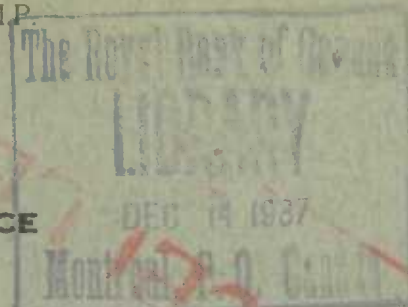


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Published by Authority of the HON. W.D. EULER, M.P.  
Minister of Trade and Commerce.

**CANADA**  
**DEPARTMENT OF TRADE AND COMMERCE**  
**DOMINION BUREAU OF STATISTICS**  
**CENSUS OF INDUSTRY**  
**MINING, METALLURGICAL & CHEMICAL BRANCH**



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Report

on

**THE MISCELLANEOUS NON-METALLIC MINERALS**  
**IN CANADA, 1936**

including

Actinolite	Natural Mineral Waters
Barytes	Peat
Bituminous Sands	Phosphate
Fluorspar	Silica Brick
Graphite	Sodium Carbonate
Lithium ore	Sodium Sulphate
Magnesitic Dolomite	Strontium Minerals
Magnesium Sulphate	Sulphur (Pyrites)
Bog Manganese	



OTTAWA  
1937

Price 15 cents





DEPARTMENT OF TRADE AND COMMERCE  
DOMINION BUREAU OF STATISTICS  
MINING, METALLURGICAL AND CHEMICAL BRANCH  
OTTAWA - CANADA

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MISCELLANEOUS INDUSTRIAL OR NON-METALLIC MINERALS IN CANADA, 1936.

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 by this industry during 1936 included: fluorspar, graphite, magnesitic-dolomite (crude and refined), magnesium sulphate, mineral waters, phosphate, silica brick, sodium carbonate and sodium sulphate. For convenience, the sulphur content of pyrites shipped, sulphur recovered from smelter gas, and peat 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 total value of production by the industry under review amounted to \$1,554,628 in 1936 as compared with \$1,040,732 in 1935. Increases in the value of shipments above those made in the preceding year were realized for all products with the exception of sodium carbonate; production of fluorspar was identical in both years and no shipments of bituminous sands were recorded for 1936.

ACTINOLITE - Commercial production of actinolite ( $\text{CaMgFe}$ ) in Canada has originated entirely in the townships of Elzevir and Kaladar in Hastings and Addington counties of Ontario. No shipments of the mineral were reported since 1934, when 30 tons valued at \$365 were produced near Kaladar, Ontario; the output in 1934 was marketed in the ground state and contained a relatively high percentage of added mica flake. Actinolite is employed chiefly in the manufacture of roofing materials.

BARITE - Barite production in Canada during past years came largely from deposits in Nova Scotia, Quebec and Ontario and in recent years more particularly from deposits in the Lake Ainslie district, Nova Scotia. The last commercial shipments from Canadian deposits were made in 1933 in which year 20 tons valued at \$60 were produced and shipped at the Tionaga mine, Penhorwood township, Ontario. A modern mill was installed a few years ago at a deposit in Langmuir township, Ontario; this property, however, was closed down without coming into commercial production. Near Spillimacheen in British Columbia barite replaces limestone in thickness from 10 to 60 feet and the possibility of producing commercial barite as a by-product here from the milling of lead ore has been suggested.

During 1936 crude barite, both domestic and foreign, used in the United States totalled 303,449 short tons of which 83,990 tons were utilized in the manufacture of ground barite, 167,014 tons for lithopone and 52,445 tons for barium chemicals. In the United States the quoted price for ground barite, \$23 per short ton, f.o.b. St. Louis, has not changed for several years; crude ore, minimum 95 per cent BaSO<sub>4</sub>, less than 1 per cent iron, ranged from \$5.50 to \$7 per ton in 1936.

Imports of barite into Canada during 1936 totalled 33,160 cwt. valued at \$26,554 compared with 42,784 cwt. worth \$33,739 in 1935. Of the 1936 imports, 19,791 cwt. came from Germany, 8,823 cwt. from the United Kingdom, and 4,534 cwt. from the United States.

Table 1 - BARITE AND BLANC FIXE USED BY THE CANADIAN PAINTS, PIGMENTS AND VARNISHES INDUSTRY IN CANADA, 1931-1936.

Year	BARITE		BLANC FIXE(x)	
	Pounds	\$	Pounds	\$
1931 .....	2,304,119	39,361	146,025	12,915
1932 .....	2,064,303	35,138	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	4,223
1936 .....	2,533,275	41,687	97,016	3,148

(x) Artificial barium sulphate.

Table 2 - IMPORTS OF BLANC FIXE AND BARITE INTO CANADA, 1931 - 1936.

Year	BARITE		BLANC FIXE	
	Pounds	\$	Pounds	\$
1931 .....	3,372,600	32,712	1,596,173	34,483
1932 .....	2,583,400	22,989	932,168	20,932
1933 .....	3,174,700	28,255	552,801	11,390
1934 .....	3,113,800	26,397	968,201	21,638
1935 .....	4,278,400	33,739	1,139,106	25,759
1936 .....	3,316,000	26,554	1,064,032	21,480

In 1936 lithopone imported into Canada totalled 18,859,517 pounds valued at \$666,667 compared with 17,383,273 pounds worth \$620,615 in 1935.

The following information is from a report on barium minerals issued by the Imperial Institute, London -

"Commercial crude barytes should contain more than 93 per cent of barium sulphate, and the better grades at least 95 per cent. The British Standard specification No. 260 for barytes for paints demands not less than 90 per cent barium sulphate, all of which shall pass a 200 mesh l.m.m. sieve, no greater amount of carbonates than is equivalent to 1.5 per cent of carbon dioxide (CO<sub>2</sub>) and not more than 2 per cent of matter soluble in water, the aqueous extract being neutral to methyl red. Discoloured barytes is usually bleached if it is to be used in the manufacture of paint. Ground barytes of suitable colour is used by the paper industry as a filler. The mineral is also employed for protection against X-rays and in the manufacture of batteries and glass. Fine ground barytes mixed with a colloidal clay and a suitable suspending medium is



effectively employed in the heavy liquids used as well - seals in drilling for petroleum. Barytes also finds employment in the manufacture of artificial marble, explosives, fireworks, printers' ink, sealing wax, shade cloth, and other textiles, soap, tiles, glazes, rubber, asbestos goods, linoleum, and artificial ivory."

Table 3 - WORLD'S PRODUCTION OF BARIUM MINERALS, 1933, 1934 and 1935.

(Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)

(Long tons)

Producing Country and Description	1933	1934	1935
<u>BRITISH EMPIRE</u>			
United Kingdom -			
Barytes, unground .....	39,943	37,719	41,881
Witherite, unground .....	5,111	10,412	9,409
Barytes - Ground, bleached .....	7,623	5,548	6,288
Ground, unbleached .....	13,943	20,315	20,554
Southern Rhodesia .....	...	13	...
Canada (sales) .....	18	...	...
India .....	5,651	3,813	5,493
Australia .....	2,095	2,492	2,544
<u>FOREIGN COUNTRIES</u>			
Austria .....	1,014	1,009	784
France .....	13,500	17,850	(a)
Germany -			
Baden .....	(a)	19,370	12,248
Bavaria .....	4,081	8,253	6,961
Prussia .....	141,199	321,164	321,786
Saxony .....	128	476	218
Thuringia .....	(a)	(a)	545
Greece .....	(a)	7,729	22,726
Italy .....	23,074	31,896	40,502
Spain (b) .....	4,193	16,586	(a)
Algeria .....	10	...	...
Egypt .....	...	49	84
United States .....	130,716	159,251	194,710
Brazil .....	877	(a)	(a)
China .....	3,043	9,350	(a)
Korea .....	4,891	5,841	10,853

Barytes is also produced in U.S.S.R. (Russia)

(a) Information not available.

(b) In addition 75 cubic metres were produced in quarries during 1933, and 147 cubic metres during 1934.

BITUMINOUS SANDS - Commercial production of bituminous sands in Canada is confined to the province of Alberta. Large deposits of the material occur along the Athabaska river in the northern part of the province. Output during 1935 totalled 40 tons valued at \$160; no production of the material was reported in 1936 but two companies, The Abasand Oils Ltd., and the International Bitumen Company, Ltd., have been actively engaged in development work and, as a result, it was anticipated that commercial production of liquid and solid hydrocarbons from the bituminous sand would commence in 1937.

Table 4 - PRODUCTION OF BITUMINOUS SANDS IN CANADA, 1927 - 1936.(x)

Year	Tons	Value \$	Year	Tons	Value \$
1927 .....	2,706	10,824	1932 .....	343	1,372
1928 .....	94	374	1933 .....	466	1,662
1929 .....	989	3,956	1934 .....	862	3,449
1930 .....	2,067	8,268	1935 .....	40	160
1931 .....	1,015	4,060	1936 .....	...	...

(x) Production came entirely from the province of Alberta.

The total value of petroleum, asphalt and their products imported into Canada during 1936 amounted to \$49,727,188 compared with \$44,092,526 in 1935. Of the 1936 imports, those from the United States were appraised at \$39,285,077. Included in the imports of these materials during the year under review, were - 125,048 cwt. of solid asphalt valued at \$145,527; 42,497 gallons of asphaltum oil valued at \$3,250 for paving purposes, and 1,285,668,408 gallons of various crude petroleum and fuel oils valued at \$40,559,423.

FLUORSPAR - Canadian mine shipments of fluorspar during both 1936 and 1935 totalled 75 tons valued at \$900. Output in these years came entirely from deposits located in the Madoc area, Hastings county, Ontario. Fluorspar has also been produced at the Rock Candy Mine, in British Columbia, by the Consolidated Mining and Smelting Company of Canada, Limited; this property, however, has not been in production since 1929 in which year shipments totalling 17,800 short tons valued at \$267,000 were made from this mine. Very few important deposits of fluorspar are known in Canada and by far the greater supply of the mineral for the ceramic and metallurgical industries is imported.

Table 5 - PRODUCTION OF FLUORSPAR IN CANADA, 1927 - 1936.

Year	Short tons	Value \$	Year	Short tons	Value \$
1927 .....	...	...	1932 .....	32	464
1928 .....	...	...	1933 .....	73	1,064
1929 .....(a)	17,870	268,120	1934 .....	150	2,100
1930 .....	80	1,240	1935 .....	75	900
1931 .....	40	620	1936 .....	75	900

(a) 17,800 tons valued at \$267,000 produced in British Columbia; production since 1929 entirely from Ontario mines.

Imports of fluorspar into Canada during 1936 totalled 223,882 cwt. valued at \$95,268 compared with 231,827 cwt. worth \$92,775 in 1935. Of the imports in 1936, 71,098 cwt. came from Newfoundland, 46,698 cwt. from the United States, 44,580 cwt. from the United Kingdom, 40,628 cwt. from Spain, and 20,878 cwt. from Germany.

Table 6 - FLUORSPAR USED IN THE CANADIAN GLASS INDUSTRY, 1930 - 1936.

Year	Short tons	Value \$	Year	Short tons	Value \$
1930 .....	179	6,458	1934 .....	119	4,472
1931 .....	96	4,815	1935 .....	98	3,357
1932 .....	125	4,989	1936 .....	71	2,360
1933 .....	115	7,803			

Table 7 - FLUORSPAR USED IN CANADIAN STEEL FURNACES, 1930 - 1935.

Year	Short tons	Value \$	Year	Short tons	Value \$
1930 .....	6,486	92,743	1933 .....	2,949	31,657
1931 .....	4,969	66,471	1934 .....	4,555	55,643
1932 .....	2,253	27,939	1935 .....	5,859	73,047

Note - Data for 1936 not yet complete.

The following table from the Minerals Yearbook of the United States Bureau of Mines, shows the relative importance of consuming industries as markets for fluorspar in the United States.

Table 8 - FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES, BY USES, 1936.  
(United States Bureau of Mines)

Industry	Short tons	Average value per ton \$
Steel .....	141,618	16.22
Foundry .....	2,326	15.79
Glass .....	11,014	24.27
Enamel and vitrolite .....	5,249	24.62
Hydrofluoric acid and derivatives .	12,627	25.82
Miscellaneous .....	3,157	16.19

Fluorspar prices in the United States (October, 1937) as published by "Metal and Mineral Markets" New York, were - per net ton, 85 per cent  $\text{CaF}_2$ , and not over 5 per cent  $\text{SiO}_2$ , Kentucky and Illinois, in bulk, f.o.b. mines, washed gravel, \$20 for all rail movement. No. 2 lump, \$21, f.o.b. mines. Ground fluorspar, f.o.b. Illinois mines, 95 to 98 per cent  $\text{CaF}_2$  and not over  $2\frac{1}{2}$  per cent  $\text{SiO}_2$ , \$35 in bulk. F.O.B. Colorado mines, 82-6, \$12.80 to \$13. Foreign fluorspar, gravel 85-5, \$24.00 per gross ton, duty paid, Baltimore or Philadelphia.



Table 9 - WORLD'S PRODUCTION OF FLUORSPAR, 1933, 1934 and 1935.

(Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)  
(Long tons)

Producing Country	1 9 3 3	1 9 3 4	1 9 3 5
<u>BRITISH EMPIRE</u>			
United Kingdom .....	28,058	34,216	31,146
Union of South Africa .....	463	1,371	1,949
Canada .....	65	134	67
Australia .....	985	1,737	685
Newfoundland (c) .....	...	2,400	2,930
<u>FOREIGN COUNTRIES</u>			
France .....	14,800	13,900	(a)
Germany -			
Anhalt .....	(a)	7,241	7,941
Baden .....	(a)	6,424	3,879
Bavaria .....	25,948	29,193	30,783
Prussia .....	10,485	21,215	24,229
Saxony .....	3,614	6,424	6,828
Thuringia .....	(a)	(a)	23,200
Italy .....	7,592	9,515	9,400
Norway .....	499	662	1,050
Spain (b) .....	3,130	5,400	(a)
United States .....	52,300	78,000	91,000
Argentina .....	197	306	397
China .....	4,700	5,000	(a)
Korea .....	8,933	11,908	9,568

Fluorspar is also produced in Federated Malay States and U.S.S.R. (Russia).

(a) Information not available.

(b) In addition 120 cubic metres were produced from quarries during 1933 and 270 cubic metres during 1934.

(c) Exports for year ended June 30.

GRAPHITE - Canadian mine production of graphite during 1936 was valued at \$88,812 compared with \$79,781 in 1935. The output in 1936 came solely from the Black Donald mine, Renfrew county, Ontario. Relatively small and intermittent shipments of graphite were also made from Quebec properties prior to 1935.

The Bureau of Mines, Ottawa, describes the Black Donald deposit as of exceptional size and richness, and while the graphite flakes are too small to be suitable for crucible use, the products made are well adapted for lubricants and foundry facings. In recent years, the highest grade has been successfully employed in pencil manufacture, being exported to the United States and there reduced to the requisite degree of fineness. All other graphite mines and mills established at various times in Ontario and Quebec have been inactive for many years and the plants have, in most cases, been dismantled.

According to the United States Bureau of Mines the graphite mining industry in the United States remained virtually dormant in 1936. The largest



world producers of amorphous graphite include Germany, Austria, Czechoslovakia, Mexico and Chosen, while flake and vein graphite came chiefly from Madagascar and Ceylon, respectively.

"Canadian Chemistry and Metallurgy" - Toronto - quotation: for graphite, October, 1937, was - various grades, 100 pound lots - per pound, 15 cents to 40 cents. "Metal and Mineral Markets" - New York - October, 1937, quotations for graphite were - per pound, f.o.b. New York. Ceylon lump, 7 to 7½ cents; carbon lump, 6 to 7 cents; chip, 5 to 6 cents; dust, 3 to 4 cents; Madagascar flake, 6 to 7½ cents. No. 1 flake, 9½ to 17 cents; No. 2, 17 cents upwards. Crude amorphous graphite, f.o.b. New York, \$12 to \$23 per ton, according to grade.

Table 10 - VALUE OF MINE PRODUCTION OF GRAPHITE IN CANADA, 1927 - 1936.

Year	Value \$	Year	Value \$
1927 .....	111,656	1932 .....	18,483
1928 .....	57,041	1933 .....	18,367
1929 .....	103,174	1934 .....	71,424
1930 .....	96,392	1935 .....	79,781
1931 .....	32,149	1936 .....	88,812

Table 11 - IMPORTS OF GRAPHITE INTO CANADA, 1934, 1935 and 1936.

	1934	1935	1936
Plumbago, not ground or otherwise manufactured .	2,989	6,559	5,166
Plumbago crucibles .....	36,363	38,066	38,559
Plumbago, ground, and manufactures of, n.o.p. ..	103,652	92,852	88,188
Total GRAPHITE and ITS PRODUCTS .....	143,004	137,477	131,913

Table 12 - EXPORTS OF GRAPHITE FROM CANADA, 1935 and 1936.

	1935	1936
	Cwt.	Cwt.
Graphite or plumbago, crude and refined ...	70,965	67,686
Carbon and graphite electrodes .....	488,188	657,361

Table 13 - CONSUMPTION OF GRAPHITE OR PLUMBAGO IN CANADA, BY INDUSTRIES, AS REPORTED TO THE CENSUS OF INDUSTRY, 1935 and 1936.

Industries	1935		1936	
	Quantity	Cost at	Quantity	Cost at
	Tons	works \$	Tons	works \$
Paints and varnishes .....	64	5,293	59	5,023
Polishes .....	57	6,679	55	5,796
Iron and steel products .....	156	16,179	(a)	(a)
Acids and salts .....	38	11,834	35	11,132
Prepared foundry facings .....	121	5,740	(a)	(a)
Total Accounted for .....	436	45,725	...	...

(a) Not yet complete.

Production of graphite in Canada during the first six months of 1937 was valued at \$63,070 as compared with \$41,738 in the corresponding period of 1935.

Table 14 - WORLD'S PRODUCTION OF GRAPHITE, 1933, 1934 and 1935.  
(Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)  
(Long tons)

Producing Country	1 9 3 3	1 9 3 4	1 9 3 5
<u>BRITISH EMPIRE</u>			
Union of South Africa .....	58	62	65
Canada (sales) .....	362	1,355	(a)
Ceylon (exports) .....	9,559	11,569	13,908
Australia .....	30	5	44
<u>FOREIGN COUNTRIES</u>			
Austria (crude) .....	14,537	17,858	19,182
Czechoslovakia .....	120	3,448	1,840
Germany (crude) .....	19,443	17,258	21,321
Italy .....	3,149	3,846	5,072
Norway .....	1,951	2,245	2,305
Sweden .....	...	...	68
Madagascar .....	3,518	8,343	9,621
Mexico .....	2,643	3,827	6,865
Japan .....	855	954	1,182
Korea - Flake .....	1,906	2,394)	43,992
Other .....	20,412	28,406)	

NOTE - Graphite is also produced in U.S.S.R. (Russia) and the United States.  
(a) Information not available.

Table 15 - CEYLON GRAPHITE TAKEN BY CHIEF PURCHASING COUNTRIES, 1930 - 1936.

Year	JAPAN	UNITED STATES	UNITED KINGDOM	GERMANY
	Cwt.	Cwt.	Cwt.	Cwt.
1930 .....	26,341	63,845	28,154	29,737
1931 .....	24,937	53,308	17,345	19,951
1932 .....	32,655	24,233	23,846	13,745
1933 .....	71,614	44,226	29,592	16,822
1934 .....	78,500	67,078	32,567	19,457
1935 .....	82,820	88,800	51,669	20,297
1936 .....	76,869	83,841	57,361	25,213



Table 13 - EXPORTS OF GRAPHITE FROM MADAGASCAR, 1935 and 1936.  
(Source - United States Department of Commerce)

Destination	1	9	3	5	1	9	3	6
	Metric tons			Value francs	Metric tons			Value francs
Great Britain .....	2,820			3,103,000	4,210			4,708,000
France .....	2,309			2,548,000	1,983			2,202,000
Germany .....	1,045			1,192,000	380			408,000
United States .....	1,691			1,970,000	1,600			1,868,000
Italy .....	124			149,000	237			285,000
Belgium .....	50			60,000	51			61,000
Japan .....	2			3,000	86			63,000
Other countries .....	5			5,000	11			12,000
TOTAL .....	8,046			9,030,000	8,558			9,607,000

Average value of franc in United States currency - 1935 = \$0.660  
1936 = \$0.0611

LITHIUM ORE - During 1936 the Lithium Corporation of Canada, Ltd., conducted considerable diamond drilling on a lithium bearing deposit located at Bernie Lake, near Pointe du Bois, Manitoba. The first recorded commercial shipments of lithium ores in Canada were made from this property in 1937 when, during the first six months of the year, shipments valued at \$1,202 were made to the United States for the manufacture of chemicals. Lithiated waters and medicinal preparations still account for a relatively large part of the consumption of lithium; there is a growing use of lithium chloride in air-conditioning and the uses of the metal are not unimportant. The United States Bureau of Mines reported that, although amblygonite was still quoted nominally at \$34 to \$35 per short ton, f.o.b. South Dakota mines, actual sales were made at prices up to \$40 a ton for 8 to 9 per cent material. The price of spodumene was about \$20 f.o.b. South Dakota mines.

MAGNESITIC-DOLOMITE - Production in Canada of magnesitic-dolomite (calcined) during 1936 was valued at \$768,742 compared with \$486,084 in 1935. The pronounced improvement experienced in this industry in 1936 continued into 1937 with production during the first six months totalling \$340,907 against \$295,177 in the first half of 1936.

Magnesitic-dolomite production in Canada, as an industry, is confined to Grenville and Harrington townships, Argenteuil county, Quebec. Deposits of the rock were discovered here in 1900 but it was not until 1907 that these were developed. The cutting off of the Austrian supply of magnesite during the world war greatly stimulated investigations of the Ottawa Valley deposits as a Canadian source of magnesite for the manufacture of refractory brick and furnace lining.

The annual output of the material in Canada, since 1923, has surpassed \$100,000 in value; production reached \$491,170 in 1929 later declining, during the depression, to \$262,860 in 1932. Recovery since that year has been consistently steady up to the all-time high record of \$768,742 for the year under review.

The Bureau of Mines, Ottawa, reports that deposits of earthy hydro-magnesite occur in British Columbia near Atlin and Clinton, and large deposits of magnesite containing considerable amounts of silica and alumina occur between Granbrook and Kimberley. These latter have been acquired by the

Consolidated Mining and Smelting Company and some development has been done as well as experimental work designed to remove the aluminium silicates; there has been no commercial production from these deposits to date.

Continued progress is being made in the development of new refractory products from the magnesitic-dolomite deposits of Quebec and, according to the Bureau of Mines, one of the newest development is the production of chemically bonded unburned bricks and shapes, which have proved satisfactory for the lining of cement kilns and metallurgical furnaces; certain of these materials are particularly adapted for use in the roofs of metallurgical furnaces; new cements and refractory basic plastics have also been developed, and uses have been extended for many of the other products made from magnesitic-dolomite.

"Sales of both foreign and domestic magnesite in the United States increased sharply in 1936 owing to increased steel-making activity. Apparently several times as much caustic-calcined magnesite is now used in the United States as a chemical accelerator in rubber as is used in oxychloride cements. Although the quantity of these cements used in stucco has decreased, the quantity employed in flooring and wallboard has increased. Caustic calcined magnesite is also used as a base for magnesium salts and for heat-insulating materials." (United States Bureau of Mines - Minerals Yearbook).

Table 17 - PRODUCTION OF MAGNESITIC-DOLOMITE (CALCINED) IN CANADA, 1927 - 1936.

Year	Value \$	Year	Value \$
1927 .....	230,309	1932 .....	262,860
1928 .....	346,990	1933 .....	360,128
1929 .....	491,170	1934 .....	382,927
1930 .....	336,162	1935 .....	486,084
1931 .....	295,579	1936 .....	768,742

Table 18 - MAGNESITE AND DOLOMITE USED IN THE CANADIAN PRIMARY IRON AND STEEL INDUSTRY, 1931 - 1935.

Year	DOLOMITE		MAGNESITE	
	Short tons	Value \$	Short tons	Value \$
1931 .....	15,773	76,317	(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

(a) Information not available.

NOTE - In addition to dolomite and magnesite the Canadian iron and steel industry consumes large quantities of other refractories; these included, in 1935, firebrick valued at \$451,604 (kind unspecified); fireclay, 11,510 short tons at \$101,601, and \$28,064 worth of cupola blocks.



Table 19 - CALCINED MAGNESITE USED BY THE ARTIFICIAL ABRASIVES AND ABRASIVE PRODUCTS INDUSTRY IN CANADA, 1933 - 1936.

Year	Ton	Value \$	Year	Ton	Value \$
1933 .....	(a)	16,430	1935 .....	40	2,448
1934 .....	104	6,370	1936 .....	418	25,256

Table 20 - IMPORTS OF MAGNESITE AND MAGNESITE FIRE BRICK INTO CANADA, 1931 - 1936.

Year	Magnesite, dead burned, sintered caustic calcined or plastic magnesia		Magnesite fire brick	
	Cwt.	\$		\$
1931 .....	35,741	40,628		152,435
1932 .....	21,302	28,626		71,077
1933 .....	28,053	43,229		246,855
1934 .....	9,439	26,740		396,915
1935 .....	15,296	42,644		384,141
1936 .....	23,254	56,515		568,565

Table 21 - EXPORTS OF MAGNESITE, CALCINED, DEAD-BURNED, ETC., FROM CANADA, 1931-1936.

Year	Cwt.	\$	Year	Cwt.	\$
1931 .....	32,214	45,257	1934 .....	39,933	56,670
1932 .....	23,885	33,103	1935 .....	31,531	43,338
1933 .....	46,396	63,056	1936 .....	58,554	71,183

Canadian Trade Journal quotation for calcined magnesite (October, 1937) was \$48 to \$60 per ton. "Metal and Mineral Markets" - New York - (October, 1937) quotations for magnesite were - per ton, f.o.b. California, dead burned, \$25. Artificial periclase, 94 per cent MgO, \$65; 90 per cent, \$35. Caustic, 95 per cent MgO, white color, \$40; 85 per cent MgO, no color standard, \$37.50. Washington: dead burned grain magnesite, \$25.

Table 22 - WORLD'S PRODUCTION OF MAGNESITE, 1933, 1934 and 1935.

(Taken from the Imperial Institute's publication "The Mineral Industry of the British Empire and Foreign Countries")  
(Long tons)

Producing Country and Description	1933	1934	1935
<b>BRITISH EMPIRE</b>			
Union of South Africa - Crude .....	1,471	1,641	1,462
Canada - Crude .....	26,729	26,953	26,700
India - Crude .....	15,206	14,975	16,984
Australia - Crude .....	9,720	15,923	16,071

Table 22 - WORLD'S PRODUCTION OF MAGNESITE, 1933, 1934 and 1935. (concluded)  
(Long tons)

Producing Country and Description	1 9 3 3	1 9 3 4	1 9 3 5
<u>FOREIGN COUNTRIES</u>			
Austria - Crude .....	161,736	254,301	295,569
Caustic (c) .....	23,462	35,247	44,000
Dead-burnt (c) .....	63,260	63,704	85,000
Bricks (c) .....	24,970	28,325	37,000
Czechoslovakia - Crude (b) .....	9,265	8,698	9,317
Calcined (b) .....	18,988	23,151	28,763
Greece - Crude .....	44,013	69,276	92,085
Caustic (c) .....	16,039	13,943	18,807
Dead-burnt (c) .....	2,605	5,888	6,162
Italy - Crude .....	2,152	1,100	940
Germany (Prussia) - Crude .....	(a)	10,836	13,600
Norway - Crude .....	1,975	2,461	2,486
Calcined (c) .....	579	659	603
Bricks (c) .....	483	660	787
U.S.S.R. (Russia) - Crude .....	361,000	474,000	(a)
Yugoslavia (Serbia only) - Crude .....	14,371	24,690	29,286
Calcined .....	5,561	9,611	11,475
United States - Crude .....	96,596	90,154	158,173
Caustic (sales) (c) .....	7,269	6,721	9,563
Dead-burnt (c) .....	38,940	34,406	60,515
Korea - Crude .....	(a)	3,118	2,372
"Manchoukuo" - Crude .....	70,249	71,000	(a)
Turkey - Crude .....	936	618	1,075

(a) Information not available.

(b) Exports less imports.

(c) Derived from crude shown, and not additional.

MAGNESIUM SULPHATE (EPSOM SALTS - NATURAL) - Production of natural magnesium sulphate in Canada during 1936 totalled 654 short tons valued at \$13,712 compared with 340 short tons at \$7,965 in 1935. The output of the mineral in Canada represents recovery of hydrous magnesium sulphate from brine lakes located in British Columbia. Epsom Refineries, Ltd., the sole producers of this mineral in Canada, conducted mining operations from August to September while its refining plant, located at Ashcroft, was active from February to April and from July to the close of the year. The rated capacity of the Ashcroft refinery in 1936 was one ton of finished salts per hour.

Magnesium sulphate is used largely in the tanning and medicinal industries. Discussing magnesium salts generally, the United States Bureau of Mines states that improved technique for handling magnesium precipitates, especially from dilute solutions, has made possible the commercial recovery not only of technical carbonate but of refractories and other moderately low prices magnesia products from natural brines and bitterns and even from raw ocean water; as a result, the potential improvement of natural magnesium salts has increased enormously.

Canadian trade publications quoted (October, 1937) magnesium sulphate, B.P. bbls.  $2\frac{1}{2}$  to 3 cents per pound. Technical bags, \$36 to \$40 per ton.



Table 23 - IMPORTS INTO CANADA OF MAGNESIUM SULPHATE (EPSOM SALTS) 1931 - 1936.

Years	Pounds	\$	Years	Pound	\$
1931 .....	4,120,086	43,807	1934 .....	4,599,518	48,459
1932 .....	4,383,115	47,679	1935 .....	3,684,390	40,407
1933 .....	4,269,852	49,868	1936 .....	3,579,069	37,928

Table 24 - MAGNESIUM SULPHATE USED IN CANADIAN PHARMACEUTICAL PREPARATIONS AND TANNING, 1932 - 1936.

Years	Pharmaceutical preparations		Tanning (x)	
	Pounds	Value	Pounds	Value
		\$		\$
1932 .....	622,459	28,073	181,811	2,418
1933 .....	851,355	24,629	396,424	4,467
1934 .....	816,830	33,793	228,281	4,789
1935 .....	826,082	22,647	759,744	12,254
1936 .....	(a)	(a)	(a)	(a)

(x) Data not entirely complete for years prior to 1935.

(a) Data not yet complete.

**MANGANESE BOG** - Bog manganese consists mainly of oxide of manganese and water with usually some oxide of iron and often silica, alumina and baryta. Shipments of bog manganese from Dawson Settlement, Albert county, New Brunswick, during 1931 amounted to 77 tons valued at \$462. Some development work in 1934 was reported on a bog manganese deposit located at North Renous, New Brunswick. No commercial shipments of bog manganese have been made since 1931. The mineral is utilized chiefly in the ceramic industry.

**MINERAL WATERS** - Shipments of natural mineral waters from Canadian springs totalled 154,286 imperial gallons valued at \$18,516 in 1936 compared with 146,516 imperial gallons worth \$16,590 in the preceding year. 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. Francois river in Yamaska county; **Potton** springs in Brome county and the **Coulombia** 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 totalled 16 in 1936, of which 14 were located in the province of Quebec and 2 in Ontario.

It is interesting to note that natural mineral waters from springs in the county of **Lac St. Jean**, Quebec, were utilized during 1936 in highway maintenance.

Table 25 - SHIPMENTS OF NATURAL MINERAL WATERS FROM CANADIAN SPRINGS, 1930 - 1936.

Years	Q U E B E C		O N T A R I O		C A N A D A	
	Imp.gal.	\$	Imp.gal.	\$	Imp.gal.	\$
1930 .....	12,941	3,727	214,200	20,754	227,141	24,481
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

Shipments of natural mineral waters from Canadian springs during the first six months of 1937 totalled 45,169 imperial gallons valued at \$7,142 compared with 41,512 gallons at \$6,882 in the corresponding period of 1936.

Imports into Canada of natural mineral waters, not in bottles, totalled 55 imperial gallons valued at \$22 in 1936 compared with 83 gallons worth \$46 in 1935. Mineral and aerated waters, n.o.p., imported during 1936 were valued at \$89,505 against \$85,040 in the preceding year.

Exports of mineral and aerated waters during 1936 were valued at \$4,057 while in 1935 similar exports amounted to \$4,627.

Table 26 - SALES OF NATURAL MINERAL WATERS(x) BY THE CANADIAN AERATED WATERS INDUSTRY, 1930 - 1936.

Years	\$	Years	\$
1930 .....	178,348	1934 .....	52,113
1931 .....	140,730	1935 .....	45,100
1932 .....	92,066	1936 .....	(a)
1933 .....	77,125		

(x) Whether fortified or not.

(a) Not complete.

PEAT - The production of peat for fuel in Canada during 1936 totalled 1,341 short tons valued at \$7,376 compared with 1,340 tons worth \$5,761 in 1935. Of the 1936 output, 45 tons valued at \$255 came from Quebec and the balance from bogs in Ontario. The Bureau of Mines, Ottawa, reported that during 1936 there were five bogs operating in Ontario and one in Quebec for the production of air-dried peat, to be used in localities close to the bogs; eleven other deposits were operated for the production of moss litter, and of insulating material, four of them in Quebec, two in Ontario, and one each in New Brunswick, Manitoba, Saskatchewan, Alberta and British Columbia. In addition, considerable development took place on a peat-shell-marl property in Ontario, the finished material to be used as fertilizer.

PHOSPHATE - Shipments of Canadian mined phosphate during 1936 totalled 525 tons valued at \$4,927 compared with 186 tons worth \$1,103 in 1935. Production in 1936 represented apatite recovered chiefly as a by-product mineral in the mining or dressing of mica in the province of Quebec. No production of phosphate rock has been reported in British Columbia during recent years.



The only important recorded occurrences of phosphate rock in Canada are the Precambrian apatite deposits of the Ottawa-Kingston region, in Ontario and Quebec, and the rather low-grade sedimentary phosphate of the Crowsnest district just west of the boundary between southern Alberta and British Columbia.

Phosphate rock is consumed largely in the production of superphosphate (for fertilizer), while the apatite mined in Eastern Canada is utilized in the manufacture of phosphorus. Phosphorus-bearing basic slag, a by-product in the manufacture of basic steel from phosphatic iron ores, is also largely employed as a fertilizer, particularly in England, Germany, Belgium, France and Luxemburg.

Table 27 - PRODUCTION OF PHOSPHATE IN CANADA, 1927 - 1936.

Years	short tons	\$	Years	short tons	\$
1927 .....	151	1,717	1932 .....	1,316	12,333
1928 .....	641	8,276	1933 .....	2,214	5,475
1929 .....	1,185	5,380	1934 .....	81	683
1930 .....	40	760	1935 .....	186	1,103
1931 .....	...	...	1936 .....	525	4,927

Table 28 - IMPORTS OF PHOSPHATE ROCK INTO CANADA, 1931 - 1936.

Years	Cwt.	\$	Years	Cwt.	\$
1931 .....	2,834,458	619,079	1934 .....	635,494	165,240
1932 .....	1,428,657	346,907	1935 .....	1,270,284	234,580
1933 .....	367,020	74,527	1936 .....	1,669,478	298,179(x)

(x) Came entirely from the United States.

Imports of acid phosphate, not medicinal, totalled 438,466 pounds valued at \$28,462 in 1936 while those of soda phosphate for the same year totalled 2,164,520 pounds valued at \$77,961.

Table 29 - PHOSPHATE ROCK AND SUPERPHOSPHATE USED IN THE MANUFACTURE OF CANADIAN FERTILIZERS, 1931 - 1936.

Years	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

"Metal and Mineral Markets" - New York - October, 1937, phosphate quotations, were - per long ton, f.o.b. mines: Florida pebble for export, 77 to 76 per cent, \$7.25; 68 per cent, \$4.50. Tennessee, ground lime phosphate, 85 per cent, through 300 mesh, 34.30 per cent P<sub>2</sub>O<sub>5</sub>, \$8.25 per short ton, bags extra.

Table 30 - WORLD'S PRODUCTION OF PHOSPHATE ROCK, 1933, 1934 and 1935.  
(Taken from the Imperial Institute's publication - The Mineral Industry  
of the British Empire and Foreign Countries)  
(Long tons)

Producing Country	1933	1934	1935
<u>BRITISH EMPIRE</u>			
Tanganyika .....	...	205	191
Seychelles (exports) .....	12,113	11,871	9,923
Union of South Africa .....	1,163	76	...
Canada .....	1,977	72	166
India .....	37	59	102
Christmas Island .....	91,280	128,010	147,929
Australia .....	96	207	235
Nauru Island .....	363,680	418,950	480,950
Ocean Island .....	185,575	211,250	228,100
TOTAL .....	656,000	771,000	868,000
<u>FOREIGN COUNTRIES</u>			
Belgium (b) .....	24,733	14,158	(a)
Estonia .....	8,809	10,441	11,458
France .....	74,450	65,700	(a)
Germany .....	(a)	723	177
Poland .....	6,250	7,534	(a)
Roumania (e) .....	...	1,200	(a)
Spain .....	14,278	18,992	(a)
U.S.S.R. (Russia) (d) .....	200,000	376,000	758,000
Algeria .....	578,470	523,804	594,326
Egypt .....	433,673	431,016	466,411
Madagascar .....	13,000	8,208	6,000
Morocco (Franch) .....	1,048,822	1,171,150	1,134,117
Tunis .....	1,780,000	1,738,000	1,470,000
Netherlands West Indies (exports)	84,199	99,038	89,019
United States .....	2,359,635	2,898,238	3,215,586
French Indo-China .....	...	4,000	5,800
China (estimated) .....	8,000	8,000	8,000
Japan .....	34,193	55,600	89,807
Netherlands East Indies .....	7,821	4,934	11,371
Philippine Islands (c) .....	3,048	(a)	(a)
Angaur Island (exports) .....	73,250	63,783	76,878
Makatea .....	77,797	80,700	133,800
New Caledonia .....	6,000	2,000	9,000
TOTAL .....	6,800,000	7,600,000	8,100,000
WORLD'S TOTAL .....	7,500,000	8,400,000	9,000,000

(a) Information not available.

(b) In addition phosphatic chalk was produced as follows -

1933 ..... 59,840 long tons

1934 ..... 37,808 long tons.

(d) Apatite concentrate from Kola district only. In addition a quantity of low grade phosphate-rock is produced, the total output of all phosphate-rock including apatite was 2,389,000 long tons during 1934 and 2,214,000 long tons during 1935.

(e) Converted from cubic metres at the rate of 1 cubic metre = 2 long tons.

(c) Including guano.



POTASH - Natural potash salts are not yet mined or recovered on a commercial scale in Canada. Potash occurs in small quantities in rock salt strata at Malagash, Cumberland county, Nova Scotia, and at Gautreau, Westmorland county, New Brunswick. A search for beds of economic importance has been made and results so far obtained have been sufficiently promising to warrant future work. Potassium chloride so far opened up at Malagash occurs in a number of definite bands in the salt mass in the form of crystalline beds of pink and yellowish green sylvite in the matrix of halite. Small shipments of potash-bearing salt have been made from the Malagash deposit; this salt was employed as a fertilizer.

Imports into Canada of crude muriate of potash, as a fertilizer, totalled 594,252 cwt. valued at \$583,155 during 1936, while those of crude sulphate of potash, for the same purpose, amounted to 72,717 cwt. valued at \$104,238. The total value of saltpetre and all other potassium compounds imported in 1936 was \$352,635.

SILICA BRICK - The production of silica brick in Canada during 1936 totalled 2,393 M valued at \$97,285 compared with 2,461 M worth \$96,194 in 1935. 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. Reflecting the increased production of steel was a distinct advance in the manufacture of silica brick during the first six months of 1937 when production totalled 1,000 M valued at \$53,299 compared with 437 M worth \$20,568 in the first half of 1936.

Table 31 - PRODUCTION OF SILICA BRICK IN CANADA, 1927 - 1936.

Years	M	\$	Years	M	\$
1927 .....	1,791	79,527	1932 .....	93	4,304
1928 .....	3,224	155,502	1933 .....	636	23,185
1929 .....	3,951	173,581	1934 .....	2,528	85,945
1930 .....	2,418	97,379	1935 .....	2,461	96,194
1931 .....	900	35,746	1936 .....	2,393	97,285

Table 32 - IMPORTS OF SILICA BRICK(x) INTO CANADA, 1931 - 1936.

Years	\$	Year	\$
1931 .....	234,909	1934 .....	210,190
1932 .....	122,952	1935 .....	215,500
1933 .....	147,901	1936 .....	261,974(a)

(x) Containing not less than 90 per cent silica.

(a) \$261,952 from the United States.

SODIUM CARBONATE (NATURAL)-- Commercial shipments of natural sodium carbonate from Canadian deposits totalled 192 short tons valued at \$1,677 in 1936 compared with 242 tons at \$2,430 in 1935. Production of this mineral in Canada is restricted to the province of British Columbia where it occurs in the form of "natron" ( $\text{NaCO}_3 \cdot 10\text{H}_2\text{O}$ ) and also as brine in several lakes located principally in the Clinton mining division. Production in 1936 came from the Liberty property located some four miles east of Big Bar lake in the Clinton district; the mineral was consigned to Vancouver for the manufacture of soap. "Mineral Industry" states that the low price of sodium carbonate produced by the highly technically developed ammonia-soda industry, coupled with the difficulty of producing a pure product from the natural deposits and brines, makes the natural sodium carbonate industry relatively unimportant. Sodium carbonate, or soda ash, has many industrial uses, being employed in the manufacture of glass, soap, and in the purification of oils, etc.

Table 33 - PRODUCTION OF SODIUM CARBONATE (NATURAL) IN CANADA, 1927 - 1936.

Years	Tons	\$	Years	Tons	\$
1927 .....	805	9,995	1932 .....	495	5,450
1928 .....	519	4,922	1933 .....	559	5,773
1929 .....	600	8,100	1934 .....	244	1,920
1930 .....	364	4,550	1935 .....	242	2,430
1931 .....	712	7,351	1936 .....	192	1,677

Table 34 - IMPORTS OF SODA ASH OR BARILLA INTO CANADA, 1931 - 1936.

Years	Pounds	\$	Years	Pounds	\$
1931 .....	1,647,304	25,771	1934 .....	2,311,498	32,258
1932 .....	1,803,951	27,751	1935 .....	2,647,572	37,995
1933 .....	1,616,483	23,256	1936 .....	(x) 3,184,692	43,503

(x) 2,600,080 pounds from the United States and 584,612 pounds from the United Kingdom.

Table 35 - SODIUM CARBONATE (SODA ASH) USED IN THE CANADIAN CHEMICALS AND ALLIED PRODUCTS INDUSTRIES, 1931 - 1936.

Years	Pounds	\$	Years	Pounds	\$
1931 .....	12,439,458	201,654	1934 .....	21,879,170	327,214
1932 .....	11,421,879	193,422	1935 .....	24,971,934	372,286
1933 .....	12,221,928	191,639	1936 .....	Data not yet complete	



Table 36 - SODA ASH USED IN CANADIAN INDUSTRIES, AS SPECIFIED, 1931 - 1936.

Years	Pulp and Paper		Non-metallic minerals(x)		Dyeing, cleaning and laundry	
	Tons	\$	Pounds	\$	Pounds	\$
1931 .....	3,707	120,461	47,764,713	694,806	(not available)	
1932 .....	2,556	86,996	43,545,840	598,884	502,459	16,322
1933 .....	2,628	92,818	38,336,000	505,152	556,599	17,220
1934 .....	1,863	67,276	49,259,418	644,655	761,515	19,274
1935 .....	2,074	74,568	47,847,466	632,715	682,033	16,282
1936 .....	2,692	93,418	52,222,000	673,232	(a)	(a)

		Dyeing and finishing of textiles		Sugar refineries	
		Pounds	\$	Pounds	\$
1931 .....	.....	.....	.....	.....	.....
1932 .....	.....	424,340	8,122	278,152	7,078
1933 .....	.....	310,073	6,197	173,066	4,364
1934 .....	.....	497,328	10,255	192,241	4,635
1935 .....	.....	419,909	8,014	193,966	4,578
1936 .....	.....	339,812	5,922	173,203	4,095

(x) Includes coke and gas, glass and petroleum refining.

(a) Not yet complete.

"Canadian Chemistry and Metallurgy" - Toronto - quoted soda ash (October, 1937) - bags of 100 pounds, \$2.05 to \$2.25.

SODIUM SULPHATE (NATURAL) (GLAUBER'S SALT AND SALT CAKE) - Producers' shipments of natural sodium sulphate totalled 75,598 short tons valued at \$552,681 in 1936 compared with 44,817 tons at \$343,764 in 1935. The tonnage produced in 1936 established an all-time high record for the industry and the value was only surpassed by that of 1934. Production during the first six months of 1937 amounted to 37,817 short tons valued at \$264,784 against 30,610 tons worth \$235,158 in the corresponding period of 1936.

The mineral is recovered in Canada only in the province of Saskatchewan and is produced either as hydrated sodium sulphate, known as Glauber's salt, or anhydrous sodium sulphate, known to the trade as "salt cake." It occurs as crystals (Glauber's salt) or in the form of partially saturated or saturated brines in many lakes throughout western Canada. Some of the Saskatchewan properties are equipped with plants for the purification and dehydration of the crude salt.

Sodium sulphate finds its principal use in the pulp and paper industry for the manufacture of "Kraft paper" by the sulphate process; it is also used in the manufacture of glass, in the dyes industry, in the smelting of nickel-copper ores, and as one of the raw materials in the manufacture of sodium carbonate.

According to the Bureau of Mines, Ottawa, the product from these western deposits should find a rapidly extending market, as the by-product material from the manufacture of hydrochloric acid is each year decreasing in volume owing to the manufacture of this acid synthetically.

During 1936 five firms reported production of natural sodium sulphate; capital employed in the industry was reported at \$766,058; fuel, purchased electricity and process supplies consumed totalled \$221,294, and \$137,207 were distributed as salaries and wages to the 138 employees.

"Canadian Chemistry and Metallurgy" - Toronto - (October, 1937) - quoted sodium sulphate (Glauber's salt), crystals in bags, cwt. to \$1.25; carlots, \$16 to \$17 per ton; anhydrous, \$32 to \$42 per ton.

Table 37 - PRODUCTION OF NATURAL SODIUM SULPHATE(x) IN CANADA, 1927 - 1936.

Years	short tons	\$	Years	short tons	\$
1927 .....	5,659	11,319	1932 .....	22,466	271,736
1928 .....	6,016	68,804	1933 .....	50,080	485,416
1929 .....	5,018	64,112	1934 .....	66,821	587,986
1930 .....	31,571	293,847	1935 .....	44,817	343,764
1931 .....	44,957	421,097	1936 .....	75,598	552,681

(x) Produced in the province of Saskatchewan.

Table 38 - IMPORTS INTO CANADA OF SALT CAKE (SULPHATE OF SODA), 1931 - 1936.

Years	Pounds	\$	Years	Pounds	\$
1931 .....	17,321,652	97,215	1934 .....	21,154,815	123,980
1932 .....	8,865,730	51,925	1935 .....	10,352,070	49,354
1933 .....	5,191,036	34,371	1936 .....	(x) 23,494,805	110,676

(x) Of the 1936 imports, 9,202,877 pounds came from the United States and 14,291,928 pounds from the United Kingdom.

Table 39 - IMPORTS INTO CANADA OF GLAUBER'S SALTS, 1931 - 1936.

Years	Pounds	\$	Years	Pounds	\$
1931 .....	1,999,042	10,838	1934 .....	1,266,665	8,853
1932 .....	1,806,882	11,027	1935 .....	3,167,715	26,591
1933 .....	1,791,011	13,237	1936 .....	(x) 2,510,103	27,521

(x) 2,037,970 pounds from Germany, 248,716 pounds from the United States and 80,784 pounds from the United Kingdom.

Imports of bisulphate of soda or nitre cake during 1936 totalled 1,192,806 pounds valued at \$15,727, all from the United States.

Table 40 - SALT CAKE USED IN THE MANUFACTURE OF CANADIAN WOOD PULP, 1930 - 1936.

Years	Tons	\$	Years	Tons	\$
1930 .....	33,119	676,597	1934 .....	34,559	655,905
1931 .....	24,756	503,560	1935 .....	35,350	642,801
1932 .....	24,301	489,343	1936 .....	41,524	711,635
1933 .....	29,563	580,251			



Table 41 - SODIUM SULPHATE USED IN THE CANADIAN ACIDS, ALKALIES AND SALTS, and MEDICINAL AND PHARMACEUTICAL INDUSTRIES, 1932 - 1936.

Years	ACIDS, ALKALIES AND SALTS		MEDICINAL AND PHARMACEUTICALS	
	Tons	\$	Tons	\$
1932 .....	94	1,811(x)	...	...
1933 .....	9,929	141,322	39	4,879
1934 .....	26,075	368,576	51	7,278
1935 .....	22,485	316,734	59	4,617
1936 .....	7,220	102,176(x)	(a)	(a)

(x) Does not include sodium sulphate consumed in the nickel mining and smelting industry.

(a) Information not available.

STRONTIUM MINERALS -- Four celestite ( $\text{Sr SO}_4$ ) deposits of economic interest occur in eastern Ontario but there has been no commercial production of the mineral in Canada for several years. A special report prepared by the Imperial Institute, London, refers to strontium minerals, as follows - "The reserves of strontium minerals, however, in both England and Germany appear to be limited, and it is possible that the known deposits in Canada, United States, France, Tunis and the U.S.S.R. will be opened up and exploited to an increasing extent in the future ... Strontium minerals are used principally in the beet-sugar industry; in pyrotechnics; as fillers; as "cleansers" for removing sulphur and phosphorus from special steels; as precipitants in the purification of caustic soda; in the chemical, pharmaceutical and ceramic industries; and in certain refrigerators." World production of celestite and strontianite in 1934 totalled 9,981 long tons. Prices of English celestite at the quarry during recent years have ranged from about 12s. 6d. per long ton for second grade material up to 32s. per long ton for best quality. No imports of these minerals into Canada were reported in either 1935 or 1936.

SULPHUR (PYRITES) -- The sulphur content of pyrites shipped and sulphur recovered from non-ferrous smelter gas ( $\text{SO}_2$ ) amounted in 1936 to 122,132 short tons valued at \$1,033,055 compared with 67,446 short tons worth \$634,235 in 1935. Production in both years came from the provinces of Quebec, Ontario and British Columbia. The production figures for 1936 represent an all-time high record in the output of sulphur by the Canadian mining and smelting industries.

The increase in Canadian sulphur production from the sources referred to above continued in 1937 when the output during the first six months totalled 62,055 short tons valued at \$544,425 compared with a production of 48,652 tons valued at \$442,631 in the corresponding period of 1936.

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 during 1936 was recovered from salvaged smelter gas 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 at Trail, using the by-product gases of its metallurgical plants; the 1936 annual report of the company states: "The fertilizer plant has been undergoing several changes to combine the operation of the direct production units with the new sulphur dioxide absorption and recovery plants; most of the new plants were started late in the summer. The performance of the commercial sulphur dioxide recovery plants fulfilled the prediction made from the pilot plant. Up to 165 tons per day of excellent grade ammonium sulphate have been recovered at a cost slightly above the cost of that made directly from ammonia and sulphuric acid. The extra cost is due to the extra evaporation required. A remarkably pure elemental sulphur is also obtained from these plants."

"All the gases from the zinc plant will now be treated, the sulphur from the fumes being recovered as ammonium sulphate, sulphuric acid and elemental sulphur - the last two being interchangeable. When the absorption plant proved successful, an appropriation was made to build further absorption plants to treat the tail gas from the sulphuric acid plant and to start recovery of the low grade roaster gas from the lead plant."

At Eustis, Quebec, the Consolidated Copper and Sulphur Co. Limited produced and shipped iron pyrites concentrates during 1936; these were consigned to chemical and other pyrites-consuming industries. In the same province mining operations were resumed at the Aldermac mine and during the first half of 1937 iron pyrites concentrates were produced and stock piled at the property.

In British Columbia, shipments of iron pyrites concentrates were made to both foreign and Canadian plants from Britannia Beach by the Britannia Mining and Smelting Company Limited.

"Canadian Chemistry and Metallurgy" - Toronto - quoted sulphur (October, 1937) - crude, contracts f.o.b. cars at mines - long ton \$18 to \$20. Crude, contracts, ex-vessel, St. Lawrence and Maritime ports, long ton \$23.50 to \$25.50; ground, 100 pounds, \$2.50 to \$2.75; roll, 100 pounds, \$3.50 to \$3.75. "Metal and Mineral Markets" - New York - quoted pyrites (October, 1937) - per long ton unit of sulphur, c.i.f. United States ports, guaranteed 48 per cent sulphur, Spanish, 12 to 12½ cents nominal.

Table 42 - PRODUCTION OF PYRITES(x) IN CANADA, 1927 - 1936.

Years	Pyrites	Sulphur	Value	Years	Pyrites	Sulphur	Value
	Tons	content Tons	\$		Tons	content Tons	\$
1927 .....	50,863	25,229	198,388	1932 .....	...	53,172	470,014
1928 .....	68,836	38,589	321,033	1933 .....	...	57,373	510,299
1929 .....	...	42,781	350,843	1934 .....	...	51,537	515,502
1930 .....	...	37,730	314,835	1935 .....	...	67,446	634,235
1931 .....	...	50,107	429,457	1936 .....	...	122,132	1,033,055

(x) Since 1928 includes sulphur content of by-product pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making and also elemental sulphur produced at Trail, British Columbia, since 1933.



Table 43 - PRODUCTION IN CANADA OF PYRITES WITH SULPHUR CONTENT, including SULPHUR CONTAINED IN SULPHURIC ACID, ETC., MADE FROM SMELTER GASES, 1935 and 1936.

	PYRITES(x)			:	SMELTER GAS	:	TOTAL SULPHUR
	Sales	Sulphur	content:	Sulphur	content:		
	Tons	Tons	Value :	Tons	Value:	Tons	Value
			\$		\$		\$
<u>1 9 3 5</u>							
Quebec .....	15,042	7,370	47,779	...	...	7,370	47,779
Ontario .....	...	...	...	13,292	132,920	13,292	132,920
British Columbia	14,163	7,152	57,216	(b)39,632	396,320	46,784	453,536
CANADA .....	29,205	14,522	104,995	52,924	529,240	67,446	634,235
<u>1 9 3 6</u>							
Quebec .....	86,919	43,084	282,743	...	...	43,084	282,743
Ontario .....	...	...	...	14,152	141,520	14,152	141,520
British Columbia(a)	40,293	20,084	160,672	(b)44,812	448,120	64,896	608,792
CANADA .....	127,212	63,168	443,415	58,964	589,640	122,132	1,033,055

(x) Recovered from copper ores.

(a) In addition, iron pyrites ore was shipped for smelting purposes.

(b) Includes elemental sulphur and sulphur in sulphuric acid and direct ammonium sulphate.

Table 44 - IMPORTS INTO CANADA OF BRIMSTONE AND SULPHUR, 1931 - 1936.

Years	Cwt.	\$	Years	Cwt.	\$
1931 .....	2,483,842	2,281,654	1934 .....	3,153,943	2,589,311
1932 .....	2,099,895	2,023,085	1935 .....	2,733,499	2,297,650
1933 .....	2,816,202	2,529,920	1936 .....	3,375,484	2,802,282

Sulphur contained in pyrites exported from Canada during 1936 totalled 52,192 short tons valued at \$284,718 of which 32,787 tons went to the United States and 19,405 tons to Japan.

Table 45 - CONSUMPTION OF SULPHUR BY SPECIFIED CANADIAN INDUSTRIES, 1935 and 1936.

Industries	1 9 3 5		1 9 3 6	
	Tons	\$	Tons	\$
Wood-pulp .....	126,958	2,960,761	143,317	3,310,932
Petroleum refining .....	78	5,098	66	4,631
Acids, alkalies and salts .....	14,301	295,336	11,738	222,053
Matches .....	32	1,507	28	1,344
Explosives .....	1,576	41,098	1,902	49,427
Insecticides .....	845	29,821	1,038	42,920
Adhesives .....	67	2,187	59	1,963
Chemicals, miscellaneous .....	6	231	(a)	(a)
Rubber .....	1,134	47,464	(a)	(a)
Sugar .....	154	7,986	179	8,568

(a) Not yet complete.

In addition to the consumption recorded above, there were 215 tons of sulphur used during 1935 in the dyeing and finishing of textiles and the fruit and vegetable and starch and glucose industries.

Table 46 - WORLD'S PRODUCTION OF SULPHUR, 1933, 1934 and 1935.

(Taken from the Imperial Institute's publication - The Mineral Industry  
of the British Empire and Foreign Countries)  
(Long tons)

Producing Country and Description	1933	1934	1935
<u>BRITISH EMPIRE</u>			
United Kingdom and Irish Free State -			
Spent oxide (b) .....	132,700	158,600	156,500
Canada - Smelter gas (d) .....	26,067	41,104	47,254
Palestine - Sulphur .....	...	...	634
<u>FOREIGN COUNTRIES</u>			
France - Sulphur rock .....	(a)	738	(a)
Germany (estimated) - Recovered from gases	20,500	23,000	30,000
Other by-product sulphur	4,000	4,000	4,000
Greece - Sulphur ore .....	...	2,018	118
Refined sulphur .....	...	105	23
Italy - Sulphur ore .....	2,283,381	2,071,265	1,910,805
Crude sulphur (c) - Fused .....	370,675	337,965	305,497
Ground .....	24,569	21,820	18,738
Norway (estimated) - Sulphur recovered			
from pyrites .....	60,000	60,000	65,000
Portugal - Sulphur recovered from pyrites.	...	1,411	8,563
Spain - Sulphur rock .....	53,184	54,065	(a)
Refined sulphur (e) .....	37,871	42,372	(a)
Sweden - Sulphur .....	624	497	11,502
United States - Crude sulphur .....	1,406,063	1,421,473	1,632,590
Slurry (f) .....	2,500	1,500	(a)
Smelter gas (g) .....	200,000	200,000	200,000
Bolivia (exports) - Sulphur .....	2,461	5,620	4,183
Guatemala - Sulphur .....	16	...	...
Chile - Ore .....	...	...	4,785
Sulphur .....	12,557	20,356	19,792
China - Sulphur .....	3,721	3,409	(a)
Formosa - Sulphur .....	854	(a)	(a)
Japan - Sulphur rock .....	2,657	4,706	20,764
Refined sulphur .....	112,619	133,273	162,340
"Manchoukuo" - Sulphur .....	500	1,000	(a)
Netherlands East Indies - Sulphur .....	11,036	12,047	9,492
Turkey - Sulphur .....	148	198	2,144

- (a) Information not available.  
 (b) Consumed by the sulphuric acid industry.  
 (c) Derived from sulphur ore above.  
 (d) Estimated sulphur content of gas used in acid making.  
 (e) Derived partly from sulphur rock above and partly from imported crude sulphur.  
 (f) The result of the purification of manufactured fuel gases.  
 (g) Estimated sulphur content of gas driven off in the smelting of zinc and copper concentrates, chiefly used in acid making.



Table 47 - PRODUCTION OF MISCELLANEOUS NON-METALLIC MINERALS IN CANADA, 1935 and 1936.

Item	Unit of measure	1 9 3 5		1 9 3 6	
		Quantity	Value	Quantity	Value
			\$		\$
Actinolite .....	ton	...	...	...	...
Barytes .....	ton	...	...	...	...
Bituminous sands .....	ton	40	160	...	...
Fluorspar .....	ton	75	900	75	900
Graphite .....	\$	...	79,781	...	88,812
Lithium ore .....	xxx	...	...	...	...
Magnesitic-dolomite .....	\$	...	486,084	...	768,742
Magnesium sulphate .....	ton	340	7,965	654	13,712
Mineral waters .....	Imp.gal.	146,516	16,590	154,286	18,516
Peat .....	ton	1,340	5,761	1,341	7,376
Phosphate (a) .....	ton	186	1,103	525	4,927
Silica brick .....	M	2,461	96,194	2,393	97,285
Sodium carbonate .....	ton	242	2,430	192	1,677
Sodium sulphate .....	ton	44,817	343,764	75,598	552,681
TOTAL (Gross) .....	\$	...	1,040,732	...	1,554,628
Sulphur production (x) .....	ton	67,446	634,235	122,132	1,033,055

(a) Represents apatite mined in Quebec and Ontario.

(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).

Table 48 - PRINCIPAL STATISTICS RELATING TO MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1935 and 1936.

	1 9 3 5	1 9 3 6
Number of plants .....	44	41
Capital employed .....	\$ 2,555,124	2,195,621
Number of employees - On salary .....	49	76
On wages .....	317	401
Total .....	366	477
Salaries and wages - Salaries .....	\$ 91,736	106,761
Wages .....	266,101	419,487
Total .....	357,837	526,248
Selling value of products (Gross) .....	1,040,732	1,554,628
Cost of fuel and electricity .....	219,057	296,017
Cost of process supplies used .....	35,891	252,427
Selling value of products (Net) .....	785,784	1,006,184

Table 49 - WAGE-EARNERS, BY MONTHS, IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1932 - 1936.

Month	1932	1933	1934	1935	1936
January .....	80	89	239	161	214
February .....	87	94	253	154	219
March .....	98	117	269	205	165
April .....	166	156	243	222	379
May .....	229	175	446	328	404
June .....	226	234	498	419	473
July .....	197	344	460	429	509
August .....	151	378	431	420	429
September .....	157	369	402	418	533
October .....	175	363	340	372	507
November .....	165	322	286	378	481
December .....	91	318	283	228	452
AVERAGE .....	147	253	348	317	401

Table 50 - FUEL AND ELECTRICITY USED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1935 and 1936.

Kind	Unit of measure	1 9 3 5		1 9 3 6	
		Quantity	Cost	Quantity	Cost
Bituminous coal - Canadian .....	tons	9,521	\$ 55,730	14,851	\$ 90,701
Imported .....	tons	943	4,527	1,385	6,654
Anthracite - from United States .....	tons	10	150	2	30
Anthracite - other .....	tons	2	30	12	180
Lignite coal .....	tons	16,010	39,476	26,045	63,412
Coke .....	tons	1	9	2	31
Gasoline (exclusive of that used in motor cars) .....	Imp. gal.	47,403	9,209	60,076	13,456
Fuel oil and diesel oil .....	Imp. gal.	1,377,925	75,484	1,701,478	91,170
Kerosene or coal oil .....	Imp. gal.	792	177	954	186
Wood (cords of 128 cubic feet) .....	cords	1,733	6,573	1,143	2,541
Gas - Manufactured .....	M cu.ft.	87,410	8,652	37,989	3,742
Other fuel .....	\$	...	602	...	14
Electricity purchased .....	K.W.H.	2,029,225	18,438	3,242,068	23,900
TOTAL .....	\$	...	219,057	...	296,017
Electricity generated for own use K.W.H.		1,569,321	...	2,108,997	...

Table 51 - POWER EQUIPMENT EMPLOYED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES, 1935 and 1936.

Kind	1 9 3 5		1 9 3 6	
	Number of units	Total rated horse power	Number of units	Total rated horse power
Steam engines and steam turbines ...	5	880	7	742
Diesel engines .....	4	885	5	850
Gasoline, gas and oil engines .....	17	898	18	460
Hydraulic turbines or water wheels ..	3	240	2	200
Electric motors .....	206	3,845	234	4,111
Boilers .....	7	667	7	1,010



DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA,  
1936.

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Name of Operator and Province

Office Address

BARYTES

ONTARIO -

Barytes Products Ltd. (x)

4 Notre Dame St. E., Montreal, P.Q.

BITUMINOUS SANDS

ALBERTA -

Abasand Oils Ltd. (a)

703 ... 330 Bay St., Toronto, Ont.

Bituminous Sand Extraction Co. Ltd. (a)

507 MacLean Block, Calgary

International Bitumen Co. Ltd. (a)

411 Williamson Bldg., Edmonton

McMurray Asphaltum & Oil Ltd. (a)

Petrolia, Ont.

FLUORSPAR

ONTARIO -

Stoklosar, Chas. A.

Box 198, Madoc, Ontario

GRAPHITE

ONTARIO -

Black Donald Graphite Co. Ltd.

Calabogie, Ontario

LITHIUM ORE

MANITOBA -

The Lithium Corp. of Canada, Ltd.

403 Avenue Bldg., Winnipeg

MAGNESITIC-DOLOMITE

QUEBEC -

International Magnesite Co. Ltd.

Calumet, P.Q.

Canadian Refractories Ltd.

1050 Canada Cement Bldg., Montreal, P.Q.

BRITISH COLUMBIA -

Consolidated Mining & Smelting Co. Ltd. (a) Trail, B.C.

MAGNESIUM SULPHATE

BRITISH COLUMBIA -

Epsom Refineries Ltd.

395 Main St., Winnipeg, Manitoba.

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA,  
1936 (continued)

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Name of Operator and Province

Office Address

MINERAL WATERS

QUEBEC -

Abenakis Springs Co.	Blondin
Eau Minerale Etoile	Ste. Genevieve de Batiscan
Gurd, Chas., & Co. Ltd.	1016 Bleury St., Montreal
Laboratoire Mont-Clair	935 Robillard Ave., Montreal
Lacerte Adelard-Madame	St. Severe
Lamarre dit Bellemare, Josaphat	St. Barnabe Nord
La Cie d'Eau Minerale	148 Concorde St., St. Hyacinthe
La Cie Embouteillage Ideal	3 St. Germain St., St. Hyacinthe
L'Eau Naturelle Purgative de Chambord	Desbiens
Maski Bottling Works	Maskinonge
Pellerin, Albert	St. Barnabe Nord
Radnor Mineral Water Springs	St. Maurice
Richard, Gerard	St. Gregoire
Source Coulombia	L'Epiphanie
Vandal, Donat	64 rue St. Pierre, St. Hyacinthe

ONTARIO -

Boyd, T. Russell	Carlsbad Springs
Deneault, F. (x)	Bourget
Gurd, Chas., & Co. Ltd.	1016 Bleury St., Montreal

PHOSPHATE

QUEBEC -

Bigelow, V.	Glen Almond
Boisvenue, A.	Notre Dame de la Salette
Cameron, B. & D.	Buckingham
Miller, Jas.	Glen Almond
Wallingford Bros.	Perkins

SILICA BRICK

NOVA SCOTIA -

Dominion Steel and Coal Corp. Ltd.	Sydney, N.S.
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ONTARIO -

Algoma Steel Corp. Ltd.	Sault Ste. Marie, Ont.
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SODIUM CARBONATE

BRITISH COLUMBIA -

B. C. Sodium Syndicate	Kamloops
Bishop, James A.	Clinton



DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA,  
1936 (concluded)

Name of Operator and Province

Office Address

SODIUM SULPHATE

SASKATCHEWAN -

Domlnion Sodium Refineries Ltd.	513 Lougheed Bldg., Calgary, Alberta
Horseshoe Lake Mining Co. Ltd.	Ormiston
Midwest Chemicals Ltd.	Palo
Muskiki Sulphates Ltd. (a)	Chinook, Alberta
Natural Sodium Products Ltd.	Expanse
Oban Salt Co. Ltd. (a)	Oban
Saskasal Ltd.	513 Westman Chambers, Regina
Sodium Corporation, Ltd.	Alsask
Sodium Sulphate Development Co. (a)	Viscount

SULPHUR

QUEBEC -

Aldermac Mines Ltd. (b) (a)	941 Dominion Square Bldg., Montreal
Consolidated Copper and Sulphur Co. Ltd. (b)	Eustis, P.Q.

ONTARIO -

International Nickel Co. of Canada, Ltd. (c)	Copper Cliff
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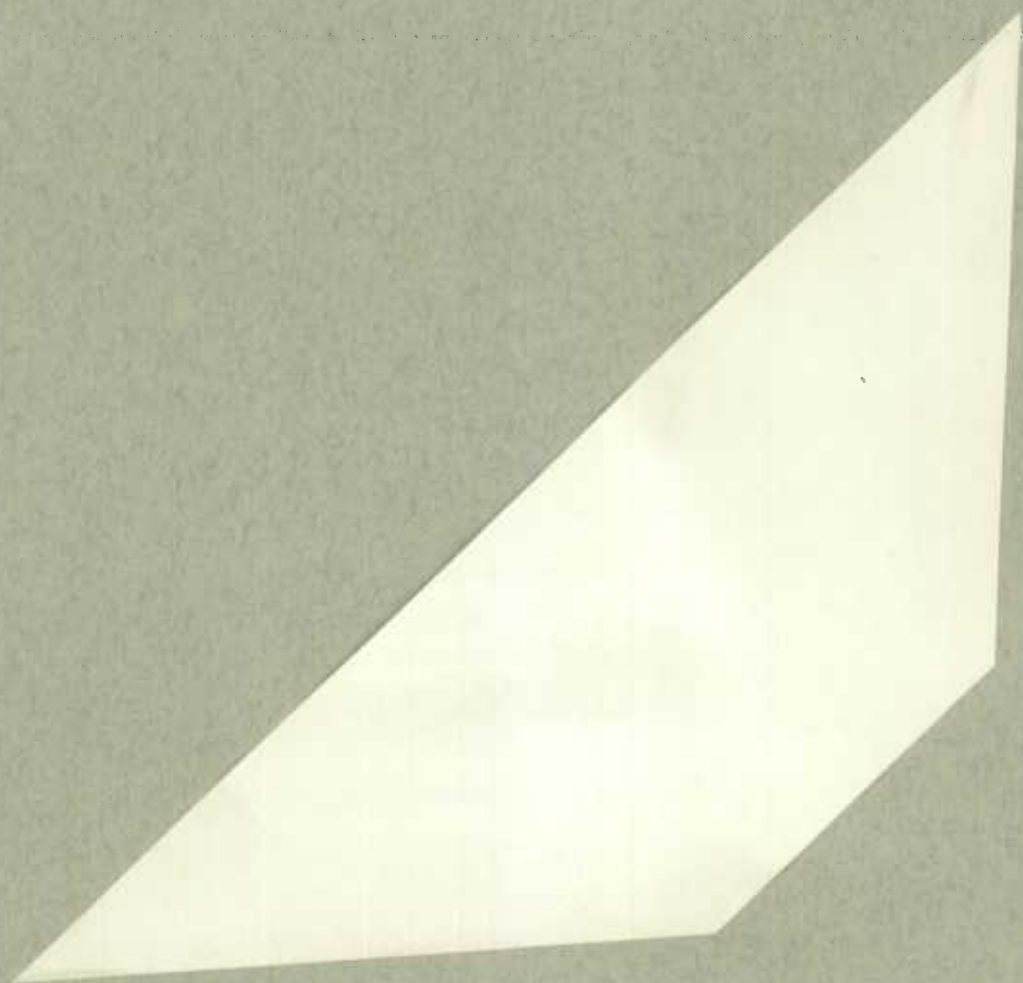
BRITISH COLUMBIA -

Consolidated Mining & Smelting Co. of Canada Ltd. (c)	Trail
Britannia Mining & Smelting Co. Ltd.(b)	Britannia Beach

- (x) Company now inactive.  
(a) Active, but no shipments made.  
(b) Pyrites  
(c) Salvaged smelter gas.







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