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CANADA

DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH

THE NICKEL-COPPER MINING, SMELTING AND NICKEL REFINING INDUSTRY IN CANADA 1939

OTTAWA
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THE NICKEL-COPPER MINING, NICKEL-COPPER SMELTING and NICKEL REFINING INDUSTRY IN CANADA, 1939

The production of new nickel in Canada during 1939 totalled 226,105,865 pounds valued at $50,920,305 compared with 210,572,738 pounds worth $53,914,494 in 1938. Almost the entire production of Canadian nickel in 1939 originated in the nickel-copper ores of the Sudbury district, Ontario, and represented the recovery of the metal in the refined state, in oxides and salts, and in matte exported. In addition to the nickel obtained from the Sudbury ores, there is a relatively small quantity of the metal recovered annually in the treatment of silver-cobalt ores from the Cobalt district of Northern Ontario. The quantity of nickel produced from Canadian ores during the year under review was the greatest in the history of the industry. Copper recovered in 1939 from nickel-copper ores totalled 328,144,517 pounds valued at $32,608,528 or 53.9 per cent and 53.5 per cent respectively of the total quantity and value of new copper produced from all sources in the Dominion in 1939. The nickel-bearing deposits of the Sudbury area also contain relatively high values in platinum metals which are recovered in refining operations.

In addition to production of nickel, copper, and the platinum metals, there is an important recovery from these ores of the associated metals - silver, gold, selenium and tellurium; sulphur for the manufacture of sulphuric acid is also salvaged in the gaseous state from waste smelter gases. The total gross value of the various primary products of the Canadian industry, considered as a whole, was estimated at $91,457,844 in 1939 compared with $96,309,239 in 1938. Silver recovered by the industry in 1939 amounted to 2,496,632 fine ounces, while the production of gold during the same period totalled 77,094 fine ounces. In 1926 the corresponding production of gold from these same ores was only 4,447 fine ounces.

Two companies operated both mines and metallurgical plants in the Sudbury area. The International Nickel Co. of Canada, Limited, conducts smelting operations at Copper Cliff and Coniston, Ontario, while the Falconbridge Nickel Mines, Ltd., smelt their ores at the Falconbridge mine located a few miles east of the town of Sudbury. This last named company treated their matte in a refinery located at Kristiansand, Norway, until the invasion of that country by Germany in 1940. The relatively small amount of nickel oxide produced at Deloro, Ontario, is recovered from silver-cobalt-nickel-arsenic ores mined in Northern Ontario. Smelter matte made by the International Nickel Co. of Canada, Limited, is treated in plants located at Clydach, Wales; Huntington, West Virginia, and at Port Colborne and Copper Cliff, Ontario. Converter copper made by the International Nickel Co. is electrolytically refined at Copper Cliff.

Capital employed in Canada by the nickel-copper mining, smelting and refining industry during 1939 was reported at $128,302,729. Employees totalled

11,494 and $20,557,838 were distributed as salaries and wages. Fuel and electricity used in 1939 were valued at $7,437,370 and the cost of chemicals, explosives and other process supplies consumed totalled $12,068,595.

Four mines and the Frood open pit were worked continuously by the International Nickel Co. during 1939; 7,273,835 tons of ore were mined of which 3,200,869 tons came from the Frood, 1,521,694 tons from the Frood open pit, 1,298,752 tons from the Creighton, 926,908 tons from the Levack and 325,612 tons from the Garson. A program of open pit mining was under way at the Stobie mine, where a large body of low-grade ore exists.

The International Nickel Company's concentrator was operated to capacity and 5,876,501 tons of ore were milled, comparable with 4,519,652 tons in 1938. Plans have been approved to increase the capacity of the concentrator to 20,000 tons per day in order to treat additional tonnages of ore from the open pit mining operations. Ore smelting at the Copper Cliff smelter was uninterrupted and 185,578 tons of bessemer matte and 165,129 tons of converter copper were produced during the year. The Coniston smelter ran continuously, processing 852,525 tons of ore and producing 50,587 tons of bessemer matte. At Port Colborne, Ontario, the nickel refinery produced 131,730,117 pounds of refined nickel, comparable with 124,233,682 pounds in 1938. At Copper Cliff the electrolytic copper refinery received 165,129 tons of molten converter copper from the Copper Cliff smelter and produced 150,541 tons of refined copper. In Wales, the nickel refinery at Clydach produced 43,962,458 pounds of pellet nickel and in addition 1,801,498 pounds of nickel sulphate; the Orford process plant was in operation during the entire year and the chemical department transferred from Smelthwick was brought into production in March, 1939. Production of platinum metals at the Acton platinum metals refinery was 4 per cent less than in 1938.

Work on the nickel mine and smelter at Kolosjoki (Petsamo) Finland continued until the invasion of Finland in November. Prior to the occupation of the property by Russian troops, the Canadian and American employees of the company left for Norway and returned home. Until the outbreak of hostilities the indications were that the mine would come into production not later than the early months of 1941.

The total number of employees of the International Nickel Company at the end of 1939 was 18,123 distributed as follows: Canada, 11,745; Great Britain, 3,754; United States, 2,585; other countries, 39. Employees on December 31, 1938, including 1,457 in Finland, numbered 17,282.

Proven ore reserves at December 31, 1939, excluding Petsamo Nikkeli O/Y (Finland) were 224,594,000 short tons, an increase of 12,226,000 tons over the figures reported a year previous. The nickel-copper contents of the ore reserves are calculated to be 7,214,000 tons.

Falconbridge Nickel Mines Ltd. reported that in 1939 ore treated totalled 576,801 tons after deducting 9,848 tons of waste picked and discarded from the hoisted ore, and adjusting for differences in above-ground storage. This tonnage consisted of 332,724 (57.7%) milling ore and 244,077 (42.3%) smelting ore. Matte produced totalled 16,965.3 short tons containing 9,232.5 short tons of nickel and 4,691.9 short tons of copper. Metals recovered per ton of ore treated were 32.01 pounds of nickel and 16.27 pounds of copper. Ore reserves as of December 31, 1938 were Falconbridge mine 5,863,000 tons, outside holdings 1,018,000 tons. New ore added at the Falconbridge mine in 1939 amounted to 1,206,661 tons.

The Falconbridge ore dressing plant, mill and smelter operated throughout 1939 with a minimum of lost time for interruptions and repairs. The nickel refinery at Kristiansand, Norway, operated steadily throughout the year, although somewhat hampered by delayed matte shipments during the beginning of the war. The precious metals separating plant, which for some time had produced pure gold, silver, platinum and palladium, was about ready at the close of the year for separation of iridium, rhodium and ruthenium. Metals in matte received at the refinery (less refining losses) during 1939 consisted of 17,346,693 pounds of nickel and 8,601,022 pounds of copper. Falconbridge and custom refined metals produced in 1939 were 20,113,286 pounds of nickel and 10,071,269 pounds of copper.

Early in April, 1940 the Kristiansand refinery fell under the control of the German invaders and Falconbridge Nickel Mines Ltd. later announced that the refinery at that time was unharmed and that the Germans were probably operating the plant to liquidate its stock of raw material and metals in process; the Company estimated that it would take five or six months to complete clean-up operations of this nature. Early in 1940, a first shipment of Falconbridge matte was made to the International Nickel Company plant at Copper Cliff for testing purposes.

Nickel Offsets Ltd., with properties in the townships of Foy, Bowell and Morgan of the Sudbury district, conducted surface operations from May 1st to January 15th, 1940 and completed several thousand feet of diamond drilling. At Yale in British Columbia the Western Nickel Corp. reported only camp work and supply packing; these operations were carried on during the period November 28th to December 28th, 1939.

Table 1 - PRINCIPAL STATISTICS OF THE NICKEL-COPPER MINING, SMELTING AND REFINING INDUSTRY IN CANADA, 1937 - 1939 (x)

		1937	1938	1939
Number of firms		(a)9	(f)9	(e)4
Number of mines		12	12	7
Number of smelters		3	3	3
Number of copper refineries		(g)	(g)	1
Number of nickel refineries		1	1	1
Capital employed	$	104,313,953	111,947,628	128,302,789
Number of employees - On salary		333	329	341
On wages		10,435	10,075	11,153
Total		10,758	10,404	11,494
Salaries and wages .. Salaries	$	1,075,552	1,114,511	1,195,565
Wages	$	17,677,175	17,122,883	19,362,273
Total	$	18,752,727	18,237,394	20,557,838
Fuel and purchased electricity used (c) ...	$	7,454,717	6,675,789	7,437,370
Process supplies used (b)	$	11,210,553	10,778,672	12,068,595
Estimated gross value of matte exported and Canadian refinery products (d)	$	111,353,066	96,309,239	91,457,844
Value of production less items (b) and (c).	$	92,687,996	78,854,778	71,951,879

(x) Does not include data for mines, power plants, etc., operated by subsidiary companies, data for copper refining in Ontario included in 1939 but not in previous years.

(a) 6 firms in Ontario, 2 in British Columbia, and 1 in New Brunswick.

(d) Data for 1937 and 1938 represent the values of products made in Canada from new or primary material only and do not include the value added in the electrolytic refining or other treatment of converter copper, scrap copper, customs ores, etc. in plants operated by subsidiary companies; value added in electrolytic copper refinery included in 1939 but not in previous years.

Footnotes to Table 1 -- (Concluded)
(e) 3 firms reported as active in Ontario and 1 in British Columbia.
(f) 7 firms in Ontario, 2 in British Columbia.
(g) In existence but not included as part of the nickel-copper mining, smelting and refining industry prior to 1939.

Table 2 - NUMBER OF WAGE-EARNERS EMPLOYED, BY MONTHS, 1932 - 1939

Month	1932	1934	1936	1937	1938	1939/
January	3,014	4,811	8,076	9,302	10,540	10,361
February	3,019	4,876	8,044	9,572	10,528	10,355
March	3,039	5,048	8,104	9,840	10,501	10,627
April	2,577	5,189	8,191	10,118	10,429	10,952
May	2,379	5,409	8,257	10,458	10,314	11,287
June	2,434	5,622	8,411	10,762	9,965	11,428
July	2,235	5,658	8,653	11,009	9,766	11,373
August	1,672	5,566	8,804	11,036	9,752	11,496
September	1,628	5,500	8,606	11,048	9,847	11,281
October	1,580	5,722	8,700	10,760	9,943	11,235
November	1,490	5,707	8,735	10,695	9,690	11,687
December	1,551	5,609	9,050	10,578	9,589	11,757

/ Includes Ontario copper refinery data for the first time in 1939.

Table 3 - NUMBER OF WAGE-EARNERS WHO WORKED THE NUMBER OF HOURS SPECIFIED, DURING ONE WEEK IN MONTH OF NORMAL EMPLOYMENT, 1939

Hours per week	Number
30 hours or less	...
44 hours	226
45 - 47 hours	982
48 hours	10,190
49 - 50 hours	...
51 - 54 hours	3
56 - 64 hours	595
65 hours and over	8
Grand Total	12,004
Total wages paid in week to employees specified $	392,275

Table 4 - FUEL AND ELECTRICITY USED FOR LIGHT AND POWER, 1938 and 1939

Kind	Unit of measure	1938 Quantity	1938 Cost at works	1939/ Quantity	1939/ Cost at works
			$		$
Bituminous coal - Canadian	short ton	1,528	9,695	1,455	9,062
Imported	short ton	19,112	121,426	35,808	216,638
Anthracite coal - U.S. ..	short ton	136	1,771	66	850
Other ..	short ton	154	2,464	178	2,845
Coke	short ton	147	1,450	262	2,581
Gasoline	Imp. gal.	51,840	11,121	84,473	15,722
Kerosene	Imp. gal.	8,790	1,744	10,081	1,932
Fuel oil and diesel oil ..	Imp. gal.	337,888	33,876	339,862	31,872
Wood	cord	20	80	...	...
Electricity purchased	K. W. H.	353,514,218	1,244,598	514,179,542	1,413,726
TOTAL	$	...	1,428,225	...	1,695,228

/ Includes data relating to copper refining in Ontario in 1939 but not in 1938.

Table 5 - FUEL AND ELECTRICITY USED FOR METALLURGICAL PURPOSES, 1938 and 1939

Kind	Unit of measure	1938 Quantity	1938 Cost at works	1939 Quantity	1939 Cost at works
			$		$
Bituminous coal - Canadian	short ton	239,248	1,417,644	316,749	1,760,788
Imported	short ton	121,241	696,151	113,510	686,383
Coke	short ton	216,469	2,060,410	215,613	2,041,088
Gasoline	Imp. gal.	5,118	1,033	4,532	904
Kerosene	Imp. gal.	295	59	...	...
Fuel oil and diesel oil	Imp. gal.	12,519,614	606,154	15,041,339	651,802
Wood	cord	7,910	40,652	5,863	27,005
Gas - Natural	M cu. ft.	300	297	308	302
Other fuel	$	...	2,327	...	2,696
Electricity purchased	K. W. H.	130,475,771	422,833	196,239,559	570,674
TOTAL	$	...	5,247,566	...	5,742,142

NOTE - In addition to the data shown in Tables 4 and 5 there was consumed in Canada during 1938 approximately $396,000 worth of fuel and electricity, chiefly in the refining of converter copper made from nickel-copper ores. Corresponding data for 1939 are included with the 1939 statistics.

Table 6 - POWER EQUIPMENT INSTALLATION, 1939

Description	Ordinarily in use: Number of units	Ordinarily in use: Total horse power	In reserve or idle: Number of units	In reserve or idle: Total horse power
Steam engines and steam turbines	18	5,511	3	1,134
Electric motors -				
(a) Operated by purchased power	3,307	175,484	231	18,251
Total	3,325	180,995	234	19,385
(b) Operated by power generated by the establishment	321	4,030	23	326
Stationary boilers	23	9,900	1	450

Table 7 - OUTPUT FROM CANADIAN NICKEL-COPPER MINES AND SMELTERS, 1936-1939

(Short tons)

	1936	1937	1938	1939
Ore shipped from mines	4,634,434	6,318,907	6,276,232	7,850,636
Ore and concentrates treated(*)	4,620,183	6,304,517	6,280,283	7,839,187
Blister copper produced in Ontario(a)	137,369	154,415	147,439	155,860
Nickel produced in Ontario(b)	51,952	73,650	62,141	65,883
Matte exported(c)	50,644	58,673	63,423	71,315
Nickel content of matte exported	32,766	38,663	43,075	47,057
Copper content of matte exported	6,496	6,497	6,914	8,212

(*) Represents the tonnage of crude ore smelted together with the tonnage of ore milled; also in addition to the totals recorded for 1936 and 1937 a relatively small tonnage of nickel-bearing ore was exported from a property located in British Columbia.

(a) Copper content.

(b) Includes nickel content of salts and oxides produced.

(c) Less a relatively small tonnage of matte returned annually to Canada for retreatment since 1934.

Table 8 - PRODUCTION IN CANADA, IMPORTS AND EXPORTS OF NICKEL, 1938 and 1939

	1938		1939	
	Quantity	Value	Quantity	Value
	Lb.	$	Lb.	$
Production -				
Nickel in matte exported .....) Refined and electrolytic nickel produced .....) Nickel in oxides and salts sold or produced .....)	210,572,738	53,914,494	226,105,865	50,920,305
Imports -				
Nickel, nickel silver and German silver in ingots or blocks, n.o.p.	24,226	6,603	246,078	62,534
Nickel in bars and rods, strips, sheets and plates	830,904	330,131	992,282	388,751
Nickel silver and German silver in bars, rods, strips, sheets, plates or anodes	82,569	22,107	107,144	28,984
Nickel chromium in bars or rods, etc.	43,472	41,805	48,597	48,616
German, Nevada and nickel silver, manufactures of, not plated	...	134,791	...	161,403
Nickel-plated household hollow-ware.	...	403	...	680
Nickel kitchenware	...	1,105	...	400
Nickel-plated ware, n.o.p.	...	864,393	...	890,602
Total nickel and its products.	...	1,401,338	...	1,581,979
Exports -				
Total (metal in all forms) ...	197,704,000	52,496,417	234,781,300	57,933,511

Table 9 - PRODUCTION OF NICKEL(x) FROM CANADIAN ORES, 1926 - 1939

Year	Pounds	Value $	Year	Pounds	Value $
1926	65,714,294	14,374,163	1933	83,264,658	20,130,480
1927	66,798,717	15,262,171	1934	128,687,340	32,139,425
1928	96,755,578	22,318,907	1935	138,516,240	35,345,103
1929	110,275,912	27,115,461	1936	169,739,393	43,876,525
1930	103,768,957	24,455,133	1937	224,905,046	59,507,176
1931	65,666,320	15,267,453	1938	210,572,738	53,914,494
1932	30,327,968	7,179,862	1939	226,105,865	50,920,305

(x) Includes a relatively small quantity of nickel recovered annually from silver-cobalt ores; Canadian nickel production comes entirely from Ontario ores with the exception of 1937 when a relatively small tonnage of nickel ore was exported from a property in British Columbia.

Table 10 - PRODUCTION OF NICKEL FROM CANADIAN ORES, 1913 - 1922

Year	Pounds	Value $	Year	Pounds	Value $
1913	49,676,772	14,903,032	1918/.....	92,507,293	37,002,917
1914	45,517,937	13,655,381	1919	44,544,883	17,817,953
1915	68,308,657	20,492,597	1920	61,335,706	24,534,282
1916	82,958,564	29,035,497	1921	19,293,060	6,752,571
1917	84,330,280	33,732,112	1922	17,597,123	6,158,993

/ Electrolytic nickel first produced at Port Hope nickel refinery.

Table 11 - WORLD PRODUCTION OF NICKEL ORE, 1936 - 1938 (In terms of metal) Long tons
Imperial Institute - London

Producing country	1936	1937	1938
British Empire -			
Southern Rhodesia (estimated)	14	4	75
Union of South Africa	...	...	44
Canada	75,777	100,404	94,006
Burma (b)	1,292	1,214	944
Australia	...	...	20
TOTAL	77,100	101,600	95,100
Foreign Countries -			
Italy	...	67	(a)
Greece (e)	1,235	951	(a)
Norway	1,251	863	1,100
U.S.S.R. (estimated)	2,000	2,000	2,500
Egypt	...	14	32
Morocco (French)	146	250	316
United States (d)	96	196	371
Brazil	470	102	(a)
New Caledonia (c)	9,000	11,100	12,300
TOTAL	14,000	15,500	18,000
WORLD'S TOTAL	91,000	117,000	113,000

Nickel ores are also produced in Germany and the Netherlands East Indies.

(a) Information not available.

(b) Nickel content of speiss obtained as a by-produce in smelting operations.

(c) Estimated content of ore as mined. The estimated content of ore, matte, etc., exported was

1936	4,800	long tons
1937	5,800	" "
1938	7,250	" "

(d) Nickel content of salts and nickel produced as a by-product in the electrolytic refining of copper (partly from imported blister copper).

Secondary metal was recovered in the United States as follows:

1936	1,754	long tons
1937	2,143	" "
1938	2,054	" "

(e) Figures represent combined totals of nickel content and cobalt content of ores.

NOTE - Data for 1939 not yet available.

Table 12 - PRODUCTION OF COPPER FROM ONTARIO ORES, 1926 - 1939

Year	Pounds	Value $	Year	Pounds	Value $
1926	41,312,867	4,828,964	1933	145,504,720	10,118,847
1927	45,341,295	4,946,533	1934	205,059,539	14,822,704
1928	66,607,510	8,770,149	1935	252,027,928	19,295,965
1929	88,879,853	14,622,572	1936	287,914,078	26,898,920
1930	127,718,871	15,187,259	1937	322,039,208	41,716,364
1931	112,882,625	9,096,463	1938	309,030,106	30,405,500
1932	77,055,413	4,407,928	1939	328,429,665	32,637,305

NOTE: Almost entirely from nickel ores.

Table 13 - PRODUCTION/OF COPPER IN ONTARIO AND CANADA, 1913-1923 and 1939

Year	ONTARIO		CANADA	
	Pounds	$	Pounds	$
1913	25,885,929	3,952,522	76,976,925	11,753,606
1914	28,948,211	3,957,556	75,735,960	10,301,606
1915	39,361,464	6,799,693	100,785,150	17,410,635
1916	44,997,035	12,240,094	117,150,028	31,867,150
1917	42,867,774	11,651,461	109,227,332	29,687,980
1918	47,074,475	11,593,502	118,769,434	29,250,536
1919	24,346,623	4,550,627	75,053,581	14,028,265
1920	32,059,993	5,596,392	81,600,691	14,244,217
1921	12,821,385	1,602,930	47,620,820	5,953,555
1922	10,943,636	1,464,477	42,879,818	5,738,177
1923	31,656,800	4,565,227	86,881,537	12,529,186
1939	328,429,665	32,637,305	608,825,570	60,934,859

/ Includes copper in ores, matte, etc., exported.

Table 14 - PRODUCTION(a) OF REFINED COPPER IN CANADA FOR YEARS SPECIFIED

Year	Tons	Year	Tons
1915	...	1935	173,290
1916/.....	483	1936	191,595
1917	3,901	1937	215,080
1918	3,809	1938	227,240
1919	3,467	1939	231,684

/ First electrolytic copper produced commercially in Canada.
(a) From all sources.

Table 15 - PRODUCTION OF METALS OF THE PLATINUM GROUP FROM ONTARIO COPPER-NICKEL ORES, 1927 - 1939

Year	PLATINUM(a)		PALLADIUM(/)	
	Fine ounces	$	Fine ounces	$
1927	11,217	716,653	11,545	554,190
1928	10,483	706,090	13,607	627,833
1929	12,491	845,057	17,318	809,289
1930	34,007	1,542,490	34,092	896,867
1931	44,725	1,595,117	46,918	1,217,717
1932	27,284	1,097,021	37,613	901,890
1933	24,746	856,190	31,009	645,043
1934	116,177	4,488,712	83,932	1,699,228
1935	105,335	3,444,455	84,772	1,962,937
1936	131,551	5,319,922	103,671	2,483,075
1937	139,355	6,751,750	119,829	3,179,782
1938	161,310	5,196,279	130,893	3,677,342
1939	148,877	5,221,712	135,402	4,199,622

(a) A relatively small quantity of alluvial platinum is recovered annually in British Columbia; such recovery in 1939 totalled 25 ounces valued at $877.
(/) Includes other platinum metals except platinum.

International Nickel Company reported that world consumption and production of platinum group metals in 1939 were estimated to have been substanitally in balance at about 500,000 ounces. Increased demand for platinum metals during the year was apparently well distributed among the principal markets, although industrial requirements were somewhat more active than jewellery and other ornamental requirements. The company's platinum metals were sold principally in the United States and in the United Kingdom. The production and use have been established of platinum-clad base metals in the form of sheet, strip and tubing suitable for chemical manufacturing equipment and other purposes where substantially incorrodible platinum surfaces are required at minimum cost. A new development occurred during 1939 in the rayon industry, where platinum-rhodium spinnerets have taken the place of the older platinum-gold spinnerets. Platinum has continued its progress in the glass fibre industry, where it is used for extrusion dies and feeder apparatus. In the electrical and allied fields, palladium, platinum and their alloys, used for relay contacts and other purposes, play an increasingly important role. The conservation of gold by many countries is assisting the demand for platinum metals, particularly palladium, and the use of palladium as a substitute for gold alloys for dental restorations, pen points and jewellery articles is making substantial headway. Platinum metals requirements for jewellery during 1939 were perhaps equal to those for 1938.

Canada is at present the largest world producer of the platinum metals. In 1938, the last year for which complete data are available, the output of the principal producing countries was as follows: Canada, 292,205 fine ounces platinum metals; Russia, 120,000 ounces crude platinum; Union of South Africa, 58,734 ounces (crude and fine) platinum metals, and Colombia 29,460 ounces crude platinum. The United States, in 1938, reported a production of 42,043 ounces of crude platinum from placers; 7,247 troy ounces from domestic ores, etc. (refineries); and 64,291 troy ounces of secondary platinum metals. The United States is an important refining centre of both domestic and foreign platinum metals.

Production of selenium in 1939 from copper-nickel ores totalled 126,930 pounds; this was recovered at Copper Cliff, Ontario, in the electrolytic refining of converter copper made by the International Nickel Company of Canada. No production of tellurium from nickel-copper ores was reported in 1939. The Company reported that the demand for selenium was again stronger in 1939, while the industrial demand for tellurium continued small.

DIRECTORY

FIRMS IN THE NICKEL-COPPER MINING AND SMELTING INDUSTRY IN CANADA, 1939

NOTE - (x) Active but not producing.

Name of Firm	Head Office Address	Location of Canadian plant
ONTARIO -		
(x) Denison Nickel Mines Ltd.	607 Reford Bldg., 217 Bay St., Toronto	Worthington
Falconbridge Nickel Mines, Ltd.	25 King St. W., Toronto	Falconbridge Tp.

DIRECTORY

FIRMS IN THE NICKEL-COPPER MINING AND SMELTING INDUSTRY IN CANADA, 1939
(Concluded)

Name of Firm	Head Office Address	Location of Canadian plant
ONTARIO (Concluded)		
International Nickel Co. of Canada, Limited	Copper Cliff	Mines - Tps. of Levack, Snider, McKim and Garson. Smelters - Copper Cliff and Coniston. Nickel refinery - Port Colborne. Copper refinery - Copper Cliff.
(x) Nickel Offsets Ltd.	Room 1701 .. 372 Bay St., Toronto	Foy, Bowell and Morgan Tps.
BRITISH COLUMBIA -		
(x) Western Nickel Corp. Ltd.	3 .. 425 Howe St., Vancouver	Yale M.D.

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