science for a changing world

2019 Minerals Yearbook

CANADA [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

April 2024

The Mineral Industry of Canada

By James J. Barry

In 2019, Canada, a member of the Group of Seven (G7) nations, had one of the largest economies in the world, ranking 10th based on its nominal gross domestic product (GDP) of $1.7 trillion. Canada was one of the leading mining nations in the world. It produced a wide array of industrial minerals, metals, and mineral fuels and had one of the largest mining supply sectors, with several thousand companies providing services to global mining operations. Vancouver, British Columbia, was the headquarters for the largest concentration of the world's mineral exploration companies, and Toronto, Ontario, was a global hub for mineral industry financing. The Toronto stock exchanges accounted for 37% of the world's mining equity capital raised during the past 5 years. The Toronto Stock Exchange (TSX) and the TSX Venture Exchange (TSX–V) listed about 47% of the world's publicly traded mining companies. Canadian mining companies operated in nearly 100 countries, and the value of the country's assets abroad amounted to $134 billion, in 2018 (the latest year for which data were available).[1] There were 469 Canadian companies operating in 21 countries in North America and South America, 94 Canadian companies in 30 countries in Africa, 70 Canadian companies in 23 countries in Europe, and 57 Canadian companies in 18 countries in Asia (including the Middle East). Additionally, there were 33 Canadian companies operating in Australia, 3 in Papua New Guinea, and 2 in Fiji (Pollon, 2019; Toronto Stock Exchange, 2020; Natural Resources Canada, 2021; World Bank Group, The, 2021).

Canada was the world's leading producer of potash in 2019, accounting for 30% of world production. It was the second-ranked producer of niobium, accounting for 7% of world production, and the third-ranked producer of palladium, accounting for 9% of world production. Canada was the fourth-ranked producer of ilmenite and sulfur, each accounting for 9% of world production; tellurium, an estimated 8%; cadmium, 7%; indium, 6%; and aluminum, 5%. Canada was the fifth-ranked producer of nickel and gold, accounting for 7% and 5%, respectively, of world production, and the sixth-ranked producer of mica, accounting for 5% of world production. As reported by the Kimberley Process Certification Scheme (2021), Canada was the third-ranked diamond producer by both weight and value in 2019. Canada's diamond production accounted for 13% of world production and the average value of Canada's diamond was $91.07 per carat. According to the World Nuclear Association, Canada was the second-ranked producer of uranium, accounting for 13% of world production. Canada was also a leading producer of crude petroleum and natural gas liquids. According to BP p.l.c. (2020, p. 16, 19), the country accounted for 8.0% of world production of natural gas liquids and 5.9% of world production of crude petroleum in 2019 (BP p.l.c., 2020, p. 16, 19; World Nuclear Association, 2020b; Anderson, 2021a, b; Apodaca, 2021; Bray, 2021; Callaghan, 2021a, b; Gambogi, 2021; Jasinski, 2021a, b; Kimberley Process Certification Scheme, 2021; McRae, 2021; Schulte, 2021; Sheaffer, 2021).

Canada continued to hold significant mineral resources. In 2019, Canada had the largest potash reserves in the world with 1,200 million metric tons (Mt) of K_2O equivalent. Canada's niobium reserves accounted for more than 10% of the world's reserves and were the second largest in the world. According to BP, Canada had the third largest crude petroleum reserves, accounting for 9.8% of the world's total proven reserves. Peat reserves in Canada were the fourth largest reserves in the world, accounting for 6.0% of the world's total peat reserves. Details of Canada's share of total world production and world reserves for a number of nonfuel mineral commodities in 2019 can be found in the U.S. Geological Survey Mineral Commodity Summaries 2021 and 2020 (table 3; BP p.l.c., 2020, p. 14; Brioche, 2020; Padilla, 2020; World Nuclear Association, 2020a; U.S. Geological Survey, 2020, 2021).

In December, Canada and the United States signed a memorandum of understanding in which Canada agreed to join the Energy Resource Governance Initiative (ERGI). ERGI was a U.S. State Department effort to create secure and stable supply chains, promote good governance in the energy minerals subsector, and invest in renewable power and battery storage technologies. Canada supplied the United States with 13 of the 35 mineral commodities that were identified by the United States Government as critical to the country's security and economic success. In 2019, those 13 mineral commodities included cesium and rubidium (for which Canada was the only import source), potash and tellurium (for which Canada was the leading import source), and aluminum (metal), cobalt, graphite, indium, magnesium (metal and compounds), niobium, rhenium, titanium (ilmenite), and vanadium (U.S. Department of the Interior, 2018; Natural Resources Canada, 2019a; U.S. Geological Survey, 2020, p. 7).

Minerals in the National Economy

In 2019, the real GDP of Canada was $1.49 trillion, which was a 1.7% increase compared with that in 2018. The mineral industry contributed $118.5 billion to Canada's real GDP, accounting for 8% of the total real GDP. The value added by sectors of the mineral industry decreased with the exception of oil and gas extraction, which increased by 1.7%, and mining of metal ores, which increased by 1.4%. Within the extractives industry, petroleum and natural gas extraction accounted for $83.9 billion of real GDP, metal ore mining accounted for $14.6 billion, nonmetallic mineral mining and quarrying (industrial minerals and construction materials, but not mineral fuels) accounted for $9.2 billion, and coal mining accounted for $2.4 billion (Statistics Canada, 2021b).

[1]Where necessary, values have been converted from Canadian dollars (CAD) to U.S. dollars (US$) at the annual average exchange rates of CAD 1.327=US$1.00 for 2019 and CAD 1.297=US$1.00 for 2018.

The mineral industry employed 495,000 people in Canada in 2019. About 85% of those jobs were in the mining (including quarrying) sector, which employed 421,000 people. There were 71,000 jobs in nonfuel mineral extraction and 56,000 jobs in oil and gas extraction. In 2019, fabricated metal product manufacturing accounted for 163,000 jobs; primary metal manufacturing, for 58,000 jobs; nonmetallic mineral product manufacturing, for 55,000 jobs; and petroleum and coal product manufacturing, for 18,000 jobs. Support activities for mining and quarrying employed a reported 73,000 people in Canada in 2019, although this number does not include all those employed in mining support services (Statistics Canada, 2021a).

In 2019, $1.7 billion was spent on mineral exploration in Canada. More than one-half, or 56.7%, of these expenditures was spent on exploration for precious metals; 18.6%, for base metals; 7.1%, uranium; 5.6%, diamond; 0.7%, iron; and the remaining 11.2%, for other mineral commodities, including coal. Ontario was the leading Province in terms of mineral exploration expenditures, accounting for 22.9% of Canada's total exploration and deposit appraisal expenditures; Quebec, 22%; British Columbia, 17%; Saskatchewan, 12.1%; Yukon, 7.3%; Nunavut, 5.1%; Northwest Territories, 3.5%; Manitoba, 3.4%; Alberta, 2.3%; Newfoundland and Labrador, 2.2%; Nova Scotia, 1.7%; and New Brunswick, 0.6%. As of May, a total of 114 major mining projects were planned or under construction [major mining projects included those with capital costs of at least $37.7 million (reported as $50 million Canadian dollars)], including 20 new projects. This was the most mining projects within a year since 2015 and was a 5.5% increase in the number of mining projects compared with that in 2018 and a 17.5% increase compared with that in 2016. Canada-owned companies were invested in 70 mining projects and accounted for 64% of the country's total investment in mining projects. Australia-owned companies were the leading source of foreign investment in mining projects in Canada; these companies were invested in 12 mining projects and accounted for 10% of the total investment, followed by United States-owned companies, 14 mining projects and 9% of the total; China-owned companies, 3 mining projects and 6% of the total; United Kingdom-owned companies, 4 mining projects and 1% of the total; and companies from other countries accounted for the remaining 10% of investment in mining projects in Canada (Natural Resources Canada, 2019c, p. 1, 10–11; 2020d).

Government Policies and Programs

The Minerals and Metals Policy of the Government of Canada is the Federal policy that outlines and describes the Federal Government's role, objectives, and strategies for development of the country's mineral resources. Minerals, however, are generally owned and managed by the government of the Province or Territory in which they occur, and each jurisdiction has its own environmental, mining, and occupational health and safety legislation. The three territories—Northwest Territories, Nunavut, and Yukon—have responsibilities for environmental assessment, land-use planning, and water resources, and generally operate under a system of co-management boards with representation from First Peoples groups (First Nations, Inuit, and Métis). In general, there are two types of First Peoples claims in Canada that are commonly referred to as land claims, including comprehensive claims and specific claims. Comprehensive claims arise in areas where First Peoples land rights have not been defined by past treaties or through other legal means, whereas specific claims have been covered by past treaties or laws. In these areas, agreements are negotiated between the First Peoples group, the Government of Canada, and the Province or Territory (Wacaster, 2017, p. 5.2; Government of Canada, 2020b).

New mines and some mine expansion projects are subject to Federal review and approval, in addition to Provincial or Territorial permitting requirements. In August, the Impact Assessment Act replaced the Canadian Environmental Assessment Act of 2012. Under the Impact Assessment Act, the scope for mining project assessments was widened from solely environmental assessments to also include economic, health, and social conditions in those assessments. Mining projects may also be subject to approvals under the Fisheries Act and the Canada Navigable Waters Act (Winfield-Lesk, 2019; Mining Association of Canada, 2020, p. 63).

Mineral resources that underlie the continental shelf, Federal lands (including national parks), Indian Reserves, and offshore waters are owned by the Federal Government. Direct Federal regulation of mining operations is limited in scope, but includes those activities associated with the uranium fuel cycle from exploration to disposal of nuclear waste, activities related to Federal Crown corporations, and mining activities on Federal lands and offshore areas. The manufacture, sale, use, storage, and transportation of explosives used in exploration and mining in Canada is regulated under the Federal Explosives Act. The export, import, and transit across Canada of rough diamond is regulated under the Federal Export and Import of Rough Diamonds Act. Any written or oral mining disclosures made available to the public in Canada are governed by National Instrument 43–101 (NI 43–101) Standards for Disclosure in Mineral Projects (Kazaz and Fipke, 2012, p. 4; Natural Resources Canada, 2017).

Although the majority of mineral rights in Canada are owned by the Provinces and Territories, mineral rights may also be held by the Federal Government, First Peoples groups, or private entities. The Federal, Provincial, and Territorial governments have shared regulatory responsibilities that are similar across jurisdictions, but each jurisdiction maintains its own distinct regulatory regime in terms of mineral management. Responsibilities that are generally in the Provincial or Territorial regime include exploration and development of resources; resource ownership and management; land-use decision making; mining royalties and Provincial income taxes; resource exploration and development regulations; operational matters, including licensing, permitting, and monitoring; Provincial statistics; generation and distribution of electricity; and Provincial geoscience data. Mineral processing and further beneficiation are generally subject to the same legislative regimes that apply to mineral exploration and extraction because the same Provincial, Territorial, or Federal statutes regulate all stages of the mining process. Most jurisdictions do not require mineral processing to take place within the Province or Territory of extraction except for New Brunswick, Newfoundland and

Labrador, and Nova Scotia. Local or municipal governments administer bylaws dealing with land-use planning and issuance of permits for construction, water supply and distribution, and waste management. First Peoples governments exercise powers over reserve lands and other territories covered by specific agreements negotiated with the Federal and Provincial governments. Such governance on reserves has many of the same powers and responsibilities as local, municipal, or Provincial governments (Natural Resources Canada, 2017; Lawson Lundell LLP, 2019).

With respect to energy development in Canada, Federal and Provincial governments share responsibility. The Provinces have jurisdiction over the development of crude petroleum within the Provincial boundaries. The Government of Canada shares responsibility with the Provinces for energy production, environmental protection, and trade. In August, the National Energy Board Regulator Act was replaced by the Canada Energy Regulator Act, which replaced the National Energy Board with the Canada Energy Regulator (CER). The CER's responsibilities are described in the Canada Energy Regulator Act, the Canada Oil and Gas Operations Act, and the Canada Petroleum Resources Act. The CER regulates construction, operation, and abandonment of pipelines; construction and operation of international power lines and designated interprovincial power lines; imports of natural gas and exports of crude petroleum, natural gas liquids, natural gas, refined petroleum products, and electricity; and petroleum and natural gas exploration and production activities in specified areas that are not regulated under joint Federal and Provincial accounts. For certain projects, an environmental assessment is required by such Federal laws as the Canadian Impact Assessment Act, the Inuvialuit Final Agreement (Nunavut Land Claims Agreement), and the Mackenzie Valley Resource Management Act (Department of Justice, 2019; Canada Energy Regulator, 2020b).

The Federal Government in Canada receives direct revenue from mining and energy companies in the form of corporate income taxes and from indirect taxes, including excise, payroll, and sales taxes. The Provincial and Territorial governments have the authority to raise revenue from mining and energy companies using tax regimes similar to those of the Federal Government. In addition, the individual Provinces and Territories may set royalty rates based on the extraction of mineral resources from their respective lands (Natural Resources Canada, 2019d, 2020b).

More-extensive coverage of Government policies and programs of Canada, including provisions for each Province and Territory, can be found in the 2014 U.S. Geological Survey Minerals Yearbook, volume III, Area Reports—International—Canada.

Production

In 2019, the top mineral commodities produced in Canada were, by value, gold, coal, iron ore, potash, copper, nickel, sand and gravel, diamond, stone, and platinum-group metals (PGMs); they had a combined value of about $32 billion. Production of metals, which increased notably in 2019 compared with that in 2018, included production of iridium, which increased by an estimated 40%; mined lead, by 40%; mined titanium, by an estimated 14%; mined cadmium and mined iron, by 11% each; and mined zinc, by 10%. The increases in cadmium, lead, and zinc were largely attributable to the first full year of production at the Silvertip Mine, which was owned by Coeur Mining, Inc. of Chicago, Illinois. The increase in titanium production was attributed to all furnaces operating at the metallurgical complex at Sorel-Tracy, Quebec, which was owned by Rio Tinto Fer et Titane Inc. (a wholly owned subsidiary of Rio Tino plc). The reopening of the Scully iron ore mine, which was owned by Tacora Resources Inc. of the United States, and the first full year of production at Quebec Iron Ore Inc.'s Bloom Lake Mine helped increase iron ore output. Among metals, production in 2019 decreased most notably for selenium, by 33%; molybdenum, by 23%; direct-reduced iron, by 14%; secondary refined copper, by 12%; and mined niobium, by an estimated 12% (table 1; Government of Newfoundland and Labrador, 2019a, p. 7; Coeur Mining Inc., 2020a, p. 29; Natural Resources Canada, 2020a; Rio Tinto plc, 2020, p. 55; Champion Iron Ltd., 2021).

In 2019, notable increased production of industrial minerals included that of fluorspar, by an estimated 129%; sulfur, by 30%; and magnesite, by an estimated 20%. The increase in sulfur production was attributed to a larger amount recovered in the natural gas and petroleum refining process. Fluorspar output increased as a result of the first full year of production at Canada Fluorspar Inc.'s St. Lawrence Fluorspar Mine. Among industrial minerals, production in 2019 decreased most notably for lithium, by an estimated 92%; colored gemstones, by 44%; gypsum, by 26%; diamond, by 20%; and talc, by 13%. In February, North American Lithium Inc., suspended mining operations at its North American Lithium Mine, which was the only operating lithium mine in Canada. The decrease in diamond production was attributed to the closure of the depleted Victor Mine, which was owned by the De Beers Group of the United Kingdom. Data on mineral production are in table 1 (table 1; Facada, 2019; Moore, 2019; Rockstone Research, 2019).

Structure of the Mineral Industry

As one of the world's most active mining countries, Canada had numerous mineral exploration, mine development, and mining projects underway. Canada's mineral industry is characterized by free enterprise in which private companies are involved in exploration, mine development, mineral production, mineral processing, and marketing. In April, U.S. company Newmont Corp. of Greenwood Village, Colorado, acquired Goldcorp Inc., creating the largest gold mining company in the world in terms of market value, output, and reserves. In 2018 (the latest year for which data were available), the Mining Association of Canada reported that there were 1,060 operating mines in Canada, including 997 nonmetallic mineral mines and 63 mines that produced metallic mineral ores. Canada also had about 31 nonferrous metal smelters, refineries, and steel mills. According to Natural Resources Canada, the country had about 6,500 sand, gravel, and stone quarries. Table 2 is a list of major mineral industry facilities (table 2; Jamasmie, 2019; Natural Resources Canada, 2019b; Mining Association of Canada, 2020, p. 13, 23).

Mineral Trade

Canada is an open county in terms of trade and investment in mining, with few barriers to foreign ownership. In January, Vietnam became the seventh country to enter into the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), a trade agreement with 10 other countries (Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, and Singapore) designed in part to reduce tariffs between participating countries. In 2018, Canada was among the first six countries to ratify the CPTPP. Canada had 14 trade agreements with 49 countries. The Canada-European Union Comprehensive Economic and Trade Agreement (CETA) negotiations concluded in September 2014 and went into force in September 2017. Ratification of this treaty lifted nearly all tariffs between the two entities, reducing the costs of goods traded (Natural Resources Canada, 2016, p. 7; Global Affairs Canada, 2019, 2020b; Government of Canada, 2020a).

In 2019, the value of Canada's domestic exports of minerals and mineral products was $156.6 billion, of which energy products accounted for 60%; metals and nonmetallic mineral products accounted for 30%; and metal ores and nonmetallic minerals accounted for 10%. Canada's leading trade partner for exports of energy products in 2019, in terms of the value of the exports, was the United States, followed by Japan, the Republic of Korea, the United Kingdom, and the Netherlands. The leading trade partner for exports of metals and nonmetallic mineral products was the United States, followed by the United Kingdom, Hong Kong, Norway, and China. And the leading trade partner for the exports of metal ores and nonmetallic minerals was the United States, followed by China, Japan, India, and Belgium (Statistics Canada, 2021c).

In 2019, the United States received 57%, by value, of Canada's metal and nonmetallic mineral product exports and 21% of its metal ores and nonmetallic mineral exports. The combined total of aluminum and iron and steel exports accounted for 35% of the value of metals exported to the United States from Canada. The value of exports to the United Kingdom accounted for 24% of Canada's metal and nonmetallic mineral products exports. Nearly all (98%) of the metal and nonmetallic mineral products exported to the United Kingdom were precious metals. China received 17%, by value, of Canada's metal ores and nonmetallic mineral exports, of which 39% was iron ore, 29% was copper, and 24% was potash (Statistics Canada, 2021c).

In 2019, the value of Canada's imports of minerals and mineral products was $67.8 billion, of which metal and nonmetallic mineral products accounted for 43%; energy products accounted for 42%; and metal ores and nonmetallic minerals accounted for 16%. In terms of the value of the imports, Canada's leading trade partner for imports of energy products in 2019 was the United States, followed by Saudi Arabia, the Netherlands, Russia, and Norway. The leading trade partner for imports of metals and nonmetallic mineral products was the United States, followed by China, Germany, Mexico, and Taiwan. The leading trade partner for imports of metal ores and nonmetallic minerals was the United States, followed by Peru, Brazil, Egypt, and Australia (Statistics Canada 2021c).

Commodity Review

Metals

Aluminum.—The majority of aluminum smelters in Canada were wholly or partially owned by Rio Tinto Alcan Inc. (a wholly owned subsidiary of Rio Tinto plc), which was headquartered in Montreal. In 2019, aluminum production totaled 2,853,771 metric tons (t), which was a decrease of 2.4% from that in 2018. In July, Alcoa Corp. of the United States announced the beginning of the restart of the Becancour smelter (jointly owned by Alcoa Corp., 74.95%, and Rio Tinto, 25.05%), ending an 18-month labor disagreement. The smelter had the capacity to produce 413,000 metric tons per year (t/yr) of aluminum, but it operated at only 33% of capacity for all of 2018 and at 17% of capacity from January through July 2019. Alcoa expected the restart of the Becancour smelter to be completed in the second quarter of 2020 (tables 1, 2; Torrance, 2019).

Antimony.—In 2019, Canada produced 5 t of antimony, which was the same as the production (revised) in 2018. In March, the Beaver Brook antimony mine, which was owned by China Minmetals Co. Ltd. of China, reopened after being on care-and-maintenance status since 2012. In June, Beaver Brook produced its first shipment of antimony concentrate, which it sent to China. At full production, the mine was expected to produce 160,000 t/yr of antimony (Government of Newfoundland and Labrador, 2019b; Randell, 2019).

Bismuth and Cadmium.—Bismuth and cadmium are primarily obtained as byproducts of the production of concentrates from lead- and zinc-bearing ores. In 2019, mine output of bismuth was 5 t, which was unchanged from the production (revised) in 2018. Since 2011, production of bismuth had been decreasing every year, representing a total decrease of 99% between 2011 and 2016, until output began to increase slightly in 2017 and 2018 owing to the opening of the Caribou lead-zinc mine. Mine output of cadmium was 164 t in 2019, which was an 11% increase from the production (revised) in 2018 (table 1; Mining Association of Canada, 2020, p. 91, 94).

Cobalt.—In 2019, Canada's mined cobalt production was 3,336 t compared with a revised 3,279 t in 2018, and refined cobalt production was 6,075 t compared with 6,349 t in 2018. Mined cobalt included production from the following three mines owned by Vale S.A. of Brazil: 1,608 t from the Voisey's Bay Mine, 495 t from the Ontario Division Sudbury Mine, and 90 t from the Manitoba Division Thompson Mine, as well as 700 t from the Sudbury operations owned by Glencore plc of Switzerland. Vale produced 1,092 t of cobalt metal at its Port Colborne refinery and 1,583 t of cobalt metal at its Long Harbour refinery (tables 1, 2; Glencore plc, 2020, p. 73; Vale S.A., 2020a, p. 65).

In 2019, cobalt prices dropped to an average monthly price of about $32,600 per metric ton, and at one point, the price was more than 70% less than at its 2018 peak price of $95,250 per metric ton. Despite the lower prices and excess supply of cobalt on the world market, cobalt exploration and development projects continued in Canada. Fortune Minerals Ltd.'s (Fortune) NICO cobalt-gold-bismuth-copper project was ready to begin construction of the NICO Mine, which is located

160 kilometers (km) northwest of Yellowknife, Northwest Territories. Proven and probable reserves at the NICO Mine included 33 Mt of ore containing 46,000 t of bismuth, 37,000 t of cobalt, 12,000 t of copper, and 34,000 kilograms (kg) of gold. In August, construction began on a 97-km all-season road that would connect the town of Whati to the Territorial highway system. Fortune planned to build a 50-km road that would spur off this road to the NICO Mine, thus facilitating transportation of ore from the mine to a processing facility. Fortune planned to construct the Saskatchewan metals processing plant to refine the metals produced at the NICO Mine (Fortune Minerals Ltd., 2019a–c; Neary, 2019; Milewski, 2020; Trading Economics, 2020).

In September, Giga Metals Corp. updated the mineral resource estimate for the Turnagain Project in northern British Columbia. The update included 1,073 Mt of measured and indicated resources containing 2.36 Mt of nickel and 142,000 t of cobalt. Werner Lake [owned by Global Energy Metals Corp. (70%) and Marquee Resources Ltd. of Australia (30%)] was a primary cobalt project located in Kenora, Ontario. Werner Lake had 57.9 Mt of indicated resources at grades of 0.51% copper and 0.25% cobalt (Giga Metals Corp. 2019; Global Energy Metals Corp., 2021).

In 2019, First Cobalt Corp. continued to advance the restart of the First Cobalt Refinery located near Cobalt, Ontario. In April, First Cobalt had produced high-purity, battery-grade cobalt sulfate based on the metallurgical flowsheet for the refinery. In May, First Cobalt and Glencore signed a memorandum of understanding whereby Glencore would help finance the construction of the refinery and provide cobalt feedstock. First Cobalt planned to have the refinery operational by the fourth quarter of 2020. When fully operational, the refinery would have the capacity to produce 25,000 t/yr of cobalt sulfate containing 5,000 t of cobalt. First Cobalt reported that this would be enough cobalt sulfate to supply the entire North American battery market (First Cobalt Corp., 2020, p. 6–7, 9).

Copper.—In 2019, mined copper increased by 4.5% to 572,705 t, marking the first increase in production since 2016. Between 2011 and 2015, mined copper production had increased at an average annual rate of 5.5%. Teck Resources Ltd.'s Highland Valley Mine produced 121,300 t of copper in concentrate in 2019 compared with 100,800 t in 2018. Vale's Ontario Division (Sudbury) produced 92,800 t in 2019 compared with 72,300 t in 2018; and Taseko Mines Ltd.'s Gibraltar Mine produced 57,100 t of copper in 2019 compared with 56,800 t in 2018. Production at these three mines accounted for 47% of the copper produced in Canada in 2019 (table 1; Mining Association of Canada, 2020, p. 91; Taseko Mines Ltd., 2020, p. 3; Teck Resources Ltd., 2020, p. 46; Vale S.A., 2020b, p. 15).

In June, Pembridge Resources plc of the United Kingdom acquired the Minto Mine from Capstone Mining Corp. In October, Minto resumed production after being placed on care-and-maintenance status in 2018. During the 3 months of operation in 2019, Minto produced 6,436 t of copper concentrate. As of May, Minto had proven and probable reserves of 2.36 Mt containing 40,000 t of copper, 13,000 kg of silver, and 1,400 kg of gold (Pembridge Resources plc, 2019, p. 17; 2020, p. 2, 4).

Gold.—Gold production decreased by 8.8% to 174,974 kg in 2019 compared with the production (revised) in 2018. Canada's three largest gold mines [Canadian Malartic Mine, which was owned by Agnico Eagle Mines Ltd. (Agnico Eagle) and Yamana Gold Inc.; Detour Lake Mine, which was owned by Kirkland Lake Gold Inc. (acquired Detour Gold Corp. in January 2020); and the Brucejack Mine, which was owned by Pretium Resources Inc.] produced less gold in 2019 than in 2018. Only the fifth largest mine (Rainy River Mine, owned by New Gold Inc.) saw a notable increase in production. Despite the decreased gold production, Canada's growth in exports of gold was the second largest in the country's history (table 1; Global Affairs Canada, 2020a; Mines and Metals, 2020).

In May, the Meliadine Mine, owned by Agnico Eagle, commenced commercial production. Meliadine was located about 25 km north of the Rankin Inlet in Nunavut. In 2019, Meliadine produced 5,944 kg of gold. At full production, Meliadine was expected to produce about 12,400 kg of gold annually. Meliadine had proven and probable reserves of 20.7 Mt containing 126,000 kg of gold. In July, construction was completed at Victoria Gold Corp.'s Eagle Gold Mine and the mine was commissioned. The Eagle Gold Mine produced 535 kg of gold and 93 kg of silver in 2019. The Eagle Gold Mine was expected to reach full production in 2020 and to have average annual production of about 6,500 kg of gold. At full production, the Eagle Gold Mine would be the largest gold mine in the Yukon (Victoria Gold Corp., 2019; 2020a, p. 6; 2020b, 2021; Agnico Eagle Mines Ltd., 2020a, b; 2021).

Lead and Zinc.—Production of mined lead in 2019 was 21,782 t compared with a revised 15,605 t in 2018. Production of total refined lead was 260,000 t and was essentially unchanged from that in 2018. In 2019, there were two lead-producing mines in Canada—the Caribou Mine and the Silvertip Mine. Trevali Mining Corp. owned the Caribou Mine, which was located about 50 km west of Bathurst, New Brunswick. In 2019, Caribou produced 12,000 t of lead and had proven and probable reserves of 67,000 t of contained lead. The Silvertip Mine, which was located in northern British Columbia, produced 7,510 t of lead in 2019 and had proven and probable reserves of 89,000 t of contained lead (tables 1, 2; Coeur Mining Inc., 2020b, c; Trevali Mining Corp., 2020a, b).

Production of mined zinc increased by 10.1% in 2019 to 335,806 t compared with the production (revised) in 2018. Smelter zinc production increased by 5.6% in 2019 to 654,791 t compared with the production (revised) in 2018. In May, Myra Falls, which was operated by Nyrstar N.V. of Belgium, restarted zinc mining operations, producing 1,000 t of zinc concentrate through the first half of 2019 (the latest date for which data were available). Operations at Myra Falls were expected to continue ramping up into 2020. In December, Nyrstar placed its Langlois Mine in Quebec on care-and-maintenance status as it prepared to close the mine. Through the first half of 2019, Langlois had produced 13,000 t of zinc in concentrate (table 1; Nyrstar N.V., 2019a, b; Trafigura Group (Pte) Ltd., 2021).

In February, Abcourt Mines Inc. announced the results of an update to the feasibility study on its Abcourt-Barvue project.

Abcourt-Barvue was a silver-zinc project located 60 km north of Val-d'Or, Quebec. According to the feasibility study, Abcourt-Barvue had 8.1 Mt of proven and probable reserves containing 228,000 t of zinc and 418,000 kg of silver and an initial 13-year life of mine. In July, BMC (UK) Ltd. of the United Kingdom released results of a definitive feasibility study for the Kudz Ze Kayah project in south-central Yukon. According to the study, Kudz Ze Kayah would have the capacity to produce 106,800 t/yr of zinc, 25,300 t/yr of lead, 14,400 t/yr of copper, 243,000 kilograms per year (kg/yr) of silver, and 1,800 kg/yr of gold during the mine's 7 years of steady-state production (production that excludes the first and final years of the life of the mine). In August, Superior Lake Resources Ltd. of Australia released a bankable feasibility study for the Superior Lake zinc project, which was located 180 km east of Thunder Bay in northwestern Ontario. Based on the results of the study, Superior Lake would have the capacity to produce about 73,000 t/yr of zinc concentrate and 5,200 t/yr of copper concentrate over 9 years (Abcourt Mines Inc., 2019; BMC (UK) Ltd., 2019, p. 2, 4; Superior Lake Resources Ltd., 2019, p. 7, 25).

Nickel.—In 2019, nickel production was 181,410 t compared with a revised 177,867 t in 2018. Vale and Glencore accounted for 87% of the nickel produced in Canada. Vale's operations in Ontario (Sudbury Mine), Manitoba (Thompson Mine), and Labrador (Voisey's Bay Mine) produced 97,400 t of nickel, accounting for 54% of the total production of mined nickel in 2019, and Glencore's Sudbury and Raglan Mines produced 59,800 t. The other nickel operations in Canada were the Morrison Mine in Sudbury, Ontario, which was owned by KGHM Polska Miedź S.A. of Poland, and the Lac des Iles Mine, which was owned by Impala Canada Ltd. of South Africa (table 2; Glencore plc, 2020, p. 239; Vale S.A., 2020b, p. 12).

Platinum-Group Metals.—The total production of all platinum-group metals (PGMs) decreased by 4.3% in 2019 to about 28,600 kg compared with the production (revised) in 2018. In December, Impala Platinum Holdings Ltd. of South Africa completed the acquisition of North American Palladium Ltd., renaming the company Impala Canada Ltd. Included in the acquisition was the Lac des Iles Mine, which produced 5,277 kg of palladium for the first three quarters of 2019 and was reportedly expected to meet its 2019 production guidance of 6,840 to 7,310 kg (table 1; Mining Review Africa, 2019; North American Palladium Ltd. 2019a–c).

Industrial Minerals

Diamond.—Canada produced more than 18.6 million carats of diamond in 2019, which was a decrease of 19.6% from the amount produced in 2018. The Diavik Mine (Rio Tinto plc., 60%, and Dominion Diamond Corp., 40%) produced 6.7 million carats, and the Gahcho Kué Mine [De Beers Canada Inc. (a wholly owned subsidiary of De Beers Group, S.A.), 51%, and Mountain Province Diamonds Inc., 49%] produced 6.8 million carats, together accounting for more than 70% of Canada's diamond production in 2019 (tables 1, 2; Anglo American plc, 2020, p. 3; Rio Tinto plc, 2020, p. 271).

Graphite.—In 2109, Imerys Graphite and Carbon S.A. of Switzerland owned the only producing graphite mine in Canada, the Lac des Iles Mine, which produced an estimated 11,000 t of graphite. Several advanced-stage graphite projects were under development. Mason Graphite Inc. continued to advance its Lac Guéret project. According to a 2018 National Instrument (NI) 43–101 technical report, Lac Guéret would have a mine life of 25 years, producing 51,900 t/yr of graphite concentrate at a grade of 93.7% graphitic carbon (Cg). Northern Graphite Corp. anticipated construction to commence at its Bissett Creek Mine in late 2020, with initial production in 2021. Northern Graphite expected Bissett Creek to produce an average of 38,400 t/yr of graphite concentrate at a grade of 94.5% Cg. Nouveau Monde Graphite Inc.'s Matawinie graphite project, which is located about 150 km north of Montreal, was expected to start construction in 2021. According to Nouveau, Matawinie would have a 25.5-year life of mine and produce an average 100,000 t/yr of graphite concentrate at a grade of 97% Cg (table 1; Mason Graphite Inc., 2018, p. 22–3; 2019; Northern Graphite Corp., 2021; Nouveau Monde Graphite Inc., 2021).

Lithium.—As with cobalt, the price of lithium decreased by more 70% in 2019; the average monthly price for the year was about $9,800 per metric ton. Lithium production in Canada decreased by more than 90% to an estimated 9,000 t in 2019 owing to the suspension of operations at the North American Lithium Mine, which was the country's only operating lithium mine. Despite the lower prices, there were a number of advanced-stage lithium projects in Canada in 2019. The Authier lithium project (owned by Sayona Mining Ltd. of Australia) released a revised definitive feasibility study in November. Authier was located near Val-d'Or, Quebec. Authier's Joint Ore Reserves Committee (JORC)-compliant proven and probable reserves were 12.1 Mt containing 121,590 t of Li_2O; the project would have the capacity to produce 112,700 t/yr of concentrate at a grade of 6.0% Li_2O. Galaxy Resources Ltd. of Australia was continuing work toward completion of a feasibility study for the James Bay Mine in Quebec. James Bay had a defined mineral resource of 40.3 Mt at a grade of 1.40% Li_2O. The Rose lithium-tantalum project (owned by Critical Elements Lithium Corp.), which was also located in James Bay, Quebec, released a feasibility study in 2017 and was awaiting permitting before advancing to construction. According to the feasibility study, Rose was expected to produce 190,000 t/yr of chemical-grade lithium concentrate, 50,000 t/yr of technical-grade lithium concentrate, and 430 t/yr of tantalum (table 1; Bohlsen, 2019; Sayona Mining Ltd., 2019, p. 4, 7; Galaxy Resources Ltd., 2021; Trading Economics, 2021).

Potash.—In 2019, production of potash decreased by 8.9% to 12.8 Mt compared with the production (revised) in 2018. Contributing factors for the decreased production were the excess supply of potash, particularly in the North American market, and that The Mosaic Company of the United States suspended operations of its Colonsay Mine in August. Nutrien Ltd. operated the Allan, the Cory, the Lanigan, the Patience Lake, the Rocanville, and the Vanscoy potash mines. The total combined production of these mines was 11.7 Mt, which accounted for 91% of Canada's total potash production in 2019 (table 1; Giles, 2020; Nutrien Ltd., 2020, p. 33).

Mineral Fuels and Related Materials

Coal.—In 2019, total coal production decreased by 4.6% to 51.8 Mt compared with that in 2018. Three companies were responsible for most of the coal produced in Canada in 2019. Teck Resources Ltd. produced coal from six operations, and for four of them, Teck was the sole controlling company. The other two coal operations were joint ventures; one with Nittetsu Mining Co. of Japan and POSCO Canada Ltd. (a subsidiary of POSCO of the Republic of Korea) and the other with POSCO Canada Ltd. These coal operations, including the Cardinal River, Elkview, Fording River, Greenhills, and Line Creek Mines, produced 25.7 Mt of metallurgical-grade coal, which accounted for almost all Canada's metallurgical-grade coal production and 50% of Canada's total coal production in 2018. Westmoreland Mining LLC of the United States operated the Prairie mining projects, which consisted of eight mining complexes in Alberta and Saskatchewan, including the Coal Valley, Estevan (including the Bienfait and Boundary Dam Mines), Genesee, Paintearth, Poplar River, and Sheerness complexes. Production from TransAlta Utilities Corp. of Alberta's Highvale Mine was estimated to have accounted for 15% of Canada's total coal production (tables 1, 2; Teck Resources Ltd., 2020, p. 7; TransAlta Utilities Corp., 2020; Westmoreland Mining LLC, 2021).

Natural Gas.—In 2019, marketable natural gas production decreased to 170.9 billion cubic meters from 172.7 billion cubic meters in 2018. Natural gas in Canada was sourced primarily from the western Canadian sedimentary basin in Alberta, British Columbia, and Saskatchewan. Canada's technically recoverable resources of natural gas at the end of 2018 (the latest year for which data were available) included 15.4 trillion cubic meters of natural gas in conventional resources and 28.2 trillion cubic meters in unconventional resources, including coal-bed methane, shale gas, and tight gas in other reservoir rocks. Canada's domestic natural gas supply exceeded consumption, and Canada exported all of its surplus natural gas production (45% of total production) to the United States, accounting for 98% of the United States' natural gas imports. Although Canada's natural gas markets were integrated with those in the United States, there were no liquefied natural gas (LNG) production facilities in the country to facilitate overseas natural gas exports. There were several LNG projects in the country, but none were under construction (table 1; Canada Energy Regulator, 2020a; Natural Resources Canada, 2020e).

Petroleum.—In 2019, Canada produced 2.06 billion barrels (Gbbl) of crude petroleum, which was a 2.7% increase compared with the production (revised) in 2018. The country had 167.7 Gbbl of proven crude petroleum reserves, of which 97% was in oil sands. In 2019, 81% of Canada's crude petroleum and its equivalents were exported to the United States. Canada was the leading foreign supplier of crude petroleum to the United States, accounting for 56% of the United States' crude petroleum imports and 23% of the United States' refinery crude petroleum intake. About 63% of Canada's petroleum production in 2019 was sourced from oil sands, and the remainder was from conventional, offshore, and tight oil production. Crude petroleum production in Canada largely came from Alberta (80.5%), followed by Saskatchewan (10.5%), Newfoundland and Labrador (5.6%), British Columbia (2.4%), Manitoba (0.9%), and others (0.2%) (table 1; Natural Resources Canada, 2020c, p. 7, 50, 51, 53, 55).

Reserves and Resources

Proven and probable reserves of some metals in Canada have been decreasing for several decades, although lead, silver, and zinc reserves have increased recently (owing to the opening of new mines), reserves of gold have reached record highs, and reserves of copper have rebounded. The long-term decrease in reserves of certain mineral commodities has been the result of many factors, including trends of international mineral commodity prices and domestic and global economic trends, both of which could have a negative effect on the amount of capital available to junior mining companies that perform early-stage exploration activities and rely on equity financing to do so. The total value of expenditures for exploration and deposit appraisal in Canada had been in decline from 2011 to 2015. From 2016 to 2018, the total value of exploration and deposit appraisal expenditures increased year-over-year, before decreasing by 7.24% in 2019, based on spending intentions of $1.6 billion. Proven and (or) probable reserve estimates for some mineral commodities are listed in table 3 (Mining Association of Canada, 2020, p. 42, 94).

Outlook

Canada is likely to maintain its position as a leading global mining country, and its mineral industry has the potential for continued expansions based on its mineral resources and its access to international markets. Although there was excess supply of, and diminished demand for, many of the battery metals (such as cobalt, graphite, lithium, and nickel) in 2019, it is likely that the demand for electric vehicles will increase in the coming years, driving up demand for these metals. In addition to already being one of the leading world producers of nickel, a producer of other battery metals, and having a number of advanced projects with near-term production potential, Canada is well positioned to be a major supplier of these metals for battery storage, electric vehicles, and other related markets.

As a result of the coronavirus disease 2019 (COVID-19) pandemic, Canada's real GDP growth was projected to decrease in 2020 by 6.1% before showing an increase in 2021 of 6.6%. The effect that the pandemic will have on the mineral industry is not so clear, as some have predicted that there may still be strong demand for many mineral commodities, and many countries consider all extractive activities to be essential. Canada's mineral sector continues to be challenged by globalization of the industry, as many other countries can develop their mineral resources at lower costs than Canada. However, the Federal, Provincial, and Territorial governments in Canada are developing and expanding policies related to mining to meet the challenges for the medium- and long-term security of the sector while also addressing environmental and social demands. Canada is also partnering with the United States and other countries to secure sourcing and supply chains of mineral commodities deemed critical for national defense and the economy. It is also expected that in 2020, the United States-Mexico-Canada Agreement will be ratified by the United States, Mexico, and Canada, replacing the North America Free Trade Agreement. The new agreement is expected to remove barriers to trade among the three countries, and reduce the price of—and increase the demand for—cross-border trade of mineral commodities (Angulo and Shalal, 2019; International Monetary Fund, 2020, p. 144).

References Cited

Abcourt Mines Inc., 2019, The update on the Abcourt-Barvue feasibility study is positive—A major reduction in the capital cost is expected: Rouyn-Noranda, Quebec, Canada, Abcourt Mines Inc., February 8, 5 p. (Accessed February 11, 2021, at https://abcourt.com/wp-content/uploads/2019/02/PR2018-02-08.pdf.)

Agnico Eagle Mines Ltd., 2020a, Agnico Eagle reports fourth quarter and full year 2019 results—Record annual and quarterly gold production; production guidance outlines 18% growth through 2022 with declining unit costs in 2021 and 2022; pipeline projects continue to advance; quarterly dividend increased: Toronto, Ontario, Canada, Agnico Eagle Mines Ltd., February 13. (Accessed February 10, 2021, at https://www.prnewswire.com/news-releases/agnico-eagle-reports-fourth-quarter-and-full-year-2019-results--record-annual-and-quarterly-gold-production-production-guidance-outlines-18-growth-through-2022-with-declining-unit-costs-in-2021-and-2022-pipeline-projects-conti-301004930.html.)

Agnico Eagle Mines Ltd., 2020b, Mineral reserves: Toronto, Ontario, Canada, Agnico Eagle Mines Ltd., February 13, 1 p. (Accessed February 10, 2021, at https://s21.q4cdn.com/374334112/files/doc_downloads/agnico_downloads/RnR-Tables/2020/RRTable-2020-Web-Final.pdf.)

Agnico Eagle Mines Ltd., 2021, Meliadine: Toronto, Ontario, Canada, Agnico Eagle Mines Ltd. (Accessed February 10, 2021, at https://www.agnicoeagle.com/English/operations/operations/meliadine/default.aspx.)

Anderson, C.S., 2021a, Indium: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 78–79.

Anderson, C.S., 2021b, Tellurium: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 166–167.

Anglo American plc, 2020, Production report for the fourth quarter ended 31 December 2019: London, United Kingdom, Anglo American plc news release, January 23, 15 p. (Accessed February 11, 2021, at https://www.angloamerican.com/~/media/Files/A/Anglo-American-Group/PLC/media/press-release/releases/2020pr/q4-2019-production-report.pdf.)

Angulo, S., and Shalal, A., 2019, U.S., Canada and Mexico sign agreement–again–to replace NAFTA: Thomson Reuters, December 10. (Accessed February 12, 2021, at https://www.reuters.com/article/us-usa-trade-mexico/u-s-canada-and-mexico-sign-agreement-again-to-replace-nafta-idUSKBN1YE1RO.)

Apodaca, L.E., 2021, Sulfur: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 160–161.

BMC (UK) Ltd., 2019, Kudz Ze Kayah zinc-silver project feasibility study summary: London, United Kingdom, BMC (UK) Ltd., June 30, 28 p. (Accessed February 11, 2021, at https://bmcminerals.com/wp-content/uploads/2019/08/BMC-KZK-DFS-Feasibility-Summary-Bk-FINAL.pdf.)

Bohlsen, M., 2019, Critical elements lithium project environmental impact statement is now deemed complete: InvestorIntel, April 1. (Accessed February 12, 2021, at https://investorintel.com/markets/technology-metals/technology-metals-intel/critical-elements-lithium-project-environmental-impact-statement-is-now-deemed-complete/.)

BP p.l.c., 2020, BP statistical review of world energy—June 2020: London, United Kingdom, BP p.l.c., June, 65 p. (Accessed February 2, 2021, at https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2020-full-report.pdf.)

Bray, E.L., 2021, Aluminum: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 20–21.

Brioche, A.S., 2020, Peat: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 118–119.

Callaghan, R.M., 2021a, Cadmium: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 40–41.

Callaghan, R.M., 2021b, Niobium: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 114–115.

Canada Energy Regulator, 2020a, Canada's role in the global LNG market–Energy market assessment–Executive summary: Ottawa, Ontario, Canada, Canada Energy Regulator, September 29. (Accessed February 12, 2021, at https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/natural-gas/report/2017-lng-market/canadas-role-in-global-lng-market-energy-market-assessment-executive-summary.html.)

Canada Energy Regulator, 2020b, Our work: Ottawa, Ontario, Canada, Canada Energy Regulator, September 29. (Accessed February 5, 2021, at https://www.cer-rec.gc.ca/en/about/who-we-are-what-we-do/our-work.html.)

Champion Iron Ltd., 2021, Bloom Lake: Toronto, Ontario, Canada, Champion Iron Ltd. (Accessed February 8, 2021, at https://www.championiron.com/project/bloom-lake/.)

Coeur Mining Inc., 2020a, 2019 Annual report: Chicago, Illinois, Coeur Mining Inc., February 19, 118 p. (Accessed February 5, 2021, at https://www.coeur.com/_resources/pdfs/2019-Annual-Report.pdf.)

Coeur Mining Inc., 2020b, Coeur reports fourth quarter and full-year 2019 production and sales results: Chicago, Illinois, Coeur Mining Inc., January 16, 10 p. (Accessed February 11, 2021, at https://www.coeur.com/_resources/news/nr_20200116.pdf.)

Coeur Mining Inc., 2020c, Coeur reports year-end 2019 mineral reserves and resources: Chicago, Illinois, Coeur Mining Inc., February 18, 6 p. (Accessed February 11, 2021, at https://www.coeur.com/_resources/news/nr_20200218.pdf.)

Department of Justice, 2019, Canada Energy Regulator Act: Ottawa, Ontario, Canada, Department of Justice, June 21. (Accessed February 5, 2021, at https://laws-lois.justice.gc.ca/eng/acts/C-15.1/page-1.html.)

Facada, M., 2019, Lower prices push North American Lithium to pause spodumene production: London, United Kingdom, Fastmarkets, February 21. (Accessed February 8, 2021, at https://www.metalbulletin.com/Article/3859688/Lower-prices-push-North-American-Lithium-to-pause-spodumene-production.html.)

First Cobalt Corp., 2020, Amended and restated management's discussion and analysis for the year ended December 31, 2019: Toronto, Ontario, Canada, First Cobalt Corp., November 23, 30 p. (Accessed February 10, 2021, at https://www.firstcobalt.com/_resources/financials/FCC-Q4-MDA-F2019-12-31-Amended-and-Restated-Final.pdf?v=0.752.)

Fortune Minerals Ltd., 2019a, NICO cobalt-gold-bismuth-copper project: London, Ontario, Canada, Fortune Minerals Ltd. (Accessed February 10, 2021, at https://www.fortuneminerals.com/assets/nico/default.aspx.)

Fortune Minerals Ltd., 2019b, Northwest Territories government holds ground breaking ceremony for Tlicho all-season road to Whati: London, Ontario, Canada, Fortune Minerals Ltd., August 26. (Accessed February 10, 2021, at https://www.fortuneminerals.com/news/press-releases/press-release-details/2019/Northwest-Territories-Government-Holds-Ground-Breaking-Ceremony-for-Tlicho-All-Season-Road-to-Whati/default.aspx.)

Fortune Minerals Ltd., 2019c, Saskatchewan Metal Processing Plant (SMPP): London, Ontario, Canada, Fortune Minerals Ltd. (Accessed February 10, 2021, at https://www.fortuneminerals.com/assets/SMPP/default.aspx.)

Galaxy Resources Ltd., 2021, James Bay: Applecross, Western Australia, Australia, Galaxy Resources Ltd. (Accessed February 12, 2021, at https://gxy.com/james-bay/.)

Gambogi, J., 2021, Titanium mineral concentrates: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 176–177.

Giga Metals Corp., 2019, Updated resource estimate increases measured plus indicated resources at Turnagain by 24% to 1.07 billion tonnes, while contained nickel increases by 28.3% to 5.2 billion pounds: Vancouver, British Columbia, Canada, Giga Metals Corp., September 19. (Accessed February 10, 2021, at https://www.gigametals.com/news/updated-resource-estimate-increases-measured-plus-indicated-resources-at-turnagain-by-24-to-1.07-billion-tonnes-while-contained/.)

Giles, D., 2020, Mosaic shuts down Colonsay, Sask. potash mine indefinitely: Global News, January 28. (Accessed February 12, 2021, at https://globalnews.ca/news/6474799/mosaic-colonsay-saskatchewan-potash-mine/.)

Glencore plc, 2020, Annual report 2019: Baar, Switzerland, Glencore plc, March 4, 250 p. (Accessed February 9, 2021, at https://www.glencore.com/dam/jcr:79fd3300-ee50-4ee1-870d-6372274c71b5/glen-2019-annual-report-interactive.pdf.)

Global Affairs Canada, 2019, About the Comprehensive and Progressive Agreement for Trans-Pacific Partnership: Ottawa, Ontario, Canada, Global Affairs Canada, July 16. (Accessed February 9, 2021, at https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpgp/backgrounder-document_information.aspx?lang=eng.)

Global Affairs Canada, 2020a, Highlights of Canada's merchandise trade performance in 2019: Ottawa, Ontario, Canada, Global Affairs Canada, February. (Accessed February 10, 2021, at https://www.international.gc.ca/trade-commerce/economist-economiste/analysis-analyse/merchandise_trade-commerce_marchandises.aspx?lang=eng.)

Global Affairs Canada, 2020b, View the timeline: Ottawa, Ontario, Canada, Global Affairs Canada, August 19. (Accessed February 9, 2021, at https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/ceta-aecg/view_timeline-consultez_chronologie.aspx?lang=eng.)
Global Energy Metals Corp., 2021, Werner Lake Cobalt Project–Ontario, Canada: Vancouver, British Columbia, Canada, Global Energy Metals Corp. (Accessed February 10, 2021, at https://www.globalenergymetals.com/projects/werner-lake-cobalt-project/.)
Government of Canada, 2020a, About CPTPP: Ottawa, Ontario, Canada, Government of Canada, December 31. (Accessed February 9, 2021, at https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpgp/about_cptpp-propos_ptpgp.aspx?lang=eng.)
Government of Canada, 2020b, Ongoing negotiations: Ottawa, Ontario, Canada, Government of Canada, February 20. (Accessed February 4, 2021, at https://www.rcaanc-cirnac.gc.ca/eng/1100100030285/1529354158736.)
Government of Newfoundland and Labrador, 2019a, Mining in Newfoundland and Labrador: St. John’s, Newfoundland and Labrador, Canada, Natural Resources Mines Branch, Government of Newfoundland and Labrador, 20 p. (Accessed February 8, 2021, at https://www.gov.nl.ca/iet/files/MNL-Overview.pdf.)
Government of Newfoundland and Labrador, 2019b, Minister congratulates Beaver Brook antimony mine on first shipment: St. John’s, Newfoundland and Labrador, Canada, July 3. (Accessed February 9, 2021, at https://www.gov.nl.ca/releases/2019/nr/0703n02/.)
International Monetary Fund, 2020, World economic outlook—A long and difficult ascent: Washington, DC, October 16, 182 p. (Accessed February 12, 2021, at https://www.imf.org/-/media/Files/Publications/WEO/2020/October/English/text.ashx.)
Jamasmie, C., 2019, Done deal—Newmont Goldcorp becomes the world’s no. 1 gold miner: Mining.com, April 18. (Accessed February 9, 2021, at https://www.mining.com/case-closed-newmont-goldcorp-becomes-worlds-no-1-gold-miner/.)
Jasinski, S.M., 2021a, Mica: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 108–109.
Jasinski, S.M., 2021b, Potash: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 126–127.
Kazaz, C., and Fipke, J., 2012, Canadian land tenure system: American Association of Professional Landmen, 2012 AAPL Mining and Land Resources Institute, Reno, Nevada, March 15, 52 p. (Accessed February 4, 2021, https://web.archive.org/web/20160910170437/https://www.landman.org/docs/educational-material-(pdf)/3-canadian-land-tenure-system.pdf.)
Kimberley Process Certification Scheme, 2021, Annual global summary—2019 production, imports, exports, and KPC counts: Washington, DC, Kimberley Process Certification Scheme, January 11, 1 p. (Accessed January 29, 2021, at https://kimberleyprocessstatistics.org/static/pdfs/public_statistics/2019/2019GlobalSummary.pdf.)
Lawson Lundell LLP, 2019, International comparative legal guide to mining law 2019—Canada: Lawson Lundell LLP, 29 p. (Accessed February 5, 2021, at https://www.lawsonlundell.com/media/news/588_ML19_Chapter-4-Canada.pdf.)
Mason Graphite Inc., 2018, Feasibility study update of the Lac Guéret graphite project: Laval, Quebec, Canada, Mason Graphite Inc., December 11, 361 p. (Accessed February 12, 2021, at https://a8ef47d2-6707-4c99-828b-0d41724c1e51.filesusr.com/ugd/a53b7c_22115be39ccf4d85b9579f359680997c.pdf.)
Mason Graphite Inc., 2019, Headway in Mason Graphite’s Lac Guéret project: Laval, Quebec, Canada, Mason Graphite Inc., May 14. (Accessed February 12, 2021, at https://www.masongraphite.com/post/headway-in-mason-graphite-s-lac-gu%C3%A9ret-project.)
McRae, M.E., 2021, Nickel: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 112–113.
Milewski, A., 2020, Nickel and cobalt—Where is the market today?: The Assay. (Accessed February 10, 2021, at https://www.theassay.com/articles/nickel-and-cobalt-where-is-the-market-today/.)
Mines and Metals, 2020, Ranked—Largest gold mines in Canada in 2019: Mines and Metals, February 18. (Accessed February 10, 2021, at https://www.minesandmetals.com/2020/02/largest-gold-mines-in-canada-2019/#:~:text=During%20the%20year%20ended%20December,produced%20376%2C012%20ounces%20of%20gold.)
Mining Association of Canada, 2020, Facts & figures 2019—The state of the Canadian mining industry; Ottawa, Ontario, Canada, Mining Association of Canada, January 20, 104 p. (Accessed January 27, 2021, at https://mining.ca/wp-content/uploads/2020/01/FF-English-Web-1.pdf.)
Mining Review Africa, 2019, Implats concludes acquisition of North American Palladium: Mining Review Africa, December 17. (Accessed February 11, 2021, at https://www.miningreview.com/platinum-group-metals/implats-concludes-acquisition-of-north-american-palladium/.)
Moore, P., 2019, Production at De Beers Victor diamond mine in Ontario comes to an end: Hertfordshire, United Kingdom, International Mining, May 31. (Accessed February 8, 2021, at https://im-mining.com/2019/05/31/production-de-beers-victor-diamond-mine-ontario-comes-end/).
Natural Resources Canada, 2016, Exploration and mining in Canada—An investor’s brief: Ottawa, Ontario, Canada, Natural Resources Canada, February, 28 p. (Accessed February 12, 2021, at https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/mineralsmetals/pdf/mms-smm/poli-poli/pdf/Investment_Brief_e.pdf.)
Natural Resources Canada, 2017, The minerals and metals policy of the Government of Canada: Ottawa, Ontario, Canada, Natural Resources Canada, November 14. (Accessed February 4, 2021, at http://www.nrcan.gc.ca/mining-materials/policy/8690.)
Natural Resources Canada, 2019a, Canada joins the Energy Resource Governance Initiative: Ottawa, Ontario, Canada, Natural Resources Canada, December 18. (Accessed February 4, 2021, https://www.canada.ca/en/natural-resources-canada/news/2019/12/canada-joins-the-energy-resource-governance-initiative.html.)
Natural Resources Canada, 2019b, Minerals and the economy: Ottawa, Ontario, Canada, Natural Resources Canada, December 3. (Accessed February 8, 2021, at https://www.nrcan.gc.ca/science-data/science-research/earth-sciences/earth-sciences-resources/earth-sciences-federal-programs/minerals-and-economy/20529.)
Natural Resources Canada, 2019c, Natural resources—Major projects planned and under construction—2019 to 2029: Energy and Mines Ministers’ Conference, St. Andrews by-the-Sea, New Brunswick, Canada, 30 p. (Accessed February 4, 2021, at https://www.nrcan.gc.ca/sites/nrcan/files/science-and-data/Natural-resources-major-projects-planned-or-under-construction-access-1.pdf.)
Natural Resources Canada, 2019d, Taxes and levies by level of taxation: Ottawa, Ontario, Canada, Natural Resources Canada, November 29. (Accessed February 5, 2021, at https://www.nrcan.gc.ca/science-data/science-research/earth-sciences/earth-sciences-resources/earth-sciences-federal-programs/taxes-and-levies-level-taxation/8884.)
Natural Resources Canada, 2020a, Canadian mineral production: Ottawa, Ontario, Canada, Natural Resources Canada. (Accessed February 5, 2021, at https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/pdf/Canadian_mineral_production_e_access.pdf.)
Natural Resources Canada, 2020b, Energy and the economy: Ottawa, Ontario, Canada, Natural Resources Canada, October 6. (Accessed February 5, 2021, at https://www.nrcan.gc.ca/energy/facts/energy-economy/20062.)
Natural Resources Canada, 2020c, Energy fact book 2020–2021: Ottawa, Ontario, Canada, Natural Resources Canada, October 6, 133 p. (Accessed February 12, 2021, https://www.nrcan.gc.ca/sites/nrcan/files/energy/energy_fact/energy-factbook-2020-2021-English.pdf.)
Natural Resources Canada, 2020d, Exploration plus deposit appraisal expenditures, by Province and Territory, by mineral commodity sought, 2019: Ottawa, Ontario, Canada, Natural Resources Canada, September. (Accessed February 4, 2021, at https://sead.nrcan-rncan.gc.ca/PDF/ExploTable302019-en.pdf.)
Natural Resources Canada, 2020e, Natural gas facts: Ottawa, Ontario, Canada, Natural Resources Canada, October 6. (Accessed February 12, 2021, at https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/natural-gas-facts/20067.)
Natural Resources Canada, 2021, Canadian mining assets (CMA) by country and region, 2018 and 2019: Ottawa, Ontario, Canada, Natural Resources Canada, February 8. (Accessed May 7, 2021, at https://www.nrcan.gc.ca/maps-tools-and-publications/publications/minerals-mining-publications/canadian-mining-assets/canadian-mining-assets-cma-country-and-region-2018-and-2019/15406.)
Neary, D., 2019, Fortune’s road still has twists and turns: Northern News Service, November 18, 1 p. (Accessed February 10, 2021, at https://s1.q4cdn.com/337451660/files/doc_downloads/articles/191118-NewsNorth-Mining-2019-Fortune’s-road-still-has-twists-and-turns.pdf.)

North American Palladium Ltd., 2019a, Correction—North American Palladium reports record revenue in Q2 2019, announces special dividend: Toronto, Ontario, Canada, North American Palladium Ltd., August 1. (Accessed February 11, 2021, at https://impalacanada.com/investors/news/news-details/2019/CORRECTION-North-American-Palladium-Reports-Record-Revenue-in-Q2-2019-Announces-Special-Dividend/default.aspx.)
North American Palladium Ltd., 2019b, North American Palladium delivers strong Q1 financial results; eliminates debt and increases dividends: Toronto, Ontario, Canada, North American Palladium Ltd., May 2. (Accessed February 11, 2021, at https://impalacanada.com/investors/news/news-details/2019/North-American-Palladium-Delivers-Strong-Q1-2019-Financial-Results-Eliminates-Debt-and-Increases-Dividend/default.aspx.)
North American Palladium Ltd., 2019c, North American Palladium reports Q3 2019 record EBITDA: Toronto, Ontario, Canada, North American Palladium Ltd., November 7. (Accessed February 11, 2021, at https://impalacanada.com/investors/news/news-details/2019/North-American-Palladium-Reports--Q3-2019-Record-EBITDA/default.aspx.)
Northern Graphite Corp., 2021, Overview: Manotick, Ontario, Canada, Northern Graphite Corp. (Accessed February 12, 2021, at http://www.northerngraphite.com/project/bissett-creek-project/overview/.)
Nouveau Monde Graphite, Inc., 2021, Matawinie Graphite Mine: Saint-Michel-des-Saints, Quebec, Canada, Nouveau Monde Graphite, Inc. (Accessed February 12, 2021, at https://nouveaumonde.group/operations/#matawinie-graphite-property.)
Nutrien Ltd., 2020, Annual report 2019: Saskatoon, Saskatchewan, Canada, Nutrien Ltd., February 19, 136 p. (Accessed February 12, 2021, at https://www.nutrien.com/sites/default/files/uploads/2020-03/Nutrien_2019_Annual_Report_Enhanced.pdf.)
Nyrstar N.V., 2019a, Change of Nyrstar's scheduled date for the publication of the half year results 2019 and production update for half year 2019: Antwerp, Belgium, Nyrstar N.V., September 28. (Accessed February 11, 2021, at https://otp.tools.investis.com/clients/fi/nyrstar1/omx/omx-story.aspx?cid=250&newsid=69331&culture=en-US.)
Nyrstar N.V., 2019b, First quarter 2019 interim management statement: Antwerp, Belgium, Nyrstar N.V., May 26. (Accessed February 11, 2021, at https://otp.tools.investis.com/clients/fi/nyrstar1/omx/omx-story.aspx?cid=250&newsid=68162&culture=en-US.)
Padilla, A.J., 2020, Niobium: U.S. Geological Survey Mineral Commodity Summaries 2020, p. 114–115.
Pembridge Resources plc, 2019, Competent person's report Minto Mine—Yukon, Canada: London, United Kingdom, Pembridge Resources plc, June 23, 171 p. (Accessed February 10, 2021, at https://www.pembridgeresources.com/component/rsfiles/download?path=Presentations%252FPEM-20190623_Minto%2BCPR%2BFinal%2BSigned.pdf.)
Pembridge Resources plc, 2020, Annual report and consolidated financial statements for the year ended 31 December 2019: London, United Kingdom, Pembridge Resources plc, June, 60 p. (Accessed February 10, 2021, at https://www.pembridgeresources.com/component/rsfiles/download?path=Reports-and-presentations%252FFINAL%2BACCOUNTS%2BSigned%2BFS.pdf.)
Pollon, C., 2019, Why is B.C. home to more mining exploration companies than anywhere else on earth?: The Narwhal [Victoria, British Columbia, Canada], May 28. (Accessed January 29, 2021, at https://thenarwhal.ca/why-is-b-c-home-to-more-mining-exploration-companies-than-anywhere-else-on-earth/.)
Randell, A., 2019, Restart of Beaver Brook antimony mine near Glenwood announced: The Telegram [St. John's, Newfoundland and Labrador, Canada], March 8. (Accessed February 9, 2021, at https://www.saltwire.com/newfoundland-labrador/business/restart-of-beaver-brook-antimony-mine-near-glenwood-announced-290631/.)
Rio Tinto plc, 2020, Annual report 2019: Melbourne, Victoria, Australia, Rio Tinto plc, February 26, 300 p. (Accessed February 5, 2021, via https://www.riotinto.com/invest/reports/annual-report.)
Rockstone Research, 2019, Fluorspar—The sweet spot for Quebec's steel and aluminum industries: Stein am Rhein, Switzerland, Rockstone Research, November 26. (Accessed February 8, 2021, at https://www.rockstone-research.com/index.php/en/research-reports/5558-Fluorspar-The-Sweet-Spot-for-Quebecs-Steel-and-Aluminium-Industries.)
Sayona Mining Ltd., 2019, Revised Authier DFS shows boost to profitability: Paddington, Queensland, Australia, Sayona Mining Ltd., November 11, 19 p. (Accessed February 12, 2021, at https://sayonamining.com.au/wp/wp-content/uploads/2019/11/SYA_ASX-Announ_20191111_Revised-Authier-DFS.pdf.)
Schulte, R.F., 2021, Platinum-group metals: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 124–125.
Sheaffer, K.N., 2021, Gold: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 70–71.
Statistics Canada, 2021a, Employment by industry, annual: Ottawa, Ontario, Canada, Statistics Canada, February 3. (Accessed February 3, 2021, at https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1410020201.)
Statistics Canada, 2021b, Gross domestic product at basic prices, by industry, Provinces, and Territories, growth rates: Ottawa, Ontario, Canada, Statistics Canada, February 2. (Accessed February 3, 2021, at https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3610040201.)
Statistics Canada, 2021c, The international trade explorer: Ottawa, Ontario, Canada, Statistics Canada, February 5. (Accessed February 9, 2021, at https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2019005-eng.htm.)
Superior Lake Resources Ltd., 2019, Bankable feasibility study confirms Superior Lake as a high margin asset: West Perth, Western Australia, Australia, Superior Lake Resources Ltd., August 28, 37 p. (Accessed February 11, 2021, at https://www.investi.com.au/api/announcements/sup/e7c3501d-edd.pdf.)
Taseko Mines Ltd., 2020, Taseko reports 2019 fourth quarter and annual financial results: Vancouver, British Columbia, Canada, Taseko Mines Ltd., February 20, 86 p. (Accessed February 10, 2021, at https://www.tasekomines.com/assets/docs/TKO2019Q4.pdf.)
Teck Resources Ltd., 2020, Teck reports unaudited annual and fourth quarter results for 2019: Vancouver, British Columbia, Canada, Teck Resources Ltd., February 20, 77 p. (Accessed February 10, 2021, at https://www.teck.com/media/Q4-2019-Quarterly-NR.pdf.)
Toronto Stock Exchange, 2020, Toronto Stock Exchange—Toronto Venture Exchange: Toronto, Ontario, Canada, Toronto Stock Exchange. (Accessed January 29, 2021, at https://mining.tsx.com/.)
Torrance, L., 2019, Alcoa announces planned restart, new labor contract for Quebec smelter: Pittsburgh [Pennsylvania] Business Times, July 3. (Accessed February 9, 2021, at https://www.bizjournals.com/pittsburgh/news/2019/07/03/alcoa-announces-planned-restart-new-labor-contract.html.)
Trading Economics, 2020, Cobalt: Trading Economics. (Accessed February 10, 2021, at https://tradingeconomics.com/commodity/cobalt.)
Trading Economics, 2021, Lithium: Trading Economics. (Accessed May 11, 2021, at https://tradingeconomics.com/commodity/lithium.)
Trafigura Group (Pte) Ltd., 2021, Trafigura Mining Group: Singapore, Trafigura Group (Pte) Ltd. (Accessed February 11, 2021, at https://www.trafigura.com/financials/2020-the-year-in-review/industrial-and-financial-assets/#trafiguramininggroup.)
TransAlta Utilities Corp., 2020, Highvale Mine: Edmonton, Alberta, Canada, TransAlta Utilities Corp. (Accessed February 12, 2021, at https://www.transalta.com/highvale-mine/.)
Trevali Mining Corp., 2020a, Trevali reports 2019 mineral reserves and resources; increases reserves at Rosh Pinah Mine and grows global resource base: Vancouver, British Columbia, Canada, Trevali Mining Corp., March 30. (Accessed February 11, 2021, at https://www.trevali.com/news/news/news-release-details/2020/Trevali-Reports-2019-Mineral-Reserves-and-Resources-Increases-Reserves-at-Rosh-Pinah-Mine-and-Grows-Global-Resource-Base/default.aspx.)
Trevali Mining Corp., 2020b, Trevali reports fourth quarter and full year 2019 results beats production guidance with record production year: Vancouver, British Columbia, Canada, Trevali Mining Corp., February 20. (Accessed February 11, 2021, at https://www.trevali.com/news/news/news-release-details/2020/Trevali-Reports-Fourth-Quarter-And-Full-Year-2019-Results-Beats-Production-Guidance-With-Record-Production-Year/default.aspx.)
U.S. Department of the Interior, 2018, Final list of critical minerals 2018: Federal Register, v. 83, no. 97, May 18, p. 23295–23296. (Accessed February 4, 2021, at https://www.govinfo.gov/content/pkg/FR-2018-05-18/pdf/2018-10667.pdf.)
U.S. Geological Survey, 2020, Mineral commodity summaries 2020: U.S. Geological Survey, 200 p.
U.S. Geological Survey, 2021, Mineral commodity summaries 2021: U.S. Geological Survey, 200 p.
Vale S.A., 2020a, Form 20-F: Rio de Janeiro, Brazil, Vale S.A., April 3, 201 p. (Accessed February 9, 2021, at http://www.vale.com/EN/investors/information-market/annual-reports/20f/20FDocs/Vale%2020-F%202019_i.pdf.)
Vale S.A., 2020b, Vale's production and sales in 4Q19 and 2019: Rio de Janeiro, Brazil, Vale S.A., February 11, 18 p. (Accessed February 9, 2021, at http://www.vale.com/en/investors/information-market/quarterly-results/quarterlyresultsdocs/preport4t19_i.pdf.)

Victoria Gold Corp., 2019, Victoria's Eagle Gold Mine construction complete—Operations ramping up: Toronto, Ontario, Canada, Victoria Gold Corp., September 9, 4 p. (Accessed February 10, 2021, at https://vgcx.com/site/assets/files/6426/nr-eagle-update-2019-09-09-klg.pdf.)

Victoria Gold Corp., 2020a, Management's discussion and analysis of financial results as at and for the ten month period ended December 31, 2019: Toronto, Ontario, Canada, Victoria Gold Corp., April 17, 26 p. (Accessed February 10, 2021, at https://vgcx.com/site/assets/files/6519/vit_q4_dec19_mda_2020-04-15_final.pdf.)

Victoria Gold Corp., 2020b, Victoria provides COVID-19 and operational update: Toronto, Ontario, Canada, Victoria Gold Corp., April 7, 2 p. (Accessed February 10, 2021, at https://vgcx.com/site/assets/files/6518/200407-vgcx_pr_ops_covid_2020-04-07_final.pdf.)

Victoria Gold Corp., 2021, The Eagle Gold Mine is the newest mine and largest gold mine in Yukon history: Toronto, Ontario, Canada, Victoria Gold Corp. (Accessed February 10, 2021, at https://vgcx.com/development/eagle-gold-project/

Wacaster, Susan, 2017, The mineral industry of Canada, *in* Area reports—International—Latin America and Canada: U.S. Geological Survey Minerals Yearbook 2014, v. III, p. 5.1–5.26.

Westmoreland Mining LLC., 2021, Locations: Englewood, Colorado, Westmoreland Mining LLC. (Accessed February 12, 2021, at https://westmoreland.com/mine-location-map/.)

Winfield-Lesk, M., 2019, The Impact Assessment Act and how it will affect your project: Hatch Ltd. (Accessed February 4, 2021, at https://www.hatch.com/en/About-Us/Publications/Technical-Papers/2019/09/The-Impact-Assessment-Act-and-How-it-Will-Affect-Your-Project.)

World Bank Group, The, 2021, GDP (current US$): Washington, DC, The World Bank Group. (Accessed January 29, 2021, at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2019&most_recent_value_desc=true&start=2012&year_high_desc=true.)

World Nuclear Association, 2020a, Supply of uranium: London, United Kingdom, World Nuclear Association, December. (Accessed February 2, 2021, at https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/uranium-resources/supply-of-uranium.aspx.)

World Nuclear Association, 2020b, Uranium production figures, 2010-2019: London, United Kingdom, World Nuclear Association, September. (Accessed February 2, 2021, at http://www.world-nuclear.org/information-library/facts-and-figures/uranium-production-figures.aspx.)

TABLE 1

CANADA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2015	2016	2017	2018	2019
METALS						
Aluminum:						
Alumina, Al_2O_3 content		1,560,932	1,566,467	1,570,000	1,568,000	1,522,000
Aluminum, metal, primary		2,880,035	3,208,888	3,211,882	2,923,204	2,853,771
Antimony, mine, Sb content		1	--	1	5 r	5
Bismuth, mine, Bi content		2	2	4	5 r	5
Cadmium:						
Mine, Cd content		68	60	158	148 r	164
Refinery, primary		1,159	2,305	1,802	1,857 r	1,803
Cobalt, Co content:						
Mine[3]		4,339	4,216	3,704	3,279 r	3,336
Refinery, metal, metal powder, oxide		6,126	6,302	6,355	6,349 r, 4	6,075
Copper:						
Mine, concentrates, Cu content		714,647	693,059	594,994	548,011 r	572,705
Smelter, blister:						
Primary		281,416	304,349	289,400	290,100	290,000 e
Secondary		28,713	29,165	31,000	30,000	30,000 e
Total		310,000	334,000	320,000	320,000	320,000 e
Refinery:						
Primary:						
Leaching, electrowon		500	--	--	--	--
Other		301,300	284,400	300,700	259,300 r	253,100
Secondary		29,100	30,000 r	29,700 r	32,000 r	28,100
Total		330,000	314,000	330,000 r	291,000 r	281,200
Ferroalloys:						
Ferroniobium:						
Gross weight[e]		8,300	9,400	11,000	11,000	10,000
Nb content		5,385	6,099	6,981	7,400 r, e	6,000 e
Ferrosilicon[e]	thousand metric tons	38	38	40	36	37
Ferrovanadium[e]	do.	1	1	1	1	1
Gold, mine, Au content	kilograms	160,751	161,497	172,877 r	191,882 r	174,974
Indium, refinery, primary, In content, metal[e]	do.	70,000	71,000	67,000	58,000	61,000
Iron ore, mine:						
Gross weight	thousand metric tons	46,220	46,731	50,300	52,755 r	58,472
Fe content[e]	do.	27,700	28,100	30,200	31,700 r	35,200
Iron and steel:						
Direct-reduced iron	do.	1,502	1,399	1,608	1,670	1,440
Pig iron	do.	5,851	6,240	6,306	6,680	6,360
Raw steel	do.	12,473	12,646	13,208	13,443	12,790
Lead:						
Mine, Pb content		3,699	12,020	13,494	15,605 r	21,782
Refinery:						
Primary		127,264	142,076	124,555	120,000 r, e	112,909
Secondary		141,600	132,150	149,506	141,000 r, e	147,358
Total		269,000	274,000	274,000	261,000 r, e	260,000
Molybdenum, mine, Mo content		2,505	2,783	4,765	5,048 r	3,896
Nickel:						
Mine, sulfide ore, concentrate, Ni content		225,351	230,210	206,354	177,867 r	181,410
Refinery, metal		149,716	158,299	154,759	137,411 r	124,736
Niobium, mineral concentrate, Nb content[5, 6]	kilograms	5,600,000	6,300,000	7,200,000	7,700,000 e	6,800,000 e

See footnotes at end of table.

TABLE 1—Continued

CANADA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2015	2016	2017	2018	2019
METALS—Continued						
Platinum-group metals, mine:[e]						
Iridium, Ir content	kilograms	100	300	200	300	420
Palladium, Pd content	do.	24,000	22,000	19,000	21,000 [r]	20,000
Platinum, Pt content	do.	8,600	8,400	7,600	7,600 [r]	7,200
Rhodium, Rh content	do.	600	600	60	300	280
Ruthenium, Ru content	do.	300	300	500	700	700
Total	do.	33,600	31,600	27,400	29,900 [r]	28,600
Selenium, Se content	do.	156,000	175,000	72,000	85,000 [r]	57,000
Silicon, metal[e]	thousand metric tons	30	27	28	34	34
Silver:						
Mine, Ag content	kilograms	371,000	385,000	368,000 [r]	392,000 [r]	379,000
Refinery, primary	do.	1,891,692	1,877,394	1,758,682	1,700,000 [e]	1,700,000 [e]
Tellurium, refinery, Te content	do.	10,000	18,000	49,000	40,000 [e]	40,000 [e]
Titanium, titaniferous slag, sorelslag[e]		700,000	700,000	800,000	700,000	800,000
Tungsten, mine, concentrate, W content[7]		1,600 [e]	--	--	--	--
Zinc:						
Mine, Zn content		275,410	301,210	305,314	304,964 [r]	335,806
Smelter, primary		683,118	691,389	598,438	620,202 [r]	654,971
INDUSTRIAL MINERALS						
Barite[e]		42,000	20,000	50,000	40,000	40,000
Cement and clinker:						
Clinker	thousand metric tons	11,541	11,383	12,412	13,184	13,000 [e]
Hydraulic cement	do.	12,167	11,693	12,706	13,554	13,200 [e]
Diamond, unspecified	thousand carats	11,677	13,036	23,234	23,194	18,638
Feldspar, mine, nepheline syenite	thousand metric tons	614	571	612	565 [r]	523
Fluorspar		--	--	NA	35,000 [r, e]	80,000 [e]
Gemstones, amethyst and jade		8,233	154	89	87 [r]	49
Graphite, crystalline flake[e]		NA	NA	14,000	11,000 [r]	11,000
Gypsum, and anhyrdite[8]	thousand metric tons	1,726	1,679	3,001	3,240 [r]	2,408
Lime	do.	1,852	1,807	1,842	1,785 [r]	1,706
Lithium, spodumene		--	--	--	114,000	9,000 [e]
Magnesite[e]		100,000	150,000	150,000	150,000	180,000
Mica		NA	22,000 [e]	22,000 [e]	21,000 [e]	21,000 [e]
Nitrogen, ammonia, N content		4,004,000	4,133,000	3,745,000	3,832,000	3,937,000
Potash, K_2O content	thousand metric tons	11,462	10,790	12,563	14,024 [r]	12,770
Salt	do.	14,343	10,252	11,424	10,713 [r]	10,243
Sand and gravel, industrial, silica	do.	2,053	2,256	2,540	4,864 [r]	4,740
Stone, sand, and gravel:						
Sand and gravel, construction, unspecified	do.	228,030	280,550	231,219	245,815 [r]	243,818
Stone, unspecified	do.	158,034	160,016	169,518	188,974 [r]	177,733
Sulfur, byproduct:						
Metallurgy	do.	558	635	524	505 [r]	520
Natural gas and petroleum	do.	5,187	4,746	4,803	4,828 [r]	6,418
Total	do.	5,750	5,380	5,330	5,330 [r]	6,940
Talc and related materials, pyrophyllite, soapstone, talc	do.	175	199	215	279 [r]	243
MINERAL FUELS AND RELATED MATERIALS						
Coal:[e]						
Bituminous	thousand metric tons	4,340	4,290	4,250	3,800	3,630
Lignite	do.	8,060	7,970	7,900	7,060	6,730
Metallurgical	do.	27,900	27,600	27,300	24,400	23,300
Subbituminous	do.	21,700	21,500	21,300	19,000	18,100
Total	do.	62,000	61,300	60,800	54,300	51,800

See footnotes at end of table.

TABLE 1—Continued

CANADA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2015	2016	2017	2018	2019
MINERAL FUELS AND RELATED MATERIALS—Continued						
Natural gas, marketable	million cubic meters	154,633	159,854	166,278	172,725	170,890
Peat, horticultural use	thousand metric tons	1,297	1,452	1,459	1,306 r	1,259
Petroleum:						
Crude	thousand 42-gallon barrels	1,601,985	1,631,550	1,838,505 r	2,007,865 r	2,062,615
Natural gas liquids, gas plant production	do.	317,563	360,328	370,508	236,285 r	248,900
Refinery:						
Asphalt	do.	25,445	28,892	31,388	25,000 e	22,600 e
Diesel	do.	176,595	175,300	193,261	208,000 e	188,000 e
Fuel oil:						
Heavy	do.	31,263	27,150	31,275	21,000 e	19,000 e
Light	do.	35,206 [9]	26,936	25,653	21,000 e	19,000 e
Gasoline:						
Aviation	do.	26,810 [10]	35,954	44,463	69,000 e	62,400 e
Motor	do.	258,126	271,848	284,326	291,000	263,000 e
Liquefied petroleum gas	do.	9,717	7,893	7,119	5,700 e	5,160 e
Other	do.	84,688 [11]	86,467	65,940	53,000 e	48,000 e
Total	do.	648,000	660,000	683,000	694,000 e	628,000 e
Uranium, mine, uranium oxide, U content		13,279	14,133	12,207	6,975 r	6,796

[e]Estimated. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through January 28, 2021. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]In addition to the commodities listed, aluminum hydroxide $Al(OH)_3$ (hydrate), bentonite, refined bismuth, cesium, ore containing indium, pumice, silicon metal, and zeolites may have been produced, but available information was inadequate to make reliable estimates of output.

[3]Recoverable metal in ores and concentrates shipped.

[4]Excludes cobalt oxide.

[5]Pyrochlore concentrate.

[6]Production includes niobium (columbium) contained in ferroniobium shipped with the value as reported by the shipper.

[7]Datum for 2015 based on half-year production from North American Tungsten Corp. and an estimate for production from July—October 2015.

[8]Prior to 2017, reported production excluded quantity used for manufacture of cement products.

[9]Includes stove oil, kerosene and tractor fuel.

[10]Includes aviation gasoline and aviation turbo fuels.

[11]Includes petrochemical feedstocks, naphtha specialties, petroleum coke, lubricating oils and greases, still gas and other products.

TABLE 2
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Axens IFP Group Technologies	Brockville refinery, Brockville, Ontario	18.
Do.	Rio Tinto Group	Vaudreuil refinery, Jonquiere, Quebec	1,559.
Aluminum	Alcoa Corp.	Baie-Comeau Smelter in Baie-Comeau, Quebec	280.
Do.	do.	Deschambault smelter in Deschambault, Quebec	280.
Do.	Alcoa Corp., 74.95%, and Rio Tinto Alcan Inc., 25.05%	Becancour smelter in Becancour, Quebec	413.
Do.	Rio Tinto Group	Alma smelter in Alma, Quebec	471.
Do.	do.	Arvida smelter in Arvida, Jonquiere, Quebec	236.
Do.	do.	Grande-Baie smelter in Grande-Baie, Quebec	227.
Do.	do.	Kitimat smelter in Kitimat, British Columbia	420.
Do.	do.	Laterriere smelter in Laterriere, Quebec	247.
Do.	Rio Tinto Alcan Inc., 40%; Aluminium Austria Metall Québec, 20%; Hydro Aluminum, 20%; Marubeni Québec Inc., 13.33%; Société générale de financement du Québec, 6.67%	Alouette smelter in Sept-Iles, Quebec	611.
Ammonium sulfate metric tons	Teck Resources Ltd.	Trail Refinery, Trail, British Columbia	NA.
Antimony	China Minmetals Co. Ltd.	Beaver Brook mine, about 45 kilometers south of Glenwood, Newfoundland and Labrador	160.
Barite	Fireside Minerals Ltd.	Fireside Mine, Fireside, British Columbia	NA.
Do.	MarFred Minerals Ltd.	Tracey Lake barite property, North Williams, Ontario	NA.
Bismuth metal	Teck Resources Ltd.	Trail Refinery, Trail, British Columbia	NA.
Cadmium metal	Coeur Mining, Inc.	Silvertip Mine, British Columbia, 8 kilometers south of the border with Yukon Territory	NA.
Do.	Noranda Income Fund	Valleyfield Refinery, Quebec	NA.
Do.	Teck Resources Ltd.	Trail Refinery, Trail, British Columbia	100.
Cement	Ciment Québec Inc.	Plant in Saint-Basile, Quebec	1,571.
Do.	Colacem Canada Inc. (Colacem S.p.A.)	Plant in Grenville-sur-la-Rouge, Quebec	300.
Do.	ESSROC Canada Inc. (Italcementi Group)	Plant in Picton, Ontario	792.
Do.	Federal White Cement Ltd.	Plant in Woodstock, Ontario	544.
Do.	Holcim (Canada) Inc. (Holcim AG)	Plant in Joliette, Quebec	1,475.
Do.	do.	Plant in Mississauga, Ontario	2,000.
Do.	Lafarge Canada Inc. (Lafarge North America)	Plant in Bath, Ontario	1,176.
Do.	do.	Grinding plant, Stoney Creek, Ontario	814.
Do.	do.	Plant in Exshaw, Alberta	1,422.
Do.	do.	Plant in Kamloops, British Columbia	324.
Do.	do.	Plant in Richmond, British Columbia	1,319.
Do.	do.	Plant in St. Constant, Quebec	1,157.
Do.	do.	Plant in Brookfield, Nova Scotia	621.
Do.	Lehigh Inland Cement Ltd. (HeidelbergCement Group)	Plant in Edmonton, Alberta	1,380.
Do.	do.	Plant in Delta, British Columbia	1,356.
Do.	St. Marys Cement (Canada) Inc. (Votorantim Cimentos S.A.)	Plant in Bowmanville, Ontario	1,800.
Do.	do.	Plant in St. Marys, Ontario	645.
Clay, bentonite	Canadian Clay Products Inc.	Mine in Wilcox, Saskatchewan	NA.
Coal	Anglo American plc	Trend open pit mine, near Tumbler Ridge, British Columbia	2,000.
Do.	Bighorn Mining Ltd.	Vista Mine, near Hinton, Alberta	4,200
Do.	Conuma Coal Resources Ltd.	Willow Creek Mine, Tumbler Ridge, British Columbia	1,200.
Do.	do.	Brule Mine, Tumbler Ridge, British Columbia	2,500.
Do.	do.	Wolverine Mine, Tumbler Ridge, British Columbia	2,000.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Coal—Continued		Teck Resources Ltd.	Cardinal River operations, near Hinton, Alberta	2,000.
Do.		do.	Coal Mountain open pit mine[1] at Sparwood, British Columbia	2,700.
Do.		do.	Fording River open pit mine, near Elkford, British Columbia	8,500.
Do.		do.	Line Creek Mine, near Sparwood, British Columbia	3,500.
Do.		Teck Resources Ltd., 95%; Nittetsu Mining Co. Ltd., 2.5%; POSCO Canada Ltd., 2.5%	Elkview open pit mine, near Sparwood, British Columbia	7,000.
Do.		Teck Resources Ltd., 80%, and POSCO Canada Ltd., 20%	Greenhills open pit mine, near Elkford, British Columbia	5,200.
Do.		TransAlta Utilities Corp.	Highvale open pit mine, near Seba Beach, Alberta	13,000.
Do.		Up Energy Dev. Group Ltd., 85.31%, and Winsway Coking Coal Holdings Ltd., 14.69%	Grande Cache Mine, near Grande Cache, Alberta	3,600.
Do.		Westmoreland Coal Co.	Coal Valley Mine, near Edson, Alberta	5,200.
Do.		do.	Boundary Dam open pit mine, near Estevan, Saskatchewan	6,500.
Do.		do.	Poplar River open pit mine, near Coronach, Saskatchewan	3,600.
Do.		do.	Bienfait open pit mine, near Bienfait, Saskatchewan	2,800.
Do.		do.	Genesee open pit mine, near Warburg, Alberta	5,600.
Do.		do.	Sheerness open pit mine, near Hanna, Alberta	3,000.
Do.		do.	Paintearth open pit mine, near Forestburg, Alberta	3,500.
Cobalt:				
Ore, Co content	metric tons	Glencore plc	Raglan Mine in Ungave, Quebec	700.
Do.	do.	Vale S.A.	Voisey's Bay Mine, Newfoundland and Labrador	NA.
Do.	do.	do.	Ontario Operations Sudbury Mine, Ontario	700.
Do.	do.	do.	Manitoba Operations Thompson Mine, Manitoba	NA.
Metal	do.	Glencore plc	Sudbury smelter in Sudbury, Ontario	NA.
Do.	do.	Vale S.A.	Copper Cliff refinery and smelter in Sudbury, Ontario	NA.
Do.	do.	do.	Port Colborne refinery, Ontario	NA.
Do.	do.	do.	Voisey's Bay refinery, Newfoundland and Labrador	NA.
Do.	do.	do.	Long Harbour hydrometallurgy smelter, Newfoundland and Labrador	NA.
Copper:				
Ore, Cu content		Agnico Eagle Mines Ltd.	LaRonde Mine, about 650 kilometers northwest of Montreal, Quebec	5.
Do.		Copper Mountain Mining Corp., 75%, and Mitsubishi Materials Corp., 25%	Copper Mountain Mine, British Columbia	48.
Do.		Glencore plc	Kidd Creek Mine, about 20 kilometers north of Timmins, Ontario	46.
Do.		do.	Matagami Mine, near Matagami, Quebec	9.
Do.		do.	Nickel Rim South Mine, Sudbury Division, Sudbury, Ontario	18.
Do.		do.	Raglan Mine in Ungave, Quebec	7.
Do.		Impala Canada Ltd. (Impala Platinum Holdings Ltd.)	Lac des Iles Mine, about 85 kilometers northwest of Thunder Bay, Ontario	2.
Do.		Imperial Metals Corp.	Mount Polley Mine[2] at Williams Lake, British Columbia	25.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper:—Continued				
Ore, Cu content—Continued		Imperial Metals Corp., 50%; Mitsubishi Materials Corp., 31.25%; Dowa Metals & Mining Co., Ltd., 6.25%; Furukawa Co., Ltd., 6.25%; Marubeni Corp. 6.25%	Huckleberry Mine, 123 kilometers southwest of Houston, British Columbia	32.
Do.		KGHM Polska Miedź S.A.	Sudbury mining operations, Ontario	30.
Do.		Nyrstar N.V. [Trafigura Group (Pte) Ltd.]	Langlois Mine,[7] 313 kilometers northeast of Val-d'Or, Quebec	39.
Do.		do.	Myra Falls Mine, British Columbia British Columbia	4.
Do.		Pembridge Resources plc	Minto Mine, Yukon Territory	21.
Do.		Taseko Mines Ltd., 75%; Lojitz Corp., 12.5%; Dowa Holdings Col Ltd., 6.25%; Furukawa Co. Ltd., 6.25%	Gibraltar Mine, British Columbia	63.
Do.		Teck Resources Ltd.	Duck Pond Mine, about 100 kilometers southwest of Grand Falls-Windsor, Newfoundland and Labrador	19.
Do.		do.	Highland Valley Mine, Kamloops, British Columbia	125.
Do.		Vale S.A.	Ontario Division (includes the Garson Mine, Clarabelle Mine, Copper Cliff North, Coleman Mine, Creighton Mine, and Totten Mine), Ontario	120
Do.		Vale S.A.	Voisey's Bay Mine, Newfoundland and Labrador	55.
Do.		Yukon Zinc Corp.	Wolverine Mine, Yukon Territory	5.
Smelter		Glencore plc	Horne smelter in Noranda, Quebec	194.
Do.		do.	Sudbury smelter, Ontario	131.
Do.		Vale S.A.	Copper Cliff smelter in Sudbury, Ontario	NA.
Do.		do.	Long Harbour hydrometallurgy smelter	NA.
Refinery		Cobalt Refinery Co. Inc.	Fort Saskatchewan refinery	NA.
Do.		Glencore plc	CCR Refinery in Montreal-Est, Quebec	276.
Do.		Government	Royal Canadian Mint, Ottawa, Ontario	NA.
Do.		Noranda Income Fund	Valleyfield refinery	NA.
Do.		Taseko Mines Ltd., 75%; Lojitz Corp., 12.5%; Dowa Holdings Col Ltd., 6.25%; Furukawa Co. Ltd., 6.25%	Gibraltar solvent extraction-electrowinning (SX–EW) facility, British Columbia	1.
Do.		Vale S.A.	Copper Cliff refinery in Sudbury, Ontario	NA.
Do.		do.	Voisey Bay refinery, Newfoundland and Labrador	NA.
Diamond	thousand carats	De Beers Group	Snap Lake underground mine, 220 kilometers northeast of Yellowknife, Northwest Territories	16,000.[1]
Do.	do.	do.	Victor open pit mine[1], 90 kilometers west of Attawapiskat, Ontario	600.
Do.	do.	De Beers Canada Inc., 51%, and Mountain Province Diamonds Inc., 49%	Gahcho Kué open pit mine, 280 kilometers northeast of Yellowknife, Northwest Territories	4,500.
Do.	do.	Dominion Diamond Corp., 88.9%, and unnamed owner 11.1%	Ekati Mine (includes the Koala and the Panda underground mines and the Beartooth, Fox, Koala, and Misery open pit mines) in the Lac de Gras region, Northwest Territories	5,000.
Do.	do.	Rio Tinto plc, 60%, and Dominion Diamond Corp., 40%	Diavik open pit mine (includes the A154 North and the A154 South kimberlite pipes), northeast of Yellowknife region, Northwest Territories	10,000.
Do.	do.	Stornoway Diamond Corp.	Renard mine, 350 kilometers north of Chibougamau, Quebec	1,600.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Diatomite		Absorbent Products Ltd.	Red Lake deposit, British Columbia	NA.
Fluorspar		Canada Fluorspar Inc.	St. Lawrence Mine, St. Lawrence, Newfoundland and Labrador	200.
Gold				
Ore, Au content Continued	kilograms	Abcourt Mines Inc.	Elder Mine, Rouyn-Noranda, Quebec	NA.
Do.	do.	Agnico Eagle Mines Ltd.	Goldex Mine, Val-d'Or, Quebec	5,000.
Do.	do.	Agnico Eagle Mines Ltd.	LaRonde Mine, about 60 kilometers west of Val-d'Or, Quebec	9,300.
Do.	do.	do.	Meadowbank Mine, about 70 kilometers north of Baker Lake, Nunavut Territory	10,000.
Do.	do.	do.	Meliadine Mine, about 25 kiloometers north of Rankin Inlet, Nunavut Territory	12,400.
Do.	do.	Agnico Eagle Mines Ltd., 50%, and Yamana Gold Inc., 50%	Canadian Malartic Mine, about 20 kilometers west of Val d'Or, Quebec	17,000.
Do.	do.	Alamos Gold Inc.	Young-Davidson Mine, Larder-Cadillac Break, 487 kilometers northwest of Toronto, Ontario	5,400.
Do.	do.	Anaconda Mining Inc.	Pine Cove Mine, near Baie Verte, Newfoundland and Labrador	500.
Do.	do.	Aurizon Mines Ltd.	Casa Berardi Mine, about 95 kilometers north of La Sarre, Quebec	5,000.
Do.	do.	Barkerville Gold Mines Ltd.	QR Mine, British Columbia	400.
Do.	do.	Barrick Gold Inc.	Hemlo operation, includes David Bell underground mine and Williams open pit and underground mine, about 350 kilometers east of Thunder Bay, Ontario	7,100.
Do.	do.	Bonterra Resources Inc.	Bachelor Lake Mine and mill[3], about 225 kilometers northeast of Val-d'Or, Quebec	1,200.
Do.	do.	Brigus Gold Corp.	Black Fox Mine, about 75 kilometers east of Timmins, Ontario	2,800.
Do.	do.	Capstone Mining Corp.	Minto Mine, about 240 kilometers northwest of Whitehorse, Yukon Territory	600.
Do.	do.	Claude Resources Inc.	Seabee operations (includes the Seabee Deep and the Santoy 8 Mines), Laonil Lake, Saskatchewan	1,500.
Do.	do.	Detour Gold Corp.	Detour Lake Mine, 208 km northeast of Timmins, Cochrane District, Ontario	20,400.
Do.	do.	Eldorado Gold Corp.	Lamaque Mine, Val-d'Or, Quebec	4,700.
Do.	do.	Golden Band Resources Inc.	EP Mine and Roy Lloyd Mine, Saskatchewan	1,500.
Do.	do.	Harte Gold Corp.	Sugar Zone Mine, 30 kilometers north of White River, Ontario	1,900.
Do.	do.	IAMGOLD Corp.	Westwood Mine, 40 kilometers east of Rouyn-Noranda	4,200.
Do.	do.	Impala Canada Ltd. (Impala Platinum Holdings Ltd.)	Lac des Iles Mine, about 85 kilometers northwest of Thunder Bay, Ontario	400.
Do.	do.	Imperial Metals Corp.	Mt. Polley Mine[2], 8 kilometers southwest of Likely, British Columbia	1,200.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold:—Continued				
Ore, Au content—Continued	kilograms	Imperial Metals Corp., 50%; Mitsubishi Materials Corp., 31.25%; Dowa Metals & Mining Co., Ltd., 6.25%; Furukawa Co., Ltd., 6.25%; Marubeni Corp., 6.25%	Huckleberry Mine, 123 kilometers southwest of Houston, British Columbia	110.
Do.	do.	KGHM Polska Miedź S.A. GK	Sudbury mining operations, Ontario	NA.
Do.	do.	Kirkland Lake Gold Inc.	Holloway Mine, Ontario	700.
Do.	do.	do.	Holt Mine, Ontario	2,700.
Do.	do.	do.	South Mine complex (Macassa Mine, Ontario)	2,400.
Do.	do.	Klondex Mines Ltd.	Rice Lake Mine, Manitoba	2,500.
Do.	do.	Monarch Mining Corp.	Beaufor Mine[4], about 21 kilometers northeast of Val-d'Or, Quebec	800.
Do.	do.	New Gold Inc.	Rainy River Mine, about 50 kilometers northwest of Fort Francis, Ontario	11,000.
Do.	do.	Newmont Corp.	Eleonore Mine, Eeyou Istchee/James Bay, Quebec, 800 kilometers north of Montreal, Quebec	7,700.
Do.	do.	do.	Hoyle Pond Mine, 20 km northeast of Timmins, Eastern Ontario District, Ontario	2,300.
Do.	do.	do.	Musselwhite Mine, 480 kilometers north of Thunder Bay, Ontario	8,100.
Do.	do.	do.	Porcupine Mine, Timmins, Ontario	10,000.
Do.	do.	do.	Red Lake Mine (includes Red Lake and the Cochenour complexes), 180 kilometers	26,000.
Do.	do.	Nyrstar N.V. [Trafigura Group (Pte) Ltd.]	Myra Falls Mine, British Columbia	300.
Do.	do.	Pretium Resources Inc.	Brucejack Mine, about 65 kilometers north of Stewart, British Columbia	12,600.
Do.	do.	QMX Gold Corp.	Lac Herbin Mine, Quebec	1,000.
Do.	do.	Richmont Mines Inc.	Island Gold Mine, near Dubreuilville, Ontario	1,200.
Do.	do.	Tahoe Resources Inc.	Bell Creek Mine, northeast of Timmins, Ontario, and Timmins West Mine, 18 kilometers west of Timmins, Ontario	1,500.
Do.	do.	Stroud Resources Ltd.	Hislop Mine, Ontario	600.
Do.	do.	Vale S.A.	Manitoba Division (includes the Birchtree Mine and the Thompson Mine), Thompson, Manitoba	NA.
Do.	do.	do.	Ontario Division (includes the Garson Mine, Clarabelle Mine, Copper Cliff North, Creighton Mine, Coleman Mine, and Totten Mine), Ontario	2,500.
Do.	do.	Victoria Gold Corp.	Eagle Mine, 350 kilometers north of Whitehorse, Yukon Territory	6,500.
Do.	do.	Wesdome Gold Mines Ltd.	Eagle River Mine, about 50 kilometers west of Wawa, Ontario	1,900.
Do.	do.	do.	Kiena Mine, about 10 kilometers west of Val-d'Or, Quebec	1,300.
Do.	do.	Yukon Zinc Corp.	Wolverine Mine, Yukon Territory	628.
Refinery	do.	Glencore plc	CCR refinery in Montreal-Est, Quebec	300.
Do.		Government	Royal Canadian Mint, Ottawa, Ontario	NA.
Do.		Teck Resources Ltd.	Trail refinery, Trail, British Columbia Newfoundland and Labrador	NA.
Graphite		Imerys Graphite and Carbon S.A.	Lac des Iles Mine in Saint Aime du Lac des Iles, Quebec	NA.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gypsum	CertainTeed Gypsum Canada, Inc.	Amaranth Mine, Harcus, Manitoba	NA.
Do.	CGC Inc.	Hagersville Mine, Hagersville, Ontario	NA.
Do.	Mosher Limestone Co. Ltd.	Upper Musquodoboit Mine, Nova Scotia	NA.
Do.	National Gypsum (Canada) Ltd.	East Milford quarry, Milford, Nova Scotia	3,100.
Ilmenite (titanium production)	QIT Fer et Titane Inc.	Lac Tio Mine, Havre Saint Pierre,	600.
Indium metric tons	do.	do.	70.
Iron and steel:			
Iron ore:			
Ore	ArcelorMittal Inc., 85%, and POSCO-China Steel Consortium, 15%	Fire Lake and Mont-Wright open pit mines, Quebec	24,000.
Do.	Baffinland Iron Mines Corp. (ArcelorMittal Inc., 50%, and The Energy and Minerals Group, 50%)	Mary River Mine, Baffin Island, Nunavut	6,000
Do.	Quebec Iron Ore Inc. (Champion Iron Ltd., 63.2%, and Ressources Québec, 36.8%)	Bloom Lake Mine, 13 kilometers north of Fermont, Quebec	20,000.
Do.	Rio Tinto Ltd., 58.72; Mitsubishi Corp., 26.18%; Labrador Iron Ore Royalty Income Fund, 15.1%	Carol Lake (IOC) open pit mine, Labrador City, Newfoundland and Labrador	23,000.
Do.	Tacora Resources Inc.	Scully Mine, Wabush Newfoundland and Labrador	6,130.
Do.	Tata Steel Minerals Canada Ltd. (Tata Steel Ltd., 77.68%; Ressources Quebec Inc., 18%; New Millennium Iron Corp., 4.32%)	DSO Timmins Mine in Menihek, Newfoundland and Labrador	NA.
Do.	do.	DSO Goodwood Mine in Schefferville, Quebec	NA.
Pellets	ArcelorMittal Mines Canada Inc. (ArcelorMittal)	Pelleting plant, Port Cartier, Quebec	9,000.
Do.	Cliffs Natural Resources Inc.	Pelleting plant, Pointe Noire, Quebec	5,200.
Do.	Iron Ore Company of Canada (Rio Tinto Ltd., 58.72%; Mitsubishi Corp., 26.18%; Labrador Iron Ore Royalty Income Fund, 15.1%)	Pelleting plant, Labrador City, Newfoundland and Labrador	13,000.
Steel, raw	AltaSteel Ltd. (Arrium Ltd.)	Plant, Edmonton, Alberta	320.
Do.	ArcelorMittal Dofasco Inc. (ArcelorMittal SA)	Plant, Hamilton, Ontario	4,100.
Do.	ArcelorMittal Montreal Inc. (ArcelorMittal SA)	Contrecoeur East and Contrecoeur West plants, Quebec	2,500.
Do.	Essar Steel Algoma Inc. (Essar Global Ltd.)	Plant, Sault Ste. Marie, Ontario	2,800.
Do.	Gerdau Steel North America Inc. (Gerdau S.A.)	Plant, Whitby, Ontario	790.
Do.	do.	Plant, Selkirk, Manitoba	430.
Do.	do.	Plant, Cambridge, Ontario	380.
Do.	Hamilton Specialty Bar (2007) Inc.	Plant, Hamilton, Ontario	360.
Do.	Ivaco Rolling Mills Inc.	Plant, L'Orignal, Ontario	450.
Do.	MMFX Steel of Canada Inc. (MMFX Technologies Corp.)	Plant, Welland, Ontario	120.
Do.	Rio Tinto Fer et Titane Inc. (Rio Tinto plc.)	Plant, Sorel, Quebec	500.
Do.	SSAB Svenskt Stål AB—IPSCO Division	Plant, Regina, Saskatchewan	1,500.
Do.	U.S. Steel Canada Inc. (United States Steel Corp.)	Lake Erie Works, Nanticoke, Ontario	2,400.
Lead:			
Ore, Pb content	Coeur Mining, Inc.,	Silvertip Mine, British Columbia, 8 kilometers south of the border with Yukon Territory	17
Do.	Trevali Mining Corp.	Caribou Mine, Bathurst, New Brunswick	NA.
Refinery	Teck Resources Ltd.	Trail Operations, Trail, British Columbia	NA.
Smelter	Glencore Plc	Belledune smelter, New Brunswick	NA.
Do.	Teck Resources Ltd.	Trail Operations, Trail, British Columbia	100.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Lead:—Continued				
Secondary, includes alloys		Metalex Products Ltd.	Smelter, Richmond, British Columbia	300.
Do.		NovaPb Inc. (Newalta Corp.)	Smelter, Ville Sainte Catherine, Quebec	100.
Do.		Tonolli Canada Ltd.	Smelter, Mississauga, Ontario	35.
Lime		Brookville Manufacturing Co.	Brookville plant, Saint John, New Brunswick	NA.
Do.		E.C. King Contracting Ltd	Owen Sound plant, Ontario	NA.
Do.		Graymont Inc.	Havelock plant, New Brunswick	110.
Do.		do.	Bedford plant, Bedford, Quebec	400.
Do.		do.	Faulkner plant, Manitoba	117.
Lithium, Li_2CO_3		North American Lithium Inc. (Contemporary Amperex Technology Co. Ltd.)	North American Lithium Mine,[5] La Corne, Quebec	23
Magnesite		Baymag Inc.	Mount Brussilof Mine, British Columbia	NA.
Molybdenum	metric tons	Imperial Metals Corp., 50%; Mitsubishi Materials Corp., 31.25%; Dowa Metals & Mining Co., Ltd., 6.25%; Furukawa Co., Ltd., 6.25%; Marubeni Corp., 6.25%	Huckleberry Mine, 123 kilometers southwest of Houston, British Columbia	140.
Do.	do.	Taseko Mines Ltd., 75%; Sojitz Corp., 12.5%; Dowa Holdings Co. Ltd., 6.25%; Furukawa Co. Ltd., 6.25%	Gibraltar Mine, British Columbia	1,200.
Do.	do.	Teck Resources Ltd., 97.5%, and Highmont Mining Co., 2.5%	Highland Valley copper mine, Kamloops, British Columbia	5,000.
Do.	do.	Thompson Creek Metals Company Inc., 75%, and Sojitz Moly Resources, Inc., 25%	Endako Mine, near Fraser Lake, about 160 kilometers northwest of Prince George, British Columbia	5,200.
Mica (phlogopite)		Imerys Mica Suzorite, Inc	Suzorite Mine, Mauricie, Quebec	NA.
Natural gas	million cubic meters	Cenovus Energy Inc.	Deep Basin, numerous gas fields in northwestern Alberta and northeastern British Columbia	3,409.
Do.		Chevron Canada Ltd., 70%, and Kuwait Foreign Petroleum Exploration Co., 30%	Kaybob Duvernay gas fields project, approximately 260 kilometers northwest of Edmonton, Alberta	816.
Do.		CNOOC International Ltd.	Dilly Creek gas fields, northeastern British Columbia	207.
Do.		Headwater Exploration Inc.	McCully field, about 10 kilometers northeast of Sussex, New Brunswick	362.
Do.		Ikkuma Resources Corp. (Pieridae Energy Ltd.)	Foothills gas field assets, central and southern Alberta	1,229.
Do.		Keyera Corp.	Bigoray gas plant, 110 kilometers southwest of Edmonton, Alberta	919.
Do.		do.	Brazeau North gas plant, 140 kilometers southwest of Edmonton, Alberta	516.
Do.		do.	Pembina North gas plant, 140 kilometers southwest of Edmonton, Alberta	444.
Do.		do.	Strachan gas plant, 200 kilometers southwest of Edmonton, Alberta	2,841.
Do.		do.	Wapiti gas plant, about 40 kilometers south of Grande Prairie, Alberta	1,549.
Do.		Keyera Corp., 70%; Bellatrix Exploration Ltd., 25%; O'Chiese Energy Ltd., 5%	Alder Flats gas plant, about 130 kilometers southwest of Edmonton, Alberta	2,376.
Do.		Keyera Corp., 93.5%; Cenovus Energy Inc., 6.4%; Hamel Energy Inc., 0.1%	Brazeau River gas plant, approximately 170 kilometers southwest of Edmonton, Alberta	2,252.
Do.		Keyera Corp., 98.8439%; Green Valley Energy Ltd., 0.9942%; AltaGas Ltd., 0.1365%; Centipede Resources, 0.017%; Canadian Natural Resources Ltd., 0.0053%; Bonavista Energy Corp., 0.003%	Rimbey gas plant, 100 kilometers southwest of Edmonton, Alberta	4,359.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas—Continued	million cubic meters	Keyera Corp., 83.1%; Paramount Resources Ltd., 4.2%; Boulder Energy Ltd., 3.2%; Canlin Resources Partnership, 3.2%; Canadian Natural Resources Ltd., 2.9%; Baytex Energy Corp., 2.6%; Canadian Natural Resources North Alberta Partnership, 0.7%; Tourmaline, 0.1%; Vermillion Resources Inc., 0.1%	West Pembina gas plant, 130 kilometers southwest of Edmonton, Alberta	1,498.
Do.		Keyera Corp., 70.8%; TAQA North Ltd., 28.7%; Cenovus Energy Inc., 0.5%	Ricinus gas plant, 110 kilometers west of Red Deer, Alberta	2,283.
Do.		Keyera Corp., 60%, and Velvet Energy Ltd., 40% Ltd., 2.4%	Zeta Creek gas plant, 60 kilometers west of Drayton Valley, Alberta	558.
Do.		Keyera Corp., 89.4%; Westbrick Energy Ltd., 8.2%; TAQA North Ltd., 2.4%	Nordegg River gas plant, 165 kilometers southwest of Edmonton, Alberta	775.
Do.		Keyera Corp., 94%; Whitecap Resources Inc., 5%; Enerplus Corp., 0.5%; Vermillion Resources Inc., 0.5%	Cynthia gas plant, approximately 50 kilometers west of Drayton Valley, Alberta	806.
Do.		North Montney Joint Venture [Petroliam Nasional Berhad (PETRONAS), 62%; Sinopec Canada Energy Ltd.., 15%; Japan Petroleum Exploration Co. Ltd., 10%; Indian Oil Corp., 10%; PetroleumBRUNEI Sdn Bhd, 3%)	North Montney gas project, British Columbia	4,380.
Do.		Ovintiv Inc.	Duvernay gas plant, about 125 kilometers west of Edmonton, Alberta	620.
Do.		do.	Montney, 789,000 acres in northwest Alberta and northeast British Columbia	9,813.
Do.		Pieridae Energy Ltd.	Sierra gas field, northeastern British Columbia	258.
Do.		Shell Canada Ltd., 80%; PetroChina Canada Ltd., 20%	Groundbirch gas field, about 50 kilometers south of Fort John's, British Columbia	5,165.
Nepheline syenite		Unimin Canada Ltd.	Blue Mountain quarry, Methuen Township, Ontario	NA.
Do.		do.	Nephton quarry, Methuen Township, Ontario	NA.
Nickel:				
Ore, Ni content		Glencore plc	Raglan Mine in Ungave, Quebec	29.
Do.		do.	Fraser Mine and Nickel Rim South Mine in the Sudbury district, Ontario	20.
Do.		Impala Canada Ltd. (Impala Platinum Holdings Ltd.)	Lac des Iles Mine, about 85 kilometers northwest of Thunder Bay, Ontario	800.
Do.		KGHM Polska Miedź S.A.	Morrison (Levac) Mine, Sudbury, Ontario	6.
Do.		Vale Canada Ltd. (Vale S.A.)	Ontario Division (includes the Garson Mine, Clarabelle Mine, Copper Cliff North, Creighton Mine, Coleman Mine, and Totten Mine), Ontario	85.
Do.		do.	Manitoba division (includes the Birchtree Mine[3] and the Thompson Mine), Thompson, Manitoba	45.
Do.		Vale Newfoundland & Labrador Ltd. (Vale S.A.)	Voisey's Bay Mines (includes the Ovoid Mine), Newfoundland and Labrador	80.
Refinery		The Cobalt Refinery Company Inc. (Moa joint venture of General Nickel S.A., 50%, and Sherritt International Corp., 50%)	Fort Saskatchewan refinery, Fort Saskatchewan, Alberta	35 (Ni briquets and powder); 4 (Co briquets and powder).
Do.		Glencore plc	CCR refinery in Montreal-Est, Quebec	NA.
Do.		do.	Port Colborne refinery, Ontario	NA.
Do.		Vale S.A.	Copper Cliff refinery in Sudbury, Ontario	NA.
Do.		do.	Thompson refinery in Thompson, Manitoba	NA.
Do.		do.	Voisey's Bay refinery, Newfoundland and Labrador	NA.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nickel:—Continued				
Smelter, primary		Glencore plc	Sudbury smelter in Sudbury, Ontario	131 (Cu-Ni matte).
Do.		Vale S.A.	Copper Cliff refinery in Sudbury, Ontario	NA.
Do.		do.	Long Harbour hydrometallurgy smelter, Newfoundland and Labrador	50.
Do.		do.	Smelter in Thompson, Manitoba	82 (Ni anode).
Petroleum:				
Crude	barrels per day	Athabasca Oil Corp.	Leismer Mine, about 95 kilometers south of Fort McMurray, Alberta	20,000.
Do.	do.	Athabasca Project (Canadian Natural Resources Ltd., 70%; Chevron Canada Ltd., 20%; Shell Canada Ltd., 10%)	Jackpine Mine, about 70 kilometers north of Fort McMurray, Alberta	145,000.
Do.	do.	do.	Muskeg River Mine, about 70 kilometers north of Fort McMurray, Alberta	145,000.
Do.		BP Canada, 50%, and Cenovus Energy Inc., 50%	Sunrise Mine, 60 kilometers north of Fort McMurray, Alberta	NA.
Do.	barrels per day	Canadian Natural Resources Ltd.	Horizon Mine, 70 kilometers north of Fort McMurray, Alberta	294,000.
Do.	do.	do.	Jackfish Mine, about 100 kilometers northeast of Lac La Biche, Alberta	105,000.
Do.	do.	do.	Kirby Mine, about 75 kilometers northeast of Lac La Biche, Alberta	80,000.
Do.	do.	do.	Peace River Mine, 190 kilometers northeast of Grande Prairie, Alberta	12,500.
Do.	do.	do.	Primrose and Wolf Creek Mine, about 45 kilometers northwest of Cold Lake, Alberta	120,000.
Do.	do.	Cenovus Energy Inc.	Christina Lake Mine, 120 kilometers southeast of Fort McMurray, Alberta	310,000
Do.	do.	do.	Foster Creek Mine, 330 kilometers northeast of Edmonton, Alberta	295,000.
Do.		do.	Tucker Mine, 30 kilometers northwest of Cold Lake, Alberta	NA.
Do.		do.	White Rose oil field (inludes the North Amethyst, West White Rose, and South White Rose extensions), 350 kilometers east of St. John's, Newfoundland and Labrador	NA.
Do.	barrels per day	CNOOC International Ltd.	Long Lake Mine, about 40 kilometers south of Fort McMurray, Alberta	92,000.
Do.	do.	ConocoPhillips Co., 50%, and Total SE, 50%	Surmont Mine, about 35 kilometers south of Fort McMurray,Alberta	148,000.
Do.	do.	Corex Resources Ltd.	Daly-Sinclair oilfield, near Virden, Manitoba	12,000.
Do.		Crescent Point Energy Corp.	Viewfield Bakken field, Viewfield, Saskatchewan	NA.
Do.	barrels per day	Fort Hills Energy LP (Suncor Energy Inc., 54.11%; Total SE, 24.58%; Teck Resources Ltd., 21.31%)	Fort Hills Mine, 90 kilometers north of Fort McMurray, Alberta	194,000.
Do.	do.	Exxon Mobil Canada, 35.5%; Chevron Canada Resources, 29.6%; Suncor Energy Inc., 21%; Equinor ASA, 9%; Nalcor Energy-Oil and Gas Inc., 4.9%)	Hebron oilfield, 340 kilometers southeast of St. John's, Newfoundland and Labrador	150,000.
Do.	do.	Hibernia Management and Development Co. Ltd. (Exxon Mobil Canada, 33.125%; Chevron Canada Resources, 26.875%; Suncor Energy Inc., 20%; Canada Hibernia Holding Corp., 8.5%; Murphy Oil Corp., 6.5%; Equinor Canada Ltd., 5%)	Hibernia offshore oilfield, 315 kilometers east of St. John's, Newfoundland and Labrador	220,000.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:—Continued				
Crude—Continued	barrels per day	Imperial Oil Ltd. (Exxon Mobil Corp., 69.6%)	Cold Lake Mine, northeastern Alberta	140,000.
Do.	do.	do.	Kearl Mine, 70 kilometers north of Fort McMurray, Alberta	220,000.
Do.	do.	MEG Energy Corp.	Christina Lake Mine, 150 kilometers south of Fort McMurray, Alberta	100,000.
Do.	do.	Ovintiv Inc.	Montney Mine, 789,000 acres in northwest Alberta and northeast British Columbia	55,000.
Do.	do.	PetroChina Canada	MacKay River Mine, about 30 kilometers west of Fort McMurray, Alberta	35,000.
Do.	do.	Suncor Energy Inc.	Firebag Mine, about 65 kilometers northeast of Fort McMurray, Alberta	215,000.
Do.	do.	do.	MacKay River Mine, about 50 kilometers northwest of Fort McMurray, Alberta	38,000.
Do.	do.	do.	Millennium Mine and Steepbank extension, about 25 kilometers north of Fort McMurray, Alberta	330,000.
Do.	do.	Syncrude Project (Suncor Energy Inc., 58.7%; Imperial Oil Ltd., 25%; Sinopec Oil Sands Partnership, 9%; CNOOC Oil Sands Canada, 7.3%)	Aurora North Mine, 75 kilometers north of Fort McMurray, Alberta	225,000.
Do.	do.	do.	Mildred Lake Mine, 40 kilometers north of Fort McMurray, Alberta	150,000.
Do.	do.	Terra Nova (Suncor Energy Inc., 37.675%; Exxon Mobil Corp., 19%; Equinor ASA, 15%; Cenovus Energy Inc., 13%; Murphy Oil Corp., 10.475%; Mosbacher Operating Ltd., 3.85%; Chevron Canada Resources, 1%)	Terra Nova offshore oilfield, 350 kilometers southeast of Newfoundland and Labrador	40,000.
Do.	do.	Tundra Oil and Gas Ltd.	Whitewater oilfield, southern Manitoba	30,000.
Refined	do.	Chevron Canada Ltd. (Chevron Corp.)	Burnaby refinery, Burnaby, British Columbia	55,000.
Do.	do.	Consumers' Co-operative Refineries Ltd. (Federated Co-operatives Ltd.)	Regina refinery, Saskatchewan	100,000.
Do.	do.	Husky Energy Inc.	Prince George refinery, Prince George, British Columbia	10,000.
Do.	do.	do.	Lloydminster asphalt refinery, Lloydminster, Alberta	25,000.
Do.	do.	Imperial Oil Ltd. (Exxon Mobil Corp., 69.6%)	Dartmouth refinery, Halifax, Nova Scotia	82,000.
Do.	do.	do.	Nanticoke refinery, 40 kilometers southwest of Hamilton, Ontario	112,000.
Do.	do.	do.	Sarnia refinery, Sarnia, Ontario	121,000.
Do.	do.	do.	Strathcona refinery, Edmonton, Alberta	187,000.
Do.	do.	Irving Oil Ltd.	Irving refinery, Saint John, New Brunswick	250,000.
Do.	do.	Moose Jaw Refinery (Gibson Energy ULC)	Moose Jaw asphalt refinery, Moose Jaw, Saskatchewan	4,100.
Do.	do.	North Atlantic Refining Ltd. (Harvest Operations Corp.)	North Atlantic refinery, Come by Chance, Newfoundland and Labrador	115,000.
Do.	do.	North West Redwater Partnership (Canadian Natural Resources Ltd., 50%, and North West Refining Inc., 50%)	Sturgeon refinery, 45 kilometers northeast of Edmonton, Alberta	79,000.
Do.	do.	Nova Chemicals Corp.	Corunna petrochemical and refinery complex, Corunna, Ontario	80,000.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:—Continued				
Refined—Continued	barrels per day	Shell Canada Ltd. (Royal Dutch Shell plc)	Scotford refinery, 40 kilometers northeast of Edmonton, Alberta	100,000.
Do.	do.	do.	Sarnia manufacturing center (Corunna refinery), Sarnia, Ontario	72,000.
Do.	do.	Suncor Energy Inc.	Edmonton refinery, Edmonton, Alberta	135,000.
Do.	do.	do.	Montreal refinery, Montreal East, Quebec	129,800.
Do.	do.	Ultramar Ltd. (Valero Energy Corp.)	Jean Gaulin refinery, Levis, Quebec	265,000.
Platinum-group metals:				
Palladium:				
Ore, Pd content	kilograms	Impala Canada Ltd. (Impala Platinum Holdings Ltd.)	Lac des Iles Mine, about 85 kilometers northwest of Thunder Bay, Ontario	9,900.
Do.	do.	KGHM Polska Miedź S.A.	Sudbury mining operations, Ontario	NA.
Do.	do.	Vale S.A.	Ontario Division (includes the Garson Mine, Clarabelle Mine, Copper Cliff North, Creighton Mine, Coleman Mine, and Totten Mine), Ontario	6,000.
Refinery		Glencore plc	CCR refinery in Montreal-Est, Quebec	NA.
Do.		Vale S.A.	Port Colborne refinery, Ontario	NA.
Do.		do.	Copper Cliff refinery in Sudbury, Ontario	NA.
Smelter		do.	Copper Cliff smelter in Sudbury, Ontario	NA.
Do.		do.	Copper Cliff refinery in Sudbury, Ontario	NA.
Platinum:				
Ore, Pt content	kilograms	Impala Canada Ltd. (Impala Platinum Holdings Ltd.)	Lac des Iles Mine, about 85 kilometers northwest of Thunder Bay, Ontario	900.
Do.		KGHM Polska Miedź S.A.	Sudbury mining operations, Ontario	NA.
Do.	kilograms	Vale S.A.	Ontario Division (includes the Garson Mine, Clarabelle Mine, Copper Cliff North, Creighton Mine, Coleman Mine, and Totten Mine), Ontario	5,000.
Smelter		do.	Copper Cliff smelter in Sudbury, Ontario	NA.
Refinery		Glencore plc	CCR refinery in Montreal-Est, Quebec	NA.
Do.		Vale S.A.	Copper Cliff refinery in Sudbury, Ontario	NA.
Do.		do.	Port Colborne refinery, Ontario	NA.
Perlite		Le Groupe Berger Lté	Saint-Modeste quarry, Saint-Modeste, Quebec	NA.
Do.		do.	Sarnia refinery, Sarnia, Ontario	85,000.
Potash (K_2O equivalent)		The Mosaic Co.	Colonsay Mine,[6] Saskatchewan	2,100.
Do.		do.	Esterhazy Mine, southeast Saskatchewan	5,300.
Do.		do.	Belle Plaine Mine, Saskatchewan	2,800.
Do.		Nutrien Ltd.	Lanigan Mine, near Lanigan, Saskatchewan	3,800.
Do.		do.	Rocanville Mine, southeast Saskatchewan	6,500.
Do.		do.	Allan Mining Division, Allan, Saskatchewan	4,000.
Do.		do.	Cory Mine, near Saskatoon, Saskatchewan	3,000.
Do.		do.	Patience Lake Mine, near Saskatoon, Saskatchewan	300.
Do.		do.	Vanscoy Mine, Saskatchewan	3,000.
Salt		Canadian Salt Co. Ltd.	Rock salt mine at Ojibway, Ontario	2,600.
Do.		do.	Pugwash Mine, Nova Scotia	1,400.
Do.		do.	Belle Plaine Mine, Saskatchewan	NA.
Do.		do.	Lindberg plant, Alberta	NA.
Do.		Dow Chemical Canada Inc.	Fort Saskatchewan Mine, Alberta	NA.
Do.		Junex Solnat (Junex Inc.)	Becancour Mine, Quebec	NA.
Do.		Mosaic Potash Esterhazy Limited Partnership Ltd. [The Mosaic Co., 75%, and Potash Corp. of Saskatchewan Inc. (Potash Corp.), 25%]	Esterhazy plant, southeast Saskatchewan	NA.
Do.		Nexen Inc. and Albchem Industries Ltd.	Plant near Bruderheim, Alberta	NA.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Salt—Continued		NSC Minerals Inc.	Salt recovery from potash tailings at Rocanville and Vanscoy, Saskatchewan	NA.
Do.		Potash Corp. of Saskatchewan Inc. (Potash Corp.)	Sussex Mine, New Brunswick	700.
Do.		Saskatoon Chemicals Holdings, Inc.	Plant near Saskatoon, Saskatchewan	NA.
Do.		Seleine Mines Division of Canadian Salt Co. Ltd.	Iles-de-la-Magdalen Mine, Quebec	1,625.
Do.		Sifco Canada Inc. (Compass Minerals Group Inc.)	Goderich Harbour Mine, Ontario	6,500.
Do.		do.	Amherst salt mine and plant, Nova Scotia	NA.
Do.		do.	Plant near Unity, Saskatchewan	NA.
Silicon, metal		Québec Silicon Ltd. (Globe Specialty Metals Inc., 51%, and Dow Corning Corp., 49%)	Plant at Becancour, Quebec	47.
Silver:				
Ore, Ag content	kilo-grams	Agnico Eagle Mines Ltd., 50%, and Yamana Gold Inc., 50%	Canadian Malartic Mine, about 20 kilometers west of Val d'Or, Quebec	18,500.
Do.	do.	Capstone Mining Corp.	Minto Mine, about 240 kilometers northwest of Whitehorse, Yukon Territory	7,600.
Do.	do.	Coeur Mining, Inc.,	Silvertip Mine, British Columbia, 8 kilometers south of the border with Yukon Territory	345,000.
Do.	do.	Glencore plc	Kidd Creek underground mine, 25 kilometers north of Timmins, Ontario	115,000.
Do.	do.	Imperial Metals Corp.	Mount Polley Mine[2] at Williams Lake, British Columbia	13,000.
Do.	do.	KGHM Polska Miedź S.A.	Sudbury Operations	NA.
Do.	do.	Nyrstar N.V. [Trafigura Group (Pte) Ltd.]	Langlois Mine[7], 313 kilometers northeast of Val-d'Or, Quebec	11,500.
Do.	do.	do.	Myra Falls Mine, British Columbia	17,000.
Do.	do.	Yukon Zinc Corp.	Wolverine Mine, Yukon Territory	153,000.
Refinery		Glencore plc	CCR refinery in Montreal-Est, Quebec	NA.
Do.		Government	Royal Canadian Mint, Ottawa, Ontario	NA.
Do.		Teck Resources Ltd.	Trail refinery, Trail, British Columbia	NA.
Smelter		Glencore Plc	Belledune smelter, New Brunswick	NA.
Stone, dolomite and limestone		Antigonish Limestone Ltd.	Southside Antigonish Harbour Mine, Nova Scotia	NA.
Do.		Atlantic Minerals Ltd. (Newfoundland Cement Co. Ltd., 100%)	Lower Cove quarry, Newfoundland and Labrador	800.
Do.		ESSROC Canada Inc	Picton Mine, Ontario	NA.
Do.		Graymont Inc.	Havelock quarry, Havelock, New Brunswick	NA.
Do.		do.	Faulkner Mine, Manitoba	NA.
Do.		Holcim (Canada) Inc. (Holcim AG)	Joliette Mine and plant, Quebec	NA.
Do.		do.	Ogden Point quarry, Victoria, British Columbia	NA.
Do.		Lafarge Canada Inc.	Brookfield Mine and plant, Brookfield, Nova Scotia	NA.
Do.		do.	Bath Mine, Ontario	NA.
Do.		do.	Woodstock quarry, Ontario	NA.
Do.		Mosher limestone Co. Ltd.	Upper Musquodoboit Mine, Nova Scotia	NA.
Do.		Nova Scotia Power Inc.	Glen Morrison quarry, Cape Breton, Nova Scotia	NA.
Do.		St. Marys CBM (Canada) Inc.	Bowmanville Mine, Ontario	NA.
Do.		do.	St. Marys Mine, Ontario	NA.
Talc		IMERYS Talc	Penhorwood Mine, Ontario, Canada	NA.
Titanium, TiO_2 slag		Rio Tinto Fer et Titane Inc. (Rio Tinto plc.)	Metallurgical complex at Sorel-Tracy, Quebec	1,100 (Sorelslag®); 250 (UGS™ slag); NA (RTCS™ slag).
Tungsten, WO_3 content		North American Tungsten Corporation Ltd.	Cantung Mine,[8] Northwest Territories	3,500.

See footnotes at end of table.

TABLE 2—Continued
CANADA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Uranium:				
Oxide	metric tons	Cameco Corp., 69.805%, and Orano Group, 30.195%	McArthur River Mine,[9] Saskatchewan	9,300.
Do.	do.	Cameco Corp., 50.025%; Orano Group, 37.1%; Idemitsu Canada Resources Ltd., 7.875%; Tokyo Electric Power Co. (TEPCO), 5%	Cigar Lake Mine, Saskatchewan	4,100.
Dioxide		Cameco Corp.	Port Hope conversion facility	NA.
Trioxide		do.	Blind River refinery, Ontario	NA.
Hexafluoride		do.	Port Hope conversion facility	NA.
Vermiculite		Le Groupe Berger Ltée	Saint-Modeste quarry, Saint-Modeste, Quebec	NA.
Wollastonite		Canadian Wollastonite (2005948 Ontario Ltd.)	St. Lawrence Mine, City of Kingston and the municipality of Leeds and the Thousand Islands, Ontario	NA.
Zeolites		Absorbent Products Ltd.	Red Lake deposit, British Columbia	NA.
Do.		HCA Mountain Minerals (Lethbridge) Ltd. (Heemskirk Canada Ltd.)	Processing plant at Lethbridge, Alberta	NA.
Do.		Heemskirk Canada Ltd. (Heemskirk Consolidated Ltd.)	Bromley Creek (Princeton) Mine, near Copper Mountain, British Columbia	NA.
Do.		do.	Z1 (Ranchlands) quarry, near Cache Creek, British Columbia	NA.
Do.		Industrial Mineral Processors Ltd.	Z2 quarry, near Cache Creek, British Columbia	NA.
Do.		do.	Processing plant at Ashcroft, British Columbia	NA.
Zinc:				
Lead-zinc ore		Agnico Eagle Mines Ltd.	LaRonde Mine, 60 kilometers west of Val-d'Or, Quebec	55.
Ore, Zn content		Coeur Mining, Inc.,	Silvertip Mine, British Columbia, 8 kilometers south of the border with Yukon Territory	20.
Do.		Glencore plc	Kidd Creek underground mine, 25 kilometers north of Timmins, Ontario	80.
Do.		do.	Matagami complex, near Matagami, Quebec	115.
Do.		Nyrstar N.V. [Trafigura Group (Pte) Ltd.]	Langlois Mine,[7] 313 kilometers northeast of Val-d'Or, Quebec	39.
Do.		do.	Myra Falls Mine, British Columbia	35.
Do.		Trevali Mining Corp.	Caribou Mine, Bathurst, New Brunswick	NA.
Refined		Hudson Bay Mining and Smelting Co., Ltd. (HudBay Minerals Inc.)	Zinc plant (pressure leach and electrowinning) at Flin Flon, Manitoba	115.
Do.		Noranda Income Fund, 75%, and Glencore plc, 25%	CEZ Refinery, Valleyfield, Quebec	265.
Do.		Teck Resources Ltd.	Trail Operations, Trail, British Columbia	295.

Do., do. Ditto. NA Not available.

[1]Closed in 2019.

[2]Placed on care-and-maintenance status in May 2019.

[3]Birchtree Mine placed on care-and-maintenance status in October 2017.

[4]Placed on care-and-maintenance status in June 2019.

[5]Suspended in February 2019.

[6]Suspended in August 2019.

[7]Placed on care-and-maintenance status in December 2019.

[8]Placed on care-and-maintenance status in 2015.

[9]Placed on care-and-maintenance status in June 2018.

TABLE 3
CANADA: RESERVES OF MAJOR MINERALS IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Reserves
Cesium		120
Coal (anthracite, bituminous, subbituminous, and lignite)	million tons	6,583 [1]
Cobalt		220
Copper		8,196 [2]
Gold	metric tons	2,696 [2]
Iron ore	million tons	6,000 [1]
Lead		116 [2]
Molybdenum		80 [2]
Natural gas	trillion cubic meters	2.0 [3]
Nickel		2,296 [2]
Niobium		1,600
Peat	million tons	720
Petroleum, crude	billion barrels	167.7 [4]
Platinum group metals	metric tons	310 [1]
Potash[7]	million tons	1,200 [1]
Rare earth oxides		15,000 [5]
Selenium	metric tons	6,000
Silver	do.	4,754 [2]
Sulphur		118,823 [2]
Uranium (U content)		565 [6]
Zinc		1,936 [2]

do. Ditto.
[1]Source: Natural Resources Canada, data as of 2018.
[2]Source: Statistics Canada, data as of 2018.
[3]Source: Statistics Canada.
[4]Source: Natural Resources Canada.
[5]Source: Natural Resources Canada, reserves and resources.
[6]Source: World Nuclear Association.
[7]K_2O equivalent.