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IRON ORE IN CANADA IN 1957

by

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The Canadian iron ore industry is an infant compared to the iron ore industry of its great neighbour, the United States of America. It is both young in years and small in size. The Canadian industry, as it exists today, did not commence until 1939, following a period of fifteen years in which not one ton of iron ore was produced in Canada. During that period all Canadian iron ore requirements were imported, principally from the United States and to a lesser extent from Newfoundland, which was not then a part of Canada⁺⁺. Last year the Canadian iron ore industry produced over 20 million long tons of ore valued at \$156 million. It moved into position as the fifth most valuable segment of the Canadian mineral industry, at the same time making Canada the fourth largest producer of iron ore, after the United States, Russia and France. Despite its overall importance to the Canadian economy and its prominent international position, the Canadian iron ore industry was still responsible for less than 5 per cent of total world production of iron ore. Nevertheless, Canadians are justifiably proud of the progress the industry has made in Canada and, by and large, they are fully aware of the very considerable contribution that has been made to the growth of the industry by many of the large American iron and steel and merchant ore companies.

It is of interest that it was a Canadian company which sparked the revival of the Canadian iron ore industry in 1939. Algoma Ore Properties Limited, which had previously mined direct-shipping goethite ore in the

⁺⁺Newfoundland entered Confederation in 1949.

Michipicoten area of Ontario during the first quarter of this century, courageously commenced the development of a beneficiating-grade siderite orebody adjacent to the Old Helen mine- the first operation of its kind on the North American continent. Algoma has developed this operation into a large and profitable one and is, at this very moment, in the process of expanding mine and plant capacity to 2 million long tons of Algoma sinter per year.

In 1956, seven companies contributed to Canada's shipments of iron ore from properties operated solely for the production of iron ore. Of these, two produced direct-shipping iron ore, two, magnetite concentrates; one, sinter; one, pelletized magnetite concentrates; and one, heavy-media concentrates. In addition, one company produced iron oxide sinter from pyrite concentrates as a co-product of sulphur and sulphur dioxide; one produced iron oxide pellets as a co-product of nickel from nickeliferous pyrrhotite; one produced desulphurized iron as a co-product of titanium dioxide slag from ilmenite; and one produced small quantities of finely-ground magnetite concentrate for use in heavy media separation plants. In addition to these producing companies, seven companies are in various stages of developing their properties for early production.

By reason of geography, company affiliations, and to a certain extent metallurgy, by far the major part (about 68%) of all iron ore produced in Canada is exported to the United States. The remainder is exported to the United Kingdom, Western Europe and Japan or is consumed domestically. In turn, about $\frac{3}{4}$ of the Canadian consumption of about $5\frac{1}{2}$ million long tons of iron ore is imported, principally from the United States. This situation practically duplicates that which exists in relation to coking coal - Canada relies on the United States for about $\frac{3}{4}$ of the coking coal required for the production of primary iron and steel.

The continued growth of the Canadian iron ore industry is dependent entirely on the export market and this, in turn, is dependent principally upon the continued growth of the United States iron and steel industry. In competition with Canadian ores there are not only American domestically-produced ores but also Venezuelan ores, Brazilian ores to a certain extent, and Peruvian, Chilean and Liberian ores, to a lesser extent. As the Canadian industry sees it, there is no shortage of iron ore raw-materials in the world as a whole, although regional shortages do exist.

Recently an attempt was made by the Department of Mines and Technical Surveys to forecast the prospects for the Canadian industry in the years immediately ahead. Projected on the basis of company intentions and on probable activities in the iron ore field, it would seem that Canadian iron ore production by the mid - 1960's will be somewhere in the range^{of} 46 to 60 million long tons. Projecting further ahead to 1980, it seems possible that Canadian production may attain a figure in the general vicinity of 96 million long tons, of which an estimated 70 million tons may be exported to the United States, about 16 million to the United Kingdom, Western Europe and other destinations, and about 10 million tons may be consumed domestically. These estimates are, of course, based on the best available information as to the intentions and future growth of the United States iron and steel industry and to the extent in which the American industry will be supplied from Canadian iron ore sources.

Sufficient exploration has taken place in Canada to indicate very clearly that Canadian resources of iron ore are tremendous. Not only does Canada possess large reserves of direct-shipping iron ore but also vast quantities of low grade iron-bearing material of concentrating grade. Iron formation, for instance, extends in an almost continuous belt from the northerly tip of the west coast of Ungava Bay to an area lying about 150 miles north of the Gulf of St. Lawrence. The quantity of low grade iron-bearing material in this belt may be measured in billions of tons. It is meaningless to place an arithmetic figure on the tonnage present as insufficient detailed diamond drilling has been carried out for adequate assessment. Not only in Quebec but also in Ontario there are large areas of low grade iron formation. The shortages of iron ore that do exist in Canada are regional shortages, such as the shortage on the Pacific Coast of Canada. There is, in fact, an absolute abundance of iron ore in Canada, sufficient to supply the Canadian domestic and export market for generations to come.

The following brief selective comments touch on the highlights of individual operations in Canada - it is not possible to be other than brief or selective, inasmuch as there were at least 60 companies active in the iron ore exploration, development and production fields during 1956.++

++See references at end of paper

Dominion Wabana Ore Limited

Since 1950, Dominion Wabana Ore Limited at Wabana, Newfoundland, has completely mechanized its underground and surface operations at a cost of about \$22 million. At this large submarine mining operation all underground production is now hauled to the surface on a 12-thousand foot conveyor belt system. A newly-constructed heavy media separation plant up-grades what used to be considered a direct-shipping iron ore. From the separation plant, the ore is hauled on a 9-thousand foot conveyor belt system to the ore dock on the other side of the island. It is of interest that Dominion Wabana, during the past six years, has changed its trans-island ore haulage system from a continuous mine car rail system of haulage to 22-ton diesel truck haulage to conveyor belt haulage. Mine production is now at the rate of about 3 million long tons per year. Of the 1956 production of about 2½ million tons, approximately 2 million tons were exported to the United Kingdom and Western Europe and the remaining one-half million tons was consumed at the parent company's steel plant at Sydney, Nova Scotia. The company reports that it has firm commitments for its output of iron ore up to and including 1961.

Quebec Iron and Titanium Corporation

At Sorel, Quebec, the Quebec Iron and Titanium Corporation continues to make desulphurized iron and titanium dioxide slag from ilmenite mined at Allard Lake, 26 miles north of Havre St. Pierre on the north shore of the Gulf of St. Lawrence. During 1956 this company completed a large \$7½ million ore beneficiation and rotary kiln plant to up-grade the ilmenite ore before smelting. The company now plans to increase its operations by approximately 60 per cent through the addition of three new furnaces to the five which already exist. This expansion will entail an expenditure of approximately \$16 million and will make possible an output of over 200,000 tons of desulphurized iron per year.

Iron Ore Company of Canada

Iron Ore Company of Canada, at its operations in Labrador-New Quebec, completed its third year of production with a total of over 12 million long tons shipped to Seven Islands. The company's schedule calls

for 20 million tons of direct-shipping ore per year by 1960. During 1956, the Iron Ore Company opened its fourth mine, the Gill, formerly known as Ruth Lake No. 1 deposit. The Gill mine and also the Ruth mine are in Labrador; the French mine and the Gagnon mine are in Quebec. The destination of 1956 shipments was the United States $9\frac{1}{2}$ million tons; United Kingdom $1\frac{1}{2}$ million tons; Western Europe about 400,000 long tons. Slightly in excess of 700,000 tons were consumed domestically. Shipments through the Contrecoeur transfer dock near Montreal amounted to about $2\frac{3}{4}$ million long tons. In 1956, for the first time, ore shipments were sent on all rail from Contrecoeur to consuming areas south of Lake Erie. In 1957 it is expected that shipments from Seven Islands will exceed 13 million long tons and that a fifth mine, the Ferriman will come into production. It is conceivable that at some period after 1960 production of direct-shipping iron ore from the operations of Iron Ore Company may rise to the 30 million ton level and that there may be substantial additional production from either the Company's wash ores or from its low-grade beneficiating type magnetite-specular hematite deposits in the vicinity of Wabush Lake.

The Hilton Mines

During 1956 development of the Hilton Mines, formerly known as the old Bristol Mines, was commenced by Pickands Mather and Company in association with The Steel Company of Canada Limited. This project involves a \$15 million expenditure for open pit development and construction of magnetic concentration and pelletizing facilities. Mine and plant capacity is designed at 600,000 long tons of pellets per year, with initial production scheduled for late this year. Fifty per cent of the output will be shipped all rail to the Hamilton, Ontario plant of The Steel Company of Canada Limited; the other half will move by rail to plants of Jones and Laughlin Steel Corporation and Interlake Iron Company, in the United States.

Quebec Cartier Mining Company

Early this year the Cartier Mining Company Limited, a subsidiary of United States Steel Corporation, announced a \$200 million iron ore development program in the vicinity of Mount Reed, in the southwest part of the Quebec-Labrador Iron Belt, about 70 miles south of the Company's Mount Wright holdings. Plans call for the construction of a private railway, 150

miles in length, from Shelter Bay on the north shore of the Gulf of St. Lawrence. Initial production is expected in 1961 at an annual rate of 3 million long tons with expansion to 10 million, possibly by 1965. Eventual output from the company's operations in the general area could exceed this figure considerably. Iron-bearing minerals in several deposits range from coarse-grained specular hematite to relatively fine-grained concentrating grade magnetite with varying proportions of the two. Overall average grade of the deposits is about 35 per cent iron. In addition to rail construction, the project will involve the building of dock loading and storage facilities at Shelter Bay; a hydro-electric power development on the Hart Jaune River; concentration and possibly later agglomeration facilities, and an integrated townsite.

Other Developments in Quebec

In addition to the properties in production and slated for early production in Quebec there are many properties under active exploration by geological and geophysical examination, and diamond drilling. A number of companies are investigating various sections of the Quebec-Labrador Iron Belt with the southwest part receiving the most attention. Companies with extensive interests in this latter part include, in addition to Quebec Cartier Mining Company, Jones and Laughlin Steel Corporation, Pickands Mather and Company, Iron Ore Company of Canada, The Steel Company of Canada Limited, Canadian Javelin Limited and Albabel Minerals Limited.

At the far northern end of the Quebec-Labrador Iron Belt, west of Ungava Bay, large reserves of concentrating grade iron ore have been outlined by reconnaissance diamond drilling and surface examination by several companies. Atlantic Iron Ore Limited and International Iron Ore Co. Limited, both sponsored by Cyrus S. Eaton interests; Oceanic Iron Ores of Canada Limited, a subsidiary of Rio Tinto Mining Company of Canada Limited, and Consolidated Fenimore Iron Mines Limited have outlined large reserves of iron-bearing material consisting of beneficiating grade magnetite, specular hematite and siderite at various locations. Investigations involving harbour and trans-shipment facilities have brought into consideration a possible transshipment point on the west coast of Greenland in the vicinity of Gothaab and Rype Island. It is too soon to say what stage any of these investigations have reached or to estimate when production will commence. The problems connected with developments in the area are, of course, well known.

The shipping season is relatively short, now being $2\frac{1}{2}$ months in duration. There are four possible harbours - Diana Bay, Kyak Bay, Hopes Advance Bay and Leaf Bay, with Hopes Advance Bay appearing the most attractive. The tides in the various Bays of Ungava Bay are among the highest in the world. The usual problems which are connected with all iron ore developments, exist in this area to an even greater degree than in most other areas i.e. markets and financing, each dependent on the other.

Steep Rock Iron Mines Limited

The output of direct-shipping ore from the operations of Steep Rock Iron Mines Limited is increasing steadily, year by year. Production in 1956 amounted to about $3\frac{1}{3}$ million long tons. The output for this year is scheduled at $3\frac{1}{2}$ million long tons, of which $2\frac{3}{4}$ million tons will come from the Hogarth Open Pit and $\frac{3}{4}$ of a million tons from the Errington Underground. The schedule for 1958, 1959 and future years envisages a production of 4 million tons in 1958 and $5\frac{1}{2}$ million tons in 1959 and future years. Dredging of the silt overlying 'G' orebody is continuing at a rapid pace so that this mine can come into production as an open pit in 1959. Shaft sinking has commenced at the Hogarth mine so that underground production can begin in 1960. In 1960, therefore, the company will have in operation two open pit mines and two underground mines.

Caland Ore Company

Also in the Steep Rock Lake area, Caland Ore Company, a subsidiary of Inland Steel Company, continued its large scale dredging operations on "C" ore zone leased from Steep Rock Iron Mines. Although this property will be operated initially as an open pit, concurrent preparation has commenced on a site for a shaft and mine plant buildings necessary for the underground mining of the south end of the ore body, on the east side of Falls Bay. Initial production of $\frac{3}{4}$ of a million long tons is scheduled for 1960, with an ultimate minimum annual output of 3 million long tons by 1969.

Algoma Ore Properties Limited

As stated earlier, Algoma Ore Properties is engaged in a mine and plant expansion program designed to raise the production of sinter from $1\frac{1}{2}$ to 2 million long tons per year by 1958. A new open pit, known as

the Sir James mine, will supply the additional tonnage of ore necessary for their expansion program. Underground development of the block of three levels, below the levels currently supplying ore at the Helen mine, was somewhat curtailed last year to permit speedier development of the Sir James Mine. Approximately 2/3 to 3/4 of Algoma's production is regularly exported to the United States and the remainder is shipped to the parent company's steel plant at Sault Ste. Marie.

Marmoraton Mining Company Limited

At Marmora, Ontario, Marmoraton Mining Company Limited, a subsidiary of Bethlehem Steel Company, completed its second year of open pit operations, exporting about $\frac{1}{4}$ million long tons of pelletized magnetite concentrates to the parent company's plant at Lackawana, New York State. Designed capacity of the Marmora low-grade magnetite mine and plant is 500,000 long tons of pellets per year.

Noranda Mines Limited

At Port Robinson, Ontario, Noranda Mines continued the small scale production of iron oxide sinter from pyrite flotation concentrate, as a co-product of elemental sulphur and sulphur dioxide gas. At Cutler, Ontario, Noranda Mines is constructing a similar plant to produce sulphuric acid for use in the uranium mills of the Blind River area. This plant is expected to produce about $\frac{1}{4}$ million tons of co-product iron oxide sinter per year with initial production commencing late this year.

The International Nickel Company of Canada Limited

At Copper Cliff, Ontario, The International Nickel Company of Canada Limited began production early in 1956 of high grade iron ore pellets from nickeliferous pyrrhotite. The first unit of this plant was built at a cost of \$19 million; at full operations it will produce a $\frac{1}{4}$ million tons of pellets per year. An eventual production of 1 million tons is scheduled.

Lowphos Ore Limited

Lowphos Ore Limited, a subsidiary of National Steel Corporation is proceeding with the development of a low grade magnetite property located at Moose Mountain, 35 miles north of Sudbury. M.A. Hanna

Company will act as operator of the property for Lowphos. The property will be mined by open pit methods at a rate of $\frac{1}{2}$ million long tons of concentrates per year. Shipments are scheduled to commence in 1958, by rail to a port on Georgian Bay and thence by ore boat to Lower Lake Erie Ports.

Other Developments in Ontario

In Ontario, there are a number of areas containing iron-bearing occurrences of possible commercial importance that have been under active investigation during recent years. Jalore Mining Company Limited, a wholly owned subsidiary of Jones and Laughlin Steel Corporation at Pittsburgh, exercised its option to lease an iron property in Boston township, six miles from Kirkland Lake, from Dominion Gulf Company. Mattagami Mining Company was formed by The Steel Company of Canada and Interlake Iron Corporation to acquire an iron property about 35 miles north of Kapuskasing. Iron Bay Mines Limited, holding 90 claims at Bruce Lake south of Red Lake, has outlined a substantial tonnage of concentrating iron ore. Iron-bearing material requiring beneficiation has been under examination and exploration by diamond drilling by a number of companies in Eastern Ontario, Temagami, Thunder Bay, Nemegos, Michipicoten, Sioux Lookout, Shebandowan, and Atikokan areas.

Utah Company of the Americas

Texada Iron Mines Limited

In British Columbia two companies continued to mine magnetite concentrates for export to Japan. Total exports in 1956 amounted to about $\frac{1}{3}$ million long tons. The Argonaut Mine Division of Utah Company of the Americas mined out its Iron Hill mine near Campbell River, B.C. Texada Mines Limited operated three open pit mines on Texada Island. This company, which still has an uncompleted contract for ore shipments to Japan, constructed a new mill last summer. Because of the high copper, high sulphur content of the ore in Texada's Cameron Yellow Kid deposit, this new mill employs flotation in addition to magnetic separation.

Empire Development Company

Empire Development Company, formed last year by Quatsino Copper Gold Mines Limited and Mannix Limited, is preparing a small low-grade

magnetite property located near the northwest coast of Vancouver Island for production this year. Contracts for the shipment of 1-1/3 million long tons of concentrate over a three-year period have been signed with iron and steel interests in Japan.

Developments in Other Areas

Developments of an exploratory nature have taken place in 1956 at a number of widely scattered locations in Canada, other than those already outlined.

In Nova Scotia, Torbrook Iron Ore Mines investigated the long dormant iron occurrences in the Nictaux-Torbrook district, near Middleton.

In New Brunswick, Strategic Manganese Corporation report reserves in the order of 200 million tons of 15 to 16 per cent manganese and 18 to 19 per cent iron on its holdings near Woodstock.

In northern Saskatchewan, Triana Explorations, Irex Mining Syndicate, and Yankee Canuck Oil and Mining Corporation Ltd., have investigated iron ore occurrences outlined in an aeromagnetic survey conducted by the Saskatchewan government.

In Alberta, West Canadian Collieries Limited has outlined about 35 million tons of titaniferous magnetite north of Burmis, which is 9 miles east of Blairmore. These flat lying occurrences are reported to average 41 per cent iron and from 4 to 12 per cent titanium dioxide. Deposits of loosely consolidated oolitic goethite with siderite of considerable extent have been investigated in the Clear Mills area of the Peace River District of northern Alberta. They are reported to carry about 34 per cent iron, 24 per cent silica, and to be difficult to concentrate into a marketable grade of material.

In British Columbia, several companies, particularly Frobisher Limited and Utah Co. of the Americas, investigated promising occurrences of beneficiating grade magnetite by diamond drilling during 1956 on the off-coast islands.

In the Northwest Territories, Belcher Mining Corporation Limited has indicated large reserves of iron-bearing material on Inmetalling

Island, in the southeast part of the Belcher Archipelago. Ultra-Shawkey Mines Limited has carried on exploration of iron-bearing deposits on Baffin Island.

The increasing tempo of exploration activity which has characterized the Canadian iron ore during the post World War II years has continued into the year 1957. Undoubtedly some of this activity will culminate in major mine development programs similar to those now underway. Much of the credit for this continued growth of the iron ore industry lies with those beneficial Canadian features - abundant resources, geography, and a favourable political and legislative climate.

References:

Janes, T.H. -"A Survey of the Iron Ore Industry in Canada During 1956"; Mineral Resources Information Circular, MR 22, 1957, 80 pp.

"Iron Ore in Canada, 1957"; Mineral Resources Division Annual Mineral Review on Iron Ore, 1957, 15 pp.

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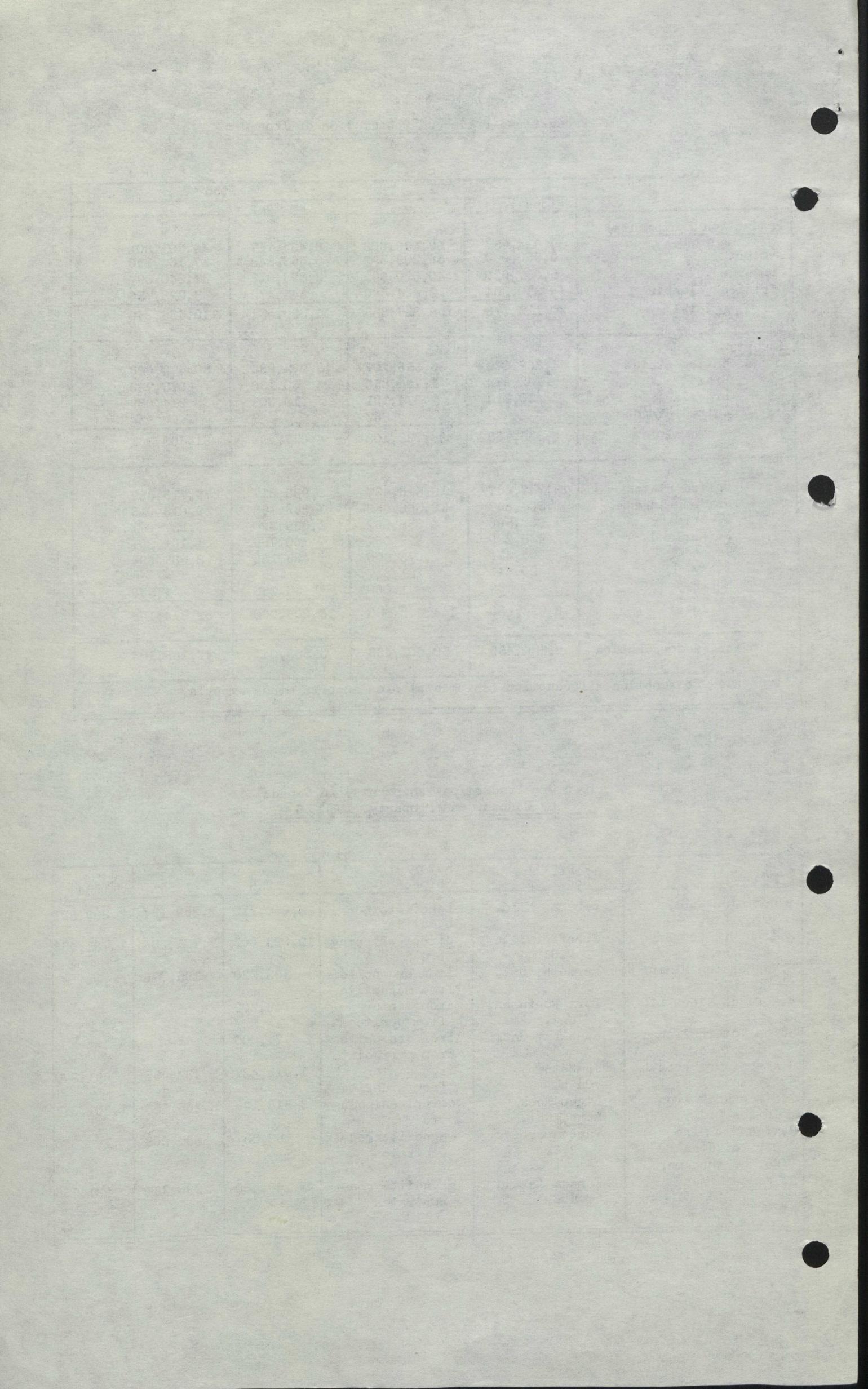
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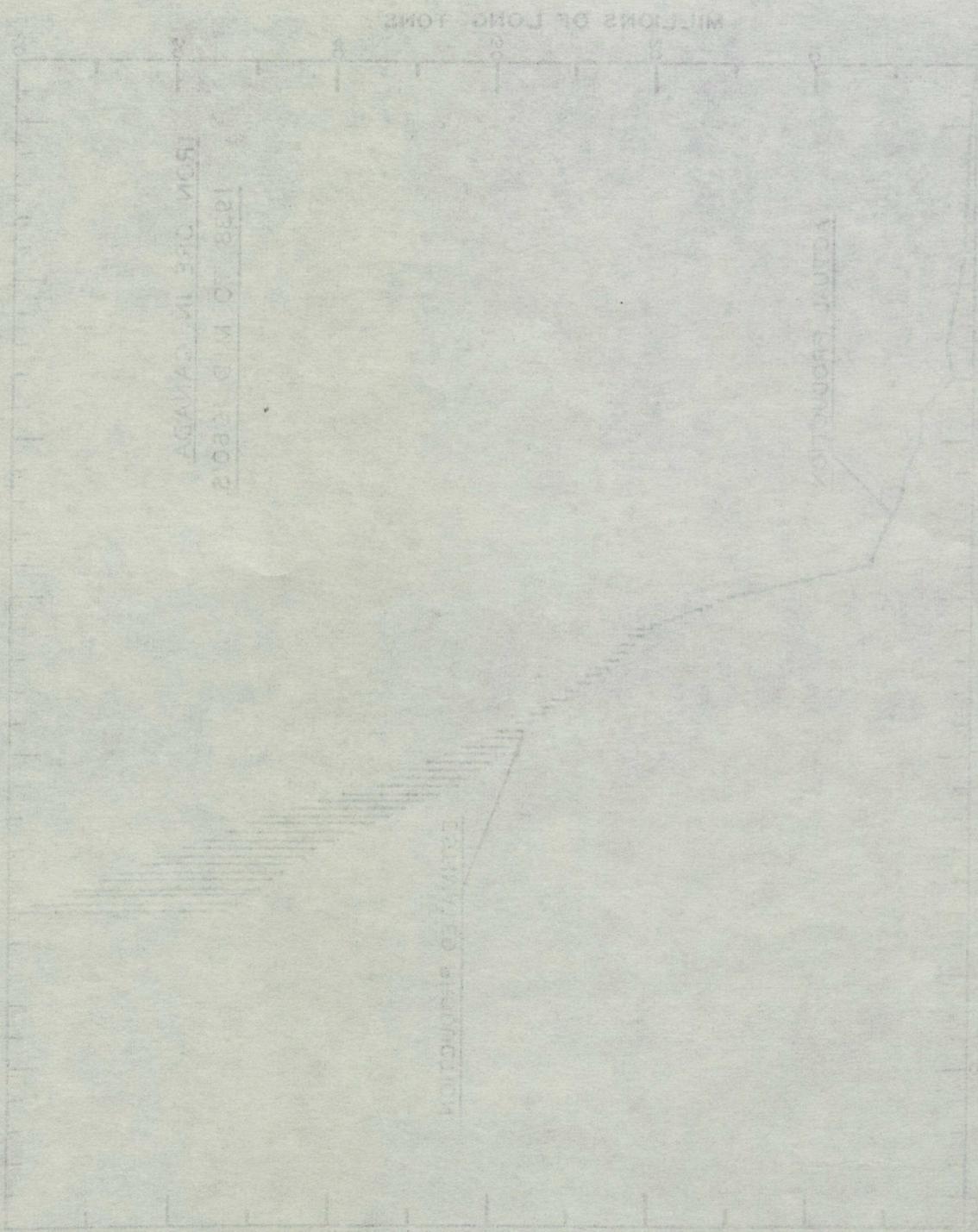
Production, Trade and Consumption of Iron Ore

	1956		1955	
	long tons	\$	long tons	\$
Production (shipments)				
Newfoundland	7,814,054	57,699,008	6,434,717	45,701,801
Quebec	6,960,000	56,203,392	3,663,548	27,164,396
Ontario	5,007,920	40,020,605	3,894,813	34,340,897
British Columbia	330,804	2,404,880	545,473	3,228,756
Total	20,112,778	156,327,885	14,538,551	110,435,850
Imports				
From: United States	4,362,070	36,556,207	3,972,983	30,472,608
Brazil	132,979	1,790,853	60,133	875,730
Liberia	30,710	374,191	19,365	214,089
United Kingdom	9	852	9	934
Total	4,525,768	38,722,103	4,052,490	31,563,361
Exports				
To: United States	13,737,467	113,516,437	9,983,817	79,713,357
United Kingdom	2,504,847	18,506,953	1,342,153	9,013,015
W. Germany	1,088,506	6,858,962	1,035,820	6,337,071
Netherlands	438,290	3,322,051	160,766	1,161,391
Japan	304,470	2,075,500	485,186	3,587,694
Italy	20,411	161,647	-	-
Norway	89	1,000	258	1,578
Total	18,094,080	144,442,550	13,008,000	99,814,106
*Indicated Consumption	6,544,466	50,607,438	5,583,041	42,185,105
*Indicated Consumption = Production (shipments) plus imports minus exports.				

Iron Ore Production (shipments) in Canada
by Company and Property, 1954-56

Company	Property Location	Material Shipped	1956	1955	1954
1. Dominion Wabana Ore, Ltd.	Wabana, Nfld.	beneficiated hematite	2,654,219	2,369,127	2,399,821
2. Iron Ore Company of Canada	Schefferville, P.Q.	direct-shipping ore	12,023,000	7,721,694	1,781,453
3. Marmoraton Mining Co. Ltd.	Marmorata, Ont.	iron ore pellets from magnetite	283,220	195,776	-
4. Noranda Mines Ltd.	Port Robinson, Ont.	iron sinter from pyrite	48,200	-	-
5. The International Nickel Co.	Sudbury, Ont.	iron ore pellets from pyrrhotite	71,000	-	-
6. Algoma Ore Properties, Ltd.	Jamestown, Ont.	iron sinter from siderite	1,411,427	1,432,455	991,870
7. Steep Rock Iron Mines Ltd.	Steep Rock Lake, Ont.	direct-shipping ore	3,316,126	2,265,555	1,301,377
8. Argonaut Mine Div. of Utah Co. of the Amer.	Vancouver Is. B.C.	magnetite concentrates	183,837	335,903	164,338
9. Texada Mines	Texada Island B.C.	magnetite concentrates	146,480	236,392	331,566



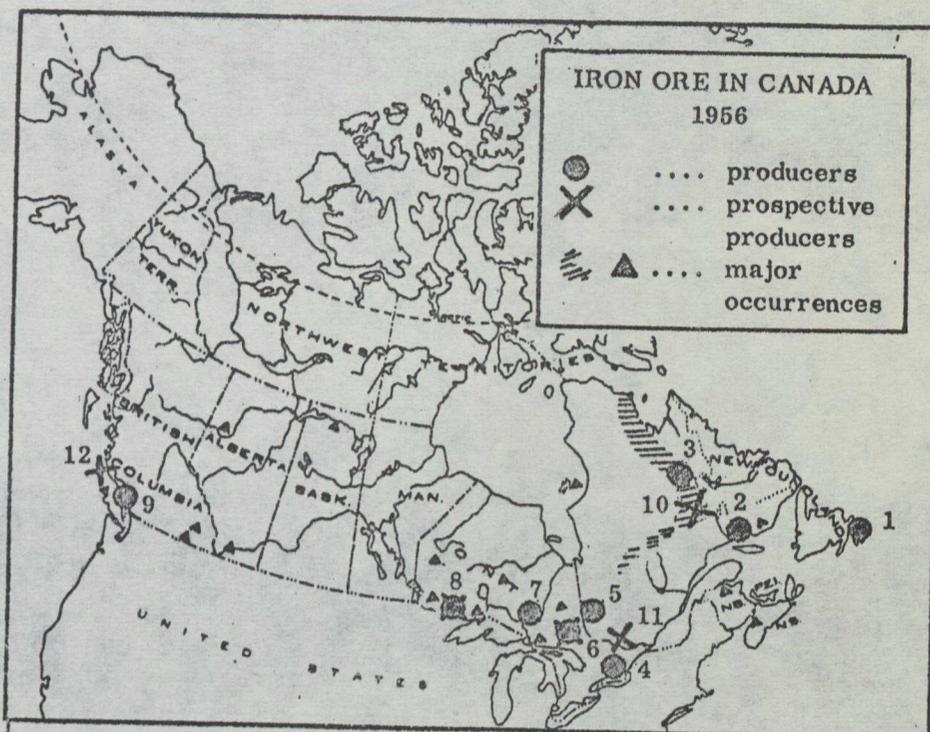


IRON ORE IN CANADA
1953 TO MID 1980'S

MILLIONS OF LONG TONS

ACTUAL PRODUCTION

ESTIMATED PRODUCTION

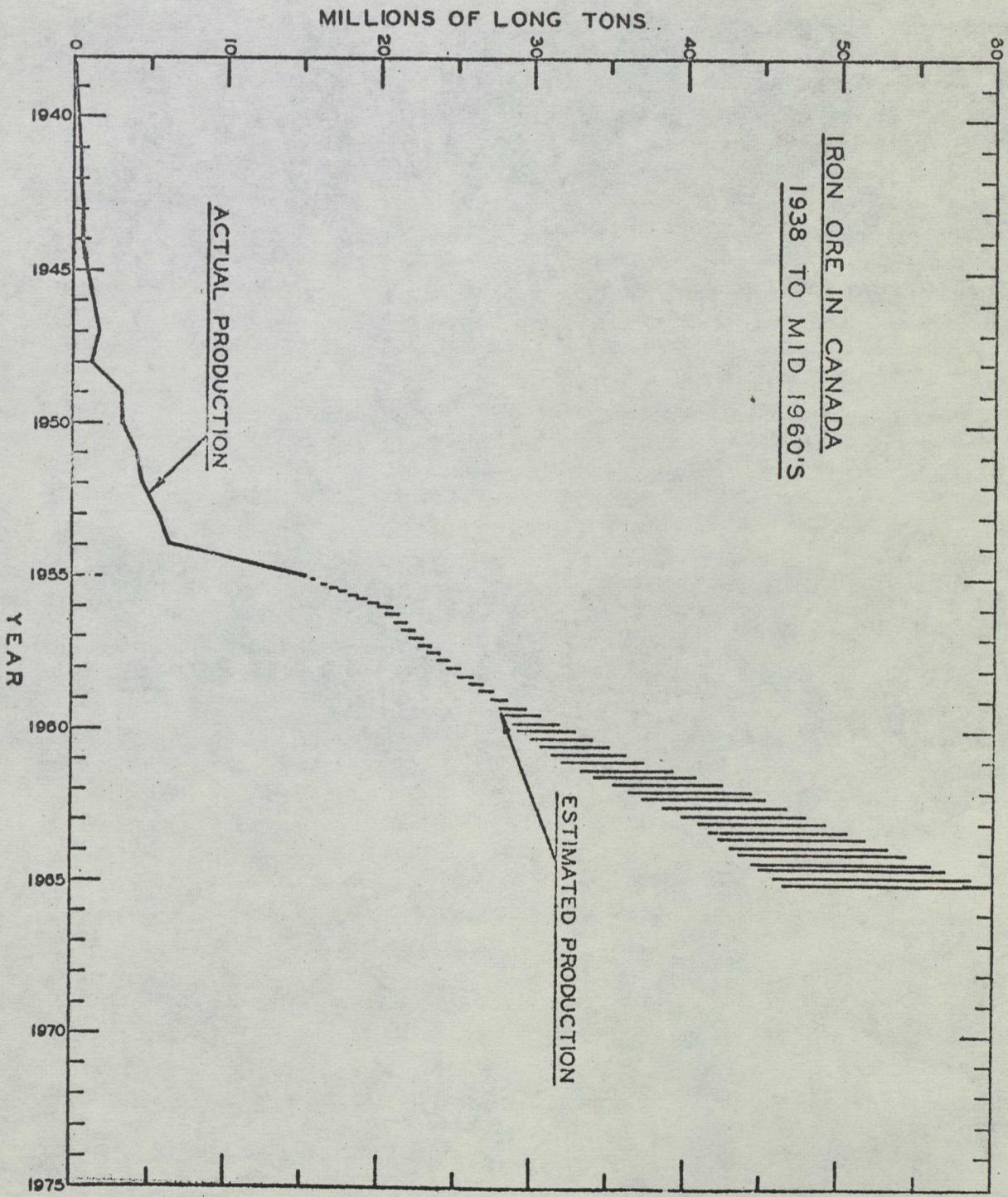


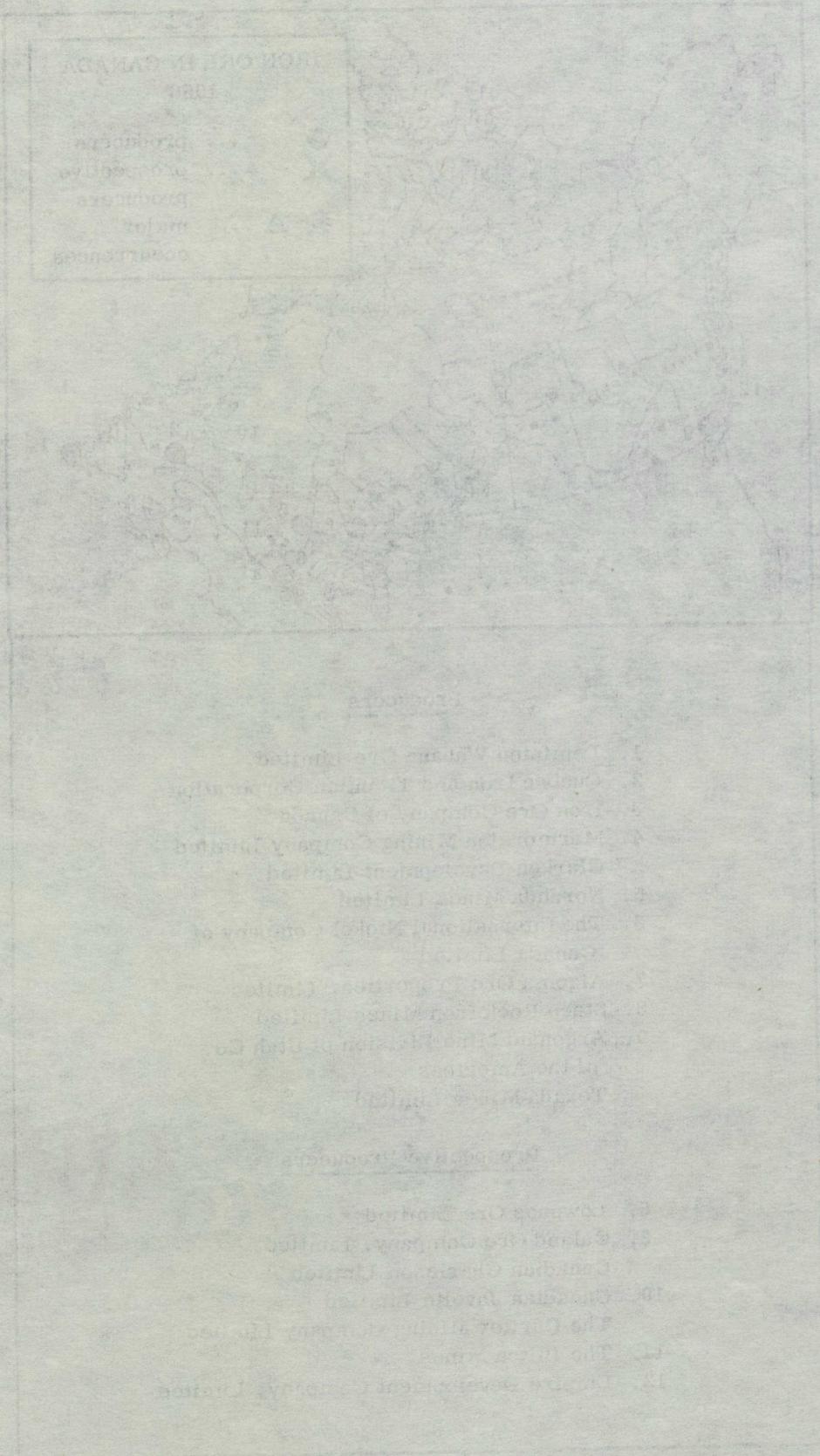
Producers

1. Dominion Wabana Ore Limited.
2. Quebec Iron and Titanium Corporation
3. Iron Ore Company of Canada
4. Marmoraton Mining Company Limited
Clarken Development Limited
5. Noranda Mines Limited
6. The International Nickel Company of
Canada Limited
7. Algoma Ore Properties, Limited
8. Steep Rock Iron Mines Limited
9. Argonaut Mine Division of Utah Co.
of the Americas
Texada Mines Limited

Prospective Producers

6. Lowphos Ore Limited
8. Caland Ore Company, Limited
Canadian Charleson Limited
10. Canadian Javelin Limited
The Cartier Mining Company Limited
11. The Hilton Mines
12. Empire Development Company, Limited





FROM ONE BY CANADA
LINES
DISTRICTS
COUNTIES
MUNICIPALITIES
CITIES

COMPANIES IN CANADA PRODUCING IRON ORE, OR WITH
PROPERTIES UNDER DEVELOPMENT AND ANNOUNCED
PLANS OF PRODUCTION

Company	Property Location	Type of Ore	Product Shipped
<u>In Production</u>			
Dominion Wabana Ore Ltd.	Wabana, Bell Island, Nfld.	hematite	heavy-media concentrates
Quebec Iron & Titanium Corporation Iron Ore Company of Canada	Allard Lake, P.Q. (mine) Sorel, P.Q. (smelter) Labrador-New Que. near Schefferville, P.Q.	ilmenite-hematite goethite and	desulphurized iron direct shipping ore
Noranda Mines Limited	Noranda area, P.Q.(mines) Port Robinson, Ont. (sinter plant)	hematite by-product pyrite flotation concentrate	iron oxide sinter
Marmoraton Mining Co.Ltd. (Bethlehem Steel Co.) Clarcken Development Ltd.	Marmorata, Ont. Lake township, Hasting county, eastern Ont.	magnetite magnetite	pelletized magnetite concentrate magnetic concentrate
Algoma Ore Properties Ltd. Steep Rock Iron Mines Limited	Mines and sinter plant near Jamestown, Ont. Steep Rock Lake, Ont. near Atikokan	siderite goethite	iron oxide sinter direct-shipping ore
The International Nickel Company of Canada, Ltd.	Mines in the Sudbury area and plant at Copper Cliff, Ont.	pyrrhotite flotation concentrates	iron oxide pellets
Texada Mines Limited Argonaut Mine Division of Utah Co. of the Americas	Texada Island, B.C. Quinsam Lake near Campbell River, Vancouver Island, B.C.	magnetite magnetite	magnetite concentrates magnetite concentrates
<u>Under Development with Plans of Production</u>			
Canadian Javelin Ltd.	Wabush Lake area, Labrador just west of mileage 224 off the Quebec North Shore and Labrador Railway	beneficiating grade magnetite and specular hematite	iron oxide pellets
The Quebec Cartier Mining Company Ltd. (1961)	Mt. Reed and Mt. Wright areas, Que., 150 and 210 miles north of Shelter Bay	beneficiating grade specular hematite & magnetite	iron ore concentrates
The Hilton Mines (1957)	Near Bristol, Que., 40 miles northwest of Ottawa	beneficiating grade magnetite	iron oxide pellets
Noranda Mines Limited (1957)	Noranda area, Que.(mines) Cutler, Ont. (sinter plant)	by-product pyrite flotation concentrate	iron oxide sinter
Lowphos Ore Ltd. (1958)	Near Sellwood, Ont. 20 miles north of Capreol	beneficiating grade hematite bearing gravels	iron oxide conc. or pellets washed & sized hematite
Can. Charleson Ltd. (1958)	Steep Rock Lake, Ont.	magnetite	
Empire Development Co. Ltd. (formerly Quatsino Copper-Gold Mines Ltd. (1957)	Elk River deposit near north end of Vancouver Island, B.C.	magnetite	magnetite concentrate

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WATER RESOURCES DIVISION

Project No.	Project Name	Project Location	Project Description
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