THE MINERAL INDUSTRY OF

PHILIPPINES

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Although the mining and quarrying sector of the minerals industry accounted for only about 1.5% of the country's gross domestic product (GDP) in 1994, this sector contributed substantially to economic development in terms of employment, exports, foreign exchange, and tax revenues.[2] Copper and gold production remained the backbone of the Philippine minerals industry for the year, ranking 13th and 12th, respectively, in world production, although the country is estimated to rank among the top 10 worldwide in terms of copper and gold resources. The country also was among the largest producers of chromite in the world, as well as a world force in the output of other commodities, including ferroalloys, mined nickel, and refined copper, in 1994.

The country's GDP increased by an estimated 4.5% compared with that of 1993, to $56.1 billion,[3] following an increase of less than 2% in 1993 and a nearly stagnate GDP in 1992.[4]

Government Policies and Programs

Based on recommendations concerning mineral tariffs and value-added tax refunds from a presidential task force, the Philippine Congress issued in 1994 the Excise Tax Act, reducing the excise tax rates on metallic and nonmetallic minerals and quarry resources from 5% and 3%, respectively. Taking effect on June 2, tax rates for gold and chromite were set at 2%, while tax rates for copper and all other metallic minerals were fixed at 1% from 1994 to 1997, 1.5% in 1998 and 1999, and 2% thereafter. Nonmetallic minerals and quarry products were established at a 2% rate.

The mining industry continued to be governed during the year by executive and administrative orders providing guidelines for both mineral production-sharing agreements and financial and technical assistance agreements, while waiting for passage of the long-awaited new mining code. Legislation for the final version of a comprehensive mining code was expected to be ratified early in 1995 by the full Congress, although both chambers had passed their own versions of a new code by yearend. The new mining law was expected to allow foreign investors to hold up to 100% equity in mining projects and to permit recovery of their investments before sharing profits, thus scrapping the previous guidelines requiring the foreign equity partner to divest its equity to no more than 40% 10 years after the contractor's recovery of preoperating expenses.[5]

With emergency powers authorized by the Congress, the debilitating power crisis which has been gripping the country with "revolving brownouts" every working day for several hours at a time in recent years was nearing resolution because energy development was becoming one of the Government's highest priorities. The National Power Co. was allowed to speed up the repair of aged powerplants by eliminating overly complex and time consuming bureaucratic procedures, or official red tape. New plants were being constructed under a new build-operate-transfer law, and the Department of Energy, which had been abolished by the previous administration because of past official corruption spawned during its predecessor's administration, was revived to provide a coherent energy development strategy.[6]

Environmental Issues

The Department of Environment and Natural Resources (DENR) was the primary Government agency responsible for conservation, management, development, and proper use of the country's natural resources, including its minerals. Since its reorganization in 1987, the DENR continually has strived to maintain a balance between proper economic objectives and protection of the environment within the mining industry through appropriate regulation. However, Philippine policies and standards of regulating the condition of the environment mostly were derived from the Industrialized West, or First World, and sometimes were based on premises more stringent than were warranted or feasible for the Philippines, a less developed country.[7] Accompanying legislation was expected to be contained within the new mining code to exempt from taxation pollution abatement structures, such as tailings dams, and improvements in treating and/or neutralizing mine waste.

Production

The minerals industry of the Philippines employed an estimated 400,000 people, or about 1.5% of the labor force, including an estimated 300,000 workers engaged in small-scale mining and panning activities, chiefly in artisanal gold workings. The metallic sector accounted for an estimated 75% of the industry's production value and nearly 100% of

export earnings. Of the dozen or so major mining companies engaged in metal mining, six produced copper, gold, and silver from various operations; one of the six companies also produced refractory chrome ore; three additional companies operated mines for gold and silver; and three companies mined nickel ore. The industrial minerals sector was dominated by the production of limestone for cement manufacture, marble, and sand and gravel for construction uses. Coal production continued to expand in 1994 in an effort to reduce the country's dependence on imported oil.

Refined gold and copper continued to be the country's most important mineral products, each representing more than 30% of total mineral value. *(See table 1.)*

Trade

Japan remained the primary market for the country's mineral products in 1994. Almost all of the Philippine production of chromite and nickel and more than 60% of its copper concentrates were exported to Japan. The remaining copper concentrates were smelted by the Philippine Associated Smelting and Refining Corp. into copper cathodes at Isabel, Leyte Province, for export, again primarily to Japan.

Structure of the Mineral Industry

The Philippines has had one of the oldest and most active mining industries of Southeast Asia, with a strong, established mining structure. Mining in the Philippines operated on a leasehold system until 1987, when this system was abolished in favor of a new system of joint-venture or production-sharing agreements under policies governed by interim regulations until a new mining law and enabling regulations could be passed. A new mining code was expected to be enacted early in 1995, thus promoting the involvement of foreign investors in large-scale exploration, development, and utilization of mineral resources while retaining small-scale development by Filipinos. State control over mineral resources will provide the flexibility to undertake mining as a Government activity or to enter into coproduction, joint-venture, or production-sharing agreements with both the domestic private sector and with foreign corporations and associations.

The mining industry of the Philippines was dominated by a few large-scale private local companies mining chromite, copper, gold, nickel, and silver. Coal was mined by numerous private companies and three subsidiaries of the state-owned Philippine National Oil Co. (PNOC). One of the large Government-owned companies, the Semirara Coal Corp. (SCC), produced more than one-half of the country's coal. Copper, ferroalloys, and phosphate fertilizer were produced by three joint-venture firms. Cement was produced by private companies; most were Filipino owned, with only minor foreign interests. *(See table 2.)*

Commodity Review

Metals

Chromium.—Chromite production was centered in the Province of Zambales in northern Luzon. Metallurgical- and refractory-grade chromite had been produced from two principal deposits mined by Acoje Mining Co. Inc. and Benguet Corp., respectively. Production in 1994 was dominated by Benguet from its Masinloc operations (Coto Mine), based on the world's largest single refractory chromite deposit. Historically, the principal supplier of metallurgical chromite was Acoje from its Santa Cruz operations, but the mine has remained dormant since 1992.

There also had been significant output of metallurgical- and chemical-grade chromite from alluvial and lateritic deposits on eastern Samar Island, Samar Province, and on Dinagat Island, Surigao del Norte Province, but these operations were closed throughout 1994.

Copper.—After 4 years of negotiations, Australia's Arimco Mining Corp. was awarded in midyear the first Financial and Technical Assistance Agreement (FTAA) issued by the Philippine Government to a foreign mining company. The FTAA allows Arimco to wholly own its mining project in the central-northern part of Luzon Island, thus enabling it to proceed, at an estimated cost of $150 million to $200 million, with what is expected to be the most significant mining project in the country. Arimco defined for the purposes of its final feasibility study reserves of approximately 450,000 metric tons (mt) of copper and 115 mt of gold. Arimco planned, depending on the final results, to begin mining at the site, known as Didipio, toward yearend 1995.[8]

Due to financial difficulties caused, in part, by massive rehabilitation efforts following severe typhoon damage at yearend 1993, Atlas Consolidated Mining and Development Corp. formally suspended in September operations for the remainder of the year at its Carmen open pit-underground and Lutopan underground copper-gold mines in the Toledo district of central Cebu. Although mining from the Carmen open pit recommenced in early January following dewatering from the typhoon-caused flooding, its production was insufficient to supply the mill and the mines ceased altogether in February, but with plans formulated for mining and milling to be resumed shortly. The definitive work stoppage laying off 3,000 workers was agreed upon in September as a temporary arrangement by both management and the union pending the outcome of talks with Japan's Mitsubishi Corp. for a financial assistance package with Atlas. In midyear, Atlas signed an agreement with 15 domestic and foreign banks to retire $104 million in debt and $8 million in interest and penalties.[9]

Gold.—London Fiduciary Trust PLC (LFT) of the United Kingdom acquired in October the Masara Mine in southeast

Mindanao Island from Apex Mining Co. Apex previously operated the underground mine from 1981 to 1989, producing almost 12.5 mt of gold before closing it following a prolonged labor dispute. Ore production, initially from a surface operation but supplemented by small tonnages of high-grade underground ore being mined in selected areas where access to workings could be made secure, was being raised from 400 metric tons per day (mt/d) to 1,000 mt/d to match the capacity of the existing mill and carbon-and-pulp plant at the site. Production at the Masara Mine was expected to be about 1,500 kilograms per year (kg/a).[10]

LFT also acquired in November the Runruno vat/heap leach gold project from Runruno Mining Corp., the second of a number of mining projects that LFT was planning to become involved with in the Philippines. The Runruno property, about 280 kilometers (km) north of Manila on the main island of Luzon, previously had been independently appraised by London Mining and Metal Consultants (LMMC). LMMC delineated mineral reserves of 1.7 million metric tons (Mmt) of vat leach ore grading 1.81 grams per metric ton (g/mt) of gold and more than 9 Mmt of heap leach ore averaging 0.73 g/mt gold, sufficient for a mine life of 8 years at a production rate of about 1,500 kg/a.[11]

Following complaints from environmentalists that illegal gold mining, especially in southern Mindanao Island, was disturbing the ecological balance, the Government ordered in November the Agricultural Department to regulate mineral extraction activities, especially those that damage the environment. About 20 illegal gold mining operations, using highly destructive methods including hydraulic mining that discharges tailings directly into rivers, have been reported in Mindanao.[12]

Iron and Steel.—The Philippines does not have a fully integrated steel sector, although several rod and bar mills and galvanizing plants have been established, all since the end of World War II.

Steelmaking in the Philippines involved scrap-based electric furnace steel melting operations, of which there were 17 facilities in 1994—13 in the National Capital Region; 3 in Pampanga Province to the northwest of Manila, the capital; and the Government-owned National Steel Corporation's (NSC) steelworks at Iligan, Mindanao. NSC was the single largest steel company in the country, producing about one-third of total production. In April, the Government-owned National Development Corp. (NDC) rejected the bids submitted for the purchase of a 65% interest in NSC. The bids for privatizing the Iligan plant were deemed unacceptable by NDC as they were below the indicative price of $370 million.[13]

The Philippine Sinter Corp., owned by Kawasaki Steel Corp. of Japan, imported iron fines from various overseas sources, primarily Australia, and exported iron ore sinter and pellets to Japan. The plant was opened in 1977 and has a capacity of 5 million metric tons per year.

Manganese.—Manganese output was centered on the islands of Bohol, Busuanga, Marinduque, Masbate, and Siquijor, as well as in the Provinces of Zamboanga del Sur and Agusan del Norte on Mindanao. Many of the deposits, however, were small and unsuitable for large-scale mining operations.

Portman Mining Ltd. terminated early in the year its efforts to develop the small manganese deposit at its Doi property on Bohol Island.[14]

Nickel.—The mainstay of the Philippine nickel production continued to be Rio Tuba Nickel Mining Corp.'s Rio Tuba Mine in the far south of Palawan Island, Palawan Province. Hinatuan Mining Corp. and Taganito Mining Corp. both operated smaller mines in Surigao del Norte Province. All three worked lateritic nickel deposits, exporting all ore production to Japan.

Mineral Fuels

Coal.—The Government commenced a major expansion program for the country's coal industry as part of its efforts to alleviate the serious power shortages the country has been experiencing for the past few years. The plan was to develop and commission eight new coal-fired powerplants over the next 6 years and, in order to cope with the return of rapid growth in the economy, six new coal-fired cement plants were scheduled for completion by the end of the century.

Coal in the Philippines was lignite or subbituminous and of poor quality for use in power generation. Thus, higher grade imported coal has been blended with indigenous coals to improve its burning characteristics. With the commencement of new coal-fired powerplants and accompanying cement plants, the demand for coal should increase considerably. The Government therefore has planned to almost double domestic production and to increase coal imports substantially.[15]

The country's worst coal mine disaster occurred in August when methane gas caused an explosion at PNOC's underground mine at Malangas, Zamboanga del Sur Province, on Mindanao Island.[16] The mine produced about 200,000-mt/a of high-grade coal.

Petroleum.—The Philippines has produced only about 2% of its crude petroleum requirements domestically, with about 95% of production coming from the West Linapacan Field in the Palawan Basin off the northwest coast of Palawan Island. Remaining domestic production was from the older Nido Field, also in the Palawan Basin in the South China Sea, which produced on a cyclical scheme during the year as it neared the end of its productive life.

Development drilling continued in the Camago and Malampaya Fields, Palawan Basin, in which appraisal drilling completed in August enabled the Pilipinas Shell Petroleum Corp. to announce that they were commercially viable. Plans were being formulated to develop the fields

together, to be fully on-stream by 2001, at an estimated cost of $2 billion.[17]

The country's only gas producer was the onshore San Antonio Field on Luzon Island operated by the PNOC. It was on extended production testing, producing only about 10 million cubic meters per year to fuel a 3-megawatt pilot powerplant.

The Saudi Arabian Oil Co. purchased 40% of Petron Corp., the country's largest oil refiner that operated the 136,000 barrel per day (bbl/d) Bataan Refinery at Limay in Bataan Province, Luzon Island, and marketed its products with a network of about 860 service stations.

Pilipinas Shell completed the construction of the new process units at the site of its existing oil refinery at Tabangao in Batangas Province, 120 km south of Manila, near yearend. The new state-of-the-art refinery, dubbed STAR for Shell Tabangao Asset Refinery, will produce a wider range of products than the previous refinery and be more energy and process efficient. It was to be commissioned early in January 1995 with the simultaneous closing of the old refinery. However, due to growth in demand, Shell announced plans to refurbish the newer of the two crude distillation units at the old plant and recommission it by mid-1995 with a capacity of 40,000 bbl/d.

Caltex (Philippines) Inc. announced plans to expand its Batangas refinery to 150,000 bbl/d in 1995, with the possibility of a further expansion to 260,000 bbl/d by 2000.

In addition to the expansion being undertaken by the existing refiners, plans were underway for building at least two new refineries: The Asian Dragon Oil Refinery, formed in midyear by Thai Petrochemical Industry Co. and the Philippines' Chem Holdings, was proposing a $240 million, 65,000-bbl/d plant at Surigao, Mindanao Island; plans for a Filipino-Indonesian joint venture were approved by the Department of Energy for a 140,000-bbl/d export refinery at Nonoc, Mindanao.[18]

Reserves

Mineralization in the Philippines, although usually not rich, nonetheless is extensive. The Chamber of Mines of the Philippines ranks the mineral reserves of the country at the top in Southeast Asia and seventh worldwide. There are abundant deposits of gold, especially in eastern Mindanao and in Benguet and Camarines Norte Provinces, Luzon Island; copper in Zambales Province on Luzon and in the Visayan Islands; zinc at Zamboanga on Mindanao; high-grade chromium in Zambales and Camarines Sur Provinces on Luzon, near Surigao on Mindanao, and near Puerto Princesa on Palawan Island; and nickel in Surigao del Norte Province, especially on Hinatuan and Nonoc Islands, Mindanao. Ores of iron, manganese, and mercury also occur in the country. Lead and silver, as well as less common cadmium and molybdenum, mineralization occurs in association with other ores. Deposits of industrial minerals include limestone on Cebu, Luzon, and Romblon Islands; salt and asbestos on Luzon; marble on Romblon and Panay Islands; gypsum on Luzon; sulfur on Luzon, Leyte, and Mindanao Islands; and phosphate rock on Cebu and Bohol Islands. Asphalt occurs on Leyte, and coal deposits are found on Cebu and Mindoro Islands. *(See table 3.)*

Infrastructure

Sea and air transport were essential elements of the communications-transportation infrastructure of the Philippines, an archipelago of more than 7,100 islands comprising about 300,000 square kilometers of land area. Railroads (378 km in length, all on Luzon) and pipelines (357 km for refined oil products) played only a modest role, but there was more than 157,000 km of roads, including 22,400 km paved, 85,050 km loose-surface improved (gravel, crushed stone, or stabilized soil surface), and 50,000 km unimproved earth. Inland waterways, of which there is 3,219 km, are relatively unimportant because of their shallowness. None can accommodate vessels with a draft greater than 1.5 meters.

There are 238 usable airports in the country, 74 with permanent-surface runways, and most are on the larger islands such as Luzon and Mindanao. Two, those at Cebu and Manila, are international airports. Many of the smaller islands can only be reached by interisland ferries or small chartered vessels.

International shipping uses 18 major ports, including Bacolod (Negros Occidental Province), Bago (Negros Occidental Province), Batangas (Batangas Province), Cagayan de Oro (Misamis Oriental Province), Cebu (Cebu Province), Davao (Davao del Sur Province), Dumaguete (Negros Oriental Province), General Santos (South Cotabato Province), Iligan (Lanao del Norte Province), Iloilo (Iloilo Province), Legaspi (Albay Province), Manila (National Capital Region), Ozamis (Misamis Occidental Province), Puerto Princesa (Palawan Province), Subic Bay (Zambales Province), Surigao (Surigao del Norte Province), Toledo (Cebu Province), and Zamboanga (Zamboanga del Sur Province), out of more than 450 seaports in the country. The merchant marine fleet included 33 petroleum, oils, and lubricant tankers; 1 chemical tanker; 1 liquefied gas tanker; and 1 combination ore-oil tanker.

The Philippines has had a considerable excess of power-generating capacity relative to present actual production levels, but power costs are relatively high. Generating capacity in 1994 was reportedly 7,850 megawatts. The Philippines was the world's second largest producer, after the United States, of geothermal energy. Total power production in the same year was 28 million megawatt-hours.[19]

Generally, the infrastructure for mineral industry operations was regarded as adequate on the Islands of Cebu, Luzon, Marinduque, Negros, and Palawan. Elsewhere, infrastructural development was less than ideal.

Outlook

The Philippine mining industry in 1994 was neither vibrant nor healthy, continuing to reflect the general decline that began in the mid-1980's. The primary contribution to this situation continued to be the fact that the mining regime contained in the 1987 Philippine Constitution, which basically provided for a production-sharing structure to replace the leasehold system with the Government, has not been realized yet with enactment of an implementing mining code; thus, new investment into the industry continued to be hindered.

The mining industry also continued to be hampered by the country's tax structure, one of the highest in the world. The combination of all the direct and indirect taxes applied to the mining industry continued to place a tremendous burden on the individual companies, making them uncompetitive with respect to other producers, as well as continuing to discourage new investment, both domestic and foreign.

The Philippine mining industry has been damaged by recent slowdowns of economic activity in the industrialized countries, poor international commodity prices, and severe natural disasters, such as volcanic activity, drought, and tropical cyclones, which drastically affected its competence in the international marketplace. Despite this, it could become a competitive, functional, vibrant industry again with prompt enactment of a new mining code that will provide the country with a favorable investment climate.

The pending legislation has already caught the interest of some of the world's leading mining companies, such as Australia's Western Mining Corp., which began exploring for gold in various locations on southern Mindanao Island, and Newmont Mining Co. of the United States, which applied for exploration licenses covering a large area on northern Luzon Island.[20]

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[1]Text prepared Apr. 1995.
[2]Asian Journal of Mining (Richmond North, Australia). Sept. 1994, p. 60.
[3]Where necessary, values have been converted from the Philippine peso (P) to U.S. dollars at the yearend rate of P24.80=US$1.00.
[4]Far Eastern Economic Review (Hong Kong). V. 158, No. 5, Feb. 2, 1995, pp. 54-55.
[5]Mining Journal (London). V. 324, No. 8314, Feb. 17, 1995, p. 121.
[6]Business Week (New York). No. 3411, Feb. 13, 1995, pp. 92A-92J.
[7]Chamber of Mines of the Philippines. CMP Newsletter. V. 1, No. 2, Nov.-Dec. 1993, p. 9.
[8]Asian Journal of Mining (Richmond North, Australia). July-Aug. 1994, pp. 8-9.
[9]Mining Journal (London). V. 323, No. 8289, Aug. 14, 1994, p. 131.
[10]South-East Asia Mining Letter (Hong Kong). V. 6, No. 19, Oct. 14, 1994, pp. 3-4.
[11]———. V. 6, No. 21-22, Nov. 25, 1994, p. 8.
[12]Mining Journal (London). V. 323, No. 8302, Nov. 18, 1994, p. 357.
[13]Metal Bulletin (London). No. 7878, May 9, 1994, p. 21.
[14]Portman Mining Ltd. (Perth, Australia). Preliminary Final Statement to the Australian Stock Exchange (Perth). Mar. 15, 1995, 15 pp.
[15]International Bulk Journal (London). V. 14, No. 9, Oct. 1994, p. 51.
[16]South-East Asia Mining Letter (Hong Kong). V. 6, No. 17, Sept. 9, 1994, p. 1.
[17]Oil and Gas Journal (Tulsa, Oklahoma). V. 92, No. 38, Sept. 19, 1994, p. 4.
[18]Petroleum Economist. Jan. 1995, pp. 17-19.
[19]U.S. Central Intelligence Agency, Washington, DC. The World Factbook 1994, pp. 315-316.
[20]Mining Journal (London). V. 324, No. 8309, Jan. 13, 1995, p. 22.

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Chamber of Mines of the Philippines, Manila: Newsletter and Annual Report.

Mines and Geosciences Bureau, Manila: Mineral News Service and Annual Report.

TABLE 1
PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/		1990	1991	1992	1993	1994 e/	Annual capacity e/ (Jan. 1, 1995)
METALS							
Arsenic: White (equivalent of arsenic acid) e/		5,090 4/	5,000	5,000	2,000	2,000	5,000
Chromium: Chromite, gross weight:							
Metallurgical-grade		61,800	89,200	16,400 r/	17,200 r/	8,750	123,000
Chemical-grade		20,200	19,800	9,990 r/	1,600 r/	--	21,000
Refractory-grade		101,000	82,500	39,300 r/	49,600 r/	60,100 4/	135,000
Total		183,000	191,000	65,700 r/	68,400 r/	68,900	279,000
Copper:							
Mine output, Cu content		182,000	148,000	124,000	136,000	110,000 4/	235,000
Metal:							
Smelter		153,000	167,000	169,000	171,000	168,000	169,000
Refined		126,000	115,000	146,000	172,000 e/	153,000 4/	172,000
Gold, mine output, Au content	kilograms	24,600	25,900	22,700	15,800	14,600 4/	35,000
Iron and steel:							
Ferroalloys, electric-furnace: e/							
Ferrochromium		55,700 r/	24,800 r/	27,400	11,900 r/	16,200	82,000
Ferromanganese		-- --	5,000	5,000	5,000	5,000	5,000
Ferrosilicon		10,000	10,000	10,000	10,000	10,000	20,000
Steel, crude	thousand tons	600 r/	605 r/	497 r/	623 r/	640	700
Lead: Metal, secondary refined		12,100	16,100 r/	19,100 r/	24,300 r/	24,300	17,500
Manganese ore and concentrate, gross weight		14,600	4,060	3,220	12,400 r/	10,000	14,500
Nickel, mine output, Ni content		15,800	13,700	14,000	10,200	12,300	28,000
Silver, mine output, Ag content	kilograms	47,100	38,400	31,100	32,500	30,300 4/	52,500
Zinc, mine output, Zn content		53	--	--	--	--	2,000
INDUSTRIAL MINERALS							
Barite e/		289 4/	500	500	500	500	500
Cement, hydraulic	thousand tons	6,360	6,910	6,730	7,960 r/	9,600 4/	10,000
Clays:							
Bentonite		14,600	42,100	31,900	5,050 r/	25,000	42,000
Red		148	552	500 e/	791	800	550
White		105,000	51,500	45,000 e/	5,560 r/	50,000	105,000
Other		500,000 e/	808,000	742,000	700,000 e/	800,000	810,000
Feldspar		168,000	48,000	45,000 e/	24,200	30,000	169,000
Gypsum and anhydrite:							
Natural		30,000	28,000	25,000	25,000 e/	25,000	30,000
Synthetic		115,000 e/	--	--	--	--	115,000
Lime		12,500	7,460	10,000 e/	10,000 e/	10,000	51,000
Magnesite e/		3,680 4/	700	700	700	700	4,800
Perlite		3,150	2,890	2,800 e/	19,800 r/	20,000	3,650
Phosphate:							
Guano		5,820	11,700	465	5,250	5,000	48,500
Phosphate rock		13,300	20,600	4,830	91,800	20,000	20,700
Pyrite and pyrrhotite (including cuprous), gross weight		430,000	360,000	350,000 e/	317,000 r/	320,000	430,000
Salt, marine		490,000	493,000	496,000	535,000	540,000	786,000
Sand and gravel:							
Silica sand	thousand tons	256	532	500	828 r/	800	535
Other 5/	thousand cubic meters	15,700	15,700	15,800	15,000 e/	15,000	15,800
Stone:							
Dolomite		321,000	609,000	600,000 e/	692,000	675,000	609,000
Limestone 6/	thousand tons	3,840	5,380	5,090	5,190	5,000	5,400
Marble (dimension), unfinished	cubic meters	6,390	24,200	19,700	359,000 r/	300,000	400,000
Volcanic cinder e/	do.	2,000	2,000	2,000	2,000	2,000	7,000
Tuff		99,900	51,800	50,000 e/	3,260	50,000	100,000
Quartz e/		36,000 4/	60,000	50,000	50,000	50,000	94,000
Crushed, broken, other e/ 7/	thousand cubic meters	1,000	1,000	1,000	1,000	1,000	1,000
Sulfur: e/							
S content of pyrite		158,000	155,000	64,000	114,000 e/	100,000	195,000
Byproduct of metallurgy		120,000	119,000	111,000	147,000 e/	125,000	150,000
MINERAL FUELS AND RELATED MATERIALS							
Coal, all grades	thousand tons	1,190	1,270	1,510	1,530	1,800	1,500
Petroleum:							
Crude	thousand 42-gallon barrels	1,730	1,090	2,950	3,320	1,740 4/	3,900

See footnotes at end of table.

TABLE 1--Continued
PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity 3/		1990	1991	1992	1993	1994 e/	Annual capacity e/ (Jan. 1, 1995)
MINERAL FUELS AND RELATED MATERIALS--Continued							
Petroleum--Continued:							
Refinery products:							
Liquefied petroleum gas	thousand 42-gallon barrels	2,920	2,780	2,910	2,610	2,810 4/	XX
Gasoline	do.	14,300	15,300	13,400	13,100	12,200 4/	XX
Jet fuel	do.	3,420	3,400 e/	4,070	3,060	4,350 4/	XX
Kerosene	do.	3,900	3,300	4,280	4,270	3,920 4/	XX
Distillate fuel oil	do.	23,700	24,200	26,700	25,200	26,300 4/	XX
Residual fuel oil	do.	26,400	24,100	27,500	28,400	29,600 4/	XX
Other	do.	5,650	5,500 e/	3,920	5,890	5,230 4/	XX
Refinery fuel and losses	do.	3,070	2,840	3,300	3,300	3,260 4/	XX
Total	do.	83,400	81,400	86,100	85,800	87,700 4/	102,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Table includes data through Apr. 7, 1995.

3/ In addition to the commodities listed, the Philippines produces platinum-group metals as byproducts of other metals, but output is not reported quantitatively, and no basis is available to make reliable estimates.

4/ Reported figure.

5/ Includes "pebbles" and "soil" not further described.

6/ Excludes limestone for road construction.

7/ Includes materials described as rock, crushed or broken; stones, cobbles, and boulders; rock aggregates; and broken adobe.

TABLE 2
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Cement		Davao Union Cement Corp., 100%	Davao City plant, Mindanao Island	648
Do.		Floro Cement Corp., 100%	Higait plant, Mindanao Island	450
Do.		Iligan Cement Corp., 100%	Iligan City plant, Mindanao Island	420
Do.		Northern Cement Co. Inc., 100%	Sison plant, Luzon Island	640
Do.		Republic Cement Corp., 100%	Norzagaray plant, Luzon Island	950
Do.		Rizal Cement Co. Inc., 100%	Binangonan plant, Luzon Island	964
Chromite:				
Concentrate		Acoje Mining Co. Inc., operator. (Voest Alpine AG of Austria, 75.6%; and Merlin Mining NL of Australia, 24.4%)	Santa Cruz Mine, Zambales Province, Luzon Island	100 1/
Do.		Alamag Processing Corp., operator. (Pacific Shore Mining Co., 50%; and Rio Chico Mining Corp., 50%)	Llorente, Eastern Samar Province, Samar Island	20 2/
Do.		Benguet Corp., 70%, operator; and Consolidated Mines Inc., 30%	Masinloc Chromite Operations, Zambales Province, Luzon Island	105 3/
Ferrochromium		Ferrochrome Philippines Inc., operator. (Voest Alpine AG of Austria, 100%)	Tagoloan plant, Lanao del Norte Province, Mindanao Island	60
Do.		Ferro-Chemicals Inc., 100%	Manticao plant, Misamis Oriental Province, Mindanao Island	30
Do.		Integrated Chrome Corp., 100%	Cagayan de Oro plant, Misamis Oriental Province, Mindanao Island	26
Coal		Semirara Coal Corp. (Government), manager. Voest Alpine AG of Austria, 60%; National Development Corp., 56%; and Development Bank of the Philippines, 4%)	Unong Mine, Antique Province, Semirara Island	1,000
Copper, ore		Atlas Consolidated Mining and Development Corp., 100%	Cebu Copper Operations, Cebu Province, Cebu Island	24,300
Do.		Benguet Corp., 50%, operator; and Dizon Copper-Silver Mines Inc., 50%	Dizon Copper-Gold Operation, Zambales Province, Luzon Island	6,000
Do.		Far Southeast Resources Inc., manager. (Lepanto Consolidated Mining Co. Inc., 60%; and CRA Ltd. of Australia, 40%)	Far South East Project, Benguet Province, Luzon Island	4,000 4/
Do.		Lepanto Consolidated Mining Co. Inc., 100%	Mankayan Mine, Benguet Province, Luzon Island	1,100
Do.		Marcopper Mining Corp., 60%; and Placer Dome Inc. of Canada, 40%	San Antonio Mine, Marinduque Province, Marinduque Island	30,000
Do.		Maricalum Mining Corp., manager. [Asset Privatization Trust (Government), 100%]	Sipalay Mine, Negros Occidental Province, Negros Island	6,250
Do.		Philex Mining Corp., 100%	Sto. Tomas II (Padcal) Mine, Benguet Province, Luzon Island	10,200
Copper, metal, refined		Philippine Associated Smelting and Refining Corp., operator. [National Development Corp. (Government), 42%; Japanese consortium of companies led by Marubeni Corp., 32%; domestic copper producers led by Atlas Consolidated Mining and Development Corp., 21%; and International Finance Corp. (United Nations Agency), 5%]	Isabel, Leyte Province, Leyte Island	172
Gold	kilograms	Atlas Consolidated Mining and Development Corp., 100%	Masbate Gold Operations, Masbate Province, Masbate Island	2,500 5/
Do.	do.	Benguet Corp., 100%	Benguet Gold Operations, Benguet Province, Luzon Island	1,100 5/
Do.	do.	do.	Benguet Antamok Gold Operation, Benguet Province, Luzon Island	3,000
Do.	do.	Philex Mining Corp., 100%	Bulawan Mine, Negros Occidental Province, Negros Island	2,800 4/
Do.	do.	United Paragon Mining Corp., operator. (Paragon Resources of Australia, 12.5%; and public shares, 87.5%)	Longos Mine, Camarines Norte Province, Luzon Island	1,800
Iron ore, sinter		Philippine Sinter Corp., operator. (Kawasaki Steel Corp. of Japan, 100%)	Cagayan de Oro, Misamis Oriental Province, Mindanao Island	5,000 6/
Nickel, ore		Rio Tuba Nickel Mining Corp., 60%; and Japanese interests, 40%	Rio Tuba Mine, Palawan Province, Palawan Island	500
Do.		Taganito Mining Corp., 100%	Taganito Mine, Palawan Province, Palawan Island	100
Petroleum	thousand 42-gallon barrels per day	Caltex (Philippines) Inc., 100%	Caltex Batangas Refinery, Batangas Province, Luzon Island	68
Do.	do.	Petron Corp., operator. [Philippine National Oil Co. (Government), 100%	Petron Bataan Refinery, Bataan Province, Luzon Island	156
Do.	do.	Pilipinas Shell Petroleum Corp., 100%	Shell Batangas Refinery, Batangas Province, Luzon Island	70

See footnotes at end of table.

TABLE 2--Continued
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY FOR 1994

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity e/
Steel	National Steel Corp., operator. [National Development Corp. (Government), 100%]	Iligan, Lanao del Norte Province, Mindanao Island	350

e/ Estimated.
1/ Metallurgical-grade concentrates.
2/ Chemical-grade concentrates.
3/ Refractory-grade concentrates.
4/ In planning stage during year.
5/ On care and maintenance during year.
6/ Self-fluxing sinter.

TABLE 3
PHILIPPINES: RESERVES OF MAJOR MINERAL COMMODITIES FOR 1994

(Thousand metric tons)

Commodity	Reserves /e
METALS	
Chromite:	
Chemical	3,200
Metallurgical	11,000
Refractory	4,700
Copper, primary	3,700,000
Gold, primary	83,000
Iron ore:	
Aluminous laterite	290,000
Lump ore	71,000
Magnetite sand	104,000
Lead, primary	6,300
Manganese	1,300
Mercury	16,000
Molybdenum	31,000
Nickeliferous laterite/garnierite	1,500,000
Zinc, primary	6,200
INDUSTRIAL MINERALS	
Asbestos	24,000
Barite	160
Bauxite	83,000
Clays	1,100,000
Bentonite	1,400
Diatomaceous earth	3,900
Dolomitic limestone	490,000
Feldspar	29,000
Guano	1,000
Gypsum	1,900
Limestone:	
Agricultural	310,000
Industrial	9,600,000
Magnesite	26,000
Marble	4,100,000
Perlite	18,000
Phosphate rock	2,400
Pumice and pumicite	22,000
Pyrite	980,000
Silica pebbles/cobbles/boulders	6,800
Silica rock form	1,800,000
Silica sand	210,000
Sulfur	44,000
Talc	500

e/ Estimated. All data are rounded to two significant digits.

Source: Mines and Geosciences Bureau.