

Mineral Production in 2021 and Exploration in 2022



Information Circular ME 75

Mineral Management Division



Halifax, Nova Scotia

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Cover photo

Goldbond Canada Ltd. Gypsum Mine, East Milford, Halifax County.

Note

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Nova Scotia Department of Natural Resources and Renewables

Honourable Tory Rushton
Minister

Karen M. Gatien
Deputy Minister

Message from the Director of Mineral Management

This report on mineral production and exploration highlights recent activities of the exploration and mining industry in Nova Scotia. The report includes 2022 exploration statistics, and mineral production information for 2021. The report also includes a summary of reclamation activities completed in 2022, and 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 Natural Resources and Renewables 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 2022, which included progress in both grassroots exploration and advanced exploration projects. Exploration staking activity in the province increased by 37% in terms of claims under license, with exploration expenditures also increasing, estimated at \$58.1 million.

The gold sector continues to lead this trend, with the largest commodity value from mine production. Gold shipments dipped in 2021 compared to 2020, but operators 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 gypsum sector experienced a slight decrease in output while several new and former producers explored options to either restart or develop new gypsum mining operations. Salt and limestone producers experienced a slight decline in salt and limestone shipments.

Employment levels at active mine sites exceeded 700 employees in 2021. Approximately 40% of the employees in Nova Scotia's mineral industry work in the gold sector. Royalties collected in 2021 from producing mine sites totalled \$2.2 million.

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 at GMB@novascotia.ca.



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2022 Exploration Highlights

Mineral claim-staking activity in Nova Scotia increased by 37% in 2022 relative to 2021, with the total number of claims under license increasing to 57 000 from 42 000 in the previous year (Fig. 1). Interest in salt deposits (for underground storage) and critical metal potential, combined with the continued search for gold, contributed to the increase in licenced ground. 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.

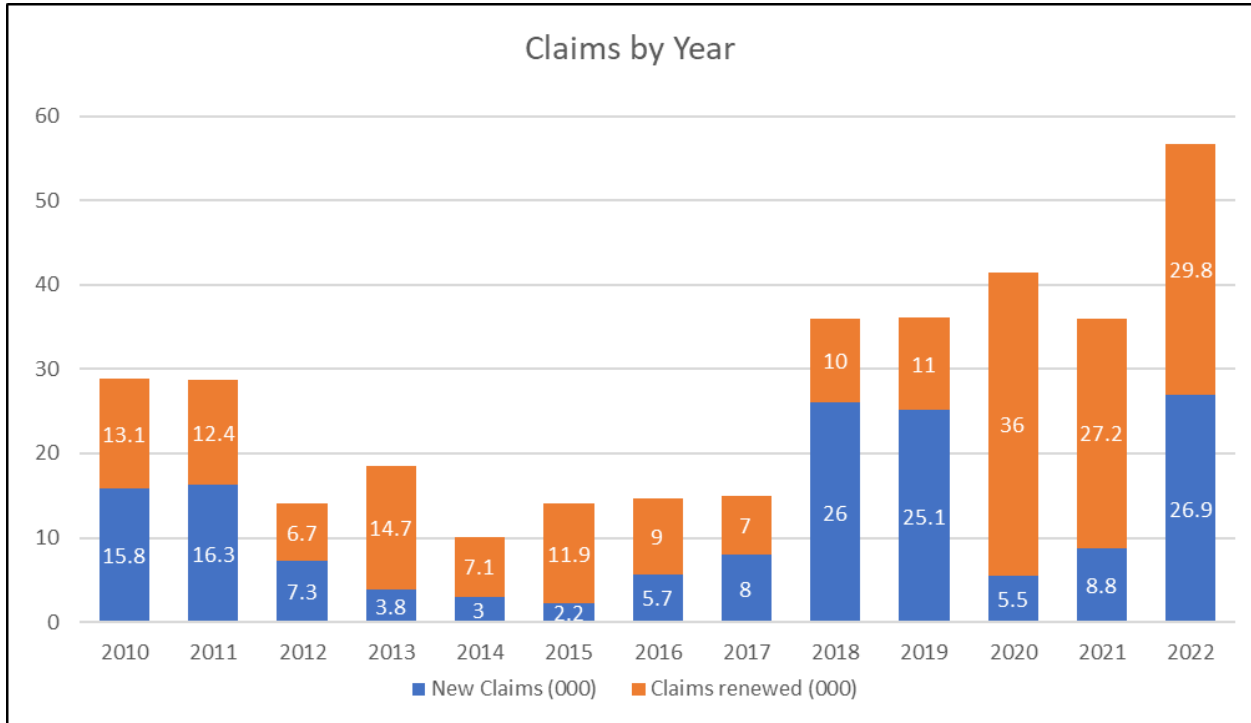


Figure 1. Number of claims under license by year, 2010 – 2022.

Field expenditures by the mineral exploration industry in 2022 are estimated at \$58.1 million, a level that increased partially due to continued make-up of reduced work in 2020-21 attributed to the pandemic. Overall, this is consistent with expenditures of \$50.3 million in 2021, and \$26.3 million in 2020.

There were 209 companies and individuals holding exploration interests (licenses or options) in the province in 2022, including 2 major (operating 1 mine), 16 junior (public traded company not operating a mine), and 57 private companies, as well as 134 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). Entities actively engaged in advanced exploration during 2022 included 1 major, 11 junior and private companies, as well as 8 individuals. Prospecting and geological surveys were done by 81 licensees.

Figures 2 and 3 show the locations of exploration licenses and mineral leases within the province in 2022 compared with 2021.

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 display a map showing the current mineral rights held throughout the province.

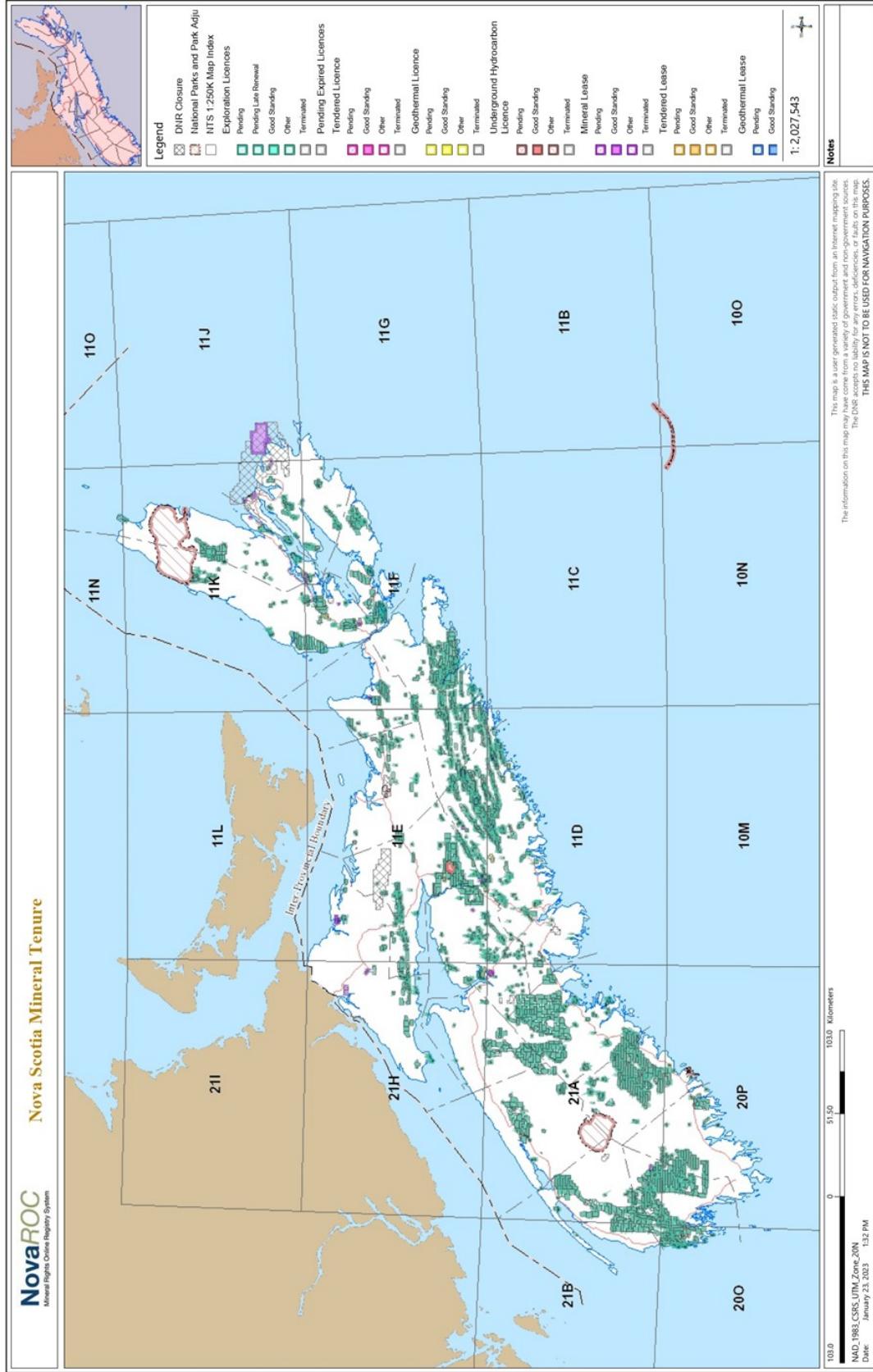


Figure 2a. Mineral exploration activities in 2022.

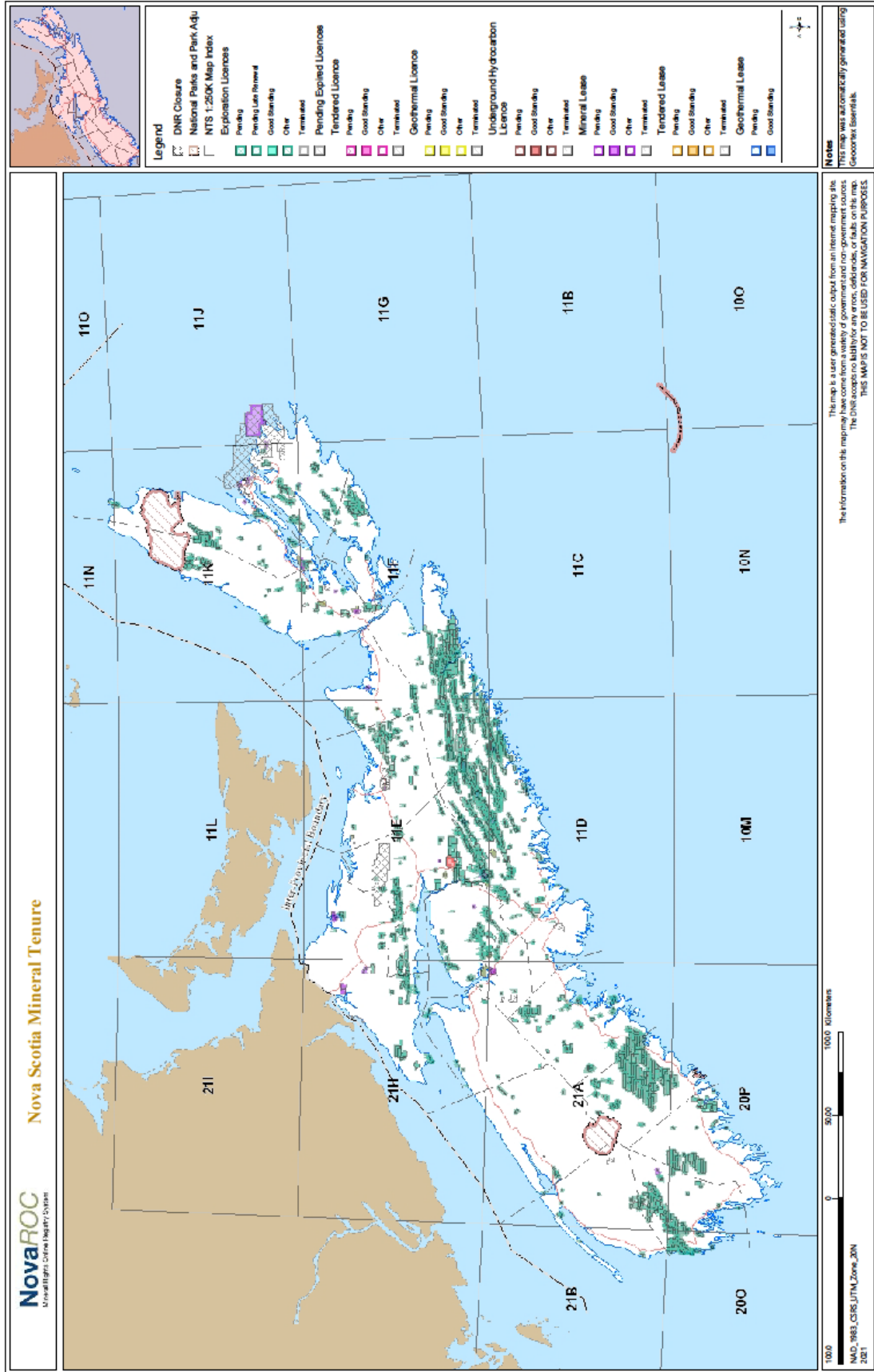


Figure 2b. Mineral exploration activities in 2021.

2021 Production Highlights

There were twelve producing mines in Nova Scotia in 2021 (Fig. 3), which operated under the authority of the *Mineral Resources Act*. In addition, six operations were under care and maintenance, awaiting improved market conditions to restart production.

In 2021, the market value of the province’s mineral production was \$290 million. This amount continues the recent upward trend of mineral production values due to a renewed demand in gypsum and an increase in gold prices.

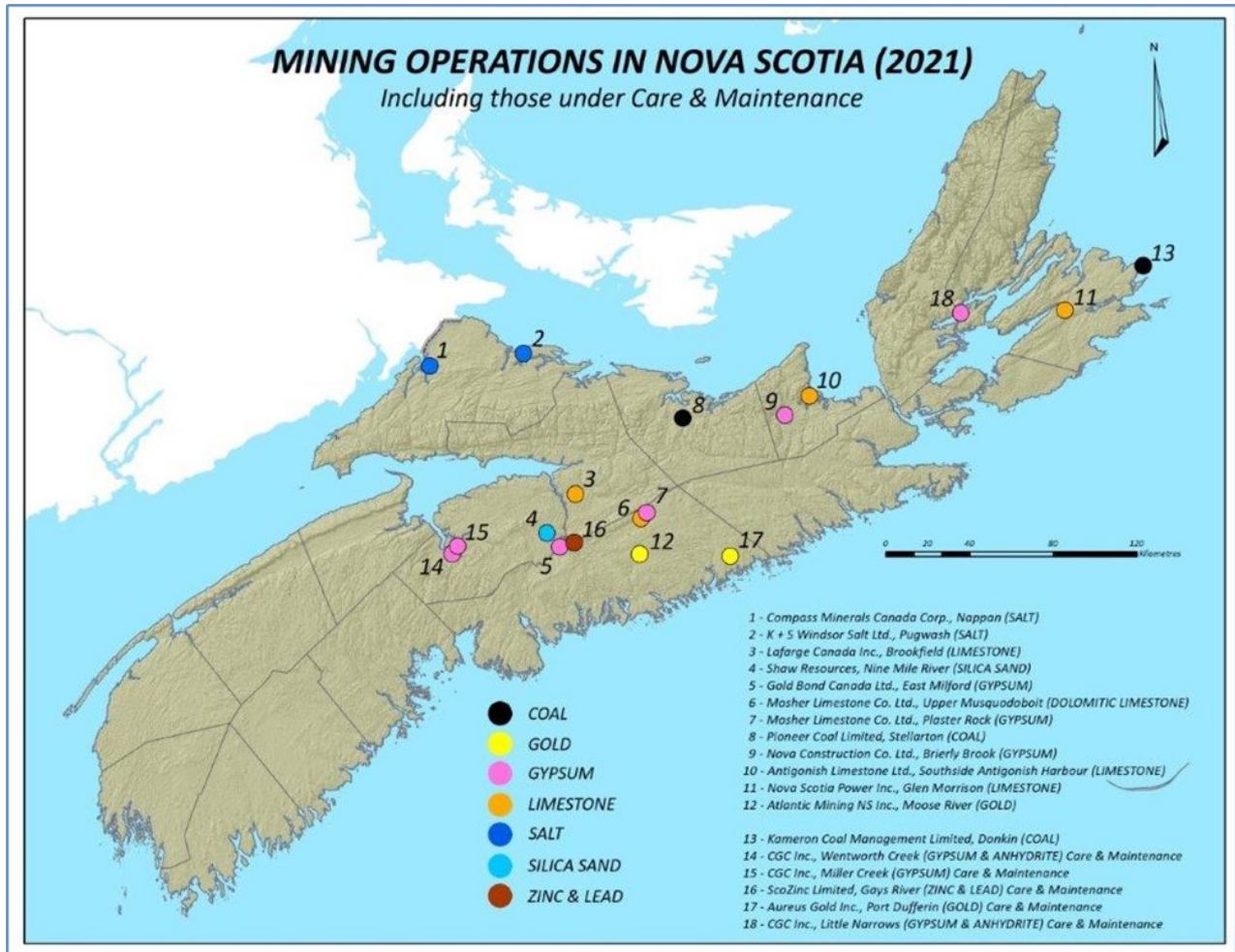


Figure 3. Active mines, and care and maintenance mine sites in 2021.

Table 1. Nova Scotia mineral production in 2021*.

Commodity	Production (Tonnes**)	Market Value***	Percentage of Total Market Value
Coal	163 684	\$7,958,000	2.8%
Gold (ounces)	81 106	\$172,837,000	60.2%
Gypsum	2 306 283	\$30,904,000	10.8%
Limestone	458 498	\$8,879,000	3.1%
Salt	620 276	\$65,803,000	22.9%
Silica Sand	11 638	\$572,000	0.2%
Total Mineral Production		\$286,953,000	100.0%

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

** Tonnes shipped, except gold (ounces)

*** Market value of shipped products

Historical prices for individual commodities are available from the [London Metal Exchange](#).

Salt

Two operating salt mines in Nova Scotia produced 620 276 tonnes of salt during 2021. This amounts to 199 214 fewer tonnes (-24.3%) of salt produced than in 2020. Salt accounted for \$65.8 million (22.9%) 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.

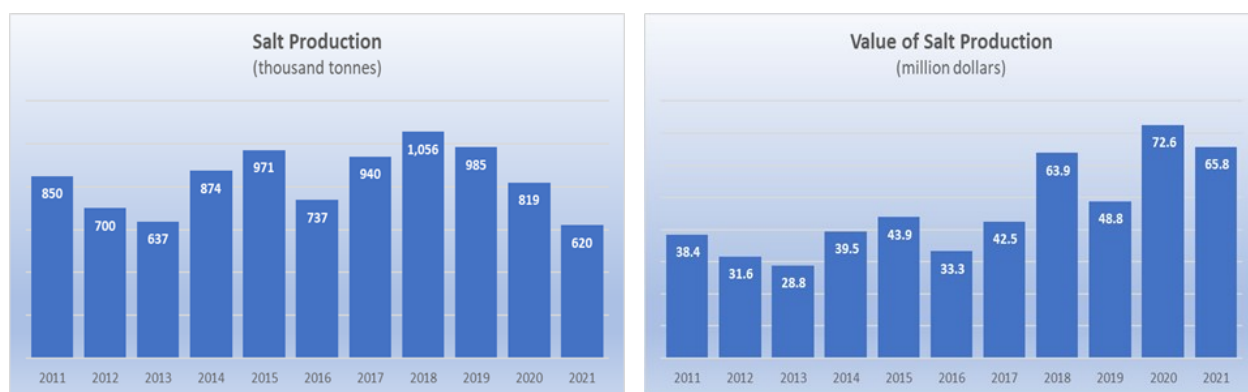


Figure 4. Salt production and market value of shipped salt and salt products.

Pugwash, Cumberland County

The Pugwash underground salt mine (Fig. 5) 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 342 889 tonnes of finished product in the form of bulk and packaged salt during 2021 and shipped 509 020 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.

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 2020, the plant shipped 115 689 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 is shipped in bulk and packaged form to markets in eastern Canada, northeastern United States, and the Caribbean.



Figure 5. Pugwash mine, Cumberland County.

Gold

There was one gold mine in production in 2021, located in Halifax County. The Touquoy project is an open pit mine at Moose River Gold Mines.

A total of 81,106 ounces of gold was shipped in 2021, representing \$172.8 million (60.2%) of the total value of Nova Scotia's mineral production (Fig. 6; Table 1).

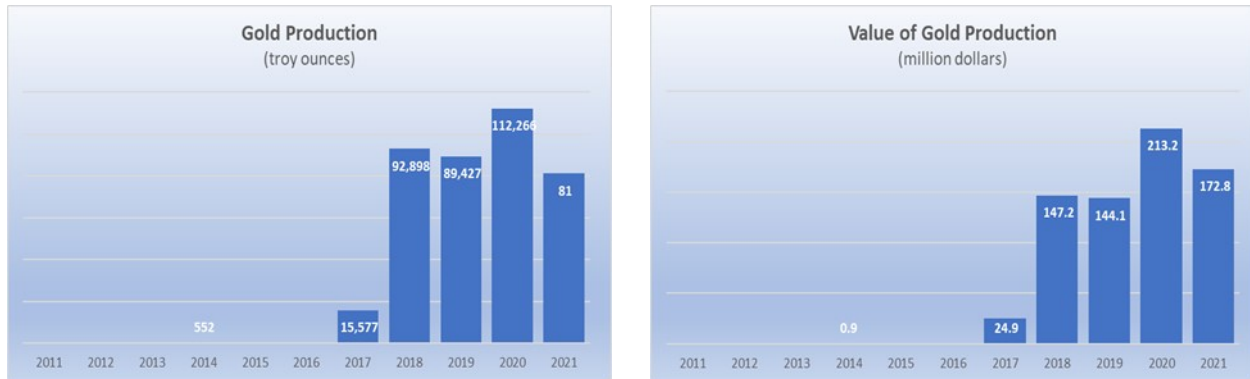


Figure 6. Gold production in Nova Scotia (ounces produced and market value).

Touquoy, Halifax County

The Touquoy Mine (Fig. 7) 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 81 106 ounces for the year.

In 2021, 2.7 million tonnes of ore were mined from the Touquoy pit, using a drill and blast mining method where broken ore is loaded with hydraulic excavators into haulage trucks for transport to the mill. Ore is crushed using a tertiary crusher circuit followed by a single stage ball mill with gold being recovered using a CIL circuit and further refined using an electrowinning process.

The company is also developing projects at several other locations in the province.



Figure 7. Touquoy Gold Mine, Halifax County.

Gypsum

During 2021, gypsum production of 2.31 million tonnes accounted for \$30.9 million (10.8%) of the total value of Nova Scotia's mineral production (Fig. 8; Table 1). This represented a decrease in gypsum production of 188 780 tonnes from 2020. There were three gypsum mines of varying scale in production in 2021. 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 produces gypsum used for both the cement industry and for the manufacturing of wallboard. The Dean Settlement gypsum is processed into an agricultural product and marketed locally, while the bulk of the East Milford production is shipped for manufacturing wallboard. No anhydrite was produced in 2021.

Gypsum production has been relatively steady at approximately 2 million tonnes per year since 2010, 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. 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. While housing starts in the United States have increased, natural gypsum demand has not matched this upward trend in recent years. Nonetheless, 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, 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.

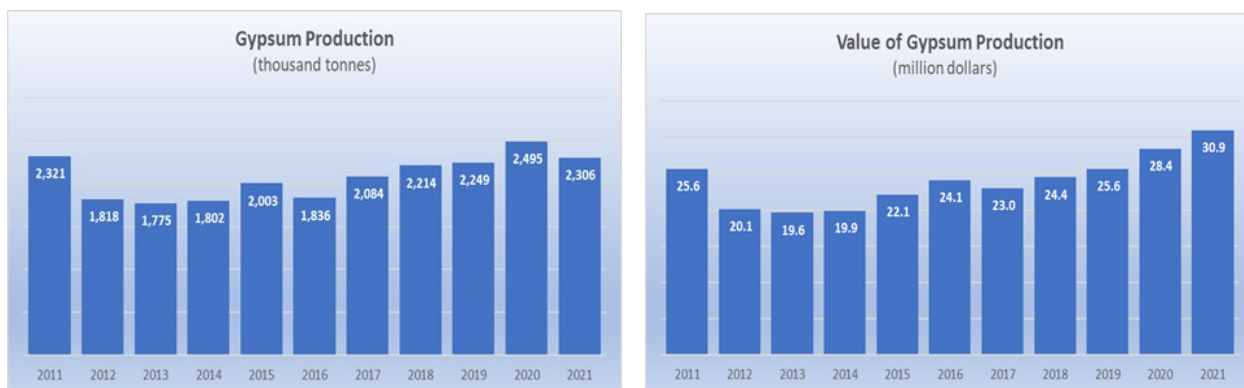


Figure 8. Gypsum production in Nova Scotia.

East Milford, Halifax County

Gold Bond Canada, Ltd. operates a gypsum quarry in East Milford, Halifax County. In 2021, the mine produced 2.19 million tonnes of gypsum, and has produced more than 140 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 (Fig. 9) is owned by Nova Construction Co. Ltd. and shipped 113 565 tonnes of gypsum in 2021. The quarry operated consistently throughout 2021 after ending a period of care and maintenance in 2019.

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 2021, 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.



Figure 9. Brierly Brook Gypsum Quarry, Antigonish County.

Coal

During 2021, coal production of 163 684 tonnes accounted for \$7.9 million (2.8%) of the total value of mineral production in Nova Scotia (Fig. 10; Table 1). In 2021, coal was produced exclusively from the surface mine in Stellarton, Pictou County, with the Donkin underground coal mine in Cape Breton County entering a period of care and maintenance. Coal from the Stellarton surface coal mine is used as a fuel for electrical power generation within the province.

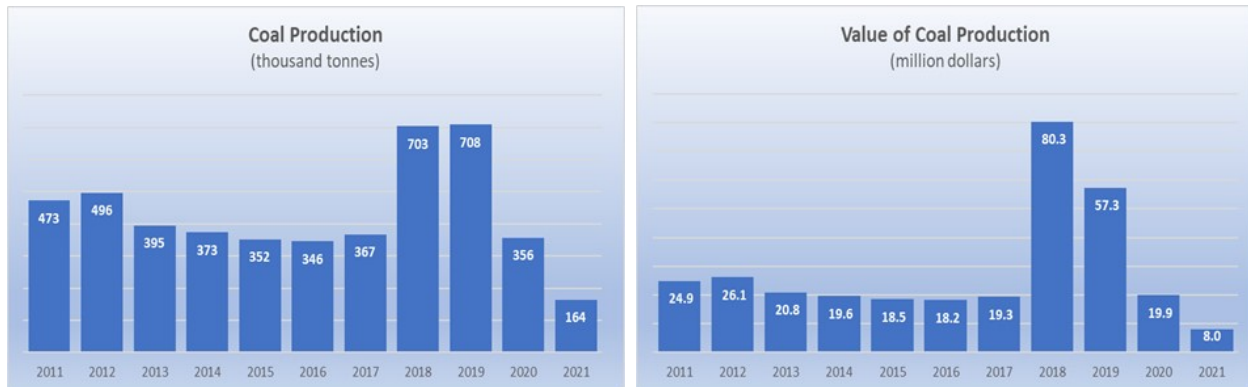


Figure 10. Coal production in Nova Scotia.

Stellarton, Pictou County

Pioneer Coal Limited has operated the Stellarton surface coal mine (Fig. 11) since 1996. In 2021, the operation produced 94 554 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% 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.

Limestone

In 2021, limestone production of 458 498 tonnes from four mines accounted for \$8.9 million, or 3.1% of the total value of Nova Scotia’s mineral production (Fig. 12; Table 1). Most of the limestone produced (353 577 tonnes) was used as a feedstock or raw material for Portland cement production. There were also 70 366 tonnes of limestone used for management of combustion gas emissions at a coal-fired power station. The remainder of the limestone production (35 942 tonnes) was sold for agricultural soil amendments, the manufacture of pulp and paper products, and for miscellaneous uses.

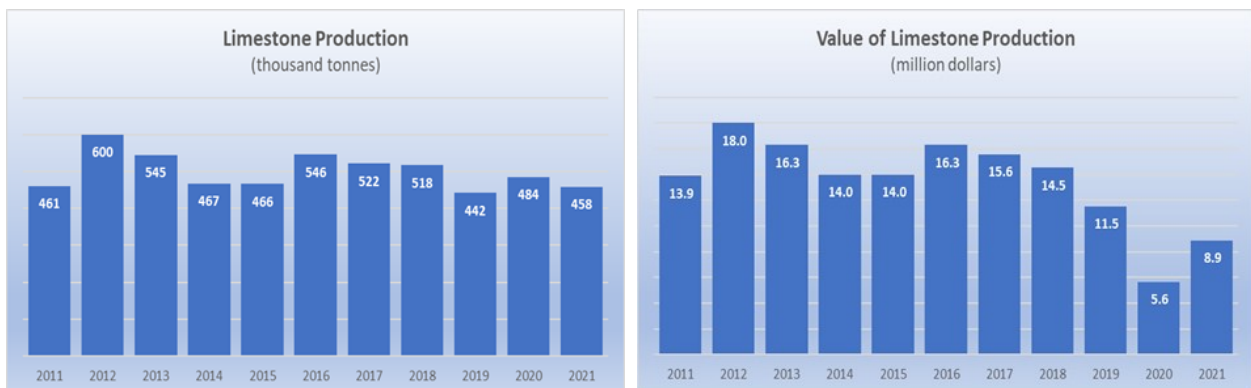


Figure 12. Limestone production in Nova Scotia.

Brookfield, Colchester County

Lafarge Canada Inc. has operated a limestone quarry and a cement manufacturing plant (Fig. 13) in Pleasant Valley, 5 km west of Brookfield, Colchester County, since 1965.

In 2021, the Brookfield Quarry produced 343 734 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.

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 Northern Contracting Limited operated the quarry in 2021. 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 70 366 tonnes of limestone produced in 2021 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. The company processed and sold 35 942 tonnes of limestone for the year in 2021. In 2021, the majority of this material was produced from the quarries with the remainder being sourced from stockpiles.

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.



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

Southside Antigonish Harbour, Antigonish County

Antigonish Limestone Ltd. operates a small quarry at Southside Antigonish Harbour. In 2021, all of the limestone produced 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 2021, 12 642 tonnes of product were sold, with much of the limestone being used in the agricultural 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 2021, silica sand shipments of 11 638 tonnes accounted for \$572 000, or 0.2% of the total value of Nova Scotia’s mineral production (Fig. 14; Table 1).

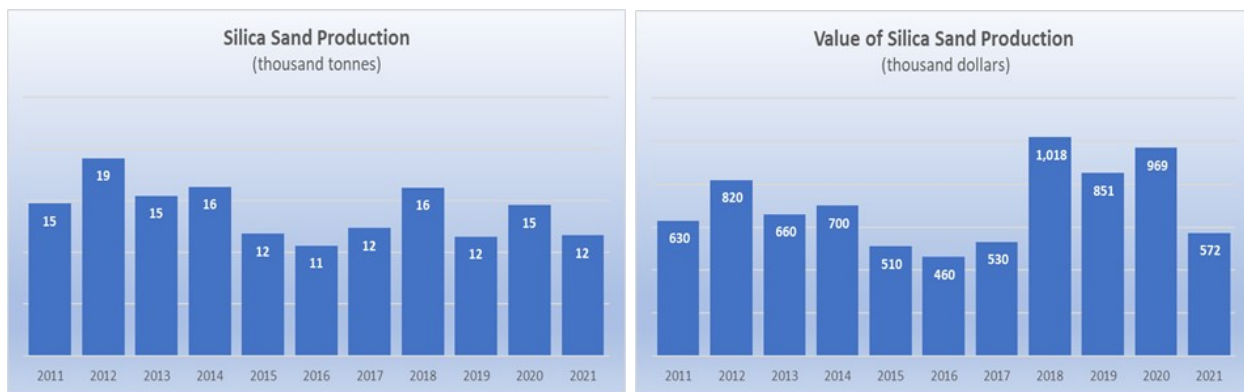


Figure 14. Silica sand production in Nova Scotia.

Nine Mile River, Hants County

Shaw Resources, a member of The Shaw Group Limited, produces silica sand from a deposit located on West Indian Road in Nine Mile River (Fig. 15). 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 2021, 11 638 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.



Figure 15. Nine Mile River Silica Quarry, Hants County.

2021 Reclamation Activity Update

In 2021 several mine sites within the province completed reclamation activities to restore land that has been affected by mining activity. These activities consisted of both progressively reclaiming areas on active mine sites that are no longer required for future production, along with the final reclamation and closure of mine sites that are no longer producing.

In 2021 approximately \$5 million was spent on reclamation activities by mine operators in Nova Scotia, including the Georgia Pacific quarry in Hants County (Fig. 16). This reclamation includes items such as the re-sloping of steep gradients to maintain long-term stability, and revegetation work. Mine operators also engaged in studying mining areas to determine future reclamation requirements and the dismantling of infrastructure.

As part of the updated *Mineral Resources Act*, mine operators are required to submit updated reclamation plans every three years. The Mineral Management Division of the Department of Natural Resources and Renewables reviewed and accepted nine reclamation plans that were submitted in 2021.



Figure 16. Recently reclaimed gypsum quarry operated by Georgia Pacific LLC., Hants County.

Reclamation Security Table for Operating Mines

Reclamation securities for seven of the province's operating mines are listed in Table 2. The data are voluntarily reported by the companies, and are current as of December 2022. The reclamation securities may be held by the Department of Natural Resources and Renewables (NRR) or the Department of Environment and Climate Change (ECC), 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 NRR and/or ECC. For tax and royalty data please refer to the Natural Resources Canada website at:

[Access ESTMA reports and data \(nrcan.gc.ca\)](https://nrcan.gc.ca)

Table 2. Reclamation security information for active Nova Scotia mines¹.

Mine	Company	Status	Commodity	Reclamation security held	Reclamation cost estimate and date
Touquoy	Atlantic Mining NS Inc.	Producing	Gold	\$41.20 million	\$41.20 million (2021)
Donkin	Donkin Tenements Inc.	Producing	Coal	\$7.95 million	\$7.55 million (2020)
Brookfield	Lafarge Canada Inc.	Producing	Limestone	\$3.10 million	\$3.10 million (2021)
Stellarton	Pioneer Coal Limited	Producing	Coal	\$2.50 million	\$2.50 million (2021)
Glen Morrison	Nova Scotia Power Incorporated	Producing	Limestone	\$0.75 million	\$4.65 million (2022)
South Side Antigonish Harbour	Antigonish Limestone Ltd.	Producing	Limestone	\$0.23 million	\$0.23 million (2022)
Nappan	Compass Minerals Canada Corp.	Producing	Salt	\$6.30 million	\$6.30 million (2021)
Upper Musquodoboit	Mosher Limestone Company Limited	Producing	Limestone / Gypsum	\$0.04 million	\$0.04 million (2018)
Pugwash	K+S Windsor Salt Ltd.	Producing	Salt	For information, please contact: K+S Windsor Salt Ltd. 755 boul. St-Jean Pointe Claire, Québec H9R 5M9 Phone: 1-514-630-0900 syelle@windsorsalt.com	(2020)

Table 2. Reclamation security information for active Nova Scotia mines¹ (continued).

Mine	Company	Status	Commodity	Reclamation security held	Reclamation cost estimate and date
Milford	Gold Bond Canada, Ltd.	Producing	Gypsum	For information, please contact: National Gypsum Company 2001 Rexford Road Charlotte, North Carolina, U.S.A. 28211 Phone: 1-704-365-7300 ng@nationalgypsum.com	(2021)
Nine Mile River	Shaw Resources	Producing	Silica Sand	For information, please contact: The Shaw Group Ltd. 255 Lacewood Drive, Suite 100C Halifax, Nova Scotia B3M 4G2 Phone: 1-902-457-0689 lhawker@shawgrouppltd.com	(2021)
Brierly Brook	Nova Construction Company Ltd.	Producing	Gypsum	For information, please contact: Nova Construction Co. Ltd. PO Box 1328 Antigonish, Nova Scotia B2G 2L7 Phone: 1-902-863-4004 contact@nova-construction.ca	(2022)

¹ Includes mines producing as of November 1, 2022.

Contact Us

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