THE MINERAL INDUSTRIES OF

CÔTE D'IVOIRE, GUINEA, LIBERIA, AND SIERRA LEONE

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CÔTE D'IVOIRE

In 2001, Côte d'Ivoire's production of minerals represented a minor component of its national economy, which had a gross domestic product (GDP) of $29.63 billion based on 2001 purchasing power parity data (International Monetary Fund, 2002§[1]). Agriculture was the leading sector in the economy, accounting for 29% of the GDP in 2000. In 2000, Côte d'Ivoire's population was estimated to be about 16 million (World Bank, 2001a§). The country was one of the world's largest producers of cocoa beans, coffee, and palm oil. Although mineral production was modest, offshore hydrocarbon production remained an important domestic source of energy. Côte d'Ivoire had proven deposits of bauxite, cobalt, copper, diamond, gold, iron, manganese, nickel, and tantalite (Mining Journal, 2001a). A number of companies were actively operating on exploration permits in 2001.

Despite electing a new President at the end of 2000, civil unrest continued in 2001. The Ministère des Ressources Minières et Pétrolières is responsible for the administration of the mining sector. All mineral rights are vested in the State. Exploration permits are valid for 3 years, and can be renewed twice in consecutive periods of 2 years. Upon each renewal, the permit surface area is reduced by one-half. Upon discovery of deposits, an exploitation permit may be awarded for a period of time not exceeding 20 years. Such a permit must be held by a corporation registered in Côte d'Ivoire of which the Government holds a 10% free-carried interest. During the exploitation stage, corporations are exempted from tax for the first 5 years of financial operations. Thereafter, they are subject to a tax on profits of 35%. An ad valorem tax of 3% on precious metals is payable on a quarterly basis on revenues (Resource Information Unit, 2002, p. 77).

In 2001, the Governments of seven countries in western Africa agreed to form a free-trade zone. The countries include Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Niger, and Nigeria. According to the Minister of Co-operation and Integration in Africa, the agreement will work towards expanding the economic and infrastructural development in the region (Guardian Online, 2001§).

In May 2001, Etruscan Resources, Inc. of Canada agreed to purchase all the Côte d'Ivorian gold assets of Diversified Minerals Resources NL of Australia; these included the Agbaou, the Hiré, the Loho, and the Sirasso permits. The Agbaou permit has had the most exploration, and its resources are more than 26,000 kilograms (kg) (reported as 847,000 ounces) (African Mining Bulletin, 2001).

In December 2001, Normandy Mining Ltd. of Australia sold its 51% holdings in the Ity gold mine to Cie Generale Des Matieres Nucleaires Group (COGEMA) of France for $10.8 million; the state-owned Société d'Etat pour le Développment Minier controlled the remaining 49%. In 2001, the Ity gold mine, which was the largest gold mine in Côte d'Ivoire, produced about 1,500 kg of gold (Metal Bulletin, 2001b). The Angovia gold mine also produced about 1,500 kg of gold in 2001; it was owned by COGEMA through its subsidiary Compagnie Francaise de Mines et Metaux (COGEMA Group, 2000§).

Other companies with gold interests in Côte d'Ivoire were Ashanti Goldfields Co. Ltd. of Ghana, Durban Roodepoort Deep Ltd. of South Africa, Eden Roc Mineral Corp. of Canada, Equigold NL of Australia, Jandera Resources NL, which was a subsidiary of Diversified Mineral Resources NL of Australia, North Ltd. of Australia, Randgold Resources Ltd. of the United Kingdom, and Shield Equities Ltd. of Australia.

Although kimberlites were known to exist at Kanangone, Seguela, and Tortiya, diamond was produced only from the alluvial deposits at Tortiya and Seguela. Carnegie Minerals Ivory Coast S.A.R.L. (CMIC) explored the Bobi concession, which included the Toubaboukou dyke. CMIC was a joint venture of African Mining and Petroleum Resources plc (75%) and the state-owned Société d'Etat pour le Développment Minier de la Côte d'Ivoire (SODEMI) (25%). The Director General of SODEMI noted that the Government was planning to implement a diamond certification scheme to respond to worldwide concerns over conflict diamonds (Mining Journal, 2001b).

Iron ore deposits in Côte d'Ivoire were at Monogaga, Mount Gao, Mount Klahoyo, Mount Nimba, Mount Segaye, Mount Tia, and Mount Tortro (Mines98, 1998a§). The country's total iron ore resource was estimated to be 3,000 million metric tons (Mt). Poor infrastructure has been a problem in pursuing the development of these resources; recently, however, there has been some interest in constructing a gas pipeline to service an iron ore pelletizing plant onsite and developing a rail link between Mount Nimba to the port of San Pedro (MBendi Information Services (Pty.) Ltd., 2000a§).

Falconbridge Ltd. of Canada continued evaluation of its Touba-Biankouma license. The property contains a laterite deposit of nickel and cobalt that was estimated to be 292 Mt of ore at a grade of 1.46% nickel and 0.11% cobalt (MBendi

[1]References that include a section twist (§) are found in the Internet References Cited section.

Information Services (Pty.) Ltd., 2000b§). In 2000, Consolidated Trillion Resources Ltd. of Canada sold its 15% interest in the license to Falconbridge for $2.5 million (Consolidated Trillion Resources, 2000§). Falconbridge officials noted that the project was still in an early stage and future development would depend on three things—construction of a proposed 500-kilometer (km) railway between San Pedro and Biankouma; an energy source, potentially from an offshore oil and gasfield; and political stability (Mining Journal, 2001b).

The largest gasfield in Côte d'Ivoire was the Foxtrot on offshore Block CI-27. The gasfield was operated by France's Bouygues Group and was owned by a consortium made up of the state-owned La Société Nationale d'Operations Pétroliéres de la Côte d'Ivoire (Petroci) (40%); Mondoil Côte d'Ivoire (24%), which was a subsidiary of Mondoil of the United States; SAUR Energies Côte d'Ivoire (24%), which was a subsidiary of SAUR International of France; and the Electricité de France/Gaz de France Group (12%) (Africa Energy and Mining, 1999). In 2001, 700 million cubic meters (reported as 68 million cubic feet per day) of gas were produced from the Foxtrot field; reserves were estimated to be about 18 billion cubic meters (reported as 650 billion cubic feet). The Lion and the Panthere gasfields located on offshore Block CI-11 produced 510 million cubic meters (reported as 49 million cubic feet per day) of gas in 2001. This gasfield was owned by a consortium of Ocean Energy, Inc., of the United States and Petroci (Africa Energy Intelligence, 2002; MBendi Information Services (Pty.) Ltd., 2000c§). Total gas reserves for Côte d'Ivoire were estimated to be 30 billion cubic meters (reported as 1,050 billion cubic feet) (Oil & Gas Journal, 2001).

After being shut down in 1998 owing to high operating costs, plans were made in 2001 to redevelop the Espoir oilfield and gasfield. A partnership made up of Petroci, Ranger Oil Ltd. of Canada, and Tullow Oil plc of the United Kingdom planned to bring the field back into operation in 2002 (Africa Energy Intelligence, 2001a). Total oil reserves for Côte d'Ivoire were estimated to be 100 million barrels (Oil & Gas Journal, 2001).

Among the other companies with oil and gas interests in Côte d'Ivoire were Addax Petroleum NV, which was a subsidiary of Addax and Oryx Group of the United Kingdom, CNR International Ltd. (previously Ranger Oil) of the United Kingdom, Dana Petroleum plc of the United Kingdom, Oranto Petroleum Co. of Nigeria, Santa Fe Energy Resources, Inc. of the United States, and Vanco Energy Co. of the United States.

The Government announced its intention to privatize 26 state-owned companies. Among them was the Société Ivoirienne de Raffinage (SIR), which was Côte d'Ivoire's oil refinery. The Government planned to sell 37% of its 47.25% holding in SIR. The Government of Burkina Faso owned 5.39% equity interest in SIR, and the remainder was held by subsidiaries of the Elf Aquitane Group of France, ExxonMobil Corp. of the United States, the Royal Dutch/Shell Group of the Netherlands and the United Kingdom, Texaco, Inc. of the United States, and the TotalFina Elf Group of France. SIR had a refining capacity of about 21 million barrels per year [reported as 3 million metric tons per year (Mt/yr)] and mainly refined crude oil from Nigeria (Alexander's Gas and Oil Connections, 1999§). The December 24, 1999, military coup d'état resulted in the indefinite postponement of the SIR privatization (Africa Energy and Mining, 2000a).

Although Côte d'Ivoire faces similar infrastructure obstacles as the rest of the countries in West Africa, its network of 8,000 paved roads and 2 active ports make it attractive for business. Continued infrastructure developments in the future, especially the proposed 500-km railway between San Pedro and Biankouma would help open up the undeveloped mineral and energy resources; after having seen no sign of progress on this project for several years, the current (2001) Government was seen to be actively pursuing this $500 million railroad project.

GUINEA

In 2001, Guinea's production of minerals represented a major component of its national economy, which had a GDP of $16.31 billion based on 2001 purchasing power parity data (International Monetary Fund, 2002§). Mining accounted for about 16% of the GDP and about 90% of exports, most of which were bauxite. In 2000, Guinea's population was estimated to be about 7.4 million (World Bank, 2001b§). In 2001, Guinea was the world's second largest bauxite producer and had the world's largest bauxite resources (Plunkert, 2002a); bauxite accounted for about 90% of Guinea's exports. Guinea supplied about 32% of the United States' metallurgical-grade bauxite imports in 2001; this was down from 39% of bauxite imports in 2000 owing to an increase in imports from Jamaica (Plunkert, 2002b, p. 1). In addition to possessing significant bauxite reserves, Guinea has diamond, gold, granite, and iron ore deposits. The Government encouraged the foreign participation in the bauxite sector and promoted the diversification of the mineral industry.

The Ministère des Mines, de la Géology et de l'Environment is responsible for the administration of the mining sector. The Centre de Promotion et de Developpement deals with all aspects of investment in the mining sector. The Government reserves 15% free equity for itself in all gold and gem operations. State participation in bauxite- and iron-ore-mining ventures is subject to negotiation. Mineral beneficiation in Guinea is encouraged. Royalties are 5% on alumina and 3.5% on concentrates of other minerals compared with 10% on bauxite and 7% on other ores. The corporate income tax rate was 35%.

Five different mining titles are listed in the Guinean mining code—reconnaissance permits last 3 to 6 months and allow prospecting of areas not under permit, exploration permits are valid for 3 years, are renewable for 4 years, and cover a maximum of 500 square kilometers, exploitation permits on areas defined by a feasibility study grant exclusive rights to minerals for 10 years and are renewable for 5-year periods, mining concessions reserved for large ore deposits as defined by a feasibility study are of 25 years duration and renewable for 10-year periods, and artisanal mining is allowed only to Guinean nationals on consigned areas (Resource Information Unit, 2002, p. 132).

In 2001, the French Government announced that it had awarded to Guinea a $1.3 million grant under the French overseas development fund Fonds de Solidarite Prioritaire. The grant will be managed by the Agence Francaise de Developpement and will go toward achieving the following three goals: improving Guinea's geological and mining information system, completing a geologic map of the central part of the country (an area covering 58,000 square kilometers), and funding training programs in Guinea and France (Africa Mining Intelligence, 2001a).

Compagnie des Bauxites de Guinée (CBG), which was the largest bauxite producer in the world, operated a number of open pit bauxite mines, which included the Bidikou, the Sangarédi, and the Silidara. CBG had a capacity of 14 Mt/yr and was controlled by the Government (49%) and Halco Mining, Inc. (51%), which was a consortium comprised of Alcan, Inc. of Canada, Pechiney of France, and Alcoa, Inc. of the United States. CBG had additional resources at the Boundou Waade, N'danga, and Paravi deposits. Total existing reserves are estimated to be more than 300 Mt at a grade of 51% Al_2O_3; these are sufficient to support production at current (2001) rates for at least 25 years (Mining-Technology.com, undated§).

In April 2001, Russian Aluminium Co. (Rusal) of Russia announced that it had signed an agreement to manage the production facilities of Guinea's state-owned Societe de Bauxite de Kindia (SBK). The agreement granted Rusal the right to manage SBK for 25 years. Company officials noted that they planned to invest $40 million on SBK within 3 years and an additional $40 million on expanding the main consumer of Guinea's bauxite, its Nikolayevsky Aluminum Plant facilities in Russia. Bauxite production at the Kindia bauxite mine is expected to grow from 1.5 Mt/yr to 2.5 Mt/yr during the next 3 years (metals-Russia.com, 2001§).

In 2000, Guinea Aluminum Products Corp. of the United States signed a memorandum of understanding with the Guinean Government for the construction and operation of an alumina refinery. The facility would involve investment of $1.5 billion with an operating capacity of 240,000 metric tons per year (t/yr) (boubah.com news service, 2000§).

In June 2001, the Alumina Co. of Guinea [75% controlled by Guinea Investment Co., which was owned by the United Kingdom metals investment and trading group Manro Haydan; 15% by the Guinean Government; and 10% by Alcoa (via takeover of Reynolds Metal Co.)] announced that it had increased alumina production at its Friguia refinery by 150,000 t/yr to 700,000 t/yr (Metal Bulletin, 2001a).

In 2000, the Government awarded Semafo, Inc. of Canada a 10-year mining license for the Jean Gobele gold project. Construction of the Kiniero open pit gold mine began in early 2001 and the mine officially opened in early 2002; construction costs were about $12.4 million. Production was expected to be about 1,900 kilograms (reported as 60,000 ounces) per year of gold with costs of operations estimated to be $157 per ounce of gold. Sefamo also had a joint-venture agreement with Rio Tinto plc of the United Kingdom to explore the Mont Kakoulima property; initial studies indicated the presence of a 1-meter (m)-thick horizontal layer of massive sulfides that contain cobalt, copper, nickel, palladium, and platinum (Semafo, Inc., undated§).

In 2001, Société Ashanti de Guinée (85% owned by Ashanti Goldfields Co. Ltd. of Ghana and 15% owned by the Guinea Government) reported a 7% decrease in gold production to 8,808 kg (reported as 283,199 ounces) at its Siguiri mine, which was the largest gold mine in Guinea. Ashanti noted that the decrease was attributed to a reduction in the amount of ore mined as well as a lower than expected metallurgical recovery from their stacked material during the year (Ashanti Goldfields, 2002§).

Société Minière de Dinguiraye (85% owned by Kenor ASA of Norway and 15% owned by Guinea Government) reported a 20% increase in production of gold to 3,279 kg at the Léro-Karta gold mine in 2001 (Kenor ASA, 2002§). During the year, Kenor was seeking partners to cofinance a $9 million drilling project, which it hoped would more than double its gold resources (Kenor ASA, 2001§).

Diamond production in 2001 was an estimated 370,000 carats, which was down slightly from the average of about 381,000 carats recorded from 1998 to 2000. The Guinea Government noted that the majority of production was from small- scale operators (Africa Energy and Mining, 2000b). Trivalence Mining Corp. of Canada was the largest producer with diamond production of about 40,000 carats at its 85%-owned Aredor diamond concession; the Guinea Government owned the remaining 15%. Trivalence estimated that with indicated resources of 461,282 carats, its production from Aredor at the current (2001) level could continue for an additional 10 years (Trivalence Mining Corp., undated§). In December 2000, a letter of intent was signed between Trivalence and Rio Tinto Mining and Exploration of the United Kingdom that granted Rio Tinto the option to earn an interest of up to 58% of the Aredor concession if Rio Tinto made a $6 million exploration expenditure during the next 3 years (40%), conducted a feasibility study within 2 years (13%), and arranged additional debt financing (5%) (Trivalence Mining Corp., 2000). Other companies with diamond interests in Guinea were Dia Bras Exploration, Inc., of Canada, Pinnacle Resource, Inc. of the United States, Searchgold Resources, Inc., of Canada, and Societe Alpha Plus of Guinea.

In March 2001, the African Development Bank Group approved a $1.21 million grant to finance a study on how to improve the road that connected the cities of Boke, Guinea, and Quebo, Guinea-Bissau. Work expected to be accomplished as part of the study included an economic and feasibility analysis, a socio-economic analysis, an environmental impact assessment, an engineering analysis, and a preparation of tender documents (African Development Bank Group, 2001b§). Generally speaking, major highways in Guinea have been paved, but the rural transportation infrastructure was inadequate to meet needs. Guinea had two main ports—Conakry and Kamsar. Conakry, which was the country's main general cargo port, was linked to the Kinda Bauxite Mine by a 104-km 1.435-m standard-gauge railroad line and to the Fria Bauxite Mine by a 145-km 1-m narrow-gauge railway. Kamsar, which handled only bauxite shipments, was linked to the Sangarédi Mine by a 135-km standard-gauge railroad line. In addition to the mine railroads, a 661-km 1-m narrow-gauge line connected Conakry with Kankan.

Although the 1995 mining code significantly improved the business climate for the mineral industry, mining operations remained hampered by infrastructural constraints. International funding of mineral deposit development was proceeding more slowly than anticipated. The less-than-expected foreign investment was attributed to the country's perceived political and economic risks and decreased availability of financing for junior mining companies, as well as civil disturbances in the adjacent countries of Guinea-Bissau, Senegal, and Sierra Leone.

Alumina, bauxite, and gold production are expected to continue to dominate Guinea's economic activity. Ventures requiring significant electric power availability, such as an aluminum smelter, could become feasible as the nation's power-generation capacity is increased by the state-owned Société National d'Electricité. The potential of electricity that could be generated by rivers is high; the newly built Garafiri hydroelectric facility features a 75-MW powerplant on the Kondoure River.

LIBERIA

In 2001, mineral production in Liberia consisted mainly of artisanal recovery of diamond and gold. Liberia had a GDP of $3.35 billion based on 2000 purchasing power parity data; its population in 2001 was estimated to be about 3.2 million (U.S. Central Intelligence Agency, 2001§). Eastern Liberia is made up of rocks of Birimian age with significant potential for gold. Western Liberia is made up of rocks of Archean age that contain diamond, gold, iron ore, nickel, manganese, palladium, platinum, and uranium (Mines98, 1998b§).

In recent years, the Ministry of Lands, Mines, and Energy has been responsible for the administration of the mining sector; in early 2001, however, the Liberian President pressed the National Legislature of Liberia to grant him control over the country's mineral resources via the Strategic Commodities Act (Allafrica.com, 2001§). A new Mineral Development Policy and Mining Code that outlined five types of mining licenses—reconnaissance licenses are valid for 6 months, with an option to renew; exploration licenses are valid for 3 years, with an option to renew for a further 2 years; Class A licenses cover small-scale alluvial operations and are available for Liberians only; Class B licenses are valid for 5 years over an area of 100 acres; and Class C licenses are valid for 25 years, can be extended for an additional 25 years, and must have a feasibility report submitted for each license—was passed by the Ministry (Resource Information Unit, 2002, p. 152-153).

In June 2001, Mano River Resources, Inc., announced the discovery of its sixth kimberlite pipe in western Liberia since beginning its exploration program in 2000. The company believed that the artisanal diamond workings in the area, which have yielded a number of high-quality diamonds, were located on top of their newly discovered kimberlite (Mano River Resources, Inc., 2001). Also in 2000, a United Nations (U.N.) panel called for an embargo on all diamond exports from Liberia owing to concerns of its potential involvement in civil unrest in Sierra Leone, its neighbor to the northwest. This action by the United Nations followed previous bans on diamond exports from Angola and Sierra Leone (Associated Press, 2000§).

Mano River Resources, Inc., continued exploration at its Gondoja, King George-Larjor, and Weaju properties after having made several gold discoveries in 2000 on them. Resources at Weaju were estimated to be around 660,000 t at a grade of 10.9 g/t gold (233,000 ounces of contained gold), and those at King George-Larjor were estimated to be 4.1 Mt at a grade of 4.6 g/t gold (610,000 ounces of contained gold) (Mano River Resources, Inc., 2000a, b). Other companies with gold interests in Liberia in 2001 were AmLib United Minerals of Liberia, Freedom Gold Ltd. of the United States, and Haddington International Resources Ltd. of Australia.

Fusion Oil & Gas plc of Australia and Daytona Energy Corp. of Australia performed a seismic survey on Block A, offshore Liberia. Liberian Government withheld granting oil exploration permits to the companies until the results of the survey were finalized. Although the region of offshore Liberia has not undergone significant exploration in the past, company officials noted that significant risks were involved. Still, they were initially optimistic that the results of the survey would prove positive (Africa Energy Intelligence, 2001b).

SIERRA LEONE

Mineral production in Sierra Leone in 2001 consisted mainly of artisanal recovery of diamond and gold. Sierra Leone had a GDP of $2.20 billion based on 2001 purchasing power parity data (International Monetary Fund, 2002§); in 2000, Sierra Leone's population was estimated to be about 5.0 million (World Bank, 2001c§). Civil strife has adversely affected investment in natural resource development since 1995, although conditions would improve with the declaration that war had ended in September 2001.

The Ministry of Mineral Resources is responsible for the administration of the mining sector. In 1999, the Sierra Leonean Parliament enacted an amendment to the 1994 Mines and Minerals Act that introduced three new sections. These are a procedure for sale and export of precious minerals by licence holders, penalties for unlawful possession of precious minerals, and penalties for smuggling precious minerals from Sierra Leone (Mining Journal, 2000).

In December 2001, Sierra Rutile Ltd. of Sierra Leone [(jointly owned by MIL Investments SA of Luxembourg (75%) and U.S. Titanium (25%)] announced rutile production at the Sierra Rutile mine would resume production in 2003. The company was expected to receive a $15 million grant from the International Finance Corporation in 2002 (Africa Mining Intelligence, 2001b). In 2000, Sierra Leone's President announced that he hoped that Sierra Rutile, which had operated the largest and highest grade resource of rutile in the world prior to its closing in 1995, would be producing sometime in 2002. Furthermore, he pledged to assist in any financing needed to restart operations. Nord Resources Corp. of the United States, which sold its 50% share in Sierra Rutile in 1999, had expected that capital expenditures of more than $100 million would be needed to restart operations (Industrial Minerals, 2001).

In early 2001, Sierra Leone and Angola introduced a diamond certification scheme in response to U.N. sanctions that are aimed at the prohibition of importation of diamonds coming from rebel-controlled areas in their countries. The announcement came after an international meeting on "conflict diamonds" in Namibia and the establishment of a task force comprised of diamond producing, exporting, and manufacturing countries within the Southern African Development Community, the World Diamond Council, and the European

Union (South African Broadcasting Corp., 2001§). The main diamond deposits in Sierra Leone are the Koidu and the Tongo fields. In 2001, DiamondWorks Ltd. of Canada, which had a 60% ownership of the Koidu mine, announced that it was returning to Sierra Leone. In early 2002, the company began to undergo an assessment of the status of the mine. The mine has reserves of 2.67 million carats. DiamondWorks also holds two separate diamond exploration licenses on the Sewa River, which host reserves estimated to contain 1.7 million carats. Rex Diamond Corp. had mining licenses at the Tongo fields deposit and the Zimmi deposit (Mbendi Information Services, 2001§; Africa Mining Intelligence, 2002).

After initial oil surveys in 2001 by TGS Nopec, Inc. of the United States indicated the potential for oil in the offshore Sierra Leone regions of Pujehun and Bonthe, the Government announced that it would draft a decree that outlines the legal conditions for exploring for oil in these offshore concessions and plan for a bidding round. First exploration wells could be drilled as early as 2003 with production as early as 2005 (Africa Energy Intelligence, 2001c).

In April 2001, the African Development Bank Group (ADBG) approved a $12.92 million loan to assist in the economic recovery of Sierra Leone. The loan is part of the ADBG's role in the National Rehabilitation and Recovery Program (NRRP) of Sierra Leone, which is a partnership among the ADBG, the International Monetary Fund, the Sierra Leone Government, and the World Bank. The NRRP focuses on several goals including the restoration of peace and the stabilization of the economy (African Development Bank Group, 2001a§).

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Major Sources of Information

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TABLE 1

CÔTE D'IVOIRE, GUINEA, LIBERIA, AND SIERRA LEONE: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity		1997	1998	1999	2000	2001
CÔTE D'IVOIRE 3/						
Cement		1,100	650	650	650	650
Columbite	kilograms	NA	NA	273 4/	137 4/	130
Diamond	carats	306,665 4/	310,000	398,282 4/	320,207 4/	320,000
Gold	kilograms	2,419 4/	3,400	2,717 4/	3,154 4/	3,100
Gravel and crushed rock		NA	NA	570 4/	540 4/	550
Natural gas	million cubic meters	879	1,000	1,395 r/ 4/	1,323 r/ 4/	1,230
Petroleum:						
Crude	thousand 42-gallon barrels	5,334 4/	7,300	10,000	11,700 r/	12,000
Refinery products	do.	7,850 4/	7,500	10,000	11,700 r/	12,000
Sand		NA	NA	230	740	750
Tantalite	kilograms	1,350 4/	1,400	686 4/	408 4/	400
GUINEA 5/						
Alumina:						
Production:						
Hydrate		527	490	500	550	550
Calcined		650 4/	500 r/ 4/	568 r/ 4/	541 r/ 4/	550
Shipments, calcined		640	511 4/	480 4/	480	500
Bauxite:						
Mine production:						
Wet basis 6/		19,300 r/	17,300 r/ 4/	17,320 r/ 4/	17,950 r/ 4/	17,950 4/
Dry basis 7/		16,359 4/	15,570 r/ 4/	15,590 r/ 4/	15,700 r/ 4/	15,700
Calcined		660	100	100	100	100
Shipments (dry basis):						
Metallurgical		14,500	14,000	14,000	14,000	14,000
Calcined		95	100	100	100	100
Cement		260 r/	277 r/ 4/	297 r/ 4/	300 r/ 4/	300 4/
Diamond 8/ 9/	thousand carats	205	392 r/ 4/	383 r/ 4/	369 r/ 4/	370
Gold 9/	kilograms	7,100	7,835 r/ 4/	12,001 r/ 4/	13,104 r/ 4/	13,000
Salt		NA	NA	15	15	15
LIBERIA 10/						
Cement, hydraulic 11/		7	10	15	15	15
Diamond	carats	200,000	300,000	200,000	170,000	170,000
Gold	kilograms	500	800	1,000	1,000	1,000
SIERRA LEONE						
Cement 12/		50	100	100	100	100
Diamond	thousand carats	400	250	600	600 r/	600
Gold	kilograms	20	15	30	30	30
Gypsum		2	4	4	4	4
Salt		10	1	1	1	1

r/ Revised. NA Not available.

1/ Table includes data available through May 22, 2002.

2/ Estimated data are rounded to no more than three significant digits.

3/ In addition to the commodities listed, Côte d'Ivoire produced clays, crushed granite, manganese, sand and gravel, and stone; but information is inadequate to make estimates of output levels.

4/ Reported figure.

5/ In addition to the commodities listed, Guinea produced modest quantities of crude construction materials (clays, sand and gravel, and stone); but information is inadequate to make reliable estimates of output levels.

6/ Metallurgical plus calcinable ore estimated to be 13% water.

7/ Data are for wet-basis ore estimated to be 13% water, reduced to dry basis estimated to be 3% water.

8/ Production is approximately 70% to 80% gem quality.

9/ Figures include artisanal production.

10/ In addition to the commodities listed, Liberia produced a variety of industrial minerals and construction materials (clays, gypsum, sand and gravel, and stone); but information is inadequate to make reliable estimates of output levels.

11/ Cement production from the Liberian Cement Corporation had been reported as zero in 1997 because of the civil war. The Scancem AB 1997 annual report indicates the cement plant was open during most of the civil war.

12/ Production from imported cement clinker.