

# SOUTHEAST REGION

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## SUMMARY AND TRENDS

It was another strong year for exploration, development and mining in the Southeast Region of British Columbia, although the impacts of the global economic downturn were definitely felt in the latter part of the year. Significant events in 2008 included:

- record prices for metallurgical coal for Teck Coal Limited's five mines in the Elk Valley;
- the first full year of operation at Roca Mines Inc's MAX molybdenum mine at Trout Lake;
- the opening of Merit Mining Corp's Lexington-Grenoble gold-copper mine near Grand Forks; and
- the start of an ambitious program targeting underground-mineable coal resources near Fernie by Kennecott Canada Exploration Inc.

Exploration expenditures in 2008 are projected to be about \$42 million, down only slightly from the record level of the previous year (Figure 6.1). This total was divided between metals (about 58%), coal (41%) and industrial minerals (1%). This represents a significantly higher proportion for coal, and lower proportion for metals, than in the previous year.

Exploration expenditures in 2008 for the various stages may be roughly broken down as follows:

- grassroots exploration – 2%
- early-stage exploration – 50%
- advanced exploration – 42%
- mine property exploration – 6%
- mine evaluation – 0%

In addition to the exploration expenditures, approximately \$45 million was spent on mine development projects in the Southeast Region in 2008. The largest development projects were at MAX mine, Lexington-Grenoble mine and Line Creek mine.

An estimated 138 000 m of exploration drilling was carried out in the Southeast Region in 2008 (Figure 6.2). Of this total, roughly 60% represents drilling for metals and 40% for coal (not including mine production and development drilling).

As in previous years, past-producing mines and camps were actively explored. These included programs in the Beaverdell, Rosslund, Greenwood, Ymir, Ferguson, Salmo, Moyie and Coal Creek areas.

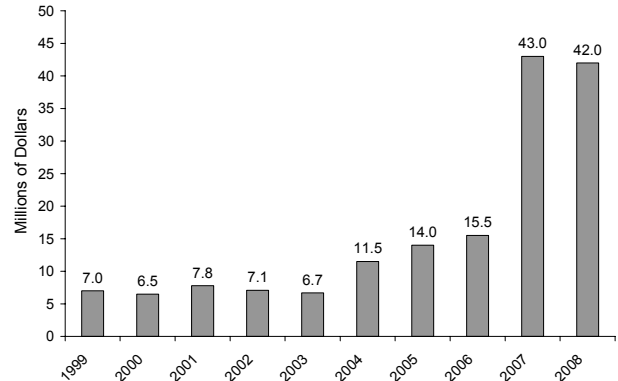


Figure 6.1. Annual exploration spending in millions of dollars, 1999 to 2008, Southeast Region.

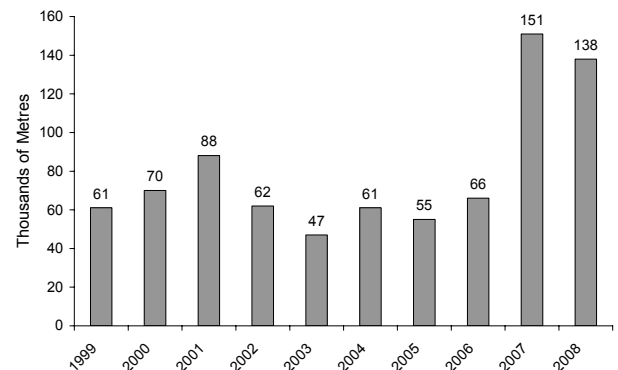


Figure 6.2. Annual exploration drilling in thousands of metres, 1999 to 2008, Southeast Region. Note that prior to 2004 coal production (in pit) drilling at operating coal mines was included in the total.

A time-domain electromagnetic and magnetic airborne geophysical survey was flown over the southern part of the Kootenay Arc in the fall of 2008. The survey, which totals over 4360 line km at a 200 m spacing, was funded jointly by Natural Resources Canada (as part of Targeted Geoscience Initiative-3) and Geoscience BC. Two exploration companies with properties in the survey area, Sultan Minerals Inc (**Jersey-Emerald**) and Dajin Resources Corp (**Oscar**), also contributed to the costs of the survey in order to have the line spacing reduced to 100 m over their properties. The survey area, which is in the vicinity of Salmo, extends over 45 km in a northeast direction from the US border. Besides the **Jersey** lead-zinc and **Emerald** tungsten mines the survey area also

includes the **Reeves-McDonald** and **HB** lead-zinc mines, and the **Sheep Creek** and **Ymir** gold camps. It includes potential for carbonate-hosted, sedex, skarn, porphyry and polymetallic vein-style mineralization.

## OPERATING MINES AND QUARRIES

Current major producing mine and quarry locations in the Southeast Region are shown on Figure 6.3 and basic data concerning these operations are listed in Table 6.1.

### METALS

There are two small underground metal mines in the Southeast Region, Merit Mining Corp's Lexington-Grenoble gold-copper mine, and Roca Mines Inc's MAX molybdenum mine.

Merit Mining Corp's new **Lexington-Grenoble** (MINFILE 082ESE041) underground gold-copper mine achieved commercial production in June 2008. Prior to commencing production, a 10 000-tonne underground bulk sample was extracted. A temporary shutdown of the Lexington-Grenoble mine was announced near the end of the year, due in part to low commodity prices.

The Lexington-Grenoble mine and the new 200 tonnes-per-day **Greenwood Mill** (Figure 6.4) are major components of the company's **Greenwood Gold Project**, which includes several past producers and other mineral occurrences on both sides of the British Columbia-Washington border between Greenwood and Grand Forks. Lexington-Grenoble is an underground mine with a planned production rate of 72 000 tonnes per year. Prior to production resources included 297 000 tonnes combined measured and indicated resources containing



Figure 6.4. Merit Mining Corp's new Greenwood Mill, part of the Greenwood Gold Project, which is processing ore from the Lexington-Grenoble.

8.36 g/t Au and 1.35% Cu, at a cut-off grade of 6.0 g/t Au equivalent.

The Lexington-Grenoble deposit is hosted by an altered package of dacitic to andesitic tuffs. Mineralization, which is believed to have been emplaced during development of the Republic graben, is hosted by sub-parallel lenses of disseminated to narrow veins of pyrite, chalcopyrite and quartz (with or without native gold) adjacent to a fault contact with serpentinite.

Roca Mines Inc's new **MAX** molybdenum mine (MINFILE 082KNW087) at Trout Lake began shipping concentrate in November 2007, and achieved full commercial production in April 2008 (Figure 6.5). MAX is an underground mine with a production rate of 500 tonnes per day on a campaign basis, for an annual production rate of 72 000 tonnes. Mill capacity is 1000 tonnes per day. A major accomplishment in 2008 was completion of a second adit, which will lower operating costs and improve ventilation.

The MAX deposit contains measured and indicated resources of 42.9 million tonnes grading 0.20% MoS<sub>2</sub> using a 0.10% cut-off. The first phase of production will focus on a high-grade zone which, at start-up, contained 280 000 tonnes of measured plus indicated resources grading 1.95% MoS<sub>2</sub>.

Metasediments of the Lower Cambrian to Middle Devonian Lardeau Group at the MAX property are intruded by the Cretaceous Trout Lake stock. The deposit is a pipe-like quartz vein stockwork that extends from surface to a depth of at least 1000 metres, in which molybdenite occurs mainly along margins of veins. The vein stockwork is best developed in close proximity to the margins of the intrusive body and its associated offshoots.



Figure 6.5. Bags of molybdenum concentrate outside Roca Mines Inc's MAX mill.

### COAL

Teck Coal Limited, the world's second-largest supplier of seaborne metallurgical coal, operates five large open pit coal mines in the Elk Valley area. Projected

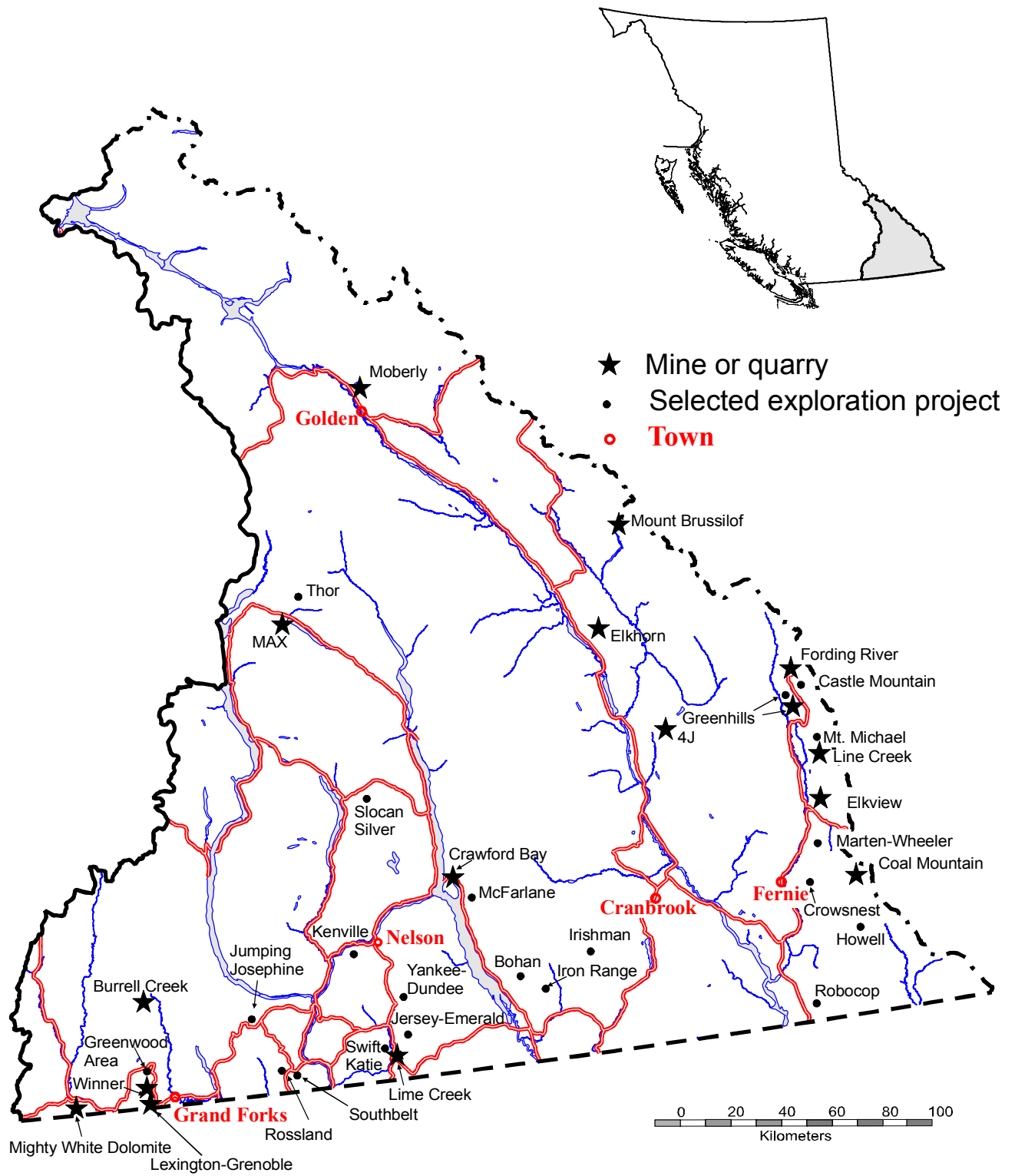


Figure 6.3. Mines, quarries and selected exploration projects, Southeast Region, 2008.

**TABLE 6.1. PRODUCING MINES AND QUARRIES, SOUTHEAST REGION, 2008**

| Mine                                  | Operator                            | Commodity                      | Employment | Forecast 2008 production (million tonnes) | Proven and Probable Reserves as of January 1, 2008 (million tonnes)    |
|---------------------------------------|-------------------------------------|--------------------------------|------------|---|--|
| <b>Coal</b>                           |                                     |                                |            |   |  |
| Coal Mountain                         | Teck Coal Limited                   | Metallurgical coal             | 228        | 2.4 (clean coal)                          | 28.2   |
| Elkview                               | Teck Coal Limited                   | Metallurgical coal             | 850        | 4.9                                       | 235  |
| Fording River                         | Teck Coal Limited                   | Metallurgical coal             | 968        | 8.2                                       | 216.7  |
| Greenhills                            | Teck Coal Limited                   | Metallurgical coal             | 505        | 4.6                                       | 88.9   |
| Line Creek                            | Teck Coal Limited                   | Metallurgical and thermal coal | 347        | 2.2                                       | 17.4   |
| <b>Industrial Minerals (selected)</b> |                                     |                                |            |   |  |
| 4J                                    | Georgia-Pacific Canada Inc          | Gypsum                         | 11         |   |  |
| Crawford Bay                          | Imasco Minerals Inc                 | Dolomite                       |            | 0.040                                     |  |
| Elkhorn                               | CertainTeed Gypsum Canada           | Gypsum                         | 21         | 0.520                                     |  |
| Lime Creek                            | Imasco Minerals Inc                 | Limestone                      |            |   |  |
| Moberly                               | HCA Mountain Minerals (Moberly) Ltd | Silica sand                    | 7          | 0.048                                     |  |
| Mount Brussilof                       | Baymag Inc                          | Magnesite                      | 21         | 0.112                                     |  |
| Burrell Creek                         | Roxul (West) Inc                    | Intrusive rock (mineral wool)  |            |   |  |
| Rock Creek                            | Mighty White Dolomite Ltd           | Dolomite                       |            |   |  |
| Winner                                | Roxul (West) Inc                    | Intrusive rock (mineral wool)  |            |   |  |
| <b>Metals</b>                         |                                     |                                |            |   |  |
| MAX                                   | Roca Mines Inc                      | Mo                             | 100        | 0.109                                     | Measured and indicated resource of 280 000 t at 1.95% MoS <sub>2</sub> |
| Lexington-Grenoble                    | Merit Mining Corp                   | Au-Cu                          | 43         | 0.045                                     | Measured and indicated resource of 297 000 t at 8.36 g/t Au, 1.35% Cu  |

total 2008 coal production at the company's **Coal Mountain, Elkview, Line Creek, Greenhills** and **Fording River** (Figure 6.6) operations is approximately 22.275 million tonnes of clean coal (predominantly metallurgical), up slightly from 2007 (see Table 6.1 for 2008 projected mine production and current reserve statistics). The mines employ 2900 people and make a very important contribution to the local, regional and provincial economies.

Commercially mineable coals in southeast British Columbia belong to the Jurassic-Cretaceous Mist Mountain Formation and are contained in three structurally distinct coalfields. The more northerly Fording River, Greenhills and Line Creek mines are in the Elk Valley coalfield, while the Elkview and Coal Mountain mines are in the Crowsnest coalfield.



Figure 6.6. Eagle Mountain, part of Teck Coal Limited's Fording River Mine.

## INDUSTRIAL MINERALS

The Southeast Region continues to be an important source of a variety of industrial minerals, including magnesite, gypsum, silica sand, dolomite, limestone, tufa, flagstone, ballast, aggregate and slag. A selected number of the larger operations are described below, listed in Table 6.1 and shown on Figure 6.3.

Baymag Inc produces high-quality magnesite from its open pit mine near **Mount Brussilof** (MINFILE 082JNW001), northeast of Radium. Magnesite is transported by truck to Exshaw, Alberta, to the company's processing facilities for production of magnesia (MgO). Production in 2008 is projected to be approximately 110 000 tonnes.

There are two gypsum producers in the Kootenay region. CertainTeed Gypsum Canada operates the **Elkhorn** mine (MINFILE 082JSW021) east of Windermere, and Georgia-Pacific Canada Inc operates the **Four J** mine (MINFILE 082JSW009) southeast of Canal Flats. Production at the Elkhorn mine is projected to be approximately 520 000 tonnes for 2008.

Silica sand is produced from friable quartzite by HCA Mountain Minerals (Moberly) Ltd at the **Moberly** mine (MINFILE 082N 001) and plant, north of Golden. Mine production in 2008 is predicted to be 48 000 tonnes, based on material hauled from the pit.

Imasco Minerals Inc produces a variety of crushed and ground rock products at its Creston Operations Plant at **Sirdar**; rock types include limestone, dolomite, granite and quartzite. Raw sources for these products include an underground dolomite mine at **Crawford Bay** (MINFILE 082FNE113), a limestone quarry at **Lime Creek** (MINFILE 082FSW307) east of Salmo, and a granite quarry at **Sirdar** (MINFILE 082FSE072). Production at Crawford Bay is expected to be 40 000 tonnes of dolomite in 2008.

Mighty White Dolomite Ltd produces a range of crushed and ground dolomite products from its quarry (MINFILE 082ESE200) and plant at **Rock Creek**.

The **Winner** quarry (MINFILE 082ESE265), west of Grand Forks, and the **Burrell Creek** quarry, 45 km north of Grand Forks, both supply feed for the Roxul (West) Inc mineral wool (insulation) manufacturing plant in Grand Forks.

## EXPLORATION HIGHLIGHTS

Major 2008 mineral and coal exploration projects in the Southeast Region are listed in Table 6.2. Their locations, and locations of some other selected projects, are shown on Figure 6.3. Generally the "major" exploration programs involved expenditures in excess of \$500 000 on work that included mechanized ground disturbance, for example, drilling, trenching or bulk

sampling. Except where otherwise indicated, the information in this report was derived from discussions with exploration project staff, as well as from company reports, presentations, press releases and Internet websites.

## BOUNDARY DISTRICT

Kettle River Resources Ltd was active on a few fronts within its **Greenwood Area** holdings, which encompass many known mineral deposits and occurrences, including the past-producing **Phoenix** (MINFILE 082ESE020) and **Emma** (MINFILE 082ESE062) mines. Trenching and diamond drilling were the main activities in 2008 (Figure 6.7). One component of the work focused on the **Minnie Moore** showing, northeast of the Emma, a 2007 discovery of an epithermal siliceous breccia zone in limestone. The **Battle** zone (MINFILE 082ESE029), immediately south of the Phoenix, comprises an area of gold-bearing quartz-pyrite stockworks and shear zones. Finally, a series of parallel gold-bearing quartz-sulphide veins were targets of the work at the **Stemwinder** zone (MINFILE 082ESE013, 14); these veins were known from the past-producing **Stemwinder** and **Brooklyn** mines.

Activities at the **Jumping Josephine** property, 22 km west of Castlegar and just north of Highway 3, undertaken by joint venture partners Astral Mining Corporation



Figure 6.7. Drilling on Kettle River Resources Ltd's Greenwood area properties.

**TABLE 6.2. MAJOR EXPLORATION PROJECTS, SOUTHEAST REGION, 2008**

| Property  | Operator                                     | MINFILE                   | NTS            | Commodity          | Target Type                                    | Work program            | Metres of drilling (estimated in some cases) |
|---|--|---------------------------|----------------|--------------------|--|-------------------------|--|
| Castle Mountain                                       | Teck Coal Limited (Fording River Operations) | 082JSE008                 | 82J/2W         | coal               | sedimentary                                    | RC                      | 13 854                                       |
| Crowsnest   | Kennecott Canada Exploration Inc             |                           | 082G/7W        | coal               | sedimentary                                    | S, RC, DD               | 3445   |
| Elkview mine (Baldy and Natal ridges)                 | Teck Coal Limited                            | 082GNE013, 16, 17         | 82G/15W        | coal               | sedimentary                                    | RC                      | 3100   |
| Greenhills mine (Cougar North and Phase 6 extensions) | Teck Coal Limited                            | 082JSE010                 | 82J/2W         | coal               | sedimentary                                    | RC, G                   | 12 524                                       |
| Greenwood Area properties                             | Kettle River Resources Ltd                   | 082ESE013, 14, 20, 29, 62 | 82E/2E         | Au, Ag, Cu         | epithermal vein, mesothermal vein, skarn       | DD, TR, GC, MG          | 2551   |
| Howell  | Max Resource Corp                            | 082GSE037, 48, 70         | 82G/2E,7E      | Au, Ag, Zn, Pb     | intrusion-related                              | DD, GC, P               | 1300   |
| Jersey-Emerald  | Sultan Minerals Inc                          | 082FSW009, 10, 11, 218    | 82F/3E         | Mo, W, Zn, Pb      | porphyry (Mo), skarn (W), replacement (Pb, Zn) | DD, TR, G, GC, EN       | 7925   |
| Jumping Josephine (JJ)                                | Astral Mining Corp                           | 082ESE275                 | 82E/8E, 82F/5W | Au                 | intrusion-related                              | DD, TR, IP              | 5072   |
| Kenville  | Anglo Swiss Resources Inc                    | 082FSW086                 | 82F/6W         | Au, Cu             | vein, porphyry                                 | DD, IP, MG,             | 14 058                                       |
| Marten-Wheeler  | Teck Coal Limited (Coal Mountain Operations) | 082GNE006, 7              | 82G/10W        | coal               | sedimentary                                    | RC                      | 13 071                                       |
| MAX   | Roca Mines Inc                               | 082KNW087                 | 82K/12E        | Mo, W              | porphyry (mo), skarn (W)                       | G, GC, DD               | 1914   |
| McFarlane   | Jasper Mining Corporation                    | 082FNE125                 | 82F/10W        | Mo                 | porphyry                                       | DD, GC                  | 14 580                                       |
| Mt. Michael   | Teck Coal Limited (Line Creek Operations)    | 082GNE022                 | 82G/15W        | coal               | sedimentary                                    | RC                      | 8903   |
| Rossland  | West High Yield (W.H.Y.) Resources Ltd       | 082FSW119, 116, 117       | 82F/4W         | Mg, Ni, Au, Co     | ultramafic, mesothermal vein                   | DD                      | 5700   |
| Slocan Silver   | Klondike Silver Corp                         | 082FNW013, 43, 50         | 82F/14W        | Ag, Pb, Zn         | vein   | P, G, GP, GC, UG, UG-DD | 350  |
| Southbelt   | Rossland Resources Ltd                       | 082FSW123, 145, 146       | 82F/4W         | Ag, Au, Pb, Zn, Cu | polymetallic vein                              | DD, GP                  | 2750   |
| Swift Katie   | Valterra Resource Corporation                | 082FSW290, 291            | 82F/3W         | Au, Cu             | porphyry                                       | AB-GP, DD               | 2954   |
| Thor  | Taranis Resources Inc                        | 082KNW030, 31, 60, 61, 62 | 82K/11W        | Au, Ag, Cu, Pb, Zn | massive sulphide                               | DD, GC                  | 8765   |
| Yankee –Dundee  | Dundee Mines Ltd                             | 082FSW067, 068            | 82F/6E         | Au                 | mesothermal vein                               | P, G, AB-GP, DD         | 2975   |

**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; CQ = coal quality testing; CT = carbonization test (coal); DD (Xm) = diamond drilling totaling X metres; EN = environmental baseline studies/monitoring, remediation work; FS = feasibility studies; G = geology, mapping, etc; GC = geochemical sampling (rock, soil, silt, etc); GD = geotech drilling; GP = geophysics (general); IP = Induced Polarization; 3D-IP; MG = magnetics; MK = marketing-primarily for industrial mineral products; MS = metallurgical studies; OB = overburden drilling; OP-BU = open-pit bulk sample; P = prospecting; PD = percussion drilling; PF = pre-feasibility studies; PP = Pilot plant, R = reclamation; RC = reverse circulation drilling; TR = trenching, UG (X m) = X metres of underground development; UG-BU = underground bulk sample; UT = UTEM; VLF; WT = washability test (coal)

(60% owner) and Kootenay Gold Inc have been centred on a 2003 discovery of high-grade gold mineralization known as the **JJ Main** zone (MINFILE 082ESE275). Mineralization in this zone is hosted by Jurassic intrusive rocks of the Nelson plutonic suite, and may be related to a later-phase Jurassic intrusion that does not reach surface. Occurrences of Eocene Coryell syenite are also widespread. Mineralization (chiefly pyrite and arsenopyrite) occurs with quartz in stockworks, vein-breccias, ladder veins and sheeted veins, and is associated with a prominent northeast-trending shear zone. Geology, geophysics and geochemistry suggest that the host structure may extend for over 2.5 km. The possibility of more deep-seated porphyry-style mineralization is also being assessed.

Exploration in 2008 included IP chargeability, diamond drilling and trenching. This large property also has other zones with potential economic mineralization, and in addition Astral Mining holds large blocks of adjacent ground.

West High Yield (W.H.Y.) Resources Ltd carried out a third major phase of diamond drilling on its **Rossland** project on the western outskirts of the town of Rossland. Past producers of gold on the company's property include the **Midnight, OK** and **IXL** (MINFILE 082FSW119, 116 and 117). Gold mineralization is associated with ultramafic contacts and a regional tectonic boundary, and consists of gold-bearing quartz-carbonate veins in contrast to the more typical Rossland-style base metal sulphide-rich veins. The major effort in 2008 was focused on the Mg potential of the **Record Ridge** ultramafic body, which, along with the OK ultramafic body, has potential for magnesium, nickel, cobalt and gold. Preliminary metallurgical testing of the extractability of magnesium from drill core of ultramafic material was carried out in 2008.

In the same camp, Rossland Resources Ltd drilled the **Southbelt** property in 2008. The property includes the so-called Rossland Southbelt veins (e.g. MINFILE 082FSW146, 145 and 123) hosted by Jurassic Rossland Group volcanics, immediately south of the town of Rossland.

## **WEST KOOTENAYS**

The **Jersey-Emerald** project 10 km south of Salmo was the site of extensive drilling by Sultan Minerals Inc. The underground **Jersey** lead-zinc and **Emerald** tungsten mines (MINFILE 082FSW009, 10, 11 and 218) closed in 1973. Exploration by Sultan over the past few years has focused on molybdenum and tungsten, and was recently expanded to include zinc and lead. Work in 2008 included large underground and surface diamond drilling programs designed to test the East Emerald Tungsten zone and the East Dodger Molybdenum zone. Environmental-baseline studies are also underway.

Stratabound zinc-lead mineralization in the Jersey mine is associated with Paleozoic carbonates near the south end of the Kootenay Arc. Six un-mined tungsten targets were reported by the operator at the time of the closure of the Emerald mine, which lies beneath the Jersey zinc-lead bodies. These targets occur as broad linear bands trending for more than 1500 m to the north and south of the old mine workings. In addition, another target referred to as the East Emerald Tungsten zone, associated with a unit referred to historically as the "lower skarn horizon", was identified by Sultan Minerals from historic mine plans and drill logs. This new zone lies between the Invincible and Dodger Tungsten zones, and has been shown to extend more than 1000 m in length and 200 m in width. It is a low-grade, bulk tonnage target. Molybdenum-bearing, granitic intrusion-hosted quartz stockworks lie beneath the old tungsten mine workings in the East Dodger mine area. Molybdenum is also associated with tungsten in the East Emerald zone.

Duncastle Gold Corp carried out a large diamond drilling program on the **Yankee-Dundee** property near Ymir. The property includes several past producers, including the **Yankee Girl** (MINFILE 082FSW068), and the **Dundee** (MINFILE 082FSW067), which produced polymetallic (silver, lead, zinc, gold) veins. The objective of the current exploration program, which included diamond drilling and an airborne EM/magnetic survey in 2008, is to identify extensions of the high-grade material that was worked in the past.

Mineralized veins are mainly hosted by argillites and quartzites of the Jurassic Ymir Group, which were intruded by granodiorites of the Middle to Late Jurassic Nelson plutonic suite. Veins are typically composed of quartz, pyrite, galena and sphalerite.

Roca Mines Inc carried out two initial surface diamond drilling programs at the **MAX** molybdenum mine. A biogeochemical Mo anomaly in close proximity to the MAX portals found in 2007 by workers conducting research under the Geological Survey of Canada's Targeted Geoscience Initiative was one target for drilling. Two drillholes intersected a wide zone of intense silicification, quartz veining and sericite alteration with trace molybdenite throughout. By analogy with the MAX deposit itself, this new zone may represent the uppermost portions of a new Mo system. The Ridge Tungsten zone on the MAX mine property was also drilled. From previous mapping this tungsten skarn zone was known to occur over a strike length of 1400 m, and the 2008 drilling targeted the southern part. Drill results suggest that tungsten mineralization, which lies above the mine, may be accessible from the underground workings.

Taranis Resources Inc's **Thor** property (Figure 6.8), located on the eastern flank of Great Northern Mountain in the Ferguson area, was the site of an intensive drilling program in 2008. The property encompasses several polymetallic (silver, lead, zinc, gold, copper) mineral occurrences, including the past-producing **True Fissure** (MINFILE 082KNW030), **Great Northern** (MINFILE



Figure 6.8. Field office at Taranis Resources Inc's Thor property.

082KNW061) and **Broadview** (MINFILE 082KNW031). Results to date, including geophysical surveys conducted in 2007, suggest strongly that the various known occurrences, previously classified as polymetallic veins, are part of a single, laterally-extensive, faulted and stratabound massive sulphide system with volcanogenic massive sulphide (VMS) affinities. This system has been dubbed the “combined metals unit” (CMU) by the company. Sulphides occur both in massive form as well as associated with quartz breccia.

The CMU on the Thor property occurs in association with the contact between a volcanoclastic and an argillaceous unit within the Broadview Formation of the Paleozoic Lardeau Group. The contact dips steeply to the east and is overturned on the west limb of the north-northwest-plunging Broadview Anticline. To date mineralization has been demonstrated to occur over a distance of greater than 1.6 km parallel to the fold axis, and tectonic thickening may occur along this trend. The close association with a graphitic fault zone has allowed for geophysical extrapolation and correlation of the various mineralized zones. For example, the True Fissure zone is believed to be a faulted-off portion of the larger Great Northern zone.

Work in 2008, which included 8765 m of diamond drilling, has focused on further developing the VMS model and defining the source of mineralization, affirming correlation and continuity of the various zones, and defining resources.

The **Slocan Silver** project, east of New Denver, is in a rich past-producing district of vein-style silver-lead-zinc mineralization. Major progress was made in 2008 by Klondike Silver Corp. Klondike's holdings have been broken down into six areas, each of which encompasses several past producers. These include **Sandon**, **Hewitt-Van Roi**, **Silverton Creek**, **Cody Creek**, **Payne** and **Jackson Basin**. The company's **Silvana mill** at Sandon, a 100 tonnes-per-day concentrator, is currently operational and is processing ore-grade material from this project and

another project in western Canada. Moreover, shipments of concentrate from the mill to a smelter have begun.

Klondike Silver activities on the Slocan Silver project range from prospecting, geological mapping, geophysics and soil geochemistry to underground drilling, rehabilitation, development and small-scale production. The overall objective is to discover new lodes or extensions of the known deposits through the use of modern exploration technologies. In the cases of the past producers, an emphasis is on locating and recovering zinc-rich zones that may have been previously ignored.

Underground work in 2008 at the **Silvana** (MINFILE 082FNW050), **Wonderful** (MINFILE 082FNW043) and **Hinckley** (MINFILE 082FSW013) mines, all past-producers in the Sandon area, was intended to outline bodies of mineralization in the range of thousands to tens of thousands of tonnes, and resulted in delivery of mineralized rock to the Silvana mill. Surface work included geology, geochemistry and geophysics at several locales. New mineral showings have been discovered this year in the Hewitt-Van Roi area. Vein-hosted mineral occurrences in the Slocan are hosted by sheared and brecciated argillite and slate of the Triassic Slocan Group, which are intruded by granodiorite and quartz monzonite dikes.

Valterra Resource Corporation undertook a large diamond drilling program on its **Swift Katie** property, southwest of Salmo. The **Katie** portion of the property (MINFILE 082FSW290) is host to an alkaline Cu-Au porphyry occurrence, while the **Swift** (MINFILE 082FSW291) hosts gold mineralization related to shear zones, but is considered to have potential for porphyry-style mineralization at depth.

The Swift Katie property is underlain by Rossland Group volcanics and sediments. Mineralization is primarily hosted by intermediate to mafic volcanic rocks, including flows and tuffs, of the Elise Formation. Mafic intrusive rocks of probable synvolcanic origin are closely associated with the volcanics. Rossland Group in the area is intruded by Middle Jurassic Nelson intrusions as well as Tertiary stocks and dikes.

In the Katie alkaline porphyry occurrence sulphide minerals, mainly pyrite and lesser chalcopyrite, occur disseminated in volcanic and intrusive rocks or in veinlets of quartz, calcite, potassium feldspar, chlorite and epidote. Mineralization is associated with propylitic and potassic alteration.

Anglo Swiss Resources Inc was very active on its **Kenville** property, roughly six kilometres west of Nelson. The Kenville (MINFILE 082FSW086), also known as the Granite-Poorman, operated intermittently between 1890 and 1954, with the bulk of production from 1899 to 1912. More than 180 000 tonnes of ore were mined, which yielded over 2 million grams Au and 861 000 grams Ag. Production averaged more than 17 g/t Au, from a series of thin, northeast-dipping quartz veins. Hostrocks are lower Jurassic “pseudodiorites” and pyroxenites which are



intruded into, and may be intrusive equivalents of, basalts of the lower Jurassic Elise Formation of the Rosslund Group. Middle Jurassic (Nelson suite) and Tertiary intrusive rocks are also common in the immediate area.

Recent work by Anglo Swiss has focused on underground rehabilitation, mill upgrading, and diamond drilling, as well as pilot production and marketing of aggregate from old waste dump material. The company wants to be in a position to embark on a pilot underground gold production and milling program, while continuing to explore for extensions of known ore-grade material and new mineralization. Veins occur in two groups, one being the system of veins that were mined in the past on the east or Kenville Mine side of the property, and the other a system of veins on the west side of the property referred to collectively as the Eagle vein. Drilling has been directed at evaluating both groups of veins as well as the potential for porphyry-style gold-copper. The company reports the discovery of up to four new veins on the west side of the property. Also, a significant Cu-bearing shear zone that parallels the vein systems has been outlined on the west side of the property.

### ***EAST KOOTENAYS***

Jasper Mining Corporation carried out another large diamond drilling program on its **McFarlane** molybdenum property (MINFILE 082FNE125) east of Kootenay Lake near the community of Gray Creek. Cretaceous quartz monzonite is the predominant host lithology. Molybdenite is associated with quartz veins which may represent the uppermost portions of a porphyry system. Individual veins are up to 1.5 m in thickness, and may also contain pyrite and sericite. The company believes there may be potential for recovery of both high-grade material and bulk-tonnage lower-grade material. An independent resource assessment will be carried out in the near future. The property is adjacent to the company's **Lydy** molybdenum property.

Max Resource Corp drilled the **Howell** gold property, which straddles Howell and 29 Mile creeks approximately 45 km southeast of Fernie. At the Howell property Upper Cretaceous syenites are intruded into platformal sedimentary rocks. Mineralization occurs as disseminations in Paleozoic carbonates and as quartz stockworks in both intrusives and sediments. There is also believed to be potential for carbonate replacement-style mineralization.

The search for stratabound base metal mineralization in the Proterozoic Purcell Supergroup, including sedex-style lead-zinc at the Sullivan horizon in the Aldridge Formation, continued on several fronts, although efforts were in general scaled back from the past few years. Ruby Red Resources Inc drilled the **Robocop** property (MINFILE 082GSW019), on the east side of the Rocky Mountain Trench 80 km southeast of Cranbrook. The

Robocop hosts Cu-Co mineralization in sandstone in the upper part of the Purcell Supergroup. Eagle Plains Resources Ltd drilled on both the **Bohan** (MINFILE 082FSE125) and **Iron Range** (MINFILE 082FSE014 to 28) properties to the east of Creston. There are two styles of mineralization present at the Iron Range, sedex lead-zinc associated with the Sullivan horizon, and Cu-Au associated with iron oxide mineralization along the Iron Range fault. There is also potential for sedex-style mineralization at the Bohan property, although at a higher stratigraphic position within the Purcell Supergroup. Lastly, Klondike Gold Corp completed a drillhole begun in 2007 at the **Irishman** property (MINFILE 082FSE110) 35 km southwest of Cranbrook. The Sullivan horizon was intersected in the Irishman hole, and it contained sulphide mineralization reminiscent of distal fringes of sedex-style occurrences.

### ***EAST KOOTENAY COALFIELDS***

Exploration in the coal-bearing Jurassic-Cretaceous strata of the Mist Mountain Formation (collectively known as the East Kootenay coalfields where they occur in British Columbia) in 2008 was carried out by Teck Coal Limited (formerly Elk Valley Coal Corporation) and Kennecott Canada Exploration Inc. This work contributed significantly to the overall exploration totals in southeast BC. Not including production and development drilling at Teck Coal's five mines, coal exploration expenditures totalled over \$17 million and coal exploration drilling totalled close to 55 000 m, the bulk of it rotary drilling.

In some cases unconventional drilling techniques were used. Notably, Teck Coal is successfully utilizing large-diameter, reverse-flood rotary drilling for the collection of bulk samples, cutting down significantly on sampling costs. In the case of Kennecott Canada Exploration's deep drilling program, oil and gas exploration equipment, including blowout-prevention technology, was used (Figure 6.9).



Figure 6.9. Drilling on the Crowsnest coal project, Kennecott Canada Exploration Inc.

All of Teck Coal's five metallurgical coal mines carried out major exploration programs in 2008, aimed at establishing reserves outside of the active pits. Beginning in the Elk Valley coalfield, Fording River Operations drilled on **Castle Mountain** (MINFILE 082JSE008), 5 km south of and along strike from, active **Fording River** mine pits on **Eagle Mountain** (MINFILE 082FSE009), and roughly 10 km northeast of Elkford. The Mist Mountain Formation at this location is preserved on both limbs of the Alexander Creek syncline.

Greenhills Operations drilled the **Cougar North Extension** and **Phase 6 Extension** areas at the north end of the **Greenhills** mine (MINFILE 082JSE007) on the Greenhills Range; coal seams are contained within the Greenhills syncline.

Line Creek Operations drilled on **Mt. Michael** (MINFILE 082GNE022), approximately 3 km north along strike from the **Line Creek** mine, and roughly 9 km southeast of Elkford. Surface-mineable coal seams are on the east limb of the Alexander Creek syncline and dip moderately to the west.

The other coal exploration projects were carried out in the Crowsnest coalfield (or Fernie Basin), a broad synclorium to the south of the Elk Valley coalfield. Elkview Operations carried out rotary-drilling programs in the **Baldy Ridge** (MINFILE 082GNE016) and **Natal Ridge** (MINFILE 082GNE013) areas, at the western and eastern extents of the **Elkview** mine, respectively.

Coal Mountain Operations continued to assess the potential of the **Marten-Wheeler** area (MINFILE 082GNE006, 7), roughly 19 km northeast of Fernie and immediately south of **Parcel 73** of the Dominion Coal Block (MINFILE 082GNE008). This site, which encompasses Marten, Wheeler and Hosmer ridges, is not structurally contiguous with **Coal Mountain** mine and is approximately 18 km distant. Surface-mineable coal in the Marten-Wheeler area tends to be of higher volatile-matter content than current typical products from Elk Valley's mines.

Kennecott Canada Exploration Inc began evaluation of their **Crowsnest** property in the Crowsnest coalfield, approximately 8 km east of Fernie. The Mist Mountain Formation on this property is overlain by younger Kootenay Group and Blairmore Group strata and is relatively flat-lying. Coal seams at this location are essentially the easterly, down-dip extensions of coals which crop out and were mined underground at the **Coal Creek Colliery** between 1898 and the 1950s. The objective of the Crowsnest project is to identify reserves of metallurgical coal mineable by underground longwall techniques. Longwall mining requires large panels of relatively flat-lying, undisturbed coal of reasonable thickness; the company is targeting areas distant from faulting and folding, and within the upper part of the Mist Mountain Formation. The target coal seams are referred to as A, 10, 9 and 8 based on the nomenclature at the Coal Creek colliery. Exploration in 2008 consisted of a seismic

survey and deep drilling using both rotary and core drilling for interseam strata and coal seams, respectively.

## OUTLOOK FOR 2009

It is anticipated that next year will be challenging for the industry in southeast BC. All signs are that it will be difficult to attract investors for exploration projects, and that the economics of some existing mining operations will be affected by lower commodity prices. Consequently, exploration expenditures could drop substantially, and mine production totals may also decline.

On the other hand, southeastern BC boasts well-developed infrastructure, and is host to a wide variety of commodities. These factors may partially mitigate the impacts of the economic downturn.

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