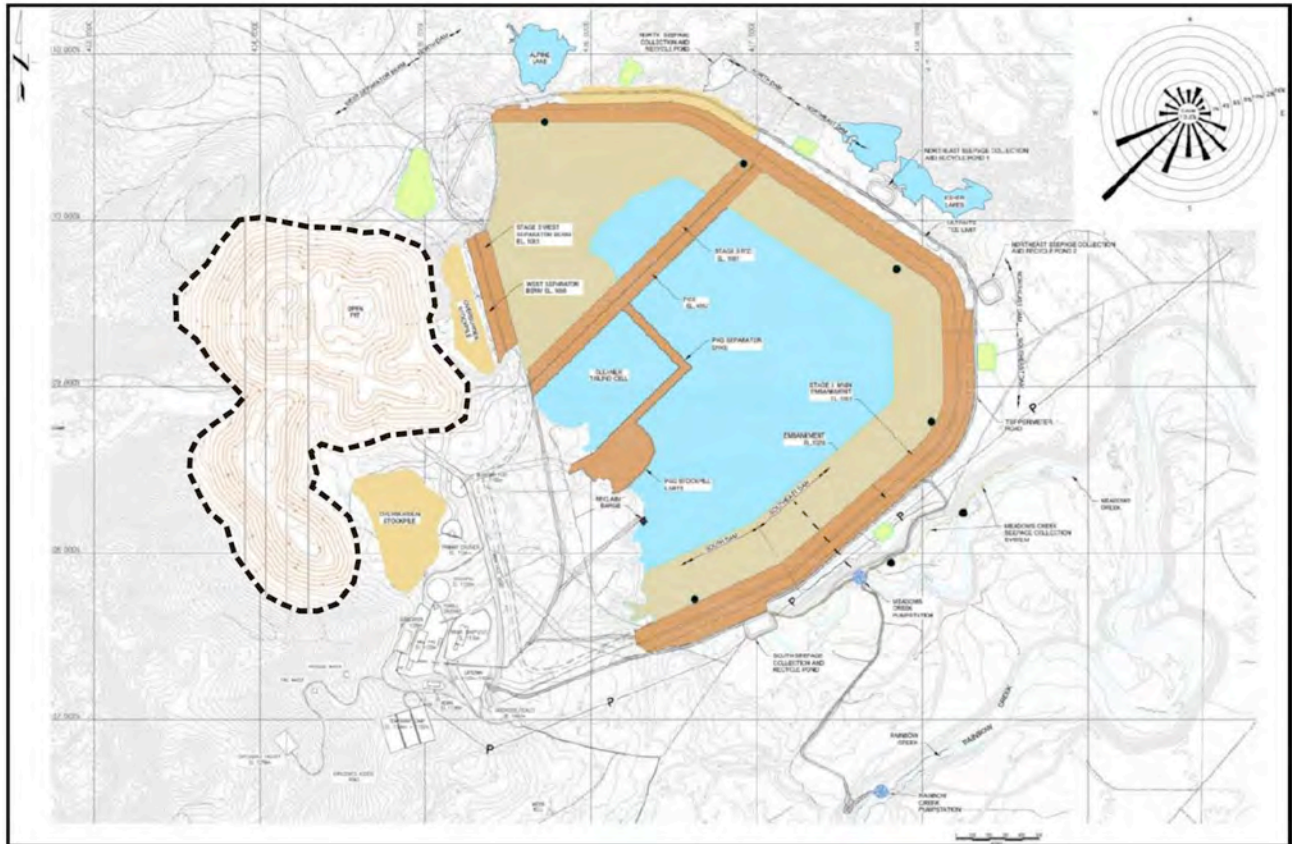


Figure 9. Mt. Milligan Mine – Planned site layout of the mine showing open-pit area (black dashed line), mine facilities southeast of the pit, and segmented Tailings Storage Facility; from Terrane Metals Corp Feasibility Update report, 2009.

scavenging, the residual ore will be further reduced to 20 µm before flotation. The 60 000 t/d of ore will produce 400 t/d (138 000 t/y) of concentrate grading about 24% Cu and 31 g/t Au. The concentrate will be trucked by private road to the leased Kemess Mine rail load-out facility in Mackenzie until the planned 2014 completion of a permanent load-out being constructed on a site purchased from Dunkley Lumber. The expected average annual production over the current 22-year mine life is 36.7 Mkg (81 Mlbs) of copper and 5514 kg (194 500 oz) of gold. Expected silver production of 10 129 kg (357 300 oz) was included in the 2009 Terrane Feasibility Update report. The first six years production will be higher averaging 40 Mkg (89 Mlbs) of copper and 7428 kg (262 000 oz) of gold. Life-of-mine strip ratio is 0.84 : 1. Mining will start in the North Pit, where ore is closer to surface, capturing the DWBX, WBX, MBX, and 66 mineralized subzones. After about 14 years, mining will dogleg into the South Pit capturing the unnamed stock and Southern Star subzones. The combined Main and Southern Star deposits have a resource of:

- 706.7 Mt at 0.33 g/t Au and 0.18% Cu - containing 212 621 kg (7.50 Moz) Au, and 1288 Mkg (2840 Mlbs) Cu (Measured and Indicated);

Inclusive reserves are reported at:

- 482.4 Mt at 0.39 g/t Au and 0.20% Cu - containing 170 664 kg (6.02 Moz) Au, and 963 Mkg (2124 Mlbs) Cu (Proven and Probable).

The mineral resource was determined from 220 286 m of drilling (969 holes) from 1987 - 2007. Once achieving design production capacity, the mine is expected to account for 50% of TCMC's revenue, and will diversify the company from being a pure-play molybdenum producer, adding copper and gold as a hedge against commodity price cycles.

At the height of construction there were over 1100 people, including contractors, working on site daily. An average of 950 personnel working 77 000 hrs/week continued into 2013. A 1075 man camp provided lodging for construction workers. The permanent operations full-time workforce is estimated up to 450, including 50 support staff and 200 expected to live on-site. On opening day there were 350 mine employees. In December 2012, the company had partnered with Globe 24-7 HR & Recruitment to manage a Recruitment Process Outsourcing program to deliver 200+ jobs across processing, mining, health and safety, administration, HR, environmental and technical services through 2013. In June, the mine construction project won the John Ash Safety Award for achieving the lowest injury frequency rate for mines with over one million worker hours. Staff and contractors had worked over 5 million person-hours without lost time injury. For 2012, Initiatives Prince George reported an estimated \$124.4 M in purchased goods and services from over 200 businesses came from the local economy, of which \$61 M was spent in Prince George.

Mt. Milligan is a tabular, near-surface, alkalic copper-gold porphyry deposit that measures about 2.5 x 1.5 km and 400 m depth. The deposit is underlain by basaltic-andesitic rocks of the Late Triassic Witch Lake volcanic succession (Takla Group) and moderately west-dipping monzonitic stocks, the MBX and Southern Star. Copper-gold mineralization in sulfide veinlets and disseminations is hosted in the stocks, their brecciated margins, and in the adjacent hornfelsed and variably altered volcanics. Alteration and mineralization is concentrated along horizons in the volcanic stratigraphy and the monzodiorite Rainbow Dike, which has combined sill-dike geometry suggestive of a cone sheet. In the Main deposit, magnetite-rich potassic alteration and Cu-Au mineralization gives way to Au-only mineralization and iron carbonate-rich phyllic and/or intermediate argillic alteration in the 66 zone, southeast of the Rainbow Fault. Brownfields exploration targets include five coincident airborne HeliGEO TEM and ground IP chargeability anomalies defined by Terrane Metals Corp in 2008 in the North and South Grid areas, 4 km northwest and 2 km south of the mine, respectively. Three proximal magnetic anomalies, the Snell, Mitzi and D3 targets, are suggestive of additional mineralized alkalic porphyry stocks within the Heidi Lake cluster.

MINE EVALUATION

Kemess Underground (KUG)

At the end of March, intermediate gold producer AuRico Gold Inc reported the results of a positive Feasibility Study on the **Kemess Underground (KUG)** (MINFILE 094E 021) project in a NI-43-101 Technical Report prepared by SRK Consulting (Canada) Inc. The project is located 6.5 km north of the past-producing Kemess South mine and 294 km northwest of Mackenzie. The report describes an underground block cave operation that would utilize existing infrastructure at the Kemess South mine (now on care and maintenance) to process 24 600 t/d (or 9 Mt/y) of mill throughput. An anticipated 22% Cu concentrate would be produced at recoveries of 91% Cu and 72% Au. Only half of the original milling circuit from the Kemess South concentrator is required for ore processing. Flotation, thickening and concentrate handling facilities would remain the same. Tailings would be pumped to the Kemess South pit, as they were towards the end of Kemess South operations in 2010. The mine would operate for 12 years. Reserves are reported at:

- 100.4 Mt at 0.28% Cu, 0.56 g/t Au, and 2.05 g/t Ag - containing 280.9 Mkg (619.2 Mlbs) Cu, 51 029 kg (1.8 Moz) Au, and 187 106 kg (6.6 Moz) Ag (Proven and Probable).

The resource exclusive of reserves is reported at:

- 65.4 Mt at 0.24% Cu, 0.41 g/t Au, and 1.81 g/t Ag - containing 157.2 Mkg (346.5 Mlbs) Cu, 24 210 kg (854 000 oz) Au,

and 107 728 kg (3.8 Moz) Ag (Measured and Indicated);

- 10.0 Mt at 0.21% Cu, 0.39 g/t Au, and 1.57 g/t Ag - containing 20.9 Mkg (46.1 Mlbs) Cu, 3544 kg (125 000 oz) Au, and 14 260 kg (503 000 oz) Ag (Inferred).

This represents a higher-grade deep portion of the open-pit mineable Kemess North reserve that in a 2004 revised Prefeasibility study by Northgate Minerals Corp was reported at 414 Mt at 0.16% Cu and 0.31 g/t Au, containing 1.46 Blbs Cu and 4.1 Moz Au. A decision was made in 2007 by a joint federal-provincial panel not to issue Kemess North an EA Certificate on account of environmental and cultural values concerning Amazay Lake (Duncan Lake) and the proposed mine design.

The KUG orebody sits 150 m beneath two north-facing cirques (Central and the East Cirque) along an E-W oriented ridge. It has dimensions of 540 x 230 m, extending to more than 600 m depth. The mine would establish a single extraction level with 640 drawpoints. Caving would initiate in the highest grade ore in the northeast part of the orebody and progress to the southwest and lower grade ore over the mine life. A 3.4 km conveyer would carry crushed material from a centrally-located gyratory crusher south of the orebody to a transfer station at surface, where a second conveyer will carry it another 4.6 km down-slope to the mill stockpile. Twin 3.25 km long declines would be driven for the conveyor and for general access. For safety, these would have separate ventilation from the intake and exhaust raises designed for circulating 400 m³/s of air to the underground mine. SRK also noted a higher pyrite/chalcopyrite ratio and finer disseminated nature of copper and gold compared to ore from Kemess South, which will necessitate the addition of a stirred mill at the regrind circuit stage (to 15 µm or finer) of ore processing. Construction of the mine is expected to take 5 years until commissioning and commercial production. Pre-production capital cost is estimated at \$502 M. The mine is expected to create between 100 - 400 full-time jobs.

Existing surface infrastructure at the Kemess South mine includes the grinding and flotation circuit, coarse ore stockpile area, maintenance facility, administration buildings, 300-personnel accommodation, and a 380 km power line (230 kV) with associated transformers. Since completing acquisition of the project in late 2011, the company has made significant investment in reclamation and closure work at Kemess South including a final spillway for the previous tailings facility. The KUG project, essentially an underground extension of the earlier mine to access a deeper part of the mineralized district (similar to New Afton and Mt. Polley mines elsewhere in BC), has a large volume of environmental data to support the project even as baseline studies continue. The company plans to submit a Project Description and initiate the EA process in 2014.

AuRico plans to enhance the intrinsic value of the project with additional exploration and infill drilling outside existing reserves. In 2013, this included a 9-hole program using two drill rigs that targeted the Kemess Offset area east of Kemess North, and also the **Kemess East** target to follow up 2007 exploration drilling. Drill holes targeted a similar deposit style and size as **KUG** within horst-and-graben fault blocks constrained by N-S and E-W trending faults. Holes were collared on either side of a N-S trending cross ridge of Toodoggone volcanics and tested for indications of fault displacement

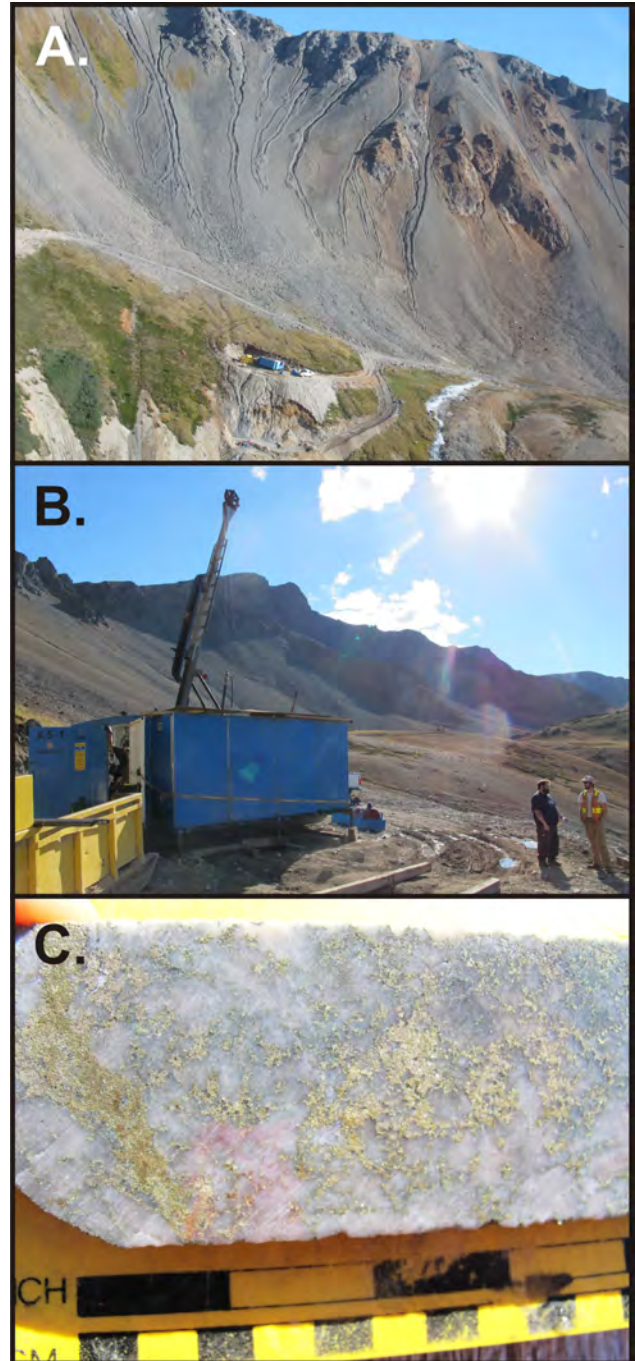


Figure 10. Kemess East – A. drilling KN-13-02 (075, -80), view south; B. Drilling ENE into Kemess East. Hole is collared in the Offset area; C. Pyrite-chalcopyrite-molybdenite mineralization in strongly QSP altered quartz monzodiorite (KN-13-02).

of mineralization. Drilling in Kemess East intersected similar lithology, mineralization and alteration as historic holes KH-07-04, 10, and 24. Assays from the 2013 drill program are still pending and will be released once finalized. Kemess East has displayed some different characteristics than Kemess North. Based on historic drilling there is an outer zone of lower Au/Cu ratio and higher molybdenum values lies within the phyllic zone. Within the potassic zone, gold and copper values increase with decreasing molybdenum, and Au/Cu ratios vary from 1:1 to 3:1 from the outer margin to the core of the zone. Magnetite content is also lower than Kemess North. The N-S trending Kemess East Offset Fault truncates the property on the east.

The Kemess Underground deposit is centered on the Kemess North pluton, a quartz (monzo)diorite of the Early Jurassic Black Lake intrusive suite that follows an E-W striking, south dipping thrust fault, the Kemess North fault. The fault separates Late Triassic Takla Group basaltic-andesites from a barren wedge of Early Jurassic Toodoggone dacitic lapilli tuffs (Saunders member) to the north, and cuts off the pluton and mineralization at depth. A north-dipping secondary normal fault beneath the ridge to the south suggests a rotated thrust panel with tilted volcanic stratigraphy. Towards the west the pluton becomes a series of WSW oriented dikes. An 80 m deep oxidized sulfate leach zone of clay-rich hematite-stained broken rock overlies the deposit. Subjacent QSP (phyllic) alteration with pyrite-anhydrite/gypsum veining is dominant in the Takla volcanics until quartz-magnetite ± biotite alteration becomes prevalent at depths mantling the pluton. Auriferous chalcopyrite-pyrite with trace molybdenite occurs as disseminations, fracture fillings and quartz ± magnetite veins in the pluton, and less so in hanging-wall Takla volcanics. It forms an E-W striking tabular orebody that dips 20° to the south over 400 m. The western part of the orebody is shallower (150 m below surface) and lower grade. The KUG project would capture the deeper (300 - 500 m below surface) mineralization on the eastern side, and could potentially extend to the Kemess East target if economic grades are proven there.

Blackwater

In the first quarter of 2013, intermediate gold producer New Gold Inc commenced the Feasibility Study (FS) phase for the **Blackwater** project (MINFILE 093F 037), 110 km south of Vanderhoof in the Fawnie Range on the north slope of Mt. Davidson. All exploration work in support of the FS was completed by April, including over 20 000 m of geotechnical and condemnation drilling for proposed site facilities north of the deposit, 10 drill holes of oriented core for structural analysis in the proposed pit area, and pump and piezometric well installations. Additional work throughout the year included: geological block model completion; mine design and production scheduling; metallurgical testwork and flowsheet design; mill and related facility design and layouts; grinding circuit design studies; TSF and water

management designs, and construction scheduling; power supply connection study and transmission line routing; geotechnical testing for road and air access layouts; and layout designs for construction and permanent camps.

In early April, the company announced an increase in measured and indicated resources with the addition of 89 infill holes (22 220 m) from the 2012 drilling that brought the basis for the resource estimate to 1002 holes (309 509 m) in total. The updated total resource was stated at:

- 396.9 Mt at 0.74 g/t Au, 5.5 g/t Ag - containing 295 483 kg (9.50 Moz) Au and 2.18 Mkg (70.13 Moz) Ag (Measured and Indicated);
- 17.6 Mt at 0.66 g/t Au, 4.0 g/t Ag - containing 10 773 kg (0.38 Moz) Au and 64 070 kg (2.26 Moz) Ag (Inferred).

This estimate, to be used in the FS, was based on metal prices of \$1400/oz Au and \$28.00/oz Ag. It incorporated more detailed geological and geostatistical modelling of the deposit than previous estimates to maximize profitability, and a larger block size to match envisioned operations.

The FS built upon the positive PEA study released in September 2012. The PEA study describes an open-pit mining operation with 60 000 t/d (21.9 Mt/y) processing plant and a mine life of 16.4 years. Annual production would be 14 373 kg (507 000 oz) of gold and 57 805 kg (2.04 Moz) of silver for an initial 15 years. Production in the first five years would be higher at 16 896 kg (569 000 oz) Au with average feed grade of 0.95 g/t. The life-of-mine stripping ratio would be 2.36 : 1. The processing plant, about one kilometre north of the open-pit, would utilize conventional crushing (to 80%), grinding (to 80% and <150 µm), leaching, and a carbon-in-pulp (CIP) extraction circuit. Extracted gold and silver will be released from carbon in stripping columns, recovered by electrowinning, and smelted to produce a gold-silver doré product. Expected recoveries are 87% for gold and 53% for silver. Leach CIP residue would report to an SO₂/air circuit for cyanide conversion to cyanate, and then to the TSF where cyanate would break down to ammonium and carbonate ions. A dual cut-off strategy is planned for segregating mill feed into material for direct processing (above 0.4 g/t AuEq.), and material to be stockpiled (0.3 - 0.4 g/t AuEq.) immediately north of the open-pit. The stockpiled material will be divided into two streams: low-grade material to be used at the end of the mine life, and high Ag/low Au mill feed (avg. 45.5 g/t Ag, 0.067 g/t Au) from the northern part of the deposit to be processed through years 8 - 14. The open-pit would reach a maximum depth of 400 m over the mine life.

Similar to the Mt. Milligan Mine, benign waste materials from on site would be used for TSF construction with the TSF located near the open-pit (about 3 km to the north) to minimize the project footprint and provide more effective water management after closure. The TSF would

be designed to contain 509 Mm³ of material and require 78 Mm³ of construction material, of which about 97% would be derived from initial stripping and open-pit waste rock. This would minimize the volume of peripheral waste rock storage facilities to about 101 Mm³ of material. As at Mt. Milligan, TSF embankments would be engineered with zoned earthfill/rockfill and compacted till core using a centerline construction method. Site runoff water would be collected and stored within the TSF and recycled to the processing plant. Some years would require pumping of additional input water from Tatelkuz Lake, 15.7 km to the northeast, to support Davidson Creek and sustain fisheries.

Other requirements for the proposed mine include a 133 km long, 230 kV transmission line to follow existing logging roads from the GLN Substation near Fraser Lake, and a construction camp for 1500 personnel to be refitted into an operations camp for about 400 personnel. Completion of the FS was scheduled for end-2013, and was announced on December 12th. The open-pit design was adjusted to lower metal prices (\$1300/oz Au and \$22/oz Ag) and lower strip ratio (1.88 : 1). Life-of-mine gold and silver production decreased from the PEA by about 12% and 8% respectively to 7.0 Moz Au and 30 Moz Ag over 17 years. The total estimated cost of design, construction and commissioning of the mine increased 2.8% to \$1865 M. The project is in the Pre-Application stage of environmental assessment. A draft EA Application is planned for early 2014 submission. Upon permitting approval, construction would start in early 2015, and ore extraction by 2017. The economic benefit to the economies of Vanderhoof and Prince George is estimated at \$75 M/y during construction and \$25 M/y during operations. In January, New Gold received the 'Developer of the Year' award at the 10th annual BC Natural Resource Forum and Economic Summit in Prince George for focusing on hiring of local employees (66% in 2012) and contractors, and for communication protocols and participation agreements with First Nations (24% of employees in 2012). Of note, in 2013 the company acquired the **Rainy River** gold project in northwestern Ontario which has a 4.0 Moz Au reserve (Proven and Probable) and 6.2 Moz Au resource (Measured and Indicated) inclusive of reserves, and a completed FS that is being updated by New Gold. The company plans to decide on the sequencing of the Blackwater and Rainy River projects in 2014.

The Blackwater gold-silver deposit is interpreted as an intermediate sulfidation epithermal system. Mineralization is hosted by Late Cretaceous Kasalka Group rocks in a complex assemblage of andesite flows, lapilli tuffs and volcanic breccias; flow-banded and tuffaceous rhyodacites; heterolithic breccia containing altered fragments of other units; and intensely silicified hydrothermal breccias. Strata are discontinuous over short distances but are more discernible in the southeast corner of the deposit and are thought to dip generally northwest. Andesite host rock lies outside of the silicified zone and

may represent the protolith for much of the orebody, particularly in chlorite-sericite altered portions. Alteration and mineralization is hosted in a large upright funnel-shaped fragmental zone that averages 350 m thickness and tapers to 600 m depth in a low-grade core. It is characterized by pervasive silica-muscovite-illite ± chlorite accompanied by disseminated and replacement pyrite-sphalerite-chalcopyrite-galena ± marcasite. Native gold and electrum as micron scale grains (approx. 25 - 50 µm) are associated with sulfide and silicification, and silver with argentite occurring with galena. Local Mn-rich spessartine garnet, an important indicator mineral, occurs with pyrrhotite-bearing potassic alteration in the western part of the deposit. The mineralized zone (above 0.2 g/t Au) strikes E-W and dips shallowly NNW over an area measuring 1250 x 1000 m. It is continuous across the central and southeastern parts of the deposit and extends to the north and northwest where a zone of higher grade silver lies along the outer portion of the 2012 drilling grid. Mineralization remains open at depth in the southwest and in the north and northwest of the deposit. Steep, north-plunging high-grade ore shoots are thought to be associated with subvertical structural intersections. Highest grades (up to 47.49 g/t Au over 15 m) are localized along the margins of silicified breccia bodies. The silicified mass has moderate resistivity-chargeability and increasing chargeability marginal to silicification. The large fragmental zone of seriate subangular clasts (some glassy or devitrified shards) in a finer-grained matrix and pervasive silicification with minor quartz veinlets suggests a widespread metasomatic event in receptive host rock, possibly related to phreato-magmatic volcanism. The recent identification of ammonium-bearing clay alteration indicates a late volatile phase common to shallow hydrothermal systems. A potential source intrusion has been identified in a feldspar-porphyrific monzonite several kilometres south of the deposit area where regional magnetics (first vertical derivative) show a 6.2 km diameter ring-shaped high. Topographically, the deposit forms an S-shape due to resistive silicification and inferred glacial scour within a cirque valley on the north side of Mt. Davidson. The Blackwater wedge occupies a roughly 5 km square area and is juxtaposed against Ootsa Lake Group rocks across steeply dipping normal faults on the west and north, implying the Blackwater block is a high-standing remnant or horst in the region, preserving a Late Cretaceous volcanic edifice. Overburden thickness typically ranges from 5 - 10 m but is as high as 80 m on the east side of the deposit. Other sizeable Late Cretaceous ore deposits in the broader plateau district include the calc-alkaline Huckleberry and New Prosperity porphyry deposits to the west and south.



Figure 11. Blackwater – On-site core storage facility for the 2012 drilling program of 700 holes and over 245 000 m of core.

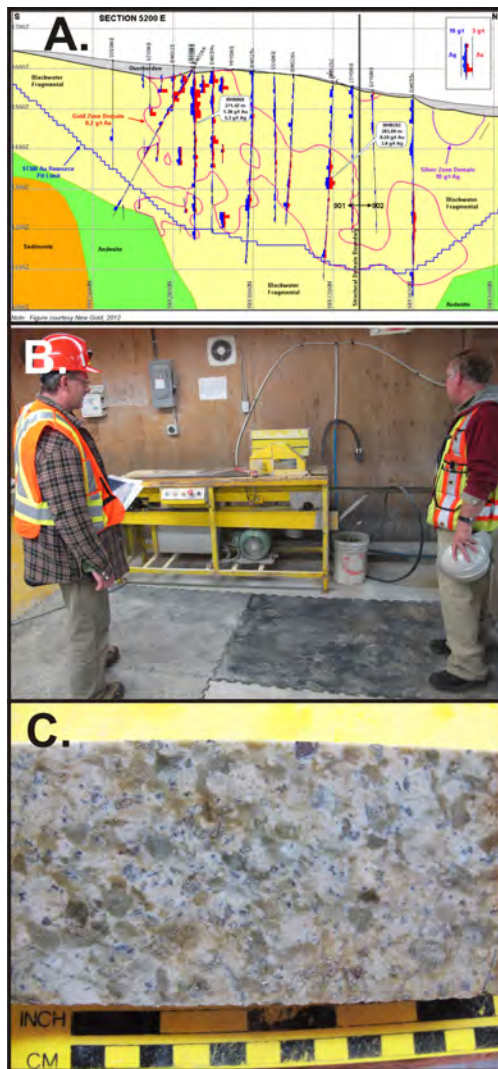


Figure 12. Blackwater – **A.** Schematic N-S cross section through the Blackwater deposit (Section 5200 E from the 2012 New Gold Inc Preliminary Economic Assessment); **B.** Discussing the Almonte saw used on a 30 000 m core backlog in 2012; **C.** BW-917 at 435 m with sphalerite-pyrite-galena replacing mafic domains in pervasively sericite-chlorite altered volcanic breccia (3.37 g/t Au, 12.3 g/t Ag).

EXPLORATION HIGHLIGHTS

PORPHYRY COPPER PROJECTS

Porphyry copper prospects in North-Central BC are hosted in the Quesnel terrane, a volcanic island arc that accreted to ancestral North America in the Early-to-Middle Jurassic, and the Stikine terrane, the eastern margin of which represents the Toodoggone district and the Nechako Plateau area west of Vanderhoof. Due to Late Paleozoic to Mesozoic oroclinal tectonics of the Quesnel-Stikine superterrane, the Quesnel and Stikine arc terranes are opposite facing (Mihalynuk et al., 1994). The Omineca Region hosts the northern 500 km of this intermediate volcanic belt, which extends over 1000 km throughout much of central BC. The arc had a two-phase development above Late Paleozoic basement rocks with probable rifted crustal fragment roots (Nelson and Bellefontaine, 1996). The Late Triassic Takla Group phase comprises basal sedimentary rocks that grade upward through interfingering volcanic successions, including the Inzana Lake and Witch Lake successions in the Quesnel Trough. These are overlain by a phase of Early Jurassic, partially subaerial volcanic suites laid down on a more mature arc, such as the Chuchi Lake succession and the Toodoggone Formation (Hazelton Group). Coeval intrusions, including the 170 x 40 km Hogem intrusive complex (Quesnel terrane) and Black Lake intrusive suite (Toodoggone district), are distributed throughout the region along structural trends. The Hogem intrusive suite generally shifts from more alkaline compositions in the Early Mesozoic to more subalkaline in the Cretaceous (Garnett, 1978). The northwest trending Manson-McLeod fault system and Pinchi fault bound the northern Quesnel terrane on the east and west sides, respectively. The Finlay-Ingenika and Moosevale fault systems bound the Toodoggone district on the east. Cretaceous to Tertiary second order transcurrent and normal faults, with local pull-apart basins, resulted in

variably tilted, rotated and down-dropped structural blocks within the terranes. Copper-gold ± molybdenum porphyry deposits of both alkalic and high-potassic calc-alkaline affinity are known in the region.

Quesnel Terrane

In February, Serengeti Resources Inc announced the results of a positive PEA study for the **Kwanika** property (MINFILE 093N 073), 140 km northwest of Fort St. James. The study, prepared by Moose Mountain Technical Services was based on 69 389 m of drilling in 168 holes drilled between 2006 and 2010. The study investigated a medium-capacity (15 000 t/d; 5.5 Mt/y) mining operation focused on the higher grade portion of the resource. Two open-pits areas are proposed to mine the Central Zone and South Zone deposits, and series of two block caves below the Central Zone pit to access deeper mineralization. The mine would use a conventional copper-gold flotation process and have a 13.5 year mine life. The first years of production would focus on the Central Pit with concurrent development of the underground mine. Access to underground would spiral down from the bottom of the Central Pit. Block caving would commence at the completion of mining in the Central Pit. Development of the deeper block cave would be concurrent with mining the higher block cave stope. Production would shift to the lower block cave and South Pit sequence toward the end of the mine life. Tailings would be pumped to a TSF southwest of the Central Pit. A 70 Mm³ waste rock storage facility would be located northeast of the Central Pit. Other requirements would include a diversion of Kwanika Creek, a contact water storage pond, and a 75 km connection from the Kemess Power Line. A large mineralized envelope not included in the mine plan provides opportunity for brownfields expansion. The estimated initial capital cost is \$364 M. The report recommended further optimization of the mine plan to improve project economics. The resources given for the open-pit areas and block cave sequence are as follows:

- *Central Pit:* 19.90 Mt at 0.33% Cu, 0.28 g/t Au, 0.86 g/t Ag (Indicated); 0.90 Mt at 0.33% Cu, 0.21 g/t Au, 0.84 g/t Ag (Inferred);
- *First block cave:* 19.92 Mt at 0.46% Cu, 0.47 g/t Au, 1.36 Ag (Indicated); 0.05 Mt at 0.33% Cu, 0.42 g/t Au, 1.79 g/t Ag (Inferred);
- *Second block cave:* 7.82 Mt at 0.47% Cu, 0.47 g/t Au, 1.27 g/t Ag (Indicated);
- *South Pit:* 25.07 Mt at 0.32% Cu, 0.12 g/t Au, 1.84 g/t Ag, 0.016% Mo (Inferred).

Over the mine life, production would be 247 Mkg (545 Mlbs) of copper, 13 863 kg (489 000 oz) of gold, 69 456 kg (2.45 Moz) of silver and 2.38 Mkg (5.25 Mlbs) of molybdenum.

At a \$7.50/tonne cut-off, the total resource estimate for property as of March 2011 is:

- *Central Zone:* 243.6 Mt at 0.23% Cu, 0.21 g/t Au, 0.69 g/t Ag - containing 558 Mkg (1230 Mlbs) Cu, 47 060 kg (1.66 Moz) Au, and 154 221 kg (5.44 Moz) of silver (Indicated);
- *Central Zone:* 55.2 Mt at 0.14% Cu, 0.14 g/t Au, 0.42 g/t Ag - containing 76 Mkg (168 Mlbs) Cu, 7087 kg (0.25 Moz) Au, and 20 979 kg (0.74 Moz) Ag (Inferred);
- *South Zone:* 240 Mt at 0.20% Cu, 0.09 g/t Au, 1.49 g/t Ag, 0.007% Mo - containing 490 Mkg (1081 Mlbs) Cu, 18 711 kg (0.66 Moz) Au, 326 020 kg (11.5 Moz) Ag, and 17.1 Mkg (37.6 Mlbs) Mo (Inferred).

The Kwanika Project consists of two porphyry deposits, the Central Zone (Cu-Au) and the South Zone (Cu-Mo-Au-Ag), separated by about one kilometre along a NNW trend paralleling the Pinchi Fault. Both are associated with potassically altered rocks of diorite to monzonite composition of the Hogem intrusive suite. The Central Zone is a NNE-striking, roughly 1250 x 600 m pear-shaped zone in plan. It is characterized by two major and several minor intrusive bodies hosted in Takla Group andesites. Both intrusive and volcanic rocks are mineralized, with higher copper-gold grades in the intrusives. The NNW trending Pinchi Fault and an associated ~415 m wide conglomeritic sedimentary basin truncates the Central Zone on the west. Mineralization occurs as chalcopyrite-pyrite-quartz ± anhydrite-magnetite-bornite veins, vein stockwork and disseminations with potassic alteration. Later stage dolomite-ankerite and quartz-sericite-tourmaline-hematite veins are associated with phyllic alteration that variably overprints the potassic. A supergene enrichment zone follows the sedimentary basin contact for up to 500 m and extends to 70 m depth below the unconformity. Both native copper and sulfides (chalcocite, covellite) are observed with grades commonly above 1% CuEq. In the South Zone, mineralization occurs in strongly-altered monzonitic rocks within a 2.9 x 0.5 km NNW trending fault-bounded corridor about 750 m east of the Pinchi Fault. There is more arsenic anomalism in the South Zone.

The property hosts several additional exploration targets as the system remains open to the north and at depth. Geochemical analysis of historic drilling data in early 2013 showed a Fe-Zn-W anomaly in the Northwest Central Zone (hole K07-42) that coincides with a zone of strong phyllic alteration (quartz-sericite-pyrite ± magnetite-anhydrite) at about 400 m depth. This overlies and is slightly offset northwest from a Cu-Au-Ag anomaly at 500 m depth that may represent the mineralized cupola of a deep porphyry stock. This deep target is untested by drilling. A weakly mineralized comminuted breccia in phyllic-altered monzonite also occurs above the deep target at depths less than 200 m in K08-122. Drilling 800 m north of the Central Zone encountered mineralized monzonite in faulted rock that

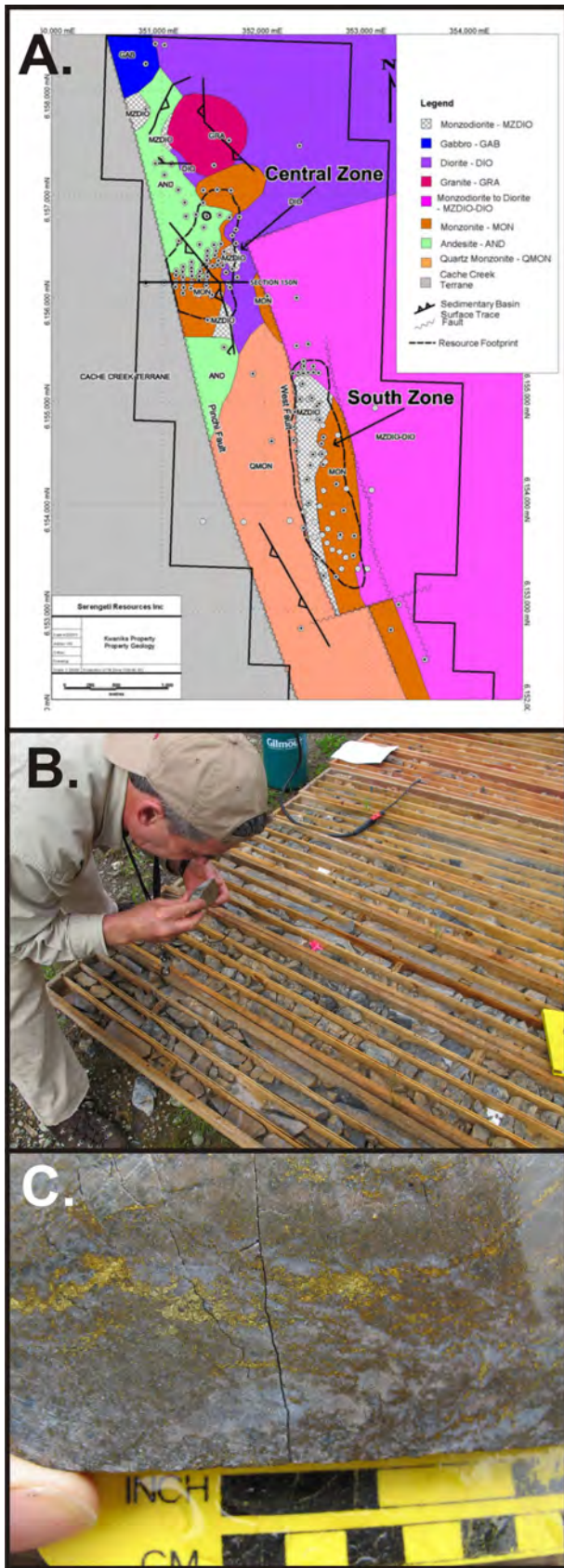


Figure 13. Kwanika – **A.** Plan view of Kwanika project area with geology; Serengeti Resources Inc; **B.** Reviewing some key holes of the historic drilling; **C.** K07-15 at 258.2 m with quartz-pyrite-chalcopyrite-magnetite veining in potassically altered monzonite.

may represent domains of the Central Zone translated northwards in the Pinchi fault zone. A series of sedimentary basins extending for 25 km to the south of the deposit area may host additional supergene-enrichment zones.

In addition to near-deposit target identification work and selective core relogging at Kwanika, Serengeti conducted grassroots exploration on other properties in the Quesnel terrane and Toadoggone district. At **Osilinka**, 75 km northwest of Kwanika in the Omineca Mountains Hogem Range, reconnaissance soil sampling identified anomalous copper associated with a 3 km long northwest-trending aeromagnetic anomaly about 4 km east of the Pinchi Fault. One sample returned anomalous Cu-Au-Pd from an area of extensive overburden. At **Rottaker**, 25 km southeast of Kwanika, a northwest-trending magnetic high area was mapped and sampled. Three select outcrop and float samples ranged from 0.38 - 6.6% Cu, 0.1 - 1.0 g/t Au, 73 - 141 g/t Ag. At **SYL**, 25 km northwest of the Mt. Milligan Mine, two Ah and selective extraction soil transects were completed above a prospective magnetic anomaly. At **Fleet**, 50 km south of the past producing Kemess Mine, soil (Ah and B-horizon) and rock float sampling identified a 750 x 600 m geochemical (Cu-Au-Mo-W) anomaly. Follow up is planned for 2014.

In November 2012, Orestone Mining Corp initiated a 3-hole drill program at **Captain**, (MINFILE 093J 026), 41 km north of Fort St. James, and began site preparation for over 38 newly approved drill sites. In December, the company reported 487 m of sulfide mineralization in vertical hole C12-05 that encountered two intervals of elevated gold grading 0.65 g/t Au, 0.06% Cu over 118.8 m (upper zone) and 0.41 g/t Au, 0.07% Cu over 164.6 m (lower zone). The hole was drilled along the southern flank of the 1 x 1.5 km Admiral target within the 1 x 3 km East Magnetic target area. Alkalic porphyry-style alteration included sericite-carbonate and potassically altered volcanic rocks with monzonite porphyry dikes. Intensity of magnetite and copper sulfide bearing potassic alteration increased down-hole remaining open at depth. Hole C12-03 was drilled 500 m to the east and encountered potassically altered monzonite dikes grading 0.13 g/t Au, 0.05% Cu over 70 m suggesting another mineralized system.

In January 2013, a 50 line-km ground magnetic survey was conducted to better define the Admiral target and Southeast aeromagnetic anomaly. Two E-W trending 1500 x 100-1000 m magnetic highs separated by 600 m were detailed. The smaller anomaly on the south correlates with mineralized dikes in DDH C12-05, and the larger anomaly was untested by drilling. By late March 130 line-km of ground magnetic survey in the East Magnetic and West Magnetic target areas was completed at 100 m line spacing (Admiral Target) and 200 m spacing (West Magnetic). Both targets areas lie outboard of a large (+4.5 x 1.8 km) northwest trending magnetic feature interpreted to be a main diorite/monzodiorite

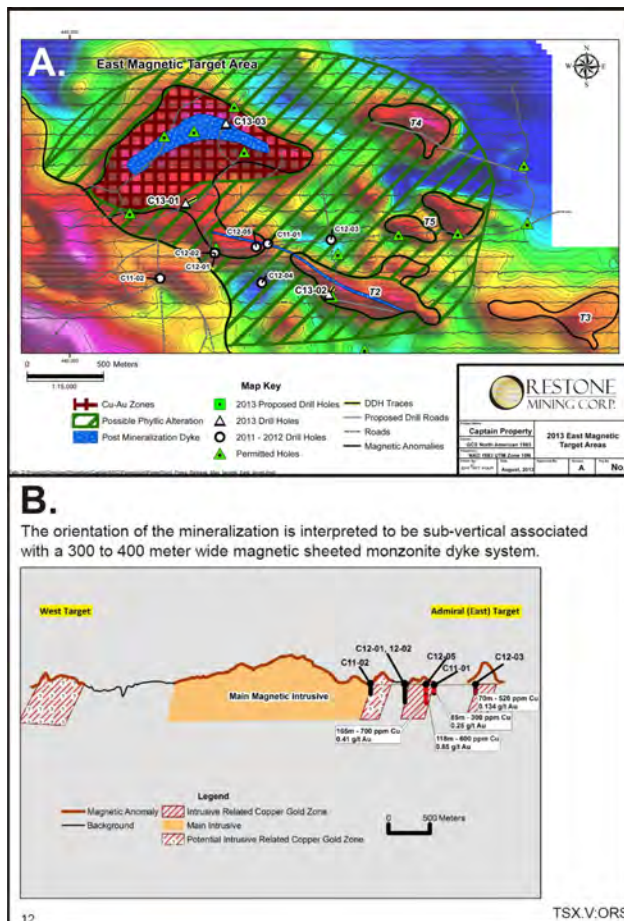


Figure 14. A. Plan view of East Magnetic Target area with drill hole collar locations; B. Cross section through the Magnetic Target areas with select drill holes and assay intervals; Orestone Mining Corp.

intrusive and have small central magnetic highs with moderate-to-high peripheral IP chargeability signatures suggestive of derivative dikes or plugs. Data generated from the survey defined nine such anomalies as attractive drill targets. These included the Admiral target, five additional targets east and southeast of Admiral within a 200 x 700 m area, and three larger magnetic highs within the 3.8 x 1 km northwest trending West Magnetic target area where there has been no drilling to date.

In July 2013, a 3-hole drill program was completed in the East Magnetic target area. Hole C13-03, drilled at the center of the Admiral target, intersected a northeast trending 1000 x 50 m post-mineral gabbro dike with a xenolith of altered monzonite porphyry over 3 m from 204.9 m depth that assayed 1.90 g/t Au and 0.23% Cu. The xenolith is thought to be derived from host rock adjacent to the dike where a large IP anomaly is observed. The company plans to drill north and south of the dike in future programs. Hole C13-02, drilled 500 m southeast of mineralized hole C12-05, intersected 34.0 m and 48.8 m of mineralized monzonite dikes at 32.4 m and 121.3 m depth. Average grade within the dikes was 0.20 g/t Au, 0.073% Cu and 0.35 g/t Au, 0.055% Cu, respectively.

Hole C13-01, drilled 500 m northwest of hole C12-05, intersected phyllic-altered volcanics on the south margin of the Admiral target and returned anomalous gold-copper.

The Captain property is underlain by Late Triassic basaltic-andesite volcanics of the Takla Group covered by 20 - 60 m of overburden. The property is thought to contain a large (7 x 14 km) intrusive system with gold-copper alkalic porphyry mineralization. The East Magnetic target area represents a northeast offshoot to the dominant northwest magnetic trend and central dioritic intrusive. Mineralization is interpreted as sub-vertical and associated with a 300 - 400 m wide series of N-S trending alkalic porphyry dikes. There is apparent similarity of geophysical signature with the mineralized MBX zone at the Mt. Milligan Mine.

In November 2013, Manado Gold Corp ran a 10-hole shallow drilling program at **Takla-Rainbow**, (MINFILE 093N 082) 151 km NNW of Fort St. James. The program aimed to confirm historic drilling results and test along-strike and down-dip extensions of the West and East zones. A series of structurally-controlled subvertical auriferous quartz veins trend northwest along the Twin Creek Fault, an apparent high angle normal fault. The shear zone cuts across an E-W trending contact between Early Jurassic Twin Creek Formation volcanics (Takla Group) and diorite of the Hogem intrusive suite within a kilometre wide embayment in the east margin of the batholith. Sheared quartz syenite-to-granite porphyry dikes of probable Early Cretaceous age appear to be genetically linked to gold mineralization. The 183 x 130 x 140 m West Zone comprises five parallel gold-bearing structures within a broader elongate pyrite halo. The 289 x 100 x 140 m East Zone comprises two or more similar structures. Mineralization occurs as disseminated sulfide and native gold with silica-carbonate alteration. The Red Zone alkalic copper-gold porphyry target lies 1.2 km to the northwest. A historic preliminary resource estimate (non 43-101 compliant) by Imperial Metals Corp was calculated at 291 298 tonnes at 7.81 g/t Au.

At the **Col-Later** project (MINFILE 093N 101), 106 km west of Mackenzie, Pacific Empire Minerals Corp followed up historic exploration work, most recently done by Solomon Resources in 2007-08. The program focused on an area 500 m north of the historic Solomon drilling. Surface trenching and sampling tested a coincident large IP anomaly and 2 x 5 km soil anomaly overlapping a 2007 Airborne DIGHEM conductive signature with resistive halo. The Col prospect is situated near the southern margin of the Hogem intrusive complex within alkaline rocks (monzonite, syenite, aplite, pegmatite) in contact with volcanic flows of the Lower Jurassic Chuchi Lake succession. Northwest-striking steep parallel fractures with potassic alteration envelopes host chalcopyrite, bornite and malachite mineralization. A non 43-101 compliant resource estimate of 1.8 Mt grading 0.6% Cu (Indicated) was provided by Kookaburra Gold Inc in 1989.

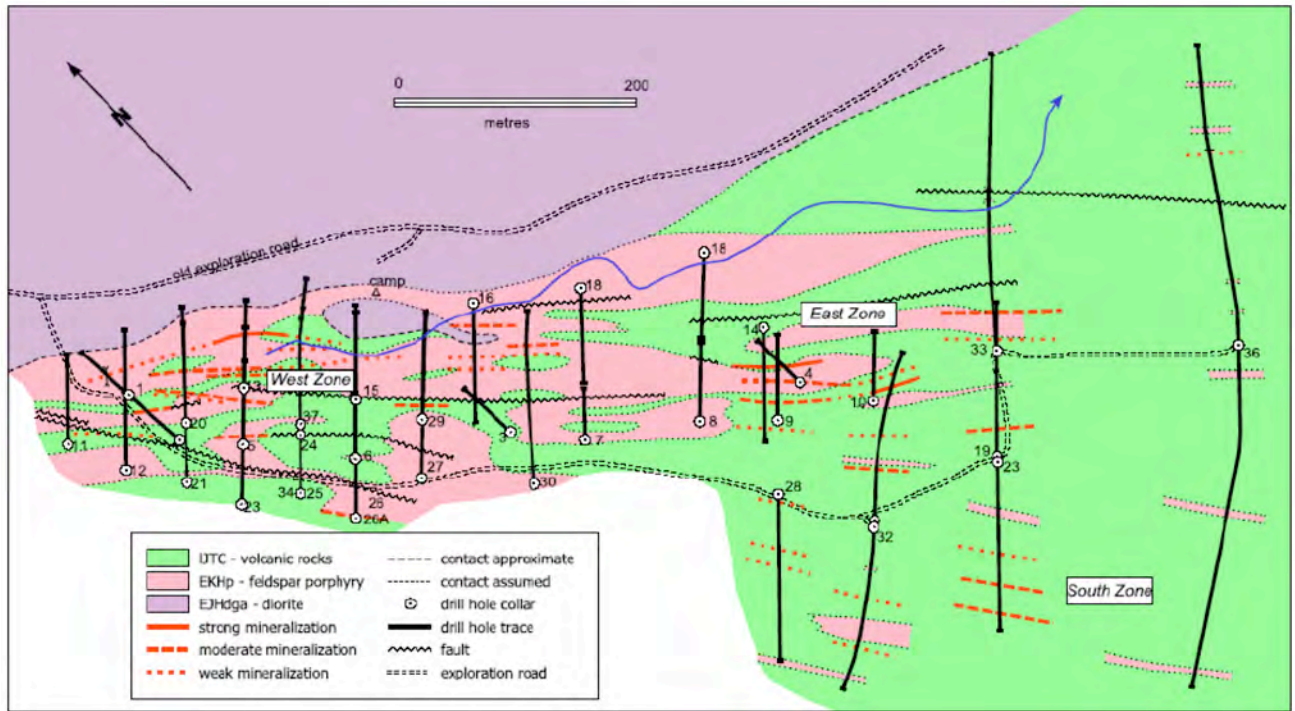


Figure 15. Takla-Rainbow – Drill plan with geology and mineralization, from 2013 technical report prepared for Rainbow Gold Resources Ltd.

In December 2012, Rich Rock Resources Inc announced the results of a follow-up program of ground 3D-IP (20 line-km) and magnetic (55 line-km) surveys that were completed on the Freegold, West, and Ridge zones at the **Tas** property (MINFILE 093K 110), 50 km north of Fort St. James. The survey consisted of infill lines in the eastern half of a 2011 grid and five new lines towards the northwest. It was designed to provide better near-surface resolution and define resistivity-chargeability anomalies to 350 m depth. As a result, several controlling geologic structures were remapped. NNW trending faults in the Ridge zone were extended southward to intersect the Freegold fault, and a previously unmapped E-W trending fault appears to crosscut the West and Ridge zones. These structural enhancements fit with intrusives indicated by magnetic highs underlying the West, Ridge, and Southeast zones. The 3D-IP modelling also showed deep chargeability highs generally align with faults identified in the resistivity model. The company is focused on the outer, lower-chargeability envelopes of these features as similar features at surface are related to auriferous sulfide mineralization proximal to the Freegold and Ridge zone faults. The combined geochemical and geophysical signatures suggest widely disseminated porphyry-style mineralization with local high tenor gold zones.

The Tas property is underlain by cherty tuff and argillite of the Inzana Lake Formation (Takla Group) and the coeval Tas pluton, an oval-shaped (3 x 4 km) augite diorite of Late Triassic age. A kilometre north of the pluton, the E-W oriented Ridge zone (1200 x 600 m) consists of hornfelsed volcanics cut by northeast-trending

monzonite porphyry dikes and associated breccias, and gold-enriched massive sulfide lenses (pyrite-pyrrhotite-chalcopyrite-arsenopyrite-magnetite) less than a metre wide in sheared host rock. Within the West, 19, 21, and East subzones, mineralized shear structures trend northwest to north. The Freegold zone hosts visible gold in the silica-carbonate altered northern margin of the Tas pluton. The Southeast zone is a deep porphyry target related to an intrusion breccia at the pluton margin. A genetic model by Dr. Peter Fox suggests an alkalic copper-gold porphyry system associated with dikes derived from the Tas pluton. The dike-porphyry complex tilted northward as dike emplacement continued to late stage. Fault-controlled massive sulfide replacement bodies formed with shearing as ambient fluids overrode the system. Mineralized rocks, as indicated by chargeability data, extend from surface to several hundred metres depth paralleling erosional remnants of the dike complex. The system remains open to the east and west. The property has a historic (non 43-101 compliant) preliminary resource estimate of 86 700 tonnes at 6.86 g/t Au for the combined East and West zones.

After a prolonged 15 months of negotiations and antitrust reviews, Glencore International plc completed the \$30 B acquisition of Xstrata plc in early May 2013 to form the world's fourth largest mining company, Glencore Xstrata plc. In February, Xstrata Canada Corp had notified Strongbow Exploration Inc that it would not be continuing the option on the **Inza** property, part of the **Quesnel Trough (QUEST)** regional project of optioned properties from BC junior exploration companies including Kiska Metals Corp, and the QUEST joint venture of Fjordland Exploration Inc (35%) and Serengeti

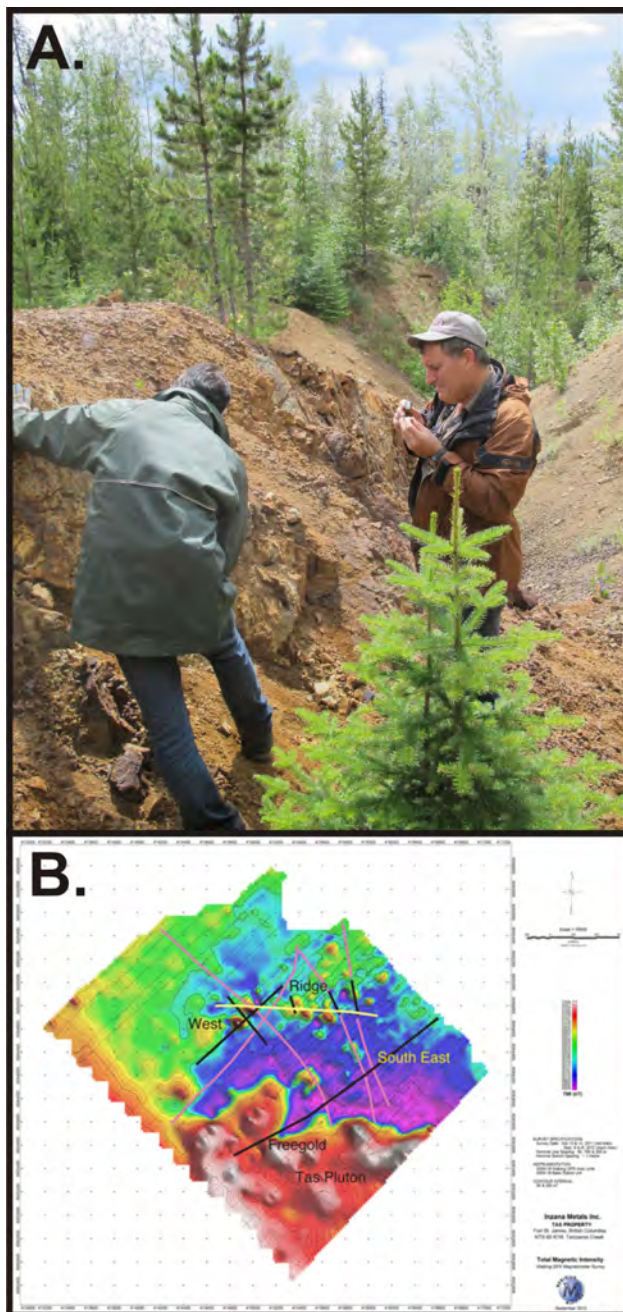


Figure 16. Tas – A. Examining historic trench in East zone; B. Total magnetic map with faults derived from SJ Geophysics resistivity model; Rich Rock Resources Inc.

Resources Inc (65%). Also in February, Xstrata returned the **MP**, **PG**, **Reid Lake**, **Rob**, and **ST** properties to Fjordland and Serengeti. In early March, Serengeti reported that Xstrata had elected to continue the option on the **Ping** property with plans to drill at least one target associated with an IP anomaly in Spring 2013. The Ping property, 49 km northwest of Prince George, is underlain by Witch Lake Formation volcanoclastics (Takla Group) and lies close to a northwest trending fault that cuts across the Quesnel terrane. However, shortly after the merger the new company began cutting into Xstrata projects. In June, the **QUEST** option agreement was terminated and the

Ping property returned to Serengeti. During an Investor Day webcast meeting in early September, the company confirmed that Xstrata greenfield projects had been “deprioritized with a material reduction in scope and costs”, that the new company would be focusing mainly on brownfields projects, and that it would cut capital spending by \$3500 M by 2015. At the end of July subsidiary company Xstrata Canada Corp had been renamed Glencore Canada Corp.

At the north end of the Omineca Mountains, 230 km northwest of Mackenzie and 66 km southeast of Kemess South Mine, Kiska Metals Corp conducted a helicopter-supported exploration program at their **Kliyul** property (MINFILE 094D 023) in September. The program consisted of ground IP and magnetic surveys, core re-logging, and geological mapping. It was designed to follow up an IP survey from 2011 and drilling by Geoinformatics in 2006 when two deep holes (over 300 and 400 m) were drilled below a shallow magnetite breccia zone. The 2006 drilling encountered several mineralized intervals and ended in above-gram gold mineralization at depth. The most significant interval in hole KL06-30 returned 0.52 g/t Au, 0.23% Cu over 217.8 m from 22 m depth. In 2009 Kiska determined the mineralization was consistent with a porphyry model. The objective of the 2013 program was to generate and validate porphyry targets and improve understanding of geological controls in the Kliyul Zone. At the end of September, the company entered into a Participation Agreement with Teck Resources Ltd whereby Teck would provide \$500 000 as a convertible grid promissory note to fund the 2013 program. Teck can elect to take up an option to earn 51% interest in the property with the note considered as initial expenditure.

The Kliyul property is located within a strong copper-gold anomaly in the BC Regional Geochemical Survey (RGS) dataset comparable to anomalies that host the Mt Milligan Mine and past-producing Kemess South. It is underlain by Late Triassic volcanoclastic and mafic volcanic rocks of the Kliyul Creek and Goldway Peak units (Takla Group) and coeval pyroxenite/diorite intrusive rocks of the Kliyul Creek Complex (KCC). Middle Jurassic and Early Cretaceous granitoid rocks also occur. The intrusive rocks are peripheral to the Hogem intrusive complex which lies 8 km to the south. The N-S trending Dortatelle and East Dortatelle faults, separated by about 5 km, cut across the property. These bracket a northwest-trending fault jog or linkage structure where the Kliyul Zone surface showing is found. Local airborne magnetic highs, a zoned chargeability anomaly (1.1 x 1.8 km), Cu-Au soil anomalism, and strong phyllic alteration are all centered on this structure over a 6 km length. Mineralization occurs as disseminated auriferous copper sulfide with silica-magnetite-chlorite alteration surrounding a core zone of banded quartz-magnetite veins and vein stockwork. Exploration potential remains high to the east and west of the main zone. The project is within 5 km of the Omineca Resource Road and Kemess

Powerline.

Canasil Resources Inc carried out assessment work to follow up remote sensing anomalies on their **Vega** property (MINFILE 094C 021), 170 km northwest of Mackenzie. The property is located on the west margin of the Manson Fault zone and is underlain by Takla Group volcanics that are intruded by dikes and sills peripheral to the Hogem intrusive complex. Pyrite-chalcopyrite-magnetite mineralization occurs in brecciated shear zones hosted in altered basaltic-andesite and syenite. A broad deformation zone (2100 x 490 m) with close-spaced fracture mesh has been observed, as well as lenses of massive sulfide.

Mapping and rock sampling by West Cirque Resources Ltd confirmed two zones of historic mineralization and discovered two new zones at **Heath** (MINFILE 093N 072), 109 km north of Fort St. James. Three grab and chip samples at each of the historic Central and A Zones averaged 1.13% Cu, 0.71 g/t Au, 3.2 g/t Ag and 0.71% Cu, 0.38 g/t Au, 19 g/t Ag, respectively. Northwest-trending mineralization in the A zone is approximately 450 m SSE of the West Target in the 1700 x 500 m Central zone. The new discoveries are located 180 m southwest of the A zone and 600 m southeast of the Central zone (Trench-C), and four samples from each averaged 2.51% Cu, 0.79 g/t Au, 34 g/t Ag and 1.15% Cu, 0.19 g/t Au, 27.8 g/t Ag, respectively. The property is underlain by ultramafic to granodioritic phases of the Hogem intrusive suite, 3 km east of the Pinchi Fault zone. Mineralization occurs as copper sulfides and pyrite with magnetite-rich potassic and carbonate alteration. Anomalous platinum and palladium values have also been reported.

Several other grassroots level programs were conducted late in 2012 and in 2013:

- Far Resources Ltd collected soil samples on their **Tchentlo Lake** property (MINFILE 093N 021), 100 km northwest of Fort St James in the Pinchi Fault zone. A 400 x 300 m copper anomaly was outlined in the North Block and strong As ± Au, Sb values were returned on the South Block. The property is underlain by carbonate rocks, gabbro and diorite of the Pennsylvanian to Triassic Cache Creek Complex and is considered prospective for Cu-porphyry and gold vein type mineralization.
- About 25 km to the north at the **Indata** property (MINFILE 093N 192), Eastfield Resources Ltd carried out grassroots sampling and prospecting. The project is underlain by carbonate, mafic volcanic and granodiorite intrusive rocks of the Cache Creek Complex and is prospective for mesothermal Au-Ag veins, Cu-porphyry, and serpentinite-hosted nickel deposit types.
- At their **Redton** property, 128 km NNW of Fort St. James, Kiska Metals Corp relogged key sections of historical drilling through the Falcon

zone and developed a geological cross-section. The 22.7 km² property hosts the Red Zone Cu-porphyry and Falcon Mo-Cu porphyry prospects (MINFILE 093N 068), and is predominantly underlain by Hogem intrusive rocks and Inzana lake Formation volcanoclastics of the Takla Group.

- Chumar Exploration conducted a trenching program at the **Koko** property, 41 km west of Mackenzie, in a recently logged area of the Manson Fault zone. The area is underlain by paragneiss of the Wolverine Metamorphic Complex separated from Takla Group volcanics on the east by a N-S trending fault. The Nat platinum-gold showing (MINFILE 093O 051) lies 4.5 km to the NNE in a small Late Triassic to Early Jurassic ultramafic intrusive at the Cariboo/Cassiar terrane boundary.
- Doubleview Capital Corp undertook an MMI soil sampling program to verify biogeochemical anomalies on its **Mt. Milligan North** property, 66 km west of Mackenzie near the Nation River. The property is underlain by Witch lake Formation volcanoclastics of the Takla Group.
- BC Gold Corp conducted an MMI soil sampling program at their **Rainbow** property (MINFILE 093N 205), 68 km WSW of Mackenzie and 3 km south of the Mt. Milligan Mine. Sampling identified a 350 x 250 m copper-gold soil anomaly that remains open in all directions and is associated with a stream sediment anomaly that drains a topographic high.
- Rich Rock Resources Inc had a follow-up magnetic gradiometer and radiometric survey flown over their **Eagle** property (MINFILE 093N 091, 092, 139, 185), 93 km north of Fort St. James, south of Tchentlo Lake. The survey identified several target areas featuring coincident magnetic-radiometric anomalies near cross-cutting structural features. The property is underlain by diorite to quartz monzonite of the Hogem intrusive complex and hornfelsed Inzana Lake Formation volcanoclastic rocks. Alkalic Cu-Au porphyry and shear-hosted Au-Ag prospects are known.
- At **Cat Mountain** (MINFILE 094C 069), 163 km northwest of Mackenzie, Rift Valley Resources Corp completed a small mapping and sampling program on the southern grid area, and preliminary metallurgical test work began on a sample from the No. 1 Magnetite Vein. A combined gravity and cyanide leach process recovered 97.9% of the gold from an 11.9 kg sample grading 59.7 g/t Au, 8.5 g/t Ag. Davis tube magnetic separation recovered 65% of the sample assaying 65.4% iron. The property is situated near the east margin of the Hogem

intrusive complex and is underlain by Takla Group volcanoclastic rocks that host small syenite intrusives. Steeply east and NE dipping copper-gold bearing magnetite rich veins occur in an area of complex syn- and post-mineral faulting.

Toodoggone District (Stikine Terrane)

In September, Canasil Resources Inc drilled at the **Brenda** property (MINFILE 094E 147), 30 km north of past-producing Kemess South mine, and 317 km northwest of Mackenzie. The objective of the program was to drill an extension of two holes from 2007 that returned increasing grades with depth and ended in mineralization at 562 m depth. In the 2007 drilling, five combined intercepts above 450 m depth graded 0.48 g/t Au, 0.79% Cu over 393.7 m; and below 450 m graded 0.68 g/t Au, 0.12% Cu over 92.8 m. A twin hole BR-13-01 was collared 2.5 m from BR-07-04 and drilled to 962 m with sampling starting below 500 m. In October, assay results returned 0.38 g/t Au, 0.07% Cu over 68 m from 504 - 572 m. Grades below 572 m were relatively low. A northwest trending, steeply dipping gold-copper mineralized zone has been outlined by previous drilling and 3D-IP programs over an area of about 400 x 350 m and 550 m depth within the historic White Pass zone. A chargeability anomaly indicates a potential strike length of a kilometre.



Figure 17. Brenda – Driller and helper retrieving 20' core tube. View is south towards Drybrough peak, Black Range.

The deep porphyry target area is underlain by a sequence of moderately SSW dipping porphyritic volcanics of the Early Jurassic Toodoggone Formation (Metsantan Member) that are andesite to latite in composition. Mineralized rocks have a thin fracture net or crackle breccia and are pervasively affected by potassic (biotite, K-feldspar) alteration overprinted by magnetite-quartz-sericite-chlorite and local phyllic alteration. Quartz-magnetite-sulfide veins and low density stockwork host copper-gold mineralization. Post-mineral brick red monzonite dikes/sills cut the host rock seemingly along fault planes or interflow horizons and dip moderately to the west. There is southwest directed offset to mineralization at the top of the zone where barren monzonite intrudes. Across the Pillar fault, a normal block fault structure about a kilometre southwest of the property, a 1.75 km diameter subcircular granitoid stock of probable Black Lake suite is hosted Late Triassic Takla volcanics. Immediately northeast of the White Pass zone, a N-S trending 2000 x 750 m advanced argillic zone with strong illite clay alteration and quartz-alunite has been mapped suggesting a high sulfidation lithocap. Combined alteration forms a 2.5 km N-S trend across the property and is thought to be controlled by tensional fractures associated with the NNW trending Pillar fault. No causal intrusive or deep-seated core of the mineralized system has been identified.

At the end of January, International Samuel Exploration Corp reported the results of a 2012 grassroots exploration program at the **Frog** property (MINFILE 094L 014, 094E 030), 107 km NNW of past-producer Kemess South. The program consisted of prospecting and sampling on the eastern half of the property and three areas of interest were identified in the southern portion. At the Forax prospect, a Cu-Au-Ag anomaly with overlapping Mo-Rh anomaly was outlined over a 6 x 4.6 km area. Of 430 rock samples collected, 23% assayed higher than 0.1% Cu. Nine ranged between 1.09 - 4.28% Cu, 0.5 - 4.0 g/t Au, 0.3 - 55.1 g/t Ag; and 28 samples between 0.01 - 0.42% Mo (avg. 0.07% Mo) with elevated rhenium between 0.04 - 1.25 ppm. The Forax prospect is fault bounded on the east, west and south and underlain by penetratively-foliated biotite hornfels schist, and a multi-phase pluton ranging from diorite to granite/syenite composition. Mineralization as copper sulfide is noted along the schist foliation, in miarolitic cavities, within joints and cleavages, and as disseminations. Alteration consists of main stage silica-magnetite-biotite and a limited muscovite-pyrite-magnetite overprint. Oxidized copper minerals malachite, azurite, chrysocolla and chalcantite are also present. West of Forax, sampling at the Whoa prospect outlined a copper-silver anomaly over 2.8 x 1.5 km. Seven of the 57 samples assayed between 0.10 - 0.61% Cu, 0.55 - 18.45 g/t Ag. Whoa is underlain by geology similar to Forax but also hosts skarn along biotite schist contacts. The company plans to investigate other gossans within the area. Regionally, the area is situated in the Quesnel terrane north of the Toodoggone district, and is underlain

by the Early Jurassic granodioritic Pitman Batholith bound by the Kechika Fault on the east and Kutcho Fault on the west. Minfile TK 43 suggests the schist bodies on the Frog property are Devonian to Permian metamorphic roof pendants caught up in the Early Jurassic pluton.

Twelve kilometres to the west at the **Lunar** property (MINFILE 094E 060, 061), Stratton Resources Inc completed an airborne magnetic and radiometric survey in June 2013. In late 2012, a grassroots geological mapping, prospecting and sampling program identified an area of anomalous copper-gold in the southeast corner of the claim block. Of 67 rock samples taken, ten ranged from 0.38 - 10.60% Cu, 0.70 - 5.37 g/t Au. The historic Mack and Earl showings describe copper sulfide and malachite disseminations in a quartz monzonite phase of the Early Jurassic Pitman Batholith along its western margin near the Kutcho Fault. Local skarn horizons and paragneiss are also noted. The Middle Triassic Lunar Creek ultramafic complex lies 900 m to the southwest, separated from the batholith by a lens of Takla Group volcanic rocks.

EPITHERMAL GOLD-SILVER AND VEIN-TYPE PROJECTS

Nechako Plateau (Stikine Terrane)

The Nechako Plateau, part of the Interior Plateau physiographic province, is an area of moderate relief bound to the north by the Skeena Arch, to the west by the Coast Mountains, and to the east by the Cache Creek terrane. The area is underlain by Early to Middle Jurassic Hazelton Group island-arc volcanic rocks of the Stikine Terrane. Following structural onlap of the Cache Creek terrane onto Stikinia, Bowser Lake Group sedimentary and volcanic rocks were deposited from Late Jurassic to Early Cretaceous alongside uplift of the Skeena Arch. Continental arc volcanism with intrusion of granodioritic plutons, including the Late Cretaceous Capoose Batholith, culminated in a Late Cretaceous orogenic event (Diakow et al., 1997). The combined Laidman and Capoose batholiths extend for close to 50 km along a NNW trend between Tsacha Lake (south) and the northeast trending Nataalkuz Fault (north). Episodic volcanism continued into the Middle Eocene with eruption of the intermediate Kasalka (Late Cretaceous), felsic Ootsa Lake, and intermediate Endako Groups. Eocene volcanism appears to be closely linked with regional crustal trans-tension and basin-and-range style block faulting. North-to-northwest trending structures and cross faults are considered an important control on mineral showings and deposits developed during Late Cretaceous to Eocene uplift and extension. The Chilcotin Group represents Miocene and younger volcanism forming lava fields of transitional basalts. Glacial till, colluvial and fluvial deposits cover the area with bedrock exposures generally restricted to higher elevations.

In April, New Gold Inc switched its exploration focus from **Blackwater** to the broader mineral tenure (over 1000 km²) where multiple targets were generated during

the 2012 regional exploration program. The regional exploration strategy combined a suite of techniques including regional mapping, soil sampling (A- and B-horizon, MMI), ground IP and magnetics survey, till sampling for indicator mineral analysis, and RC drilling through overburden to sample bedrock. The four drills that had completed the geotechnical and condemnation drilling for Feasibility at Blackwater were moved to the **Capoose** project, 21 km northwest of Blackwater, as well as other target areas including **Capoose South**, **Van Tine**, **Van Tine South**, and **Fawnie**, from 27 to 15 km west of Blackwater. Other regional properties include **Emma**, **Blackwater South/East** and **Auro** on the west to east side of Blackwater within 10 km. To help guide regional exploration, a structural study of Mt. Davidson and the greater Fawnie Range area was completed in early summer by SRK Consulting. By July, all exploration crews were mobilized. One core drill at Capoose focused on resource expansion laterally and at depth; two RC drills were active within the broader Capoose property and Van Tine; infill soil sampling was conducted at Capoose, Van Tine and Fawnie; and geophysical surveying continued at Capoose and Fawnie. By late October over 4200 m drilling was completed on Capoose and over 18 250 m in first pass drill testing on seven regional targets. The program wrapped up in November for the season, and preliminary results were reported as encouraging.

The **Capoose** property (MINFILE 093F 040) is located in the middle of a 10 km long NNW trending ridge between Fawnie Nose (south) and Tutiai Mountain (north). At end-2012 the resource was stated at:

- 14.2 Mt at 0.43 g/t Au, 20.8 g/t Ag - containing 5557 kg (196 Koz) Au, 269 235 kg (9.50 Moz) Ag (Indicated)
- 64.1 Mt at 0.29 g/t Au, 23.2 g/t Ag - containing 16 868 kg (595 Koz) Au, 1.35 Mkg (47.79 Moz) Ag (Inferred).

An updated resource estimate was scheduled for the end of Q4 2013. The property is underlain by moderately-to-steeply southwest dipping Hazelton Group andesite flows, andesite-dacite tuffs, and argillite/siltstone. These are intruded by quartz monzonite of the Capoose Batholith that dips gently eastward to about a kilometre depth below the deposit. The batholith is mapped over a 7 x 18 km area west of the deposit and spans the Late Jurassic to Late Cretaceous from its west to east margins. Apparent fragmental rhyolite sills with sheared contacts are the prime host of mineralization and are intensely altered with a silica-sericite-clay and garnet-bearing assemblage similar to the Blackwater deposit. The sills or "undifferentiated silicified volcanics" cut across the biotite hornfels aureole at the upper contact of the batholith and based on garnet geochemistry are similar in age to the east margin of the batholith (Green and Diakow, 1993). The deposit is elongated NNW parallel to stratigraphy over an 850 x 1000 m surface area, and dips

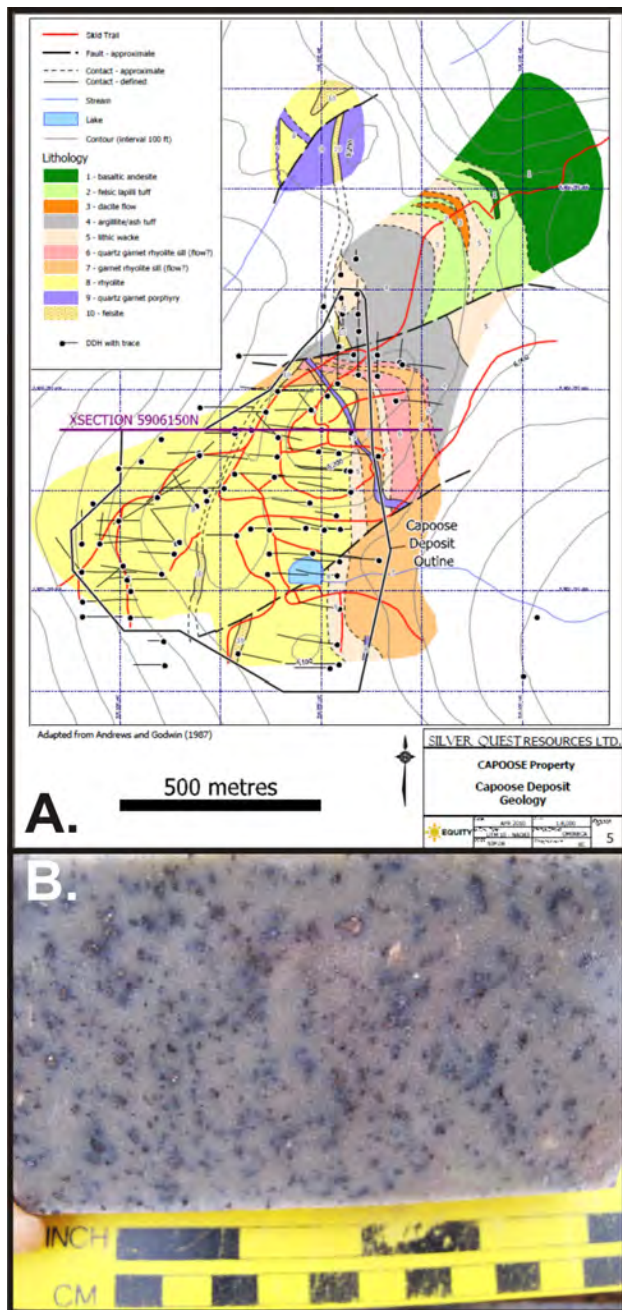


Figure 18. Capoose – **A.** Plan view of geology with historic drilling; from Silver Quest Resources Ltd 2010 technical report; **B.** D-13-194 at 512 m with galena-pyrrhotite-pyrite-sphalerite mineralization and trace garnet in undifferentiated silicified volcanic rock.

to the west below 300 m depth. Mineralization occurs as pyrite-sphalerite-galena-chalcocopyrite-arsenopyrite disseminations, aggregates, and lesser veinlets. Gold grade increases toward structural intersections with northwest trending linears that are first derivative magnetic features. A late northeast dipping clay-altered rhyolite dike cuts mineralization, with later northeast trending faults offsetting the dike. TerraSpec analysis of alteration sericite crystal structure indicates higher temperatures than at the Blackwater deposit. Both

andradite and spessartine garnets occur with the magmatic-to-hydrothermal transitional early potassic assemblage and have been subsequently replaced by sulfide. These mineralogical features along with the proximal and coeval nature of the sills to the batholith and structurally confined mineralization suggest the Capoose deposit represents a deeper, hotter feeder system to a Blackwater-style deposit.

New Gold crews engaged in mapping the **Fawnie Regional** area were focused on the potential for various deposit types. Several historic showings have been documented in the area. At the **Fawnie** property, stratabound and breccia-hosted low-sulfidation epithermal showings (Buck, Malaput, and Fawn from east to west; MINFILE 093F 050, 056, 043) have been described with pyrite-sphalerite ± galena, chalcocopyrite, pyrrhotite, arsenopyrite, pyrargyrite (Ag_3SbS_3) mineralization and silica-sericite ± clay, carbonate, barite alteration. At the east margin of **Van Tine**, the Fawn 5 (MINFILE 093F 053) showing consists of copper-gold mineralized garnet-pyroxene-epidote skarn with minor sulfide in hornfelsed volcanics. Magnetite-rich iron skarn is also documented. Near the south margin of **Van Tine South**, the Wolf and Paw showings (MINFILE 093F 045, 052) host low-sulfidation Au-Ag epithermal and Cu-Mo porphyry style mineralization, respectively. Host rocks across the area include Hazelton Group volcanic and sedimentary rocks, felsic volcanoclastics, and Middle Eocene Ootsa Lake group rhyolites. Feldspar ± quartz porphyry dikes or sills are associated with some of the epithermal showings (Buck, Wolf), as is proximity to the Laidman batholith (Malaput).

In late January, Independence Gold Corp announced the results of a 17-hole drilling program completed in November 2012 at the **3Ts** project, 15 km SSW of Mt. Davidson. Drilling tested the 230 m gap area that offsets the Mint and Ted veins, both N-S striking subvertical veins on the historic Tam property (MINFILE 093F 068). Seven holes followed up discovery hole TT12-64 and intersected the mineralized quartz-carbonate vein with grades up to 6.08 g/t Au, 62.0 g/t Ag across 10 m core length, including 28.5 g/t Au, 162 g/t Ag over 2 m in hole TT12-71. The Ted and Mint veins are thought to be segments of a single vein structure with an apparent right-lateral offset. The total strike length of the Ted-Mint vein is over 900 m and remains open at depth and along strike. Additional drilling tested the Ted and Mint vein beneath a gently dipping microdiorite sill that crosscuts the vein structure. Intercepts below the sill are generally between 250 - 330 m depth from the surface. Grades below the sill included 1.79 g/t Au, 3.0 g/t Ag over 2 m in the Mint vein and 0.69 g/t Au, 13.1 g/t Ag over 10.5 m in the Ted vein.

From February to April, an additional 12-hole drilling program tested the Ted-Mint gap area and Ted vein on the Tam property, and the Larry and Tommy vein structures on the historic Tsacha property (MINFILE 093F 055) about a kilometre to the west. Six holes were drilled in the Ted-Mint gap with the best intercept 50 m

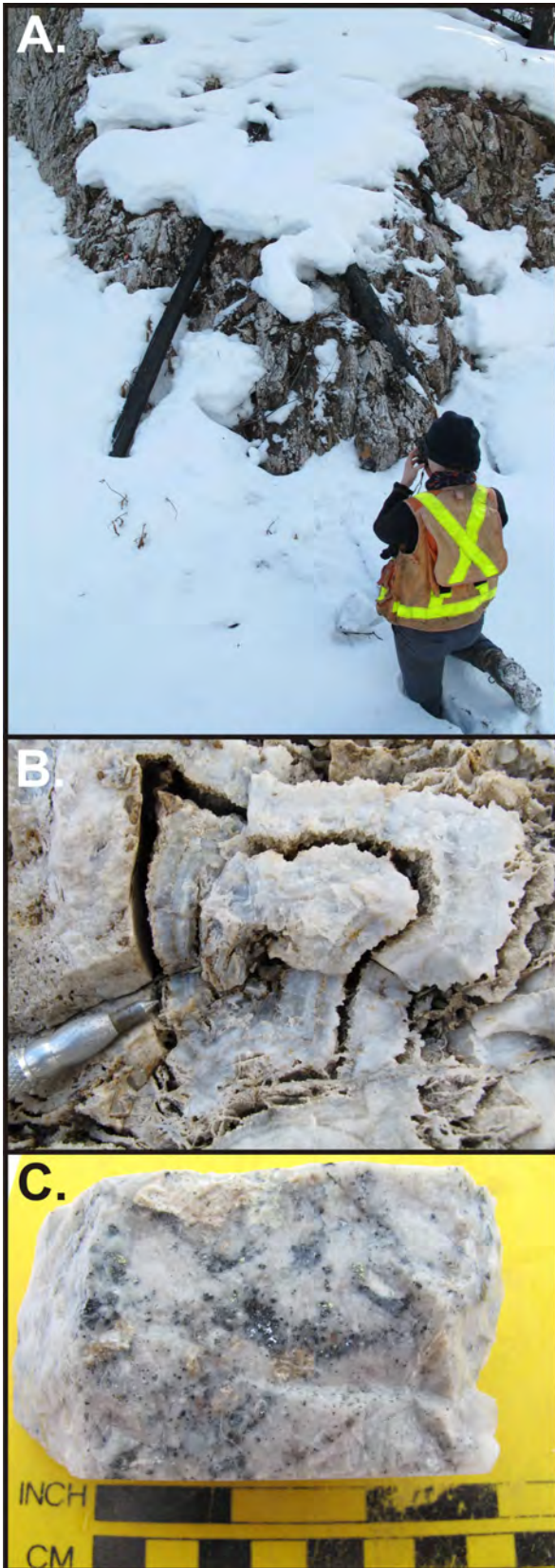


Figure 19. 3Ts – **A.** Examining Ted Vein outcrop on Tam property; **B.** Ringer Zone boulder with crustiform and silicified lattice textures; **C.** TT13-80 at 259.7 m, Mint vein. Quartz-adularia vein with late calcite fill is mineralized with pyrite-chalcopyrite-galena-sphalerite and Ag sulfosalt. Grade from 253.0 to 264.3 m is 3.19 g/t Au, 33.5 g/t Ag.

along strike from TT12-71 grading 3.19 g/t Au, 33.5 g/t Ag over 11.3 m, including 15.77 g/t Au, 93.8 g/t Ag over 2.1 m. Drilling below the microdiorite sill in the Ted vein intercepted 1.11 g/t Au, 11.6 g/t Ag over 6.4 m. Three holes were drilled at the Larry vein returning a best grade of 2.09 g/t Au, 5.0 g/t Ag over 1.0 m. The Larry vein remains open along strike and at depth. At the Tommy vein, 200 m west of the Larry vein, only a partial intercept of the vein was recovered due to bad ground conditions. This graded 2.74 g/t Au, 45.7 g/t Ag over 6.7 m and is located 80 m along strike from 2005 hole TS05-108 that graded 10.89 g/t Au, 60.2 g/t Ag over 8.86 m.

In July, the company reported the results of an initial scoping-level metallurgical study on a composite sample of mineralized Ted-Mint vein material from the 2012 drilling that graded 2.28 g/t Au, 66.5 g/t Ag. A combination of gravity separation, flotation, and cyanide leaching yielded the best recovery at 97.3% Au, 94.9% Ag. On site, continued mapping, prospecting, and geochemical sampling aimed to determine the bedrock source areas for mineralized float boulders and develop additional drill targets, particularly west of the Tommy vein. Additional ground magnetic surveying expanded the existing coverage; the magnetic data is being used to identify fault structures.

The 3Ts property is underlain by Hazelton Group volcanics (Entiako Formation) less than 700 m north of an 8 x 2 km E-W trending granodiorite assigned to the Capoose Batholith. South of the pluton and the Blackwater River, local Oosta Lake volcanics give way to regionally extensive flood basalts of the Chilcotin Plateau. The 3Ts project is a low-sulfidation epithermal vein system hosted in rhyolite lapilli tuffs with more than a dozen mineralized veins, ranging up to 900 m in length and 20 m true width. The subvertical veins are N-S striking and appear to have formed by open space filling along faults within a roughly 1 x 3 km E-W elongate area. The veins have quartz-carbonate ± sericite-adularia-amethyst gangue cementing wall rock fragments, and feature open cavities, crustiform banding, and comb crystal structures. Brecciation-silicification appears to have been episodic and extends into bleached wall rocks for up to 10 m outside the veins. Mineralization occurs as pyrite and Cu-Ag sulfosalt disseminations and sooty hairline veinlets with accessory chalcopyrite-sphalerite-galena. A Late Cretaceous microdiorite sill cuts across the vein system and averages 80 m thickness. The current resource estimate for the combined Tommy, Ted, and Mint veins is:

- 3.61 Mt at 3.39 g/t Au, 85.15 g/t Ag - containing 11 181 kg (394 383 oz) Au, 280 380 kg (9.89 Moz) Ag (Inferred).

This Inferred resource does not include 2012-13 drilling results. The bedrock source of mineralized vein boulder float in the Ringer Target area and other parts of the property remains unknown. Eight samples from the

Ringer Target boulders averaged 19.01 g/t Au, 140.1 g/t Ag.

In January, Parlane Resource Corp reported the results of a 6-hole drilling program completed in 2012 at **Big Bear**, 19 km north of Mt. Davidson, which tested moderate-high chargeability targets with coincident geochemically anomalous soils near the claim boundary with New Gold Inc. Two holes returned several mineralized intercepts at the Black Bear anomaly. Hole BB12-4 averaged 0.26 g/t Au, 2.67 g/t Ag, 0.21% Zn over its 330.7 m entirety, including 2.14 g/t Au, 12.64 g/t Ag, 0.76% Zn over 9 m at 195 m depth. Hole BB12-6, 200 m to the west, included a shallow intercept starting at 7 m depth of 0.67 g/t Au, 4.99 g/t Ag, 0.67% Zn over 8 m. Other target areas on the property include the 700 x 500 m Brown Bear anomaly, 2.6 km south of the Black Bear, with coincident Ag-Cu-Zn-Pb soil and strong chargeability anomalies; and the Medley Zone, west of Black Bear, where a north-trending silver-copper mineralized zone over 700 m is hosted in quartz-epidote veins at surface. The Black Bear anomaly is underlain by moderately northeast dipping intermediate-to-felsic fragmental Hazelton volcanics. It is located within a northwest-trending 2.8 km wide aeromagnetic high anomaly (first vertical derivative) between the Blackwater and Capoose deposits of New Gold Inc. Outcrop is limited.

In March, Venerable Ventures Ltd reported the results of the 2012 exploration program at the **Trout** property (MINFILE 093F 044), 60 km southwest of Vanderhoof. Four of seven priority targets were tested by trenching and a 10-hole drilling program. At the Camp zone, trenching returned two mineralized intervals up to 0.41 g/t Au over 21 m in vuggy silicified and brecciated volcanics, and drilling intercepted up to 0.33 g/t Au, 1.8 g/t Ag over 47.8 m. At the Camp (North) zone, 425 m to the northeast, trenching returned 2.13 g/t Au over 2 m from limited bedrock exposure. Mineralized drill intervals ranged up to 0.44 g/t Au, 2.4 g/t Ag over 16 m in a 300 x 200 m quartz cemented trachyte breccia unit that varies up to 27 m depth. The breccia target has a moderate IP resistivity signature and is open in three directions. Drilling at the Cap zone tested a 300 x 300 x 75 m chargeability-resistivity anomaly below 150 m depth and intercepted barren pyritic quartz feldspar porphyry which the company feels could be a driver of the epithermal system. Drilling in the Discovery zone returned 65.7 m of lower grade mineralization at 0.17 g/t Au, 2.2 g/t Ag. The Discovery and Camp zone showings are thought to occur within the fault-bounded Trout graben. Target areas follow the northeast and northwest boundaries of the graben over 2019 m in brecciated, silica-clay altered rhyodacitic-to-trachytic volcanic rocks of probable Late Cretaceous Kasalka Group. The Discovery Zone occurs at a mineralized contact between underlying volcanic breccia and overlying polymictic conglomerate. Banded chalcidonic quartz-adularia veins host very fine pyrite-argentite-gold.

At the end of 2012, RJK Explorations Ltd had completed a Phase-2 drilling program at **Blackwater East**, 18 km northeast of Mt. Davidson; and Phase-1 drilling at **Blackwater West**, 15 km southwest of Mt. Davidson. Three holes at Blackwater East followed up a high-grade silver intercept from 2012. The steeply northeast dipping, pyrite mineralized structure was again intersected but no economic values were returned. Further microscopic and X-ray examination of pulps from the high grade interval in BWE12-06 indicated that silver solder had been released from a compromised drill bit. At Blackwater West, drilling focused on two targets including a N-S trending area (1200 x 300-500 m) of coincident MMI soil geochemical and moderate-high chargeability anomalies called the West Grid 4. Two holes on the east and west margins of target returned anomalous Ag-Cu-Zn-Pb over 37 m and 136 m, including 23 g/t Ag, 0.22% Cu, 0.64% Zn, 0.12% Pb over 2 m. Following this program, the company decided to continue exploring the West Grid 4 target area. By March 2013, additional ground IP and magnetic survey was completed to close out the West Grid 4 anomaly on the north in preparation for Phase-2 drilling. By November, an additional three holes had been completed. The target area comprises gently dipping rhyolitic flows and crystal tuff overlying andesite, and is cut by steeply west and east dipping faults on either side of an apparent horst block.

In June, Redhill Resources Corp had completed a 13-hole drilling program at its **Aspen East** property, 34 km northeast of Mt. Davidson, to test ground IP anomalies generated in 2012 in the Chutanli and Leszek target areas, as well as historic IP anomalies. Drilling returned sub-economic values. Two higher grade intervals included 1.0 g/t Au, 0.26% Cu over 6 m. Clay-carbonate-pyrite altered volcanic rocks of the Hazelton Group included rhyodacite flows, felsic tuff, tuffaceous siltstone, and fault breccias. The company decided to stop drilling the area. Instead, a prospecting and sampling program was conducted on the northern part of the property where auriferous boulders have historically been reported and surface sampling has returned values up to 3.7 g/t Au. The Chutanli and Leszek zones are located within an apparent NNW trending fault block.

In mid January, Troymet Exploration Corp reported the results of a 16-hole reverse circulation drilling program at the **Key** property, 5 km south of Mt. Davidson. Four coincident IP and gold-in-soil anomalies were drilled including the Buzz, SGN, Blue, and P1A targets in the East Central Area. Ten holes were drilled on the northwest-trending Buzz anomaly west of the GN Fault. Hole RC-10 intersected a mineralized zone grading 0.38 g/t Au, 0.50 g/t Ag over 13.7 m starting at 3 m depth in subcrop. The zone remains open in three directions and at depth. Several anomalous intercepts of silver, zinc and molybdenum were also returned. East of the GN Fault at the NNW trending SGN anomaly, results from three IP survey lines suggested an east dipping structure. Two follow-up drill holes returned anomalous Au ± Ag



Figure 20. Aspen East – Drilling on the Chutanli Zone target in early April, 2013.

intervals in silica-hematite altered andesite with quartz veining and pyrite. At the P1A VTEM anomaly on the GN Fault, two holes returned anomalous zinc in andesite. At the northeast-trending Blue anomaly near the East Fault, two holes were drilled that included a 1.34 g/t Ag, 0.12% Cu intercept over 23.2 m in hornfelsed volcanics with quartz veinlets and trace copper sulfide. The Key property is underlain by Hazelton Group volcanic rocks (Naglico Formation) and is cut by three NW-NNW trending faults (Valley Fault, GN Fault, and East Fault from west to east) and a NE trending cross fault. A 2012 technical report describes potential for Mo-Cu porphyry (West Central and East Central zones), epithermal Au-Ag (proximity to Blackwater and 3Ts), and massive vein sulfide (Ram claims on Tsacha Mountain; MINFILE 093F 069) deposit types. In November, the company entered an agreement to sell the property to New Gold Inc.

In late 2012, Deveron Resources Ltd conducted an initial grassroots exploration program at the **Nechako** property, 24 km north of Mt. Davidson, following up a 2010 airborne geophysical survey that generated 13 target areas. Grids were established over eight of the targets in an area of limited outcrop. Two grab samples from a recently identified showing in Grid 10 returned 0.59 and 1.54 g/t Au, 51.2 and 85.7 g/t Ag with anomalous copper and zinc. Nearby soil sampling was also anomalous with the three highest samples ranging from 0.16 - 2.70 g/t Au,

121.5 - 225.2 ppm Cu. Two northwest-trending subvertical dacitic dikes (1 - 4 m wide) cut Middle Jurassic greywacke and volcanoclastic rocks. Pyrite-chalcopyrite-sphalerite mineralization is associated with quartz-carbonate/ankerite veins. A silt sample a kilometre downstream of the showing returned anomalous gold.

Kootenay Silver Inc engaged in grassroots prospecting, geochemical sampling and some geophysics on their **Copley** (MINFILE 093F 070) and **2 X Fred** properties, 63 km and 30 km southwest of Vanderhoof. At Copley, the roughly 200 x 100 x 50 m auriferous Smoking Pipe target dips to the west and remains open in three directions. Previous exploration on the property has suggested a large 7 x 2 km low-sulfidation epithermal system. Three northeast-trending topographic domes (Smoking Pipe, 45 Road and East Dome) are underlain by hydrothermally brecciated, silica and clay altered rhyolite of the Eocene Oostsa Lake Formation. Mineralization occurs near surface as disseminated and vein pyrite and appears to strengthen to the northeast.

In 2013, Amarc Resources Ltd, associated with Hunter Dickenson Inc (HDI), focused on relationship building with local communities and First Nations in regard to its **Galileo** project, a broad 1138 km² land package extending from 16 km to 62 km southwest of Mt. Davidson, surrounding the 3Ts project of Independence Gold Corp. The company began looking for a JV partner on the project as part of a capital conservation strategy responding to challenging equity market conditions. Airborne geophysical surveys over the property have identified several Au-Ag epithermal and Cu-Au porphyry targets for ground follow up. The company's other Blackwater District properties, **Hubble** and **Franklin**, are 44 km northeast and 21 km north of Mt. Davidson. In July, an agreement was announced wherein Geoscience BC would purchase airborne magnetic data from surveys recently flown over Galileo and Hubble. The data purchase extends the boundaries of the TREK airborne magnetic survey to the west and northwest.

At the end of March, Geoscience BC announced the launch of the **TREK** (Targeting Resources through Exploration and Knowledge) project. The multi-year, multi-disciplinary project is focused on the northern interior plateau region of BC, overlapping with much of the Nechako Plateau district of the Omineca region. Project partners include the BC Geological Survey (Ministry of Energy and Mines), Mineral Deposit Research Unit (UBC), PK Geophysics, and Noble Exploration Services Ltd. The \$3.9 M Phase-1 of the project covers 20 000 km² and includes updates to airborne geophysics, regional geochemical sampling (stream, lake, soil, till), biogeochemical sampling, geological mapping, mineral deposit studies, and geothermal potential studies. Data from a fixed-wing geophysical survey flown over the TREK area in the summer and fall will be merged with the Amarc's Galileo and Hubble data and released publically in early 2014. The BC Geological Survey collected over 800

geochemical samples in 2013 and is producing a basal till map (first derivative glacial till) for the area to assist future exploration. Mineral discoveries in previous regional mapping programs by the BC Geological Survey (Diakow and Webster, 1997) include the Tsacha Au-Ag epithermal vein system at the 3Ts property, and the Malapat showing now within the Fawnie project of New Gold Inc. The plateau region is considered a challenging area for mineral exploration due to complex geology and an abundance of glacial till and Miocene basalt that blankets prospective lithology. However, the recent success at Blackwater has highlighted the area's mineral potential.

Toodogone District (Stikine Terrane)

At the **JD** project (MINFILE 094E 171), 54 km northwest of past producer Kemess South, Tower Resources Ltd followed up results from their 2012 Phase-1 drilling program in the historic Finn Zone that returned 48 near surface gold-silver mineralized intervals ranging from 0.31 - 9.49 g/t Au, 0.10 - 64.54 g/t Ag over widths of 1.0 - 31.5 m. Step-out drilling had extended the gently-to-moderately NNE dipping tabular mineralized zone 350 m to the north and eastward into the footwall of the controlling structure.

In February, the company reported widespread mineralization beyond the Finn Zone indicated by extensive geochemical sampling in 2012. The soil sampling program defined the Finn zone at values above 200 ppb Au over a width of 1.2 km. Other areas where gold-in-soil anomalies were identified included: the Creek zone (2.7 km west of the Finn zone), the Wolf zone (1.5 km west of the Finn zone), the Schmitt zone (1.3 km northwest of the Finn zone), and the Crown/Tarn zone (1.5 km southwest of the Finn Zone). A contiguous soil anomaly extends 2.2 km between the Wolf and Finn zones, including the AG Carbonate zone (920 m west of the Finn zone), and could represent a western extension of Finn Zone mineralization. New anomalies were identified between the Creek and Wolf zones, 500 m north of the Creek zone, 1.3 km north of the Wolf zone, and 1.3 km southeast of the Finn Zone. Mineralized outcrop was sampled over a 3.0 x 1.7 km area with anomalous soil geochemistry. Two new target areas, the Wolf zone and MVT zone (630 m southwest of the Finn zone) were identified. A grab sample of quartz-carbonate stockwork veining from a historic trench at the Wolf zone returned 35.4 g/t Au, 44.8 g/t Ag. The MVT zone features 300 m of structurally hosted gold-silver mineralization within historic trenching. A 1.5 m chip sample assayed 7.59 g/t Au, 16.6 g/t Ag. Select grab samples from oxidized silicified breccias at the Ag Carbonate and Schmitt zones also returned near half ounce gold values.

In July, a follow-up drill program was conducted to test areas peripheral to the Finn zone where mineralization remains open, and to determine its continuity along the controlling structure. An IP survey was also completed over a 2 x 1.6 km area to investigate

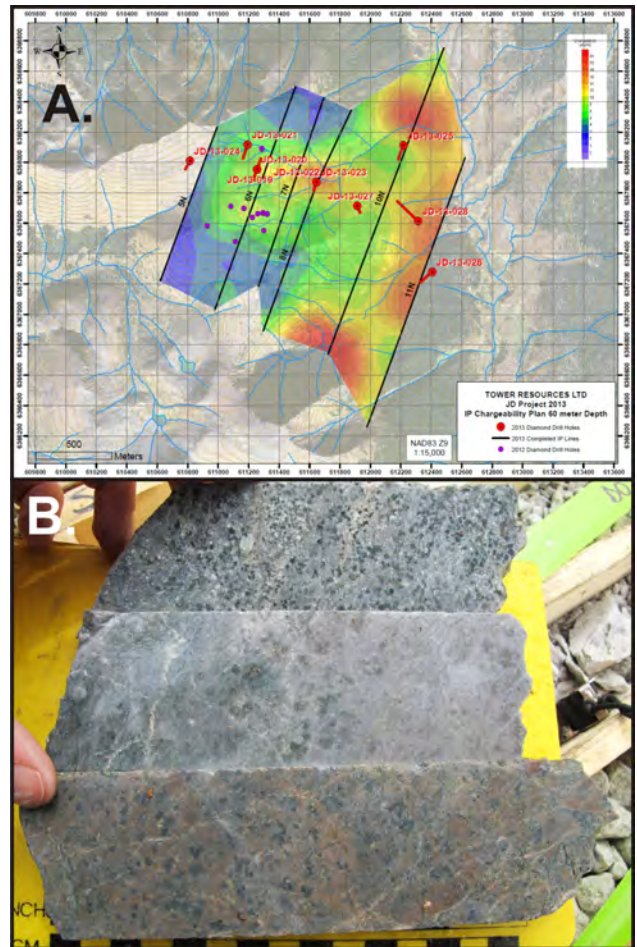


Figure 21. JD – **A.** IP Chargeability plan to 60 m depth with drillhole locations; Tower Resources Ltd; **B.** Comparing alteration in samples of JD-13-025 from 150 - 220 m (top to bottom) in porphyritic latite/andesite of apparent Takla Group. Potassic alteration (K-feldspar, biotite, magnetite) increases downhole after 205 m with chalcopyrite evident at 228 m.

the potential for mineralization at depth. Eleven total NNE oriented IP lines were run across the Finn zone at 200 m spacing, upslope of the zone, and down-slope to the southeast below the zone at 400 m spacing where a ring-shaped multi-element (Cu-Au-Ag-Te-Bi-Sb) soil anomaly surrounds a magnetic high anomaly (800 x 800 m). The first three holes were drilled to expand the Finn zone to the north and at depth, and to infill the gap between the Finn zone and the 2012 north extension hole. Anomalous gold, silver and copper intervals were returned. West of the Finn zone by 400 m, mineralization grading 2.89 g/t Au, 32.5 g/t Ag over 7 m was intercepted at the modelled depth in an area of historic trenching. The system remains open to the west toward the Ag Carbonate zone. Drilling then moved down-slope of the Finn Zone where low grade historic step-outs suggest fault displacement of mineralization. Two holes tested a down-drop of the Finn zone to the east. One drill hole intercepted footwall-style mineralization at anomalous values within a chargeability anomaly. The other was collared on a northeast striking

cross ridge in hanging wall rock and drilled to locate the controlling unit but ended short. Further down-slope over 900 m southeast of historic drilling, the last three holes tested a deep chargeability high partially coincident with the combined magnetic/soil anomaly along an 850 m N-S strike length. Hole JD-13-25 intercepted porphyry-style phyllic and potassic alteration over 200 m and 10 m respectively with disseminated and vein hosted pyrite ± chalcopyrite in augite phyric volcanics of apparent Takla Group. The hole bottomed in 1.4 m of mineralization grading 0.47% Cu, 3.4 g/t Ag. The holes to the south encountered widespread phyllic alteration, copper anomalism, and a short interval of 6.03 g/t Au over 2 m.

As part of a Multi-Year Area Based permit received in June, the company obtained approval to complete a 34 km road upgrade through Lawyers Pass, bridge installation at the Toodoggone River crossing, and an additional 24 km of new road construction up the Moosehorn valley to the property. This would eliminate the high cost of helicopter supported exploration. In addition, 30 000 m of drilling approved over 5 years will enable the company to develop a long term strategy and drill test many of the identified target areas.

In September, Tower reported the results of preliminary metallurgical test work done on a composite sample from the Finn zone grading 1.25 g/t Au, 24.70 g/t Ag. The sample was selected from low-to-moderate grade material with variable alteration and lithology. Results indicated high recoveries of gold and silver can be attained by conventional cyanide leach and sulfide flotation methods. Follow up test work on the higher grade material was planned.

The Finn zone lies within a southeast facing cirque valley at the east end of a 2.8 km ENE trending ridge on the JD property. It is underlain by plagioclase porphyritic andesite, latite, and crystal tuff of the Lower Jurassic Toodoggone Formation (Metsantan Member). Mineralization is focused along a gently-to-moderately NNE dipping polymict volcanic breccia unit that locally crops out at surface and could represent an unconformity in the volcanic stratigraphy and/or a reverse fault. Within the tabular body, pyrite-sphalerite-galena ± chalcopyrite is hosted in silica-sericite-clay altered hydrothermal breccias and quartz-calcite veins. Pyrite-sericite-chlorite alteration occurs peripherally and in the footwall of the zone with vein hosted sphalerite-galena. The company believes the JD property has discovery potential for a low grade, bulk tonnage epithermal Au-Ag deposit, and also for Cu-Au porphyry mineralization lower in the sequence towards McClair Creek.

In August, Guardsmen Resources conducted a soil geochemical survey at the **Ranch** property, 64 km northwest of past producer Kemess South. The survey consisted of an E-W elongate 1200 x 700 m grid to infill historic soil sampling on the south flank of Albert's Hump. Grassroots reconnaissance work was also carried out on other showings in the area. Nineteen showings,

prospects, developed prospects and small-scale past producers occur within the 25 km² property (MINFILE 094E 079, 099, 191). In general terms, high sulfidation Au ± Ag-Cu mineralization, often associated with barite, occurs in NW-SE trending steeply dipping to subvertical zones that are thought to be fault related. Intense vuggy silica-clay ± alunite alteration, local brecciation, and outward argillization are also present. An NI 43-101 technical report released in May 2012 recommends additional drilling, trenching, and deep penetrating 3D-IP. The area is underlain by dacitic and andesitic rocks of the Toodoggone volcanics, Adoogacho and Metsantan Members.

Cache Creek Terrane

In September, private company 0902744 B.C. Ltd resumed trenching at the **Green Gold** property, 36 km southwest of Prince George, to follow up a 2012 airborne geophysical survey. Three 50 m long trenches and test pits were excavated within a 100 m long northwest-trending target area near Henry Lake. Test-pitting was also done to the northwest in the Kellogg Creek area. Clay-rich zones with quartz vein fragments and silicified volcanics were encountered, similar to material from the 2011 discovery trench. The zone can be followed for over 200 m. Twenty kilometres southeast at the **PG** property (41 km southwest of Prince George) Porpoise Bay Minerals Ltd continued exploring a gold-in-soil geochemical anomaly that returned assays up to 0.6 g/t Au in 2011. Eight or more test pits were dug to test for extensions to mineralized bedrock zones with gold bearing quartz. Both properties are located within the Pinchi Fault zone, 2 - 3 km southwest of Takla Group volcanoclastics of the Quesnel terrane. Green Gold is underlain by basalt, limestone and fine clastic rocks of the Pennsylvanian to Triassic Cache Creek Complex, and PG by serpentinitized ultramafics and fine clastics. Rare outcrops of quartz-carbonate-sericite altered rocks and listwanite have been observed in the predominantly till covered area.

Quesnel Terrane

Angel Jade Mines Ltd continued trenching to bedrock and sampling at **Blackjack**, 78 km west of Mackenzie near Porcupine Lake. Test pits were excavated and sampled at **Jackfish**, 103 km northwest of Mackenzie in the Germansen River area. These properties are located in a well-established placer gold district immediately west of the Manson Fault zone. Trenching and test pitting was also completed at the **GPV** property, 125 km NNW of Fort St. James near Indata Lake in the Pinchi Fault zone. The company focused more on their placer operations in 2013.



Figure 22. Green Gold – Trenching to bedrock in the Pinchi Fault zone, 36 km southwest of Prince George.

Cariboo/Cassiar and Slide Mountain Terranes

Canasil Resources Inc carried out assessment work to follow up remote sensing anomalies on their **Lil** property (MINFILE 094C 079), 198 km northwest of Mackenzie at the southeast end of the Lay Range in the Cassiar terrane. Narrow argentiferous quartz veins and breccia zones extending for 300 m are hosted in quartzite and a granitic dike near fault intersections. Silver mineralization consists of argentite, pyrrargyrite [Ag₃SbS₃] and fribergite [(Ag, Cu, Fe)₁₂(Sb,As)₄S₁₃]. The property has potential for a high-grade silver vein/breccia deposit as well as carbonate replacement mineralization. It lies along the east margin of the Manson Fault zone and is underlain by fine clastic rocks of the Swannell Formation (Ingenika Group). Fault contacts with Ordovician to Lower Devonian dolomites (Echo Lake Group) and Upper Devonian to Permian siliclastics (Big Creek Group) lie immediately to the west and south. The Early Jurassic Polaris ultramafic complex lies 2.2 km to the southwest.

Other grassroots programs included Saville Resources Inc at their **Wolf** property, 97 km WNW of Mackenzie in the Manson Fault zone where prospecting along a 2012 soil anomaly looked for extensions of a gold and silver-bearing galena vein. The area is underlain by Early Mississippian to Late Permian Wolf Ridge gabbro/diorite and Nina Creek Group siliclastics of the Slide Mountain terrane. Killdeer Minerals Inc at their **Osilinka** property, 144 km northwest of Mackenzie, did preliminary soil sampling near the Childhood Dream prospect (MINFILE 094C 029) where massive pyrite with galena and sphalerite occurs as breccia infillings and replacement mineralization along a steeply dipping fault

in Middle Ordovician to Early Devonian dolomites (Echo Lake Group) of the Cassiar terrane.

SEDIMENTARY EXHALATIVE (SEDEX) PROJECTS

The Kechika Trough is a regionally elongate southern extension of the Paleozoic Selwyn Basin of the Yukon and Northwest Territories, a prolific sedimentary basin for Ordovician to Early Devonian sedimentary exhalative (SEDEX) deposits. The **Akie**, **Cirque** and **Kechika Regional** projects together comprise mineral claim blocks extending over 135 km following northwest-trending panels of siliceous and carbonaceous shale of the Devonian-Mississippian Gunsteel Formation (Earn Group) within the Ancestral North American margin. The Gunsteel shale panels are preserved in a series of thrust plates and synformal keels of northwest-trending regional folds and are thus repeated from west to east. A broad antiform fold structure defines the Akie property, and the southwest limb of this structure hosts the Cardiac Creek deposit. Cross structures appear to offset blocks of stratigraphy. The Cirque deposit occurs within a separate, more west-lying panel of Gunsteel shale, and also lies along the southwest limb of an anticline. The deposits are thought to have originally formed from vent activity along regional growth faults in second order sub-basins within the Kechika Trough, bounded on the northeast by Early-to-Middle Devonian platform reefs, as represented by the regional Kwadacha limestone (MacIntyre, 1998).

Ancestral North America

At the end of 2012, Canada Zinc Metals Corp (CZM) reported the results of a hydrogeochemistry program at their **Akie** (MINFILE 094F 031), **Pie** (MINFILE 094F 023), and **Mt. Alcock** (MINFILE 094F 015) properties. The Akie property is located 251 km NNW of Mackenzie in the Kechika Trough. Pie and Mt. Alcock are 11 km and 48 km northwest of Akie. The hydrogeochemical survey technique provides real-time results for visually measuring elevated sulphate downstream of baritic mineral occurrences. The program tested primary, secondary, and select tertiary drainages that cross prospective Gunsteel Formation shale. On the Akie property, anomalous Zn ± Pb signatures came from Silver Creek and the GPS showing. On the Pie property, the north end of Central Pie showed anomalous signatures and elevated sulphate, whereas the West Pie target was more moderate. At Mt. Alcock, anomalous sulphate and zinc values were associated with an eastern panel of Gunsteel Formation shale and the Main Barite showing. Follow-up sampling was planned within tertiary drainages to pinpoint sulphate sources and metal anomalies.

In February, CZM reported excellent correlation between known geology and conductivity response in the preliminary interpretive results of a deep-penetrating airborne VTEM survey flown by Geotech Ltd in 2012. Results show the Gunsteel Formation shale and western

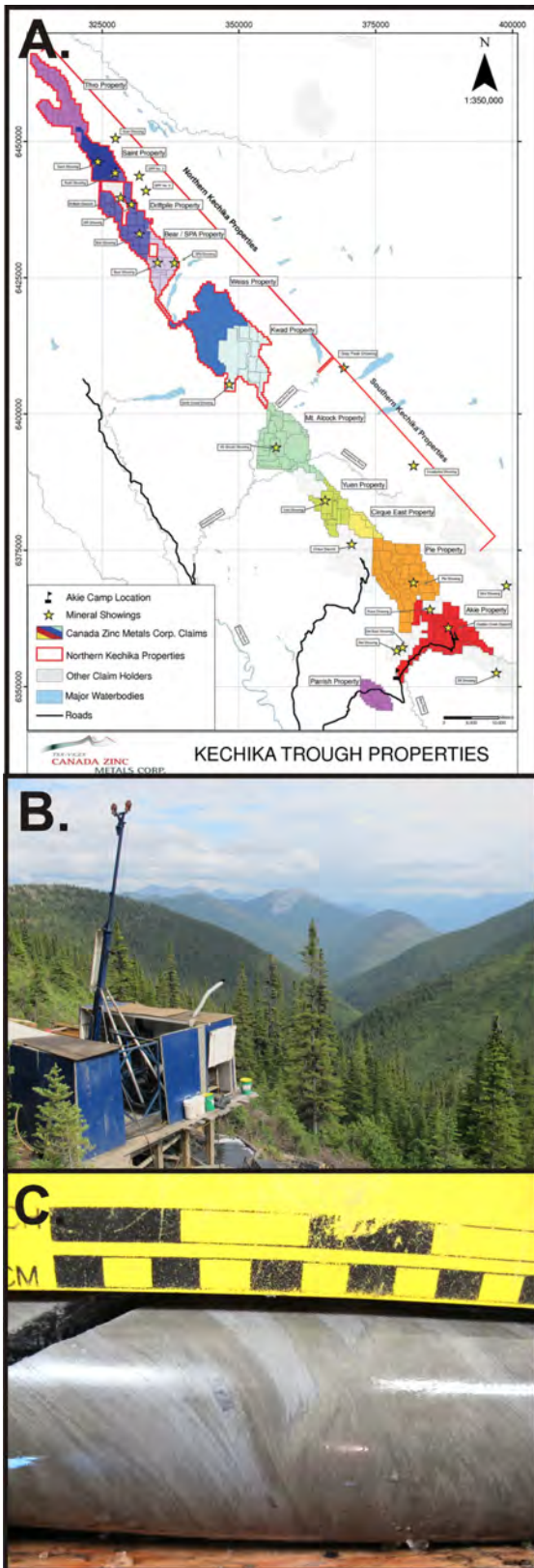


Figure 23. Akie – **A.** Plan view of Kechika Regional and Akie properties extending over 135 km; Canada Zinc Metals Corp. The Yuen, Cirque East, and Pie properties have been optioned to Teck Resources Ltd. **B.** Drilling at the North Lead Anomaly; **C.** Cardiac Creek drillhole A-13-105 at 400 m with fine-grained grey sphalerite and pyrite banding.

thrust panel on Akie and Pie properties are both distinct conductors. The Mt. Alcock results indicate greater structural complexity than prevailing mapping suggests, and a prominent EM lineation southeast of the Main Barite showing outside historical exploration. Comprehensive analysis and interpretation of the VTEM data was then completed by Condor Consulting Inc, and a deposit signature defined from the geophysical response of the Cardiac Creek deposit and other mineralized occurrences. This work indicates mineralization occurs in areas of elevated conductivity with coincident magnetic lows. The analysis generated 25 high ranking target areas. On the Akie property these included areas northwest and southeast of the Cardiac Creek deposit, the eastern panel of Gunsteel Formation, the South Zinc anomaly, and the eastern side of Silver Creek; on the Pie property, the GPS showing and the West Pie target; and on the Mt. Alcock property, northwest of the Main zone. Many of these target areas remain untested. The Condor Consulting interpretation was then combined with a digital GIS compilation for the three properties to generate high priority targets for 2013. The GIS compilation began in November 2012 and combines recent data with historic geological, geochemical, geophysical, and drilling data from over 35 years of assessment reports in the Kechika Trough, and is completed for the key properties.

In May, CZM received multi-year exploration permits for the **Yuen** (MINFILE 094F 013) and **North Kechika Regional** properties. The North Kechika Regional properties, 12 - 71 km NNW of Mt. Alcock, include **Kwad** (MINFILE 094F 021), **Weiss**, **Bear/Spa** (MINFILE 094F 024, 003), **Driftpile South** (MINFILE 094K 066, 085), **Saint** (MINFILE 094K 068), and **Thro**. Yuen, 20 km northwest of Pie, has seen little exploration since 1979 - 1981 when limited drilling tested soil anomalies. The other properties are similarly under-explored since that time. Drill targets are being developed through the digital GIS compilation program. With extensions on existing multi-year permits and a new exploration camp planned for Mt. Alcock, CZM is developing a long-term exploration strategy.

Exploration in 2013 started with a 2795 line-km expansion of the airborne VTEM survey to include the remaining eight core properties of the **Kechika Regional** group at 200 m line spacing. The process of combining historical data with the VTEM survey results for target generation is to continue regionally. The hydrogeochemistry program also continued from 2012 and focused on identifying anomalous areas in the under-explored **Kwad** and **Weiss** properties 12 - 23 km NNW of Mt. Alcock. Several prominent anomalous trends were identified in the field.

A 9-hole exploration drilling program on the **Akie** property tested the:

- down-dip extension of the GPS showing (West Akie GPS zone) in an interpreted western panel of Gunsteel Formation shale;

- down-dip extension of mineralization at the North Lead Anomaly, a 1000 x 200 m lead-in-soil anomaly 2.3 km northwest of the Cardiac Creek deposit;
- South Zinc Anomaly, a 1700 x 300 m zinc-cadmium anomaly southeast of the Cardiac Creek deposit that coincides with VTEM geophysical targets;
- and northwest and southeast margins of the Cardiac Creek deposit to infill and expand known mineralization.

Two holes in the West Akie GPS zone intersected Earn Group black shale with minor nodular-to-laminar barite and bedded pyrite, and narrow zones of anomalous Zn-Pb ± Ni, Tl. One hole in the North Lead Anomaly intersected Gunsteel Formation shale with thick intervals of laminar-to-bedded pyrite and nodular barite. Assays of 0.19 - 0.24% Zn+Pb, 1.70 - 2.43 g/t Ag were returned over three intervals ranging from 27.8 - 75.3 m width. Mineralization-style is similar to Cardiac Creek and shows continuity along strike and down-dip. Drilling in the South Zinc Anomaly returned a 0.5 m interval of 'Nick-Style' mineralization assaying 0.4% Zn, 0.9% Ni with anomalous Pb, Mo, As, U, V, P, La, Cr, Hg, and Se at the contact between Kwadacha Limestone and Road River Group siltstone. The samples were rerun to assess gold and PGE potential. Drilling at the margins of the Cardiac Creek deposit demonstrated the continuity of high-grade mineralization in a thick package of Gunsteel Formation shale. In the southeast, a 40.1 m interval returned 3.24% Zn+Pb, 5.35 g/t Ag (including 8.89% Zn+Pb, 11.09 g/t Ag over 6.0 m). In the northwest up-dip portion of the deposit, a 10.6 m interval returned 7.53% Zn+Pb, 10.70 g/t Ag (including 10.53% Zn+Pb, 13.69 g/t Ag over 6.6 m). In addition, a similar 1.2 m interval of Nick Style mineralization was encountered. Widely-spaced intercepts of this mineralization in three separate holes suggests it could be continuous across the property associated with the subjacent Paul River Formation rocks.

Soil sampling in 2013 comprised four separate grids on Akie and two grids on Mt. Alcock covering 24 km² in total. At **Akie**, extensive sampling in the South Zinc Anomaly covered VTEM anomalies in a more flat-lying eastern panel of Gunsteel Formation shale. A prominent zinc-lead anomaly (2.25 km x 600 m) was defined. Sampling southeast of the GPS barite showing identified a large Pb-Th-Mo ± Zn-Ba-Ag anomalous zone (1.3 km x 300 m) in black shale. Three soil lines at the Cardiac Creek deposit were designed to test different soil horizons and lab techniques for refining the geochemical signature of known mineralization. At **Mt. Alcock**, sampling covered VTEM anomalies along strike of the Main Barite showing and expanded the historic zinc-lead anomaly to 3.25 km x 600 m. Geologic mapping was completed with soil work across the Akie targets, and also

on the **Weiss, Kwad, and Mt. Alcock** properties in areas of high potential.

In August, the company announced a new discovery called the **Sitka** showing within the eastern panel of Gunsteel Formation shale at Akie. Massive barite with coarse galena and sphalerite was found in a locally brecciated 6 m-wide vein or fault structure near the Silurian siltstone thrust contact. A similar 3 m-wide structure is located 10 m northeast. Rock saw channel sampling, detailed mapping and soil sampling along strike of the showing followed. Anomalous assay results suggest another northwest-trending baritic SEDEX horizon and included four channel samples ranging from 0.6 - 5.1% Zn and up to 1.8% Pb, 4.0 g/t Ag over 0.7 - 2.4 m width. Thirteen grab samples collected within a 2.1 km strike length of the showing returned values of 1.6 - 43.55% Zn, 2.2 - 48.95% Pb, and anomalous silver. Mineralization extends beyond the structures into host rock and remains open in all directions. An open-ended linear silver anomaly (1.4 km x 300 m) is evident in soils down-slope from the showing in the Silver Creek grid which may link to another anomalous silver trend a kilometre to the southeast along strike.

In September, the company announced an option agreement with Teck Resources Ltd wherein Teck could gain up to 70% interest in the **Pie, Cirque East and Yuen** properties of the **South Kechika Regional** group. The properties lie 9 km southeast, 5 km NNW, and 11 km northwest of the adjacent Cirque property of Teck and Korea Zinc within a mountainous block bound by the Kwadacha River on the north and Del Creek on the south. The companies will form a joint venture with Teck as exploration manager and operator. Teck commenced exploration on the properties by early October.

The Cardiac Creek deposit is zone of baritic zinc-lead-silver SEDEX mineralization within the **Akie** property. It is a moderate-to-steeply southwest dipping tabular mineralized body that extends over 1300 m of strike length, at least 800 m below surface, and averages 20 m in thickness. The deposit remains open in all directions. At a 5% zinc cut-off, the current resource estimate is:

- 12.7 Mt at 8.4% Zn, 1.7% Pb and 13.7 g/t Ag - containing 1067 Mkg (2352 Mlbs) Zn, 214 Mkg (472 Mlbs) Pb, and 158 620 kg (5.6 Moz) Ag (Indicated);
- 16.3 Mt at 7.4% Zn, 1.3% Pb and 11.6 g/t Ag - containing 1202 Mkg (2650 Mlbs) Zn, 218 Mkg (481 Mlbs) Pb and 171 600 kg (6.1 Moz) Ag (Inferred).

Mineralization is characterized by a top down stratiform sequence of: fine nodular barite; fine banded barite-pyrite; fine banded proximal pyrite (0.5 - 3% Zn); grey-white sphalerite bands with pyrite (up to 10% Zn); mottled sphalerite-galena-pyrite with increasing barite-calcite; bedded to massive barite. The company has an approved underground exploration permit and intends to

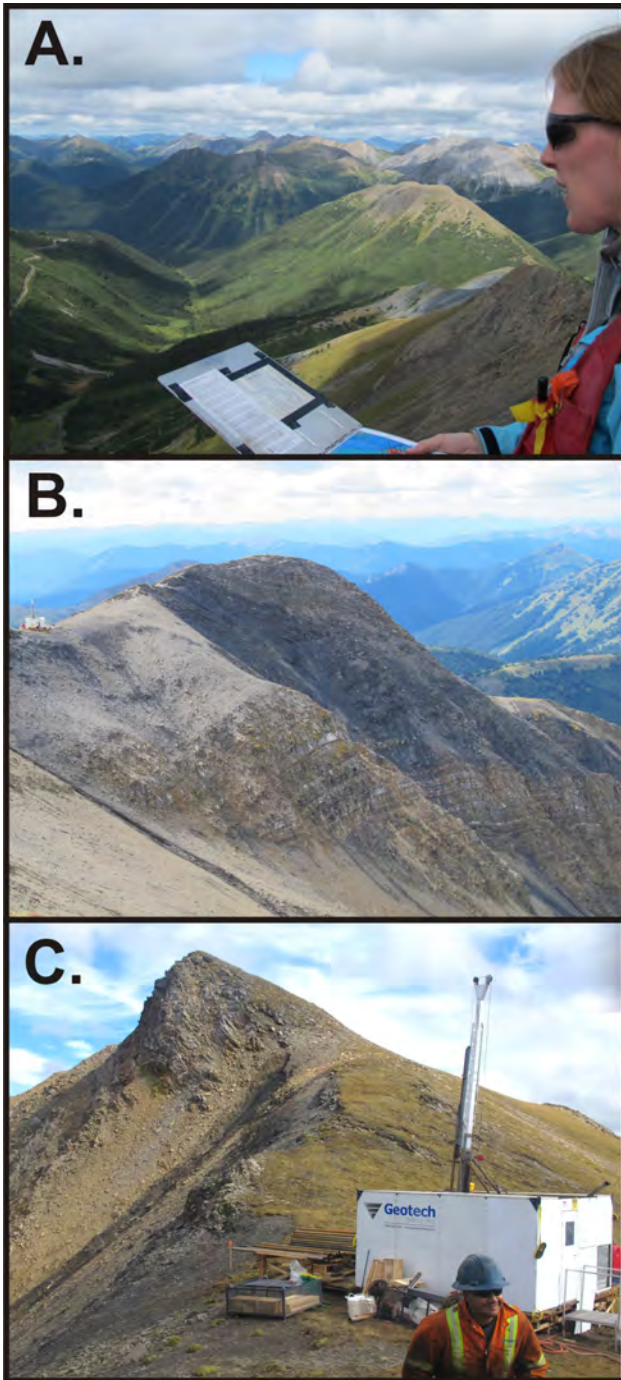


Figure 24. Cirque – A. Teck Resources Ltd project geologist overlooking North Cirque. Kwadacha limestone and Gunsteel Formation shale outcrops are in the background, view is to the northeast; B. Drilling deep target from saddle above Road River Group rocks at South Cirque. View is west; C. Same as previous but at the drill, looking south.

construct portal and waste rock storage sites in preparation for underground infill and expansion drilling. Environmental baseline studies are ongoing.

In 2013, Teck Resources Ltd returned to their **Cirque** property (MINFILE 094F 008), a joint venture with smelting company Korea Zinc Co Ltd. The last work on

the property, located 20 km northwest of Akie and 270 km NNW of Mackenzie, was in 1995 when a Prefeasibility study was completed for an open-pit mine operation with a 7.3 : 1 stripping ratio and reserves of 18.5 Mt at 8.1% Zn, 2.2% Pb. The 2013 program was the first year of a multi-year exploration program in the area, and re-establishing the Cirque camp demanded much of the first half of the season. This included replacing the cribbing for the bridge on Cirque Mine Road, installing a new bridge to camp, and a spur road upgrade. Two core drills were turning in mid August and focused on deep targets in the North Cirque and South Cirque deposit areas. Drill holes were planned between 550 - 1000 m in length. Three holes were completed, and downhole magnetics and resistivity was measured on two of these. New concepts were being tested including the possibility of a westward extension of mineralization at North Cirque cut off by steep faulting and down-dropped relative to the east beneath an overriding thrust plate of Ordovician and Silurian rocks. Drilling at South Cirque aimed to better define the shape (tabular or folded) and structural controls of that mineralized zone. The mapping program covered several areas of interest to improve understanding of stratigraphy and regional structure. Mapping coverage included a property-wide transect from South Cirque to the northeast part of the property informally called the Flying V zone; the Gap zone valley separating North and South Cirque, and one transect up Elk Creek. The soil geochemical survey program aimed to develop a multi-element baseline signature and verify historic soils data. Sampling covered North and South Cirque in NE-SW oriented lines, and a series of lines in the Flying V zone. The program was also extended to the companies' other Kechika Trough properties **Fluke** (MINFILE 094F 009) and **Elf** (MINFILE 094F 011), located 15 km and 32 km SSE of Cirque on either side of CZM's Akie property. Two lines on Fluke covered the Main showing, plus one to the southeast for baseline data. Several lines on Elf covered three lead anomalies (Ian Creek, Joel Creek and Big Elf) over a 5 km NW-SE trending area south of Akie River.

The North Cirque deposit is a moderately southwest dipping, east-tapering lensoid stratiform mineralized body that is 1000 x 300 m and up to 60 m thick. The northeastern margin is exposed at surface. Mineralization from highest to lowest grade is comprised of three major facies: pyritic, baritic, and laminar banded pyrite. The pyrite facies is dominant in the north part of the deposit and the baritic facies in the south. Previous work used metal grade distribution, metal ratios, and deposit thickness to suggest a feeder zone in the north (Pigage, 1986). However, in re-examining the structural setting and deposit characteristics, and looking for expansions, the company remains open to the possibility of an alternate feeder zone. The South Cirque deposit, a kilometre to the southeast, is a partially-delineated apparent tabular mineralized body with similar features to North Cirque, but does not outcrop at surface. The Fluke showing similarly comprises pyrite-sphalerite-galena

mineralization in a southwest-dipping panel of Gunsteel Formation shale within a structurally complex rock package.

Other grassroots exploration work in the Kechika Trough included a program by Asia Base Metals Inc at their **Gnome** zinc project (MINFILE 094F 016), 24 km southeast of Akie, and southeast of Elf. Mapping and sampling was completed in early 2013 followed by an updated geological report, data evaluation and assessment. Massive pyrite and three barite horizons in Gunsteel Formation shale have historically been reported.

ULTRAMAFIC-HOSTED PROJECTS

Cache Creek Terrane

In January, First Point Minerals Corp (FPM) received assay results for the last eight holes of the 34-hole drilling program conducted in 2012 at the **Decar** project (MINFILE 093K 039, 041, 072), 88 km northwest of Fort St. James. The project is managed and operated by Cliffs Natural Resources Exploration Canada Inc, an affiliate of Cliffs Natural Resources Inc. Cliffs has 60% interest in the project, and FPM has 40%. The drilling program was conducted by Caracle Creek International Consulting Inc. These final holes represented a northwest step-out of the Baptiste deposit, and a hydrological hole drilled outside the northeast boundary of the deposit. The NW extension drilling added 580 m to the strike length of mineralization, returning intervals grading between 0.116 - 0.152% DTR nickel over 220 - 492 m. Except for one hole where grades weakened below 360 m depth, the deeper holes were mineralized to at least 460 m depth. The zone narrows to a width of 150 m in the northwest corner but remains open. The 75 m vertical hydrological hole that stepped out from the northeast boundary returned 0.121% DTR nickel over 64.8 m.

In February, FPM released an updated resource estimate for the Baptiste deposit that would be incorporated into the PEA study. The resource was significantly increased and upgraded from the April 2012 estimate. At a cut-off grade of 0.06% Ni (DTR), the resource now stood at:

- 1159.5 Mt of 0.124% Ni (DTR) - containing 1437.8 Mkg (3169.7 Mlbs) Ni (Indicated);
- 870.4 Mt of 0.125% Ni (DTR) - containing 1088.0 Mkg (2398.6 Mlbs) Ni (Inferred).

The estimate, prepared by Caracle Creek, added data from 32 drill holes (16 347 m) completed in 2012, and was based on a total of 28 917 m drilling in 74 holes. The Davis Tube magnetically-recovered (DTR) method is an industry standard metallurgical test for magnetic recovery operations in which the magnetic component of a geological sample is separated and assayed. Nickel mineralization at the Decar property occurs as fine-grained pervasively disseminated nickel-iron alloy called awaruite ($Ni_{2-3}Fe$). Nickel is typically mined from Ni-sulfide magmatic deposits or lateritic nickel deposits

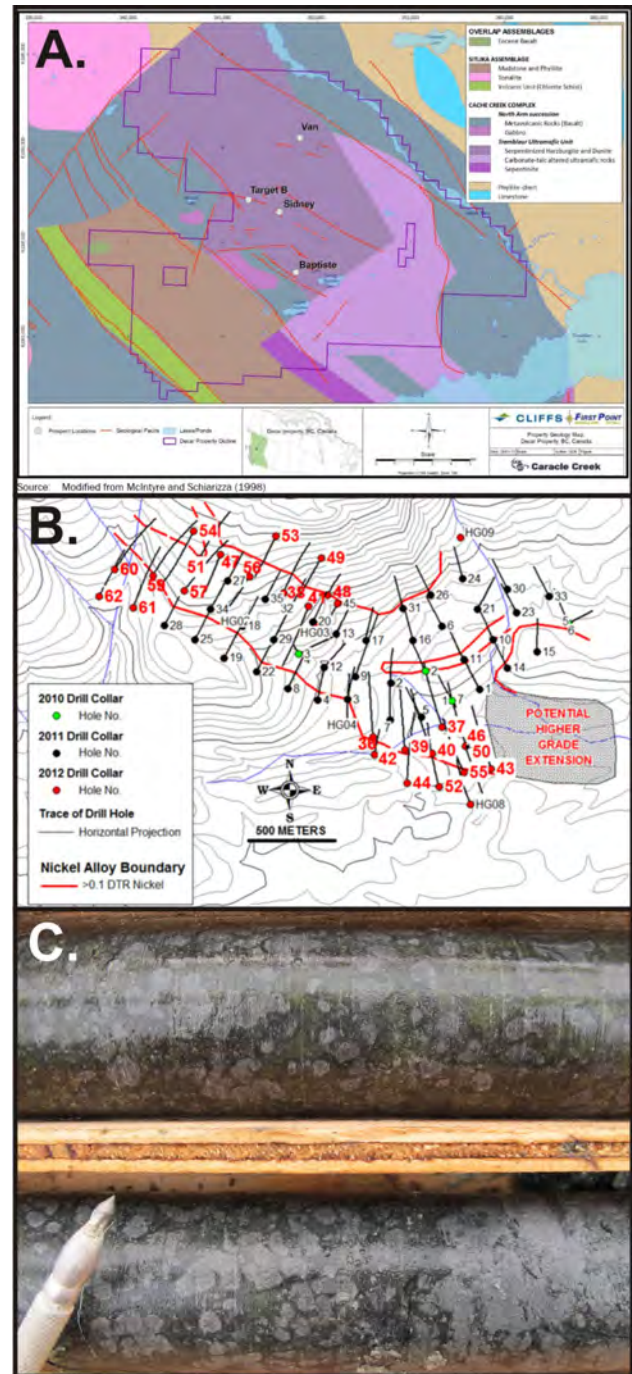


Figure 25. Decar – **A.** Property geology map from the 2013 Amended PEA report; Cliffs Natural Resources Exploration Canada Inc and First Point Minerals Corp; **B.** Baptiste 2012 drillhole location map; First Point Minerals Corp; **C.** 12-BAP-041 serpentinized peridotite with mottled pseudo-breccia texture and fine disseminated awaruite.

formed by tropical weathering of ultramafic rocks. The Decar project is the first to assess this Ni-Fe alloy as an economically viable mineral for commercial production.

In March, FPM announced the results of a positive PEA study prepared by Tetra Tech Inc. The PEA describes a greenfield open-pit mining operation with 114 000 t/d (40 Mt/y) milling rate that would produce an

average 82.4 Mlbs of nickel annually over a 24 year mine life. Processing would use on-site magnetic separation and gravity concentration, and conventional technology and equipment, to produce a 13.5% nickel concentrate with iron (45 - 50%) and chromium (about 2%) by-products. The mine as proposed would comprise a four-stage open-pit, progressing from east to west across the Baptist deposit at a low average stripping ratio of 0.17 : 1. The size of this ultimate pit design is 2.60 x 1.15 km, with a maximum depth of 970 m. The pit would capture only 730 Mt of the Indicated resource at 0.119% Ni (DTR), and 195 Mt of the Inferred resource at 0.114 Ni (DTR), leaving room for the mine to grow with improved economics. According to the proposed processing flow diagram, three balls mills would be required to process the material flow and 24 trains of magnetic separators are suggested. Knelson concentrators would recover the final nickel-rich component of the slurry. Water recovered from tailings would be recycled back to the process. The Tailings Management Facility (TMF) proposed site is in an alpine valley 2.5 km northwest of the plant site. It would contain 300 Mm³ of milled tailings from the first 19 years of operation. A quarry would be developed to supply rockfill material for ongoing TMF construction, and serve as a storage area for 110 Mm³ of tailings from the last 5 years of operation. A standard earthfill retention structure with low permeability core is proposed for the TMF. Similar to Mt. Milligan, the mine would have no waste rock dump as all excavated material from the open-pit and quarry would be used as construction material. A unique advantage of a metal alloy mine is that the tailings material has virtually no acid rock drainage potential.

Other requirements stated in the PEA include: a new bridge crossing near Dzitl'ainli (Middle River) and 7 km of new road connecting existing FSRs to reduce drive time from Fort St. James to two hours; a concentrate transload facility adjacent to the CN Railway near Middle River and 85 km of rail line improvement to Fort St. James; a 140 km power transmission line (230 kV) from the BC Hydro Glenannan substation; and a 275 person camp during operations to accommodate shift employees and 60% of staff employees. It is anticipated that 60% of employees would come from the Fort St. James area. The total project capital cost is estimated at \$2147 M.

To identify technical, economic, and marketing considerations for a non-conventional Ni-Fe alloy concentrate in the prevailing nickel market, Cliffs commissioned a Value-in-Use study and smelting test work. The first study concluded that a Decar product between 12.5 - 15.0% Ni could be a desired feed for any ferronickel plant, and is also suitable for sulfide smelters. In August, FPM sent a 6-tonne bulk sample for metallurgical testing and the production of a Ni-Fe-Cr concentrate. Preliminary lab scale smelting test results showed high-grade ferronickel could be produced from Decar concentrate on a stand-alone basis at 35 - 50% Ni with recoveries of 94 - 99% and 31 - 46% for nickel and iron, respectively. Blending of Decar concentrate with

laterite (saprolite-type) ore produced 17 - 19% Ni and 69 - 76% Fe with recoveries of 95 - 99% and 86 - 95% for nickel and iron. Chromium content was 1.4 - 1.9%. While demonstrating a Decar concentrate would be amenable with ferronickel processing, the tests also indicated that preparatory agglomeration or sintering would be required due to its fineness. In September, Cliffs elected to proceed with the Prefeasibility study phase, scheduled for completion by August 2015, and was determining the scope of work for 2014. On completion of the PFS, Cliffs would attain a 65% interest in the project.

The **Decar** property lies within the Late Pennsylvanian to Late Triassic Trembleur ultramafic complex, representing the upper mantle to lower crustal portion of an obducted ophiolite sequence in the oceanic Cache Creek terrane (Schiarizza and MacIntyre, 1998). The complex trends northwest and averages 15 km x 5.5 km in area. The peridotite (harzburgite) intrusive rock is in fault contact with two northwest-trending metavolcanic basalt panels of the Permian to Triassic Sitlika Assemblage. Two broad northwest-trending mineralized zones occur on the property, and within these are four zones of relatively coarse (50 - 500 µm) disseminated awaruite referred to as the Baptiste, Sydney, Target B, and Van targets. Below the southern flank of Mt. Sydney Williams, the Baptiste orebody consists of a large curved sub-vertical volume of tectonically foliated and serpentinized peridotite. It is 3 km long, 600 - 1500 m wide and as deep as 600 m. Subvertical foliation is thought to parallel diffuse shear zones that developed prior to and during serpentinization (the seawater alteration of olivine to hydrous minerals). Fine disseminated awaruite and magnetite are alteration products from the serpentinization of nickeliferous olivine. Mineralization is continuous over the volume, particularly in the west and central parts, with highest grades trending NW-SE. The deposit remains open along strike in both directions, to the southeast in the central area, and at depth over the entire system. It is bound on the southwest by a northwest-trending subvertical fault and is cut by minor ENE trending barren gabbro dikes ranging from 2 - 15 m thickness. Overburden thickness averages 13.9 m.

SPECIALTY METAL PROJECTS

Cache Creek Terrane

In September, Teck Metals Ltd received the Jake McDonald Mine Reclamation Award for decommissioning and reclamation of the past producing **Pinchi** mercury mine (MINFILE 093K 049), 24 km NNW of Fort St. James, on the north side of Pinchi Lake. The Cominco operation was in production from 1940-44 as an underground mine, and again from 1968-75 as two open-pits. Reclamation commenced in 1996 and was completed in 2013. Monitoring of the site and surrounding area for environmental stability will be ongoing. The mine was located on a prominent limestone

hill and associated with a northwest-trending strand of the Pinchi fault called the South fault. Cinnabar ± stibnite mineralization occurred as open-space fillings and veinlets in breccia zones, and along bedding planes in dolomitized limestone and mica schist host rocks.

Ancestral North America

In late February, Taseko Mines Ltd reported that metallurgical tests on mineralized samples from their **Aley** niobium project (MINFILE 094B 027), 130 km north of Mackenzie, had succeeded in producing a niobium concentrate. Work in 2013 aimed at finalizing the process flowsheet for a Prefeasibility study, and baseline studies continued on site. The current resource estimate stands at:

- 286 Mt at 0.37% Nb₂O₅ - containing 739 Mkg of niobium (Measured and Indicated);
- 144 Mt at 0.32% Nb₂O₅ - containing 323 Mkg of niobium (Inferred).

The company envisions a long-life, low-cost mining operation. Niobium is used in the manufacture of corrosion-resistant, high-strength low alloy steels (HSLA) specifically used in green technologies, turbines, aerospace, automobiles, and oil and gas pipelines. Ferro-niobium (FeNb) prices fell modestly from about \$42 to as low as \$40/kg in 2013. There are only three major producers of FeNb worldwide accounting for about 99% of total reported production: two Brazilian companies and IAMGOLD which operates the Québec-based Niobec underground mine.

The Aley Carbonatite Complex is a 3 - 3.5 km ovoid-shaped alkalic ultramafic intrusion emplaced in Cambrian to Early Devonian sediments of the Northern Rocky Mountain fold and thrust belt, close to the Late Proterozoic rifted margin of ancestral North America. The carbonatite has been divided into a 50 - 200 m deep zone containing disseminations, aggregates and fragmented cumulate (phoscorite) bands of Nb-enriched magnetite-apatite-baddeleyite(ZrO₂)-forsterite ± pyrite, and a deeper sodic-calcic amphibole bearing zone to about 300 m depth. Niobium occurs in the minerals pyrochlore and columbite, and secondary fersmite. The intrusive has historically been divided into a rauhaugite (dolomitic carbonatite) core zone with local “sweats” of soivite (calcitic carbonatite), but petrographic work by the company suggests post-ore dolomitization occurred that remobilized niobium to a more uniform distribution and may have left relict soivite domains. Offshooting carbonatite dikes interfinger with an amphibolitic fenitized breccia zone that mantles the carbonatite intrusion, and some syenite xenoliths have been noted. Fenitization is a type of alkalic metasomatism associated with carbonatites. The deposit remains open at depth in the east and to the south. A noteworthy paper by D.F. McLeish and S.T. Johnston, published by the University of Victoria Library in 2013 as part of the McLeish M.Sc. thesis, suggests the carbonatite was emplaced as a syn-

kinematic sill during a Late Devonian compressive tectonic event, possibly a Cordilleran wide Antler orogeny. The carbonatite is presented as an overturned erosional remnant of the sill within a recumbent-folded crustal scale nappe.

INDUSTRIAL MINERAL PROJECTS

Slide Mountain Terrane

In June, Graymont Western Canada Inc, a subsidiary of Graymont Ltd, the second largest producer of lime (calcium oxide, CaO) in North America, announced it was conducting an Environmental Impact Assessment and consultation process in regard to building a lime plant and quarry at **Giscome** (MINFILE 093J 025), 34 km northeast of Prince George near Eaglet Lake. High quality limestone would be quarried and calcined (heated to about 1095°C) in lime kilns to produce high calcium quicklime. As a past producer, the Giscome quarry supplied high-calcium limestone to pulp mills in the area. The company first proposed the project in 2007 as a 600 000 t/y quarry operation to produce 200 000 t/y of lime from a single lime kiln. A potential later phase would add a second kiln, depending on market conditions. Close proximity to rail would enable the company to ship lime product from site to customers throughout Western Canada and the North. In December 2007 the company suspended the environmental assessment process due to concerns over tightening government policy around greenhouse gas emissions and offsetting. The original proposal used thermal coal to calcine the limestone. Graymont has since investigated other potential fuel sources including pulverized petroleum coke and wood waste biosolids. The company hopes to receive permitting approval in 2014, and envisions start of construction in early 2015 with production in 2016. A minimum 25 year mine life is expected. The property area is underlain by basaltic volcanics of the Mississippian to Permian Antler Formation of the Slide Mountain terrane, with fossiliferous limestone outcrops. High quality limestone grades of about 98% CaCO₃ have historically been reported. Quicklime is used as a chemical base and acid neutralizing agent in industrial and agricultural applications and requires limestone with less than 5% magnesium carbonate for its production. It is used in steel and specialty steel manufacturing, cement production, environmental and wastewater treatments, soil stabilization, as well as a component in the production of fibreglass, pulp and paper, and metals (aluminum, uranium, gold, copper).

OUTLOOK FOR 2014

Thompson Creek Metals Co Ltd will complete their first full year of production at the **Mt. Milligan Mine** in 2014, and final construction projects will be completed including a permanent residence at the mine and rail load-out facility in Mackenzie. The **Endako Mine** will

continue to optimize production activities and continue the Super Pit expansion. New Gold Inc will continue to move the **Blackwater** project through the EA and Mines Act Permit review stages, and decide on the sequencing of the Blackwater and Rainy River projects. AuRico Gold Inc will continue drilling at **Kemess East** to increase reserves and enhance the intrinsic value of the **Kemess Underground** project. Canada Zinc Metals Corp and Teck Resources Ltd will continue exploration for baritic SEDEX deposits in the Kechika Trough on their separate **Akie** and **Cirque** properties, and on joint venture projects. Cliffs Natural Resources Exploration Canada Inc will begin Prefeasibility level studies on the Baptiste deposit at **Decar**. Taseko Mines Ltd will advance the Prefeasibility work at **Aley**. There is considerable mineral potential across the region in a variety of commodities and several attractive projects with potential for further discovery. The success of the Mt. Milligan Mine and Blackwater projects could drive more grassroots and early-stage exploration in the Quesnel terrane and Nechako Plateau given improved venture capital accessibility. A forecast deficit in global zinc supply by 2020 will continue to drive exploration in the Kechika Trough.

ACKNOWLEDGMENTS

The information in this report has been sourced from news releases, quarterly reports, company websites, technical reports, MINFILE reports, Geological Survey of British Columbia publications, site visits and direct conversation with geologists, explorationists, and professionals who were generous with their time and resources. The writer again thanks those who provided statistical and related information, and exchanged ideas. Further thanks to the Regional Geologists and the Mineral Development Office for helpful support, including MDO Director Bruce Madu for reliable feedback, and Gabriel Li for GIS support. Continued thanks for the support of staff in the Prince George Regional Office. Any errors or omissions are the responsibility of the author.

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