

Ferrous Minerals

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MANGANESE

Summary

Approximately 90% of the manganese consumed in the world is used in metallurgical applications. Manganese ferroalloys and manganese metal are used in the production of iron and steel; manganese metal is also used in the production of nonferrous products such as aluminum alloys. The non-metallurgical applications include manganese chemicals for use in fertilizers, bricks and paint, and for water purification.

Because of the relatively low grade of domestic deposits, Canada has never produced manganese ore on a commercial basis. However, the price increase of the late eighties/early nineties for manganese ore has resulted in renewed interest in three projects: the Wabush Mines Ltd. and the Hollinger North Shore Exploration projects located in the Labrador Trough, and the Woodstock project in New Brunswick.

The world's production of manganese ore in 1994 declined by about 1.3% compared to 1993 because of capacity closures in Russia, China and South Africa brought about by poor market conditions. These capacity closures slowed down, and in some cases put on hold, the development of new manganese ore production capacity which had been encouraged by the relatively high price for the commodity since 1989. Brazil, Burkina Faso, Ghana, Australia, Ukraine and the Philippines are some of the host countries for these new developments.

These developments affected the traditional producers, mostly in South Africa, who were forced initially to cut their production to stabilize the price of manganese ore. However, because of increasing demand and to protect their market share, South African producers started bringing production capacity back on

line and, at the same time, stabilizing prices. Also affected by overcapacity, the relatively high price for raw materials, and the low price for its products, the world's manganese alloy manufacturers kept their operations working at below capacity to weather the downturn. Increased demand later in the year enabled producers to re-activate some production capacity.

The outlook for 1995 shows some promise. Consumption of manganese products is forecast to remain strong and even to increase as the world economies finish recovering from the recession and start expanding. However, the continued realignment of the market will result in a further redistribution of production capacity. Prices for manganese ore and manganese alloys are expected to stabilize at current levels in the first half of 1995 and to improve slightly afterwards.

Canadian Developments

In 1994, Canada remained dependent on imports for all of its manganese product requirements for the domestic production of steel and non-metallurgical products. However, changing market conditions, such as the manganese ore price hike in 1989, have encouraged the re-evaluation of known Canadian resources to supply the domestic market.

In Canada, important manganese occurrences are found in the Labrador Trough of Quebec and Labrador, in New Brunswick near Woodstock, in Nova Scotia, and in the Northwest Territories. Lately, renewed interest has focused on some of the deposits in Quebec/Labrador and New Brunswick.

Occurrences of manganese in the Labrador Trough are associated with iron ore deposits. Two manganese projects located in this area are under study.

Wabush Mines Ltd. and the Canada Centre for Mineral and Energy Technology (CANMET) completed test work on a process to recover a 58% manganese content metallurgical-grade concentrate from iron ore. The manganese, which is in the form of pyrolusite, would be removed in a proposed rare earth separator circuit installed at the mine's iron ore concentrator. A flow sheet to produce up to 100 000 t/y of manganese concentrate has been developed; its completion would require a capital

investment of \$50 million-\$60 million. The manganese products produced, half of the output in briquette form and the rest in concentrate, would be suitable for the ferroalloys, battery and chemical industries. Wabush's owners were considering the economics of the project at year-end.

Near Schefferville, Quebec, Hollinger North Shore Exploration, a subsidiary of La Fosse Platinum Group Inc., is planning to produce from several small manganese deposits concurrently with the production of iron ore. Ore reserves of more than 1.66 Mt grading an average of 23.9% manganese were outlined by the diamond drilling and surface sampling of 15 deposits. These deposits range in size from 15 000 to 600 000 t grading between 17.0% and 48.5% manganese. Beneficiation of the ore up to 43% manganese by crushing and screening, followed by heavy media separation, will be done locally to produce two lumpy products grading 40% plus and 35% manganese. Initial production is planned at around 68 000 t/y, growing to 135 000 t/y after four years. Adequate financing has not yet been found to go ahead with the project.

In New Brunswick, manganese deposits located near Woodstock host reserves estimated at 175 Mt grading 9% manganese. The Plymouth property holds the largest of these deposits with reserves of 46 Mt grading 10.9% manganese. Various studies in the past to develop these resources failed to outline an economic way to concentrate the ore. However, these deposits are the subject of renewed interest for the production of manganese dioxide or electrolytic manganese dioxide.

Canadian consumption of manganese ore in 1993 (the most recent year for which all data are compiled) was 8226 t gross weight, down 7.2% compared to 1992. The decrease in consumption is a result of reduced demand from some consumers following drawdowns in stocks, closures, and reduced activities in some cases. Canada's consumption of manganese ore fell dramatically between 1991 and 1992 as a result of the May 15, 1991, closure of the Elkem Métal Canada Inc. ferroalloy plant located in Beauharnois, Quebec. This smelter was the only producer of manganese ferroalloys in Canada.

Canada's consumption of ferromanganese and ferrosilicomanganese in 1993 increased 10% to 66 312 t gross weight compared to 1992. The major part of this increase was reported in the use of ferrosilicomanganese, which jumped about 16% concurrent with improved demand for steel products (the main use for manganese ferroalloys).

Manganese metal consumption increased by about 19% in 1993 to 5300 t manganese content on the basis of increased demand from aluminum and steel producers.

Trade

Canada's trade in manganese products is relatively small. However, it is vital to the country since manganese is essential to the activities of the steel and aluminum industries.

In 1994, total imports of manganese products were valued at \$108.8 million, up 20% compared to 1993, while exports amounted to about \$0.25 million, down 12%.

Imports of manganese ores and concentrates in 1994 remained low following the ongoing closure of Elkem's Beauharnois ferroalloy plant in 1991. Partly because of this closure, and partly because of strengthening demand from steel producers, imports of ferromanganese and silicomanganese increased by 17% to \$87.6 million. Imports of manganese metal in 1994 increased by 105% to 3133 t compared to 1993. The increase is due to greater demand from steel plants across Canada, while demand for the production of aluminum alloys used in the packaging industry decreased as a result of oversupplied markets. Exports of manganese products were negligible.

World Developments

World production of manganese ores and concentrates in 1994, as estimated by the International Manganese Institute (IMI), was 19.25 Mt gross weight, down 1.3% from 1993 and well below the 1987-90 average of 23.8 Mt gross weight. World manganese consumption is estimated by the IMI at 6.1 Mt of contained metal.

The drop in production results from capacity closures, mostly in China, Russia and South Africa, brought about by deterioration of production apparatus and poor market conditions. Markets, oversupplied during the early stages of the recession, are now slowly re-balancing on the strength of increased demand from the steel industry.

The Commonwealth of Independent States (C.I.S.), South Africa, China, Gabon, Brazil and Australia are the leading producers of manganese ores and concentrates. The export market for manganese ores and concentrates totals an average 3.75 Mt/y gross weight. Gabon, South Africa, Australia, Brazil and Ghana are the major exporting countries. The damage from C.I.S. and Chinese exports, as observed in other metal markets, did not occur in the manganese concentrates market as much because of the relatively low quality of their material. This is not the case, however, with manganese alloys, as witnessed by the anti-dumping suits filed against these countries in 1994.

Relatively high but decreasing ore prices and the realignment of the markets encouraged the development of new manganese production capacity in some areas of the world, while traditional producers like

South Africa were forced to cut capacity. Some of the 1994 developments are described below by country.

Australia

Following the deal signed in 1992 between Broken Hill Proprietary Co. Ltd. (BHP) and the Norwegian ferroalloy producer, Elkem S.A., BHP has been able to increase its capacity utilization to 75%. Groote Eylandt Mining Co. (GEMCO), a BHP subsidiary operating the Groote Eylandt manganese mine, has a production capacity of 2 Mt and reserves of 100 Mt grading 48% manganese. In another development in 1994, BHP announced its acquisition of a 14% stake in the Mexican manganese ferroalloy producer, Minera Autlán.

Portman Mining put its Woodie Woodie mine on care and maintenance in mid-May because it was uneconomic at current prices. Located in Western Australia's Pilbara district, the mine had a production capacity of 350 000 t/y of high-grade (48.8% manganese) ore.

Valiant Consolidated Ltd., a third Australian manganese ore producer, started operating, in June, the Mount Sydney deposit located in the East Pilbara area in Western Australia. Adjacent to the Woodie Woodie deposit, the Mount Sydney deposit has proven mineable ore reserves of 1 Mt grading 42% manganese. Production at this mine in 1994 was expected to be 75 000 t of manganese, and could reach its capacity of 150 000 t/y in 1995.

Brazil

Companhia Vale do Rio Doce (CVRD) acquired an additional interest of 46.66% to hold 93.2% of Urucum Mineracao SA (Urucum), who owns the rights to manganese reserves estimated at 70 Mt. Urucum's underground mine, located close to Brazil's border with Bolivia, has a 500 000-t/y production capacity, but is reported to be producing at about 33% of capacity. When added to CVRD's other reserves at its Igarapé Azul mine in Pará State near Carajás, the company now has control of over 130 Mt of manganese reserves.

The Buritirama manganese mine, located in the east-central part of Pará State, approximately 55 km north of the CVRD-Carajás iron mine, started production in July. Proven reserves at the site total 18.4 Mt grading 35.8% manganese. The mine, owned 55% by Prometal Produtos Metalúrgicos S.A., 25% by Outokumpu Engineering Contractors OY, and 20% by Toniolo Busnello S.A., was expected to reach a production rate of 200 000 t/y by the fourth quarter of 1994. Nominal concentrate production, to be reached in 1996/97, is set at 500 000 t/y split 40% lump ore grading 44-46% manganese and 60% sinter feed grading 42-44% manganese. This mining operation will be integrated with a sintering plant that is being built at a cost of US\$36.9 million in Marabá and is

due for start-up in 1996. An agreement is also being finalized for a ferroalloy plant to be built by 1997 at the same location. Project costs are estimated at US\$140 million and will result in the production of 80 000 t/y of high-carbon ferromanganese, 50 000 t/y of ferro-silicomanganese, and 20 000 t/y of low- and medium-carbon ferromanganese.

Following the December 1993 application for protection under the *Stock Company Reorganization and Rehabilitation Act* by companies of the Cia Paulista de Ferro-Ligas Group, a reconstruction plan was submitted in 1994. Under that plan, the companies have a grace period of two years to reconstruct and repay their debts. Paulista, who also owns Sibra Electrosiderurgica Brasileira SA, is Brazil's largest manganese alloy producer with a capacity of 500 000 t/y.

Burkina Faso

InterStar Mining Group Inc. started shipments in early 1994 from its Tambao manganese deposit located in Burkina Faso. The deposit contains more than 13.6 Mt of proven and developed high-grade metallurgical-quality reserves grading 54% manganese and a relatively high 0.15% phosphorus. The mining operation has a production capacity of 140 000 t/y, and is estimated to have produced 90 000 t of manganese concentrate in 1994.

China

China, with production of about 3.5 Mt, is the third largest producer of manganese ore after South Africa and the C.I.S. However, because of the low quality of its ore, it hardly exports any. Indeed, China imports some high-quality ore from Australia, South Africa and Gabon. On the basis of nine-month data, Chinese imports of manganese ore in 1994 increased about 60% versus 1993 to an annual estimate of 750 000 t gross weight.

In the ferroalloy market, China is a major exporter. In 1993, reported exports of manganese alloys totalled about 320 332 t gross weight, an increase of 41% compared to the previous year. By international standards, the material it exports is of low quality, but its low price undercuts the market. Since 1993, anti-dumping charges have been put on imports of Chinese ferroalloys in Japan, the European Union, and the United States. For this reason, exports in 1994 are expected to be less than in 1993.

China is also an important supplier of manganese metal, a material used in the aluminum alloying industry for the production of cans.

Commonwealth of Independent States

Most of the manganese ore production inside the C.I.S. is supplied by operations in Ukraine's Nikopol Basin, in Georgia's Chiatura District, and in

Kazakhstan. In 1994, Ukraine's export quota of manganese concentrates was reported at 365 000 t, while production in Georgia was operating at 15% of its 200 000-t/y capacity, and Kazakhstan's production was about 150 000 t.

Production of manganese alloys in the C.I.S. comes largely from three complexes. Ukraine's Nikopol Ferroalloy Works is reportedly operating at 60-70% of its 1-Mt/y capacity. Production in 1994 is estimated at 620 000 t, split 90% silicomanganese and 10% ferromanganese, down 2.4% compared to 1993. The Zaporozhye plant, also located in Ukraine, has a 350 000-t/y capacity. Operating rate levels at that plant have not recently been reported, but a large part of C.I.S. exports is said to come from there. Georgia's Zestafoni Plant, also affected by power cuts, operated at a small fraction of its 150 000-t/y capacity.

European Union

Near the end of December, the European Commission confirmed the imposition of duties on imports of silicomanganese from Russia, Ukraine, Brazil, and South Africa. The duties range between 40.6% and 57.8%.

South Africa

South Africa's production of manganese ore was last reported at 2.273 Mt gross weight in 1993, up 1.3% compared to the previous year, but about 51.8% less than the recent peak in 1989. Production in 1994 is expected to have increased.

The production of manganese alloys is estimated to have increased in 1994 at South Africa's three producers. Samancor Ltd. reported a 23% increase in its manganese alloy sales volume in fiscal year 1994. It currently produces at a rate of about 500 000 t/y, split 70% ferromanganese and 30% silicomanganese. The company's production from the Metalloys plant was increased by about 103 000 t by converting five idled ferrochromium furnaces at the Ferrometals plant to manganese alloy production. A further 200 000-t/y capacity could be resumed on short notice. However, because of duties on its exports of silicomanganese to Europe, the company instead plans to export more ore.

Associated Manganese Mines of South Africa Ltd. is reportedly operating all four furnaces at full capacity (150 000 t/y of ferromanganese) at its Cato Ridge plant in Natal. This contrasts with early 1993 when only one furnace was operating.

South Africa's third producer, Transalloys, a subsidiary of Highveld Steel & Vanadium Corp. Ltd., is currently operating at 170 000 t/y, split about two thirds silicomanganese and one third ferromanganese.

United States

Elkem Metals Corp. of Pittsburgh completed, in 1994, a contract started in 1983 with the U.S. Defense Logistics Agency (DLA) to upgrade manganese. Elkem's plant in Marietta, Ohio, was upgrading manganese ore to high-carbon ferromanganese in exchange for payments in kind. Its intentions are now to compete for market share with other international producers.

A Defense Authorization Bill approved by Congress in 1992 called for the sale, over a 10-year period, of part of the material contained in the National Defense Stockpile. The DLA is to make available for sale 1 467 937 t of metallurgical-grade manganese ore, 61 540 t of battery-grade natural manganese ore, 2716 t of synthetic dioxide battery-grade manganese, and 846 333 t of ferromanganese.

In fiscal year 1994, as in the previous year, the maximum amount authorized to be sold under the Annual Materials Plan (AMP) was 362 800 t of metallurgical-grade manganese ore, 54 420 t of battery-grade natural manganese ore, and 45 350 t of chemical-grade manganese ore. A total of 45 350 t of ferromanganese initially included in the AMP was later removed from the list because of complaints from manganese alloy producers.

Beginning with fiscal year 1995, the DLA will offer approximately 181 000 t of metallurgical-grade manganese ore under a negotiated bid process for long-term contracts, while the balance of the authorized amounts will be offered under the sealed bid process as before. The AMP for fiscal year 1995 was set at 67 120 t of metallurgical-grade manganese ore, 54 420 t of battery-grade natural manganese ore, 36 280 t of chemical-grade manganese ore, and 1814 t of electrolytic manganese metal.

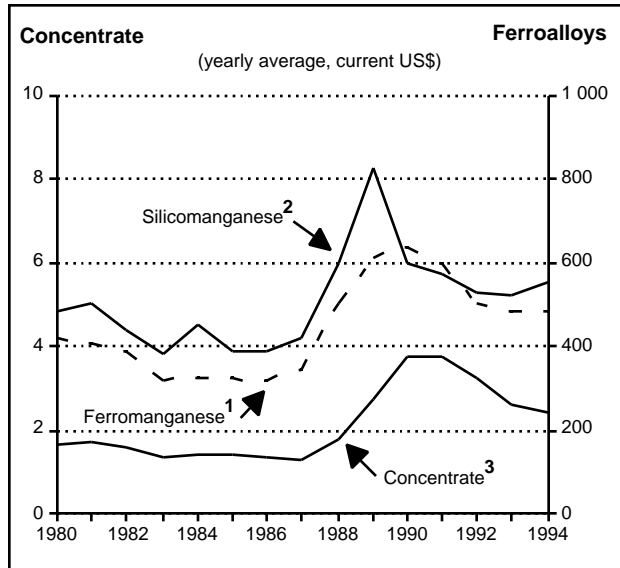
In early November, as a result of increased market competition, and to defend its industry against unfairly priced imports, the U.S. Department of Commerce announced the imposition of definitive anti-dumping duties ranging between 17.6% and 163.0% on silicomanganese imports from China, Brazil, and Ukraine. Duties on Ukrainian imports were suspended following an agreement between the two countries on annual import quotas for the next five years. Another anti-dumping petition filed in November by Kerr-McGee Chemical Corp. and Elkem Metals Co., alleging that Chinese manganese metal was dumped in the United States, was voted on and accepted by the U.S. International Trade Commission. Alleged anti-dumping margins were fixed in the range of 104.77-143.22%.

Prices

Despite a decrease in mine production in 1994, recent ferroalloy plant capacity closures, and a general increase in consumption, an imbalance in supply

persisted during the year, resulting in lower prices. Manganese ore prices were quoted in the range of US\$2.15-\$2.25 per metric tonne unit (mtu)¹ at the start of the year, decreased to US\$2.04/mtu on June 23, and widened to US\$1.95-\$2.04/mtu on July 14, finishing the year at that level.

Figure 1
Manganese Price Variations in the Past Fifteen Years, 1980-94



Sources: *Metal Bulletin*; U.S. Bureau of Mines.

¹ Average annual (mid-range) price for ferromanganese – free market 78% Mn, standard 7.5% carbon in warehouse Pittsburgh US\$/t.

² Average annual (mid-range) price for silicomanganese – free market in warehouse Pittsburgh US\$/t.

³ Concentrate – average annual price for metallurgical ore grade, 46-48% Mn, US\$/mtu, c.i.f. U.S. Ports.

Similarly, the U.S. price for imported ferromanganese (78% manganese) decreased from a high of US\$490-\$500/t in early January to a low of US\$470-\$480/t from June 22 to the end of December, when prices widened to US\$470-\$500/t. The price for imported 2% carbon silicomanganese remained fairly stable during the year. It registered a small decrease in the first quarter from a range of US26.0¢-26.5¢/lb to a range of US24.0¢-25.5¢/lb, where it hovered until it closed the year at US24.5¢-25.5¢/lb.

The price for electrolytic manganese metal flake (minimum 99.7% manganese) gradually increased from a low of US\$1050-\$1150/t to a high of US\$1250-\$1300/t at the end of the year.

¹ Price is reported in dollars, U.S. currency, for each percentage point of manganese in a tonne of ore; e.g., at \$3.00/mtu of manganese, ore grading 48% manganese would bear a price of 48 x \$3.00 = US\$144.00/t.

Outlook

Experts agree that the steel industry is at a mature stage. Average world steel production is not expected to increase significantly before the next decade. With that viewpoint, the consumption of manganese products will not expand, but is actually expected to decrease since improvements in production efficiency enable steel producers to use less manganese in the steel-making process for an equal-quality product. The restructuring in Eastern Bloc countries and a revamping of their antiquated steel industry using new technologies should also result in lower average manganese consumption in the long term.

In the short term, however, world consumption of manganese products should increase by about 5% in 1995 as world economies expand. This will especially be the case in Japan where consumption is expected to increase significantly in the second half of the year as a result of re-building efforts in the wake of the earthquake it experienced in January 1995.

The manganese market imbalance, which started in the second half of 1990 when supply exceeded demand, persisted throughout 1994. As a result of increased demand, the imbalance is expected to lessen in 1995, but very slowly because ore production capacity is being restarted or installed very rapidly. For this reason, the price for manganese ore is expected to stabilize at current levels.

Ferroalloy prices appear to have reached the low end. They are expected to stabilize at this level for the short term until demand increases substantially. The application of anti-dumping suits against exports from China and C.I.S. countries may, however, distort the market and contract supplies which will cause prices to firm up.

Difficult market conditions for manganese ore and ferroalloy producers could result in the further elimination of higher-cost producers serving the international market.

The realignment of the market will continue in 1995. Producers are trying to protect themselves through vertical integration, obtaining equity positions, or arranging partnerships with firms located both upstream and downstream from them in the processing of manganese. Through vertical integration, they are trying to protect their source of supply and their market while becoming more competitive.

TARIFFS

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
2530.90.50	Natural manganese oxides	Free	Free	Free	Free
2602.00	Manganese ores and concentrates, including a manganese content of 20% or more, calculated on the dry weight	Free	Free	Free	Free
2820.10	Manganese dioxide	Free	Free	Free	Free
72.02	Ferromanganese				
7202.11	Containing by weight more than 2% of carbon				
7202.11.10	Containing by weight not more than 1% of silicon	0.82¢/kg or fraction thereof on the manganese content	Free	Free	
7202.11.10	Containing by weight more than 2% but not more than 4% of carbon				Free
7202.11.20	Containing by weight more than 1% of silicon	1.44¢/kg or fraction thereof on the manganese content	Free	Free	
7202.11.50	Containing by weight more than 4% of carbon				Free
7202.19	Other ferromanganese				
7202.19.10	Containing by weight not more than 1% of silicon	0.81¢/kg on the manganese content	Free	Free	Free
7202.19.20	Containing by weight more than 1% of silicon	1.44¢/kg on the manganese content	Free	Free	Free
7202.30	Ferro-silicomanganese	1.44¢/kg or fraction thereof on the manganese content	Free	Free	Free
8111.00.11	Unwrought manganese, not alloyed	Free	Free	Free	
8111.00.12	Unwrought manganese, alloyed	8.8%	6.5%	3%	
8111.00.21	Manganese powders, not alloyed	Free	Free	Free	
8111.00.22	Manganese powders, alloyed	8.8%	6.5%	3%	
8111.00.30	Manganese waste and scrap	8.8%	6.5%	3%	
8111.00.40	Articles of manganese	8.8%	6.5%	3%	
8111.00.45	Unwrought manganese				4.2%

Sources: Customs Tariff, effective January 1995, Revenue Canada; Harmonized Tariff Schedule of the United States, 1995.

TABLE 1. CANADA, MANGANESE TRADE, 1992-94 AND CONSUMPTION, 1991-93

Item No.	1992		1993		1994 ^p	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
IMPORTS						
2530.90.50	Natural manganese oxides					
	United States					
	4	15	7	15	...	...
	Total					
	4	15	7	15	...	...
2602.00	Manganese ores and concentrates, including manganiferous iron ores and concentrates with a manganese content of 20% or more, calculated on the dry weight					
	United States					
	7 611	2 077	7 772	1 133	5 859	992
	Other countries					
	-	-	191	47	426	106
	Total					
	7 611	2 077	7 962	1 181	6 285	1 098
2820.10	Manganese dioxide					
	Japan					
	865	1 546	852	1 645	917	1 926
	Australia					
	-	-	571	1 046	979	1 901
	United States					
	3 166	2 442	2 667	1 749	1 111	611
	Other countries					
	90	130	18	29	24	43
	Total					
	4 121	4 119	4 109	4 471	3 030	4 483
72.02	Ferromanganese					
7202.11	Containing by weight more than 2% of carbon					
7202.11.10	Containing by weight not more than 1% of silicon					
7202.11.10.10	Containing by weight more than 2% but not more than 3% of carbon					
	United States					
	16	11	233	221	14	11
	Total					
	16	11	233	221	14	11
7202.11.10.20	Containing by weight more than 3% of carbon					
	South Africa					
	7 741	5 001	10 181	6 214	20 584	12 694
	France					
	4 544	2 841	17 403	8 452	12 461	7 920
	Norway					
	9 118	5 294	2 600	1 300	6 878	4 771
	United States					
	3 749	2 707	6 471	4 369	3 655	2 693
	Other countries					
	19	11	2 505	1 314	437	550
	Total					
	25 171	15 855	39 161	21 650	44 015	28 631
7202.11.20	Containing by weight more than 1% of silicon					
7202.11.20.10	Containing by weight more than 2% but not more than 3% of carbon					
	-	-	-	-	-	-
7202.11.20.20	Containing by weight more than 3% of carbon					
	Russia					
	-	-	-	-	498	367
	United States					
	233	138	931	683	387	263
	Other countries					
	208	98	-	-	20	13
	Total					
	441	236	931	683	905	645
7202.19	Other ferromanganese					
7202.19.10	Containing by weight not more than 1% of silicon					
7202.19.10.10	Containing by weight not more than 0.75% of carbon					
	Norway					
	4 326	5 308	2 986	4 543	3 044	4 343
	Italy					
	-	-	-	-	1 105	1 895
	United States					
	508	471	1 095	1 347	1 096	1 415
	France					
	399	657	68	53	162	169
	Other countries					
	211	282	91	79	212	305
	Total					
	5 444	6 720	4 239	6 025	5 619	8 129
7202.19.10.20	Containing by weight more than 0.75% but not more than 2% of carbon					
	South Africa					
	7 753	8 081	5 486	5 892	8 332	9 406
	United States					
	5 875	6 798	7 077	8 828	4 786	6 339
	Norway					
	1 889	2 278	2 316	2 644	1 414	1 774
	Brazil					
	2 545	2 768	1 183	970	859	1 116
	Other countries					
	863	899	168	171	213	285
	Total					
	18 925	20 825	16 229	18 508	15 605	18 923

TABLE 1 (cont'd)

Item No.	1992		1993		1994P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)	
IMPORTS (cont'd)							
7202.19.20	Containing by weight more than 1% of silicon						
7202.19.20.10	Containing by weight not more than 0.75% of carbon						
	Italy	1 040	1 664	129	201	454	871
	South Africa	—	—	—	—	656	590
	Norway	—	—	49	95	138	190
	Other countries	109	236	—	—	28	58
	Total	1 149	1 901	178	296	1 276	1 711
7202.19.20.20	Containing by weight more than 0.75% but not more than 2% of carbon						
	United States	78	124	79	113	58	87
	Other countries	—	—	246	368	9	13
	Total	78	124	324	482	68	101
7202.30	Ferro-silicomanganese						
	Brazil	8 009	4 409	15 730	9 186	15 362	11 231
	United States	8 681	6 933	8 958	7 763	6 488	6 829
	South Africa	4 036	2 090	9 819	5 955	6 956	5 574
	Norway	2 042	2 333	517	653	2 156	3 260
	Other countries	1 401	986	3 971	3 596	3 044	2 566
	Total	24 169	16 753	38 996	27 156	34 006	29 464
8111.00.11 a	Unwrought manganese, not alloyed						
	People's Republic of China	—	—	816	1 407	802	1 421
	United States	248	681	209	574	200	539
	South Africa	—	—	342	893	18	50
	Total	248	681	1 367	2 875	1 020	2 011
8111.00.12 c	Unwrought manganese, alloyed						
	United States	1 313	3 843	791	2 150	835	2 622
	Other countries	—	—	155	358	81	227
	Total	1 313	3 843	947	2 508	916	2 850
8111.00.20.90 e	Manganese powders, alloyed, including waste and scrap						
	United Kingdom	..	291	208	598	..	..
	United States	..	309	68	244	..	..
	Total	..	600	277	843	..	..
8111.00.21 b	Manganese powders, not alloyed						
	South Africa	1 673	3 825	1 336	3 390	2 822	7 240
	People's Republic of China	—	—	118	219	206	565
	United States	93	224	73	196	94	252
	United Kingdom	—	—	..	..	11	37
	Total	1 766	4 050	1 527	3 806	3 133	8 095
8111.00.22 f	Manganese powders, alloyed						
	United States	..	..	..	..	589	1 844
	United Kingdom	..	..	..	..	90	270
	Total	..	..	..	..	679	2 114
8111.00.30 g	Manganese waste and scrap						
	United States	..	..	..	..	37	82
	Total	..	..	..	..	37	82
8111.00.40 d	Articles of manganese, n.e.s.						
	United Kingdom	—	—	—	—	63	283
	United States	..	839	15	148	27	112
	Other countries	—	—	8	34	14	53
	Total	..	839	23	183	104	450
EXPORTS							
2820.10	Manganese dioxide						
	United States	2	12	9	6	29	22
	Total	2	12	9	6	29	22

TABLE 1 (cont'd)

Item No.	1992		1993		1994 ^p	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
EXPORTS (cont'd)						
7202.11	Ferromanganese, containing by weight more than 2% of carbon					
	United States	224	92	82	45	—
	France	20	17	—	—	—
	Total	243	109	82	45	—
7202.19	Ferromanganese, n.e.s.					
	United States	—	—	55	43	—
	France	71	59	—	—	—
	Philippines	2	15	19	45	—
	Total	73	75	74	88	—
7202.30	Ferro-silicomanganese					
	United States	142	86	167	77	385
	France	6	4	—	—	142
	Total	148	90	167	77	385
8111.00	Manganese and articles thereof, including waste and scrap					
	United States	94	164	117	49	58
	Netherlands	24	68	—	—	79
	Other countries	1	3	2	10	...
	Total	119	236	118	60	58
		1991	1992	1993^p		
		(gross weight, tonnes)				
CONSUMPTION¹						
Manganese ore		109 028	8 860	8 226		

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available or not applicable; ... Amount too small to be expressed; n.e.s. Not elsewhere specified; ^p Preliminary; ^r Revised.^a For 1992/93, the H.S. code for unwrought manganese, not alloyed is 8111.00.10.10. ^b For 1992/93, the H.S. code for manganese powders, not alloyed is 8111.00.10.20.^c For 1992/93, the H.S. code for unwrought manganese, alloyed is 8111.00.20.10. ^d For 1992-93, the H.S. code for articles of manganese, n.e.s. is 8111.00.20.20. ^e H.S. code 8111.00.20.90 has been discontinued for 1994. For 1994, for manganese powders, alloyed, see H.S. code 8111.00.22.For 1994 for manganese waste and scrap, see H.S. code 8111.00.30. ^f For 1992-93 manganese powders, alloyed is included in H.S. code 8111.00.20.90.^g For 1992/93, manganese waste and scrap is included in H.S. code 8111.00.20.90.¹ Available data as reported by consumers.

Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA, MANGANESE IMPORTS, EXPORTS AND CONSUMPTION, 1970, 1975, 1980, AND 1985-94

	Imports			Exports	Consumption ¹	
	Manganese Ore	Ferro-manganese	Ferro-Silico-manganese	Ferro-manganese	Ore	Ferromanganese and Silicomanganese
	(metal content)	(gross weight, tonnes)				
1970	115 052	17 891	975	510	153 846	97 952
1975	69 773	35 701	5 732	1 168	160 976	95 869
1980	95 161	26 704	20 901	11 278	157 680	95 796
1985	102 199	27 481	6 601	43 408	160 241	93 994
1986	94 914	20 283	6 773	45 090	199 699	86 687
1987	80 957	39 606	13 301	23 103	220 053	112 868
1988	108 255	35 071	17 140	25 790	160 146	112 678
1989	70 033	44 616	13 097	21 894	203 574	113 484
1990	62 809	29 230	16 808	14 611	253 002	88 841
1991	7 324	46 088 ^r	15 526	13 658	109 028	92 630
1992	7 611	51 224	24 169	316	8 860	95 146
1993	7 962	61 295	38 996	156	8 226	96 337
1994 ^p	6 285	67 502	34 006	—	..	..

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available or not applicable; ^p Preliminary; ^r Revised.¹ Available data as reported by consumers.