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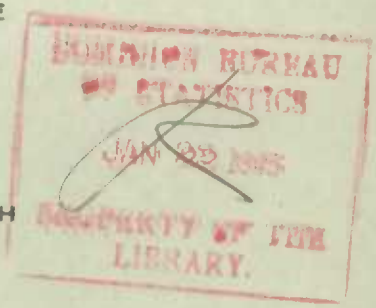
DOMINION BUREAU OF STATISTICS

CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH



Report

on

THE MISCELLANEOUS NON-METALLIC MINERALS

IN CANADA, 1943

including

Barite
Diamonds
Diatomite
Fluorspar
Garnet
Graphite
Grindstones
Kyanite
Lithium Minerals
Magnesitic Dolomite
Magnesium Sulphate
Natural Mineral Waters
Phosphate
Silica Brick
Sodium Carbonate
Sodium Sulphate
Strontium Minerals
Sulphur (Pyrites)
Volcanic Ash

OTTAWA
1945

Price 25 cents

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MISCELLANEOUS INDUSTRIAL OR NON-METALLIC MINERALS IN CANADA, 1943

Canadian operators producing certain industrial minerals, and who are usually relatively few in number, have been segregated for statistical purposes into a single group designated as the Miscellaneous Non-Metal Mining Industry. Minerals or primary mineral products produced (or deposits developed) by this industry during 1943 included barite, brucite, diatomite, fluorspar, graphite, grindstones, lithium minerals, magnesitic-dolomite (crude and refined), mineral waters, phosphate, silica brick, sodium carbonate, sodium sulphate and volcanic ash. For convenience, the sulphur content of pyrites shipped and sulphur recovered from smelter gas are recorded with the various miscellaneous minerals listed above; the value of sulphur production, however, is not included in the total for the miscellaneous non-metallic or industrial minerals as the value of this element is credited to the copper-gold-silver mining and non-ferrous smelting industries.

The number of firms reported as active in the industry during 1943 was 52; capital employed totalled $3,522,842; employees numbered 911 and salaries and wages paid amounted to $1,563,526. The cost of fuel, purchased electricity, containers and process supplies used during the year was reported at $1,208,470, and the gross value of production totalled $3,476,707 compared with $3,006,167 in 1942.

BARITE - Canadian mine shipments of barite during 1943 totalled 24,474 short tons valued at $279,253 compared with 19,667 tons worth $188,144 in 1942. Production of the mineral in both years was confined to the provinces of British Columbia and Nova Scotia and of the 1943 output the latter province contributed 22,550 tons valued at $263,419. The following information is from a report on barite prepared by the Bureau of Mines, Ottawa.

"The most important development in the history of the industry was the discovery in 1940 of a deposit of exceptional size and richness near Walton, Hants county. This deposit is being actively developed, and since the commencement of operations, three years ago, it has produced about 45,000 tons, or approximately 50 per cent of the total recorded Canadian output.

"Scattered occurrences of barite are known in Ontario, the chief of which are in the Elk Lake, Porcupine, and Sudbury areas. Spasmodic attempts at development have been made, but with limited success and only a small total output.

"In British Columbia, development was commenced in 1941 of a deposit near Parson, 25 miles south of Golden, and this is now supplying a substantial part of the domestic requirements.

"Only Nova Scotia and British Columbia recorded sales of barite in 1943. The fluorspar ores of the Madoc area, Ontario, and of a deposit operated in 1942-1943 at Lake Ainslie, Nova Scotia, contain important amounts of barite. A small tonnage of handpicked barite has been stock-piled at the Lake Ainslie operation. Tests made by the Bureau of Mines, Ottawa, on ores from these two areas indicate the possibility of recovering a marketable barite by-product from them by flotation.

"The barite deposit at Walton, Nova Scotia, shows promise of proving to be one of the largest known world occurrences of the mineral. Preliminary drilling of the property indicated reserves of 1¼ million tons to a depth of 200 feet, and this tonnage was increased by further drilling in 1943 to a total of 3,000,000 tons, with one hole showing over 100 feet of barite. The deposit is being operated by Canadian Industrial Minerals, Limited (subsidiary of Springer-Sturgeon Gold Mines, 67 Yonge Street, Toronto), which to date has given chief attention to the production of a 325-mesh product for use in oil-well drilling. Shipments of crude ore have been made to the United States for use in the manufacture of lithopone and barium chemicals. The Walton barite is mostly off-colour material and rather heavily stained by iron, and is thus not suitable for the general pigment and filler trade without bleaching.

"Commercial deposits of witherite (barium carbonate), the only other ore of barium, are rare and no occurrences of economic interest are known in Canada. Most of the world supply has come from England, but in 1942 a small amount was mined in California. American imports in recent years have been running at around 3,000 to 3,500 tons a year.

"World production of barite prior to the war approximated one million tons a year, of which Germany supplied 50 per cent and the United States 30 per cent. The remainder came mainly from the United Kingdom, Italy, Greece, France, and India.

"Ground barite has a number of industrial uses, the chief of which are as a heavy, inert filler or loader in rubber, paper, oilcloth, textiles, leather, and plastics. It is one of the most important pigments and extenders in paints, and it is used extensively as a weighting material in oil drilling muds to overcome gas pressures. In the United States, 66 per cent of the ground and crushed barite sold in 1942 was used in oil-well drilling; 12 per cent in the glass industry, where it serves as a batch fluxing ingredient for moulded flint glass; and 10 per cent in the paint trade.

"For most filler and loader uses, and also for paints, barite is required to contain not less than 95 per cent barium sulphate and to have a good white colour; some off-colour material is also employed for less essential purposes. The best grades of prime white barite are produced by bleaching with sulphuric acid. A 325-mesh material is usually specified. For use in glass, barite must contain not less than 96 per cent barium sulphate, under 3 per cent moisture, and not over 0.4 per cent iron oxide, with a fineness within the range of 20 to 100 mesh. Colour is immaterial in barite for use in oil-well drilling, the requirements for which are a minimum specific gravity of 4.25 (corresponding to a barium sulphate content of 93 per cent) and a grind of 325-mesh. The Walton product more than meets this specification, having an average gravity of 4.40 and a barium sulphate content of 95-96 per cent.

"Large quantities of barite are used in the lithopone and barium chemicals trades. In 1942, consumption of barite for lithopone use in the United States was 32 per cent of the total, and for barium chemicals 23 per cent, the remaining 45 per cent representing ground material employed for oil-well drilling, paints, and general filler and loader use. Barite for use in lithopone should contain not less than 96 per cent barium sulphate and not more than 3 per cent silica and 1 per cent iron (Fe_2O_3). The ore must be crushed to not larger than $1\frac{1}{2}$ inches.

"Certain barium chemicals, notably the nitrate and carbonate, are used in making green flares, tracers, incendiary bombs, shell primers, etc., and for case-hardening of steel. Blanc fixe, or precipitated barium sulphate, is used in white paints, rubber, linoleum, and oilcloth. Barium carbonate is the principal intermediate salt used in the manufacture of other barium chemicals, particularly the peroxide and nitrate. It is also used to inhibit scumming in bricks and other heavy clay products. Barium chloride, obtained by crystallization from a solution of barium sulphide and calcium chloride, is used to purify salt brines for the manufacture of chlorine and sodium hydroxide; in coatings for photographic paper; as an extender in titanium pigments; in colour lakes; in finishing white leather, and in the purification of beet sugar. Barium hydroxide is used in the purification of beet sugar, and in refining animal and vegetable oils. Barium metal has only limited industrial uses.

"Barite is a relatively low-priced commodity. Canadian quotations for good white crude range from $7 to $10 per ton, f.o.b. mines, freight costs governing the price offered. Domestic ground barite sold in 1943 for $40 per ton, f.o.b. works, and prime white imported for $50.

"In the American market, crude barite is usually sold on a penalty-premium basis, with a content of 95 per cent barium sulphate and 1 per cent iron oxide considered as standard. A premium or penalty of 25 cents per short ton is set for each per cent of barium sulphate above or below 95 per cent, and a similar premium or penalty for each 0.1 per cent of iron oxide below or above 1 per cent. Average prices for standard crude in the American market have been showing an upward tendency in recent years, and in 1942 stood at $7.25 per ton, f.o.b. mines, with the average overall figure for all grades $6.22. Early in 1943, the Office of Price Administration authorized price increases for crude from mines in the Georgia-Tennessee field, with a ceiling at $8.50 per ton for 1943 contracts. Total United States consumption of barite in 1942 was 450,000 short tons."

Table 1 - PRODUCTION OF BARITE IN CANADA, 1913-1943

Year	Short tons	$	Year	Short tons	$
1913	641	5,410	1926	100	2,307
1914	612	6,169	1927	56	1,268
1915	550	6,875	1928	127	2,847
1916	1,368	19,393	1929	105	2,341
1917	3,490	54,027	1930	66	1,484
1918	640	10,165	1931	16	363
1919	468	8,154	1932	...	...
1920	751	22,983	1933	20	60
1921	270	9,567	1939	323	3,639
1922	289	9,537	1940	338	4,819
1923	409	8,548	1941	6,890	74,416
1924	151	3,308	1942	19,667	188,144
1925	95	2,259	1943	24,474	279,253

Table 2 - BARITE AND BLANC FIXE USED BY THE CANADIAN PAINTS, PIGMENTS AND VARNISHES INDUSTRY IN CANADA, 1931-1942

Year	Barite		Blanc Fixe (x)	
	Pounds	$	Pounds	$
1931	2,304,119	39,361	146,025	12,915
1932	2,064,303	35,158	23,353	817
1933	2,062,957	33,578	47,793	1,471
1934	2,393,330	44,690	93,918	2,481
1935	2,308,628	43,702	141,975	4,225
1936	2,533,275	41,687	97,016	3,148
1937	2,630,566	42,821	125,743	4,156
1938	2,729,212	46,288	116,545	5,287
1939	2,884,965	49,659	139,408	4,455
1940	3,281,747	71,492	99,422	3,875
1941	4,906,829	112,760	169,585	8,010
1942	6,833,584	150,927	104,948	5,328

(x) Artificial barium sulphate.

Table 3 - IMPORTS AND EXPORTS OF BARITE AND SPECIFIED COMMODITIES, 1942 and 1943

	1942		1943	
	Pounds	$	Pounds	$
Imports				
Blanc fixe	620,498	24,224	345,556	16,694
Lithopone	19,996,324	948,244	17,754,879	857,507
Barite	5,072,300	68,196	3,372,500	43,259
Exports				
Barite	— Data not shown separately in Trade Reports —			

CORUNDUM - Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the province of Ontario. Corundum mining as an industry made its appearance there in 1900 and production reached a maximum in 1906. Shipments of the mineral in Canada during the period 1900-1921 totalled 19,524 short tons valued at $2,104,251. No commercial shipments have been reported since 1921. No imports of corundum into Canada were shown in Customs reports for either 1942 or 1943. Imports of emery, in bulk, during 1943 were appraised at $78,303; imports of manufactures of emery, n.o.p., in the same period were valued at $81,984. It is interesting to note that a shipment of corundum-bearing material was made in 1943 from old mine dumps located in the Renfrew-Hastings district of Ontario; this was exported to the United States for experimental purposes.

Work has been proceeding in the Bureau of Mines, Ottawa, on the removal of the small content of corundum present in some sections of the Blue Mountain nepheline syenite deposit, located near Lakefield, Ontario, and it was found that a combination of jigging and flotation at 28-mesh was effective in reducing the corundum content to 0.134 per cent. A treatment unit, employing this method, which would provide also for the recovery of a corundum by-product, was placed in semi-commercial operation at the Rochester mill of American Nepheline Corporation during 1943.

The fine dust product resulting from the processing of Lakefield syenite has been found of service as a substitute for pumice for grinding and polishing and in the cleanser, enamelware, and heavy clay industries.

South Africa is the world's largest corundum producer and imports from that country into the United States have increased rapidly during the last few years. The material is crushed and sized, and the coarse grain products are sold to manufacturers of grinding wheels, especially snagging wheels, and the finer products to optical lens grinders.

"E & M J Metal Markets", New York, quoted corundum August, 1944—natural, per pound, size 8 to 60 inclusive, 8¾ cents; 70 to 275, 9¾ cents; 500, 30 cents; 850, 45 cents; 1000, 45 cents; 1200 to 1600, 65 cents; 2600, 70 cents.

DIAMONDS - Diamonds are not produced in Canada and requirements for stones in the Dominion are supplied entirely by imports. In 1943 imports of black diamonds for borers were appraised at $1,631,019 compared with $1,382,955 in 1942. Imports of unset white diamonds in 1943 were valued at $1,407,044 as against $957,348 in the preceding year. The "Mining Journal", London, in a review on South Africa for 1943 stated: The favourable market conditions which the diamond trade experienced in 1942 showed a considerable expansion in 1943. The total sales made by the Diamond Trading Company in 1943 were approximately £20,000,000, which constitutes a record in the history of the industry. As in 1942, the Diamond Trading Company and its associates continued to give their fullest support to the war industry, sales of industrial diamonds being somewhat in excess of £5,000,000, all of which were made at pre-war prices. In addition, the various companies operating outside the Union, which are the principal producers of industrial diamonds, have, in association with the Diamond Corporation and the Diamond Trading Company, transferred a substantial quantity of industrial diamonds to Canada, where they will be retained as a reserve stock against any emergency during the continuation of hostilities. These producers continued during 1943 to supply the allied powers with their needs of industrial diamonds.

DIATOMITE - Canadian production of diatomite during 1943 totalled 98 short tons valued at $3,331 compared with 365 tons worth $9,088 in 1942. The 1943 output comprised 82 tons produced in Nova Scotia and 16 tons in British Columbia.

"Diatomite consists of the microscopically small remains of siliceous shells of diatoms, a form of algae that at one time lived under water. The material of Recent fresh water origin, which is the most common in Canada, usually occurs as a grey or brown mud or peat, whereas the Tertiary diatomite is in more or less dry and compact beds, very light in weight and white to cream to colour.

"For many years International Diatomite Limited, Tatamagouche, Nova Scotia, has been the principal producer, but operations in the ponds near New Annan ceased in the fall of 1940. The two producers during the past 3 years were G. Wightman, from a deposit on Digby Neck, Nova Scotia; and R. L. Marsh for L. T. Fairey of Vancouver, from lot 1122 on the west bank of Fraser River, north of Quesnel in the Cariboo district, British Columbia.

"Northern Diatomite Company of Toronto started the erection of a treatment plant on its deposit south of Gravenhurst in the Muskoka district in the fall of 1942, but it was not completed. Some prospecting was done on deposits in Quebec and in British Columbia.

"In 1943 slightly more than 70 per cent of the diatomite consumed in Canada was used in the form of filter-aids, mainly in the refining of cane sugar. Eleven per cent was used for insulation, including a small amount for the slow cooling and tempering of steel parts; and the remainder was used principally as a filler in the paint, chemical, paper, rubber, soap, and textile industries, and to a small extent in silver polish bases and as an admixture in concrete. In the United States diatomite is used for blocks and pipe insulation in combination with asbestos in the naval construction program; in light weight fireproof structural sheets for minimizing fire hazards on warships; and as an extender for painting army equipment to cut down lustre.

"The price of Canadian diatomite for insulation varies from $25 to $40 and of imported diatomite for insulation and filtration from $26 to $75 per ton; for material suitable for polishes the price for small lots ranges up to $200 a ton. Imported insulation bricks vary in price from $85 to $140 per 1,000, according to grade and density." - (Bureau of Mines, Ottawa).

Table 4 - PRODUCTION OF DIATOMITE IN CANADA, 1928-1943

Year	Short tons	$	Year	Short tons	$
1928	368	8,960	1936	615	13,650
1929	429	10,330	1937	645	18,606
1930	554	15,247	1938	398	15,842
1931	1,610	32,789	1939	301	10,388
1932	1,496	29,509	1940	248	7,957
1933	1,789	36,648	1941	544	9,955
1934	1,372	54,910	1942	365	9,088
1935	825	33,140	1943	98	3,331

Table 5 - CONSUMPTION OF INFUSORIAL EARTH BY THE CANADIAN SUGAR REFINING INDUSTRY, 1932-1942

Year	Pounds	Value	Year	Pounds	Value
		$			$
1932	2,577,585	73,309	1938	4,908,597	101,473
1933	2,507,469	70,191	1939	4,819,811	105,711
1934	2,582,552	69,116	1940	4,984,362	112,369
1935	4,307,142	96,560	1941	5,545,151	138,973
1936	4,375,999	98,954	1942	3,007,180	75,295
1937	4,586,786	95,532			

Imports into Canada of diatomaceous earth or infusorial earth, ground or unground, during 1943 totalled 11,246,800 pounds valued at $184,010 compared with 8,588,500 pounds worth $155,802 in 1942.

FLUORSPAR - Canadian mine shipments of fluorspar in 1943 totalled 11,210 short tons valued at $318,424 compared with 6,199 tons worth $146,039 in 1942; of the 1943 output, 825 tons originated in Nova Scotia and 10,385 tons in Ontario.

Fluorspar is not widely distributed in Canada, and commercial deposits are restricted to a few local areas which have supplied practically all of the comparatively small production, totalling about 75,000 tons to the end of 1943. Chief centre of production has been the Madoc area, Hastings county, Ontario. In 1943 seven producers reported shipments from the Madoc district. No beneficiation, other than cobbing and picking, is practised on Madoc ores and shipments consist of screened fines sweetened with clean picked lump. Most of the activity in the Madoc field in 1943 resulted from financial assistance given by the Dominion Government in an effort to stimulate production. Interest also developed during the year in the commercial possibilities of fluorspar occurrences in the Harcourt-Wilberforce area, Haliburton county, about 50 miles north of Madoc. The only other fluorspar mined in 1943 came from the old MacKay property at Lake Ainslie, Cape Breton, Nova Scotia. In British Columbia an important deposit of fluorspar exists at the Rock Candy mine, near Grand Forks.

World production of fluorspar prior to the war averaged about 500,000 short tons annually, the United States and Germany supplying about 75 per cent of the total. The remainder came mainly from Russia, the United Kingdom, Newfoundland, France, Korea, Italy and the Union of South Africa.

Around 55 per cent of fluorspar shipments in the United States in 1943 went to the steel industry and 29 per cent to manufacturers of hydrofluoric acid. The remainder was used for ceramic purposes, chiefly in the glass industry.

"By arrangement with consumers, the price of domestic metallurgical fluorspar was set in 1942 by the Metals Controller on the following basis: $24 in U.S. funds, per short ton, f.o.b. Kentucky-Illinois mines, plus 11 per cent exchange, plus 10 per cent war exchange tax, plus freight from above field to Canadian consuming point, less freight from Canadian mine to same point, less 25 cents for each per cent CaF_2 below 85 per cent. As an example, this would work out at $36.36 per short ton for standard 85 per cent grade, f.o.b. Madoc, for shipment to Sault Ste. Marie, Ontario, or $32.38 for shipment to Hamilton, Ontario. Although revised maximum prices went into effect in the Illinois-Kentucky field in July, 1943, there was no change in the above agreement as a result of the increases. The revised prices were in the nature of premiums offered in an effort to increase production and were as follows:

	70 effective units and over	$33	per ton
65 to 70	"	$32	"
60 to 65	"	$31	"
Under 60	"	$30	"

"Glass and enamel grades call for not less than 95 per cent CaF_2, with a maximum of 2½ to 3 per cent silica and 0.12 per cent iron (Fe_2O_3). The material must be in ground form, in mesh sizes ranging from coarse to extra fine.

"Acid-grade spar has the most rigid specification, namely, a minimum of 98 per cent CaF_2 and not over 1 per cent silica. Like the ceramic grade, it must be in powder form, and most of the material supplied to both the acid and ceramic trades is a flotation concentrate. In July, 1943, the United States price for both acid and ceramic spar was raised to $37 per short ton, f.o.b. mines, an increase of $2 to $3 over the 1942 levels. There has been little or no production of these grades in Canada, so that no price has been set for them.

"It is estimated that 95 per cent of all fluorspar now being used in the United States and Canada is consumed in war industries."--(Bureau of Mines, Ottawa).

Table 6 - PRODUCTION OF FLUORSPAR IN CANADA, 1924-1943

Year	Short tons	$	Year	Short tons	$
1924	76	1,343	1935	75	900
1925	3,886	19,234	1936	75	900
1926-1928	...	...	1937	150	2,550
1929	17,870	268,120	1938	217	3,906
1930	80	1,240	1939	240	4,995
1931	40	620	1940	4,454	59,317
1932	32	464	1941	5,534	97,767
1933	75	1,064	1942	6,199	146,039
1934	150	2,100	1943	11,210	318,424

Table 7 - CONSUMPTION OF FLUORSPAR IN CANADA, BY USES, AS REPORTED TO THE ANNUAL CENSUS OF INDUSTRY, 1941 and 1942

Industry	1941		1942	
	Quantity	Cost at works	Quantity	Cost at works
	Tons	$	Tons	$
Steel furnaces	17,054	366,701	20,133	562,480
Chemicals (acids, alkalies and salts) ..	12,360	394,833	21,689	684,194
Glass	185	7,984	231	10,273
Ferro-alloys	539	14,659	853	21,203
Enamelling and glazing	153	6,120	103	4,120
TOTAL ACCOUNTED FOR	30,291	790,297	43,009	1,282,270

Table 8 - IMPORTS OF FLUORSPAR INTO CANADA, 1929-1943

Year	Tons	$	Year	Tons	$
1929	12,092	159,798	1937	11,444	158,082
1930	12,651	160,995	1938	15,057	212,131
1931	3,216	31,257	1939	16,322	258,796
1932	1,009	22,965	1940	30,312	628,719
1933	2,219	21,165	1941	26,539	567,656
1934	7,220	56,628	1942	47,784	1,046,526
1935	11,591	92,775	1943	77,436	1,738,669
1936	11,194	95,268			

GARNETS - There were no commercial mine shipments of garnet in Canada during 1943. In 1942 some 17 tons of crude garnet rock valued at $176 were shipped to the United States for experimental purposes; the mineral was obtained from a deposit located in Dana township near River Valley, about fifty miles northwest of North Bay, Ontario.

Commercial garnet belongs to a group of complex silicate minerals of which almandite, the brownish-red iron-aluminum silicate is generally considered the hardest and best as an abrasive. Garnet is a rather common mineral constituent of certain rocks distributed throughout the Dominion and it usually occurs as a garnetiferous-gneiss, large areas of which are known in parts of Ontario and Quebec. Garnet, crushed and suitably graded as to size, is used for making abrasive-coated papers and cloth. The specifications for garnet for use in the making of high-quality abrasives are somewhat exacting. The individual crystals should be clear and free from embedded impurities and from minute fractures. They should be of a deep wine-red colour and not smaller than pea size, walnut size or larger being preferable. The deposit should be extensive and the garnet content not less than 25 per cent. It should also be close to rail transportation and industrial centres. About 80 per cent of the world output of garnet comes from the United States. Canadian consumption of prepared garnet grain suitable for "sand paper" manufacture has decreased and is now less than 200 tons annually.

The price in the United States of the best-quality concentrate from which grain is prepared for abrasive papers and cloths ranges from $65 to $80 a ton f.o.b. mines and of graded grain, $90 a ton. Canadian prices of crushed garnet rock for sand-blasting were $7 to $10 a ton in 1942, but none was sold in 1943.

Crude garnet ore or ungraded mixed concentrate enters the United States duty free, the duty on grain graded into separate sizes and specially prepared garnet being one cent a pound.

GRAPHITE - Production of graphite in Canada in 1943 continued to be confined to the old-established Black Donald mine at Whitefish Lake, near Calabogie, Renfrew county, Ontario, which now has a record of 35 years of operation. The output during the year under review totalled 1,903 tons valued at $197,451 compared with 1,192 tons worth $117,904 in 1942. The following information is from a report "Graphite in 1943" as prepared by the Bureau of Mines, Ottawa:

"Flake graphite is widely distributed in the Archaean gneisses and crystalline limestones of western Quebec and eastern Ontario, and this region formerly supported a somewhat extensive graphite industry; but growing dependence on Madagascar as a source of supply, more especially of high-grade crucible flake, led to a gradual closing down of operations, and all of the plants except that of the Black Donald Company were dismantled many years ago.

"In 1942, owing to the possibility of supplies from Madagascar being cut off, renewed investigation of deposits in Canada was encouraged and surface stripping was done by established mining companies on some of the discoveries that were made, with a view to possible development. Various properties, including old idle mines, were examined by the Bureau of Mines and the Metals Controller, Ottawa, in company with representatives of the United States War Production Board, and several sample shipments were tested by the Bureau of Mines. The threatened emergency was averted by the British occupation of Madagascar, and it was not found necessary to take further steps to encourage interest in the development of a Canadian supply. Ore reserves at many of the old properties are believed to be considerable, and could probably be used in an emergency, though this would entail the erection of new mills, or possibly of a central custom mill, to treat the ore.

"World production of natural graphite of all grades and including flake, crystalline (plumbago) and amorphous, averaged about 140,000 short tons a year prior to the present war. Madagascar, Germany, Austria and Czechoslovakia were the principal producers of flake graphite; Ceylon of crystalline; and Mexico and Korea of the amorphous variety. The United States obtains most of its requirements of graphite from Madagascar and Ceylon, but there was a production of flake in 1943 from Alabama, Texas, and Montana; of low-grade amorphous graphite from Nevada and Michigan; and of anthracite-graphite (so-called "sea-coal") from Rhode Island.

"Graphite has many uses in industry, but is employed principally in foundry facings, lubricants, crucibles, retorts and stoppers, packings, pencils and crayons, paints, and stove polish. Dry batteries, electrodes, and commutator brushes use important quantities, mostly amorphous or artificial.

"Canadian graphite requirements are principally for the foundry, dry battery, packings, lubricants, and paint trades. Foundry needs are met in part by domestic (Black Donald) production, and in part by imported Ceylon plumbago. The battery trade uses mainly Mexican amorphous; and paint requirements are filled largely by low-grade amorphous and flake.

"Prices showed little change in 1943 from those of the previous year. Average quotations in the American market were as shown below. Ceylon graphite, which is marketed in a considerable range of types and qualities, sold as follows: crude lump, 97 per cent carbon, 15 cents per pound; high carbon lump, 85 to 98 per cent, 10 to 13 cents; chip, 85 to 90 per cent, 11 to 12½ cents; crystalline dust, 65 to 80 per cent, 6½ to 9 cents; flying dust, 55 to 80 per cent, 4½ to 8 cents; carbon dust, 55 to 60 per cent, 4 to 5 cents. Madagascar crucible flake, 85 per cent carbon and up, was nominal, under allocation control, at 10 to 11 cents. Domestic lubricating flake, 90 per cent plus, sold at 15 to 20 cents, and domestic fine flake, 65 to 70 per cent, for use in the manufacture of foundry facings, at 4½ cents. Metals Reserve Company prices, per pound, for domestic flake, were as follows: No. 1A, 14 cents; No. 1, 13 cents; No. 1B, 12 cents; No. 2, 11 cents; No. 3, 7 cents; No. 4, 5 cents. Mexican amorphous, 80 to 90 per cent carbon, crude lump, sold for $20 per ton, f.o.b. Sonora, and powdered, for 4 to 6 cents per pound.

"At the beginning of the year, all graphite was placed in Group 1 (supply insufficient for war and essential industrial needs) of the list of materials in critical supply issued by the Conservation Division of the United States War Production Board.

"Canadian exports of milled products in 1943 were valued at $42,987, compared with $58,572 in 1942. Imports of unmanufactured graphite were valued at $23,773; of manufactured, at $286,583; and of graphite crucibles at $191,296. Exports of Canadian graphite and graphite products have been subject to

special export license, since January, 1941."

Table 9 - MINE PRODUCTION (SALES) OF GRAPHITE IN CANADA, 1931-1943

Year	Short tons	$	Year	Short tons	$
1931	548	32,149	1938	(x)	41,590
1932	346	18,483	1939	(x)	61,684
1933	405	18,367	1940	(x)	94,058
1934	1,518	71,424	1941	(x)	132,924
1935	1,782	79,781	1942	1,192	117,904
1936	(x)	88,812	1943	1,903	197,451
1937	(x)	125,343			

(x) Not available for publication.

Table 10 - CONSUMPTION OF GRAPHITE OR PLUMBAGO IN CANADA, BY INDUSTRIES, AS REPORTED TO THE CENSUS OF INDUSTRY, 1941 and 1942

Industry	1941		1942	
	Quantity	Cost at works	Quantity	Cost at works
	Short tons	$	Short tons	$
Paints and varnishes	85	9,416	103	11,855
Polishes	40	4,466	39	5,020
Foundries	367	53,406	410	59,874
Acids and salts	74	32,345	114	34,582
Prepared foundry facings	583	41,516	316	19,108
TOTAL ACCOUNTED FOR	1,149	141,149	982	130,439

GRINDSTONES AND SHARPENING STONES - Production of grindstones and sharpening stones in Canada during 1943 totalled 164 short tons valued at $6,225 compared with 216 tons worth $10,000 in 1942. Comprising the 1943 output were 2 tons of sharpening stones valued at $225 and 162 tons of grindstones worth $6,000. There was no production of pulpstones in 1943. The production of both grindstones and sharpening stones during the year under review came entirely from the quarries of the Read Stone Company, located near Stonehaven, New Brunswick.

Material suitable for these stones occurs in certain sandstone beds in Nova Scotia, New Brunswick, and on the coast of British Columbia. Many years ago the output was considerable, but most of the known beds have been depleted and the demand for natural stones has decreased.

The large-size Canadian grindstones are used mainly for sharpening pulp-mill and tobacco knives; and in the United States in the file, machine-knife, granite tool, and sheer manufacturing industries. The small stones are used for grinding scythes and axes. Because of the competition from the artificial grinding wheel and from foreign natural stones, production of grindstones from quarries continues to decline.

Good pulpstones are in demand, particularly for use in the large magazine grinders, but known Canadian deposits containing thick beds of sandstone of the proper quality appear to have been worked out and production has ceased. There is also an increasing competition from Canadian-made artificial segmental pulpstones, mainly of silicon carbide grit, and about 620 of these stones are in use and in stock in the various Canadian pulp mills. The imported natural pulpstones come mainly from West Virginia.

Canadian trade reports show the following imports in 1943: grinding wheels, $493,247; grinding stones, $115,561; grindstones, 36 inches or over, $64,731 and grindstones n.o.p. $2,266.

Table 11 - PRODUCTION OF GRINDSTONES, PULPSTONES AND SCYTHESTONES IN CANADA, 1931-1943

Year	Tons	$	Year	Tons	$
1931	621	38,103	1938	306	16,198
1932	328	15,755	1939	304	15,278
1933	498	21,919	1940	341	14,543
1934	987	46,478	1941	188	11,500
1935	708	34,010	1942	216	10,000
1936	569	24,724	1943	164	6,225
1937	412	21,429			

Table 12 - PRODUCTION OF NATURAL ABRASIVE STONES, BY KINDS, 1943

	Pulpstones		Sharpening Stones		Grindstones	
	Tons	$	Tons	$	Tons	$
Nova Scotia	...	...	...	...	...	...
New Brunswick	...	...	2	225	162	6,000
CANADA	...	...	2	225	162	6,000

Table 13 - CONSUMPTION OF PULPSTONES BY THE CANADIAN PULP AND PAPER INDUSTRY, 1931-1943

Year	Number for 2 ft. wood	Value	Number for 2.5 ft. wood	Value	Number for 4 ft. wood	Value
		$		$		$
1931	226	72,588	225	71,760	285	337,580
1932	210	65,450	139	46,436	222	249,373
1933	321	98,475	95	31,945	199	223,635
1934	378	103,811	84	29,680	268	292,359
1935	417	116,501	52	20,297	237	243,805
1936	463	120,227	61	19,478	253	281,265
1937	392	123,598	84	21,700	280	382,084
1938	306	92,822	37	13,351	186	238,488
1939	242	60,622	60	22,443	203	238,620
1940	311	96,957	110	49,899	163	257,628
1941	295	127,349	77	35,843	97	215,913
1942	237	100,466	53	23,898	94	208,986
1943	197	102,888	54	20,000	66	151,411

KYANITE - Kyanite is usually a rock-forming mineral, and only rarely does it occur in large monomineralic masses as segregations in quartz-kyanite gneiss or schist. Indian kyanite is the most popular at the present time; the production in India commenced in 1924 and amounted to 24,787 tons in 1936. The mineral also occurs in Nyasaland, British East Africa and Western Australia.

The leading andalusite mine in the world is operated by Champion Sillimanite, Inc., in the White Mountains, California; this company is a subsidiary of the Champion Spark Plug Co., Detroit, Mich.

None of the minerals, kyanite, sillimanite or andalusite are commercially mined in Canada at the present time and any imports of these minerals into Canada are not shown separately in the Canadian Customs classification. "Metal and Mineral Markets", New York, October, 1944, quoted kyanite--per ton f.o.b. point of shipment, crude, $19; 35 mesh, $37.50; glass grade $40 nominal.

LITHIUM MINERALS - Lithium minerals were mined intermittently on a small scale in Manitoba between 1926 and 1937, but there has been little activity since. The last recorded shipment was made in 1937 and was valued at $1,694.

Amblygonite, spodumene, and lepidolite are the chief lithium minerals of commerce, with spodumene in greatest supply, and their ores usually contain, respectively, about 8, 6 and 4 per cent of lithium oxide. The known Canadian occurrences of these minerals of present economic interest are confined to Manitoba, where there is a considerable development of lithium-bearing pegmatites, notably in the Pointe du Bois area in the southeastern part of the province. This district has furnished all of the small Canadian production, amounting to a few hundred tons, the material shipped being mainly spodumene.

Increased interest was evidenced in the commercial possibilities of Manitoba's lithium deposits in 1942 and 1943.

The high-lithia minerals amblygonite and spodumene are used chiefly in the production of lithium chemicals and metal. The principal use of lepidolite is as a batch constituent in the making of opal and heat-resistant glass, and increasing amounts are now employed in glass for electronic tubes and boiler gauges. In recent years, spodumene has been receiving increasing attention as a ceramic raw material. Spodumene is rather refractory, but spodumene-feldspar mixtures have lower melting points than has feldspar alone. The objectionable high thermal expansion of spodumene can be overcome by calcining and converting it to the stable "beta" form, as is done in the so-called decrepitation process for the recovery of

spodumene in the form of fine powder from rock consisting of intimate mixtures of spodumene and quartz, or of spodumene and feldspar. The mineral appears to have possibilities for use in pottery bodies, glazes and enamels, where it would replace more costly prepared lithium carbonate, provided that it can be obtained in standard grade of the required purity. Lepidolite is highly effective as a fluxing addition in high-talc bodies. Amblygonite is of value for use in opaque glasses.

Lithium is the lightest of the metals, having a specific gravity of only 0.53. A wide range of master alloys of lithium with calcium, silicon, brass, copper, manganese, zinc, lead, tin, magnesium, and aluminium has been developed in the United States.

There are no plants in Canada for the chemical treatment of lithium ores. Most of the world production marketed prior to the war was treated by a few large chemical firms specializing in the business, the principal plants being in the United States, Great Britain, Germany, and France. Such firms usually purchased their requirements under individual contract and there has thus been little in the way of an open market, price quotations given in trade journals being merely nominal. Such of the larger consumers own and operate their own mines.

Prices of lithium minerals in 1943 showed little change from those of the previous year. Amblygonite was quoted at $40 to $50 per ton, f.o.b. mines, for crude containing 8 to 9 per cent Li_2O; spodumene, 6 per cent grade, sold for $5 to $6 per unit, nominal, for mill concentrate in carload lots, f.o.b. North Carolina; lepidolite, crude lump, brought $24 to $25, f.o.b. mines. Price of lithium metal, 98 to 99 per cent, continued unchanged at $15 per pound in 100-pound lots, and the various master alloys of lithium sold at $0.50 to $8 per pound, in ton lots. Prices of the leading lithium chemicals, all under allocation, were $1.25 for the carbonate and hydroxide, $1.65 for the chloride, and $2.45 for the fluoride.

MAGNESITIC DOLOMITE (including Brucite) - Canadian production of magnesitic dolomite, including brucite granules totalled $1,260,056 in 1943 compared with $1,059,374 in 1942. The following information has been supplied by the Bureau of Mines, Ottawa:

"Magnesitic dolomite consisting of an intimate mixture of magnesite and dolomite is quarried at Kilmar and at Harrington East, Argenteuil county, Quebec, and is processed for use as refractory materials. Products at present marketed include caustic calcined magnesitic dolomite, dead-burned or grain materials, bricks and shapes (both burned and unburned), finely ground refractory cements, and, in combination with chrome, the dead-burned material is used as an ingredient in certain other types of refractory. Magnesia products made in Canada from imported magnesite and magnesia include fused magnesia (artificial periclase), optical periclase, and "85 per cent magnesia" pipe covering.

"Large deposits of magnesite containing considerable silica and alumina occur in British Columbia near Marysville, between Cranbrook and Kimberley. They are owned by Consolidated Mining and Smelting Company of Canada, Limited, and experimental work to remove the silica and alumina by flotation has been done, but there has been no commercial production to date. A number of other deposits of magnesite are known in British Columbia and Yukon, but either because of their limited extent or remoteness from transportation they are not of commercial importance at present.

"Deposits of earthy hydromagnesite occur in British Columbia near Atlin and Clinton, and at various times some have been worked on a small scale, but there has been no production in recent years.

"Brucite (magnesium hydroxide) in the form of granules thickly disseminated through a matrix of crystalline limestone occurs in large deposits at Rutherglen, Ontario, and at Bryson and Wakefield in the province of Quebec. By a process developed in the Bureau of Mines laboratories, Ottawa, it is possible to recover these brucite granules in the form of magnesia of a high degree of purity and to have hydrated lime as a co-product. A plant using this process is now in operation near Wakefield, Quebec. The granular magnesia produced is at present used mostly for making basic refractories, and for making a special grade of paper.

"Magnesite is available in many countries; Russia is probably the world's greatest producer of magnesite, but almost all is for domestic use.

"Magnesite is usually calcined before shipment and the resultant magnesia is used for the making of refractory products to withstand extremely high temperatures, for making oxychloride cement, and for magnesium metal. It is also the basis of a number of magnesium salts and has many minor uses. The world-wide demand for magnesium metal has greatly stimulated interest in deposits of magnesite. Although until 5 years ago almost all the world's magnesium was made from magnesium chloride brine and from waste water used in treating potash minerals, magnesite is now an important source of this light metal in continental Europe, England, and the United States.

"Brucite is much less common than magnesite. The only deposits being worked commercially are in Canada and the United States. The magnesia obtained by calcining brucite may be used for the same purposes as that obtained from magnesite and also has some special applications of its own."

Table 14 - PRODUCTION OF MAGNESITIC DOLOMITE (CALCINED) IN CANADA, 1930-1943

Year	Tons	Value	Year	Tons	Value
		$			$
1930	13,336	336,162	1937	(a)	677,207
1931	11,411	295,579	1938	(a)	420,261(✓)
1932	(a)	262,860	1939	(a)	474,418
1933	(a)	360,128	1940	(a)	897,016
1934	(a)	382,927	1941	(a)	851,041
1935	(a)	486,084	1942	(a)	1,059,374(b)
1936	(a)	768,742	1943	(a)	1,260,056

(✓) Represents value of magnesite (dead-burned, etc.) only, whereas the values for years immediately preceding include the value of some end products containing imported material; for this reason the 1938 to 1943 values are not entirely comparable with those for preceding years.
(a) Not available for publication.
(b) 1942 and following years include the value of brucite shipped.

Table 15 - MAGNESITE AND DOLOMITE USED IN THE CANADIAN PRIMARY IRON AND STEEL INDUSTRY, 1931-1942

Year	Calcined Dolomite (b)		Dolomite, crude		Magnesite	
	Short tons	Value	Short tons	Value	Short tons	Value
		$		$		$
1931	...	...	15,773	76,517	(a)	(a)
1932	...	...	6,725	32,523	420	14,500
1933	...	...	6,874	30,557	399	14,798
1934	...	...	14,748	69,104	2,733	105,072
1935	...	...	18,394	79,914	3,891	149,987
1936	...	...	43,562	145,502	6,432	230,656
1937	...	...	53,066	181,146	8,994	326,091
1938	...	...	40,540	137,127	9,219	356,811
1939	14,858	99,838	40,592	78,904	11,401	351,680
1940	21,949	136,360	59,284	123,429	13,673	506,032
1941	21,608	160,602	71,087	159,057	18,127	682,742
1942	22,550	179,427	79,091	225,393	20,665	786,521

(a) Information not available.
(b) Included with crude dolomite prior to 1939.

Relatively large quantities of magnesite or magnesium refractories are also used in the smelting of non-ferrous ores but complete data relating to this consumption are not yet available.

Table 16 - CALCINED MAGNESITE USED BY THE ARTIFICIAL ABRASIVE AND ABRASIVE PRODUCTS INDUSTRY IN CANADA, 1933-1942

Year	Tons	Value	Year	Tons	Value
		$			$
1933	(x)	16,430	1938	...	...
1934	104	6,370	1939	121	7,755
1935	40	2,448	1940	302	19,331
1936	418	25,256	1941	809	77,508
1937	484	29,242	1942	398	58,648

(x) Information not available.

Prices of calcined magnesite in 1943 f.o.b. Montreal or Toronto, as quoted by Canadian Chemistry and Process Industries, were $70 to $90 a ton. This price has continued since November, 1939 when the price rose from the $48 to $60 range that had prevailed for more than a year previously.

Trade reports show the following imports into Canada during 1943: magnesite firebrick, $1,111,754; crude magnesite rock, 82,000 pounds valued at $1,583; dead-burned magnesite, 15,897,200 pounds valued at $365,080; magnesite for insulating material, 1,237,100 pounds at $40,536; magnesia pipe covering, $249,634; magnesium carbonate for rubber, 860,007 pounds, $47,068; magnesium oxide, 1,900,513 pounds, $180,039.

Exports from Canada during 1943 included 792 tons calcined magnesite valued at $16,398 and 8,610 tons of dead-burned refractories worth $94,578.

MAGNESIUM SULPHATE - There were no commercial mine shipments of natural magnesium sulphate in 1943; in 1942 production totalled 1,140 short tons valued at $38,760, the mineral being obtained in that year from deposits located about 14 miles from Ashcroft in British Columbia.

The following information is from a report prepared by the Bureau of Mines, Ottawa:

"Natural hydrous magnesium sulphate (Epsom Salts or Epsomite) occurs in deposits in lake bottoms or in solution in brine lakes in British Columbia. In Saskatchewan, it is found associated with sodium sulphate. Attempts have been made to produce refined salts, and a number of years ago there was a considerable production from several of the "lakes" in British Columbia, and experimental shipments have been made from one of the lakes in Saskatchewan.

"Canada's output of magnesium sulphate has come chiefly from a deposit in Basque, British Columbia, production from which was discontinued in the autumn of 1942. The salt was refined at Ashcroft, 15 miles south of the deposit and the grade of the product was high. The refinery, owned by Ashcroft Salts Company, Limited, was dismantled in 1943. There are a number of other occurrences in British Columbia, near Clinton, north of Kamloops, and in Kruger's Pass, south of Penticton.

"In Saskatchewan, two lakes south of Wiseton contain brines high in magnesium sulphate, and Muskiki Lake, just north of Dana, contains brine high in magnesium and sodium sulphate, which at certain times of the year, crystallizes into a bedded deposit with layers of both salts.

"In the chemical industries, Epsom salt has many uses. It is employed for tanning and in dyeing, and for textile and medicinal use. Magnesium sulphate is used in the paper industry for weighting paper. In the sole leather industry it is used to obtain a clean shiny cut, and it also helps to retain moisture in the leather and increases its weight. Magnesium salt is used to a small extent in the dyeing industry. In some cases it is used in the after treatment of leather to increase the fastness of the colour in washing. It is used extensively and in large quantities in medicine and for various purposes in the manufacture of textiles. In bleaching wool, magnesium sulphate is added to destroy the corrosive effect of sodium peroxide. It is also used for weighting textile fabric, especially silk. Mixed with gypsum and ammonium sulphate it is used in the manufacture of non-inflammable fabrics.

"Prices for Epsom salts remained steady, due to the discontinuance of supplies from European countries, hitherto the main sources of supply. Quotations for the technical grade, as given by Canadian Chemistry and Process Industries for Toronto or Montreal delivery, ranged from $63.00 to $65.00 per short ton in bags, whereas the B.P. material was quoted at $3.60 per barrel throughout the year."

Imports of magnesium sulphate or Epsom salts into Canada during 1943 totalled 6,757,551 pounds valued at $137,372 compared with 3,376,767 pounds worth $68,532 in 1942.

Table 17 - PRODUCTION OF NATURAL MAGNESIUM SULPHATE IN CANADA (x), 1935-1943

Year	Tons	Value	Year	Tons	Value
1935	540	7,965	1939	550	9,900
1936	654	13,712	1940	...	...
1937	727	14,456	1941	265	7,343
1938	470	9,400	1942	1,140	38,760
			1943	...	...

(x) Produced entirely in British Columbia.

Table 18 - MAGNESIUM SULPHATE USED IN CANADIAN PHARMACEUTICAL PREPARATIONS AND IN TANNING, 1935-1942

Year	Pharmaceutical Preparations		Tanning	
	Pounds	Value	Pounds	Value
		$		$
1935	826,082	22,647	759,744	12,254
1936	878,120	23,162	1,115,965	15,120
1937	919,825	23,881	992,205	16,165
1938	855,547	23,687	1,272,549	14,153
1939	830,927	24,091	1,139,670	17,808
1940	925,948	31,554	1,646,217	34,242
1941	1,043,110	35,389	1,508,824	43,400
1942	1,077,601	38,352	1,782,479	45,956

MINERAL WATERS - Shipments of natural mineral waters from Canadian springs in 1943 totalled 139,611 gallons valued at $67,541 compared with 157,085 gallons worth $74,505 in 1942.

Production during both years originated in Ontario and Quebec. Some of the more prominent Canadian mineral waters possessing special therapeutic or hygienic properties include the following: in Quebec, the Abenakis springs on the St. François river in Yamaska county; Potton Springs in Brome county and the Colombia spring at L'Epiphanie. In Ontario, saline, sulphur and gas springs occur at Caledonia Springs and at Carlsbad Springs, near Ottawa; the waters range from alkaline to strongly saline. St. Catharines, near Niagara, is one of the oldest Canadian mineral water resorts and sulphur waters are found at the Preston mineral springs in Waterloo county. The most famous of all Canadian springs is undoubtedly the group of hot sulphur springs at Banff, Alberta. In British Columbia the Harrison Hot Springs in the Fraser Valley and the Halcyon Hot Springs on Arrow Lake are noted for their curative properties.

The total number of firms reporting production of natural mineral waters in the Dominion was 17 in 1943, of which 12 were located in the province of Quebec and 5 in Ontario.

Table 19 - SHIPMENTS OF NATURAL MINERAL WATERS FROM CANADIAN SPRINGS, 1931-1943

Year	Quebec		Ontario		CANADA	
	Imp.gal.	$	Imp.gal.	$	Imp.gal.	$
1931	19,868	4,746	197,540	8,578	217,408	13,324
1932	15,506	4,697	61,208	2,473	76,714	7,170
1933	9,024	3,094	29,794	2,347	38,818	5,441
1934	75,665	16,116	21,775	1,622	97,440	17,738
1935	126,616	15,113	19,900	1,477	146,516	16,590
1936	131,186	17,399	23,100	1,117	154,286	18,516
1937	198,319	19,697	26,700	889	225,019	20,586
1938	159,893	19,033	28,416	2,586	188,309	21,619
1939	104,629	17,503	19,140	1,602	123,769	19,105
1940	109,025	18,466	31,638	2,426	140,663	20,892
1941	144,441	58,062	36,623	14,469	181,064	72,531
1942	129,062	60,316	28,023	14,189	157,085	74,505
1943	125,605	61,793	14,006	5,748	139,611	67,541

PHOSPHATE (Apatite) - Shipments of apatite from Canadian mines in 1943 totalled 1,451 short tons valued at $18,385 compared with 1,264 short tons worth $17,431 in 1942; of the 1943 output, 1,050 tons worth $14,272 came from properties located in the province of Quebec and 401 tons valued at $4,113 from Ontario. The following information is from a report prepared by the Bureau of Mines, Ottawa:

"All of the phosphate produced in Canada consists of apatite, a common associate of phlogopite mica occurring in the Precambrian crystalline pyroxenites of adjacent sections of southwestern Quebec and eastern Ontario. Since about 1900, the mining of straight apatite has been on a limited scale and a large part of the mineral sold has been by-product material from mica mines. Since the commencement of the present war, there has been a slight revival of interest in the production of apatite and several of the larger old mines, mainly in Quebec, have produced small tonnages. The largest total annual output from these recent operations has been only 2,487 tons (in 1941), but this exceeded the production in any other year since 1900.

"For many years, Electric Reduction Company, Buckingham, Quebec, has purchased most of the apatite produced, for use in the production of elemental phosphorus and various phosphorus compounds. Canadian Refractories Ltd., Kilmar, Quebec, also are in the market for small tonnages.

"Sedimentary phosphate rock occurs in Canada in beds of Carboniferous and Permo-Jurassic age along the Rocky Mountains divide, notably in the Crowsnest area. The rock, however, is rather low-grade and is not considered to be of present economic interest. An attempt to develop the deposits in the Crowsfeet-Michel area was made about ten years ago by Consolidated Mining and Smelting Company, as a source of phosphate for its Trail fertilizer plant, but the project was abandoned in favour of higher-grade rock obtained from Garrison, Montana. Eastern Canadian plants using phosphate for fertilizer or other purposes employ mainly Florida rock.

"No form of beneficiation of Canadian apatite has ever been employed other than picking and cobbing, and the shipping product has consisted of picked crude lump, sometimes mixed with screened mine and cobbing fines. The average grade is comparatively low and often erratic, commonly ranging from about 60 to 70 per cent tricalcic phosphate. The usual impurities are calcite, iron sulphide, pyroxene, mica, and other silicate minerals.

"In this connection, it should be noted that although Canadian apatite reserves, doubtless, are substantial, the deposits tend to be erratic and pockety, and are incapable of supplying more than a small fraction of domestic requirements for phosphate, which amount to about 250,000 tons annually. Total production since the inception of mining in 1870 is estimated at about 350,000 tons.

"Phosphate is used chiefly for the manufacture of superphosphate fertilizers. It is used also in the manufacture of phosphoric acid and its derivatives; phosphorus; ferrophosphorus; in stock and poultry feeds; as fertilizer filler; as a calcined phosphate addition in pig iron blast furnaces; and for direct application to soils.

"Total world reserves of phosphate have been estimated to be in excess of 26 billion tons, of which about half is in the United States, one-third in Russia, and one-eighth in North Africa, with the remainder scattered over Oceania, South America, and Asia.

"Purchase price basis for Canadian apatite remained at $16 per short ton for 80 per cent material, with a penalty or premium of 20 cents per unit below or above that figure. The average price of imported Florida phosphate, laid down, during 1943 was about $17.50 per long ton for 73 per cent grade."

Phosphate prices were quoted by "E & M J Metal and Mineral Markets", New York, October, 1944, as follows: per long ton f.o.b. mines, Florida pebble, 77 to 76 per cent, $5.20; 75 to 74 per cent, $4.20; 72 to 70 per cent, $3.20; 70 to 68 per cent, $2.60 and 68 to 66 per cent, $2.20.

Canadian imports of phosphate rock during 1943 totalled 260,846 tons valued at $1,085,080 compared with 271,372 tons worth $1,053,229 in 1942.

Table 20 - PRODUCTION OF PHOSPHATE IN CANADA, 1929-1943

Year	Short tons	$	Year	Short tons	$
1929	1,185	5,380	1937	100	900
1930	40	760	1938	208	1,886
1931	...	...	1939	157	1,712
1932	1,516	12,333	1940	358	4,039
1933	2,214	5,475	1941	2,487	33,376
1934	81	683	1942	1,264	17,431
1935	186	1,103	1943	1,451	18,385
1936	525	4,927			

Table 21 - PHOSPHATE ROCK AND SUPERPHOSPHATE USED IN THE MANUFACTURE OF CANADIAN FERTILIZERS, 1931-1943

Year	Superphosphate		Phosphate Rock	
	Short tons	$	Short tons	$
1931	51,639	595,789	48,373	395,547
1932	36,005	366,462	41,114	316,518
1933	59,443	657,123	21,961	164,614
1934	73,182	839,980	48,007	396,133
1935	86,701	986,674	74,507	610,118
1936	97,515	1,103,222	60,924	438,948
1937	137,801	1,661,243	101,704	726,572
1938	180,243	2,193,699	102,125	765,816
1939	174,989	2,026,293	96,319	711,508
1940	175,045	2,175,615	143,667	1,262,847
1941	143,420	1,719,674	156,038	1,573,165
1942	177,421	2,748,290	207,842	2,253,517
1943	— Not available —		226,350	2,528,062

SILICA BRICK - The production of silica brick in Canada during 1943 totalled 4,165 M valued at $295,505 compared with 4,273 M worth $263,006 in 1942. The manufacture of these refractories was confined, in both years, to the plants of the Dominion Steel and Coal Company, Ltd., at Sydney, Nova Scotia, and the Algoma Steel Corporation, Ltd., Sault Ste. Marie, Ontario. The brick manufactured by both of these companies are processed from crushed silica rock and are utilized in furnace construction and repairs.

Table 22 - PRODUCTION OF SILICA BRICK IN CANADA, 1928-1943

Year	M	$	Year	M	$
1928	3,224	155,502	1936	2,393	97,285
1929	3,951	173,581	1937	3,744	181,126
1930	2,418	97,379	1938	1,788	100,403
1931	900	35,746	1939	2,493	124,807
1932	93	4,304	1940	3,438	182,786
1933	636	23,185	1941	4,111	238,433
1934	2,528	85,945	1942 (x)	4,273	263,006
1935	2,461	96,194	1943	4,165	295,505

(x) Largest annual output.

SODIUM CARBONATE - Production of natural sodium carbonate in Canada during 1943 totalled 468 short tons valued at $5,148 compared with 256 tons worth $2,048 in 1942. The output in both years came entirely from deposits located in the province of British Columbia.

Deposits of natural sodium carbonate in the form of "Natron" (sodium carbonate with 10 molecules of water) and also as brine, occur in a number of "lakes" throughout the central part of British Columbia, chiefly in the Clinton mining division near 70 mile House about 20 miles northeast of Clinton, and in the neighbourhood of Kamloops. Since 1921 there has been a small intermittent production from several of these deposits; and the production is marketed in Vancouver for use in the manufacture of soap.

Sodium carbonate, or "soda ash", has many industrial uses, such as in the manufacture of glass and soap, in the purification of oils and of bauxite for the production of aluminium, and in the flotation of minerals. Owing to technical advances, the use of soda ash in the glass industry continued to grow. The next largest use of sodium carbonate is in the production of sodium hydroxide or caustic soda. An interesting new use for sodium carbonate is in the manufacture of "synthetic salt cake" anhydrous sodium sulphate). Considerable quantities of soda ash are also consumed in the smelting of iron ores.

The price of "soda ash" in 1943 as reported by Canadian Chemistry and Process Industries remained at $2.00 per bag of 100 pounds throughout the year.

Imports into Canada of soda ash or barilla in 1943 totalled 70,557 short tons valued at $1,213,818 compared with 65,589 tons worth $1,540,247 in 1942.

Table 23 - PRODUCTION OF SODIUM CARBONATE (NATURAL) IN CANADA, 1930-1943

Year	Tons	$	Year	Tons	$
1930	364	4,550	1937	286	2,574
1931	712	7,351	1938	252	2,268
1932	495	5,450	1939	300	2,400
1933	559	5,773	1940	220	1,760
1934	244	1,920	1941	186	1,488
1935	242	2,430	1942	256	2,048
1936	192	1,677	1943	468	5,148

SODIUM SULPHATE (Glauber's Salt and Salt Cake) - Commercial shipments of natural sodium sulphate in 1943 from Canadian deposits totalled 107,121 short tons valued at $1,025,151 as compared with the all-time high of 131,258 tons worth $1,079,692 in 1942. The production in both years came from deposits located in the province of Saskatchewan. The mineral occurs as crystals or in the form of high concentrated brines in many lakes throughout Western Canada. Investigations of the sodium sulphate deposits of Western Canada was started by the Bureau of Mines, Ottawa, in 1921, and over 120,000,000 tons of hydrous salts was proved in the few deposits examined in detail. The operating plants in Western Canada are capable of producing over 900 tons of dried salts a day, and if necessary the tonnage could be greatly increased. Complete data on the world production of salt cake are not available; Germany, before the war, was probably the largest producer of total salt cake and Canada was among the first ten producers. Canada is, however, one of the largest producers of salt cake from natural deposits. Glauber's salt is used widely in the chemical industries, and the demand is increasing. Sodium sulphate is used extensively in the pulp and paper, glass, dye, and textile industries, and to a smaller extent for medicinal purposes and for tanning. It is also used extensively in the smelting of nickel-copper ores for the separation of these metals.

The price for natural anhydrous sodium sulphate from deposits in Western Canada ranged from $9 to $10 per short ton f.o.b. plant.

In 1943 Canada imported 11,903 short tons of crude sodium sulphate (salt cake) valued at $150,496 compared with 7,071 tons worth $85,479 in 1942. Imports of Glauber's salt in 1943 totalled 1,132,033 pounds valued at $16,399. Data relating to exports of sodium sulphate are not shown separately in Canadian trade reports.

Table 24 - PRODUCTION OF NATURAL SODIUM SULPHATE (x) IN CANADA, 1930-1943

Year	Short tons	$	Year	Short tons	$
1930	31,571	293,847	1937	79,804	617,548
1931	44,957	421,097	1938	63,009	553,307
1932	22,466	271,736	1939	71,485	628,151
1933	50,080	485,416	1940	94,260	879,589
1934	66,821	587,986	1941	115,608	931,554
1935	44,817	343,764	1942	131,258	1,079,692
1936	75,598	552,681	1943	107,121	1,025,151

(x) All produced in the province of Saskatchewan with the following exceptions:
Includes production in: Alberta, 1937, 80 tons, value $480
1938, 89 tons, value $1,127
1939, 10 tons, value $100
1940, 10 tons, value $50
1941, 8 tons, value $32.

Table 25 - SALT CAKE USED IN SPECIFIED CANADIAN INDUSTRIES, 1932-1942

Year	Textile Industry		Medicinal and pharmaceutical industry		Acids, alkalies and salts industry (x)		Wood-pulp	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		$		$		$		$
1932	...	...	...	...	94	1,811	24,301	489,343
1933	...	...	39	4,879	9,968	146,201	29,563	580,251
1934	...	...	51	7,278	26,075	368,576	34,559	655,905
1935	...	...	59	4,617	22,485	316,734	35,350	642,801
1936	...	...	27	2,546	7,220	102,176	41,524	711,635
1937	...	...	29	2,234	8,006	113,054	50,584	884,437
1938	323	8,419	21	1,593	3,412	48,486	33,213	588,217
1939	401	11,636	24	1,940	11	314	40,685	722,178
1940	522	13,607	21	1,820	14	416	53,540	994,875
1941	884	25,390	34	3,073	10	326	61,679	1,133,623
1942	860	24,831	40	4,626	107	2,040	70,078	1,303,461

(x) Sodium sulphate used direct in smelting of nickel-copper ores included only for years 1933-1935 inclusive.

STRONTIUM MINERALS - There was no commercial production of strontium minerals in Canada during 1943. In 1941-27 tons of celestite valued at $280 was shipped from old dumps located on lots 6 and 7, concession 10 of Bagot township, Renfrew county, Ontario.

The following, relating to strontium, is from a review prepared by the Bureau of Mines, Ottawa:

"Several occurrences of celestite (strontium sulphate) of possible economic interest are known in Canada, and in 1920-21, some ground material produced from a deposit in Bagot township, Ontario, was sold to the paint trade. The material from this deposit is coarsely-fibrous in character and is not very pure, containing about 18 per cent of barium sulphate. It is accordingly not favoured for chemical use, but is regarded as suitable for paints and general filler or loader use. The old pit was pumped out in 1941 and a few tons of ore were scaled down from a small drift. This, along with some stockpile material was shipped to Montreal for grinding. The product was used in the paint trade as a substitute for barite, but is reported to have found little favour, and no further work was done. Celestite of similar character and analysis occurs at some of the old fluorspar mines of the Madoc area in Ontario, and part of it might be recoverable from the waste dumps.

"Celestite, analyzing 98 to 99 per cent strontium sulphate occurs as a small vein of coarse platey crystals in Lansdowne township, Ontario and some of it was mined many years ago.

"World production of strontium minerals is estimated at 5,000 to 7,000 tons a year. England is the principal source of supply, with Germany next. The United States produced about 350 tons in 1940, exclusive of celestite used for oil-drilling. Important deposits are reported to occur in India and Newfoundland, but there has been no production from these sources as yet.

"Celestite is the principal source of strontium used in the manufacture of the various strontium salts, and strontianite a less common mineral, is used for the same purpose. The nitrate, carbonate, and hydrate are the most important of the strontium compounds used in industry and medicine. Strontium nitrate is employed mainly in pyrotechnics, for fireworks, railroad signal flares, and military flares and rockets, to which it imparts the characteristic strong red flame colour of the element. Other strontium compounds are employed in tracer bullets and shells. The hydrate is used chiefly in the refining of beet sugar by the Scheibler process. In North America, however, sugar is refined mainly by the Steffens, or lime, process. The carbonate is reported to be used to some extent as a batch ingredient in the manufacture of certain kinds of glass, glazes, and enamels, and as a fluxing and desulphurizing and dephosphorizing agent in iron and steel. Strontium chloride powder finds limited use in refrigerators working on the solid absorption principle. Ground celestite is used in fairly large quantities for purifying caustic soda in the rayon industry, and some impure material has been ground and employed as a barite substitute for weighting oil-drilling muds. Interest has also been shown in the possibilities of the carbonate and the sulphate in glass and white wares.

"Strontium metal, made from either the natural sulphate or carbonate, is used in limited quantities in certain alloys, mainly of copper, tin, lead, zinc, and cadmium."

"E and M J Metal and Mineral Markets", New York, quoted celestite, October, 1944--per ton in carload lots, 92 per cent $SrSO_4$ finely powdered, $45. Strontianite--per ton, lump in carload lots, minimum 84 to 86 per cent $SrCO_3$, $55 nominal.

Data pertaining to imports of strontium minerals or compounds are not shown separately in Canadian trade reports.

SULPHUR (Including Pyrites) - Canadian sulphur production is computed as the sulphur in iron pyrites shipped plus the sulphur recovered from non-ferrous smelter gases. Production in 1943, as thus defined, totalled 257,515 short tons valued at $1,753,425 compared with a corresponding output of 303,714 tons worth $1,994,891 in 1942.

No iron pyrites deposits, known as such, have been mined in Canada for some years, and statistics published regarding recent pyrites production refer to by-product iron pyrites recovered in the mining and concentrating of copper-gold-silver ores.

Sulphur employed in the manufacture of sulphuric acid was recovered from smelter gases in 1943 in Ontario and British Columbia. In Ontario, Canadian Industries Limited continued the operation of its acid plant at Copper Cliff, using sulphur dioxide obtained from the smelter of the International Nickel Company, while in British Columbia the Consolidated Mining and Smelting Company of Canada Limited manufactured sulphuric acid and other chemical products at Trail, using the by-product gases of its metallurgical plants.

Iron pyrites was produced in 1943 in the treatment of copper-gold-silver ores at the Aldermac and Noranda mines in northwestern Quebec, and at the Britannia mine in British Columbia; operations at the Aldermac property were discontinued in August and the plant dismantled. In September, the Consolidated Mining and Smelting Company of Canada Limited commenced shipment of iron pyrites from the Sullivan mine for the manufacture of sulphuric acid at Trail.

World production of elemental sulphur in 1942 is estimated by the United States Bureau of Mines at over 4,300,000 long tons.

The United States is the main source of the world production of crude sulphur. The output in 1942 amounted to 3,460,700 long tons, chiefly from the states of Texas and Louisiana.

Sulphur is used in Canada chiefly in the production of sulphide pulp and for use in the making of artificial silk and newsprint. It is used to a large extent also in the manufacture of sulphuric acid, explosives, and rubber, and in the production of fertilizers.

With the construction of new sulphuric plants in Canada and the United States, the consumption of sulphur was increased in 1941 and was further increased in 1942 and 1943.

Sulphur is one of the essential raw materials for war--such as, in the form of sulphuric acid for making explosives. The rayon industry consumes large quantities of sulphur. The expansion of the pulp and paper industry has also created increased demand for sulphur.

According to "Metal and Mineral Markets", New York, the price of sulphur in 1943 remained unchanged at $16 a long ton, f.o.b. mines. The prices at consumers' plants in Canada vary from $20 to $32 according to location, the difference being due to transportation costs. The average for the Dominion in 1943 was about $27.

Pyrites was quoted October, 1944--per long ton unit of sulphur, c.i.f. United States ports, guaranteed 48 per cent sulphur, Spanish 12 cents, nominal.

Table 26 - PRODUCTION OF SULPHUR (x) IN CANADA FOR YEARS SPECIFIED

Year	Tons	$	Year	Tons	$
1886	42,906(a)	193,077	1927	25,229	198,388
1896	13,823	101,155	1928	38,589(b)	321,033
1906	17,525	169,990	1929	42,781	350,843
1913	65,012	521,181	1930	37,730	314,835
1914	93,609	744,508	1931	50,107	429,457
1915	116,157	985,190	1932	53,172	470,014
1916	116,975	1,084,095	1933	57,373	510,299
1917	155,453	1,610,762	1934	51,537	515,502
1918	154,269	1,705,219	1935	67,446	634,235
1919	65,674	522,704	1936	122,132	1,033,055
1920	67,608	719,110	1937	150,913	1,154,992
1921	12,213	116,326	1938	112,395	1,044,817
1922	6,900	74,303	1939	211,278	1,668,025
1923	11,073	113,020	1940	170,630	1,298,018
1924	9,742	95,620	1941	260,023	1,702,786
1925	7,587	58,899	1942	303,714	1,994,891
1926	8,975	63,899	1943	257,515	1,753,425

(x) Sulphur in iron pyrites shipped plus sulphur recovered from non-ferrous smelter gases.
(a) Tonnage of pyrites shipped.
(b) 1928-1943 includes sulphur recovered from smelter gas.

Table 27 - PRODUCTION IN CANADA OF PYRITES WITH SULPHUR CONTENT, including SULPHUR CONTAINED IN SULPHURIC ACID, ETC., MADE FROM SMELTER GASES, 1941-1943

	Pyrites (x)			Smelter Gas		Total Sulphur	
	Sales	Sulphur Content		Sulphur Content			
	Tons	Tons	Value	Tons	Value	Tons	Value
			$		$		$
1941							
Quebec	298,761	146,826	575,422	...	...	146,826	575,422
Ontario	...	...	...	10,057	100,570	10,057	100,570
British Columbia ...	4,599	2,303	18,424	100,857(/)	1,008,370	103,140	1,026,794
CANADA	303,360	149,129	593,846	110,894	1,108,940	260,023	1,702,786
1942							
Quebec	351,570	168,832	673,965	...	...	168,832	673,965
Ontario	...	...	...	18,634	186,340	18,634	186,340
British Columbia ...	27,923	13,947	111,576	102,301(/)	1,023,010	116,248	1,134,586
CANADA	379,433	182,779	785,541	120,935	1,209,350	303,714	1,994,891
1943							
Quebec	277,690	136,007	545,229	...	...	136,007	545,229
Ontario	...	...	...	16,907	169,070	16,907	169,070
British Columbia ...	6,836	3,442	27,536	101,159(/)	1,011,590	104,601	1,039,126
CANADA	284,576	139,449	572,765	118,066	1,180,660	257,515	1,753,425

(x) Recovered from copper ore deposits.
(/) Includes elemental sulphur and sulphur in sulphuric acid and direct ammonium sulphate.

Imports into Canada of sulphur or brimstone totalled 218,527 short tons valued at $3,524,006 in 1943. The sulphur content of iron pyrites exported from Canada in 1943 totalled 104,509 short tons appraised at $409,597.

Table 28 - CONSUMPTION OF SULPHUR BY SPECIFIED CANADIAN INDUSTRIES, 1940-1942

Industry	1940		1941		1942	
	Tons	$	Tons	$	Tons	$
Wood-pulp	182,357	4,157,629	201,575	5,062,266	211,466	5,687,331
Petroleum refining	61	3,110	51	2,649	31	1,561
Acids, alkalies and salts	22,595	479,875	44,784	1,091,913	65,056	1,694,232
Matches	67	3,116	65	3,393	80	4,119
Explosives	1,850	38,390	2,934	58,486	2,057	57,631
Insecticides	1,168	41,080	962	35,722	1,295	50,310
Adhesives	71	2,429	82	3,031	89	3,087
Chemicals, miscellaneous	2	121	½	40	½	27
Rubber	1,492	75,219	2,067	106,411	1,728	93,042
Sugar	167	8,494	147	6,877	142	7,411
Fruit and vegetable preparations	58	3,668	59	5,206	130	10,685
Other industries (x)	269	10,107	278	11,603	287	12,248

(x) Starch and glucose, dyeing and finishing of textiles.

VOLCANIC DUST - Commercial mine shipments of volcanic dust in Canada during 1943 totalled 50 short tons valued at $257. These were made from a deposit located at Rockglen in the province of Saskatchewan. The 1943 output was the first to be reported in Canada since 1934, when production amounted to 31 tons valued at $620, one ton of which came from Waldeck, Saskatchewan and 30 tons from Williams Lake, British Columbia.

The Bureau of Mines, Ottawa, describes volcanic dust (pumicite or pumice dust) as a natural glass or silicate, atomized by volcanic explosions and thrown into the air in great clouds which ultimately settle, forming beds of varying thickness, often hundreds of miles from its source of origin. Deposits are found in Canada in Saskatchewan, Alberta and British Columbia.

The war cut off supplies of high quality Italian pumice from Lipari Island near the north coast of Sicily, but suitable material is being produced in California.

In the past, about 60 per cent of the United States output was used as the abrasive base in scouring and cleansing compounds and to a lesser extent for glass bevelling, polishing aluminium, etc., but in 1942, about 43 per cent was used for these purposes and 36 per cent as a concrete admixture and concrete aggregate. Some of the United States volcanic dust was used in the manufacture of fireproof walls, building tiles and slabs, and in the refining of petroleum. The use of volcanic dust as a ceramic raw material has not been extensive in the United States, although its suitability for such use has been indicated by laboratory and industrial applications, but only on material relatively free from iron. In most of the deposits, however, this iron is in the form of a complex silicate and attempts to remove it by concentration, magnetic separation, leaching, and other methods have been unsuccessful. Volcanic dust of a certain purity has been used in place of feldspar in ceramic bodies whose colour is of secondary importance. Some promising results have been achieved, however, with decolorizers, such as selenium and arsenic trioxide. Volcanic dust has possibilities for use as a glaze component, in low-cost glass, and in bricks when mixed with plastic clays.

Imports are grouped with a number of similar products (pumice, pumice stone, lava, and calcareous tufa) the value of which totals approximately $40,000 annually.

Prices are not quoted, but in the United States sales values for cleansing and scouring were about $7.50 per ton; for acoustic plaster, $27, for concrete admixture and aggregate, $1.25 per ton.

Table 29 - PRODUCTION OF MISCELLANEOUS NON-METALLIC MINERALS IN CANADA, 1942 and 1943

Item	Unit of measure	1942 Quantity	1942 Value	1943 Quantity	1943 Value
			$		$
Barite	ton	19,667	188,144	24,474	279,253
Diatomite	ton	365	9,088	98	3,351
Fluorspar	ton	6,199	146,039	11,210	318,424
Garnets (schist)	ton	17	176	...	...
Graphite	...	...	117,904	...	197,431
Grindstones (b)	ton	216	10,000	164	6,225
Magnesium sulphate	ton	1,140	38,760	...	...
Magnesitic dolomite (c)	...	...	1,059,374	...	1,260,056
Mineral waters	Imp.gal.	157,085	74,505	139,611	67,541
Phosphate (a)	ton	1,264	17,431	1,451	18,385
Silica brick	M	4,273	263,006	4,165	295,505
Sodium carbonate	ton	256	2,048	468	5,148
Sodium sulphate	ton	131,258	1,079,692	107,121	1,025,151
Volcanic dust	ton	...	...	50	257
TOTAL (Gross)	...	...	3,006,167	...	3,476,707
Sulphur production (x)	ton	303,714	1,994,891	257,515	1,753,425

(a) Represents apatite mined in Quebec and Ontario, usually a by-product in mica production.
(b) Includes sharpening stones, etc.
(c) Includes the value of calcined brucite granules shipped from Wakefield, Quebec.
(x) Includes sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making or recovered as elemental sulphur, or in ammonium sulphate (direct). General statistics relating to production of sulphur included with those of the copper-gold mining and non-ferrous smelting industries.

Table 30 - PRINCIPAL STATISTICS RELATING TO MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1942 and 1943

		1942	1943
Number of plants		64	54
Capital employed	$	4,919,871	3,522,842
Number of employees—On salary		88	84
On wages		723	827
Total		811	911
Salaries and wages--Salaries	$	142,266	155,593
Wages	$	999,806	1,207,933
Total	$	1,142,072	1,363,526
Selling value of products (gross)	$	3,006,167	3,476,707
Cost of fuel and electricity	$	656,538	823,347
Cost of process supplies used	$	296,322	382,648
Cost of containers	$	...	2,475
Selling value of products (net)	$	2,053,307	2,268,237

Table 31 - CAPITAL EMPLOYED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1943

Capital employed as represented by:	$
Present cash value of the land (excluding minerals)	229,019
Present value of buildings, fixtures, machinery, tools and other equipment	1,630,727
Inventory value of materials on hand, ore in process, fuel and miscellaneous supplies on hand	529,714
Inventory value of finished products on hand	165,655
Operating capital (cash, bills and accounts receivable, prepaid expenses, etc.)	967,727
TOTAL	3,522,842

Table 32 - WAGE-EARNERS, BY MONTHS, IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1940-1943

Month	1940	1941	1942	1943				
				Mine			Mill	
				Surface		Underground		
				Male	Female		Male	Female
January	352	451	561	246	...	97	490	2
February	352	463	594	230	...	94	472	2
March	392	452	600	237	...	96	487	2
April	359	473	622	265	...	90	453	2
May	482	559	639	266	...	89	481	2
June	472	682	827	295	...	85	497	2
July	548	667	789	302	...	77	468	2
August	517	696	819	294	...	88	485	2
September	604	695	770	255	...	93	510	2
October	614	718	789	253	...	77	449	2
November	581	659	803	227	...	78	502	2
December	451	603	759	161	...	55	493	2
AVERAGE	480	601	723	257	...	84	484	2

Table 33 - HOURS WORKED PER WEEK BY WAGE-EARNERS, 1943 (In one week of month of highest employment)

Hours Worked per Week	Number of wage-earners	
	Male	Female
30 hours or less	64	...
31-43 hours	116	...
44 hours	11	...
45-47 hours	35	...
48 hours	189	...
49-50 hours	21	2
51-54 hours	84	...
55 hours	14	...
56-64 hours	210	...
65 hours and over	294	...
TOTAL	1,038	2
Total wages paid in selected week $	32,841	70

Table 34 - FUEL AND ELECTRICITY USED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1942 and 1943

Kind	Unit of measure	1942		1943	
		Quantity	Cost	Quantity	Cost
			$		$
Bituminous coal—Canadian	ton	15,944	82,344	21,248	104,183
Imported	ton	22,523	186,145	31,637	281,454
Anthracite--From the United States	ton	38	611	11	195
Other	ton	...	...	3	35
Lignite coal	ton	19,595	57,307	18,839	53,488
Coke	ton	1	12	...	...
Gasoline	Imp.gal.	135,943	37,737	167,998	48,116
Kerosene or coal oil	Imp.gal.	2,046	392	1,745	355
Fuel oil and diesel oil	Imp.gal.	3,398,374	191,319	2,590,358	220,049
Wood (cords of 128 cubic feet)	cord	3,391	9,365	2,379	9,570
Gas--Manufactured	M cu.ft.	176,571	21,012	114,213	11,707
Natural	M cu.ft.	...	...	...	...
Other	...	...	...	...	...
Electricity purchased	K. W. H.	5,968,148	70,294	8,782,586	88,195
TOTAL	...	...	656,538	...	823,347
Electricity generated for own use	K. W. H.	1,722,009	...	2,699,998	

Table 35 - POWER EMPLOYED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRY, 1943

Description	Ordinarily in Use		In Reserve or Idle	
	Number of units	Total horse power	Number of units	Total horse power
Steam engines	4	63	...	...
Steam turbines	...	...	...	...
Diesel engines	19	2,161	4	980
Gasoline, gas and oil engines, other than Diesel engines	20	948	8	421
Hydraulic turbines or water wheels	2	300	...	...
Electric motors -				
(a) Operated by purchased power	262	6,290	17	562
TOTAL	307	9,762	29	1,963
(b) Operated by power generated by the establishment	77	1,109	26	320
Stationary boilers	15	902	2	65
Motor generator sets	1	7	...	...

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1943

Name of Operator, Province and Product	Head Office Address	Plant Location
(x) Active but not producing.		
Asphalt -		
Alberta -		
Oil Sands Ltd. (x)	455 St. John St., Montreal, Que.	Bitumount
Barite -		
Nova Scotia -		
Canadian Industrial Minerals Ltd.	Walton, N.S.	Walton
British Columbia -		
Summit Lime Works Ltd.	Box 273, Lethbridge, Alta.	Golden M.D.
Brucite -		
Quebec -		
Aluminum Company of Canada Ltd.	Sun Life Building, Montreal	Wakefield
Diatomite -		
Nova Scotia -		
G. W. Wightman (Mrs.)	Smith's Cove, N.S.	Digby Co.
British Columbia -		
Fairey and Co.	661 Taylor St., Vancouver	Cariboo M.D. Vancouver
Fluorspar -		
Nova Scotia -		
Papke, William	Trout River, N.S.	Inverness Co.
Quebec -		
Allevato, T. (x)	Rouyn, Que.	Huddersfield Tp.
Ontario -		
Bassett Fluorspar Mining Synd. Ltd.	Room 908 .. 36 Toronto St., Toronto	Madoc Tp.
Gilman, R. T.	Madoc,	Huntingdon Tp.
Millwood Fluorspar Mines Ltd.	204 McKinnon Bldg., Toronto	Hastings Co.
Montgomery, F. K.	Havelock	Cardiff Tp.
Reliance Fluorspar Mining Synd. Ltd.	c/o W. J. Symon, Madoc	Huntingdon Tp.
Stocklosar, Chas. A.	Box 198, Madoc	Huntingdon Tp.

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1943
(Continued)

Name of Operator, Province and Product	Head Office Address	Plant Location
Fluorspar (Con.) -		
Ontario -		
Tops Mining Synd. Ltd.	c/o W. E. Clark, Harcourt	Harcourt
Trent Mining Synd. Ltd.	213 Dundas St. E., Trenton	Madoc
Wood Land Mineral Company	19 John St. S., Hamilton	Huntingdon Tp.
Garnets -		
Ontario -		
Niagara Garnet Co. (x)	Box 835, Niagara Falls, N.Y.	River Valley
Graphite -		
Ontario -		
Black Donald Graphite Ltd.	Calabogie	Brougham Tp.
Grindstones -		
New Brunswick -		
Read, H. C.	Bathurst	Stonehaven
Lithium Minerals -		
Manitoba -		
Lithium Corp. of Canada Ltd. (x)	403 Avenue Bldg., Winnipeg	Bernic and Cat Lakes
Sherritt Gordon Mines Ltd. (x)	25 King St. W., Toronto	Herb Lake
Magnesitic Dolomite -		
Quebec -		
Canadian Refractories Ltd.	1050 Canada Cement Bldg., Montreal	Kilmar Harrington
Mineral Waters -		
Quebec -		
Biron and Courville	St. François du Lac	St. François du Lac
Cie d'Eau Minerale de St. Hyacinthe	632 Concord St., St. Hyacinthe	St. Hyacinthe
Gurd, Chas. & Co. Ltd.	1016 Bleury St., Montreal	Varennes
Eau Minérale Etoile	Ste. Genevieve de Batiscan	Batiscan
Eau Naturelle Purgative de Chambord Ltd. (x)	Desbiens	Chambord
Lemay, Lucien	St. Francois du Lac,	Nicolet Tp.
Levesque, Ernest (x)	Rivière du Loup Station	St. Germain de Kamouraska
Minard, Eduard	Maskinonge	Maskinonge
Mont-Clair Richelieu Spring Water Co. Ltd.	c/o J. G. Gravelle, 3711 Basset St., Montreal	Chambly
Pellerin, Albert & Sons	St. Barnabe N., Quebec	St. Barnabe N.
Source d'Ear Minerale Radnor	St. Maurice	Radnor Tp.
Source Coulombia	L'Epiphanie	L'Epiphanie
Usine d'Embouteillage Maski	St. Justin	St. Justin
Ontario -		
Belleville Aqua Vital Co. Ltd.	201 McDonald Ave., Belleville	Thurlow Tp.
Carlsbad Springs	Carlsbad	Carlsbad
Deneault, J. F.	Bourget	Bourget
Gurd, Chas. & Co. Ltd.	1016 Bleury St., Montreal, Que.	Caledonia Springs
Renaud, Victor	Blackburn	Blackburn
Phosphate -		
Quebec -		
Bigelow, Robert	Buckingham	Papineau Co.
Crang, J. K. Corp.	24 Adelaide St. E., Toronto, Ont.	Buckingham Dist.
High Rock Phosphates Ltd. (x)	11 des Ramparts	Buckingham Dist.

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1943
(Concluded)

Name of Operator, Province and Product	Head Office Address	Plant Location
Phosphate (Con.) -		
Ontario -		
Cordick, Hilliard V.	6 Church St., Perth	Burridge
Ontario Phosphate Co.	Westport	Westport
Riley, C.	1110 Concourse Bldg., Toronto	Burridge
Robson, Bruce C.	125 Holland Ave., Ottawa	Burridge
Silica Brick -		
Nova Scotia -		
Dominion Steel & Coal Corp. Ltd.	Sydney, N.S.	Sydney
Ontario -		
Algoma Steel Corp. Ltd.	Sault Ste. Marie	Sault Ste. Marie
Sodium Carbonate -		
British Columbia -		
Bishop, Viola C. (Mrs.)	c/o Boyds Garage, Clinton,	Clinton area
Davison, E. C.	2043 W. 42nd Ave., Vancouver	Clinton area
Sodium Sulphate -		
Saskatchewan -		
Horseshoe Lake Mining Co. Ltd.	Ormiston	Ormiston
Midwest Chemicals Ltd.	Palo	Whiteshore Lake
Mellor, J. F.	Alsask	Alsask
Natural Sodium Products	Bishopric	Alsask Frederick Lake
Sybouts Sodium Sulphate Co. Ltd.	46 Goodwin Terrace, Westwood, N.J., U.S.A.	Surprise Valley
Sulphur (Pyrites) -		
Quebec -		
Aldermac Copper Corp. Ltd.	Dominion Square Bldg., Montreal	Arntfield
Noranda Mines Ltd.	Royal Bank Bldg., Toronto, Ont.	Noranda
Ontario -		
International Nickel Co. of Canada Ltd. (/)	Copper Cliff	Copper Cliff
British Columbia -		
Consolidated Mining & Smelting Company of Canada Ltd. (/)	Trail	Trail
Britannia Mining & Smelting Co. Ltd.	Britannia Beach	Britannia Beach
Volcanic Dust -		
Saskatchewan -		
Spagrud, Thor	Rockglen	Rockglen

(/) Recover sulphur from smelter gases.