



British Columbia coal industry overview 2013



Ministry of
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Ministry of Energy and Mines, British Columbia Geological Survey
Information Circular 2014-05



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Front cover: View to the southwest from the new portal for HD Mining's Murray River project bulk sample. The site of Teck Coal's newly re-permitted Mount Babcock mine can be seen on the skyline. In the middle ground is the Shikano pit of the old Quintette operation.

Back cover: Coal truck being loaded, Quinsam mine near Campbell River, Vancouver Island. Peaks of the Vancouver Island Ranges are on the skyline.

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British Columbia Geological Survey

Ministry of Energy and Mines

Introduction

In 2013, British Columbia produced an estimated 31 million tonnes of coal. This production accounted for about \$4.6 billion, or close to 58% of revenues from all mines in the province (Fig. 1). Coal exploration remained active although, because of lower prices for metallurgical and thermal coal, some exploration projects were reduced and others postponed. For the first time since 2007, two new coal leases were issued. The number of coal exploration licenses issued was steady, but new coal applications dropped from record levels set in 2012.

This overview provides a snapshot of the provincial coal industry, complementing other British Columbia Geological Survey and Ministry of Energy and Mines annual publications (see Provincial and Regional summary volumes in Information sources below). It describes industry trends and coal regions, highlights 2013 mining and exploration, describes transportation infrastructure, outlines the tenure system, and lists sources of information and contacts.

Coal is currently produced from ten mines in four regions (Fig. 2). Five mines in the southeastern part of the province and three in the northeastern part produce mainly coking and pulverized coal injection (PCI) coal, whereas the Quinsam mine on Vancouver Island and the Basin mine in the southwest Interior produce thermal coal. Major markets for British Columbia coal include Asian countries, especially Japan, China, South Korea and India, and countries in South America and Europe.

British Columbia coal industry trends in 2013

Price declines for metallurgical and thermal coal slowed in 2013 relative to those in 2012, when prices decreased dramatically from the historic highs of 2011. Prices for BC premium hard coking coal (HCC) dropped from \$175 per tonne at the end of 2012 to \$155 per tonne by the end of 2013. PCI coal prices ranged between \$125 and \$144. Per tonne prices for British Columbia thermal coal dipped from an average of \$110 in 2012 to \$95 in 2013. (All prices are in \$US, Estimated West Coast port price.)

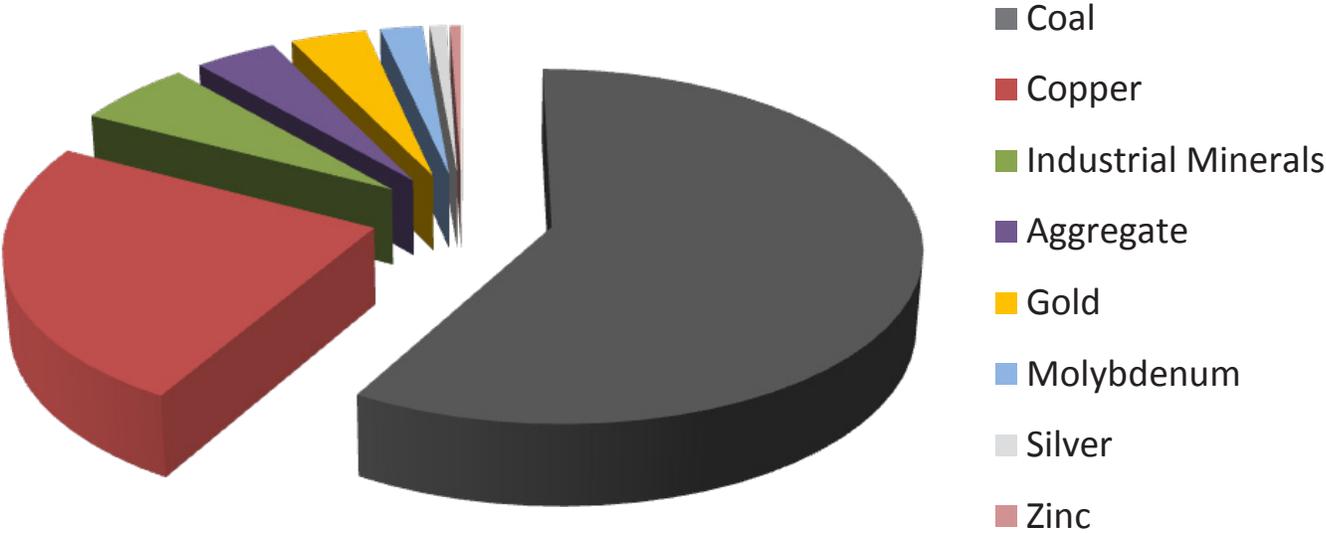


Fig. 1. Forecast production value by mined commodity for British Columbia in 2013. Coal accounted for over \$4.6 billion, about 58% of all mineral production in the province.

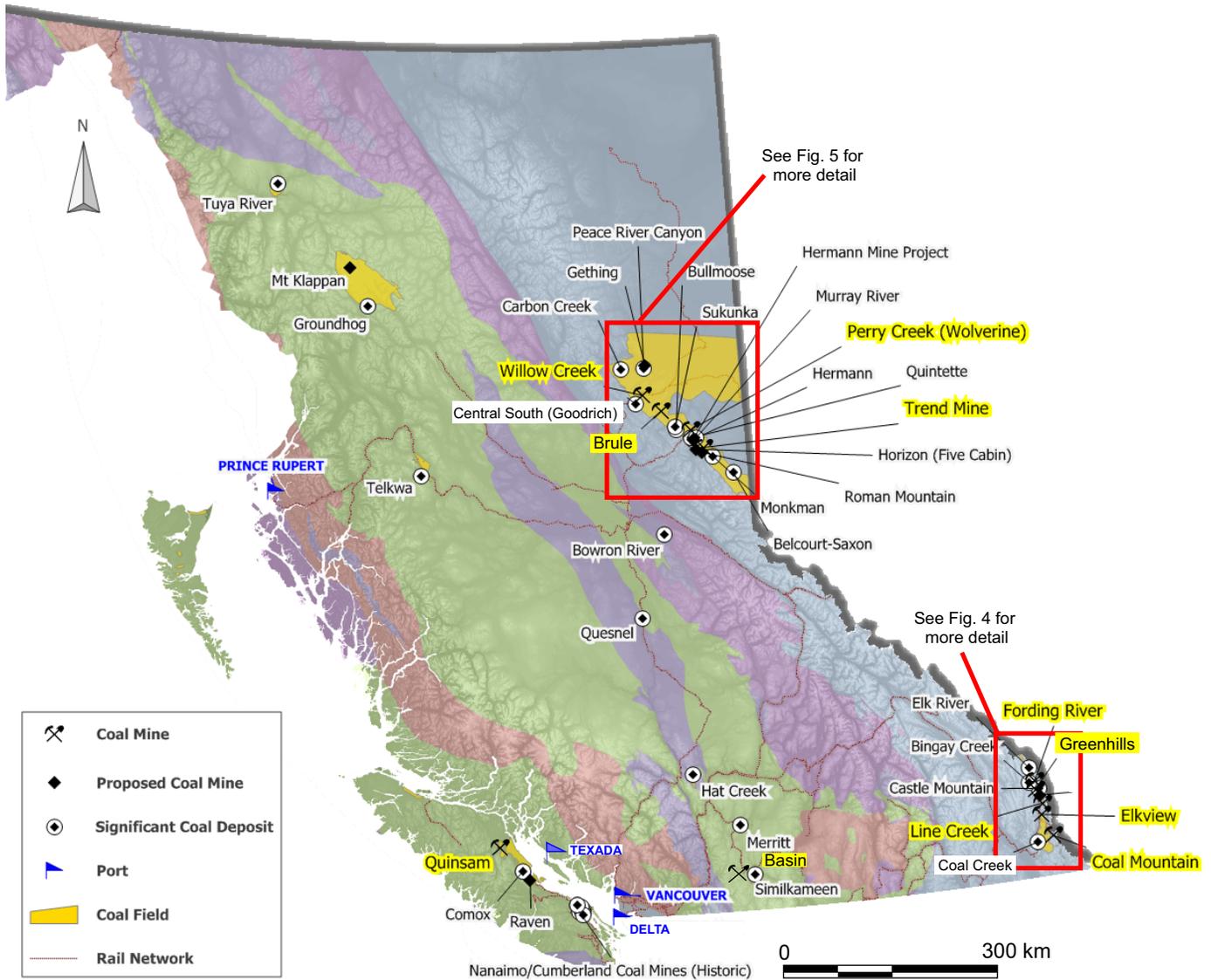


Fig. 2. Operating coal mines, coal ports, and selected major coal exploration projects in British Columbia, 2013.

In the spring, Walter Energy suspended production at the Willow Creek mine near Chetwynd in northeastern British Columbia (Fig. 2). In the southwestern Interior of the province, Coalmont Energy Corporation restarted production of thermal coal at the Basin mine near Princeton, after a hiatus of 7 years on care and maintenance.

Exploration expenditures reached about \$119 million in 2013 (not including mine development costs), a marked decrease from the record-setting levels of 2012. Many aggressive exploration projects planned in the previous year were scaled back or postponed.

New coal license applications numbered 155 in 2013 for a total of 197,681 hectares. This represents a marked

decrease from the previous year (Fig. 3). Sixteen new coal licenses were issued, totalling 15,735 hectares.

For the first time since 2007, the province issued new coal leases. A 3800 ha-lease expanded the existing lease at Teck Coal Limited's Mount Babcock project, southeast of Tumbler Ridge. In southeastern British Columbia, a new 1402-ha lease expands the existing lease at the Line Creek mine northward.

The Government of Canada is considering an open competitive sale of parts of the Dominion Coal Blocks, in the Kootenay region of British Columbia (Fig. 4). The Dominion Coal Blocks were acquired by the Government of Canada in 1905 in exchange for financial support for rail construction through the Crow's Nest Pass. If the sale proceeds, it will open 20,235 hectares of land that has

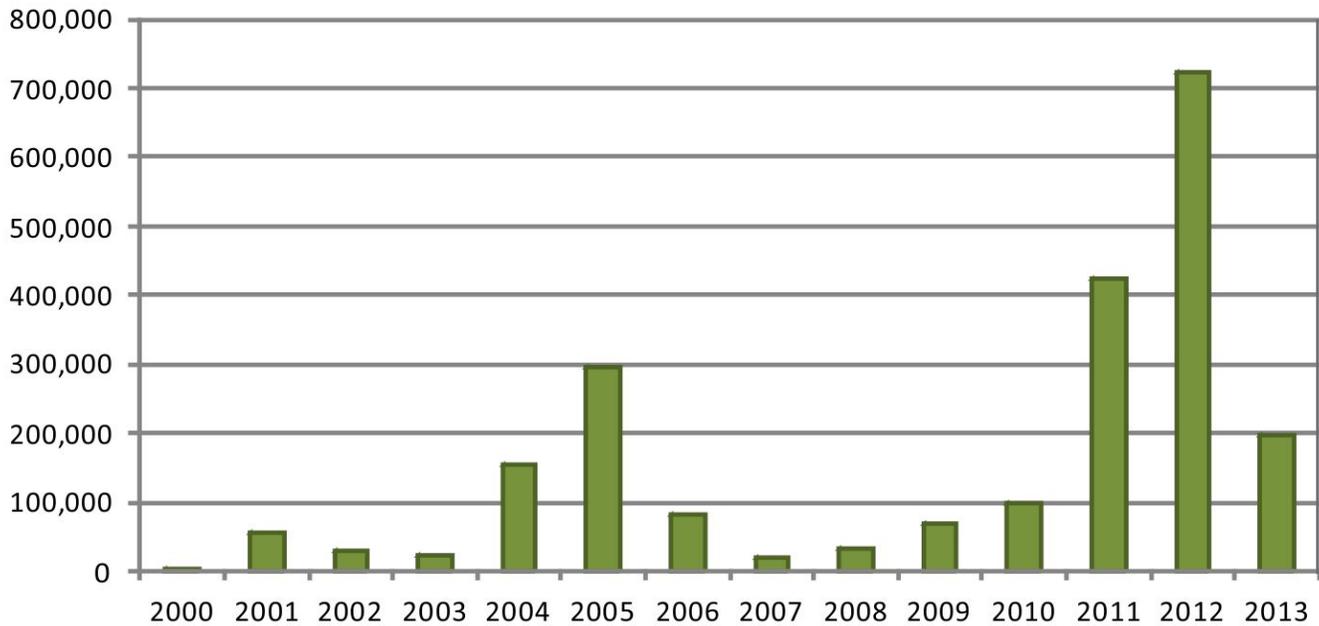


Fig. 3. Coal license claim applications in hectares, 2000-2013.

been closed to coal development since 1905. Details of the auction process have yet to be released.

Coal regions of British Columbia

Upper Jurassic to Tertiary coal seams of economic interest occur in several regions of British Columbia. The distribution of coalfields follows the southeast-northwest tectonic and physiographic grain of the province (Fig. 2). Currently, most coal mining is in the Rocky Mountain belt of eastern British Columbia. Farther west, coalfields are in the interior of the province and on west coast islands (Vancouver Island and Haida Gwaii).

Southeastern British Columbia deposits (Figs. 2, 4) are in the East Kootenay coalfields, which extend northwest from the Canada-USA border for 175 km along the Rocky Mountains. Economic coal seams are hosted by the Mist Mountain Formation of the Kootenay Group (Jurassic-Cretaceous). Most of the known resource is metallurgical coal, ranging mainly from high-volatile A bituminous to low-volatile bituminous. Southeastern British Columbia coals are characterized by low total sulphur contents. Potentially mineable coal resources are estimated at about 8.0 billion tonnes.

Northeastern British Columbia deposits (Figs. 2, 5) are in the Peace River Coalfield, which extends along the Rocky Mountain Foothills, 400 km northwest from the

Alberta border. The coals occupy a stratigraphic interval of over 3000 m and are hosted by four Lower Cretaceous units, the most important of which are the Gates Formation (Fort St. John Group) and Gething Formation (Bullhead Group). Coal rank in the Gething and Gates formations ranges from high-volatile A bituminous to low volatile bituminous. Metallurgical coals are predominant in the known resources, and total sulphur contents are typically low. Coal seams of the Wapiti Formation (Upper Cretaceous) are lower in rank and have potential for thermal coal. Coal also forms thin seams in the Minnes Group (Lower Cretaceous) but these are not currently exploration targets. Potentially mineable coal resources are estimated at 4.9 billion tonnes, with considerable potential for growth as exploration continues. The marketability of Gething Formation coals has greatly benefitted from the increased use of pulverized coal injection (PCI) products in steel making.

In **northwestern** British Columbia, the Groundhog-Klappan Coalfield (Fig. 2) covers approximately 2,300 km² and hosts Canada's only significant anthracite deposits. The estimated potential of the greater Groundhog region is in excess of 9 billion tonnes of semi-anthracite to meta-anthracite coal. Several other smaller basins host coal in the northwestern part of the province, including the Telkwa Coalfield south of Smithers, the Tuya River deposit southwest of Dease Lake, and the Naskeena prospect north of Terrace (Fig. 2).

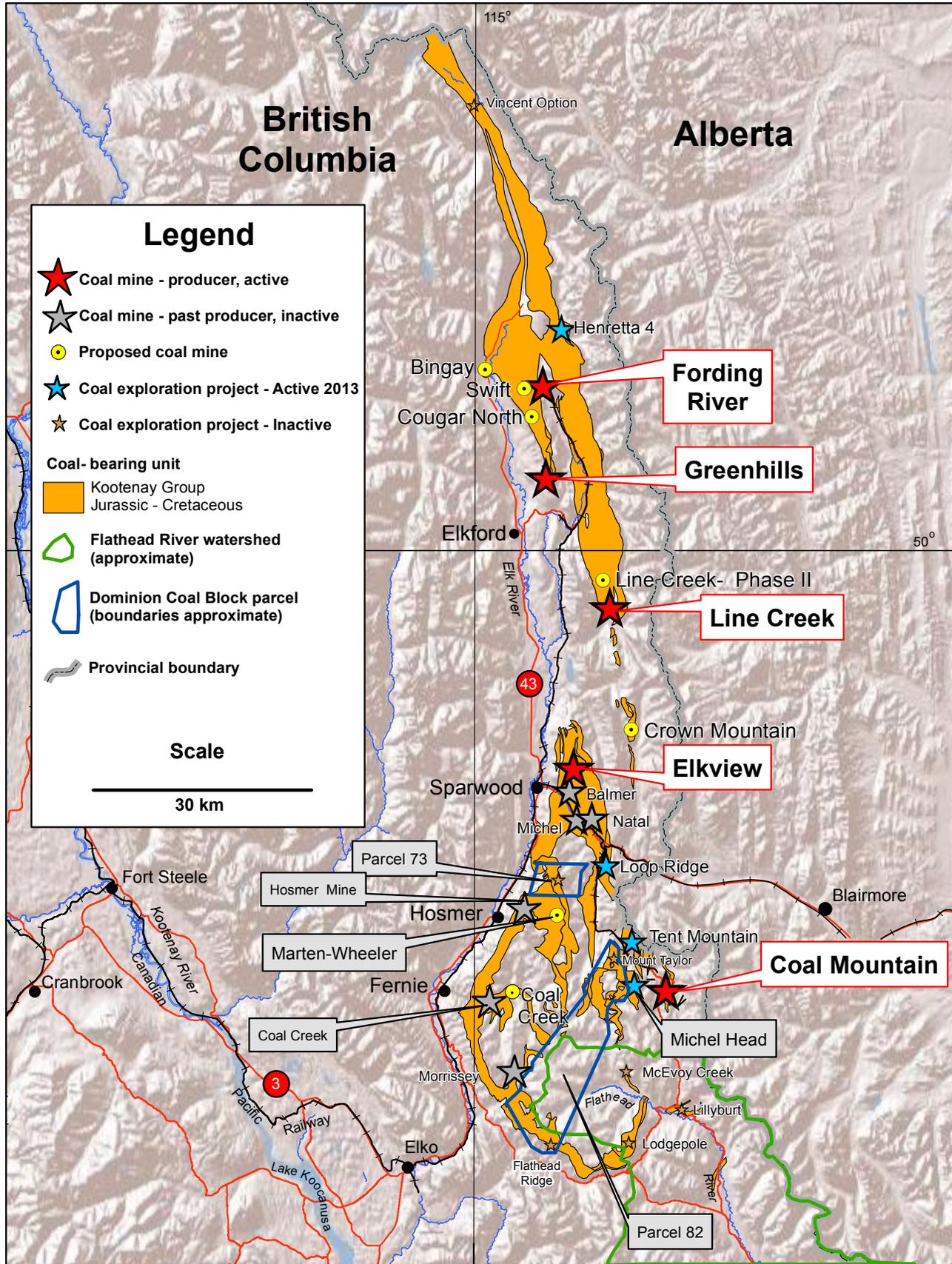


Fig. 4. Operating mines and major exploration projects, southeastern British Columbia, 2013.

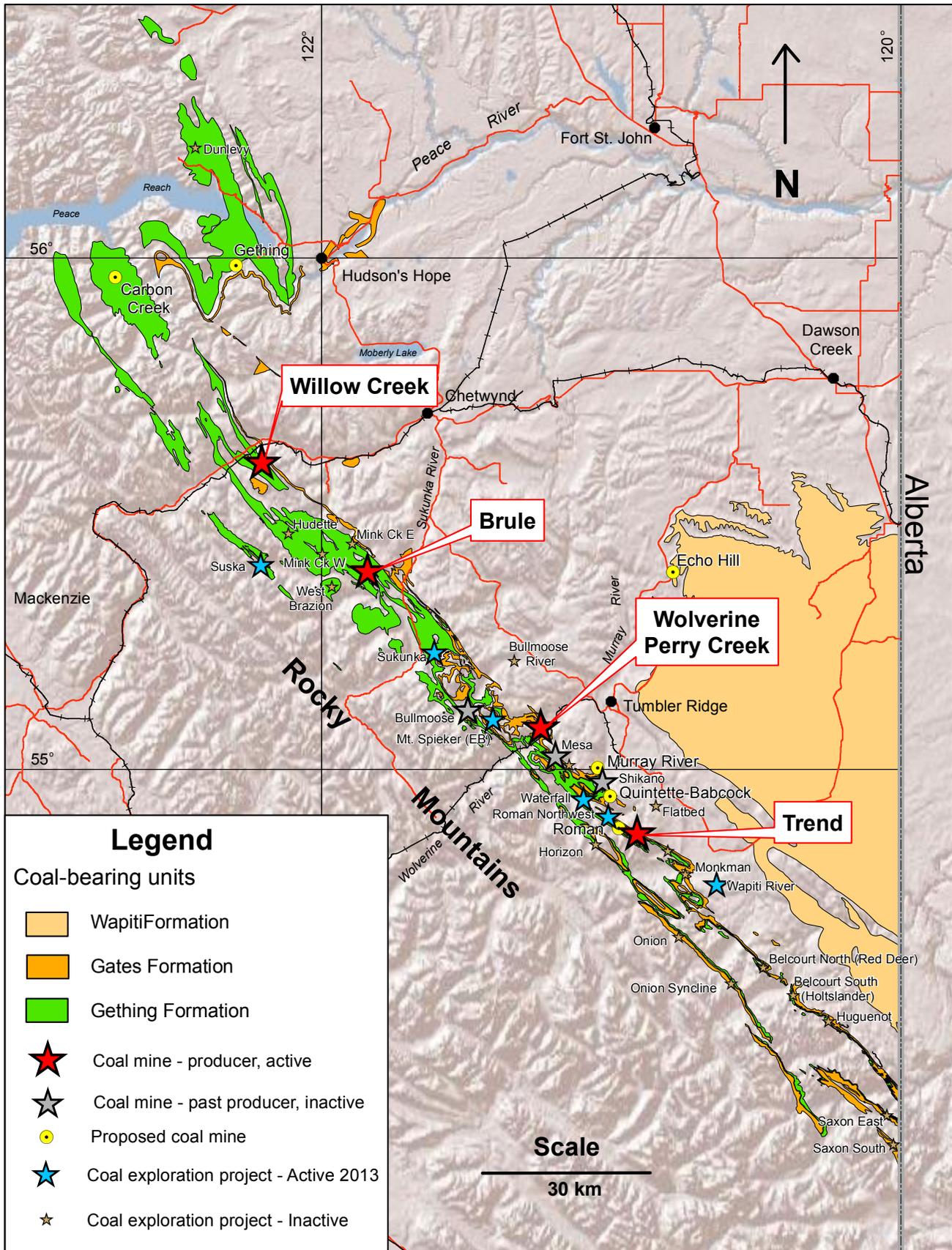


Fig. 5. Operating mines and major exploration projects, northeastern British Columbia, 2013.

In the **southern interior** of British Columbia, numerous small Tertiary basins contain coal. Tertiary basin coals in the Similkameen, Merritt, and Hat Creek coalfields range from lignite to high-volatile bituminous; they are generally low-sulphur coals.

On **Vancouver Island**, coal in the Nanaimo and Comox coalfields is hosted by several units in the Nanaimo Group (Upper Cretaceous). Coal ranks are generally in the high-volatile A to B bituminous range; sulphur contents are variable.

Coal mining

Annual coal production remained steady in 2013; at year end, British Columbia coal mines projected 31.2 million tonnes of product coal. Production has ranged between 22 and 30 million tonnes for the past 20 years. Coal mining statistics for 2013, including production rates and reserves, are summarized in Table 1; coal mine locations are shown in Figures 2, 4, and 5.

Southeastern British Columbia

Teck Coal Limited, the world's second-largest exporter of metallurgical coal, operates five large open-pit coal

mines in the Elk Valley area (Fig. 5). The mines at **Fording River, Greenhills, Line Creek, Elkview, and Coal Mountain** produce approximately 70% of Canada's total annual coal exports, and directly employ over 4,500 people full-time. All five are open-pit, truck and shovel mines. Annual combined production of metallurgical and thermal coal from these mines has increased in recent years. Total clean coal production from Teck's operations is projected to total 25.3 Mt for 2013, up from the actual production of 22.9 Mt in 2012.

As part of a plan to address water quality issues in the Elk Valley, Teck expects to open the first of six water treatment plants (West Line Creek Water Treatment Facility) by the second quarter of 2014. The plant will remove selenium and other contaminants from Line Creek.

The Elk Valley Coalfield is in the Alexander Creek and Greenhills synclines, and includes the **Fording River, Greenhills and Line Creek** operations. The Crowsnest Coalfield lies in the Fernie Basin, a broad north-trending synclinorium that hosts the current **Elkview and Coal Mountain** operations. Pulverized coal injection coal is the main product shipped from **Coal Mountain** (Fig. 6).

Table 1. Production and reserve estimates for coal producers in British Columbia, 2013.

HCC = hard coking coal; PCI = pulverized coal injection; ULV = ultra low volatile

Mine	Operator	Deposit type/commodity	Forecast 2013 production	Proven and probable reserves
Basin	Coalmont Energy Corp.	Thermal coal	100 000 t washed coal	Not available
Brule	Walter Energy, Inc.	ULV PCI coal	1.4 Mt	19.4 million tonnes
Coal Mountain	Teck Coal Limited	PCI and thermal coal	2.5 Mt	13.3 million tonnes
Elkview	Teck Coal Limited	HCC	5.35 Mt	211.1 million tonnes
Fording River	Teck Coal Limited	HCC and thermal coal	8.92 Mt	614.5 million tonnes
Greenhills	Teck Coal Limited	HCC, PCI and thermal coal	5.10 Mt	70.1 million tonnes
Line Creek	Teck Coal Limited	HCC, PCI and thermal coal	3.40 Mt	64.5 million tonnes
Quinsam and 7 South	Hillsborough Resources Limited	Thermal coal	365 000 t washed coal	not available
Trend	Anglo American plc (Peace River Coal Inc.)	HCC	1.8 Mt washed coal	20.2 million tonnes
Willow Creek	Walter Energy, Inc.	HCC and ULV PCI	0.45 Mt washed coal	19.0 million tonnes
Wolverine (Perry Creek)	Walter Energy, Inc.	HCC	1.8 Mt	11.0 million tonnes



Fig. 6. Teck's Coal Mountain Mine, Crowsnest Coalfield

The Flathead Coalfield consists of four relatively small isolated exposures of Kootenay Group rocks in the extreme southeastern corner of the region. Provincial legislation enacted in 2011 prohibits subsurface resource exploration and development in the Flathead River watershed (Fig. 4), so the Flathead Coalfield and part of the Crowsnest Coalfield are excluded from coal mining activity.

Northeastern British Columbia

The year began with four open-pit coal mines operating in the Peace River Coalfield (Fig. 5). The **Trend mine** of Peace River Coal Inc. (wholly owned by Anglo American plc) and the Perry Creek mine (Fig. 7) of Western Coal Corp. (wholly owned by Walter Energy, Inc) produce coking coal. The **Brule** and **Willow Creek** mines (Walter Energy Inc) also produce premium ultra-low volatile PCI thermal coal. In April, Walter Energy suspended operations at the Willow Creek Mine as depressed coal prices made production unprofitable. Forecast total production in the Peace River Coalfield for 2013 is about 5.5 Mt, down from actual production in 2012 of 5.9 Mt. All four mines are open-pit, truck and shovel operations, working seams from the Gates and Gething formations.

Peace River Coal produces mainly hard coking coal at the Trend Mine, where 2013 production was forecast to be 1.8 Mt of washed coal. Construction began on Peace River Coal's **Roman Mine** in August. The Roman project is immediately adjacent to the Trend mine and will use the same wash plant and other infrastructure when it begins production, expected in 2015. The combined Trend-Roman mine is expected to increase production to 2.5 Mt/y by 2016, and to 4 Mt in subsequent expansion phases. South of Babcock Creek, Phases 1, 2, and 3, began in 2006, 2008, and late 2010 respectively. Farther



Fig. 7. Mining hard coking coal from the Gates Formation at Phase 3 of Walter Energy's Perry Creek (Wolverine) operation.

southeast, along strike of the Waterfall anticline across Gordon Creek, mining is proceeding at Phase 4. Phases 5 and 6 have been explored and fully permitted. Mining at Trend is expected to continue for another 10 years.

In June, Teck received its Mines Act Permit Amendment (MAPA) to reopen the Quintette mine at **Mount Babcock**. Teck postponed the reopening pending improved prices, but continued geotechnical drilling and other preparatory work. As of December 31, 2013, Teck reported proven and probable reserves at the Mount Babcock mine at 42.2 million tonnes of coking coal.

Vancouver Island

Hillsborough Resources Limited continues to produce thermal coal from the **Quinsam Mine** in the Comox Coalfield (Figs. 2, 8). Quinsam is an underground room-and-pillar operation. Forecast 2013 production is the same as that in 2012 (365,000 tonnes). In 2013, production continued from the 7-South area, which opened in 2012, approximately 3.5 km from the main Quinsam mine.



Fig. 8. Continuous miner at the 7-South operation, Quinsam mine of Hillsborough Resources.

Southern Interior

Coalmont Energy Corp. reopened the **Basin** coal mine (Fig. 9) near Princeton. It operated from June until October, producing 100 000 tonnes of thermal coal from the Princeton Group (Tertiary).



Fig. 9. Mining at Coalmont's Basin mine.

Coal exploration

Coal exploration expenditures in British Columbia amounted to about \$119 million in 2013, down from the \$150 million record set in 2012. Most of the spending was on expansions adjacent to active mines and advanced coal projects (Table 2).

Southeastern British Columbia

In southeastern British Columbia, over \$28 million was spent on coal exploration in 2013. All five Teck operations have expansion projects in the exploration, permitting, or development stage (Table 2). Over 39,000 m of in-pit drilling was done to refine reserve definitions, coal quality analysis, geotechnical analysis, structural interpretations, and access and infrastructure construction.

Exploration drilling at **Fording River** operations was carried out at the **Henretta Phase 4** and **Swift Project** areas. The Henretta Phase 4 area is east of the current Henretta Pit footwall, on the eastern limb of the Alexander Creek syncline. The **Swift** project entered the Environmental Assessment Process (EAP) in 2011 and is in the pre-application stage. It is west of the Fording River, and partially encompasses previous **Fording River Mine** pits on the Greenhills Range. Open-pit mining methods are proposed. The **Greenhills Cougar North** extension is directly to the south of the Fording Swift area. Plans are underway to merge the mining grids and datasets for both

mines, with the Cougar North and Swift areas.

Mine expansion plans are underway with the **Line Creek Phase II**, which received conditional Environmental Assessment approval in October. This expansion will extend operations at Line Creek northward, to encompass the Mount Michael and Burnt Ridge North areas.

Teck drilled at the **Elkview** mine, immediately east of Sparwood, the mine expansion area at Baldy Ridge in the BR2 and BR6 pits, and the Natal Ridge pit PH2. Teck also continued exploration drilling at their **Coal Mountain** property, in the permitted area south of 6-Pit, to delineate a possible pit extension (Fig. 10).



Fig. 10. Fall exploration drilling at Coal Mountain, Crowsnest Coalfield.

Centermount Coal is proposing an open-pit and underground coal mine at **Bingay Main**, 21 km north of Elkford in the Elk Valley. The project entered the EAP in early 2013, but was suspended due to lower coal prices. The proposed mine would produce 2 Mt of coal annually, with a mine life of approximately 20 years and a total

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Table 2. Selected exploration and development projects in British Columbia, 2013.

Property name	Operator name	Status	2013 activity	Region
Arctos (Mount Klappan)	Fortune Minerals Limited	Pre-application (EA)	Drilling Environmental	Northwest (Skeena)
Coal Creek	Crowsnest Pass Coal Mining Ltd.	Exploration and mine evaluation	Drilling Coal quality Environmental	Southeast
Cougar North (Greenhills Operations)	Teck Coal Limited	Exploration	Drilling Coal quality Environmental	Southeast
Crown Mountain	Jameson Resources Limited	Exploration	Drilling Coal quality Environmental	Southeast
EB – Mt. Spieker	Walter Energy, Inc.	Approved (EA)	Drilling	Northeast
Elkview (Baldy Ridge and Natal Ridge)	Teck Coal Limited	Exploration	Drilling Coal quality Environmental	Southeast
Gething	Canadian Kailuan Dehua Mines Co. Ltd.	Pre-application (EA)	Environmental Reclamation	Northeast
Groundhog	Atrum Coal	Exploration	Drilling	Northwest (Skeena)
Huguenot	Colonial Coal International Corporation	Exploration	Prefeasibility Coal quality	Northeast
Line Creek Phase II (Line Creek Operations)	Teck Coal Limited	Conditionally Approved (EA)	Drilling Coal quality Environmental	Southeast (Kootenay)
Marten-Wheeler	Teck Coal Limited	Exploration and mine evaluation	Drilling Coal quality	Southeast (Kootenay)
Michel Creek (Michel Head, Loop Ridge, Tent Mountain)	CanAus Coal Limited	Exploration	Drilling Coal quality	Southeast (Kootenay)
Murray River	HD Mining International Limited	Pre-application (EA)	Bulk sample Environmental	Northeast
Quinsam 4 South and 6 South	Hillsborough Resources Limited	Exploration	Drilling	Coast (Vancouver Island)
Quintette - Babcock	Teck Coal Limited	MAPA (Mines Act Permit Amendment) issued	Bulk sample Drilling Coal quality Environmental Geophysical	Northeast
Roman Mountain	Anglo American plc (Peace River Coal Inc.)	Conditional certificate issued (EA)	Drilling Geophysical Environmental	Northeast
Roman Northwest	Anglo American plc (Peace River Coal Inc.)	Exploration	Drilling Geophysical	Northeast
Sukunka	Glencore	Pre-application (EA)	Drilling, Pre-feasibility	Northeast
Suska	Glencore	Exploration	Drilling	Northeast
Henretta 4 and Swift (Fording River Operations)	Teck Coal Limited	Pre-application (EA)	Drilling Coal quality Environmental	Southeast (Kootenay)
Wapiti River	Canadian Dehua International Mines Group Inc.	Exploration	Drilling Environmental	Northeast
Waterfall	Anglo American plc (Peace River Coal Inc.)	Exploration	Drilling Coal quality	Northeast

resource of about 39 Mt of clean coal. The company will continue to raise capital for final Feasibility Studies in anticipation of a market recovery.

Jameson Resources Limited continued drilling the **Crown Mountain** property in 2013, along with work on a Preliminary Economic Assessment (PEA) and environmental baseline studies. The drilling was a follow up to Jameson's extensive 2012 program, the first drilling on the property since 1981. Jameson estimates a total open-pit coal resource of 90 Mt at Crown Mountain, with a combined Measured and Indicated Resource of 66 Mt. Coal quality testing is ongoing, with initial results indicating characteristics that are similar to the Elk Valley coking coals.

Crowsnest Pass Coal Mining Ltd. carried out geological modelling, resource, and pre-feasibility work at their **Coal Creek** property, 8 km east of Fernie. Multiple seams in a series of thick coal zones dip gently to the east across much of the property. Coal seams at Coal Creek are on the western limb of the Hosmer Ridge syncline in the Crowsnest Coalfield. Drilling from 2012 indicated high quality hard coking and PCI coal in the upper seams. Environmental baseline studies, including a water quality survey, are ongoing.

Teck continued to assess the potential of the **Marten-Wheeler** property, 19 km northeast of Fernie. This site represents a possible expansion area for the Coal Mountain Operations. It encompasses Marten and Wheeler ridges in the western part of the Crowsnest Coalfield. Both large diameter rotary drilling and RC drilling was carried out in 2013 for geotechnical (mine design) and coal sampling purposes. A bulk sample is planned.

CanAus Coal Limited, a wholly owned subsidiary of CoalMont Pty Ltd, drilled on their three licences at the Michel Creek area, 15 km southeast of Sparwood. The **Loop Ridge, Tent Mountain, and Michel Head** projects are all on the western side of the regionally continuous Erickson normal fault. Drilling has identified twenty coal seams, with an average cumulative thickness of 70 m, in a 504 m-thick Mist Mountain Formation section. Initial raw coal tonnage estimates from historic and current data indicate potential resources between 120 and 140 Mt of high-quality, mineable coking coal. A pre-feasibility study is planned for 2014.

Northeastern British Columbia

Relative to the 2012 record, exploration and investment in the northeast region in 2013 was subdued. Cost-cutting measures and capital expenditure reductions forced some companies to reduce the scope and slow the pace of exploration projects. Exploration and mine development spending totalled \$80.5 million (down from \$109.3 million in 2012). Most of the spending was on mine evaluation and advanced stage work. Expansion work was carried out adjacent to operating mines, and other exploration projects moved toward opening new mines. Canadian Kailuan Dehua Mines Co. Ltd. received a permit for a 100 000 tonne bulk sample at the **Gething** project, and plans to take a 15 000 tonne underground sample employing a room-and-pillar mining method. Site work this year included reclamation activities for previous programs, helicopter-assisted water sampling for baseline studies, and community consultation.

In April, the **Carbon Creek** project of Cardero Resources Corp. was approved for an environmental assessment under a harmonized provincial and federal review process. The company has a prefeasibility study for a combined surface and underground (room-and-pillar) operation with an average annual production of 4.1 million tonnes of clean coal over an initial 20 years.

NWP Coal Canada Ltd, a subsidiary of Jameson Resources Limited, continued exploration and development of the Peace River coal projects: **Dunlevy, Graham River, Peace Reach and Carbon East**. During 2013 NWP focused on **Dunlevy**, refining tenure boundaries and advancing geologic models. The company was issued coal licenses late in 2013 and plans to proceed with a two-stage drilling program on the western limb of the Dunlevy syncline in 2014.

Glencore and partner JX Nippon Oil and Energy drilled the **Sukunka** project (Fig. 11) in support of combined surface and underground (long-wall) operations. The mine would initially produce 1.5-2.5 million tonnes per year of hard coking coal from a surface mine, followed by an underground component that could boost production to 6 million tonnes per year. Capital cost of the project is estimated at \$1.8 billion. The project is approved for a harmonized provincial and federal environmental review. The company also completed a first phase of drilling at the **Suska** property.



Fig. 11. The Chamberlain seam at Glencore’s Sukunka project (previously BP Canada Number 1 minesite). This seam yields high-quality hard coking coal with low ash and very low sulphur contents.

In May, the **Echo Hill** thermal coal project of Hillsborough Resources Limited was approved for harmonized environmental assessment and is in the pre-application stage.

Walter Energy drilled at **EB (Mount Spieker)** of the Wolverine property group for structural and coal quality information, hydrological assessment, and study of the Perry Creek road, which links the EB expansion to the **Perry Creek** wash plant.

Work resumed in September at HD Mining International Limited’s **Murray River** project, to prepare for a 100,000 tonne bulk sample. The targeted coal seams are at depths of 400-1000 metres. A continuous mining machine arrived on site to support a proposed underground long-wall mining operation, which could produce up to 6 million tonnes per year over a 31-year mine life.

Peace River Coal Inc. conducted large diameter core drilling at the **Roman Northwest** project near the Trend mine, and drilled the contiguous **Waterfall** property. Experimental geophysics tested mapping techniques at **Roman Mountain** and **Roman Northwest** to develop protocols for regional use. Work at the **Horizon Ridge** project (formerly Five Cabin Coal Project) west of the Trend Mine was deferred. It remains in the pre-application stage of the Environmental Assessment Process.

Canadian Dehua International Mines Group Inc. drilled the **Wapiti River** underground prospect for coal quality and subsurface assessment.

Colonial Coal International Corp released a preliminary economic assessment for a combined surface and underground operation at **Huguenot** that would produce an average 3.0 million tonnes per year of clean coal over

31 years. The company completed review of the **Flatbed** underground prospect and identified three target areas for exploration. Anglo American Exploration Canada Ltd undertook reconnaissance work at the **Onion**, **Wolverine North/South** and **Willow South** projects.

In December 2012, the Government of British Columbia established a number of Coal Land Reserves (CLR) in the South Peace region as part of an effort to protect the habitat of high-elevation northern caribou.

Northwestern British Columbia

In northwestern British Columbia, Fortune Minerals and Atrum Coal continued work in the Groundhog Coalfield, where exploration expenditures totalled \$9.6 million. Fortune Minerals continued to investigate the Lost-Fox resource area of their **Arctos** project, collecting environmental, geotechnical, archeological, and hydrogeological data to support an environmental assessment application scheduled for submission in 2016. Seventeen drill holes were completed before Fortune shut down activities in August, in response to concerns expressed by the Tahltan First Nation. Atrum Coal continued evaluating coal resources at the **Groundhog** deposit. Sixty-four holes were drilled to define reserves and acquire material for advanced material testing, including bulk sampling. In December 2013, the Government of British Columbia placed a one year deferral on granting new coal tenures in the Klappan area to allow time for discussions between the province and Tahltan Nation about cultural and environmental issues. Existing tenures are not affected.

Vancouver Island

Near the active Quinsam Mine, Hillsborough drilled 2212 metres in the **4 South** and **6 South** areas, targeting the #3 seam. Early in the year, Compliance Energy Corporation

submitted its application for environmental certification of the **Raven** project to the British Columbia Environmental Assessment Office. The Raven property hosts semi-soft coking coal and some thermal grade coal. The application was returned for revisions, and the company plans to resubmit in 2014. Exploration spending between these two projects was almost \$1 million in 2013.

Transportation infrastructure

Coal produced in the Elkview and Crowsnest coalfields in southeastern British Columbia is transported by rail to Westshore and Neptune terminals for export (Fig. 2). Coal from mines in the northeastern part of the province is transported by rail to the Ridley Terminals near Prince Rupert. Thermal coal from the Quinsam and Basin mines is shipped to international markets from facilities on Texada Island in the Strait of Georgia, and Neptune Bulk Terminals in North Vancouver, and to domestic markets by truck and barge.

Port upgrades and expansions continue. Annual capacity at the Westshore facility (Fig. 12) in Delta increased from 23.5 to 33 million tonnes in the past 5 years. In March, Westshore completed repairs to one of its two loading berths, which was damaged in December 2012. Early in 2013, Neptune Bulk Terminals received approval from Port Metro Vancouver to increase annual coal export capacity from 9 million to 18 million tonnes. Ridley Terminals in Prince Rupert is in the third year of an expansion that will double annual capacity to 24 million tonnes. This expansion will accommodate anticipated increases in production of coking and PCI coal from the Peace River coalfield in northeastern British Columbia.

Fraser Surrey Docks in Surrey has applied to Port Metro Vancouver for approval to develop part of its facility to



Fig. 12. Westshore coal terminal in Delta, British Columbia. Coal is transferred from rail cars to ships for the international market.

transfer thermal coal brought by rail from Wyoming. The proposal calls for barging coal to the deep-water port on Texada Island, where it would be loaded onto ocean-going freighters. The current plan is to build an initial annual capacity of four million tonnes, which will be doubled in future years. A health assessment was conducted in the fall of 2013 to address concerns raised by communities along the route. A decision on the project from Port Metro Vancouver is pending.

Coal tenure

The Mineral Titles Branch of the British Columbia Ministry of Energy and Mines maintains a website that provides information about Coal Titles regulations and resources for researching and acquiring coal tenures in the province (Table 3). Coal tenure in British Columbia is held in two forms: **coal licence** or **coal lease**. The coal licence is the initial stage of coal tenure, and is appropriate for exploration. It is analogous to a mineral claim. Acquisition is initiated by a **coal licence application**; a Free Miner Certificate is not required to acquire a coal licence. Coal licence holders have the

exclusive right to explore and develop Crown-owned coal resources as defined in the Coal Act. Production is limited to a 100,000-tonne sample for testing purposes. A coal lease is the appropriate tenure to hold when a mineable resource has been proven and the project is ready to switch from exploration to production of coal. Coal tenure and application maps, both for specific areas and the entire province, can be viewed online (Table 3).

An application for a coal licence is made to the Minister and must be accompanied by: the prescribed application fee; the prescribed rent in respect of location; and a plan and description of the location under Section 11 of the Coal Act. The application fee is \$25 per hectare plus \$7 per hectare first year rental. It is recommended that 75 hectares per unit be used as an estimate for calculating total hectares. Coal licenses must be renewed annually by the anniversary date of the tenure acquisition. Annual renewal requirements include remittance of the annual rental fees and submission of a technical report on all exploration work during the previous year (Table 3).

Before carrying out exploration that involves mechanized ground disturbance, the licence holder must possess a

Table 3. Websites to access coal tenure information.

To access	click
Coal titles	http://www.empr.gov.bc.ca/Titles/MineralTitles/Coal/Pages/default.aspx
Coal tenure and application maps	http://www.empr.gov.bc.ca/Titles/MineralTitles/Pub/Coal/Pages/Maps.aspx
Existing coal tenures	http://www.empr.gov.bc.ca/Titles/MineralTitles/Coal/Pages/Search.aspx
Coal licence application and other forms	http://www.empr.gov.bc.ca/Titles/MineralTitles/Pub/Coal/Pages/Forms.aspx
Annual renewal and technical report requirements	http://www.empr.gov.bc.ca/Mining/Geoscience/Coal/Pages/Reporting_Information.aspx
Notice of Work (FrontCounter BC)	http://www.frontcounterbc.ca/apps/now.html
Coal leases	http://www.empr.gov.bc.ca/Mining/Permitting-Reclamation/Pages/default.aspx
Environmental Assessment Office	http://www.eao.gov.bc.ca/ea_process.html
Dominion Coal Block infographic	http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/InformationCirculars/Pages/IC2014-2.aspx
Proposed auction of Dominion Coal Block (Natural Resources Canada)	http://www.nrcan.gc.ca/media-room/news-release/2013/11416 http://www.nrcan.gc.ca/media-room/backgrounders/2013/11418

permit under the Mines Act. The application for approval of exploration activities is termed a Notice of Work (NOW). A Notice of Work (Table 3) can be submitted at the same time as the coal license application, but the work cannot begin until tenure is granted.

A coal lease gives the holder the exclusive right to explore for, develop, and produce a coal resource on the lease location. The tenure holder must first have held a coal licence over the same location. The initial term for a coal lease is 30 years, followed by 15 years upon renewal. All appropriate approvals and authorizations must be in place before commencing work on a coal lease (Table 3).

An environmental assessment is a key component for proposed major mine construction and expansion projects; please visit the Environmental Assessment Office (EAO), an independent agency of the Government of British Columbia (Table 3).

British Columbia Geological Survey information sources

Founded in 1895, the British Columbia Geological Survey integrates historical data with active research programs and, drawing on continuously advancing concepts and technologies in the Earth sciences, supports the coal and mineral industries. The British Columbia Geological Survey preserves, archives, and provides free web-based access to over a century’s worth of geoscience information (Table 4). Each year in January, the British Columbia Geological Survey releases its Geological Fieldwork volume (a summary of field activities and current research), summaries of exploration and mining at the provincial and regional levels, and the present coal industry overview (Fig. 13, Table 4). Throughout the year, the Survey publishes maps, reports, and information circulars.

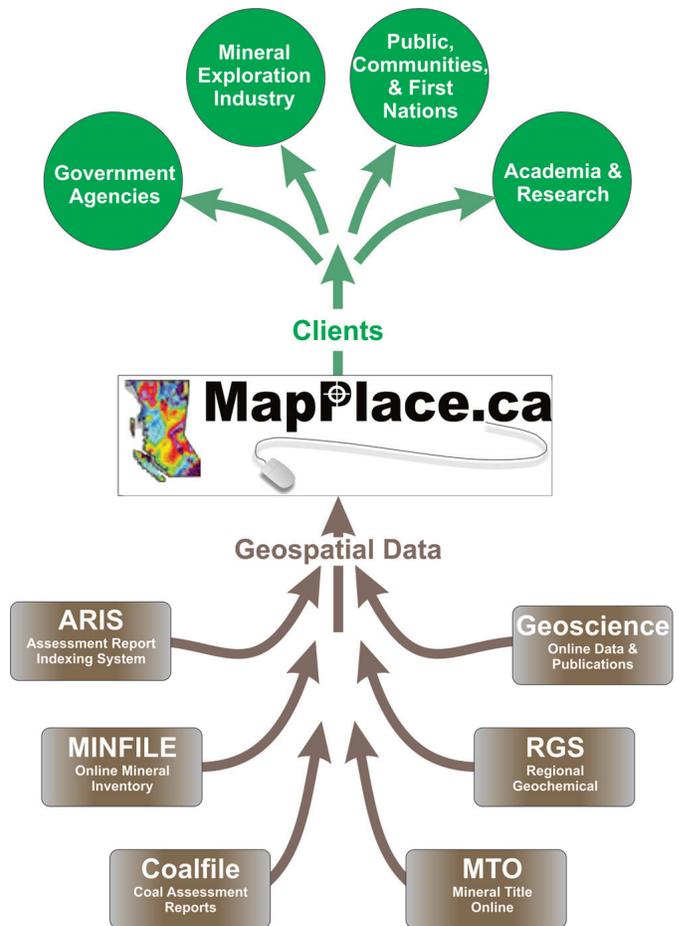


Fig. 14. MapPlace web portal

MapPlace is a web service that allows clients to browse, visualize, and analyze geoscience data. Since 1995, MapPlace has provided open geoscience data and custom map-making tools to aid in the discovery of coal and mineral potential in British Columbia. MapPlace allows users to generate custom maps by querying multiple sources (Fig. 14), including the: industry and

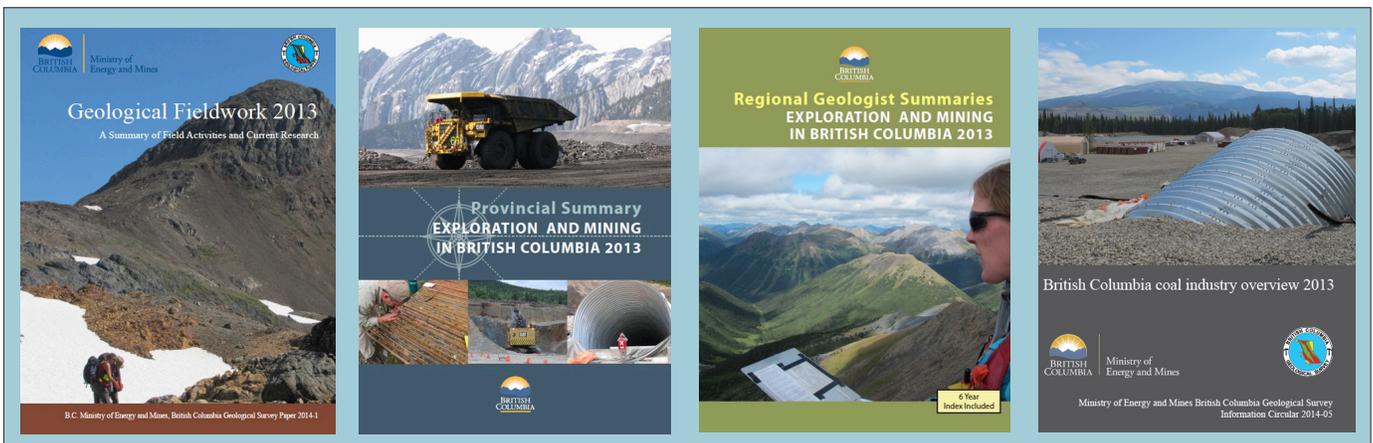
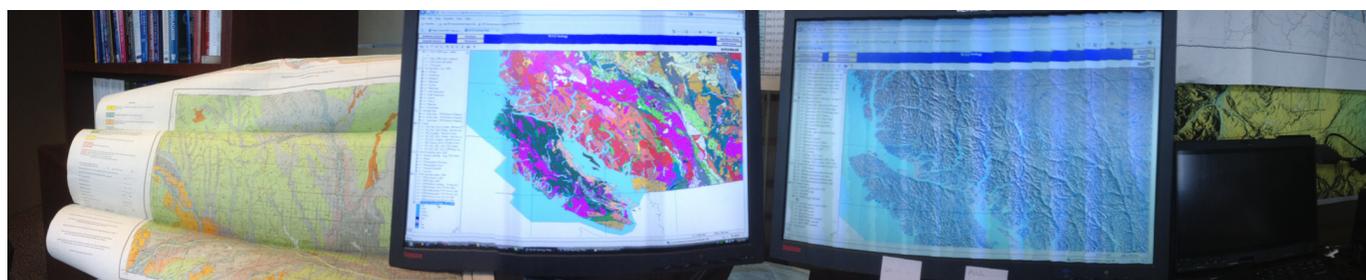


Fig. 13. Annual releases of the British Columbia Geological Survey

British Columbia coal industry overview 2013

Table 4. Websites to access British Columbia Geological Survey publications, maps, and databases, at no charge.

To access	Click
British Columbia Geological Survey publication catalogue	www.empr.gov.bc.ca/MINING/GEOSCIENCE/PUBLICATIONSCATALOGUE/Pages/default.aspx
British Columbia coal industry overview 2013 (this volume)	http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/InformationCirculars/Pages/IC2014-5.aspx
British Columbia Geological Survey geological fieldwork	www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/Fieldwork/Pages/default.aspx
British Columbia Geological Survey coal geology page	www.empr.gov.bc.ca/Mining/Geoscience/Coal/Pages/default.aspx
Provincial summary exploration and mining in British Columbia 2013	www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/InformationCirculars/Pages/IC2014-1.aspx
Regional Geologist summaries exploration and mining in British Columbia 2013	www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/ExplorationinBC/Pages/2013.aspx
Table of British Columbia coal resources (British Columbia Geological Survey GeoFile 2010-11, by B. Northcote)	www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/GeoFiles/Pages/2010-11.aspx
British Columbia coal assessment reports and COALFILE	www.empr.gov.bc.ca/Mining/Geoscience/Coal/CoalBC/Pages/CoalDataReports.aspx
MINFILE	www.empr.gov.bc.ca/MINING/GEOSCIENCE/MINFILE/Pages/default.aspx
MapPlace (requires Autodesk MapGuide Viewer)	www.mapplace.ca webmap.em.gov.bc.ca/mapplace/minpot/coal.cfm



government document archive (Property File); online mineral inventory (MINFILE); mineral assessment report database (ARIS); coal assessment report database (COALFILE); regional geochemistry survey (RGS); Mineral Titles Online (MTO) tenure database; British Columbia Geological Survey publication catalogue, and extensive collections of bedrock and surficial geology maps.

MINFILE is a mineral inventory database that contains geological, location, and economic information on more than 13,500 metallic, industrial mineral, and coal occurrences in British Columbia. COALFILE is the

database of coal reports. It contains a collection of almost 900 assessment reports dating from 1900, many of which were submitted by exploration companies in compliance with the Coal Act. COALFILE contains details of coal exploration reports in a relational database, including data for boreholes, bulk samples, maps, and trenches. A search engine leads clients to a summary page for each coal assessment report. The reports, boreholes, bulk samples and trenches are spatially referenced on MapPlace.

Industry contacts

The corporate websites of coal exploration and mining groups active in British Columbia are listed in Table 5.

Table 5. Industry contacts.

Coal Association of Canada	www.coal.ca
Teck Coal Limited	www.teck.com
Walter Energy, Inc.	www.walterenergy.com
Hillsborough Resources Limited	www.hillsboroughresources.com
Anglo American Canada plc	www.angloamerican.ca
Canadian Kailuan Dehua Mines Co. Ltd.	www.kailuandehua.com
Fortune Minerals Limited	www.fortuneminerals.com
Compliance Energy Corporation	www.complianceenergy.com
Crowsnest Pass Coal Mining Ltd.	http://crowsnestpasscoal.com
Cardero Resource Corp.	www.cardero.com
Colonial Coal International Corporation	www.ccoal.ca
Glencore Limited	http://www.glencorexstrata.com/
Canadian Dehua International Mines Group Inc.	http://www.dehua.ca/
Jameson Resources Limited	http://www.jamesonresources.com.au/
Coalmont Energy Corp.	http://coalmontenergy.com/
Atrum Coal	http://atrumcoal.com/
HD Mining International Limited	http://www.hdminingintl.com/

Contacts at the Ministry of Energy and Mines and the British Columbia Geological Survey

Ministry of Energy and Mines and British Columbia Geological Survey personnel (Table 6) are available for consultation. Should you wish to be receive notification of British Columbia Geological Survey publications released throughout the year, please subscribe to our newsletter by emailing Geological.survey@gov.bc.ca

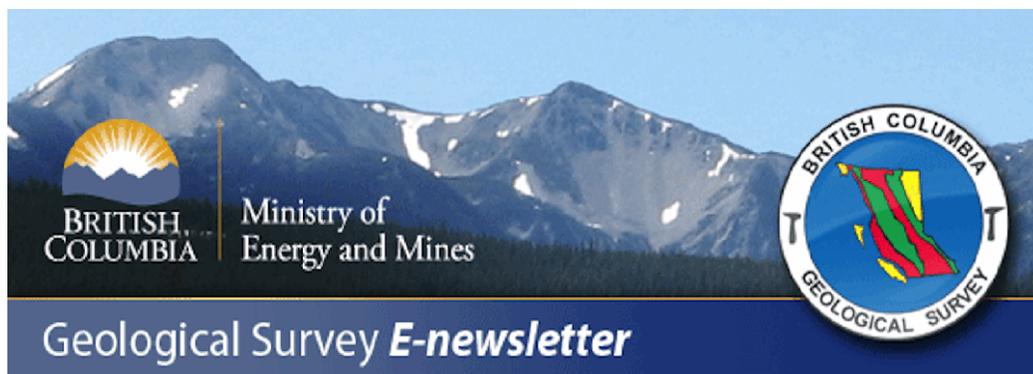


Table 6. British Columbia Ministry of Energy and Mines and Geological Survey contacts.

Bruce Madu Director, Mineral Development Office British Columbia Geological Survey, Vancouver	604 660-2094 bruce.madu@gov.b.ca
Janet Riddell Coal Geologist British Columbia Geological Survey, Victoria	250 952-0350 janet.riddell@gov.bc.ca
Kim Stone Senior Advisor, Coal Titles Mineral Titles Branch, Victoria	250 952-0169 kim.stone@gov.bc.ca
Jennifer Anthony Director, Coal Titles Mineral Titles Branch, Victoria	250 356-0185 jennifer.anthony@gov.bc.ca
Fiona Katay Regional Geologist Cranbrook, Kootenay-Boundary	250 426-1758 fiona.katay@gov.bc.ca
Paul Jago Regional Geologist Prince George, Northeast and Omineca	250 565-4316 paul.jago@gov.bc.ca
Bruce Northcote Regional Geologist, Vancouver, South/West Coast	604 660-2713 bruce.northcote@gov.bc.ca
Jeff Kyba Regional Geologist Smithers, Skeena-Smithers	250 847-7787 jeff.kyba@gov.bc.ca
Jim Britton Regional Geologist Kamloops, Thompson/Okanagan/Cariboo	250 371-3903 jim.britton@gov.bc.ca



View from the south of Roman Mountain and the Trend Mine, Peace River coalfield (Peace River Coal Inc.; wholly owned by Anglo American plc). The peak on the left is Roman Mountain; new mine construction began on the north slope of the mountain in the summer of 2013. The cut on the right is the site of current mining (Phase 3). Coking coal comes from the Gates Formation (Lower Cretaceous).



Ministry of
Energy and Mines



British Columbia Geological Survey
Ministry of Energy and Mines
www.em.gov.bc.ca/geology

