

THE MINERAL INDUSTRY OF

COLOMBIA

By David B. Doan

In spite of its modest mineral sector by world standards, Colombia's mineral production was significant to its gross domestic product (GDP), which, however, contracted by 4.4% in 1999 to about \$245 billion. In 1998 Colombia had ended the year in recession with only 0.2% growth in GDP, which was down by about 5% from the year before, and was the result of low world oil prices, diminished demand for exports (especially coffee), terrorist activity, and a decline in the investment stream. The newly characterized "Recession of 1999" was projected to change to renewed growth of Colombia's economy in 2000 (Financial Times, 2000). Colombia has had positive growth of its GDP for more than six decades and was the only Latin American country not to default on or restructure its foreign debt during the 1980's probably owing, in no small part, to the conservative monetary policy conducted by an independent central bank. Inflation, which has declined steadily during the 1990's, dropped to 16% in 1997 and about 11% in 1999 as projected (International Bank for Reconstruction and Development, 1999).

Colombia was coping to the best of its ability with indigenous violent forces (left-wing insurgents and right-wing militias) that are better armed, better financed, and holding more territory than ever before. Fueled by money from drugs, kidnapping, and extortion, both guerrilla groups point to broad ideals of social justice, but these aims are vague and fluid (Foreign Affairs, 1999). Efforts to foster an expanded mineral sector have been hindered by continuing terrorist activity, which has included destruction of oil pipelines and attacks on mines, petroleum production facilities, and personnel. A further problem that hindered the development of Colombia's mineral industry, as that of many countries, was the lack of surface access (roads, heliports) into unsettled areas.

Total foreign direct investment in Colombia, which had climbed sharply, started at about \$500 million in 1990 and reached about \$5.6 billion in 1997, of which about \$1.7 billion was directed to petroleum and mining. In 1998, however, foreign investment was down rather sharply to about \$3.2 billion (World Bank Group, 1999, Colombia—Development data, Country Data, accessed November 3, 1999, at URL <http://www.worldbank.org/data/countrydata/countrydata.html>). Public and private investment has continued at a decreased level of about \$1.8 billion in 1999, much of it in national infrastructure, especially in energy, telecommunications, and transportation (Financial Times, 2000, World news—World trade, accessed February 2, 2000, at URL <http://www.ft.com/nbearchive/email-ftbwcq33a97a.htm>). Privatization continued, in descending order of revenues received, in electric power, mining, natural gas, and telecommunications. In spite of its problems, Colombia has had investment-grade ratings from major U.S. ratings agencies for its debt, but in midyear,

Moody's downgraded Colombia's long-term foreign currency country rating by two notches, from Baa3 to Ba2 (Wall Street Journal, 1999). This move was followed soon by Standard & Poor's and other rating entities.

Government Policies and Programs

The principles of "private property and initiative" are the foundation of the economic system of Colombia. The constitution guarantees that investment of foreign capital shall have the same treatment that citizen investors have. The constitution grants the State ownership of the subsoil and nonrenewable resources with the obligation to preserve natural resources and protect the environment. The State performs supervision and planning functions and receives a royalty as economic compensation for the exhaustion of nonrenewable resources. The Colombian Constitution permits the expropriation of assets without indemnification.

The mining code (Decree 2655 of 1988) covers the prospecting, exploration, exploitation, development, beneficiation, transformation, transport, and marketing of minerals. Under the law, the Ministry of Mines and Energy grants permission to explore, exploit, and develop mineral resources through the appropriate title or right. Foreign investment is dictated by Law 9 of 1991, which covers the issue of equal treatment for foreign and domestic investors with access to all sectors except those considered to be vital to national security, defense, and toxic waste disposal; addresses the foreign exchange statute, which allows free remittance of profit and capital, and the protection of investors from adverse changes in exchange guarantees, except temporarily when Colombia's international reserves are less than 3 months of imports; and grants the responsibility of foreign investment to the Consejo Nacional de Política Económica y Social. In 1998, the Government of Colombia continued to publicize its interest in encouraging foreign investment in the mining sector and in reducing its own role as a producer of minerals.

The current (1999) tax structure (Law 223 of 1995) includes national levies of a 35% income tax, a 35% capital gains tax, a 16% value-added tax, a 7% remittance tax on dividends sent outside the country, and a 1% one-time-only stamp tax at the time the mining contract is ratified. Municipal levies include a 0.2% to 0.7% industry tax and/or a 0.2% to 1.0% trade tax, as well as a property tax that ranges between 0.1% and 0.16% depending upon the locality. According to Law 141 of 1994, royalties on mined coal are 10% on 3 million metric tons per year (Mt/yr) or more and 5% on less than 3 Mt/yr. Other royalties are 8% on nickel; 6% on alluvial gold; 5% on copper, iron ore, and platinum; 4% on lode gold and silver; and 1.5% on emeralds. Exemptions from customs duties are granted on

machinery, technical equipment and their fittings, and materials and spare parts required for mineral exploration, which includes oil and gas.

A new mining law that would increase incentives to foreign investment, which would include tax relief, longer periods of time for concessions and extensions, and less bureaucratic delay in obtaining permits was under discussion.

Environmental Issues

The Colombian Constitution expresses a fundamental interest in sustainable growth with preservation and restoration of the environment. All economic activity is subject to environmental norms. Any activity may be closed down and prohibited if it cannot justify the damage it does to the environment.

Procedures are being stabilized and streamlined so that the Ministry of Mines and Energy can supervise mines for compliance with environmental regulations and for any possible sanctions defaults.

Emission and effluent standards have been adopted, and community consultation is an obligation of a mining project before the commencement of operations. Penalties for air pollution are set forth in Law 948 of 1995; fees for direct and indirect point-source discharges and for biological oxygen demand (BOD) and total suspended solids (TSS) discharges are described in Decree 901 of 1997 and Resolution 0273 of 1997. These point source discharge, BOD and TSS fees are perhaps better described as fines imposed automatically upon determination of liability. Tax incentives are offered for buying equipment for environmental protection (Law 223 of 1995, Article 4). A mine closure reclamation bond is needed in the form of an insurance policy or bank warranty for rehabilitation and reclamation of disturbed areas, as set forth in Law 99 of 1993, Article 60, and Decree 1753 of 1994, Article 4.

Production

Coal, nickel, and petroleum were the most important minerals to the Colombian economy. According to data received by the U.S. Geological Survey through country questionnaires, other official sources, or estimates, Colombia was projected to rank 11th in the mine production of nickel in 1999, and although its rankings in coal and petroleum were lower, the contribution of those commodities to the economy was significant in terms of foreign-exchange earnings.

Colombia was also well known as a leading producer of emeralds and, in the past, had been an important producer of gold. Although the country's production of gold fluctuated conspicuously, it continued to be an important source of Government revenue. With less than one-tenth of 1% of world output in 1999, Colombia ranked about 16th in world mine production of gold and was roughly tied with Argentina as the 5th largest producer of gold in Latin America after Peru, Brazil, Chile, and Mexico. In addition, Colombia produced a number of other mineral commodities and products in modest amounts, which included copper, iron ore, lead, manganese, platinum, and zinc, and a number of industrial minerals, which included cement; in 1998, Colombia and Brazil were the sole producers of platinum in Latin America. Colombia was the fifth leading producer of crude petroleum in the region after Venezuela,

Mexico, Brazil, and Argentina.

Mineral production during the year included gains for the fuel minerals; crude oil increased to new highs; estimated production of coal climbed slightly but also to new highs. Among the metals, output of iron ore and nickel increased sharply; production of copper, gold, and platinum were not much changed, and output of silver and steel dropped compared with that of the year before. Among the more important industrial minerals, production of cement and emeralds was estimated in both cases to have reached new highs.

Trade

Colombia's value of exports totaled about \$11.57 billion in 1999, an increase of 6.47% over that of 1998. Crude petroleum and petroleum products accounted for almost 27% of all exports, or about \$3.76 billion (Wall Street Journal, 2000). Coal exports in 1998 accounted for 10% of the value of total exports, or about \$1 billion. Colombia's value of imports was \$14.4 billion. The United States, which continued to be Colombia's main trading partner, took 38% of Colombia's exports and provided 42% of its imports. Total trade between the two countries was approaching \$10 billion (Central Intelligence Agency, 1999, Colombia—Economy, World Factbook, accessed September 30, 1999, at URL <http://www.odci.gov/cia/publications/factbook/co.html>).

Mining export data for 1997 (the latest available) show coal valued at \$945 million; ferronickel, at \$193 million; emeralds, at \$129 million; gold, at \$84 million; cement and clinker, at \$69 million; platinum, at \$3 million; and silver, at \$438,000. Although these are only the principal mineral exports, their total value is about \$1.422 billion. Petroleum export data were not available.

Structure of the Mineral Industry

Although privatization was being emphasized by the Government, ownership of the mineral industry in Colombia was, nonetheless, mixed. The Government participated directly in the production of minerals through several companies associated with the Ministry of Mines and Energy. *Minerales de Colombia S.A.* managed, developed, and promoted the exploitation of minerals, except coal, petroleum, and radioactive minerals (INGEOMINAS-UPME, 1996, p. 12). The *Empresa Colombiana de Carbon Ltda.* had the responsibility to manage the country's coal resources and to promote coal production (INGEOMINAS-UPME, 1996, p. 13). The *Empresa Colombiana de Petróleos S.A. (ECOPETROL)* negotiated all petroleum contracts with the private sector on behalf of the Government and it participated in the production of petroleum and natural gas directly and in association with the private sector.

Commodity Review

Metals

Copper.—Colombia's copper production has been uneven since 1990. Output grew slowly until 1993 and then became

nonexistent. Since then, output has continued at a lesser rate than that from 1990 through 1992. During 1998, production dropped by about 22% from that of 1997 and remained about the same in 1999. Future output of copper seemed somewhat unpredictable.

Colombia has several porphyry copper deposits that are similar to porphyry-type mineralization elsewhere in the Cordillera of North America and South America. In the past, some copper had been mined at El Roble gold mines, southwest of Medellin. In 1990, El Roble Exploracion y Explotacion S.A. began operations at a new copper mine northwest of Medellin, from which concentrates were shipped to Hibi Kyodo Smelting Co. Ltd. in Japan. More recently, Cobres de Colombia S.A. operated copper smelting and refining facilities at Cali. Other copper porphyry deposits were at Acandi, El Dovio, Mocoa, Murindo, and Pantanos; Murindo was considered to be a good future mining target because of its attractively high gold content.

Gold.—Production of gold, which totaled about 18.8 metric tons (t) each year in 1997 and 1998, was estimated to be about 19 t in 1999. Between 10% and 20% of total output was by large mining companies, the remainder being produced by small- and medium-sized companies, as well as individuals. Gold mining in Colombia dates back to pre-Columbian times. As is true elsewhere in Latin America, inherited but primitive methods of treating placer (alluvial) ores result in significant loss, which has been estimated to be as much as 60%. Mineros de Antioquia S.A., which was the largest producer in 1999, extracted gold from placer deposits in the Nechi River and its affluent, the Tigui River. The company switched from bucket line dredges to suction dredges to improve the stripping the clays that overlay deeper alluvial gravels; cost reductions were about 40% (Mining Magazine, 2000). The company's production was exported mainly to North Korea, Switzerland, and the United States (Minas Hoy, 1995).

Throughout the year, Greystar Resources Ltd. (Canada) was active in exploration drilling of its Angostura gold-silver project in northeastern Colombia. On the basis of positive results, more ground was acquired; the expanded property totaled about 4,000 hectares in 1999. In its La Alta zone, Greystar delineated 53.5 Mt that averaged 2.37 grams per ton (g/t) gold and 7.96 g/t silver (Northern Miner, 1999).

Iron and Steel.—With major support from Brazil's Companhia Vale do Rio Doce (CVRD) and other potential participants, Acerias de Colombia S.A. (Acesco) anticipated the siting of a 2.4-Mt/yr DRI-based merchant slab operation on Colombia's Caribbean coast. CVRD led the feasibility studies for the project, which would become the country's largest private-sector investment and involve shipments of coal to Brazil in return for DRI pellets. Acesco contemplated the purchase of electric arc furnaces and a continuous slab caster. A further step would be the installation of a hot-strip mill (Metal Bulletin, 1999b).

Nickel.—Mine production of nickel from Cerro Matoso S.A. (CMSA), which was the only nickel producer in Colombia, was 39,300 t; this was a sharp increase of about 34% from that of

1998. Production of ferronickel included 28,345 t of nickel content, which was up slightly by about 0.7% compared with that of 1998. Most of Colombia's nickel reserves were being exploited by CMSA at a large open pit mine in Cordoba Department of northern Colombia; it was formerly a joint venture between the Colombian Government and GENCOR Ltd. of South Africa, which was the majority owner. GENCOR acquired the shares owned by the Government during the latter's privatization program and transferred ownership to Billiton plc of the United Kingdom, which was its newly constituted subsidiary (Mining Journal, 1997b). Following this, Billiton acquired Australia's QNI Ltd. and awarded its interest in Cerro Matoso to QNI for management of the operation. An interesting statistic is that for the 12 months ending June 30, 1996, run-of-mine production averaged 2.9% nickel, which was one of the highest lateritic nickel ore grades in the world (GENCOR Ltd., 1996, p. 35). Billiton planned a major \$353 million expansion of the mine and smelter to upgrade capacity from 29,000 metric tons per year (t/yr) to 55,000 t/yr of ferronickel; late in the year, it secured \$240 million in debt financing (Metal Bulletin, 1999a).

Platinum.—Colombian production of platinum in 1998 was 437 kilograms (kg), which was an increase of about 7% compared with that of 1997, and was estimated to be 440 kg in 1999. Although Colombia produced less than 1% of the total platinum, it ranked sixth among the top 10 world producers. The leading producing Departments were Antioquia and Choco; smaller quantities were produced in the Departments of Bolivar, Cauca, Cordoba, Narino, and Valle del Cavea. The Choco Department has been producing platinum since the 16th century (Loebenstein, 1985), and Colombia was the only producer of platinum until the beginning of the 20th century (Garces Gonzalez, 1995, p. 276). All platinum production in Colombia is from placer deposits that are, in some places, associated with the production of gold.

Silver.—Although Colombian production of silver has been somewhat erratic during the past 5 years, output in 1999 was 4,200 kg. Silver is known to occur with gold in epithermal veins in the Canon del Cauca in the Departments of Antioquia, Caldas, and Risalda; an old district, Antioquia has been exploited since the Spanish Crown times. Silver is also associated with gold and manganese in volcanogenic massive sulfide deposits in the so-called Canas Gordas Terrain of the Cordillera Occidental.

Industrial Minerals

Emerald production totaled 9.36 million carats in 1998, which was an increase of about 40% compared with that of 1997, and was estimated to be about 9.70 million in 1999. Emerald mining goes back to pre-Columbian times in Colombia, and many individual prospectors today work over the waste heaps of larger mines and otherwise hunt for these gemstones. The main emerald producers in Colombia were Tecnicas Minerales Ltda., Compania Colombiana de Explotaciones Mineras, Sociedad de Esmeraldas y Minas S.A., and Compania Esmeraldas de Chivor S.A. These companies were essentially contractors to

MINERALCO S.A., which was the Colombian State agency with managerial responsibility for the promotion, development, and industrialization of the country's mines, particularly emeralds and gold.

The production center best known for the quality of its emeralds was Muzo-Quipama in Boyaca Department. Other deposits were also exploited in the municipalities of Chivor, Cosquez, and Penas Blancas, which were also in Boyaca, and in Ubala, Gachala, and Yacopi in Cundinamarca Department (INGEOMINAS-UPME, 1996, p. 28).

Mineral Fuels

Coal.—Output of coal, which reached new highs during 1998, climbed a little more than 3% compared with that of 1997 and was estimated to have climbed farther to about 34.5 Mt in 1999. Colombian coal deposits are the largest in Latin America with proven reserves of 6.5 billion metric tons. The principal coal-producing regions are in Cesar and La Guajira Departments, together yielding four-fifths of the country's output. Physically, the coal sector is divided into two main areas—the highly modernized open pit mines (steam coal) of Cesar and La Guajira in which large investments in equipment and technology have been made and the more traditional underground mines (coking and steam coals) of the Andean Mountains in the Departments of Antioquia, Boyaca, Cundinamarca, and Valle del Cauca. The Cerrejon Norte Mine in La Guajira Department which was the largest producer, had an output that approached 15 Mt, or nearly one-half of the country's production. The mine was a joint venture between Carbones de Colombia S.A. and Exxon Corp. through its subsidiary International Colombian Resources Corp. (INTERCOR). In 1993, the Government created a new state-owned company, Empresa Colombiana de Carbon Ltda. (ECOCARBON), to manage and regulate the country's coal resources. ECOCARBON grants coal-mining licenses or association contracts to private companies and to individuals that intended to explore for and exploit coal in Colombia (Colombian Government Trade Bureau, [undated], Energy and mining, accessed August 24, 1998, at URL <http://www.access.digex.net/~coltrade/31.htm>).

The Government continued with its plans to privatize its 50% interest in Cerrejon Norte despite the 1997 dynamiting by the National Liberation Army of a 153-meter (m) section of the rail tracks used to ship coal for export. The terrorist group registered its evident opposition to INTERCOR and the Government (Exxon Corp.'s INTERCOR, September 29, 1997, Exxon unit's Colombia coal exports halted, press release accessed September 30, 1997, at URL http://biz.yahoo.com/finance/97/09/29/XON_y0021_1.html). Through INTERCOR, Exxon has negotiated an extension through 2034 on its development contract on Cerrejon Norte, that had been previously scheduled to end in 2009 (Financial Times, 1999b).

Two other important coal properties in northern Colombia have been combined. Cerrejon Centro, which had been owned by the Swiss company Glencore International AG (50%) and Amcoal/Minorco (50%), has been combined with Rio Tinto plc's Oreganal property into a single venture owned by Rio Tinto, Glencore, and Minorco/Amcoal in shares of one-third each (Mining Journal, 1997a). This same consortium then

acquired the contract from ECOCARBON to develop the Cerrejon Sur property that adjoins the Cerrejon Centro and the Oreganal tracts.

Colombia's consumption of coal was modest; a large proportion of its output was exported and averaged more than 80% of total production. Of this, about 60% was from the Cerrejon Norte Mine. Europe, which had been the main purchaser of Colombian coal, received about 82% of the 29.6 Mt of coal exported by Colombia in 1998. The United States received about 16.5% of Colombian coal exports; Latin America and the Far East received the remainder.

Natural Gas and Crude Petroleum.—From 1998 through 1999, production of natural gas was steady at slightly above the 13-billion-cubic-meter level. Marketed gas increased by about 8% to 5,761 million cubic meters during the year. Output of natural gas had been up sharply by about 38% in 1997 compared with that of 1996. Gas production in Colombia is from associated and, in some cases, large nonassociated reservoirs. The large difference between marketed versus produced gas is mostly reinjected; this probably reflects the degree to which production has grown faster than domestic distribution facilities.

Compared with that of 1998, production of crude oil jumped by 9.4% to 301 million barrels, which was a new record for Colombia. This represented a 41% increase in crude output in the 5 years starting in 1995. In addition to ECOPETROL, a small proportion of hydrocarbons is produced by the private sector in concessions awarded by the Government.

Events during the year continued to be unsettling for the petroleum industry. Equipment was sabotaged, employees were abducted and held hostage, pipelines were repeatedly dynamited, and production suffered. Contractual problems became acute in terms of the division of revenues and the deadlines for declaring exploration blocks feasible for commercial production to avoid losing production rights. A complication was that Colombia's arrangements with private companies involved some of the least competitive oil contracts in the world. Reportedly, the Government "take" averaged between 80% and 85% of every barrel produced; by contrast, in Britain (as one example), it is about 35%. Signs in early 1999 indicated that the Government was working to improve the investment climate for foreign oil companies (Financial Times, 1999a).

Some technological good news arose from the oilfields of Colombia starting in 1998, when several new exploratory wells were drilled out horizontally in the producing zones using underbalanced downhole mud pressures and extended lateral reach. Harken de Colombia Ltd. drilled two exploratory wells in the Middle Magdalena Valley where results were quite promising—good initial production values and high calculated deliverabilities (World Oil, 1998). Many more such wells will probably be drilled in the months to come.

Infrastructure

Colombia had 115,564 kilometers (km) of highways, of which 13,868 km were paved. The country had 14,300 km of waterways navigable by river boats. There were a total of 3,386

km of railway, of which 150 km were standard gauge and carried coal from the Cerrejon mines to the marine port of Bahia de Portete. Narrow-gauge railways totaled 3,236 km, of which about 1,830 km were in use. Colombia had 90 airports with paved runways—2 are longer than 3,047 m, 9 are between 2,438 and 3,047 m long, 37 are between 1,524 and 2,438 m long, 35 are between 914 and 1,524 m long, and 7 are less than 914 m long.

Pipeline lengths totaled 3,585 km for crude oil, 1,350 km for petroleum products, 830 km for natural gas, and 125 km for natural gas liquids. Of Colombia's nine ports, the main ones are in Barranquilla, Buenaventura, Cartagena, and Santa Marta. (Central Intelligence Agency, 2000, Colombia—U.S. Transportation, World Factbook, accessed August 30, 2000, at URL <http://www.odci.gov/cia/publications/factbook/geos/co.html>).

Outlook

The 40-year insurgent campaign to overthrow the Government of Colombia gathered strength in the late 1990's, but the movement, which has little popular support and lacks military strength in the sense of combined arms, relies instead on hand-held flat-trajectory weapons and bombs (dynamite). Support from the drug industry is widely reported (U.S. Central Intelligence Agency, 2000, Colombia—Introduction—Transnational issues, World Factbook, accessed August 30, 2000, at URL <http://www.odci.gov/cia/publications/factbook/geos/co.html>).

Resolution of Colombia's continuing problems with terrorist groups will help realize the promise of its extensive mineral resources, along with continued development of its infrastructure; development must cope successfully with the (terrorist) activities aimed at destroying this infrastructure. Continuation of its privatization program will attract new investment. Moreover, it might expect greater returns from its mineral deposits by clarifying its contractual relations with the private sector. Coal and petroleum will probably play a major role in the creation of future wealth in this well-endowed country. Colombia's past record of fiscal responsibility would seem to commend it to various forms of international assistance.

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

(Metric tons unless otherwise specified)

	1995	1996	1997	1998	1999 e/
METALS					
Bauxite e/	1,700	1,700	1,700	1,700	1,700
Copper, mine output, Cu content	2,800	2,200	1,800	1,400	1,400 3/
Gold kilograms	21,136	22,073	18,811	18,810	19,000
Iron and steel:					
Iron ore and concentrate thousand tons	550 r/	600 r/	640 r/	530 r/ e/	580 p/
Pig iron do.	282	274	322	256 r/	266 3/
Steel, crude do.	714	677	710 e/	662 r/	715
Semimanufactures, hot-rolled e/ do.	692 3/	650 e/	650	650	650
Lead:					
Mine output, Pb content e/	300	300	300	300	300
Refined (secondary)	8,000	10,000	10,000	12,000	12,000 3/
Manganese, mine output, Mn content e/	1,000 3/	1,000	1,000	1,000	1,000
Nickel:					
Mine output, Ni content	24,194	27,700	31,230	29,422	39,300 3/
Ferronickel, Ni content	24,565	22,934	25,171	28,140	28,345 3/
Platinum-group metals kilograms	973	672	409	437	440
Silver do.	5,886	6,407	3,515	5,218	4,200 3/
Zinc, mine output, Zn content	--	--	57	--	-- p/
INDUSTRIAL MINERALS					
Asbestos, mine output	122,717	137,277	136,700	136,000 e/	136,000
Barite	21,300	6,800	6,000	600 r/ e/	600
Cement, hydraulic thousand tons	9,407	8,907	8,446	9,190	9,200
Clays:					
Bentonite e/	9,000 3/	9,000	8,640	8,500	8,500
Common clay and kaolin thousand tons	7,300	3,957	8,040	8,000 e/	8,000
Diatomite e/	4,000	4,000	4,000	4,000	4,000
Feldspar	58,100	78,093	66,845	55,000 r/ e/	55,000
Fluorite	720	700	802 e/	800 e/	800
Gemstones, emerald 4/ thousand carats	6,306	7,151	6,688	9,360	9,700
Gypsum e/ thousand tons	450	522 3/	565	560	560
Lime, hydrated and quicklime e/ do.	1,300	1,300	1,300	1,300	1,300
Magnesite	17,474	12,634	10,500 e/	10,500 e/	10,500
Mica e/	55	55	55	55	55
Nitrogen, N content of ammonia	98,900 e/	101,500	80,900	100,300 r/	75,400 3/
Phosphate rock	48,100	40,484	44,517 2/	73,000 r/ e/	75,000 3/
Salt:					
Rock thousand tons	103	153	141	165	165
Marine do.	132	424	232	330	330
Total do.	235	577	373	495	495
Sodium compounds, n.e.s., sodium carbonate e/	121,000	121,000	125,000	125,000	125,000
Stone and sand: e/					
Calcite	6,500	6,500	6,500	6,500	6,500
Dolomite thousand tons	45	45	45	45	45
Limestone do.	19,248 3/	14,151 3/	13,392 3/	15,000	15,000
Marble	130,000	170,000	191,250 3/	190,000	190,000
Sand excluding metal-bearing	900,000	900,000	900,000	925,000	925,000
Sulfur:					
Native (from ore)	60,000	49,425	53,541	48,000 e/	48,000
Byproduct, from petroleum	15,000 e/	16,000	14,872	15,000 e/	16,000
Total	75,000	65,425	68,413	63,000 e/	64,000
Talc, soapstone, pyrophyllite	19,248	14,800 e/	14,832	15,000 e/	15,000
MINERAL FUELS AND RELATED MATERIALS					
Carbon black e/	24,000	24,000	24,000	24,000 3/	24,000
Coal thousand tons	25,869	29,564	32,742	33,751	34,500
Coke, all types e/ do.	600	600	610	615	615

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1995	1996	1997	1998	1999 e/	
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum:						
Crude	thousand 42-gallon barrels	213,397	228,771	238,156	272,620	301,000 3/
Refinery products:						
Liquefied petroleum gas	do.	7,010	7,955	7,881	7,491	7,500
Gasoline:						
Aviation	do.	250	136	142	145	145
Motor	do.	26,459	38,320	37,920	38,371	38,500
Jet fuel	do.	5,662	6,036	5,792	6,188	6,200
Kerosene	do.	1,342	1,523	1,180	1,025	1,100
Medium distillate fuel oil	do.	21,969	24,518	24,265	23,209	24,000
Lubricants	do.	372	400 e/	442	431	450
Residual fuel oil (Black oil)	do.	20,039	19,361	19,730	18,759	19,000
Asphalt and bitumen	do.	2,964	2,995	3,077	2,081	3,000
Refinery fuel and losses and unspecified products e/	do.	7,476	15,000	15,000	4,375	5,000
Total	do.	93,543	116,244 e/	115,429	102,075	105,000

e/ Estimated. p/ Preliminary. r/ Revised. --Zero

1/ Includes data available through September 1, 2000.

2/ Estimated data are rounded to no more than three significant digits and may not add to the totals shown

3/ Reported figure.

4/ Based on registered exports by the Banco de la República.

TABLE 2
COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Carbon black	Cabot Colombiana S.A. (private, 100%)	Cartagena, Bolivar Department (plant)	NA
Do.	Productos Petroquimicos S.A. (private, 100%)	Cali, Valle del Cauca Department (two plants)	12
Cement	Cia. Colombia de Clinker S.A. (Colclinker) (private, 100%)	Cartagena, Bolivar Department (plant)	1,100
Do.	Cementos del Caribe S.A. (private, 100%)	Barranquilla, Atlantico Department	1,000
Do.	Cementos del Valle S.A. (private, 100%)	Yumbo, Valle del Cauca Department	1,200
Do.	Cementos Rio Claro S.A. (private, 100%)	Puerto Trifuno, Antioquia Department	1,000
Coal	Carbones de Colombia S.A. [CARBOCOL (Government) 50%] and International Colombia Resources Corp. [INTERCOR (Exxon) 50%]	El Cerrejon Norte Mine, La Guajira Department	15,000
Do.	Rio Tinto (1/3); Minorco/Amcoal (1/3); Glencore International AG (1/3)	Correjon Centro mines, Correjon Sur mines, and Oreganal mines, La Guajira Department	NA
Do.	Drummond, Ltd. (Drummond Co., 100%)	Drummond Mine, Cesar Department	4,000
Do.	Prodeco (private, 100%)	Calenturitas in Cesar Department	
Do.	Acerias Paz del Rio S.A. (private, 100%)	Paz del Rio, Boyaca Department (mine)	600
Copper	El Roble Exploracion y Explotacion S.A. (Minas El Roble, 51%; Nittetsu Mining, 44.1%; and C. Itoh, 4.9%)	El Roble Mine, El Carmen, Choco Department	4
Emerald	Minerales de Colombia S.A. (MINERALCO) (Government, 100%)	Chivor, Coscuez, Muzo, and Quipama Mines, Boyaca Department	NA

See footnotes at end of table.

TABLE 2--Continued
COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold	kilograms	Frontino Gold Mines Ltd. (private, 100%)	El Silencio Mine, Segovia, Antioquia Department	1,500
	do.	Fisher-Watt Gold Co. (private, 100%)	Oronorte Mine, Segovia, Antioquia Department	500
Do.	do.	Mineros de Antioquia S.A. (private, 100%)	Rio Nechi, near El Bagre, Antioquia Department (mines)	2,000
Do.	do.	Small miners (cooperatives and individual prospectors)	Rio Nechi, Antioquia Department (mines)	NA
Iron ore		Acerias Paz del Rio S.A.	Paz del Rio, Boyaca Department (mine)	800
Kaolin		Ceramicas del Valle Ltda. (private, 100%)	Yumbo, Valle del Cauca Department (mine)	NA
Natural gas	million cubic meters	Empresa Colombiana de Petroleos (ECOPETROL) (Government, 100%)	North coast, La Guajira Department (national gasfields)	4,500
Do.	do.	International Petroleum Colombia, Ltd. (International Petroleum Corp., 100%)	Barrancabermeja locale, Antioquia and Santander Departments	2,200
Nickel		Cerro Matoso S.A. (QNI Ltd. 100%: latter owned by Billiton plc 100%).	Cerro Matoso Mine, Montelibano, Cordoba Department	40
Nitrogen		Abonos de Colombia (private, 100%)	Cartagena, Bolivar Department (plant)	100
Do.		Monomeros Colombo-Venezolanos S.A. (private, 100%)	Barranquilla, Atlantico Department (plant)	85
Petroleum 1/	thousand 42-gallon barrels	ECOPETROL	16 fields in various Departments	70,000
Do.	do.	Houston Oil Colombiana S.A. (HOCOL) (Royal Dutch Shell, 100%)	14 fields in various Departments	36,500
Petroleum products	do.	ECOPETROL	Barrancabermeja Refinery, Santander Department	74,400
Do.	do.	do.	Cartegena Refinery, Bolivar Department	25,806
Do.	do.	do.	Tibu, Norte de Santander Department	1,825
Do.	do.	do.	Orito, Putumayo Department	875
Phosphate		Fosfatos de Colombia S.A. (private, 100%)	Neiva, Huila Department	30
Do.		Fosfatos Boyaca, S.A. (Government, 100%)	Iza, Boyaca Department	20
Platinum		Small miners (cooperatives and individual prospectors)	Rio San Juan, Choco Department	NA
Salt, marine		Instituto de Fomento Industrial (IFI) (Government, 100%)	Manaure Salina, La Guajira Department	700
Salt, rock		Concesion Salinas (Government, 100%)	Zipaquirá, Cundinamarca Department	500
Silver	kilograms	Frontino Gold Mines Ltd.	El Silencio Mine, Segovia, Antioquia Department	2,500
Do.	do.	Small miners (individual prospectors and cooperatives)	Rio Nechi, Antioquia Department (mines)	2,000
Steel, intergrated plant		Acerias Paz del Rio S.A.	Belencito, Boyaca Department	400
Steel, semiintergrated plants		Siderurgica del Caribe (private, 100%)	Cartagena, Bolivar Department	NA
Do.		Siderurgica del Boyaca S.A. (private, 100%)	Santafe de Bogota	NA
Do.		Siderurgica del Medellin S.A. (private, 100%)	Medellin, Antioquia Department	NA
Do.		Siderurgica del Muna S.A. (private, 100%)	Chusaca, Federal District	NA
Do.		Siderurgica del Pacifico S.A. (private, 100%)	Cali, Valle del Cauca Department	NA
Sulfur		Industrias Purace S.A. (private, 100%)	El Vinagre Mine, Cauca Department	60
Do.		ECOPETROL	Barrancabermeja, Santander Department	29

NA Not available.

1/ These two petroleum entries are only examples. Colombia has more than 3000 producing wells, drilled by both Government and private companies, having combined capacities exceeding 755,000 barrels of oil per calendar day.