

Mineral Production in 2019 and Exploration in 2020



Gold Bond Canada, Ltd. Gypsum Quarry in East Milford, Halifax County.

Report ME 2021-001

Mineral Management Division



Halifax, Nova Scotia

March 2021

Note

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Nova Scotia Department of Energy and Mines

Honourable Chuck Porter
Minister

Simon d'Entremont
Deputy Minister

Message from the Director of Mineral Management

This report on mineral production and exploration highlights activities of the exploration and mining industry in Nova Scotia. The report includes exploration statistics for 2020, and mineral production information for 2019. The report also includes reclamation security amounts from operating mines. The information was developed in cooperation with industry, and the data were provided by each of the companies surveyed. I would like to thank Nova Scotia's exploration and mining industry for its cooperation in the preparation of this report.

As a part of the highly competitive, global environment for mineral investment dollars, Nova Scotia is attuned to the challenges faced by the mining industry. The Mineral Management Division of the Nova Scotia Department of Energy and Mines is positioning the province to compete successfully for investment dollars within this global context by providing clear and effective laws and policies that support sustainable mineral resource development.

The mineral industry in Nova Scotia maintained a high level of exploration activity in 2020, which included progress in both grassroots exploration and advanced exploration projects. Exploration staking activity in the province increased by 14 per cent in terms of claims under license, with exploration expenditures totalling \$36.8 million.

The gold sector continues to lead the trend with the largest commodity value from mine production. Gold shipments were down marginally in 2019, but were supported by the continued robust price of gold. As well, a number of gold companies continued to advance their gold exploration projects toward commercial production. The coal and gypsum sectors experienced slight increases in output, while there were small declines in limestone and salt shipments.

Employment levels at active mine sites exceeded 800 employees in 2019. Approximately 36 per cent of the employees in Nova Scotia's mineral industry work in the gold sector.

If you are interested in building a better future through sustainable mineral resource development, and would like additional information, I invite you to contact us.



George MacPherson
Director, Mineral Management

2020 Exploration Highlights

Mineral claim-staking activity in Nova Scotia grew 14 per cent in 2020 relative to 2019, with the total number of claims under license increasing to 41 486 from 36 343 in the previous year (Fig. 1). Notably, with the proclamation of the new *Mineral Resources Act* in 2018, exploration licenses issued or renewed after December 18, 2018, are for two-year terms.

Field expenditures by the mineral exploration industry in 2020 are estimated at \$36.8 million, a level consistent with expenditures of \$37.9 million in 2019, and \$40.4 million in 2018.

There were over 200 companies and individuals holding exploration interests (licenses or options) in the province in 2020, including 2 major, 9 junior, and 61 private companies, as well as 140 individuals. In addition, several mineral lease holders carried out exploration and development work on their leased areas, and exploration work for commodities that do not require staking (e.g., gypsum) was also carried out. Entities actively engaged in exploration during 2020 included 1 major, 5 junior and 24 private companies, as well as 45 individuals.

Figure 2 shows the locations of exploration licenses and mineral leases within the province.

For an up-to-the-minute view of the number and distribution of mineral exploration licenses in the province, the reader is referred to <https://novaroc.novascotia.ca>, where the map button can be used to bring up a map showing the current mineral rights held throughout the province.

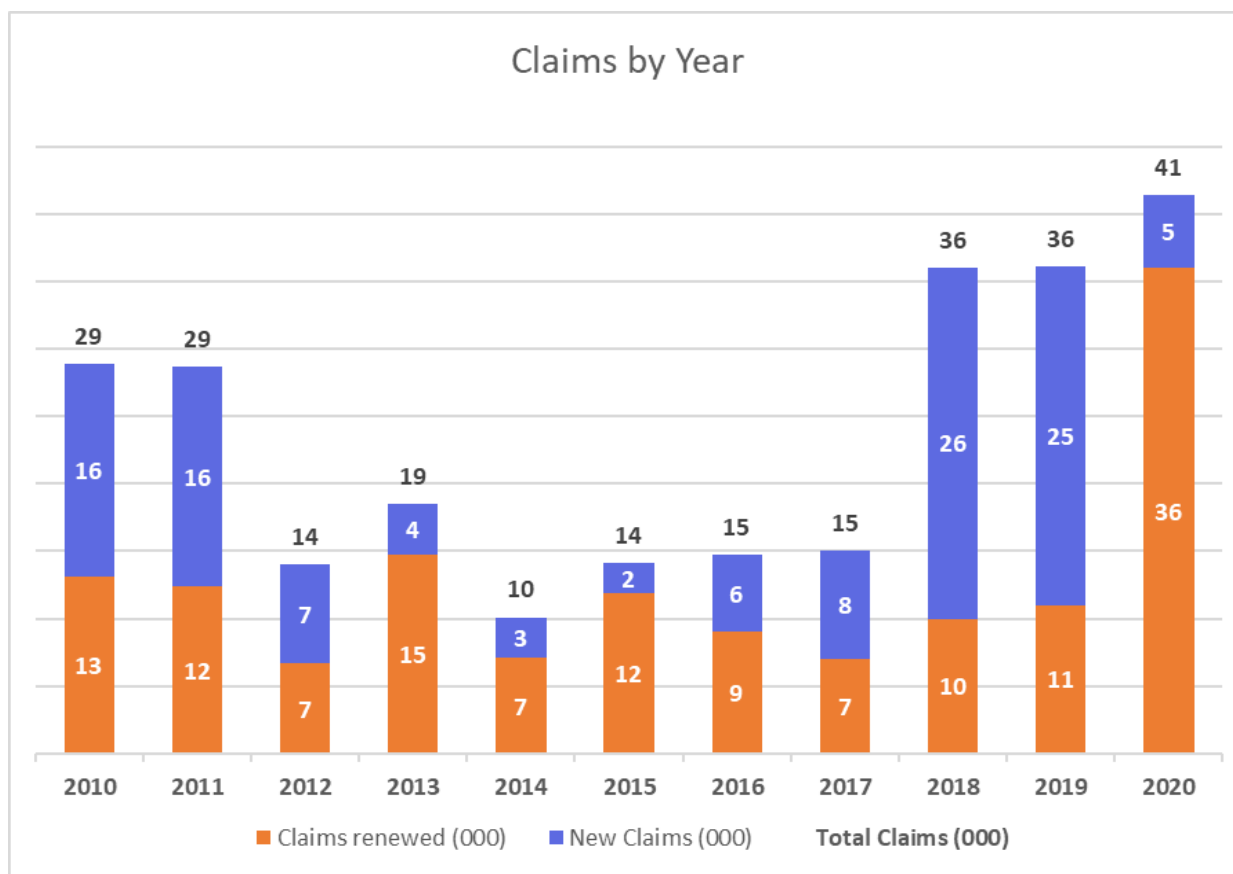


Figure 1. Number of claims under license by year, 2010 – 2020.

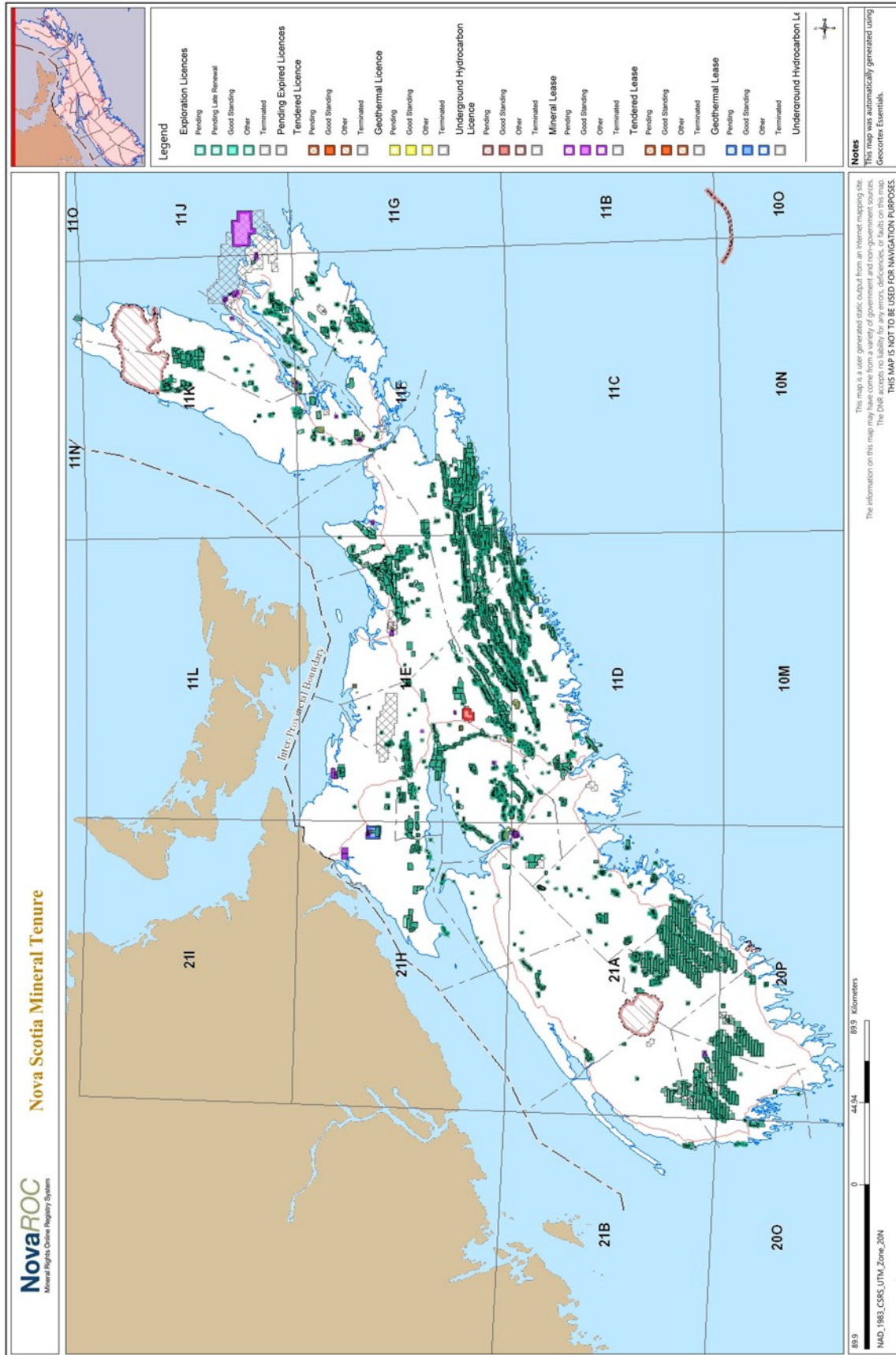


Figure 2. Mineral exploration activities in 2020.

2019 Production Highlights

There were thirteen producing mines in Nova Scotia in 2019 (Fig. 3), which operated under the authority of the *Mineral Resources Act*. In addition, six operations were under care and maintenance, awaiting favourable market conditions to restart production.

In 2019, the market value of the province’s mineral production was \$288 million. The year’s value represented a drop from the record high of \$327 million in 2018. The decrease was largely the result of market conditions experienced in the coal and salt sectors.

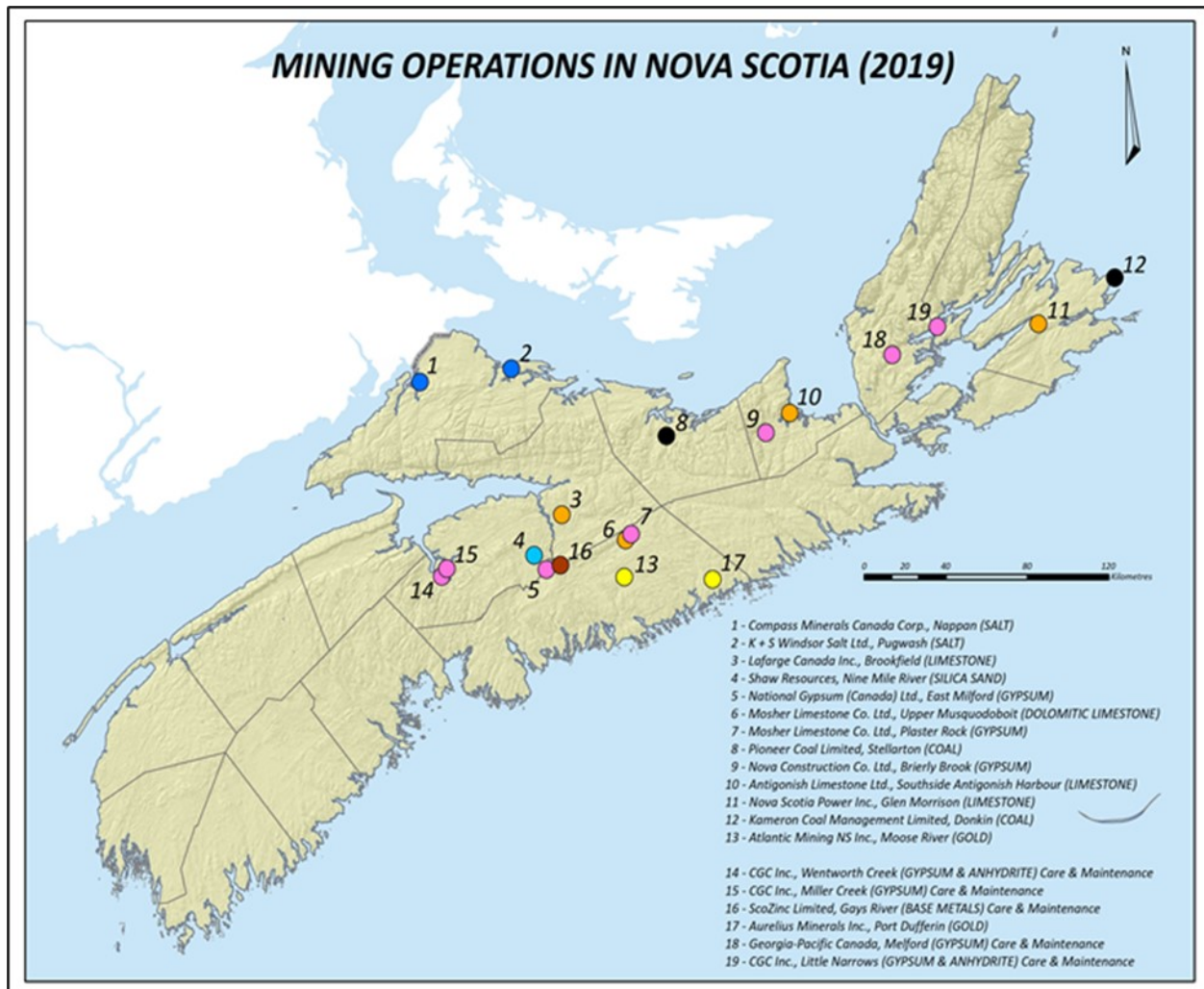


Figure 3. Active mines, and care and maintenance mine sites in 2019.

Table 1. Nova Scotia mineral production in 2019*.

Commodity	Production (Tonnes**)	Market Value***	Percentage of Total Market Value
Coal	707 808	\$ 57,281,000	19.9%
Gold (ounces)	89 427	\$ 144,119,000	50.0%
Gypsum	2 248 904	\$ 25,615,000	8.9%
Limestone	441 750	\$ 11,538,000	4.0%
Salt	986 841	\$ 48,795,000	16.9%
Silica Sand	11 514	\$ 851,000	0.3%
Total Mineral Production		\$ 288,199,000	100.0%

* Note that construction aggregates data are not included in Table 1

** Tonnes shipped, except gold (ounces)

*** Market value of shipped products

Salt

Two operating salt mines in Nova Scotia produced 986 841 tonnes of salt during 2019. There were 69 002 fewer tonnes (-6.5%) of salt produced than in 2018. Salt accounted for \$48.8 million (16.9%) of the total value of Nova Scotia’s mineral production (Fig. 4; Table 1). Since 1980, production has averaged roughly one million tonnes per year. A portion of annual production levels is directly related to the severity of winter weather in the region, and fluctuating demands for the de-icing of roads.

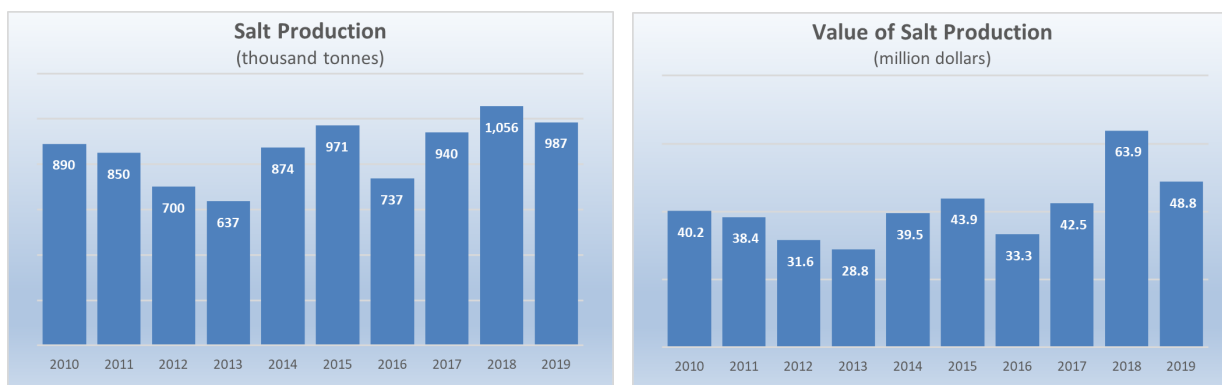


Figure 4. Salt production and market value of shipped salt and salt products, 2010 - 2019.

Pugwash, Cumberland County

The Pugwash underground salt mine has been in continuous production since 1959. It is operated by K+S Windsor Salt Ltd. Salt is extracted by room-and-pillar mining. It is undercut, drilled and blasted, then transported by trucks and conveyor belts to the production shaft, where it is hoisted to surface.

The mine produced 868 713 tonnes of finished product, in the form of bulk and packaged salt, during 2019, and shipped 870 730 tonnes. Finished rock salt was distributed throughout eastern Canada via ships and trucks. Most of the finished product was sold in Atlantic Canada for de-icing roads.



Figure 5. Pugwash Mine, Cumberland County.

Nappan, Cumberland County

The solution salt mine in Nappan has been in operation since 1947. It is operated by Compass Minerals Canada Corp. Wells are drilled into the salt formations, and water is used to create caverns and dissolve the salt, creating a brine solution. The brine is brought to the surface and sent through a processing plant, which evaporates the water and produces high-purity salt.

In 2019, the plant shipped 116 111 tonnes of salt. About half of the salt produced is for use in the food processing industry and for domestic consumption as table salt. The plant also produces and packages salt for other purposes, such as water conditioning, agriculture, and de-icing. Salt from Nappan is shipped in bulk and packaged form to markets in eastern Canada, northeastern United States, and the Caribbean.

Gold

There was one gold mine in production in 2019, located in Halifax County. The Touquoy project is an open pit mine at Moose River Gold Mines.

A total of 89 427 ounces of gold was shipped in 2019, representing \$144.1 million (50%) of the total value of Nova Scotia’s mineral production (Fig. 6; Table 1).

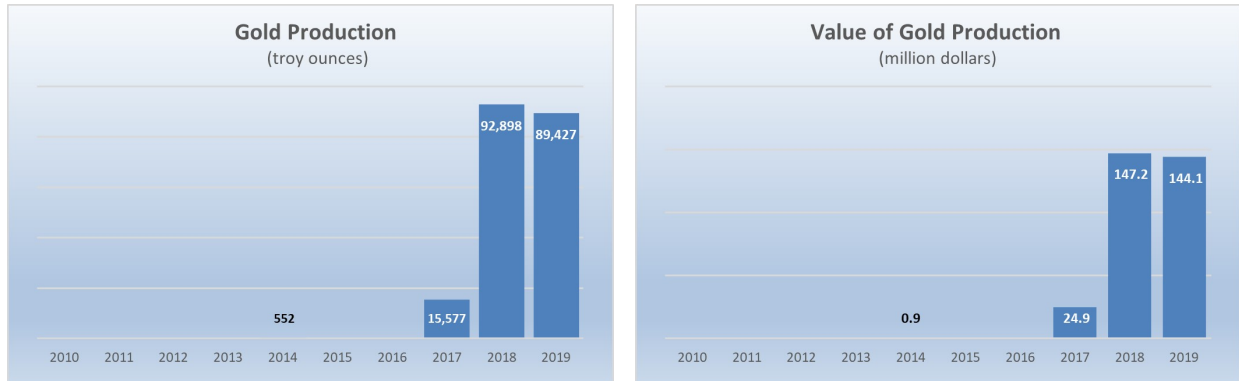


Figure 6. Gold production in Nova Scotia (ounces produced and market value).

Touquoy, Halifax County

The Touquoy Mine is operated by Atlantic Mining NS Inc., a wholly owned subsidiary of St. Barbara Limited. St. Barbara acquired Atlantic Mining NS in 2019, through the acquisition of its parent company, Atlantic Gold Corporation. The company is mining a relatively low-grade disseminated gold deposit by open pit methods. Gold shipments were 89 427 ounces for the year.

In 2019, 4.46 million tonnes of ore were mined from the Touquoy pit, using a bench mining method of drilling, blasting, and loading broken ore with hydraulic excavators into haulage trucks for transport to the mill. For the year, 2.35 million tonnes of ore were processed, yielding 93 980 ounces of gold.

The company is also developing projects at Fifteen Mile Stream, Beaver Dam and Cochrane Hill.



Figure 7. Touquoy Gold Mine, Halifax County.

Gypsum

During 2019, gypsum production of 2.25 million tonnes accounted for \$25.6 million (8.9%) of the total value of Nova Scotia's mineral production (Fig. 8; Table 1). This represented an increase in gypsum production of 34 500 tonnes from 2018. There were three gypsum mines of varying scale in production in 2019. These operations include a large gypsum quarry at East Milford, Halifax County, a quarry at Brierly Brook, Antigonish County, and a small quarry at Dean Settlement, Halifax County. The Brierly Brook Quarry had been on care and maintenance for some time, and resumed production in 2019. Gypsum from the Dean Settlement Quarry is processed into an agricultural product and marketed locally, while the bulk of the East Milford and Brierly Brook production is shipped for manufacturing wallboard. No anhydrite was produced in 2019.

Gypsum production has been relatively steady at around 2 million tonnes per year since 2012, and volumes remain significantly lower than the peak production of 8.6 million tonnes in 2005. The financial crisis of 2007–08 resulted in a reduced demand for new home construction in the United States, which dropped from 1.5 million to fewer than 0.5 million units per year. This significant decline in demand, combined with competition from synthetic gypsum (derived from pollution control equipment at coal-fired electric generating plants), resulted in an unprecedented decline in demand for natural gypsum. In 2019, housing starts in the US were up by 3% over 2018 to 1.3 million. While natural gypsum demand has not matched this upward trend in recent years, the prospect of increased demand for natural gypsum is positive. The gradual phasing out of coal-fired power plants will result in a reduction in the availability of synthetic gypsum in the marketplace. This trend has already begun to occur, with some wallboard plants having switched to natural gypsum due to a lack of locally available synthetic gypsum.

Several gypsum and anhydrite mines, including the Wentworth Creek, Miller Creek, and Little Narrows operations, remained on care and maintenance status while waiting for improved market conditions to restart.

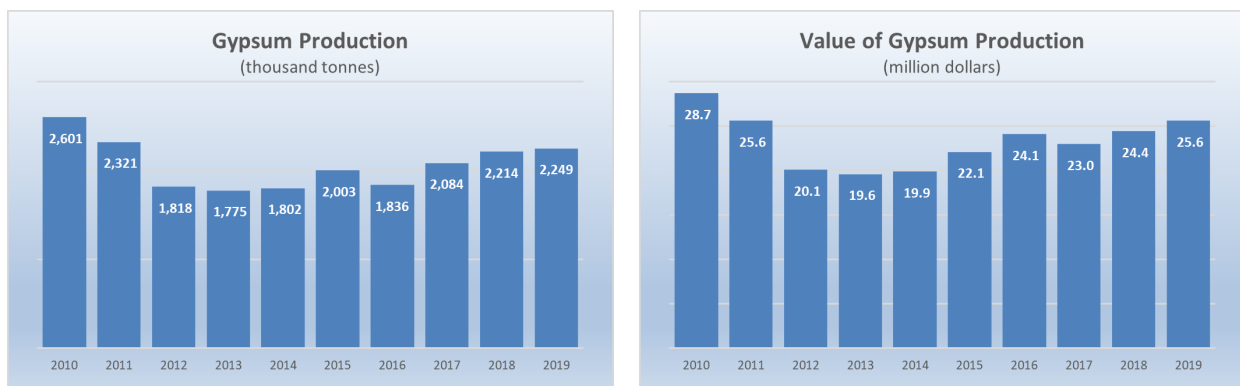


Figure 8. Gypsum production in Nova Scotia (tonnes and market value of shipped products), 2010-2019.



Figure 9. East Milford Gypsum Mine, Halifax County.

East Milford, Halifax County

Gold Bond Canada, Ltd. (formerly National Gypsum (Canada) Ltd.) operates a gypsum quarry in East Milford, Halifax County (Fig. 9). In 2019, the mine produced 2.19 million tonnes of gypsum, and has produced more than 138 million tonnes since it began continuous operation in 1954.

Mining involves drilling, blasting, and loading the gypsum onto trucks. It is then crushed and screened to remove the fines, and transported by train from East Milford to Wrights Cove, Dartmouth. Crushed rock is loaded on ships for wallboard manufacturing by its parent company in the United States, and for customers in Canada and the United States. The mine also sells products within Nova Scotia for agricultural use.

Brierly Brook, Antigonish County

The Brierly Brook gypsum quarry is owned by Nova Construction Co. Ltd. and shipped 54 077 tonnes of gypsum in 2019. The quarry resumed production in late 2019 after being on care and maintenance for a number of years.

Operations at Brierly Brook include drilling, blasting, and loading the gypsum onto trucks. The gypsum is then crushed, screened, and stockpiled for shipment. The mine supplies gypsum for the manufacturing of wallboard and cement in domestic markets.

Dean Settlement, Halifax County

Mosher Limestone Company Limited operates a small gypsum quarry at Dean Settlement. The company did not carry out mining operations in 2019, as gypsum stockpiles provided sufficient material to meet market demands. The gypsum is crushed and ground to a fine product at the company's plant in Upper Musquodoboit. The ground gypsum is sold to agricultural markets in Nova Scotia and PEI. In 2019, there were 1 290 tonnes of gypsum products sold.

Coal

During 2019, coal production of 707 808 tonnes accounted for \$57.3 million (19.9%) of the total value of mineral production in Nova Scotia (Fig. 10; Table 1). Production was from the surface mine in Stellarton, Pictou County, and from the Donkin underground coal mine in Cape Breton County. The coal is used as a fuel for electrical power generation within the province, and is also shipped from the Donkin Mine to export markets through the Port of Sydney.

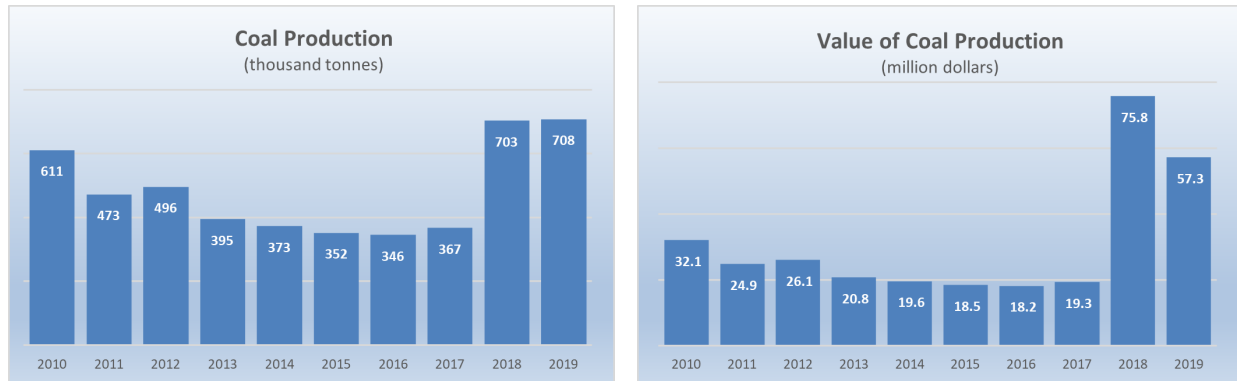


Figure 10. Coal production in Nova Scotia (tonnes and market value of shipped products), 2010-2019.

Stellarton, Pictou County

Pioneer Coal Limited has operated the Stellarton surface coal mine since 1996. In 2019, the operation produced 247 059 tonnes of coal from the Foord Seam, Cage Seam, Third Seam, and the Flemming/MacGregor seams. The coal seams in Stellarton are relatively thick, with the Foord Seam averaging over 12 m in thickness. Many of the coal seams were previously mined from underground workings, and, therefore, coal recovery is about 50 per cent of the original *in situ* reserves. Neither drilling nor blasting are conducted at this mine.

After overburden removal, excavators mine the coal and load it onto trucks for haulage to the crushing and sizing plant. Within the crushing/trans-shipment facility various coal qualities are blended and then shipped by truck to Nova Scotia Power's generating station in Trenton.

Mining at Stellarton involves a series of open cuts, with overburden materials being placed into adjacent cuts as backfill or temporary stockpiles to allow for progressive reclamation. Once an area is backfilled and contoured, it is covered with a suitable growing material, limed, fertilized, seeded, and mulched.



Figure 11. Stellarton Coal Mine, Pictou County.

Donkin, Cape Breton County

The focus in 2019 at the Donkin underground mine, operated by Kameron Coal Management Limited, was to continue with underground mine development and to establish infrastructure for full scale production capacity. The mine also adjusted the orientation of the development entries to assist with challenging ground conditions, and began driving the levels for proposed longwall retreat mining.

Shipments from the Donkin Mine in 2019 totaled 460 749 tonnes of clean coal, with the product being sold to both domestic and international markets. The company also continued work on a surface haulage road to reroute coal truck traffic around a densely populated section of public road.

A room-and-pillar mining method was employed to extract the coal, which was conveyed to a raw-coal stockpile on the surface. Coal extraction was carried out with continuous mining machines paired with battery haulers or a flexible conveyor train to transport the coal from the active face to the feeder-breaker and conveyor belt. In the latter half of the year, the company changed its mining approach and began developing the levels for longwall retreat mining.

The operation continued to experience challenging ground conditions during 2019 and early 2020, which led to it being placed on a care and maintenance basis at the end of March 2020.

Limestone

In 2019, limestone production of 441 750 tonnes from four mines accounted for \$11.5 million (4%) of the total value of Nova Scotia’s mineral production (Fig. 12; Table 1). Most of the limestone produced (283 558 tonnes) was used as a feedstock or raw material for Portland cement production. There were also 124 769 tonnes of limestone used for management of combustion gas emissions at a coal-fired power station. The remainder of the limestone production (33 423 tonnes) was sold for agricultural soil amendments, the manufacture of pulp and paper products, and for some miscellaneous uses.

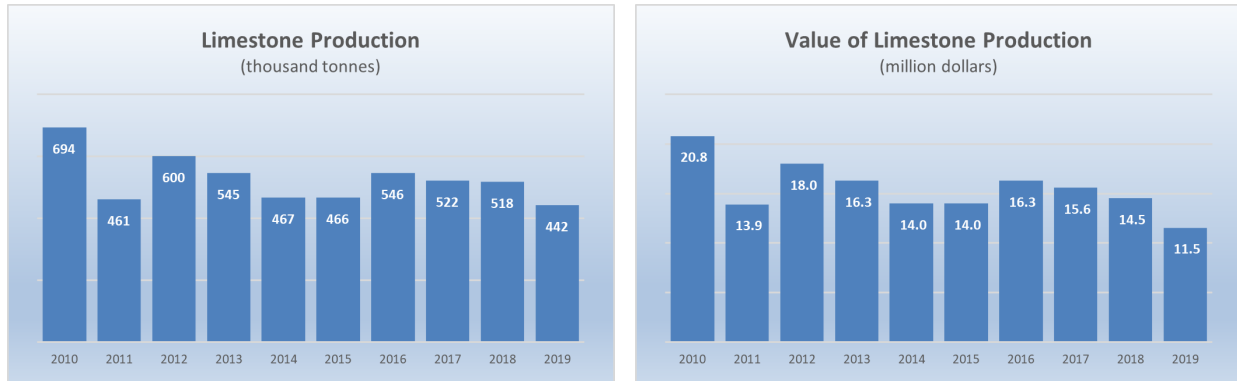


Figure 12. Limestone production in Nova Scotia (tonnes and market value of shipped products), 2010-2019.

Brookfield, Colchester County

Lafarge Canada Inc. has operated a limestone quarry and a cement manufacturing plant in Pleasant Valley, 5 km west of Brookfield, Colchester County, since 1965.

In 2019, the Brookfield Quarry produced 283 558 tonnes of crushed limestone. Mining limestone involves removing the till and cap rock overburden, followed by drilling, blasting, and loading the rock onto trucks for haulage to a crushing plant. All of the limestone from Brookfield is used to manufacture Portland cement products.



Figure 13. Brookfield Limestone Quarry and Cement Plant, Colchester County.

Glen Morrison, Cape Breton County

Production from the limestone quarry at Glen Morrison, Cape Breton County, began in 1993. The quarry is owned by Nova Scotia Power Incorporated, and contractor Kelly Rock Limited operated the quarry in 2019. Limestone is mined by first removing the overburden, followed by drilling and blasting the limestone, and hauling it by front-end loader to the primary crusher. The limestone is further crushed and processed at an on-site crushing and screening facility.

Most of the 125 144 tonnes of limestone produced in 2019 was shipped to Nova Scotia Power’s fluidized-bed, coal and pet-coke fired generating station in Point Aconi, where it is used to reduce stack emissions. A small volume of fine limestone was sold to local customers.

Upper Musquodoboit, Halifax County

Mosher Limestone Company Limited operates several quarries near Upper Musquodoboit. In 2019, the company processed material sourced from their stockpiles. The company processed and sold 19 835 tonnes of limestone for the year in 2019.

Agricultural-grade dolomite and limestone is produced at the company’s grinding plant in Upper Musquodoboit. The product is sold throughout the Atlantic provinces in bagged or bulk form. The company produces both ground and pelletized limestone.

Southside Antigonish Harbour, Antigonish County

Antigonish Limestone Ltd. operates a small quarry at Southside Antigonish Harbour. In 2019, all of the limestone production was obtained from existing stockpiles. Limestone is crushed and sorted into three different sizes, each having its own application and markets. The company also operates a cage mill to produce a finely ground product for the agricultural market. In 2019, 13 213 tonnes of product were sold, including 9 619 tonnes for agricultural use and 3 589 tonnes for the pulp and paper industry.

Silica Sand

All of the silica sand produced in Nova Scotia comes from the West Indian Road Silica Pit at Nine Mile River, Hants County. During 2019, silica sand shipments of 11 514 tonnes accounted for \$851,000 (0.3%) of the total value of Nova Scotia’s mineral production (Fig. 14; Table 1).

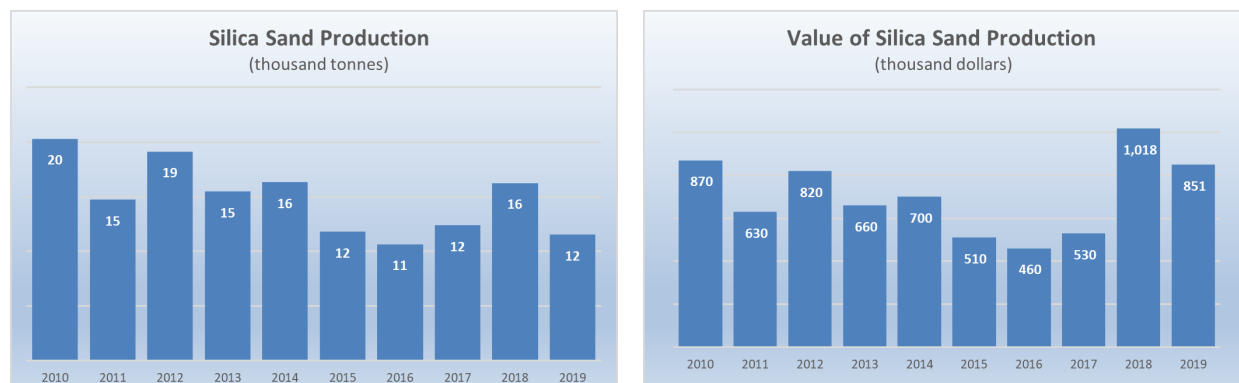


Figure 14. Silica sand production in Nova Scotia (tonnes and market value of shipped products), 2010-2019.

Nine Mile River, Hants County

Shaw Resources, a member of The Shaw Group Limited, produces silica sand from a deposit located on the West Indian Road in Nine Mile River. Sand is excavated from the pit and either stockpiled or trucked to the company's wash plant. The sand is then washed and screened into several products that are sold and shipped throughout the Atlantic provinces and Quebec.

In 2019, 11 514 tonnes of silica sand were processed and shipped. As well, the sand pit was operational during the year to supply the wash plant and replenish the stockpile. Once replenished, sand can be drawn from the stockpile for the next several years.

Reclamation Security Table for Operating Mines

Reclamation securities for seven of the province's operating mines are listed in Table 2. The information is voluntarily reported by the companies, and was current as of December 2020. Reclamation securities may be held by the Department of Energy and Mines or Nova Scotia Environment, and are in the form of cash, letter of credit, or surety bond, or combinations thereof. The reclamation cost estimate is either as estimated in each mine's reclamation plan, or as estimated by Energy and Mines and/or Nova Scotia Environment.

Table 2. Reclamation security information for Nova Scotia mines.

Mine	Company	Status	Commodity	Reclamation Security Held	Reclamation Plan Cost Estimate and Date
Touquoy	Atlantic Mining NS Inc.	Producing	Gold	\$10,400,000	\$10,400,000 (2011)
Brookfield	Lafarge Canada Inc.	Producing	Limestone	\$285,000	\$3,100,000 (2018)
Stellarton	Pioneer Coal Limited	Producing	Coal	\$2,500,000	\$2,500,000 (2008)
Glen Morrison	Nova Scotia Power Incorporated	Producing	Limestone	\$750,000	\$750,000 (2015)
South Side Antigonish Harbour	Antigonish Limestone Ltd.	Producing	Limestone	\$230,000	\$230,000 (2015)
Nappan	Compass Minerals Canada Corp.	Producing	Salt	\$150,000	\$150,000 (1998)
Upper Musquodoboit	Mosher Limestone Company Limited	Producing	Limestone	\$20,000	\$20,000 (2009)
Pugwash	K+S Windsor Salt Ltd.	Producing	Salt	For information, please contact: K+S Windsor Salt Ltd. Head Office 755 boul. St-Jean Pointe Claire, Québec H9R 5M9 Phone: 1-514-630-0900	
Milford	Gold Bond Canada, Ltd. (formerly National Gypsum (Canada) Ltd.)	Producing	Gypsum	For information, please contact: National Gypsum Company Head Office 2001 Rexford Road Charlotte, North Carolina, USA 28211 Phone: 1-704-365-7300 ng@nationalgypsum.com	
West Indian Road	Shaw Resources	Producing	Silica Sand	For information, please contact: Corporate Secretary The Shaw Group Limited P.O. Box 60 Shubenacadie, N.S. BON 2H0 Phone: 1-902-758-4727 lhawker@shawgrouppltd.com	

Contact Us

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