

Exploration and Mining in British Columbia, 2015: A summary



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1. Introduction

Reflecting its complex geological history, British Columbia is endowed with diverse minerals and deposit types. British Columbia is Canada's largest exporter of coal, leading producer of copper, and only producer of molybdenum. Also produced are significant amounts of gold, silver, lead, and zinc, and over 30 industrial minerals including gypsum, magnesite, limestone, and dimension stone. Numerous quarries produce sand and gravel or crushed aggregate.

Despite decreased commodity prices and continued difficulties securing venture capital, mine development projects and numerous mineral exploration projects remained active in 2015 (Fig. 1).

Flanked by the Pacific Ocean, British Columbia offers easy access to global markets. Mine operations benefit from tax incentives and a well-developed infrastructure, including low-cost electricity, an integrated road and rail network, and large deep-water ports. Exploration benefits from an extensive geoscience database, a web-based mineral tenure system, and investment incentives such as the British Columbia Mining Exploration Tax Credit and the British Columbia Mining Flow-Through Share Tax Credit.

This summary uses information from the British Columbia Coal Industry Overview (British Columbia Geological Survey Information Circular 2016-2) and incorporates reports, presented in this volume, from five Regional Geologists. The Regional Geologists (Fig. 2; Table 1) represent the provincial government on geological matters at a regional level. Within their communities, they provide information on exploration trends, possible investment opportunities, land use processes, First Nation capacity building, and public outreach.

2. Mine production

The Ministry of Energy and Mines estimates total value of mine production for 2015 at \$6.9 billion (Fig. 3), including coal, copper, industrial minerals, aggregate, gold, molybdenum, silver, zinc, and lead. This is close to the 2014 preliminary value reported by NRCAN of \$7.0 billion (Fig. 4). For 2015, coal remained the highest value mine product from British Columbia, comprising about 44% of the total output, followed

by copper (about 35%).

In 2015, 11 metal mines operated during at least part of the year (Table 2) and coal was produced at five large open pit operations in the southeastern part of the province and one underground mine on Vancouver Island (Table 3). About 30 industrial mineral mines and more than 1,000 aggregate mines/quarries were in operation. At the start of 2016, mine closures reduced the number of operating metal mines to seven and operating coal mines to five.

3. Mining highlights

3.1. Metal mines

Metal mines accounted for an estimated \$3.02 billion of all mine production in 2015, representing about 44% of all mine production in the province (Table 2). Nine metal mines were in production at the start of 2015. This number dropped to eight by the end of the year, and to seven as of January 2016.

Imperial Metals Corporation's **Mount Polley** mine resumed operations in August after a one-year shutdown due to a tailings pond dam breach in 2014. In June, Nystar N.V.'s **Myra Falls** base metal mine suspended operations, primarily due to low base-metal prices. Also in June, Barkerville Gold Mines Ltd.'s **Bonanza Ledge** mine operation went on care and maintenance as new management decided to assess the operation and carry out an exploration program to identify multiple high-grade gold deposits. In July, Banks Island Gold Ltd.'s, **Yellow Giant** gold mine was shut down due to regulatory compliance issues. Although Huckleberry Mines Ltd.'s **Huckleberry Mine** produced throughout 2015, in January 2016 it was announced that pit operations were to be shut down.

In the Skeena Region, Imperial Metals Corporation's **Red Chris** copper-gold mine shipped their first load of concentrate to Asia in April and commercial production was declared on July 1st. In the Omineca Region, ramp-up activities continued at Thomson Creek Metals Company Inc.'s **Mt. Milligan mine** (Fig. 5) as it completed its second full year of operations. By the end of November, average daily mill throughput reached 59,066 tonnes, essentially reaching a year-end target processing rate of 60,000 tonnes per day.

In the Thompson-Okanagan-Cariboo Region, Copper

Mines, mine development, selected proposed mines and selected exploration projects in British Columbia, 2015

Jim Britton, Gordon Clarke, Paul Jago, Fiona Katay, Jeff Kyba, Bruce Northcote, and Tim Song

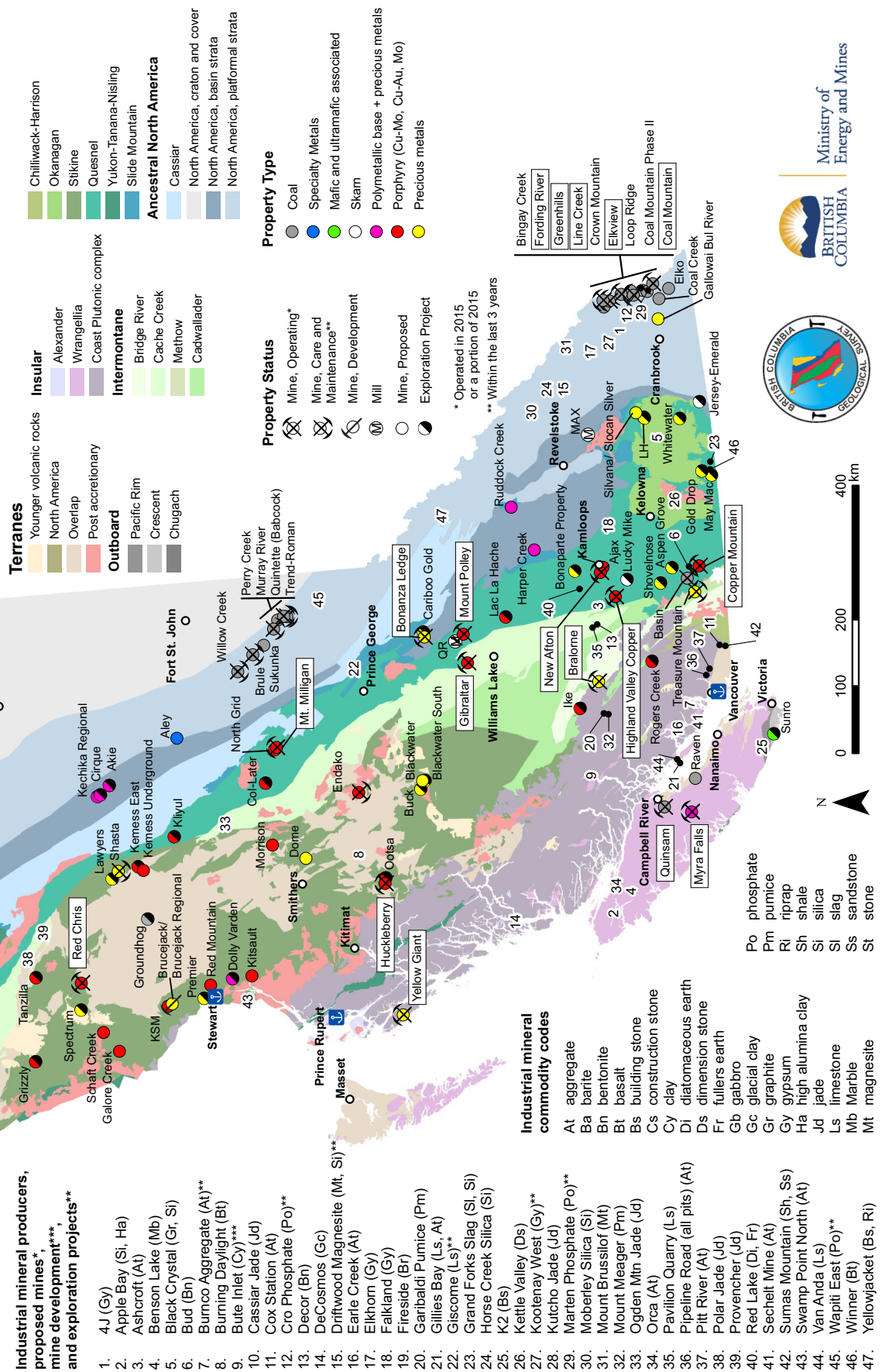
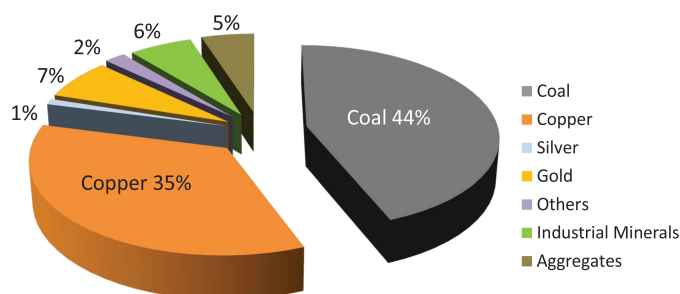
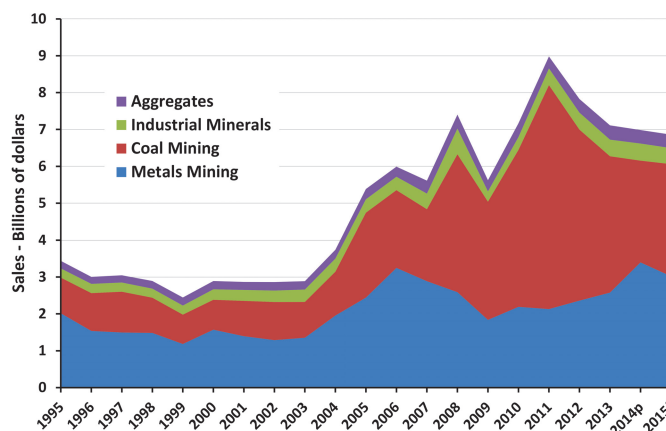


Table 1. Regional Geologists contact information.

Region	Community	Regional Geologist	Phone	email
Skeena	Smithers	Jeff Kyba	250-847-7787	Jeff.Kyba@gov.bc.ca
Omineca and Northeast	Prince George	Paul Jago	250-565-4316	Paul.Jago@gov.bc.ca
Thompson-Okanagan-Cariboo	Kamloops	Jim Britton	250-371-3903	Jim.Britton@gov.bc.ca
Kootenay-Boundary	Cranbrook	Fiona Katay	250-426-1758	Fiona.Katay@gov.bc.ca
South Coast and West Coast	Vancouver	Bruce Northcote	604-660-2713	Bruce.Northcote@gov.bc.ca
Mineral Development Office	Vancouver	Gordon Clarke	604-660-3332	Gordon.Clarke@gov.bc.ca

**Fig. 2.** The Regional Geologists monitor mining and exploration from bases in Smithers, Prince George, Kamloops, Cranbrook, and Vancouver.**Total 2015 Estimated Value of BC Mineral Production -6.9 Billion****Fig. 3.** Estimated value of British Columbia mineral production for 2015.

Mountain Mining Corporation consistently met production targets at its **Copper Mountain** mine after a new secondary crusher was installed in 2014. Teck Resources Ltd's **Highland Valley** mine achieved throughputs of 139,000 tonnes per day, exceeding its rated capacity of 130,000 tonnes per day. New Gold Inc. continued to advance their **New Afton** mine, and their new mill was commissioned ahead of schedule in the second quarter of 2015.

**Fig. 4.** Value of British Columbia mineral production by year.**Fig. 5.** Blast hole drills in pit at Mt. Milligan mine.

3.2. Coal mines

Six operating coal mines (Table 3) accounted for an estimated \$3.04 billion of production for 2015, representing about 44% of all mineral production in the province. The mines included five large open-pit operations of Teck Coal Limited, in southeastern British Columbia (Fig. 6) and the underground operation of Hillsborough Resources Ltd. on Vancouver Island.

Teck Coal Limited, carried out cost-cutting measures



Fig. 6. Pit operations at Teck Coal Limited's Greenhills coal mine.

including rotating 3-week shutdowns during the summer. Hillsborough Resources Ltd.'s underground operation shut down for several weeks over the summer. Although production resumed in August, operations were suspended indefinitely in early January 2016. Shutdowns were due to an oversupply in coal and steel markets that caused global prices to fall for the third straight year. Premium hard coking coal dropped to \$89 from \$121 in 2014, pulverized coal injection coal to \$73 from \$107, and thermal coal to \$64 from \$82 (all prices are per tonne, in \$US, estimated, West Coast port price).

3.3. Industrial minerals, aggregates, and jade

About 30 industrial mineral mines and over 1000 aggregate operations are active in British Columbia. Selected operations are listed in Table 4. With estimated production figures for industrial minerals of \$435 million (6% of total mineral production) and for aggregates of \$364 million (5% of total mineral production), these operations are important to the economy of the province. British Columbia produces the world's best quality nephrite jade, with demand close to a few hundred tonnes per year.

In the Skeena Region, Highbank Resources Ltd. began operations at their new **Swamp Point North** aggregate mine, 51 km south of Stewart. In the Northeast Region, Fireside Minerals Ltd. finished mining of its Bear pit. Overburden pre-stripping prepared the Moose Pit at the **Fireside** barite mine for mining in 2016. In the Kootenay-Boundary Region, Heemskirk Canada Limited continued with redeveloping their **Moberly Silica** operation. In addition to producing high quality silica sand for industrial applications they plan to produce frac sand. Commissioning of a new plant capable of processing up to

300,000 tonnes per year is expected by late 2016 or early 2017. Frac sand will comprise 64% of production.

In the South and West Coast regions, a number of operations remained in steady production and continue to be a major employer.

4. Mine development projects

As used herein, the term 'mine development projects' refers to those where the decision to produce has been made, necessary permits have been acquired, financing has been secured, and on-site construction has started. Both 2015 mine development projects are in the Skeena Region (Table 5).

Pretium Resources Inc.'s **Brucejack** high-grade gold project was permitted, and an initial \$540 M (US) tranche of construction financing was secured. Mine site construction is underway and operations are scheduled to start up in 2017. In June, JDS Silver received their Mines Act Permit to mill up to 75,000 tonnes per year from their underground **Silvertip**, silver-lead-zinc deposit. In 2015, the company refurbished access to the site. Mill and camp facility construction is planned for 2016; operations are projected to start up in the fall of 2016.

5. Selected proposed mine projects

Projects at the proposed mine (or mine evaluation) stage have a resource defined or largely defined and are at least preparing to submit a project description to initiate the environmental assessment process, or are waiting on permit amendments. Projects that have permits in place but have yet to obtain financing to begin site construction are also considered to be at the proposed stage. Selected projects (Table 6) discussed below are grouped by region.

5.1. Skeena Region

5.1.1. Proposed metal mines

The Skeena Region was the most active in the province, with a number of high-profile projects.

Metal Mountain Resources Inc. and subsidiary Gavin Mines Inc. partnered with Grace Mining Inc. to work towards restarting the historic **Dome Mountain** gold and silver mine. An amended mines act permit is required to allow on site milling and tailings disposal. The **Galore Creek** copper-gold-silver project is owned by the Galore Creek Partnership, in which a wholly owned subsidiary of Novagold Resources Inc. and Teck Resources Ltd. are equal partners. In 2015, work was limited to baseline monitoring and targeted engineering studies.

Alloycorp Mining Inc.'s past producing **Kitsault** molybdenum-silver mine is fully permitted, but requires project financing. In 2015, Alloycorp completed pre-construction earthworks for a new mill site, upgraded a critical bridge access, and increased camp capacity to house several hundred construction workers.

Seabridge Gold Inc. continued work on their fully permitted **KSM** copper-gold porphyry deposit. Drilling at depth intersected higher average grades than the presently defined 2.16 billion tonnes of Reserves. Highlights include 483 m

Table 2. Operating metal mines, 2015, forecast mine production, reserves and resources.

Mine	Region	Operator	Commodity; deposit type; MINFILE	Forecast 2015 Production (based on Q1- Q3)	Reserves (Proven + Probable)	Resource (Measured and Indicated)	Comments
Huckleberry	Skeena	Huckleberry Mines Ltd.	copper, gold, silver, molybdenum; porphyry Cu-Mo- Au; 093E 037	15,244 t (33.6 Mlb) Cu, 81 kg (2,616 oz) Au, 4,924 kg (158,339 oz) Ag	42 Mt at 0.33% Cu and 0.01% Mo	180.7 Mt at 0.32% Cu, 0.01% Mo	Year four of Main Zone Optimization Plan completed in 2015. Early 2016 announcement of pit closure and layoffs
Red Chris	Skeena	Red Chris Development Company Ltd.	copper, gold; porphyry Cu-Au; 104H 005	17,282 t (38.1 Mlb) Cu, 495 kg (15,925 oz) Au	301.5 Mt at 0.36% Cu and 0.27 g/t Au	1,034.7 Mt at 0.35% Cu, 0.35 g/t Au, 1.14 g/t Ag	First eight months of production (Feb.-Sept.)
Yellow Giant	Skeena	Banks Island Gold Ltd.	gold, silver; Au- quartz veins 103G 024 103G 026	279 kg (9,555 oz) Au, 866 kg (27,846 oz) Ag	n/a	78,000 t at 23 g/t Au, 43 g/t Ag (2013)	Temporarily shut down
Mt. Milligan	Omineca	Thompson Creek Metals Company Inc.	Cu, Au, Ag; Alkalic porphyry Cu-Au; 093N 194	32,124 t (70.8 Mlb) copper; 6771 kg (217,700 oz) gold	542.1 Mt at 0.201% Cu and 0.355 g/t Au; containing 1.092 Mt (2407.4 Mlb) Cu and 192.8 t (6.20 Moz) Au	122.3 Mt at 0.15% Cu and 0.321 g/t Au (additional to reserves)	Ramp-up continued, engineering studies for permanent secondary crushing circuit, second SAG mill discharge screen deck installed, Q1-Q3 reported capex was \$43.7 million
Bonanza Ledge (on care and maintenance as of June 2015)	Thompson- Okanagan- Cariboo	Barkerville Gold Mines Ltd.	gold; pyrite replacement; 093H 140	11,162 oz Au	Nil	Resource (as of 2015-03-31; cut- off 1.7 g/t Au): Measured: 170,000 t grading 8.74 g/t Au (containing 48,000 oz Au); Indicated: 240,000 t grading 6.86 g/t Au (containing 54,000 oz Au); M+I: 420,000 t grading 7.63 g/t Au (containing 102,000 oz Au)	Previously reported reserves have been reclassified as resources because profitable mining has not been demonstrated since test mining began in 2014. Ore was trucked and processed at the QR mill until June of 2015
Copper Mountain	Thompson- Okanagan- Cariboo	Copper Mountain / Mitsubishi Materials	copper, gold, silver; alkalic porphyry; 092HSE 001	77.6 Mlb Cu; 29,200 oz Au; 288,400 oz Ag	Proven and Probable reserves as of 2014-12-31; 0.18% Cu cut- off): 146 Mt grading 0.35% Cu, 1.47 g/t Ag, 0.12 g/t Au (containing 1.1 Blb of Cu; 6.9 Moz Ag; 560,000 oz Au)	Measured and Indicated resources (as of 2014-12-31; 0.18% Cu cut- off): 265 Mt grading 0.33% Cu, 1.33 g/t Ag, 0.40 g/t Au (containing 1.9 Blb Cu; 11.35 Moz Ag; 930,000 oz Au)	-

Table 2. Continued.

Gibraltar	Thompson-Okanagan-Cariboo	Taseko Mines Ltd.	copper, molybdenum; calc-alkalic porphyry; 093B 012	144 Mlb Cu; 1.3 Mlb Mo.	Proven and Probable reserves (as of 2014-12-31; cut-off not stated): 749 Mt grading 0.256% Cu and 0.008% Mo. (Recoverable metal: 3.3 Blb Cu)	Measured and Indicated resources (as of 2014-12-31; cut-off grade not stated): 1,092 Mt grading 0.254% Cu and 0.008% Mo	-
Highland Valley Copper	Thompson-Okanagan-Cariboo	Teck Highland Valley Copper Partnership	copper, molybdenum; calc-alkalic porphyry; 092ISW012	146,900 t Cu; 3.3 Mlb Mo	Proven and Probable reserves (as of 2014-12-31; cut-off not stated): 608 Mt grading 0.30% Cu; 0.008% Mo. (Recoverable metal: 1,570,000 t Cu; 30,000 t Mo.)	Resources (as of 2014-12-31; cut-off not stated): Measured: 395 Mt grading 0.32% Cu; 0.009% Mo; Indicated: 913 Mt grading 0.22% Cu; 0.011% Mo	-
Mount Polley (operations resumed August 2015)	Thompson-Okanagan-Cariboo	Imperial Metals Corporation	copper; gold; silver; alkalic porphyry; 093A 008	5.8 Mlb Cu; 11,000 oz Au; 30,000 oz Ag	Probable reserves (as of 2014-01-01; 0.15% Cu cut-off): 86 Mt grading 0.295% Cu, 0.30 g/t Au, 0.62 g/t Ag	Measured and Indicated resources (as of 2014-01-01; 0.15% Cu cut-off): 411 Mt grading 0.28% Cu, 0.29 g/t Au, 0.81 g/t Ag	Company did not upgrade reserve and resource information for 2015
New Afton	Thompson-Okanagan-Cariboo	New Gold Inc.	copper, gold; alkalic porphyry; 092INE 023	405,000 oz Au; 1.8 Moz Ag; 95 Mlb Cu	Proven and Probable reserves (as of 2014-12-31; cut-off not stated): 42 Mt grading 0.56 g/t Au, 2.3 g/t Ag, 0.84% Cu; (containing 760,000 oz Au, 3.1 Moz Ag, 781 Mlb Cu)	Measured and Indicated resources (as of 2014-01-01; cut-off not stated): 73 Mt grading 0.75 g/t Au, 2.2 g/t Ag, 0.87% Cu; (containing 1.75 Moz Au, 5.2 Moz Ag, 1.4 Blbs Cu)	-
Myra Falls	West Coast	Nyrstar N.V.	Zn, Cu, Pb, Au, Ag; G06: Noranda/Kuroko Massive Sulphide Cu-Pb-Zn; 092F 330, 092F 073	145,000 t 6.91% Zn 0.47% Pb 0.69% Cu, 1.24 g/t Au, 51.94 g/t Ag (9,000 t Zn, 200 t Pb, 600 t Cu, 4,000 oz Au, 209,000 oz Ag)	5.87 Mt 5.92% Zn 0.61% Pb 0.85% Cu 61.50 g/t Ag 1.54 g/t Au	7.36 Mt 6.41% Zn 0.66% Pb 1.00% Cu 66.31 g/t Ag 1.72 g/t Au	Operations suspended Q2. Resource inclusive of reserves

Table 3. Operating coal mines, 2015, forecast mine production and reserves.

Mine	Region	Operator	Commodity; deposit type	Forecast 2015 Production (based on Q1-Q3)	Reserves (Proven + Probable)	Resource (Measured and Indicated)	Comments
Fording River	Kootenay-Boundary	Teck Coal Limited (100%)	Coal HCC, TC	7.9 Mt	Proven + Probable: 620.4 Mt HCC + 4.5 Mt TC	Measured + Indicated: 1149 Mt HCC + 9 Mt TC; Inferred: 0.8 Mt HCC + 6 Mt TC	EA approval of Swift expansion (2015); exploration drilling in active pits
Greenhills	Kootenay-Boundary	Teck Coal Limited (80%); POSCAN (20%)	Coal HCC, PCI, TC	5.2 Mt	Proven + Probable: 60.6 Mt HCC + 3.7 Mt PCI + 1.2 Mt TC	Measured + Indicated: 264.5 Mt HCC + 1.8 Mt PCI + 3.6 Mt TC	Cougar Pit Expansion (CPX) is preparing for pre-application of EA; environmental baseline
Line Creek	Kootenay-Boundary	Teck Coal Limited (100%)	Coal HCC, PCI, TC	3.1 Mt	Proven + Probable: 66.8 Mt HCC + 3.1 Mt PCI + 8.7 Mt TC	Measured + Indicated: 712 Mt HCC + 0.7 Mt PCI + 9.1 Mt TC	Burnt Ridge Extension (BRX) in pre-application of EA (2014); pre-stripping at Line Creek Phase II (2013 EA approval)
Elkview	Kootenay-Boundary	Teck Coal Limited (95%); Nippon Steel & Sumimoto Metal Corp. (2.5%), POSCO (2.5%)	Coal HCC	6.3 Mt	Proven + Probable: 215.2 Mt HCC	Measured + Indicated: 705.3 Mt HCC; Inferred: 176.2 Mt HCC	Baldy Ridge Extension (BRE) in pre-application of EA (2014); exploration drilling in active pits; development progressing in new approved mining areas
Coal Mountain	Kootenay-Boundary	Teck Coal Limited (100%)	Coal PCI, TC	2.3 Mt	1.6 Mt Proven + 5.6 Mt Probable PCI	57.7 Mt Measured + 82.9 Mt Indicated + 9.6 Mt Inferred	Coal Mountain Phase II (CMO2; Marten Wheeler) entered pre-application of EA (2014) but withdrawn late 2015; Mineable resource at CMO is nearing depletion and expected mine shut down in late 2017
Quinsam	Northeast	Hillsborough Resources Ltd.	Coal TC	130,000 t	N/A	N/A	Operated below capacity in 2015. Suspension of operations announced early January, 2016

HCC = hard coking coal; PCI = pulverized coal injection; TC = thermal coal

(1,272 m to 1,755 m) grading 0.43g/t Au and 0.56% Cu at the Deep Kerr deposit and 174.4 m averaging 0.55 g/t Au and 0.28% Cu from 1,207.4-1,381.8 m at the Mitchell deposit. An updated resource estimate for the Deep Kerr zone is expected in early 2016.

Pacific Booker Minerals Inc.'s **Morrison** copper-gold-molybdenum-silver porphyry project resumed the Environmental Assessment process in June, after being halted to incorporate recommendations of the panel report on the causes of the Mount Polley mine tailings dam breach. In July, a letter from the British Columbia Minister of Environment and Minister of Energy and Mines stated that concerns still

remained regarding the project design. The project is now undergoing further review.

IDM Mining Ltd. began the Environmental review process for their proposed **Red Mountain** (Fig. 7) gold-silver mine by submitting a project description in August. On-site work in 2015 consisted of environmental baseline studies. The proposed 1,000 tonne per day mine plans to operate during nine months of the year over a forecasted five year mine life. Anticipated capital expenditure is \$97.4 million.

At the **Schaft Creek** copper-molybdenum-gold-silver porphyry project, Teck Resources Ltd. (75%) and Copper Fox Metals Inc. (25%) completed exploration drilling (including

Table 4. Selected industrial mineral mines and quarries, 2015, forecast mine production, reserves and resources.

Mine	Region	Operator	Commodity; deposit type; MINFILE	Forecast 2015 Production (based on Q1- Q3)	Reserves (Proven + Probable)	Resource (Measured and Indicated)	Comments
Burning Daylight	Skeena	Stone Ridge Quarries Ltd.	columnar basalt; dimension stone;	700 t	n/a	n/a	Seasonal production
Swamp Point North	Skeena	Highbank Resources Ltd.	sand and gravel; medial moraine;	4,000 t	n/a	71.7 Mt	Awaiting aggregate contracts around Prince Rupert
Fireside	Northeast	Fireside Minerals Ltd.	barite; vein barite; 094M 003	32,000 t	485,000 t (non NI 43-101 compliant)	N/A	Bear Pit has been mined out, pre-stripping overburden at Moose Pit.
Ogden Mountain	Omineca	Green Mountain Gemstones Inc.	nephrite jade; jade; 093N 156, 093N 165	N/A	N/A	N/A	Exploration and placer mining of alluvial jade boulders, excavation of in situ jade
Yellowjacket	Omineca	Private individual	Construction stone	3000 t	N/A	N/A	Mined rock for riprap material
Mount Brussilof	Kootenay-Boundary	Baymag Inc.	Magnesite; hydrothermal sparry magnesite; 082JNW001	220,000 t annually	50 Mt Proven	-	MgO, and MgOH; sediment-hosted sparry magnesite
Moberley Silica	Kootenay-Boundary	Heemskirk Canada Ltd.	Silica; industrial use silica, frac sand; 082N001	n/a	20 to 140 mesh frac sand (dry): Proven 8.9 Mt of 64% frac sand + Probable 4.6 Mt of 64% frac sand; OR Silica for industrial (dry): 12.8 Mt Proven + 0.7 Mt Probable	20 to 140 mesh frac sand (dry): 32.4 Mt at 64% frac sand Measured and Indicated + 11.7 Mt silica as frac sand residues; OR Silica for industrial (dry): 43.2 Mt Measured + Indicated	\$26M capital cost for plant construction and upgrades to existing facility (for frac sand operation); 300,000 tonne per year capacity; Construction started on frac sand processing plant in 2014, commissioning expected 2017
Horse Creek Silica	Kootenay-Boundary	HiTest Sand Inc.	Silica; industrial use, aggregate; 082N 043	n/a	n/a	Estimated: 3 Mt at 99.5% Silica (1987)	Variety of aggregate and industrial use products
Elkhorn	Kootenay-Boundary	CertainTee d Gypsum Canada Inc.	Gypsum; evaporitic bedded gypsum; 082JSW021	400,000 t annually	n/a	n/a	5 years mine-life remaining; the company will replace production by developing the Kootenay West mine (in EA)
4J	Kootenay-Boundary	Georgia-Pacific Canada Limited	Gypsum; evaporitic bedded gypsum; 082JSW009	N/A; Processing stockpiled ore	n/a	20 Mt	Processing stockpiles; updating mine expansion plans

Table 4. Continued.

Black Crystal	Kootenay-Boundary	Eagle Graphite Corp.	Graphite; metamorphic hosted flake graphite; 082FNW260, 082FNW283	N/A; Quarry on Care and Maintenance; company focused on process optimization and exploration	n/a	Regolith: Measured + Indicated: 0.648 Mt at 1.83% fixed carbon; Calc-silicate: Indicated: 4.765 Mt at 1.21% fixed carbon	Exploration drilling to expand the resource; update geological model and pit design; process optimization at plant; produced sample of 99.995% pure spheronized graphite from flake graphite; product suitable for Li-Ion battery specifications
Winner; Friday Quarry	Kootenay-Boundary	Roxul Inc.	Gabbro/basalt; crushed rock for mineral wool; 082ESE265	Quarrying to supply feed stock for mineral wool plant	n/a	n/a	Crushing, screening, stockpiling; environmental
Grand Forks Slag		Granby River Mining Company Inc.	Slag/Silica; tailings from Grand Forks smelter dumps; 082ESE264	Quarrying for abrasives and roofing granules	n/a	n/a	Crushing, screening; environmental
Ashcroft	Thompson-Okanagan-Cariboo	IG Machine and Fiber Ltd (IKO Industries Ltd.)	Basalt (roofing granules); 092INW 104	350 000 t	n/a	n/a	-
Bud	Thompson-Okanagan-Cariboo	Absorbent Products Ltd.	Bentonite; 092HSE 162	Not available	n/a	n/a	-
Decor	Thompson-Okanagan-Cariboo	Pacific Bentonite Ltd.	Alumina, landscape rock; 092INW 084	100 000 t	n/a	n/a	-
Falkland	Thompson-Okanagan-Cariboo	Lafarge Canada Inc.	Gypsum; 082LNW 001	6 000 t	n/a	n/a	-
Kettle Valley Quarries	Thompson-Okanagan-Cariboo	Kelowna Sand and Gravel Ltd / Kettle Valley Stone Ltd.	Ashlar, flagstone, thin veneer; 082ENW 109; 111; 112	Not available	n/a	n/a	-
Pavilion	Thompson-Okanagan-Cariboo	Graymont Western Canada Inc.	Limestone; 092INW 081	190 000 t	n/a	n/a	-
Red Lake	Thompson-Okanagan-Cariboo	Absorbent Products Ltd.	Diatomaceous earth; 092INE 081	Not available	n/a	n/a	-
Apple Bay (PEM 100)	South Coast	Electra Stone Ltd.	Silica+alumina; R12: Volcanic glass-perlite; 092L 150	70,000 t	n/a	n/a	Drilling, mapping sampling to assess resource. No results published. Drilling by Ashgrove Cement Company
Benson Lake	South Coast	Imasco Minerals Inc.	High brightness carbonate; R09: Limestone; 092L 295	56,000 t	n/a	100+ years	Reserves and resources not formally stated

Table 4. Continued.

Blubber Bay	South Coast	Ashgrove Cement Company	Limestone, dolostone; R09:Limestone; 092F 479	10,000 t+	n/a	100+ years	First of a multiple-barge dolomite shipment to continue into 2016
Garibaldi Pumice	South Coast	Garibaldi Pumice Ltd.	Pumice; R11:volcanic ash; 092JW 039	18,000 m ³	n/a	14,396,000 m ³ pumice 4,990,000 m ³ pumicite (fines)	2014 resource estimate. Near-lease test pits and LIDAR survey in 2015.
K2	South Coast	K2 Stone Quarries Inc.	Dimension stone, flagstone; R08:flagstone; 092C 159	22,000 t	n/a	n/a	Material extracted from quarry is cut to size
Sumas Shale	South Coast	Sumas Shale Ltd. (Clayburn Industries Ltd., Lafarge Canada Inc.)	Shale, clay, sandstone; B05:Residual kaolin; 092GSE024	480,000 t	n/a	50+ years	Product for cement production
Texada Quarry	South Coast	Texada Quarrying Ltd. (Lafarge Canada Inc.)	Limestone, aggregate; R09:Limestone; 092F 395	3,900,000 t	n/a	100+ years	Mostly limestone for cement production

Table 5. Mine development projects.

Project	Region	Operator	Commodity; deposit type; MINFILE	Reserves (Proven + Probable)	Resource (Measured and Indicated)	Work Program	Comments
Brucejack	Skeena	Pretium Resources Inc.	Au, Ag; Au-quartz veins; quartz stockwork breccia; epithermal; 104B 193	16.5 Mt at 14.1 g/t Au, 57.7 g/t Ag	15.3 Mt at 17.6 g/t Au, 14.3 g/t Ag	40,000 m underground infill drill program, underground mine development: 1,573 m of lateral workings and 239 m of raise workings.	Mine construction underway; aiming for commercial production by 2017
Silvertip	Skeena	JDS Silver	Ag, Pb, Zn, Au; Polymetallic manto; 104O 038	n/a	2.455 Mt at 315 g/t Ag, 5.88% Pb, 6.28% Zn, 0.413 g/t Au	Road reconditioning, pre-construction earthworks, mill and process plant acquisition	Fully permitted, construction dependant on financing

182 m grading 0.20% Cu), re-logging of previous drill core and regional mapping.

In 2015, the British Columbia Environment Minister announced that the environmental assessment certificate for Chieftain Metals Corp.'s **Tulsequah Chief** zinc-copper-gold massive sulphide project would remain in effect for the life of the project. A pre-production expenditure of \$198 million was announced by Chieftain, and the company is seeking financing.

5.2. Omineca Region

5.2.1. Proposed metal mines

Taseko Mines Limited and subsidiary Aley Corporation Limited continued to gather environmental baseline data at

their **Aley** niobium project, and carried out engineering and metallurgical test work to verify and improve results of a 2014 feasibility study. An open-pit mine with a 10,000 tonnes per day processing plant and ferroniobium convertor is proposed. Average annual production over the 24 year mine life would be about 9,000 tonnes niobium in the form of ferroniobium (annual production of about 14,000 tonnes FeNb).

At New Gold Inc.'s **Blackwater** gold and silver project, engineering and environmental studies continued, including a tailings alternatives assessment, in support of their Environmental Assessment, which remained in the screening stage, at the end of the pre-application phase. The project is proposed as an open-pit mining operation, with a 60,000 tonnes



Fig. 7. IDM Mining's Red Mountain project camp (view looking south).

per day processing plant and a mine life of 17 years.

AuRico Metals Inc. continued to advance its proposed **Kemess Underground** (KUG) block cave mine through a Substituted (federally and provincially harmonized) Environmental Assessment, and worked on an updated feasibility study. Geotechnical diamond and auger drilling was undertaken on key infrastructure areas, including the proposed triple decline portal, short tunnel portal, and conveyor areas. Test pitting was completed to determine geotechnical and substrate characteristics. The underground block cave operation would use processing facilities and infrastructure at the former Kemess South mine. A proposed average milling rate of 24,650 tonnes per day would have an annual production of 3,266 kg (105,000 ounces) of Au and 19,958 t (44 million pounds) of Cu, over a mine life of 12 years.

5.2.2. Proposed industrial mineral mines

At their **Giscome** limestone property, Graymont Western Canada Inc. continued engineering and environmental studies in support of an Environmental Assessment draft application and final lime plant and quarry designs. A 1,000 tonne bulk limestone sample was collected for crushing and kilning tests. Graymont proposes a 600,000 tonnes per year limestone quarry that would feed a vertical lime kiln 198,000 tonnes annually over a minimum 50 year mine life.

5.3. Northeast Region

5.3.1. Proposed coal mines

In 2015, HD Mining continued work on their **Murray River** project. Engineering and environmental studies in support of their Environmental Assessment continued, and work progressed on a decline to collect an underground bulk coal sample. Exploration drilling from the face of the decline was undertaken to further delineate seam geometry and establish coal characteristics. An 11-hole surface drilling program

was also completed for additional coal resource data and to characterize deep-level groundwater. Coal quality results of the bulk sample will determine if the project is viable. The proposed underground longwall mining operation would have a production rate of 4.8 Mt of saleable coal per year over a 25 year mine life. In October, an Environmental Assessment certificate for the project was issued.

Engineering and environmental studies continued for the **Sukunka** project of Glencore plc (75% interest) and JX Nippon Oil & Energy Corporation (25% interest). An open-pit mining operation with initial production of 1.5-2.5 Mt of saleable metallurgical coal per year is proposed. Addition of a room-and-pillar underground mining component in a future mine plan would increase production to 6 Mt per year. Mine life is expected to exceed 20 years. A substituted Environmental Assessment application for the project was accepted for review in August.

5.3.2. Proposed industrial mineral mines

At the **Wapiti East** phosphate project, Fertoz International Inc. upgraded their JORC resource estimate and completed a scoping study for mining of a surface resource. A seasonal (May-October) shallow open-pit mine, with a mine life of greater than 20 years, is proposed. Planned production is up to 75,000 tonnes per year of phosphate-bearing rock. A Mines Act permit application for the project was submitted in late 2014.

5.4. Kootenay-Boundary Region

5.4.1. Proposed metal mines

Purcell Basin Minerals Inc. is working to restart the **Gallowai Bul River** base and precious metal mine, which has been on care and maintenance since 2009. The property has existing infrastructure, including a 750 tonnes per day conventional mill, assay and metallurgical laboratories, tailings impoundment, waste dumps, and two open pits. Completing environmental baseline work and updating mine plans, the company is working towards fulfilling requirements for permit application.

Klondike Silver Corp's **Slocan Silver**, silver-lead, zinc project consists of several past-producing deposits. In 2015, the company focused on environmental work, and engineering upgrades to the tailings facility and underground structures.

5.4.2. Proposed coal mines

Centermount Coal Ltd. proposes an open pit and underground coal mine for its **Bingay Creek** property. Work in 2015 consisted of engineering, a geological review, and environmental baseline studies. Exploration drilling is planned for 2016. The project is in the pre-application stage of Environmental Assessment. If the proposed mine goes into production it would produce 2 Mt of coal annually, and have a mine life of 20 years, with a total resource of about 39 Mt of clean coal.

CrowsNest Pass Coal Mining Ltd. continued environmental baseline studies, geological modeling, engineering review, resource, and pre-feasibility work on their **Coal Creek** property.

Table 6. Selected proposed mine projects.

Project	Region	Operator	Commodity; deposit type; MINFILE	Reserves (Proven + Probable)	Resource (Measured and Indicated)	Work Program	Comments
Dome Mountain	Skeena	Dome Mountain Resources of Canada Inc.	Au, Ag; Au-quartz veins; 093L 276	135,131 t at 11.2 g/t Au,	144,144 t at 17.7 g/t Au	Corporate negotiations between Metal Mountain Resources Inc., Gavin Mines Inc. and Grace Mining Inc.; winter drill program preparation.	Awaiting Mines Act permit amendment to allow mill construction on site
Galore Creek	Skeena	Galore Creek Mining Corp.	Cu, Au, Ag; Alkalic Porphyry; 104G 090	528 Mt at 0.59% Cu, 0.32 g/t Au, 6.02 g/t Ag	814.7 Mt at 0.50% Cu, 0.31 g/t Au, 5.21 g/t Ag	Baseline monitoring	Targeted studies; minimizing expenditure
Kitsault	Skeena	Alloycorp Mining Inc.	Mo, Ag; Porphyry Mo (Low F-type)	228.2 Mt at 0.083% Mo, 5.0 g/t Ag	321.8 Mt at 0.071% Mo, 4.8 g/t Ag	Pre-construction earthworks, Nass River Bridge upgrade, construction finance negotiations	Fully permitted, additional inferred Mo Resources at Bell and Roundy Creek deposits
KSM	Skeena	Seabridge Gold Inc.	Au, Cu, Ag, Mo; Calc-alkalic porphyry, 104B 103	2,164 Mt at 0.55 g/t Au, 0.21% Cu, 2.74 g/t Ag, 44.7 g/t Mo	2,779.9 Mt at 0.55 g/t Au, 0.21% Cu, 2.9 g/t Ag, 55 g/t Mo	11,018 m drilling in 11 holes at Deep Kerr and Mitchell deposits, 1,579 line km airborne geophysics	Fully permitted; investigating viability of underground exploration portal
Morrison	Skeena	Pacific Booker Minerals Inc.	Cu, Au, Mo; Calc-Alkalic Porphyry; 93M 007	224.2 Mt at 0.33% Cu, 0.163 g/t Au, 40 g/t Mo	265.9 Mt at 0.35% Cu, 0.17 g/t Au, 50 g/t Mo	Re-submitted environmental assessment application	Ordered to undergo further assessment
Red Mountain	Skeena	IDM Resources	Au, Ag,; porphyry related gold; 103P 086	n/a	1.45 Mt at 8.15 g/t Au, 29.57 g/t Ag	Entered environmental assessment review	Initiated Feasibility study
Schaft Creek	Skeena	Teck Resources Limited	Cu, Mo, Au, Ag Calc-Alkalic porphyry; 104G 015	940.8 Mt at 0.27% Cu, 0.018% Mo, 0.019 g/t Au, 1.72 g/t Ag	1,228.5 at 0.26% Cu, 0.017% Mo, 0.19g/t Au, 1.69 g/t Ag	Drilling at La Casse zone, optimization of mine plan	Limited targeted studies
Tulsequah Chief	Skeena	Chieftain Metals Inc.	Au, Ag, Cu, Pb, Zn; Noranda/Kuroko massive sulphide; 104K 002	4.435 Mt at 2.85 g/t Au, 104 g/t Ag, 1.46% Cu, 1.29% Pb, 6.94% Zn	6.575 Mt at 2.82 g/t Au, 104.76 g/t Ag, 1.34% Cu, 1.33% Pb, 6.71% Zn	Construction financing negotiations	Fully permitted; substantially started (EA cert is valid for life of project)
Murray River	Northeast	HD Mining Int'l Ltd.	HCC; Bituminous coal; 093I 010	261.6 Mt mineable; proven	341.2 Mt in situ	Environmental Assessment (issued in October), driving decline, drilling (exploration, hydrogeological), bulk sample	Proposed underground longwall mining operation. Average annual production would be 4.8 Mt saleable coal. Mine life of 25 years
Sukunka	Northeast	Glencore plc	HCC; Bituminous coal; 093P 014	n/a	145 Mt in situ	Environmental Assessment (under review), updated resource and geologic model, engineering and environmental studies	Proposed open-pit mine. Initial annual production would be 1.5 - 2.5 Mt saleable coal. Mine life of >20 years

Table 6. Continued.

Wapiti East	Northeast	Fertoz Int'l Inc.	P ₂ O ₅ ; Sedimentary phosphate deposits; 093I 008, 093I 022	n/a	0.81 Mt at 22.3% P ₂ O ₅ ; Indicated	Upgraded resource, scoping study, small mine application submitted (late 2014)	Proposed seasonal shallow open-pit mine. Average annual production would be <75,000 t phosphate rock. Mine life of >20 years
Aley	Omineca	Taseko Mines Limited	Nb; Carbonatite-hosted deposit; 094B 027	83.8 Mt at 0.50% Nb ₂ O ₅ ; containing 292.9 Mkg* Nb *calculated by Paul Jago	258.8 Mt at 0.37% Nb ₂ O ₅ ; containing 669.4 Mkg* Nb (including Reserves) *calculated by Paul Jago	Environmental Assessment (pre-ap.), engineering studies, metallurgical testing, environmental data	Proposed open-pit mine with 10,000 t/d processing. Average annual production would be 9,000 t niobium. Mine Life of 24 years
Blackwater	Omineca	New Gold Inc.	Au, Ag; Epithermal Au-Ag-Cu (intermediate sulphidation); 093F 037	344.4 Mt at 0.74 g/t Au, 5.5 g/t Ag; containing 254,115 kg (8.17 Moz) Au, 1,891 t (60.8 Moz) Ag	396.9 Mt at 0.74 g/t Au, 5.5 g/t Ag; containing 295,483 kg (9.50 Moz) Au, 2,181 t (70.13 Moz) Ag (including Reserves)	Environmental Assessment (pre-ap.), engineering studies, environmental studies	Proposed open-pit mine with 60,000 t/d processing. Life-of-mine average annual production would be 12,846 kg (413 Koz) Au and 54,182 kg (1.74 Moz) Ag. Mine life of 17 years
Kemess Underground (KUG)	Omineca	AuRico Metals Inc.	Cu, Au, Ag, Mo; Porphyry Cu±Mo±Au; 094E 094	100.4 Mt at 0.28% Cu, 0.56 g/t Au, 2.0 g/t Ag; containing 280,842 t (619.2 Mlb) Cu, 56,142 kg (1.8 Moz) Au, 205,532 kg (6.6 Moz) Ag	65.4 Mt at 0.24% Cu, 0.41 g/t Au, 1.8 g/t Ag; containing 157,191 t (346.5 Mlb) Cu, 26,562 kg (854 Koz) Au, 118,535 kg (3.8 Moz) Ag (additional to reserves)	Environmental Assessment (pre-ap.), updated feasibility study, geotechnical drilling, test pitting	Proposed underground block cave mine with 24,600 t/d processing. Average annual production would be 3266 kg (105 Koz) Au and 19,958 t (44 Mlb) Cu. Mine life of 12 years
Giscome	Omineca	Graymont Western Canada Inc.	CaCO ₃ ; Limestone; 093J 041, 093J 025	n/a	>100 Mt of limestone (>95% calcium carbonate, <5% magnesium carbonate) in situ; Indicated	Environmental Assessment (under review), engineering and environmental studies, bulk sampling, test pitting	Proposed 600,000 t/y limestone quarry to feed a vertical lime kiln producing 198,000 t/y of lime. Mine life of >50 years
Bingay Creek	Kootenay-Boundary	Centremount Coal Ltd.	Coal (HCC); open pit and underground; 082JSE011	-	42.43 Mt Measured + 52.9 Mt Indicated (2012)	Environmental baseline studies; Engineering and geotechnical evaluation for mine design; permitting	Pre-application of EA (2012), on hold; 39Mt; 20-year mine life; 2 Mt/yr
Coal Creek	Kootenay-Boundary	CrowsNest Pass Coal Mining Ltd.	Coal (HCC and PCI); underground; 082GSE035	-	HCC + PCI: 616 Mt in the upper 3 near-surface seams (2014)	Prefeasibility Study (PFS); geological modeling; resource evaluation; baseline studies	Proposed underground mine; review of the historical mine workings of Coal Creek colliery (1897 to 1958)
Coal Mountain Phase II (Marten Wheeler)	Kootenay-Boundary	Teck Coal Ltd.	Coal (PCI and TC); open-pit and underground; 082GNE006	-	PCI + Thermal: 114.3 Mt Measured + 97.3 Mt Indicated (2015)	Environmental and baseline work; mine design; permitting	Pre-application of EA (2014); Potential of 76.5 Mt; 34-year mine life; 2.25Mt/yr; EA withdrawn in late 2015

Table 6. Continued.

Crown Mountain	Kootenay-Boundary	NWP Coal Canada Ltd. (Jameson Resources Ltd.)	Coal (HCC and PCI); open-pit; 082GNE018	HCC: 42.60 Mt Proven + 4.91 Mt Probable; PCI: 7.13 Mt Proven + 1.19 Mt Probable (2014)	HCC + PCI: 68.9 Mt Measured + 6.0 Mt Indicated (2014)	Prefeasibility studies; environmental and baseline work; mine design; permitting	Pre-application of EA (2014); 16-year mine life; 1.7 Mt /yr; review of pre-feasibility study identified upside in lower capital costs for contract mining and additional resources in Southern Extension
Driftwood Magnesite	Kootenay-Boundary	MGX Minerals Inc.	Magnesite; hydrothermal sparry magnesite; quarry; 082KNE 068	-	-	Drilling; bulk sampling; environmental baseline work; metallurgical test work; lease application; mine design; preliminary plant design	Preliminary test work indicates recovery rates of 93.4% reverse flotation and removal of up to 70% silica and 30% calcium oxides
Gallowai Bul River	Kootenay-Boundary	Purcell Basin Minerals Inc.	Cu-Ag-Au+/- Pb-Zn; Cu-Ag veins; underground; 082GNW 002	-	90,720 t at 1.3% Cu, 0.31g/t Au, 21.77g/t Ag	Draft project proposal submitted to EA; Permitting; environmental baseline; mine plan and mine design; ARD/ML	Proposed restart of Bul River Mine; on care and maintenance
Kootenay West	Kootenay-Boundary	CertainTeed Gypsum Canada Inc.	Gypsum; evaporitic bedded gypsum; quarry; 082JSW005, 082JSW020	-	North and South Quarries: Total 18.7 Mt (at average quality of 83-85%)	Environmental baseline work; mine design	Pre-application of EA (2014); 400,000 t/yr; 42-year mine life; blended product to market specifications
Michel Creek (Loop Ridge)	Kootenay-Boundary	CanAus Coal Ltd.	Coal (HCC and PCI); open-pit and underground; 082GSE050	-	HCC: 44.6 Mt Measured + 42.5 Mt Indicated; open-pit and underground (2015)	Drilling; trenching; environmental and baseline work; mine design; coal quality; permitting	Pre-application of EA (2015); Coal quality testing; updated geological model; drilling has identified 20 coal seams with cumulative thickness of 70m (14% of a 504 m section in the Mist Mountain Fm); PEA model indicates potential production of 3.4 Mt/y (~2.1 Mt/y saleable)
Slocan Silver (Silvana)	Kootenay-Boundary	Klondike Silver Corp.	Ag-Pb-Zn+/- Au; polymetallic veins; underground 082FNW 050, 013, 082KSW 006	-	-	Engineering reports: underground mining structure and tailings storage facilities; environmental monitoring	Mill on care and maintenance; work focused up upgrades identified in 2014 engineering and environmental reports

Table 6. Continued.

Ajax	Thompson-Okanagan-Cariboo	KGHM Ajax Mining Inc.	Cu, Au; Alkalic porphyry 092INE 012, 013	Reserves (P+P; NSR cut-off US\$7.10/t): 426 Mt grading 0.29% Cu; 0.19 g/t Au; 0.39 g/t Ag (containing 2.7 Bt Cu; 2.6 Moz Au; 5.3 Moz Ag)	Resources (M+I; ; NSR cut-off US\$7.10/t): 568 Mt grading 0.26% Cu; 0.18 g/t Au; 0.35 g/t Ag	Environmental and engineering studies; exploration and condemnation drilling.	Project application accepted for review in November 2015. Review temporarily suspended by applicant to allow further study by First Nations
Harper Creek	Thompson-Okanagan-Cariboo	Yellowhead Mining Inc.	Cu, Au, Ag; Stratiform, volcanic-hosted 082M 008, 009	Reserves (P+P; cut-off 0.14% Cu): 716 Mt grading 0.26% Cu; 0.029 g/t Au; 1.18 g/t Ag		Environmental and engineering studies.	Project application accepted for review in December 2014. Review suspended in October 2015 by company for economic reasons
New Prosperity	Thompson-Okanagan-Cariboo	Taseko Mines Ltd.	Cu, Au; Calc-alkalic porphyry; 092O 041	Reserves (P+P; cut-off not stated): 831 Mt grading 0.23% Cu and 0.41 g/t Au; containing (recoverable) 3.6 Blb Cu; 7.7 Moz Au		Company seeks a judicial review of Federal EA decision. Results pending.	Project at post-decision stage
Ruddock Creek	Thompson-Okanagan-Cariboo	Ruddock Creek Mining Corporation	Pb, Zn, Ag; Monashee-type sediment-hosted massive sulphide; 082M 082		Resources (M+I; cut-off 4.0% Pb+Zn): 6.2 Mt grading 6.50% Zn, 1.33% Pb	Environmental and permitting work.	Project at pre-application stage
Spanish Mountain	Thompson-Okanagan-Cariboo	Spanish Mountain Gold Ltd.	Au, Ag; Sediment-hosted gold; 093A 043		Resources (M+I; cut-off 0.20 g/t Au): 237.8 Mt grading 0.46 g/t Au; 0.69 g/t Ag; containing 3.5 Moz Au; 5.28 Moz Ag	Environmental and permitting work.	Project at pre-application stage
BURNCO Aggregate	South Coast	BURNCO Rock Products Ltd.	Aggregate; B12: Sand and Gravel; N/A	-	Approx. 20 Mt	Permitting	Submitting applications for EA and Mines Act permit
Raven	West Coast	Compliance Energy Corporation	Bituminous coal; 092F 333	29.9 Mt	71.998 Mt	Permitting	Application for EA submitted for screening and withdrawn, 2015

Due to low coal prices, Teck Coal Limited. withdrew from the pre-application phase of Environmental Assessment for their **Coal Mountain Phase II** (Marten Wheeler) project. The project was designed to replace production at the Coal Mountain mine, which is now scheduled to shut down in 2017.

At the **Crown Mountain** property of NWP Coal Canada Ltd., (a wholly owned subsidiary of Jameson Resources Ltd.) baseline environmental studies were carried out. The project is in the pre-application stage of Environmental Assessment, and the proposed project would have a production capacity of 1.7 Mt per year of clean coal and a 16-year mine life.

CanAus Coal Ltd., a wholly owned subsidiary of CoalMont Pty Ltd., carried out drilling and collected a bulk sample for carbonization test work on their **Michel Creek** project. The project consists of the Loop Ridge, Tent Mountain and Michel Head deposits; work was concentrated at Loop Ridge. In October, the company entered the pre-application phase of Environmental Assessment, proposing to mine the Loop Ridge deposit. The project has a proposed production rate of 3.5 Mt per year (2.1 Mt per year clean coal), over a 10 year mine life. Future potential mine expansion to their other areas (Tent Mountain and Michel Head) could extend the project by 10 years.

5.4.3. Proposed industrial mineral mines

At the **Driftwood Magnesite** property, MGX Minerals Inc. drilled (West zone) and bulk sampled (East zone) in 2015. The bulk sample will be used for further metallurgical testing and to evaluate processing options. The company is completing a NI 43-101 compliant resource. Test work was conducted to develop an optimized process design to remove silica and improve economic cut-off grades. They have applied for a mining lease for quarry operations, are conducting environmental baseline studies, and are evaluating mine designs.

CertainTeed Gypsum Canada Inc. continued to advance the proposed **Kootenay West Mine**, which entered the pre-application stages of Environmental Assessment in 2014. In 2015, the company focused on environmental work and mine design. They hope to begin site preparation in 2016, with a projected start-up in 2018. The proposed mine would have an average production rate of 400,000 tonnes per year, over a 42-year mine life, producing a blended product of 83-85% gypsum.

5.5. Thompson-Okanagan-Cariboo Region

5.5.1. Proposed metal mines

KGHM Ajax Mining Inc. continued engineering and baseline studies to advance their **Ajax** porphyry copper-gold project, a proposed 60,000 tonne-per-day open-pit operation with a projected 20 year life. In September 2015, the company submitted their application to the Environmental Assessment Office and Canadian Environmental Assessment Agency. Although the application was accepted, the company announced that it would suspend the process to allow First Nation partners

more time to study the submission.

The **Harper Creek** copper-gold-silver project is owned by Yellowhead Mining Inc. In June 2015, the company requested an extension to their previously submitted application for an Environmental Assessment certificate to incorporate recommendations arising from the Mount Polley tailings spill in 2014. In October 2015, the company suspended work on the project due to a lack of funds. At year end, the company announced it is seeking financing to complete the environmental review. The project has Proven and Probable mineral reserves of 716 Mt grading 0.26% Cu; 0.029 g/t Au and 1.2 g/t Ag. The proposed mine would be a 70,000 tonnes per day operation, with a mine life of 28 years. Initial capital costs would exceed \$1 billion.

The **New Prosperity** gold-copper porphyry project of Taseko Mines Limited has defined Proven and Probable reserves of 830 Mt grading 0.42 g/t Au and 0.23% Cu. Taseko continues to seek a judicial review of the February 2014 Federal decision to reject the project. British Columbia granted Taseko a project certificate in November 2013, and has extended the expiry date of the certificate by five years.

Ruddock Creek Mining Corporation (Imperial Metals Corporation (50%) and joint venture partners Mitsui Mining and Smelting Co. Ltd. (30%) and Itochu Corporation (20%)), carried out environmental baseline studies at its **Ruddock Creek** zinc-lead project. A mineral resource estimate reports 4.65 Mt grading 6.77% Zn and 1.38% Pb (Indicated) and 5.38 Mt grading 6.69% Zn and 1.31% Pb (Inferred), using a 4.0% combined Pb+Zn cut-off.

Spanish Mountain Gold Ltd. continued to carry out baseline environmental studies at its **Spanish Mountain** gold project as the company prepares for formal environmental review. As of April 2014, Measured and Indicated resources (using a cut-off grade of 2 g/t Au) are 237.8 Mt grading 0.46 g/t Au and 0.69 g/t Ag.

5.6. South Coast Region

5.6.1. Proposed industrial mineral mines

BURNCO Rock Products Ltd. submitted its application for Environmental Assessment with both provincial and federal agencies for the **BURNCO Aggregate** project. The proposed sand and gravel mine would ramp up to a 1.5 Mt per year operation, initially barging product to BURNCO Rock Products Ltd.'s ready-mix concrete plants in South Burnaby and Port Kells.

5.7. West Coast Region

5.7.1. Proposed coal mines

Compliance Energy Corporation withdrew the **Raven Underground Coal** Project's application from the British Columbia Environmental Assessment Office screening process in March. Raven is a proposed mine south of Comox on Vancouver Island. As contemplated in a 2011 feasibility study, the main product would be a semi soft coking coal with a thermal by-product. Production would be approximately

830,000 tonnes of clean coal per year, over 16 years. Compliance's original partners, LG International Investments (Canada) Ltd. and Itochu Corporation, have withdrawn from the project. Compliance has not indicated plans for Raven but has expressed doubt that the Environmental Assessment Office would certify the project. It remains in pre-application status.

6. Exploration expenditures

Total metal, aggregate, industrial mineral and coal exploration expenditures are estimated at \$272 million for 2015, down \$66 million from the 2014 total of \$338 million. Of this, \$69 million was contributed by coal projects and \$203 million by metal, aggregate, and industrial mineral projects (Fig. 8). For many companies, lower commodity prices and a depressed equity market led to reduced exploration. Exploration expenditures can be further divided into five categories: grassroots, early stage, advanced stage, mine evaluation, and mine lease (Fig. 9). Along with reduced total expenditures, difficulty in raising venture capital for new projects resulted in grassroots and early stage exploration only representing 15% of total expenditures.

7. Exploration land tenure

Acquisition of new mineral claims in 2015 was comparable to 2014 (Fig. 10). The total for 2015 was 930,981 hectares vs. 942,181 hectares for the previous year. New coal license applications in 2015 totalled 70,806 hectares, down slightly from the 2014 total of 75,972 hectares. This continues a downward

trend. In 2013, applications totalled 197,681 hectares, and in 2012 lease applications totaled a record 710,368 hectares (Fig. 11).

8. Selected exploration project highlights

Although exploration slowed in 2015, explorationists continued to discover, define, and expand porphyry and porphyry-related copper-gold and copper-molybdenum deposits, gold deposits of various types, and stratiform base-metal, specialty metals, industrial minerals, and coal deposits. Below, selected exploration projects are grouped by project type and region (Table 7). A more comprehensive list of selected exploration projects active in 2015 are described in the individual Regional Geologist sections of this volume.

8.1. Precious metal projects

8.1.1. Skeena Region

Pretium Resources Inc. carried out a 20,000 m drilling program on exploration targets that form their **Brucejack Regional** project. The targets are separate from their defined Valley of the Kings deposit, which is scheduled to go into mine production in 2017. Targets tested within two km from the deposit are collectively referred to as the Brucejack Area targets, and the most significant results were returned from the Flow Dome prospect. The Flow Dome zone returned intersections including 2,100 g/t Au uncut over 2.05 m, including 8,600 g/t Au uncut over 0.50 m; and 137 g/t Au over 0.50 m.

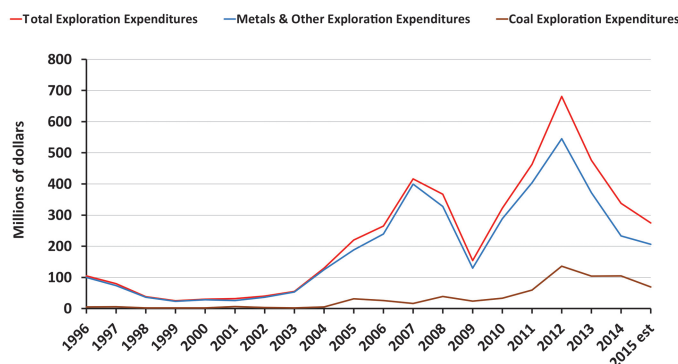


Fig. 8. Total exploration expenditures, metals plus other expenditures, and coal expenditures by year.

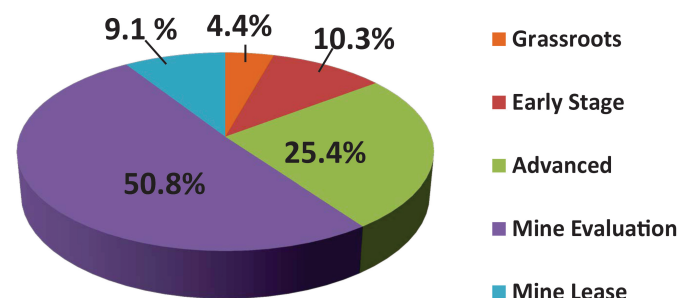


Fig. 9. Exploration expenditures for 2015 by exploration stage.

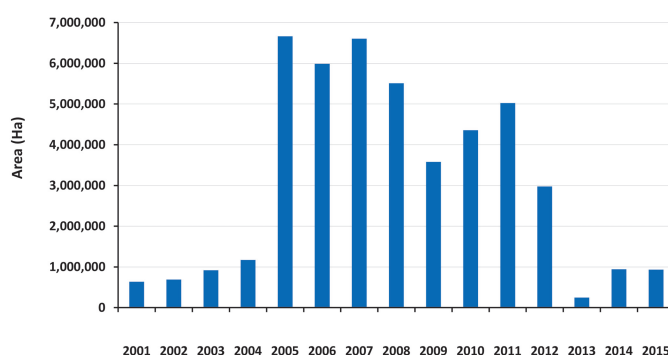


Fig. 10. Tenure, new mineral claims (area Ha) by year.

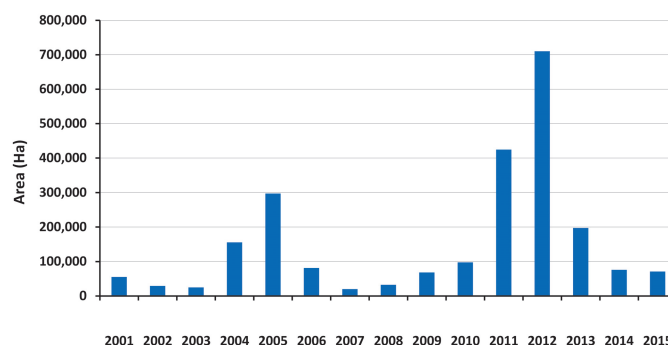


Fig. 11. Tenure, new coal license applications (area Ha) by year.

Table 7. Selected exploration projects.

Project	Region	Operator	MINFILE	Commodity; Deposit type	Resource (NI 43-101 compliant unless indicated otherwise)	Work Program	Comments
Brucejack Regional	Skeena	Pretium Resources Inc.	104B 193	Au, Ag; Au-quartz veins; quartz stockwork breccia; epithermal;	n/a	Diamond drilling, 20,000 m	Intersections included 2,100 g/t Au uncut over 2.05 m, including 8,600 g/t Au uncut over 0.50 m; and 137 g/t Au over 0.50 m
Grizzly	Skeena	Garibaldi Resources Inc.	104J 063	Au, Cu; Porphyry	n/a	Diamond drilling (1,000 m, 5 holes), prospecting, geological mapping, geophysics (IP)	-
Ootsa	Skeena	Gold Reach Resources Ltd.	093E 105	Cu, Au, Mo, Ag; Porphyry	153.97 Mt at 0.21% Cu, 0.11 g/t Au, 0.016% Mo, 1.89 g/t Ag; Inf: 223,570,000 at 0.18% Cu, 0.075 g/t Au, 0.021% Mo, 1.8 g/t Ag	Initiated PEA; prospecting, soil sampling,	-
Premier	Skeena	Ascot Resources Ltd.	104B 054	Au, Ag; Stockwork quartz veins and breccia;	n/a	Diamond drilling (40,892 m drilling in 198 holes), geology, geochemistry; evaluation high grade underground mining	-
Spectrum	Skeena	Skeena Resources Limited	104G 036	Au, Cu; Stockwork quartz veins; Porphyry	n/a	Diamond drilling (17,350 m in 61 holes), mapping, prospecting, rock (387) and soil (2,992) sampling	-
Tanzilla	Skeena	Kaizen Discovery Inc.	104I 023	Cu, Mo, Au; High sulphidation epithermal, Porphyry	n/a	Diamond drilling, mapping	-
Akie	Omineca	Canada Zinc Metals Corp.	094F 031	Zn, Pb, Ag; Sedimentary exhalative Zn-Pb-Ag	12.7 Mt at 8.4% Zn, 1.7% Pb, 13.7 g/t Ag; containing 1.07 Mt (2,352.3 Mlb) Zn, 214,000 t (471.8 Mlb) Pb, 174,024 kg (5.6 Moz) Ag; Indicated	Diamond drilling (5,350 m), 2014-15 airborne gravity gradiometry data received, environmental baseline studies	Drilling highlights: 28.51 m of 10.22% Zn, 2.34% Pb, 20.45 g/t Ag (A-15-121); 23.36 m of 8.63% Zn, 1.68% Pb, 14.64 g/t Ag (A-15-122); 21.41 m of 9.47% Zn, 2.11% Pb, 18.22 g/t Ag (A-15-124); 15.76 m of 9.71% Zn, 1.74% Pb, 15.75 g/t Ag (A-15-125)

Table 7. Continued.

Blackwater South	Omineca	New Gold Inc.	093F 037	Au, Ag; Epithermal Au-Ag-Cu (intermediate sulphidation)	n/a	Drilling (5,150 m), heliborne magnetics survey, ground-based geophysics (IP, magnetics), geochemistry (soil, rock), mapping, prospecting	Exploration focused on epithermal Au-Ag targets within 5 km south and west of the Blackwater deposit
Buck	Omineca	New Gold Inc.	093F 043	Au, Ag; Epithermal Au-Ag-Cu (low sulphidation)	n/a	Airborne geophysics (magnetics), geochemical sampling (rock), mapping, prospecting	Granite pluton is considered prospective for mineralized rhyolite dikes or sills
Cirque	Omineca	Teck Resources Limited	094F 008	Zn, Pb, Ag; Sedimentary exhalative Zn-Pb-Ag	historic non NI 43-101 compliant: 38.5 Mt at 8% Zn, 2.2% Pb, 47.2 g/t Ag (North Cirque); 15.5 Mt at 6.9% Zn, 1.4% Pb, 32 g/t Ag (South Cirque); indicated (MacIntyre, 1992)	Drilling (5,370 m), geochemical sampling (rock, soil), mapping, prospecting, 2014-15 airborne gravity gradiometry data received	Drilling to verify and step-out from historic drilling results at depth beneath a thrust sheet of Ordovician and Silurian sedimentary rocks
Col-Later	Omineca	Pacific Empire Minerals Corp.	093N 101, 093N 169, 093N 216, 093N 032	Cu, Au, Ag, Mo; Alkalic porphyry Cu-Au	historic non NI 43-101 compliant: of 1.81 Mt at 0.6% Cu; indicated (Kookaburra Gold Inc., 1989)	IP survey (68 line-km, 2014-15), drilling (2493 m)	Drilling tested two geophysical anomalies on the till-blanketed western side of the property
Groundhog	Omineca	Atrum Coal Groundhog Inc.	104A 083, 104A 086	HCC, UL coal, industrial mineral: Anthracite	349.4 Mt in situ (Groundhog North), 259.7 Mt in situ (East of Skeena)	Engineering and environmental baseline studies, coal quality tests, upgraded resource and geological model	Planned underground bulk sample. Environmental Assessment yet to be initiated
Kechika Regional (Yuen, Cirque East, Pie, Elf)	Omineca	Teck Resources Limited	094F 013, 094F 023, 094F 011	Zn, Pb, Ag; Sedimentary exhalative Zn-Pb-Ag	n/a	Geochemical sampling (rock, soil), mapping, prospecting, gravity geophysical survey (12.5 line-km), 2014-15 airborne gravity gradiometry data received	2.2 x 0.5 km Zn-Pb-Ag soil anomaly defined at Yuen with two coincident airborne gravity anomalies
Kemess East	Omineca	AuRico Metals Inc.	094E 094 (Kemess East), 094E 012 (Duncan)	Cu, Au, Ag, Mo; Porphyry Cu±Mo±Au	55.86 Mt at 0.41% Cu, 0.52 g/t Au, 2.0 g/t Ag; containing 228.5 Kt (503.7 Mlb) Cu, 29,206 kg (939 Koz) Au, 112,004 kg (3.6 Moz) Ag; Indicated	Drilling (27,719 m), geochemical sampling (rock), mapping, prospecting	Drilling highlights: 305 m of 0.625 g/t Au, 0.433% Cu (KH-15-01); 301 m of 0.466 g/t Au, 0.394% Cu (KH-15-02); 458 m of 0.640 g/t Au, 0.437% Cu (KH-15-23); 590 m of 0.516 g/t Au, 0.366% Cu (KH-15-27); 772 m of 0.465 g/t Au, 0.365% Cu (KH-15-30)

Table 7. Continued.

Kliyul	Omineca	Teck Resources Limited, Kiska Metals Corporation	094D 014, 094D 023, 094D 182	Cu, Au, Ag; Porphyry Cu±Mo±Au	historic non NI-43-101 compliant 2.3 Mt grading 0.3% Cu and 1.03 g/t Au (Gill, 1994a)	Drilling (1908 m), geochemical sampling (rock), mapping, prospecting	Drilling highlights: 245.0 m of 0.18% Cu, 0.53 g/t Au (KLI-15-034), 162.4 m of 0.20% Cu, 0.26 g/t Au (KLI-15-033)
Lawyers	Omineca	PPM Phoenix Precious Metals Corp.	094E 066	Au, Ag; Epithermal Au-Ag-Cu (low sulphidation)	historic non NI 43-101 compliant: 68.4 Kt at 7.3 g/t Au, 226 g/t Ag (Duke's Ridge; Cheni Mines Ltd., 1990)	Drilling (4,002 m; 3,282 m on Cliff Creek North, 720 m on Duke's Ridge zone), prospecting	Drilling to verify and infill historic results, and step-out deeper into the Cliff Creek north sub-zone and Duke's Ridge zone, first drilling program in 9 years
North Grid	Omineca	Thompson Creek Metals Company Inc.	093N 123, 093N 204	Cu, Mo; Alkaline porphyry Cu-Au	n/a	Drilling (2,000 m)	Drilling targets (Snell and Mitzi) with similar geophysical-geochemical signatures as Mt. Milligan deposit mineralized stocks
Cro Phosphate	Kootenay-Boundary	HighBrix Manufacturing Inc.	082GNE 031, 035	Phosphate; upwelling	n/a	Drilling (7 DDH); trenching; bulk sampling	Product shipped for direct spreading on agricultural area
Gold Drop	Kootenay-Boundary	Ximen Mining Corp.	082ESE 153, 152, 126	Au-Ag-Pb-Zn+/-Cu; vein, alkaline intrusion-associated Au	n/a	Trenching; mapping; sampling	Chip sample results up to 0.60 m grading 43.6 g/t Au, 141 g/t Ag; and 0.55 m grading 56.2 g/t Au, 259 g/t Ag; grab sample grading 159 g/t Au, 744 g/t Ag, 70 ppm Cu, and 1.7% Pb
Elko	Kootenay-Boundary	Pacific American Coal Limited	082GSE02 9	Coal (HCC, PCI)	Measured: 19.2 Mt + Indicated: 57 Mt + Inferred: 181.3 Mt (JORC 2015)	Mapping; sampling; geological modeling; field reconnaissance to locate historic adits and drilling; JORC compliant resource	Mapping of 5 coal seams over the property; 3 seams have hard coking coal quality, 2 seams have PCI coal
Jersey-Emerald	Kootenay-Boundary	Margaux Resources Inc.	082FSW 010, 009	Pb-Zn-Ag+/-W, Au, Mo, Bi; stratiform replacement, skarn	Measured and Indicated: 3.071 Mt grading 0.36% WO ₃ (2015)	Dewatering underground workings at Emerald; mapping; sampling; geological modeling	10.2 m grading 24.98 g/t Au with elevated bismuth; 2.75 m grading 0.49% WO ₃ ; 4.5 m grading 0.5% WO ₃ ; 3.35 m grading 0.52% WO ₃ ; 2.65 m grading 0.59% WO ₃ ; 4 m grading 0.35% WO ₃ ; 6.45 m grading 0.33% WO ₃ , 0.65 g/t Au; 5.15 m grading 0.47% WO ₃

Table 7. Continued.

LH	Kootenay-Boundary	Magnum Goldcorp Inc.	082FNW 212	Cu-Ag-Au; subvolcanic, skarn, Au-veins	n/a	Drilling (11 DDH); SP and IP/magnetometer survey	Phase I drilling: 16.9 m grading 13.58 g/t Au, including 10.9 m grading 20.61 g/t Au; 11m grading 20.66 g/t Au; results from Phase II drilling are pending
May Mac	Kootenay-Boundary	Golden Dawn Minerals Inc.	082ESE 045, 116	Au-Ag-Pb-Zn+/-Cu; Cu-Au-Ag skarns, polymetallic veins, Au-veins	37,200 t grading 3.4 g/t Au, 342.8 g/t Ag, 2% Pb, 2% Zn (1981; non-compliant)	Drilling (2,000 m); mapping; rock and channel sampling;	Channel sampling: 0.87m grading 12.97 g/t Au, 34 g/t Ag; 0.2 m grading 36.37 g/t Au, 43 g/t Ag; 0.4 m grading 17.07 g/t Au, 11 g/t Ag; 0.4 m grading 4.46 g/t Au, 529 g/t Ag; Drilling intersected gold-bearing vein and stockwork system with lead and zinc sulphides, assays pending
Marten Phosphate	Kootenay-Boundary	Fertoz Ltd.	082GNE 027	Phosphate; upwelling	n/a	Mapping; sampling; XRF; environmental baseline; permitted bulk sample	XRF of stockpiles: 24 – 27% P ₂ O ₅ ; product shipped for direct spreading on agricultural area
Referendum/Whitewater	Kootenay-Boundary	Braveheart Resources Inc.	082FSW 222, 171	Au-Ag-Pb-Zn+/-Mo; polymetallic veins, Au-veins	n/a	Trenching; bulk sampling (1,000 t at Referendum; 100 kg at Whitewater); milling and flotation	Projected gold recoveries of 90% from preliminary flotation testing; further results pending
Aspen Grove (Ketchan)	Thompson-Okanagan-Cariboo	Kaizen Discovery Inc.	092HNE 115	Cu, Au; Porphyry	n/a	Drilling	Improved geological model
Bonaparte	Thompson-Okanagan-Cariboo	WestKam Gold Corp.	092P 050	Au; Cu; Vein; porphyry	n/a	Drilling outside of Discovery zone area	Analytical results pending
Cariboo Gold	Thompson-Okanagan-Cariboo	Barkerville Gold Mines Ltd.	093H 019	Au; Vein; replacement	n/a	Drilling to define resources at BC vein and explore new targets	Improved resource definition; discovery of AG horizons
Ike	Thompson-Okanagan-Cariboo	Amarc Resources Ltd.	092O 025	Cu, Mo, Ag; Porphyry	n/a	Drilling	Mineralized zone extended
Lac la Hache	Thompson-Okanagan-Cariboo	GWR Resources Inc.	092P 002	Cu, Au, Ag Porphyry	n/a	Drilling; prospecting	Discovery of Berkeley zone (copper porphyry)

Table 7. Continued.

Lucky Mike	Thompson-Okanagan-Cariboo	Plate Resources Inc.	092ISE 027	W, Cu, Mo; Skarn; porphyry	n/a	Drilling	Mineralized zone extended; improved geological model
Shovelnose	Thompson-Okanagan-Cariboo	Westhaven Ventures Inc.	092HNE 308, 309	Au; Vein; breccia	n/a	Drilling	Mineralized zone extended
Margurete	West Coast	Aldever Resources Inc.	092K 025, 092K 020, 092K 030	Au; I01: Au-quartz veins	n/a	Geology, rock geochemistry, packsack drilling	Reconnaissance program in historic gold camp
Rogers Creek	South Coast	Carube Copper Corp.	092JSE033, 092JSE034, 092JSE035	Cu, Mo, Ag; L04: Porphyry Cu±Mo±Au	n/a	IP survey; soil geochemistry	Chargeability anomaly reported

Ascot Resources Ltd. carried out almost 41,000 m of diamond drilling on their **Premier** gold project, near the past-producing Premier mine. The objective of the drilling was to define a 43-101-compliant resource suitable for high-grade underground mining. Results returned several intersections grading between 250 and just over 1000 g/t Au over intervals of 0.9 to 1.0 m.

Skeena Resources Limited carried out over 17,000 m of diamond drilling on their **Spectrum** gold project as they work towards defining a 43-101-compliant resource. Highlight intersections include 18.0 m grading 6.13 g/t Au, 4.0 m grading 16.97 g/t Au, 2.0 m grading 8.27 g/t Au, 1.0 m grading 23.1 g/t Au, 18 m grading 2.69 g/t Au, 2.0 m grading 4.6 g/t gold, 2.6 m grading 10.18 g/t Au and 0.9 m grading 8.04 g/t Au.

8.1.2. Omineca Region

In 2015, drilling was carried out on the **Lawyers** property owned by a private company, PPM Phoenix Precious Metals Corp. The property covers the former Amethyst Au Breccia (AGB), Cliff Creek and Phoenix mines, which produced over 171,000 ounces of Au and 3.5 million ounces of silver (mainly from the AGB deposit). In 2015, a 24-hole drilling program designed to verify and infill historic drilling results and test for deeper extensions of mineralization was carried out. Assay results have not been made public.

On their **Buck** gold prospect, New Gold Inc., carried out an airborne magnetic survey and prospecting program. The exploration target is gold-mineralized rhyolite dikes or sills.

8.1.3. Kootenay-Boundary Region

At their **LH** gold property, Magnum Goldcorp Inc. drilled known alteration zones and geophysical anomalies identified from SP, IP and magnetometer surveys in 2014. Drilling also targeted extensions of high-grade zones from previous drilling and sampling in the historic underground workings. Drilling highlights include 16.9 m of 13.58 g/t (including 10.9 m of 20.61 g/t) and 11 m of 20.66 g/t Au.

8.1.4. Thompson-Okanagan-Cariboo Region

Barkerville Gold Mines Ltd. underwent management changes that resulted in the **Bonanza Ledge** gold mine operation being suspended. It was decided to concentrate on an aggressive exploration program to better assess the potential of their **Cariboo Gold** project. Drilling highlights for Barkerville Mountain include 43.48 g/t Au over 7.95 m.

Westhaven Ventures Inc. carried out a LIDAR survey, ground based IP, magnetometer and VLF-EM surveys and 1,400 m of drilling on their **Shovelnose** gold project. Drilling returned 50.4 m of 0.2 g/t Au.

8.1.5. West Coast Region

Aldever Resources Inc. (Formerly Glenmark Capital Corp.) conducted a reconnaissance program on their **Margurete** property that included 39 packsack drill holes. Results are not yet available.

8.2. Porphyry (Cu-Au, Cu-Mo, Mo) projects

8.2.1. Skeena Region

Garibaldi Resources Corp. completed a diamond drill program on their **Grizzly** property. The program consisted of five holes totaling approximately 1,000 m. Assay results are pending.

Gold Reach Resources Ltd. carried out prospecting, soil sampling, and environmental baseline programs on their **Ootsa** copper-gold-molybdenum-silver project. In September, they began a Preliminary Economic Assessment for the project.

Kaizen Discovery and joint venture partner Freeport McMoRan of Canada Limited carried out a three-hole 1,877 m drill program on their **Tanzilla** project, 23 km southeast of Dease Lake. Drilling intersected an advanced argillic and phyllic altered lithocap that returned elevated metal values. Additional drilling is required to test the large alteration system.

8.2.2. Omineca Region

Pacific Empire Minerals Corp. tested geophysical anomalies

on their **Col-Later** project with 2,000 m of drilling. Assay results have not been made public.

In 2015, AuRico Metals Inc. carried out a 15 hole, 27,000 m diamond drill program on their **Kemess East** project. The project includes the defined Kemess East deposit, which consists of two structurally offset zones, the Kemess Offset Zone and the Kemess East Zone. The program further delineated and expanded the known mineralization of the Kemess East deposit. Mineralization remains open in three directions in both zones. The Orion and South Dam targets were tested in a nine-hole fly drill program, but no significant values were returned. Grassroots work included rock sampling, mapping, and prospecting over these target areas.

Kiska Metal Corporation's **Kliyul** property (Fig. 12) is under option to Teck Resources Ltd. In 2015, a four-hole drilling program extended known mineralization. Drilling highlight results include 245.0 m of 0.18% Cu, 0.53 g/t Au and 162.4 m of 0.20% Cu, 0.26 g/t Au.

In 2015, Thompson Creek Metals Company Ltd. began a multi-year drilling program on their **North Grid** target area about 5 km northwest of the Mt. Milligan mine lease. Geophysical and geochemical targets were tested by five drillholes. Results are pending.



Fig. 12. Core logging at the Kliyul property.

8.2.3. Thompson-Okanagan-Cariboo Region

Kaizen Discovery Inc. (60%) and Itochu Corporation of Japan (40%) drilled 13 holes on their **Aspen Grove** copper-gold project. Drilling was carried out primarily on the Ketchikan Lake stock. All holes encountered potassic and/or calc-potassic alteration; 12 intersected copper-gold mineralization with grades up to 0.5% Cu and 0.15 g/t Au over tens of m.

WestKam Gold Corp. drilled seven holes at their **Bonaparte** project. One step out hole intersected ~8 g/t Au, 38 g/t Ag, 29 g/t Te and 0.33% Cu over 1 m.

In September of 2015, Amarc Resources Ltd. announced an option agreement with Thompson Creek Metals Company Inc. on their **IKE** project. Initial investment financed a nine-hole

5,028 m drill program in the fall of 2015. Highlights include 592 m of 0.44% CuEQ of 0.30% Cu, 0.032% Mo and 2.1 g/t Ag. Copper equivalent (CuEQ) calculations used metal prices of Cu US\$2.25/lb, Mo US\$8.00/lb and Ag US\$17.00/oz. Metallurgical recoveries and net smelter returns are assumed to be 100%.

GWR Resources Inc. carried out a prospecting and diamond drill program on its **Lac La Hache** copper-gold-silver project. Drilling targeted the Aurizon-South breccia zone and was designed to test continuity of known mineralization and assess the potential for underground mining. Drilling highlights include 12.40 g/t Au over two m and 11.67 g/t Au over 5 m. The prospecting program resulted in the discovery of the Berkey prospect, where chip sampling returned 0.45% Cu over 2.4 m.

8.2.6. South Coast Region

Carube Copper Corp. carried out an IP survey at its **Rogers Creek** porphyry copper project north of Harrison Lake. Survey results include a chargeability anomaly that may represent a new target, as previous drilling intersected anomalous Cu-Mo-Ag mineralization at the edge of the anomaly.

8.3. Polymetallic base and precious metal projects

8.3.1. Omineca Region

The **Akie** property of Canada Zinc Metals Corp., hosts the Cardiac Creek barite-bearing zinc-lead-silver SEDEX deposit. In 2015, eight holes were drilled to infill gaps in the resource model for the high-grade core of the deposit. All eight holes intersected mineralization (Fig. 13); highlights include 28.51 m of 10.22% Zn, 2.34% Pb, and 20.45 g/t Ag; 23.36 m of 8.63% Zn, 1.68% Pb, and 14.64 g/t Ag; 21.41 m of 9.47% Zn, 2.11% Pb, and 18.22 g/t Ag; and 15.76 m of 9.71% Zn, 1.74% Pb, and 15.75 g/t Ag.

The **Cirque** project, which includes the Cirque, Fluke, and Elf properties, is a joint venture between Teck Resources Ltd. and Korea Zinc Company Limited. In 2015, a five-hole diamond drilling program focused on the South Cirque target. Results have not been made public.



Fig. 13. Akie project, banded sphalerite in drillhole A-15-121.

The Yuen, Cirque East, Pie, Elf zinc-lead-silver properties are currently under option by Teck Resources Ltd. and Korea Zinc Company Limited from Canada Zinc Metals Corp. Collectively they are known as the **Kechika Regional** project. In 2015, a ground-based gravity geophysical survey was completed on selected targets on the Yuen, Pie, Cirque and Elf properties and the results of an airborne gravity gradiometry survey over the properties was received.

8.3.2. Kootenay-Boundary Region

Ximen Mining Corp. carried out mapping, trenching, and sampling on their **Gold Drop** gold, silver, and base metal project. One grab sample from trenching assayed 159 g/t Au, 744 g/t Ag, 70 ppm Cu, and 17,000 ppm Pb. Most samples that were elevated in Au also had elevated Ag, Pb, and Cu.

Braveheart Resources Inc. continued bulk sampling and trenching at their **Whitewater/Referendum** gold, silver, lead, and zinc project. Late in 2015, bulk samples were sent for crushing and milling and flotation testing; results are pending.

8.4 Skarn projects

8.4.1. Kootenay-Boundary Region

In 2015, Margaux Resources Ltd. continued work on their **Jersey-Emerald** tungsten project. Work was focused on dewatering the underground workings at the Emerald, in preparation for further underground drilling and sampling. They also mapped and sampled at the Jersey, with plans for drilling in 2016. The company released a new tungsten resource estimate for the Emerald of 3.071 Mt grading 0.34% WO₃ (Measured and Indicated) with 5.48 Mt grading 0.273% WO₃ (Inferred) using a 0.15% WO₃ cut-off grade.

Golden Dawn Minerals Inc. channel sampled and drilled at their **May Mac** project. Channel sample results include: 0.87 m grading 12.97 g/t Au, and 34 g/t Ag; 0.2 m grading 36.37 g/t Au, and 43 g/t Ag; 0.4 m grading 17.07 g/t Au, and 11 g/t Ag; and 0.4 m grading 4.46 g/t Au, and 529 g/t Ag. Drilling results include: 4.4 m of 195 g/t Ag, 1.97 g/t Au, 1.48% Pb, and 2.85% Zn; and 2.23 m of 148.8 g/t Ag, 0.24 g/t Au, 1.2% Cu, 1.9% Pb, and 1.9% Zn.

8.4.2. Thompson-Okanogan-Cariboo Region

Plate Resources Inc. has an option agreement with Nexgeo Inc. and Korea Resources Corporation to advance the **Lucky Mike** project 25 km north of Merritt. In 2015, a 17 diamond-drill hole program totalled 4,828 m. Drilling on the Lucky Mike skarn target returned 9.6 m of 0.142% WO₃.

8.5. Industrial mineral and aggregate projects

8.5.1 Kootenay-Boundary Region

Hi Brix Manufacturing Inc. shipped material from their **Cro** phosphate project for agricultural testing; results are pending. The company also conducted environmental baseline work and has received approval for a 10,000 t bulk sample.

8.6. Coal projects

8.6.1. Omineca Region

Atrum Coal Groundhog Inc. completed engineering studies and coal quality tests and upgraded the resource and geological model for the Groundhog North component of their **Groundhog** project. The permitting process for a 100,000 tonne underground bulk sample continued.

8.6.2. Kootenay-Boundary Region

Pacific American Coal Limited mapped and sampled at their **Elko** coal project. Mapping recorded the location of coal outcrops, historic adits, and drill collars. The company also compiled geological data and outlined locations for future drilling.

9. Publically funded geoscience

9.1. The British Columbia Geological Survey

Established in 1895, the British Columbia Geological Survey (BCGS) links government, the minerals industry, and British Columbians to the province's geology and mineral resources. The key roles of the Survey are to: 1) create, maintain, and deliver geoscience knowledge to lead informed decision making; 2) attract exploration for new mineral and coal resources; 3) act as the public steward of mineral and coal resources; and 4) guide public policy by providing assessments on mineral exploration and mining activities. The activities of the Survey and its geoscience products are profiled annually at the AMEBC's Mineral Exploration Roundup in Vancouver, and at regional, national, and international geoscience conferences.

Headquartered in Victoria, the BCGS is a branch in the Mines and Mineral Resources Division of the Ministry of Energy and Mines. The Cordilleran Geoscience Section is responsible for generating new geoscience knowledge, largely through field-based studies and surveys. The Resource Information Section maintains and develops the provincial geoscience databases and disseminates geoscience data online. The Section is also responsible for evaluating, approving, and archiving mineral and coal exploration assessment reports filed by the exploration and mining industry. From a satellite office in Vancouver, the Mineral Development Office links the province's mineral and coal resources to the investment community, distributes and promotes BCGS technical data, and coordinates the technical outputs of the Regional Geologists Program.

The BCGS remains committed to producing geoscience data and knowledge that stimulate exploration activity and attract investment. The Survey strives to be a leader in public government geoscience, providing information to all stakeholders and communities through reports, maps, and databases, which can be freely accessed online.

The Survey supports the minerals industry through the projects that it undertakes. Projects in 2015 focused on porphyry initiatives, deposit studies, exploration methods development, and regional synthesis and map compilation. Projects in the Nicola arc (Quesnel terrane) focused on mapping and establishing a stratigraphic and geochronologic framework

between Merritt and Likely to better understand the prolific porphyry deposits in the region. In northwest British Columbia, mapping in Stikine terrane, also with an exceptional porphyry mineral endowment, was in collaboration with the Geological Survey of Canada (GSC) through the second iteration of Geo-mapping for Energy and Mineral program (GEM 2). In recent years the BCGS has expanded and developed new mineral exploration methods. An important theme in 2015 studies was porphyry indicator minerals (PIMs) as an exploration tool. A new BCGS partnership with the Canadian Mining Innovation Council (CMIC), investigated PIMs in till from Highland Valley, continuing the work that was completed at Gibraltar, Mount Polly, and Woodjam by the BCGS and the GSC under the Targeted Geoscience Initiative (TGI-4) program. Another exploration method project, completed in partnership with the University of Victoria, used trace elements in apatite to discriminate major mineral deposit types. This method was field tested on detrital apatite in till from the Woodjam project. The results of these projects and others were presented at the fall BCGS Open House held jointly with a two-day strategic and critical materials symposium that delivered the final results of the TGI-4 Specialty Metals project and served as the launch point for further studies. Survey projects are published annually in *Geological Fieldwork* (Fig. 14) and in publications by partners including Current Research (GSC), and Summary of Field Activities (Geoscience BC).

The BCGS continues to update its databases, including MINFILE, COALFILE, Property File, the Assessment Reports Indexing System (ARIS), and regional geochemical surveys through MapPlace. Since 1995, MapPlace, has provided open geoscience data and custom map-making tools to help assess the mineral potential of British Columbia, assist exploration, and guide investment decisions. Through MapPlace, BCGS databases talk to each other. The next generation of MapPlace, (MapPlace 2), scheduled for release in 2016, is capable of accessing queried BCGS databases to display province-wide maps within seconds. The BC Digital Geology map, using a unique geospatial data model, remains a Survey priority with frequent updates. The Survey has updated the Regional Geochemical Survey (RGS) database and is modernizing the provincial litho-geochemical database. The BCGS's provincial rock and pulp archive, which hosts over 600,000 samples and is valued at more than \$20 million, was relocated to a new storage facility on Belleville Street in Victoria.

9.2. The Geological Survey of Canada

The BCGS and the Geological Survey of Canada (GSC) continue to collaborate on large and small geoscience projects. In the Kootenays, the Geological Survey of Canada is conducting a multi-year project for SEDEX-style and related base metal mineralization, as part of the Targeted Geoscience Initiative (TGI-4). The focus of the project is to generate a regional 3D geoscience model of the Purcell Anticlinorium and the Belt-Purcell Supergroup, which hosts the historic Sullivan Mine. Geological, geophysical, and geochemical data are being

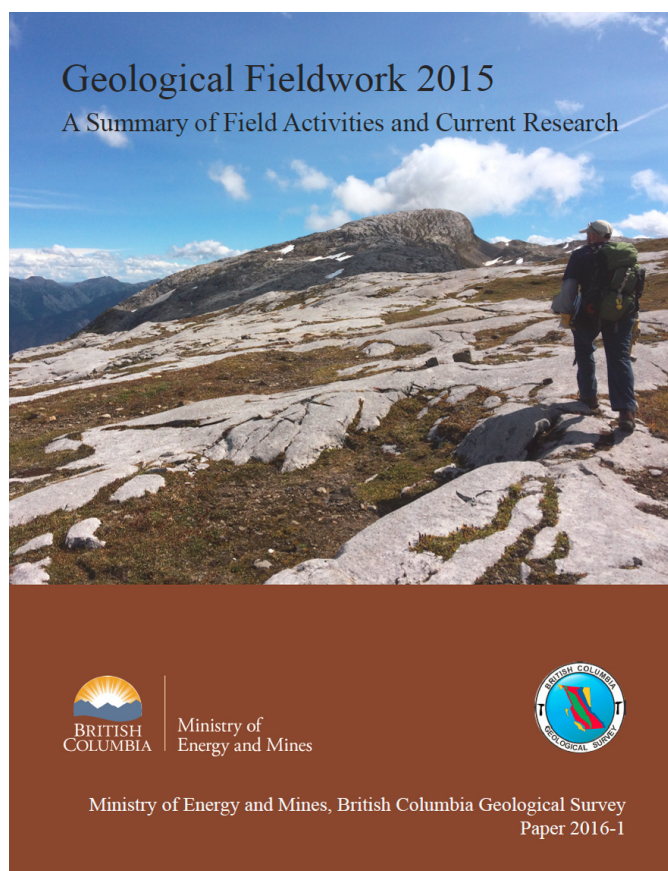


Fig. 14. *Geologic Fieldwork* contains peer-reviewed papers that summarize field activities and current research by the British Columbia Geological Survey.

compiled to generate new perspectives on ore controls for SEDEX targeting.

In 2013, the second phase of the Geo-mapping for Energy and Minerals program (GEM-2) was announced. The program will run until 2020 and the BCGS is participating in the Cordilleran Regional project that is a collaborative effort between the geological surveys of Yukon, Alaska, British Columbia and the Canadian government. Multidisciplinary field-based studies in poorly understood areas will focus on bedrock geology, crustal architecture, Cordilleran tectonics, and metallogeny to help drive the discovery of new mineral deposits and increase known resources. In addition, surficial geology and glacial history studies will provide vital knowledge for mineral exploration in covered regions.

9.3. Geoscience BC

Geoscience BC is a not-for profit, non-governmental, geoscience organization established in 2005 with grants from the provincial government. Geoscience BC is industry-focused, with a board of directors and technical advisors largely drawn from industry. It is mandated to promote mineral, oil and gas, and geothermal exploration in British Columbia by generating and distributing geoscience data. Open and targeted requests for proposals generate many of the large geoscience projects and

work is done by contractors, consultants, and other providers of public geoscience.

10. Foreign investment initiatives

Opportunities exist for companies to attract foreign investment using government services and staff. The province participates in international investment missions showcasing mineral and coal opportunities. If you are interested in profiling your projects or investment opportunities in upcoming events, connect with the Mineral Development Office in Vancouver for more information.

11. Concluding remarks

Although exploration expenditures were down compared to 2014, explorationists continued to discover, define, and expand porphyry and porphyry-related copper-gold and copper-molybdenum deposits, gold deposits of various types, and stratiform base-metal, specialty metals, industrial minerals, and coal deposits.

The Red Chris mine declared official production, and metal mine development projects continued with the Brucejack and Silvertip projects. Lower commodity prices resulted in a reduction in coal production and the shutdown of the Myra Falls base metal mine. In early 2016, shutdowns were announced for the Huckleberry copper, gold, silver, molybdenum mine and the Quinsam underground coal mine.