

263

CATALOGUE No.

26-211

ANNUAL

d. 3



NICKEL-COPPER MINES

1963

Published by Authority of
The Minister of Trade and Commerce

DOMINION BUREAU OF STATISTICS

Industry Division

July 1966
6506-901

Price: 50 cents

PUBLICATIONS ON MINERAL STATISTICS

Dominion Bureau of Statistics
Ottawa, Canada

Catalogue number	Name of publication	Price
Annual		
26-201	A—General Review of the Mineral Industries	\$.75
26-209	B—Gold Mining Industry .....	.75
26-216	C—Silver-Lead-Zinc Mines .....	.50
26-211	D—Nickel-Copper Mines .....	.50
26-210	E—Iron Mines .....	.50
26-219	F—Miscellaneous Metal Mines .....	.75
41-214	G—Smelting and Refining .....	.50
26-206	H—Coal Mines	1.00
26-213	I—Crude Petroleum and Natural Gas Industry .....	.50
26-205	J—Asbestos Mines .....	.50
26-208	K—Feldspar and Quartz Mines .....	.50
26-221	L—Gypsum Mines .....	.50
26-212	M—Peat Industry .....	.50
26-214	N—Salt Mines .....	.50
26-218	O—Talc and Soapstone Mines .....	.50
26-220	P—Miscellaneous Non-metal Mines .....	.75
44-204	Q—Cement Manufacturers .....	.50
44-215	R—Clay Products Manufacturers (from Domestic Clays) .....	.50
44-209	S—Lime Manufacturers .....	.50
26-215	T—Sand and Gravel Pits .....	.50
26-217	U—Stone Quarries .....	.50
26-207	V—Contract Drilling for the Mining Industry .....	.50
26-202	—Canada's Mineral Production (Preliminary Estimate) .....	.25
26-203	—Preliminary Report of Mineral Production .....	.75
26-204	—Mineral Industries: Principal Statistics .....	.25

Monthly

		Per copy	Per year
26-007	—Canada's Leading Minerals .....	.10	\$1.00
26-001	—Asbestos .....	.10	1.00
44-001	—Cement .....	.10	1.00
44-005	—Products Made from Canadian Clays .....	.10	1.00
26-002	—Preliminary Report on Coal .....	.10	1.00
45-002	—Coal and Coke Statistics .....	.25	2.00
26-003	—Copper and Nickel Production .....	.10	1.00
26-004	—Gold Production .....	.10	1.00
26-005	—Iron Ore .....	.10	1.00
26-006	—Crude Petroleum and Natural Gas Production .....	.10	1.00
26-009	—Salt .....	.10	1.00
26-008	—Silver, Lead and Zinc Production .....	.10	1.00

A complete catalogue of publications of the Dominion Bureau of Statistics is available upon request.



EXPLANATORY NOTES

Establishment

The reporting unit in the Census of Mines, Quarries and Oil Wells is the **establishment**. Beginning with the 1961 Census, the establishment is defined as follows:

The smallest unit which is a separate operating entity capable of reporting all the following:

- Materials and supplies used,
- Goods purchased for resale as such,
- Fuel and power consumed,
- Number of employees and their pay,
- Inventories,
- Shipments or sales.

The establishment is to be distinguished from smaller subdivisions or departments which do not have records which permit them to report all items required of an establishment. Prior to 1961, some establishments were required to submit two or more separate reports when they were engaged in operations which were classifiable to different industries. Beginning with 1961, separate reports for such operations will be required only in cases where accounting records can provide all the elements of principal statistics enumerated above. Special reporting arrangements were made with respondents when the acceptance of combined reports would

have seriously affected the statistics for particular industries or areas. Where continuity of industry statistics was affected by this change in reporting procedures, adjustments to the data were made back to 1957 in order to maintain comparability of the series for recent years.

A mining establishment is typically a mine, mine/mill, quarry, pit or bog principally engaged in mining operations. Prior to 1961, the Census of Mines, Quarries and Oil Wells attempted to cover the mining activities of all establishments, whether or not they were principally engaged in mining operations. Beginning with the 1961 Census, establishments (accounting entities) which are not primarily engaged in mining are no longer included as mining establishments in the basic industry statistics. Again adjustments to the industry statistics were made to reflect the removal of such reporting units for the period 1957-1960. These reporting units are now listed as establishments in other Bureau industry surveys, such as Wholesale Trade, Construction, etc. In order, however, to maintain complete coverage of certain commodity items produced mainly in mining establishments, many non-mining establishments are now surveyed for commodity information only and the latter are included in the appropriate tables of industry reports.

SYMBOLS

The following standard symbols are used in Dominion Bureau of Statistics publications:

- .. figures not available.
- ... figures not appropriate or not applicable.
- nil or zero.
- amount too small to be expressed.
- Ⓟ preliminary figures.
- * revised figures.

NICKEL-COPPER MINES

1963

This report includes statistics for industry 054—Nickel-Copper Mines and the relevant part of industry 295—Smelting and Refining of the Standard Industrial Classification Manual (catalogue no. 12-501).

Statistics relating to the Nickel-Copper Mining, Smelting and Refining Industry, as shown in this report, include those pertaining to the mining of nickel-copper ores, the smelting of these ores in Canada and the production in the Dominion of refined copper, nickel, etc., by the firms constituting this industry.

In Ontario there were two firms producing nickel-copper ores in the Sudbury area. These concerns also operated metallurgical plants. The International Nickel Company of Canada, Limited, has smelters at Copper Cliff and Coniston, while the Falconbridge Nickel Mines Ltd. smelted its ores at the Falconbridge mine located a few miles east of the town of Sudbury. This last-named company exported its matte to a refinery located at Kristiansand, Norway.

In addition to production of nickel, copper and the platinum metals, there is an important recovery from these ores of the associated metals—silver, cobalt, gold, selenium and tellurium—and of sulphur, in the form of sulphur dioxide, for the manufacture of sulphuric acid and liquid sulphur dioxide. Iron residue from the treatment of pyrite and pyrrhotite is included. The total gross value of the various primary products of this industry considered as a whole was estimated at \$680,847,188 in 1963 compared with \$742,241,756 in 1962.

The relatively small amount of nickel-cobalt sometimes produced at Cobalt, Ontario, is recovered from silver-cobalt-nickel-arsenic ores mines in northern Ontario. Smelter matte made by the International Nickel Company of Canada Limited, is treated in plants located at Clydach, Wales; Huntington, West Virginia, U.S.A.; and at Port Colborne and Copper Cliff in Ontario. Converter copper made by the International Nickel Company is electrolytically refined at Copper Cliff and refined nickel is produced by the company at Port Colborne. In 1963 the Inter-

national Nickel Company of Canada Limited, shipped ores from the Garson, Creighton, Levack, Frood-Stobie, Clarabelle and Murray mines. Falconbridge Mines Limited, operated the Falconbridge, East, Onaping, Hardy, Strathcona, Fecunis Lake and Boundary mines.

The Sherritt-Gordon Mines Ltd., mined and milled nickel-copper ore at Lynn Lake, Manitoba. The nickel concentrates were shipped to the firm's refinery at Fort Saskatchewan, Alberta, and the copper concentrates were treated at the Noranda smelter and at the Flin Flon smelter of the Hudson Bay Mining & Smelting Co. Ltd. The International Nickel Co. of Canada Ltd. mined, milled, smelted and refined nickel-copper ore at Thompson, Manitoba.

Concentrates produced by Marbridge Mines at Malartic, Quebec were shipped to the Falconbridge smelter for treatment. Giant Mascot Mines Ltd. in British Columbia shipped concentrates to Japan.

Employment data show an average of 22,160 persons to whom \$122,975,367 were paid as salaries and wages. Fuel cost \$12,399,300 and 2,224,943,107 kwh. of electricity were purchased for \$11,666,202. Process supplies and cost of ores amounted to \$248,021,142. Included in the above figures were the data relevant to the nickel-copper mines which used \$1,083,235 worth of fuel and 553,422,287 kwh. were purchased for \$3,136,557. Process supplies used by mines cost \$17,414,590.

Note: For presentation purposes, principal statistics and related breakdowns of same for Nickel-Copper mines have historically included relevant portions of the industry, Smelting and Refining, which relate to the smelting and refining of nickel-copper ores—see Tables 1, 20-29 inc. and Directory. As of 1964, statistics for Nickel-Copper mines will be limited to the Standard Industrial Classification (S.I.C.) definition of this industry. Principal statistics for the period 1961-63 are being recompiled in accordance with this definition and will be presented in the 1964 report as a link for purposes of historical comparability. Presentation of commodity statistics will be continued along the general lines as heretofore.

TABLE 1. Principal Statistics of the Nickel-Copper Mining, Smelting and Refining Industry^{1,2}
Significant Years, 1929 - 63

Year	Estab- lish- ments	Em- ployees	Salaries and wages	Cost of fuel and electricity at works	Cost of process supplies, materials, ³ containers at works	Gross selling value of products (f.o.b. works)	Net ⁴ value of production
	number				dollars		
1929	8	6,260	10,117,197	2,155,917	..	..	..
1931	10	4,300	7,004,403	2,472,510	..	27,709,234	..
1933	11	3,598	5,588,610	2,582,216	..	31,191,527	..
1937	16	10,758	18,752,727	7,454,717	11,210,353	111,353,066	92,687,996
1939	12	11,494	20,557,838	7,437,370	12,068,595	95,714,524	76,208,559
1941	11	12,759	25,270,497	10,213,183	13,991,741	117,287,713	93,082,789
1944	14	15,457	29,217,445	12,795,637	18,449,774	121,493,774	90,130,255
1946	20	10,181	22,240,671	8,552,300	11,065,124	88,444,103	68,826,679
1949	16	14,398	44,657,092	14,342,097	12,821,605	172,391,089	145,227,387
1951	16	18,546	64,543,280	16,500,093	179,164,037	410,677,639	215,013,509
1954	43	21,172	87,776,066	20,747,907	220,227,328	489,255,764	244,636,028
1956	61	22,684	103,619,044	22,103,753	270,422,772	614,096,947	318,652,627
1957	92	23,464	113,459,592	23,703,062	290,781,769	640,667,065	321,763,442
1958	54	17,784	88,929,124	17,230,033	184,064,905	435,443,727	229,680,771
1959	62	21,913	110,373,734	23,392,709	287,221,660	618,361,667	300,852,611
1960	46	24,052	124,723,533	26,673,053	318,697,106	698,439,362	350,100,056
1961	50	25,637	136,801,446	28,203,542	318,507,781	752,499,279	402,919,037
1962	46	24,787	134,441,487	25,495,509	290,413,289	742,241,756	422,958,099
1963	35	22,160	122,975,367	24,065,502	248,021,142	680,847,188	403,797,195

¹ Does not include data for mines, power plants, etc., operated by subsidiary companies.

² See footnote to text on page D-5.

³ Cost of ores included from 1950 onwards.

⁴ Gross value less fuel, electricity, process supplies, ores, treatment charges and freight.

TABLE 2. Output from Nickel-Copper Mines in Canada, 1961 - 63

	1961	1962	1963
	tons (2,000 pounds)		
Ore hoisted	21,639,948	17,970,652	17,628,836
Ore smelted directly	1,082,057	980,631	1,238,529
Ore milled	20,403,259	17,025,971	16,873,731
Concentrates produced	5,142,293	4,425,698	4,412,207

TABLE 3. Production of Nickel¹ from Canadian Ores, 1954 - 63

Year	Tons	Value	Year	Tons	Value
		\$			\$
1954	161,279	180,173,392	1959	186,555	257,008,801
1955	174,928	215,866,007	1960	214,506	295,640,279
1956	178,515	222,204,860	1961	232,991	351,261,720
1957	187,958	258,977,309	1962	232,242	383,784,622
1958	139,559	194,142,019	1963	217,030	360,392,658

¹ Usually includes a small quantity of nickel recovered from silver-cobalt ores.

TABLE 4. Production of Nickel,¹ by Months, 1961 - 63

Month	1961	1962	1963	Month	1961	1962	1963
	tons (2,000 pounds)				tons (2,000 pounds)		
January	18,214	20,942	17,939	August	19,871	19,747	18,202
February	16,868	18,029	17,260	September	20,922	18,966	18,037
March	17,097	21,367	19,083	October	21,908	16,385	18,399
April	16,601	18,973	19,644	November	22,306	20,310	17,747
May	19,458	20,425	19,892	December	20,264	19,921	18,945
June	19,292	18,455	17,461				
July	20,190	18,722	14,421	Totals	232,991	232,242	217,030

¹ Refined nickel and nickel in oxide produced, plus recoverable nickel in matte, etc., exported.

TABLE 5. Imports and Exports of Nickel, 1962 and 1963

	1962		1963	
	Quantity	Value	Quantity	Value
Imports		\$		\$
Nickel in ingots, blocks, shot	213,380	105,861	18,356,450	16,226,571
Nickel rods for wire (90% nickel)	77,899	113,525	83,108	127,613
Nickel in bars and rods, strips and sheets	14,556,014 ¹	14,384,118	3,409,047	4,674,707
Nickel-chromium in bars	58,806	104,973	66,555	100,125
Nickel, manufactures of, not plated .....	...	111,831	...	172,187
Nickel-plated ware, n.o.p. ....	...	1,018,431	...	492,639
Nickel-silver in ingots, blocks	82,833	55,319	37,886	37,813
Exports				
Nickel in ores, concentrates, matte	77,410	117,356,387	83,392	126,733,328
Nickel in oxide	11,126	14,478,158	15,208	22,008,249
Nickel and nickel alloy scrap	969	473,833	957	494,338
Nickel anodes, cathodes, ingots	121,712	185,517,667	109,156	169,236,925
Nickel and alloy fabricated material, n.e.s.	3,511	6,038,791	4,012	6,131,436

¹ Includes some cathodes and anodes; data were incorrectly reported.

TABLE 6. Production, Consumption and Exports of Nickel, 1953 - 63

Year	Production in Canada (all forms, including content in oxide and in matte exported)	Producers' shipments to domestic consumers	Exports		
			Nickel contained in matte, ores, etc	Nickel contained in oxide	Refined nickel
tons (2,000 pounds)					
1953	143,693	2,275	63,909	1,299	79,909
1954	161,279	2,595	65,823	1,486	91,410
1955	174,928	5,020	65,954	1,453	106,473
1956	178,515	5,545	70,715	1,767	104,356
1957	187,958	4,532	73,694	1,706	103,258
1958	139,559	4,099	67,658	1,393	85,168
1959	186,555	4,059 ¹	65,657	4,157	102,111
1960	214,506	4,861 ¹	73,910	13,257	108,350
1961	232,991	4,935 ¹	92,938	18,021	133,504
1962	232,242	5,322 ¹	77,410	11,126	121,712
1963	217,030	5,869 ¹	83,392	15,208	109,156

¹ After 1959, consumption of nickel, in all forms, as reported by consumers.

TABLE 7. World Production of Nickel, 1959-63

Country	1959	1960	1961	1962	1963
	tons (2,000 pounds)				
Canada ¹	186,555	214,506	232,991	237,044	219,941
New Caledonia ²	28,810	43,325	48,600	32,400	32,200
United States ³	11,606	14,303	11,176	11,217	11,432
Cuba ⁴	19,858	12,547	8,000	16,400	16,200
Finland ⁵	416	2,495	2,377	2,310	3,231
Republic of South Africa ⁵	2,900	3,200	2,900	2,700	2,700
Russia ⁶	60,000	64,000	83,000	90,000	98,000
Total world (estimate)	314,000	359,000	394,000	401,000	398,700

¹ Production in all forms from Canadian ores.² Nickel content of ore.³ By-product in electrolytic refining of copper.⁴ Nickel content and small fraction of cobalt in oxide.⁵ Nickel content of matte.⁶ Conjectural.

Source: "Annual Report of The American Bureau of Metal Statistics".

TABLE 8. Production of New Copper, by Provinces and by Forms, 1962 and 1963

	1962		1963	
	Tons	Value	Tons	Value
		\$		\$
By provinces:				
Newfoundland	17,308	10,731,154	14,012	8,827,797
Nova Scotia	204	126,300	237	149,394
New Brunswick	3,674	2,277,864	8,964	5,647,307
Quebec	147,431	91,407,164	141,400	89,081,976
Ontario	188,995	116,347,723	178,960	112,048,454
Manitoba	12,738	7,897,714	16,980	10,697,506
Saskatchewan	32,017	19,850,465	29,772	18,756,028
British Columbia	54,490	33,766,394	62,218	39,184,967
Yukon	214	132,990	—	—
Northwest Territories	314	194,928	16	10,281
Canada	457,385	282,732,696	452,559	284,403,710
By forms (where computed):				
In blister and anode copper produced ¹	370,923	229,972,836	361,484	227,735,086
In ores, concentrates and copper matte exported	69,874	43,304,801	77,151	48,592,702
In nickel-copper matte exported	16,588	9,455,059	13,924	8,075,922
Total accounted for	457,385	282,732,696	452,559	284,403,710

¹ Includes a quantity of copper contained in gold-silver and nickel-copper ores shipped to Canadian smelters.TABLE 9. Production of Copper,¹ by Months, 1961-63

Month	1961	1962	1963	Month	1961	1962	1963
	tons (2,000 pounds)				tons (2,000 pounds)		
January	35,996	34,113	35,010	August	37,186	43,155	39,550
February	32,421	32,852	31,665	September	37,317	40,852	40,929
March	34,795	37,321	37,091	October	40,332	38,572	42,043
April	34,263	34,330	36,220	November	39,581	41,482	41,875
May	35,836	37,555	36,536	December	36,311	38,726	36,148
June	37,692	38,254	39,688				
July	37,358	40,173	35,804	Year	439,088	457,385	452,559

¹ Blister copper produced in Canada, plus recoverable copper in concentrates, matte, etc., exported.

TABLE 10. Production of Copper, by Kinds of Ores and by Provinces, 1962 and 1963

Province	From copper-gold- silver ores	From nickel-copper ores	From other ores	Total
tons				
1962				
Newfoundland	14,331	—	2,977	17,308
Nova Scotia	—	—	204	204
New Brunswick	3,674	—	—	3,674
Quebec	144,568	87	2,776	147,431
Ontario	42,270	139,629	7,096	188,995
Manitoba	5,033	7,705	—	12,738
Saskatchewan	32,017	—	—	32,017
British Columbia	53,342	768	380	54,490
Yukon	214	—	—	214
Northwest Territories	—	314	—	314
Canada	295,449	148,503	13,433	457,385
1963				
Newfoundland	11,004	—	3,008	14,012
Nova Scotia	—	—	237	237
New Brunswick	8,964	—	—	8,964
Quebec	137,915	129	3,356	141,400
Ontario	44,973	123,483	10,504	178,960
Manitoba	7,530	9,450	—	16,980
Saskatchewan	29,772	—	—	29,772
British Columbia	61,103	871	244	62,218
Yukon	—	—	—	—
Northwest Territories	16	—	—	16
Canada	301,277	133,933	17,349	452,559

TABLE 11. Production of Refined Copper, 1954 - 63

Year	Tons	Year	Tons
1954	253,365	1959	365,366
1955	288,997	1960	417,029
1956	328,458	1961	406,359
1957	323,540	1962	382,868
1958	329,239	1963	380,075

TABLE 12. Production of Refined Copper, by Months, 1961 - 63

Month	1961	1962	1963	Month	1961	1962	1963
tons				tons			
January	32,867	34,360	32,533	August	34,958	32,265	32,048
February	30,738	30,064	29,436	September	33,433	30,637	30,856
March	34,605	31,135	29,736	October	33,993	33,109	34,308
April	33,690	30,731	31,255	November	35,100	31,459	32,873
May	35,842	33,669	32,095	December	35,456	31,722	33,660
June	32,657	30,732	29,278				
July	33,020	32,985	31,997	Year	406,359	382,868	380,075

TABLE 13. Imports and Exports of Copper, 1962 and 1963

	1962		1963	
	Quantity	Value	Quantity	Value
		\$		\$
Imports				
Copper in blocks, pigs and ingots	lb. 294,100	89,737	13,097,200	3,817,125
Copper scrap	" 908,000	262,599	6,508,300	1,983,494
Copper in bars or rods for the manufacture of trolley, telegraph and telephone wires, electric wires and electric cables	" 1,712,500	688,015	2,123,600	890,804
Copper bars or rods, n.o.p.	" 278,400	103,391	430,200	171,205
Copper in strips, sheets or plates	" 345,600	241,202	165,200	144,362
Copper tubing, not manufacturing	" 400,200	302,872	630,200	433,346
Copper rollers for wall paper	" ...	197,301	...	249,920
Copper wire, n.o.p.	lb. 40,281	41,711	44,440	42,651
Copper wire cloth, woven	" ...	45,892	...	...
Copper manufactures, n.o.p.	" ...	1,244,833	...	1,049,151
Copper sulphate (blue vitriol)	lb. 873,989	158,513	413,630	43,936
Copper oxide	" 285,702	123,469	541,852	224,073
Exports				
Copper in ore, matte, regulus etc.	ton 95,544	41,260,344	92,930	44,630,977
Copper in slag, skimmings, sludge	" 132	74,704	100	52,154
Copper scrap	" 8,135	3,991,744	10,584	5,603,458
Brass and bronze scrap	" 7,105	2,876,905	8,074	3,268,122
Copper alloy scrap n.e.s.	" 515	199,029	660	242,195
Copper refinery shapes	" 223,043	139,701,127	214,987	136,798,100
Copper bars, rods, shapes, n.e.s.	" 19,668	12,279,672	23,609	14,943,375
Copper plates, sheet, strip	" 2,495	2,207,163	2,760	2,546,955
Copper pipe and tubing	" 5,492	5,594,401	7,515	7,345,035
Copper wire, cable, not insulated	" 457	324,548	376	330,610
Copper alloy refinery shapes	" 2,840	2,521,495	2,782	2,482,377
Copper alloy pipe and tubing	" 831	913,333	1,428	1,525,931
Copper alloy wire, not insulated	" 202	252,486	320	436,749
Copper and alloy fabricated materials, n.e.s.	" 98	136,859	65	108,097
Insulated wire and cable	" 5,435	5,535,879	6,869	6,762,006

TABLE 14. Production of Primary Copper, Exports and Imports, 1954-63

Year	Production in Canada ¹	Exports			Imports refined copper
		Copper in ore, matte, etc.	Blister copper	Refined copper, ingots, bars, etc.	
	tons (2,000 pounds)				
1954	302,732	47,411	4,712	156,130	1,703
1955	325,994	41,565	—	153,199	35
1956	354,860	40,994	—	174,844	...
1957	359,109	46,548	—	198,794	...
1958	345,114	30,316	—	224,638	²
1959	395,269	32,070	—	222,437	105
1960	439,262	47,633	—	278,066	25
1961	439,088	42,894	—	266,247	3
1962	457,385	95,544	—	223,043	147
1963	452,559	92,930	—	214,987	6,549

¹ Blister copper, plus recoverable copper in matte and concentrates exported.² Includes blister and anode copper exported for refining.

TABLE 15. Production of Refined Copper, Consumption, Imports and Exports, 1953-63

Year	Production	Shipments to domestic consumers	Exports	Imports
tons (2,000 pounds)				
1953	236,966	105,482	128,467 ¹	5,515
1954	253,365	102,432	151,418 ¹	1,703
1955	288,997	138,559	153,199	35
1956	328,458	145,286	174,844	¹
1957	323,540	118,225	198,794	¹
1958	329,239	122,893	224,638	...
1959	365,366	129,973	222,437	...
1960	417,029	117,637	278,066	...
1961	406,359	141,808	266,247	...
1962	382,862	151,525	223,043	...
1963	380,075	169,750	214,987	...

¹ Excludes blister and anode copper which was included in export and import figures shown in the "Trade of Canada" reports.

TABLE 16. World Production of Copper by Countries of Origin of Ore¹

Country	1959	1960	1961	1962	1963
tons (2,000 pounds)					
United States	840,000	1,092,500	1,159,556	1,223,978	1,208,197
Canada	395,269	439,262	439,088	465,446	461,823
Mexico	63,133	66,502	54,359	51,945	61,576
Cuba	9,942	13,058	5,500	6,100	6,600
Haiti	—	1,000	3,832	6,738	6,553
Nicaragua	1,001	5,398	6,919	8,016	8,028
Bolivia ²	2,460	2,503	2,292	2,646	3,300
Brazil	1,200	1,200	1,900	1,800	1,700
Chile	600,571	586,643	603,424	646,064	662,126
Peru	55,871	200,311	218,313	183,853	195,608
Totals America	1,969,447	2,408,377	2,495,183	2,596,586	2,615,511
Austria	2,726	2,188	2,105	2,186	2,078
Finland	33,132	31,580	35,745	37,657	36,777
France	672	772	551	441	441
Germany, Federal Republic	2,256	2,454	2,389	2,202	2,515
Italy	665	561	691	973	1,100
Norway	15,828	16,965	15,379	17,124	15,724
Portugal	2,500	3,767	3,351	3,742	3,800
Spain	12,137	8,786	20,029	20,580	26,275
Sweden	18,838	18,396	18,629	21,034	21,000
Yugoslavia	38,141	36,681	41,787	57,008	68,446
Totals Europe	126,895	122,150	140,656	162,947	178,156
Japan	93,969	98,036	106,272	114,198	118,185
India	8,459	9,822	9,190	10,914	11,034
Israel	4,723	6,143	6,969	5,768	6,087
Korea, Republic of	529	649	584	473	542
Turkey	27,385	26,928	20,525	28,127	32,189
Philippines	54,587	48,512	57,182	60,327	70,201
Cyprus ³	39,978	39,096	31,585	27,735	29,000
Totals Asia	229,630	229,186	232,307	247,542	267,238
Congo, Republic of	310,952	332,900	325,440	322,974	297,537
Rhodesia	12,016	15,128	14,979	15,146	18,489
South West Africa	31,695	21,692	23,377	25,873	30,709
Uganda	13,362	16,265	14,720	17,173	17,875
Republic of South Africa	53,575	52,041	55,464	50,396	59,421
Zambia	598,834	635,326	633,534	619,856	648,238
Totals Africa	1,020,434	1,073,352	1,067,514	1,051,418	1,072,269

See footnotes at end of table.

TABLE 16. World Production of Copper by Countries of Origin of Ore¹ - Concluded

Country	1959	1960	1961	1962	1963
	tons (2,000 pounds)				
Australia	101,102	117,741	96,823	118,646	119,470
U.S.S.R. ²	485,000	507,000	523,600	550,000	600,000
Bulgaria ³	11,000	12,100	13,200	14,000	18,000
Germany, East ³	20,800	27,500	27,500	27,500	30,000
Poland ⁴	9,900	11,600	12,900	15,100	14,600
China ⁵	44,000	44,000	50,000	50,000	60,000
Totals, Soviet Sphere	570,700	602,200	627,200	656,600	722,600
World totals, ⁴ as reported	4,018,208	4,553,006	4,659,683	4,833,739	4,975,244

¹ Includes copper contents or recoverable contents of ores or concentrates smelted in country of origin and/or shipped to other countries for smelting.

² Exports.

³ Excludes copper content of iron pyrites which may or may not have been recovered.

⁴ In addition, there is production in Brazil, Burma, Ecuador, Haiti, Ireland, Nicaragua, Portugal, Taiwan, Algeria, Angola, Southern Zone Morocco, and Tanganyika; the total of all these countries is estimated to be about 25,000 tons in 1962.

⁵ Conjectural.

Source: "Annual Report of The American Bureau of Metal Statistics".

TABLE 17. Production of Metals of the Platinum Group Copper-Nickel Ores, 1954 - 63

Year	Platinum ¹		Palladium ²	
	Fine ounces	Value	Fine ounces	Value
		\$		\$
1954	154,356	12,950,469	189,350	7,956,087
1955	170,494	14,747,732	214,252	8,321,633
1956	151,357	15,725,992	163,461	6,681,098
1957	199,565	17,835,124	216,582	7,896,209
1958	146,092	9,481,371	154,366	4,840,072
1959	150,378	11,015,189	177,713	5,916,989
1960	483,585 ³	28,871,955	..	..
1961	418,278 ³	24,534,349	..	..
1962	470,787 ³	28,848,637	..	..
1963	357,651 ³	22,585,205	..	..

¹ In addition, a relatively small quantity of alluvial platinum is usually recovered annually in British Columbia; such recovery in 1953-58, nil; 1959, 4 ounces; 1962, 5 ounces; 1963, 2 ounces. Recovered 19 ounces in Yukon in 1960.

² Includes other platinum metals except platinum, and represents the entire Canadian production.

³ Includes platinum, palladium, rhodium, ruthenium and iridium.

TABLE 18. Production of Selenium and Tellurium from Nickel-Copper Ores, 1954 - 63

Year	Selenium		Tellurium	
	Pounds	Value	Pounds	Value
		\$		\$
1954	94,826	474,130	7,195	12,591
1955	94,465	708,488	6,455	11,296
1956	109,156	1,473,606	6,305	11,034
1957	86,459	951,049	6,915	12,101
1958	90,295	677,213	6,692	11,376
1959	101,400	709,800	6,900	14,835
1960	144,500	1,011,500	7,450	26,075
1961	164,800	1,071,200	8,050	39,043
1962	142,915	821,961	7,011	42,066
1963	95,100	461,235	7,705	50,082

Note: These metals are recovered also from other types of ores, in addition to above.

TABLE 19. Production of Gold and Silver from Nickel-Copper Ores, 1954 - 63

Year	Gold		Silver	
	Troy ounces	Value	Troy ounces	Value ¹
		\$		\$
1954	46,408	1,580,221	1,292,300	1,075,930
1955	46,896	1,618,850	1,497,191	1,320,223
1956	44,752	1,541,706	1,404,032	1,259,136
1957	43,993	1,475,965	1,589,881	1,389,079
1958	48,249	1,639,501	1,236,118	1,073,074
1959	43,295	1,453,413	1,402,273	1,230,915
1960	57,508	1,952,397	1,686,162	1,499,167
1961	59,976	2,126,749	1,803,941	1,700,395
1962	55,922	2,092,042	1,757,848	2,047,893
1963	48,862	1,844,540	1,320,777	1,827,955

¹ Estimated.

TABLE 20. Employees and their Earnings in Nickel-Copper Mines, Smelters and Refineries, 1959 - 63

Year	Employees					Man- hours worked	Earnings		
	Administration		Workmen		Total em- ployees		Adminis- tration	Workmen	Total
	Male	Female	Male	Female					
	number						dollars		
1959	2,504	245	19,149	15	21,913	42,781,529	18,529,344	91,844,390	110,373,734
1960	2,886	270	20,879	17	24,052	47,046,976	21,440,927	103,282,606	124,723,533
1961.....	3,170	262	22,188	17	25,637	50,935,868	23,963,822	112,837,624	136,801,446
1962	3,172	303	21,297	15	24,787	48,891,879	24,452,291	109,989,196	134,441,487
1963	3,148	318	18,676	18	22,160	45,254,271	25,668,775	97,306,592	122,975,367

TABLE 21. Workmen, by Sex and Months, Entire Industry, 1962 and 1963

Month	1962		1963	
	Male	Female	Male	Female
	number			
January	22,329	16	18,934	16
February	22,292	16	18,856	16
March	22,340	16	18,872	16
April	22,361	17	18,811	16
May	22,313	16	19,033	16
June	22,353	16	19,103	17
July	22,168	14	19,012	20
August	21,935	15	18,882	20
September	20,528	16	18,819	20
October	19,027	15	18,037	20
November	19,017	15	18,005	19
December	18,894	15	17,963	19
Averages	21,297	15	18,676	18
Total man-hours worked	41,521,228		38,529,177	

TABLE 22. Workmen, by Months, in Nickel-Copper Mines Only,¹ 1962 and 1963

Month	1962					1963					
	Mine			Mill	Total	Mine			Mill	Total	
	Surface		Under-ground	Male		Surface		Under-ground	Male		
	Male	Female				Male	Female				
	number										
January	2,564	16	9,211	810	12,601	2,503	16	7,543	640	10,702	
February	2,603	16	9,197	794	12,610	2,504	16	7,542	640	10,702	
March	2,589	16	9,187	802	12,594	2,542	16	7,517	643	10,718	
April	2,577	17	9,068	796	12,458	2,567	16	7,493	641	10,717	
May	2,692	16	9,059	810	12,577	2,625	16	7,477	677	10,795	
June	2,691	16	9,076	838	12,621	2,642	17	7,515	682	10,856	
July	2,635	14	8,988	837	12,474	2,608	20	7,522	689	10,839	
August	2,624	15	8,805	832	12,276	2,567	20	7,536	686	10,809	
September	2,378	16	7,546	725	10,665	2,589	20	7,463	666	10,738	
October	2,485	15	7,516	727	10,743	2,559	20	7,125	605	10,309	
November	2,424	15	7,513	704	10,656	2,525	19	7,154	611	10,309	
December	2,373	15	7,503	705	10,596	2,530	19	7,134	613	10,296	
Averages	2,555	15	8,554	782	11,906	2,563	18	7,419	649	10,649	
Total man-hours worked					23,166,855					21,786,314	

¹ Included in Table 21.TABLE 23. Workmen, by Months, in Nickel-Copper Smelters and Refineries Only,¹ 1962 and 1963

Month	1962	1963	Month	1962	1963
	Male	Male		Male	Male
	number			number	
January	9,744	8,232	September	9,879	8,031
February	9,698	8,154	October	8,299	7,728
March	9,762	8,156	November	8,376	7,696
April	9,920	8,094	December	8,313	7,667
May	9,752	8,238			
June	9,798	8,247	Averages	9,406	8,045
July	9,708	8,173	Total man-hours worked ...	18,354,373	16,742,863
August	9,674	8,073			

¹ Included in Table 21.

TABLE 24. Fuel and Electricity Used in the Nickel-Copper Mines, Smelters and Refineries, 1963

Kind	Quantity	Cost at plant
		\$
Bituminous coal (a) From Canadian mines..... short ton	60,128	747,166
(b) Imported	161,961	2,038,265
Sub-bituminous coal (from Alberta mines only)	—	—
Anthracite coal	—	—
Lignite coal	—	—
Coke (for fuel only)	129,586	3,005,132
Gasoline, (includes gasoline used in cars and trucks)	364,086	124,005
Kerosene or coal oil	7,553	2,160
Fuel oil	18,639,977	2,038,361
Wood (cords of 128 cubic feet of piled wood)	—	—
Gas (a) Liquefied petroleum gases, (propane, etc.)	105,010	22,414
(b) Other manufactured gas	—	—
(c) Natural gas	13,220,321	4,406,185
Other fuel .....	...	15,612
Electricity purchased for motors and lighting	1,456,823,432	7,926,612
Electricity purchased for other purposes	768,119,675	3,739,590
Total .....	...	24,065,502
Electricity generated (a) For own use	58,982,434	...
(b) For sale	5,129,366	107,554

TABLE 25. Fuel and Electricity Used in the Nickel-Copper Mines, 1963

Kind		Quantity	Cost at plant
			\$
Bituminous coal (a) From Canadian mines	short ton	103	2,126
(b) Imported	"	6,186	89,460
Sub-bituminous coal (from Alberta mines only)		—	—
Anthracite coal		—	—
Lignite coal		—	—
Coke (for fuel only)		—	—
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	203,370	75,416
Kerosene or coal oil	"	3,242	974
Fuel oil	"	5,045,443	702,346
Wood (cords of 128 cubic feet of piled wood)		—	—
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	4,336	2,174
(b) Other manufactured gas		—	—
(c) Natural gas	M. cu ft.	445,215	210,739
Other fuel		—	—
Electricity purchased for motors and lighting	kwh.	550,375,287	3,094,940
Electricity purchased for other purposes	"	3,047,000	41,617
Total .....		...	4,219,792
Electricity generated (a) For own use	kwh.	58,982,434	—
(b) For sale	"	5,129,366	107,554

TABLE 26. Fuel and Electricity Used in the Nickel-Copper Smelters and Refineries, 1963

Kind		Quantity	Cost at plant
			\$
Bituminous coal (a) From Canadian mines	short ton	60,025	745,040
(b) Imported	"	155,775	1,948,805
Sub-bituminous coal (from Alberta mines only)		—	—
Anthracite coal		—	—
Lignite coal		—	—
Coke (for fuel only)	short ton	129,586	3,005,132
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	160,716	48,599
Kerosene or coal oil	"	4,311	1,186
Fuel oil	"	13,594,534	1,336,015
Wood (cords of 128 cubic feet of piled wood)		—	—
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	100,674	20,240
(b) Other manufactured gas		—	—
(c) Natural gas	M. cu. ft.	12,775,106	4,195,446
Other fuel		—	15,612
Electricity purchased for motors and lighting	kwh.	906,448,145	4,831,672
Electricity purchased for other purposes	"	765,072,675	3,697,973
Total .....		...	19,845,710
Electricity generated (a) For own use		—	—
(b) For sale		—	—

TABLE 27. Drilling Completed on Nickel-Copper Deposits, 1962 and 1963

	Footage drilled	
	1962	1963
Diamond drilling for exploration and testing:		
By mining companies with their own personnel and equipment	264,598	587,814
By diamond drilling contractors	228,530	493,688
Other diamond drilling:		
Blast hole diamond drilling:		
By mining companies with their own personnel and equipment	230,712	227,766
By diamond drilling contractors	16,427	50,709
Drilling by percussion or other machines ¹	29,289,214	22,148,386

¹ Not complete as records are unavailable at certain mines.

TABLE 28. Specified Taxes Paid by the Nickel-Copper Mining, Smelting and Refining Industry, 1961 - 63

	1961	1962	1963
		dollars	
Dominion income tax, including tax on non-operating revenue	22,691,226	32,149,991	21,887,052
Total provincial taxes	13,508,237	17,195,307	11,663,488
Total municipal taxes	1,972,620	2,198,886	2,307,357
Grand total taxes paid	38,172,083	51,544,184	35,857,897

TABLE 29. Miscellaneous Expenditures by the Nickel-Copper Mining, Smelting and Refining Industry, 1963

	1963
	\$
(a) Workmen's compensation	2,049,368
(b) Silicosis assessment	73,134
(c) Unemployment insurance	897,279
(d) Aggregate cost of structures, roads, machinery, equipment, etc., built by or purchased from outside contractors or suppliers and chargeable to Fixed Assets Account	12,937,848
(e) Book value of fixed assets (new structures, roads, machinery, equipment, etc., including major repairs and alterations) produced by own employees and chargeable to Fixed Assets Account. Does not include value of work done by outside contractors	3,719,110
(f) Other capital expenditures not reported in (d) and (e)	1,032,154
(g) Materials and supplies used in the construction or production of above fixed assets (e). Does not include the value of work done by outside contractors nor purchases of machinery and equipment	1,261,750
(h) Cost of all other goods, materials and supplies (including office, medical, laboratory, cafeteria and store supplies) purchased and not chargeable to Fixed Assets Account	70,396,034

Directory of Nickel-Copper Mines, Smelters and Refineries, 1963

Name of firm	Head office address	Location of Canadian plant
Quebec:		
Alrose Mining Co., Ltd.	137 Wellington St. W., Toronto, Ontario	Beauchastel Twp.
Aqua Mining Corp. Ltd. ¹	1117 St. Catherine St. W., Montreal	La Motte Twp.
Asarco Exploration Co. of Can. Ltd.	2 King St. East, Toronto, Ontario	Guillet Twp.
Bachelor King Mines Ltd. ¹	550 Sherbrooke St. W., Montreal	Montbray Twp.
Bilson Quebec Mines Ltd. ¹	100 d'Youville St., Quebec	Ungava
Canadian Nickel Co., Ltd. ¹	Copper Cliff, Ontario	Frotet Lake
Delta Mining Corp. Ltd. ¹	421-1117 St. Catherine St., Montreal	Cadillac Twp.
Dumont Nickel Corp.	715-3rd Ave., Val d'Or	Duvernay Twp.
Fontbrune Nickel Mines Ltd.	491 Victoria Square, Montreal	Spalding Twp.
Jacmar Explorations Ltd.	100 Adelaide St. W., Toronto, Ontario	Desmeloizes Twp.
Lorraine Mining Co. Ltd. ¹	Bellevue	Gaboury-Blondeau Twps.
Marbridge Mines Ltd. ²	100 d'Youville St., Quebec	La Motte Twp.
Marchant Mining Co., Ltd.	100 d'Youville St., Quebec	La Motte Twp.
Marlowe Mines Ltd.	2157 Mackay St., Montreal	Lacoste Twp.
Mid-North Engineering Services Ltd.	25 Adelaide St. W., Toronto, Ontario	Dumphy Lake
Raglan Quebec Mines Ltd. ¹	200 Bay St., Toronto, Ontario	Wakeham Bay
Rim Rock Oils Ltd. ¹	421-1117 St. Catherine St. W., Montreal	Abitibi
Saguenay Exploration & Mining Inc.	753 Avenue Wilder, Outremont	Jonquière
Saguenay Mining & Smelting Co. Ltd.	2144 Mackay St., Montreal	Pied des Monts
Space Age Metals Corp. ¹	1117 St. Catherine St. W., Montreal	La Motte Twp.
Territory Mining Co., Ltd.	25 Adelaide St. W., Toronto, Ontario	St. Fabien de Panet

See footnotes at end of directory.

Directory of Nickel-Copper Mines, Smelters and Refineries, 1963 - Concluded

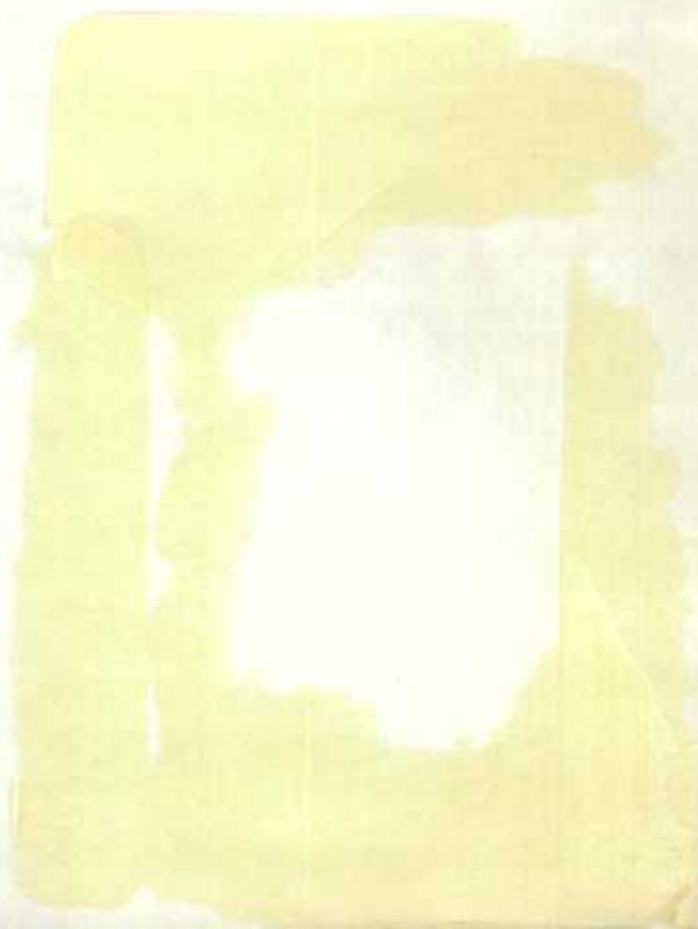
Name of firm	Head office address	Location of Canadian plant
Ontario:		
Candore Explorations Ltd. ¹	416-25 Adelaide St. W., Toronto	Timmins
Falconbridge Nickel Mines, Ltd. ²	44 King St. W., Toronto	Twps. of Falconbridge, Blezard, McKim, Levack
International Nickel Company of Canada, Limited ²	Copper Cliff	Mines: Twps. of Levack, Denison, Garson, Snider, McKim Smelters: Copper Cliff, Coniston Refineries: Copper Cliff, Port Colborne
Fatima Mining Co., Ltd.	25 Adelaide St. W., Toronto	Bartlett
Jacobus Mining Corp. Ltd. ¹	25 Adelaide St. W., Toronto	Elmhurst Twp.
JonSmith Mines Ltd. ¹	357 Bay St., Toronto	Sewell Twp.
Metal Mines Ltd. ² (Gordon Lake Division)	100 Adelaide St. W., Toronto	Kenora
Mirado Nickel Mines Ltd. ¹	220 Bay St., Toronto	Jackfish
Nickel Rim Mines Ltd. ¹	25 Adelaide St. W., Toronto	MacLennan Twp.
Norpax Nickel Mines Ltd.	85 Richmond St. W., Toronto	Werner Lake
Ryanor Mining Co. Ltd.	11 Adelaide St. W., Toronto 1	Wisner Twp.
Starratt Nickel Mines Ltd. ¹	1101-62 Richmond St. W., Toronto	Kenora
United Macfie Mines Ltd.	25 Adelaide St. W., Toronto	Cobalt
Manitoba:		
Sherritt-Gordon Mines, Ltd. ²	25 King St. West, Toronto, Ontario	Lynn Lake
Canadian Nickel Co., Ltd.	Copper Cliff, Ontario	Cross Lake
Consolidated Marbenor Mines Ltd.	8 King St. E., Toronto 1, Ontario	Cross Lake
International Nickel Co. of Canada, Ltd. ²	Copper Cliff, Ontario	Mine: Thompson Smelter: Thompson Refinery: Thompson
Starratt Nickel Mines Ltd.	62 Richmond St. W., Toronto, Ontario	Paint Lake
Jacmar Explorations Ltd.	100 Adelaide St. W., Toronto	Mystery Lake
Alberta:		
Sherritt-Gordon Mines Ltd. ²	25 King St. W., Toronto, Ontario	Refinery: Fort Saskatchewan
British Columbia:		
Glant Mascot Mines Ltd. ²	Box 820 Hope	Hope
Northwest Territories:		
North Rankin Nickel Mines Ltd.	25 Adelaide St. W., Toronto, Ontario	Rankin Inlet
Yukon:		
Hudson Bay Exploration & Development Co. Ltd.	504 Main St., Winnipeg, Manitoba	Kluane Lake
Northwest Canalask Nickel Mines Ltd.	100 Adelaide St. W., Toronto, Ontario	Mile 1167 Alcan Highway

¹ Firms doing development work only.² Producing - Other firms doing development work only or holding dormant properties.



LIBRARY

THE ROYAL BANK OF CANADA
MONTREAL - CANADA



YOUNG & CO

STATISTICS CANADA LIBRARY
BIBLIOTHÈQUE STATISTIQUE CANADA



1010632445