THE MINERAL INDUSTRY OF

NAMIBIA

By George J. Coakley

Namibia is located on the southwestern coast of Africa between South Africa and Angola. The 825,418-square-kilometer country had an estimated population of 1.8 million in 2000 and a gross domestic product (GDP) per capita of about $4,300[1] based on purchasing power parity. In 1999, the mineral industry of Namibia provided about 43% of exports and 20% of the country's GDP (U.S. Central Intelligence Agency, Namibia—Economy, World Factbook 2000, accessed December 5, 2000, at URL http://www.odci.gov/cia/publications/Factbook/geos/ wa.html#Econ). Diamond remained the most important sector of the mining industry followed by uranium, for which Namibia ranked as the world's fourth largest producer. Namibia was also the second largest producer of salt in Africa. Other important mineral products included copper, dimension stone (granite and marble), fluorite, gold, lead, silver, and zinc.

Government Policies and Programs

The principal legislative documents that govern mineral and energy development in Namibia are available on the Ministry of Mines and Energy website at URL http://www.mme.gov.na/mines/index.html.

The basic mining law is the Minerals (Prospecting and Mining) Act, No. 33 of 1992, which took effect on April 1, 1994. An accompanying Mining (Taxation) Act set forth revised fiscal and royalty provisions for the industry. The Mining Act was still being refined, and additional amendments were under consideration during 2000.

The system of taxation on diamond mining consisted of three separate taxes—on income, on diamond profits, and on diamond export duties. The export duty has now been replaced by a 10% royalty. The overall income tax on diamond mining companies is levied at the rate of 55% of taxable income plus a surcharge of 10% on the market value of diamonds shipped and sold. The Income Tax Act provides that this 10% surcharge paid as diamond profits tax be credited against the income tax payable by diamond mines. A new Diamond Law was enacted on September 30, 1999, and came into effect on April 1, 2000. The Diamond Law will regulate and control the holding, transport, and further processing of diamonds through a system of licences approved by the Diamond Commissioner. The act also establishes a Diamond Board, a Diamond Board Fund, and a Diamond Evaluation Fund. Diamond exploration and mining licensing will continue to be administered by the Office of the Mining Commissioner.

The fiscal regime for oil exploration companies consists of three principal elements—an income tax and an Additional Profits Tax levied in terms of the Petroleum (Taxation) Act, No. 3 of 1991, and a 12.5% royalty levied in terms of the Petroleum (Exploration and Production) Act, No. 2 of 1991. The Petroleum Laws Amendment Act 24 of 1998 amended the 1991 Petroleum (Exploration & Production) Act, No. 2, the 1991 Petroleum (Taxation) Act, and along with the Model Petroleum Agreement of September 1998 were designed to provide additional incentives to attract new foreign investment. The Petroleum Laws Amendments Act of 1998 introduced a number of new incentives, which included reduction of royalties on the value of oil and gas production to 5% from 12.5%, a reduction of the petroleum income tax from to 35% from 42%, allowance for full annual writeoff for exploration and operating expenditures, and the introduction of three-tiered "additional profits tax" that will become effective only when licensees earn an after-tax real rate of return of 15%, then 20%, and finally after a 25% return (Abraham, 1998).

The Foreign Investment Act of 1990 offers prospective investors a package of incentives, such as repatriation of profits, security of title and tenure, availability of foreign exchange, international arbitration, and fair compensation in case of expropriation.

The Ministry of Mines and Energy was responsible for making and enforcing policies related to minerals and energy. Within the ministry and attached to the Permanent Secretary are the Diamond Board, the Mining Advisory Board, and the National Energy Council, all of which have Government and private-sector representation. Namibia Petroleum Co. and NamPower, which is the Namibia national electric utility, also are part of the ministry. The four main directorates in the ministry are Geological Survey, Mining, Energy, and Administration and Finance. The three main functions of the Mining Directorate evaluate and control mineral license applications, ensure adequate safety standards in mining operations, and collect, analyze, and disseminate production statistics. An Ancillary Rights Commission was set up by the Ministry to handle dispute arbitration.

The Mine Health and Safety Regulations was in its 10th draft during 2000.

Environmental Issues

As one of the major sectors of the economy, the mining industry plays an active role in funding conservation awareness and environmental education programs. Some of Namibia's mines are located in or close to the Namib, which is one of the world's oldest deserts and is host to a number of extremely rare species of plant and animal life. Because this unique habitat is one of Namibia's most valuable tourist assets, the ecosystem is closely monitored by local and international scientific and conservation communities. The competition for limited water resources between human and industrial uses will remain an ongoing environmental concern for the country.

In addition to the desert, Namibia possesses several "wetland" areas of international repute, particularly the Etosha Salt Pan, the Kavango/Caprivi region, the Walvis Bay lagoon, and Sandwich Harbor, as well as the mouths of the Kunene and the

[1]Where necessary, values have been converted from Namibian dollars (N$) to U.S. dollars at the rate of N$7.1=US$1.00 for 2000 and N$6.11=US$1.00 for 1999.

Orange Rivers. The fragile nature of these desert and wetland ecosystems is a concern when considering any infrastructure projects, such as railroads or pipelines between Walvis Bay and northeastern Namibia and Botswana. Comprehensive studies have been undertaken to assess the effects of marine mining operations with respect to these areas and, in particular, the changes in tidal patterns caused by the disposal of fine sediments during offshore mining. In addition, work is being carried out to assess the extent of any interaction between marine mining activities and the local fishing (mainly lobster) and mariculture (oyster and mussel production) industries and to provide information that will assist these industries to develop and coexist with minimal adverse effects upon each other.

Production and Trade

The production statistics in table 1 were compiled mostly from data provided by the Namibia Ministry of Mines and Energy in response to the U.S. Geological Survey's annual minerals questionnaire and from company reports. Production of most mineral commodities significantly increased in 2000 compared with that of 1999; the exceptions were diamonds and fluorspar, which declined by 5% and 7%, respectively. With limited opportunities for new markets, uranium output has remained relatively constant at around 3,200 metric tons (t) from 1998 to 2000. In 2000, the value of mineral production was approximately $63.23 million—diamond, $515.16 million; uranium oxide, $75.37 million (based on a market price of $ 23.55 per kilogram); gold, $22.29 million; zinc, $19.97 million; copper $8.14 million; fluorite, $4.95 million; lead, $2.99 million; and silver, $2.56 million. The value of granite, marble, salt, and semiprecious stones amounted to $1.8 million. The value of production approximately equals the value of exports. In 1999, the total value of all merchandise exports was $1.4 billion. Total imports, chiefly food and petroleum products, totaled $1.5 billion in 1999.

Commodity Review

Metals

Copper.—In March 2000, which was nearly 2 years after its abrupt closure, the Government announced that the Tsumeb copper smelter and the Khusib Springs, the Kombat, and the Otjihase copper-lead-silver mines would reopen. A new company, Ongopolo Mining and Processing Limited, was formed as a partnership between former managers of Tsumeb Copper Limited (TCL) and the National Union of Namibian Workers (NUMW) with financing from a $5.6 million investment by the Government Institutions Pension Fund and a $4.2 million loan from a private investor. The General Secretary of NUMW was appointed as Chairman of Ongopolo (Werner Menges, March 15, 2000, Ongopolo to take the ball and run with it, The Namibian [Windhoek], accessed July 7, 2001, at URL http://www.namibian.com.na/Netstories/2000/March/News/with.html). "Ongopolo" is the word for copper in the local Otjiwambo language.

Mining was restarted at the Kombat Mine and the high-grade Khusib Mine in April and at the Otjihase Mine in November. Following a $2 million refurbishment, the old Tsumeb copper smelter came back into production in June 2000. Through the end of March 2001, the northern mines (Kombat and Khusib) produced 200,000 t of copper ore, and the Otjihase Mine, 125,000 t of copper ore. At full production, the northern mines were expected to produce at a rate of 24,000 metric tons per month (t/mo) of ore, and Otjihase, at 60,000 t/mo. A new ore block at Otjihase had a projected life span of 5 to 7 years. Through the end of March 2001, the Tsumeb smelter produced 20,200 t of blister copper; 7,000 t of blister was produced from Ongopolo concentrates, and 13,200 t of blister copper, from imported concentrates (Werner Menges, April 15, 2000, Ongopolo mines revival on course, The Namibian [Windhoek], accessed July 7, 2001, at URL http://www.namibian.com.na/Netstories/2001/April/News/with.html).

While seeking investors for TCL, the Government had reported remaining measured mineral reserves at Khusib to be 119 million metric tons (Mt) at a grade of 10.06% copper, 1.82% lead, and 584 grams per metric ton (g/t) silver; measured reserves at Kombat, 1.4 Mt at a grade of 3.16% copper, 2.67% lead, and 584 g/t silver; inferred reserves at Kombat, 5.3 Mt at a grade of 2.5% copper and 18.7 g/t silver; measured reserves at Otjihase, 2.1 Mt at a grade of 1.96% copper, 17.2% lead, and 7 g/t silver; and inferred reserves at Otjihase, 8.5 Mt at a grade of 1.8% copper, 12.8% lead, and 7.6 g/t silver (New Africa.com, [1999], Tsumeb assets for sale, accessed December 1, 1999, at URL http://www.newafrica.com/investments/projects/namibia/miningextraction.asp).

Development of the Haib copper deposit remained on hold during 2000 pending more favorable market conditions. The original partners in Namibia Copper Joint Venture (Pty.) Ltd. were Namibia Copper Mines Inc. (80%) of the United States and Great Fitzroy Mines NL (20%) of Australia. When Namibia Copper Mines defaulted in its farm-in agreement in 1998, its interest in the project reverted to Great Fitzroy. During 1999 and 2000, Namibia Copper Mines wrote down more than $8 million in losses on the Haib project and also changed its corporate name to American Southwest Holdings Inc. (American Southwest Holdings Inc., May 9, 2001, Quarterly report to U.S. Securities and Exchange Commission for period ending September 30, 2000, accessed August 6, 2001, at URL http://www.sec.gov/Archives/edgar/data/1001516/ 000102385601500010/0001023856-01-500010.txt). Great Fitzroy Mines also changed its corporate name to Copper Mines and Metals Ltd. During 2000, Copper Mines and Metals reassessed the mineral and metallurgical potential of the oxide resource within the Haib porphyry copper deposit to support a scaled-down development. The company also applied for renewal of its exploration license 2152 on the property (Copper Mines and Metals Ltd., [2001], Annual report for 2000, accessed August 6, 2001, at URL http://www.coppermines.com.au/cop00ar.htm).

Lead and Zinc.—In September, Anglo American plc initiated construction of its new $454 million Skorpion zinc mine and refinery project, which is located 25 kilometers (km) north of Rosh Pinah and 85 km northeast of Oranjemund. In 1999, Anglo American had bought Reunion Mining plc for $82 million, thus regaining a 100% interest in the project. Skorpion will produce 150,000 metric tons per year (t/yr) of zinc during a mine life of at least 15 years. First production was planned in the second quarter of 2003. The open pit mine will be based on reserves of 21.4 Mt at a grade of 10.6% zinc. The unusual zinc silicate and carbonate mineralogy will be treated by a direct acid leach of the ore, solid liquid separation, solvent extraction, and

electrowinning to produce special high-grade zinc. The company was coordinating with the nearby Rosh Pinah zinc operation to optimize the use of local power, water, and port facilities at Luderitz. Although the mining operation is subject to normal taxes and royalties, the refinery has been granted an Export Processing Zone status and will be tax free (Anglo American plc, September 7, 2000, Anglo American plc invests US$454 million in Skorpion zinc mine in Namibia, accessed August 6, 2001, at URL http://www.angloamerican.co.uk/news_detail.asp?news_item_number=80026).

Gold.—AngloGold (Namibia) Pty. Ltd. (formerly Erongo Mining and Exploration Co. Ltd.) held a 100% interest in the Navachab gold mine near Karibib following the 1999 acquisition of the 20% interest in Navachab held by Inmet Mining Corp. and the 10% interest held by Randgold Resources Ltd. Navachab accounted for more than 95% of the total national gold production. The Navachab deposit is within the Damara greenstone belt with the bulk of the gold mineralization occurring within a skarn zone. In 2000, production was 2,395 kilograms (kg) compared with 2,009 kg in 1999. The average grade of ore mined from the open pit in 1999 was 1.46 g/t. During 2000, AngloGold decided to proceed with the extension of the western side of the pit, which will extend the life of the mine from 2003 to 2005. The company has abandoned plans to extend the minelife to 2012 but did proceed with a feasibility study on substantially increasing mining rates and extending the life of the mine to 2009. A labor disagreement, pursuant to the Ministry of Labour declaring the mine a "continuous operation" was resolved with the union by an agreement on Sunday and public holiday payments (Christoff Maletsky, August 22, 2000, Navachab plans ditched, The Namibian, accessed August 5, 2001, at URL http://www.namibian.com.na/Netstories/2000/August/News/009ADC4AC2.html).

Tantalum.—Reefton Mining N.L. of Australia held seven exploration licenses in what they referred to as the Erongo base-metals, gold, and tantalite project in northwestern Namibia. The concessions included several pegmatite zones previously mined for tantalite, tin, and tungsten. The sharp rise in tantalum prices during 2000 caused a renewed interest in these old pegmatite mining areas (Reefton Mining N.L., [2001], Annual report for 2000, accessed August 8, 2001, at URL http://www.erd.pair.com/reeftonmining/rtm00ar.htm).

Uranium.—Rössing Uranium Ltd., which was owned by Rio Tinto plc of the United Kingdom (56%), was the fifth largest producing uranium mine in the world; it contributed 3,200 t of uranium oxide, or 7.8% of world supply, in 2000 (Uranium Information Center, June 2001, World uranium mining, Nuclear Issues Briefing Paper 41, accessed August 1, 2001, at URL http://www.uic.com.au/nip41.htm). Faced with an extended weak market, Rössing continued to operate at about 75% of capacity; it maintained production at around 3,200 t of uranium oxide for 4 of the past 5 years. In 2000, production was based on a mine production of 24.1 Mt of material, of which 11 Mt of ore was milled. Exploration drilling continued to define the Rössing ore body further, and construction began on the pilot radiometric ore sorting plant, which had been designed to increase uranium production and to improve cost performance by enhancing the mine feed grade for the processing plant. The sorting plant has the potential to remove about 25% of the total rock mass by eliminating low-grade rocks. Rössing has played an important part in the Namibian economy by expending more than $80 million per year in Namibia on wages, taxes, and goods and services and by accounting for about 12% of mineral exports and about 5% of all other exports (Rössing Uranium Ltd., [undated], RB 2000—Overview of operations, accessed August 5, 2001, at URL http://www.rossing.com/operate.htm).

Industrial Minerals

Diamond.—Exploration and development of new diamond fields, particularly offshore, remained active in 2000 and demonstrated the potential to expand this $25 million sector of the Namibian mineral economy. Diamond accounted for nearly 37% of total exports and 10% of GDP. In 2000, production of diamond decreased by 6% to 1.54 million carats; slightly more than one-half came from marine sources. Namdeb Diamond Corp. (Pty.) Ltd., which was established in 1994 as a 50-50 joint venture between De Beers Centenary AG and the Namibian Government, accounted for 1.32 million carats of this output. Namdeb operated the following license areas: Atlantic 1, Bogenfels, Douglas Bay, Elizabeth Bay, Mining Area 1, and Orange River. Located in the Sperrgebiet (forbidden territory), these six areas cover a strip of land that runs from the north bank of the Orange River to 26 degrees South. The 130-km-long strip extends up to 65 km into the Atlantic Ocean and inland for 100 km. In 2000, Namdeb stripped 24.8 Mt of waste material and treated 23.5 Mt of ore from land-based operations to recover an average of 2.8 carats per 100 t valued at $322 per carat. Marine mining operations in Atlantic 1 were conducted by De Beers Marine Namibia (Debmarine), which was controlled by De Beers (70%) and Namdeb (30%). Debmarine maintained a fleet of four mining vessels and two prospecting vessels. Recovery from marine mining in the Atlantic 1 license area in 2000 amounted to 570,000 carats from material that averaged 2.8 carats per 100 t valued at $298 per carat. De Beers reported a remaining mine life of 20 years at current (2000) production rates that are based on probable total (land plus marine) reserves of 59.4 Mt at a grade of 1.5 carats per 100 t, indicated total resources of 73.6 Mt at a grade of 2.3 carats per 100 t, and inferred total resources of 301.7 Mt at a grade of 1.5 carats per 100 t for a combined reserves and resources of 16.2 million carats of diamond (De Beers Group, [undated], Namdeb—Operations, accessed August 6, 2001, at URL http://www.debeersgroup.com/operations/minesNamdeb2000.asp).

In November, De Beers signed a new agreement with the Government to extend the exclusive Namdeb sales contract with the De Beers' Diamond Trading Company (DTC) (formerly Central Selling Organization) for another 5 years beginning January 1, 2001. De Beers also committed to supporting the launch of a second value-added diamond-cutting facility in Namibia in addition to Namdeb's Namgem cutting plant at Okahandja, which produced about 3,500 finished diamond stones per year. Both cutting plants would be supplied diamond rough by the DTC under terms of the agreement (De Beers Group, November 29, 2000, Government of the Republic of Namibia and De Beers Centenary AG, accessed August 6, 2001, at URL http://www.debeersgroup.com/archive/press/mr20001129-1.asp).

Following its acquisition of 92.5% of Ocean Diamond Mining Holdings Ltd. (ODM) for $60 million in late 1999, Namibian

Minerals Corp. (Namco) became the second largest diamond producer after Namdeb. Namco, which was a United Kingdom-based firm listed on the Namibian and the Toronto stock exchanges, began commercial mining of diamonds in February 1998 on its offshore Koichab prospect in Luderitz Bay. It operated three former ODM airlift mining vessels, the *Ivan Prinsep*, the MV *Namibian Gem*, and the *Oceandia*, and two Namco mining vessels, MV *Kovambo* and MV *Ya Toivo*, which supported the Namco-developed underwater *NamSSol I* (*Nam 1*) and *NamSSol II* (*Nam 2*) seabed mine-crawlers with a combined capacity of around 400,000 carats per year.

During 2000, Namco treated more than 1 million cubic meters of submarine sediments and produced 221,000 carats of diamond with an average sales price of $176 per carat compared with 273,700 carats of diamond with an average sales price of $151 per carat in 1999. The higher average price in 2000 was attributed to the larger (0.38-carat) stones recovered from ODM's Mining License 36. During 2000, Namco invested $50 million in constructing the *Nam 2* seabed crawler and conversion of its support vessel*, MV Ya Toivo*, which were launched in December; on the 3-month renovation of the MV *Namibian Gem*; and on development of a new exploration tool and conversion of it support vessel MV *Zacharias*. In January 2001, Namco suffered a major setback when the *Nam I* was damaged in an underwater landslide. Faced with the loss of significant cash flow, the company suspended all mining operations in February 2001 and was seeking outside financial help to rescue it from liquidation (Namibian Minerals Corp., May 22, 2001, Namibian Minerals Corp. (Namco) announces fourth quarter and full year 2000 results, accessed August 5, 2001, at URL http://infomine.com/index/pr/Pa070522.pdf).

In October, Diamond Fields International Ltd. (DFI) announced its plans to proceed with its $28 million Sea Diamonds Project on its Luderitz offshore diamond mining concessions, which included the Diaz Reef and the Marshall Fork areas. DFI used the results of contract sampling and test mining by Debmarine's mining vessel *MV Coral Sea* as a basis for the feasibility study completed in September. Resource estimates within the Diaz Reef and the Marshall Fork areas included indicated resources (probable reserves) of 5.03 million cubic meters of sediment at an average grade of 0.18 carat per cubic meter that contains 896,200 carats of diamond and inferred resources of 1.08 million cubic meters of sediment at an average grade of 0.19 carat per cubic meter that contains 209,800 carats of diamond. A 5.8-year mine life could be sustained by exploiting only the probable reserves, and a 7-year mine life, by the further exploitation of the inferred resources. Mining will be at the rate of 873,000 cubic meters per year. The diamond found within the Sea Diamonds Project consist of more than 95% gem-quality stones valued at $150 to $200 per carat based on August 2000 market prices (Diamond Fields International Ltd., September 12, 2000, Positive Sea Diamonds feasibility study completed, accessed August 8, 2001, at URL http://www.diamondfields.com/s/NewsReleases.asp?ReportID=15032). DFI received a 15-year mining license from the Government in February 2001 and in March 2001 announced a joint venture with the Trans Hex Group Ltd. to begin mining at the Sea Diamonds project within 8 months following Government approval of the joint venture. DFI will contribute the mining license, and Trans Hex, two air-lift mining vessels to the joint venture (Diamond Fields International Ltd., March 6, 2001, Diamond Fields and Trans Hex sign joint venture agreement, accessed August 8, 2001, at URL http://www.diamondfields.com/s/NewsReleases.asp?ReportID=20327).

Trans Hex International Ltd. (the Canadian diamond exploration subsidiary of Trans Hex Group of South Africa) managed the exploration on Block 9 of its Northbank, Orange River, property on behalf of Northbank Diamonds Ltd. (a 50-50 joint venture between Trans Hex International and Lazare Kaplan International Inc. of the United States). Based on 1997 drilling, the Northbank property had a drill indicated resource of 30 million cubic meters of diamond-bearing gravel deposited in a 4-km by 900-meter paleochannel. A dispute with the owner of the surface rights at Northbank has been under litigation and forced the suspension of exploration since early 1998, with the next hearing of the High Court of Namibia set for February 2001. Meanwhile, Trans Hex International continued parallel exploration for diamonds on its Skeleton Coast Project and conducted geophysical and sampling programs during 1999 and 2000. In partnership with Terradex (Pty.) Ltd., Trans Hex International was providing exploration funds for the Skeleton Coast Project to earn a 90% farm-in interest in Hoanib Diamonds (Pty.) Ltd. (the joint-venture company) (Trans Hex International Ltd., [undated], Trans Hex International Ltd.—Projects, accessed August 10, 2001, at URL http://www.transhex.com/s/Projects.asp).

Other companies active in diamond exploration during 2000 included Mount Burgess Gold Mining Co. NL and Kimberlite Resources Pty. Ltd., both of Australia. Both continued their geophysical and heavy-mineral concentrate sampling exploration for diamond-bearing source-rock kimberlites in the Tsumkwe region in northeastern Namibia near the Botswana border. Work by Mount Burgess during 2000 identified 18 potential kimberlite targets for drilling; these included the Khabi and the Nyae Nyae garnet anomalies (Mount Burgess Gold Mining Co. NL, February 19, 2001, Tsumkwe diamond project—Namibia, accessed August 8, 2001, at URL http://www.mountburgess.com/Announcements.html#19feb). Reefton Mining also held three exploration licenses for diamond that covered 200 km of coastline beaches along the Skeleton Coast. In August, Nora Exploration Inc. of Canada changed its corporate name to Afri-Can Marine Minerals Corp. Afri-Can held a controlling interest in 28 concessions that measured 26,500 square kilometers off the coast of Namibia in two main areas; the Northern Blocks, which is located northwest of Hottentot Bay; and the Southern Concessions (Namibian Gemstones Block), which is located southwest of Elizabeth Bay. The company was continuing with geophysical and selective grab sampling exploration during 2000 and 2001 (Afri-Can Marine Minerals Corp., 2000, Diamond concessions, accessed August 1, 2001, at URL http://www.afri-canmarine.com/concessions.shtml).

Fluorspar.—Okorusu Fluorspar (Pty.) Ltd. completed its $4 million expansion to increase capacity to 80,000 t/yr of acid-grade fluorspar in 2000. Okorusu produced 66,129 wet metric tons of fluorspar in 2000 and exported 67,393 wet metric tons, to Solvay AG of Germany (its parent company). Okorusu contracted to deliver 80,000 wet metric tons of captive production to Solvay in 2001 (Mark Dawe, Chief Geologist, Okorusu Fluorspar (Pty.) Ltd., oral commun., 2001).

Gemstones.—In December, Offshore Development Co.

(25%) and Namdiamonds Inc. (75%) of the United States signed a joint-venture agreement that formed the Namibia Gemstones Development Co.; a $3.9 million gem cutting and polishing plant will be built at Keetmanshoop. The new company will provide training and marketing assistance to small-scale miners. Cut amethysts, garnets, topaz, and tourmaline will be targeted for export (Namibian, December 6, 2000, Namibia's offshore development company seals gem deal with US, accessed August 8, 2001, at URL http://newafrica.com/news/mining/articlepg1.asp?ID=6230).

Salt.—In 2000, production of industrial and refined sodium chloride salt increased by 8% to nearly 543,000 t (table 2). Salt and Chemicals (Pty.) Ltd., which was the primary producer, accounted for more than 80% of national production.

Mineral Fuels

Namibia was import dependent for most of its energy needs with no domestic production of coal, gas, or oil. The hydroelectric dam at Ruancana provided 249 megawatts (MW) of power, and an additional 600 MW was imported from South Africa under arrangements with Eskom and the South African Power Pool. The Third Petroleum Licensing Round for bidding on open-exploration acreage that was held in October 1998 received no bids. The country's hopes for meeting future energy requirements rested on development of its hydroelectric potential and of extensive known offshore gas reserves. Shell Exploration and Production Namibia B.V. (75%), Texaco Namibia Resources (15%), and Energy Africa Ltd. (10%) held the rights to the offshore Kudu gasfield. The Government and Shell have been examining the potential for developing this resource for more than 5 years, but have been unable to work out the right combination of financing and supporting projects to justify the multibillion dollar investment required for its development.

Outlook

The long tradition of mining in Namibia was given a substantial renewal in 2000 with the announced development of the Skorpion zinc project, the reopening of the Tsumeb mines and smelter, and the continued success of offshore diamond exploration and development. These successes are encouraging further exploration for base metals and diamond. Such new mine developments, as well as the potential for new value-added manufacturing, metal-processing, and gemstone cutting and polishing industries, should keep the mineral sector a central part of the economy of Namibia for the foreseeable future. The Government's ability to attract new investment to harness the natural gas and hydroelectric power potential of the Kunene River will strongly influence future economic growth. In the longer run, greater development of regional transportation infrastructure in northern Namibia, which was stimulated by the completion of the recent Trans-Kalahari and Trans-Caprivi Highways, could make Walvis Bay a significant export route for new mineral developments in Angola and in the landlocked countries of Botswana and Zambia. With a climate that is among the driest in the world, Namibia will continue to deal with the lack of water resources as a constraint on development.

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Abraham, K.S., 1998, Namibia sweetens terms for third round: World Oil, v. 219, no. 1, January, p. 37.

Major Sources of Information

Association of Prospectors and Miners of Namibia
P.O. Box 5059
Windhoek, Namibia
Telephone: (264) 61 34978
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The Chamber of Mines of Namibia
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Geological Survey of Namibia
Private Bag 2168
1 Aviation Rd.
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Fax: (264) 61 249-146
Internet: http://www.gsn.gov.na/survey.htm
Ministry of Mines and Energy
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Ministry of Trade and Industry
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Telephone: (264) 61 229-933
Fax: (264) 61 220-227
Government Internet site: http://www.republicofnamibia.com
Namibia National Small Miners Association
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Major Publications

Chamber of Mines of Namibia, Annual Report.
Geological Survey of Namibia, 1992. The Mineral Resources of Namibia, 598 p.

TABLE 1
NAMIBIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity		1996	1997	1998	1999	2000
METALS						
Antimony, sodium antimonate (47% Sb):						
Gross weight		16	--	--	--	--
Sb content		8 e/	--	--	--	--
Arsenic, white, 99% arsenic trioxide		1,559	1,297	175	--	--
Cadmium metal, refined		14	2	--	--	--
Copper:						
Mine output, concentrate (26% to 28% Cu):						
Gross weight		57,095	66,879	22,819	--	18,597
Cu content		14,845	17,879	7,500 r/	--	5,070
Metal, blister 2/		16,659	24,997	8,014	--	13,488
Gold	kilograms	2,145	2,417	1,882	2,005 r/	2,456
Lead:						
Mine output, concentrate:						
Gross weight		58,197	32,378	24,273	18,653 r/	22,754
Pb content		15,349	13,577	13,568	9,885 r/	12,115
Metal, refined, primary 2/		8,588	1,530	236	--	--
Manganese, mine output, concentrate (44% Mn):						
Gross weight		92,647	39,671	--	--	--
Mn content		40,765	17,455	--	--	--
Silver, mine output, Ag content of concentrate	kilograms	42,352	41,000	22,670	9,670	16,669
Uranium, U_3O_8 content of concentrate		3,188	3,775	3,257	3,171	3,201
Zinc, mine output, concentrate (49% to 54% Zn):						
Gross weight		69,689	72,816	78,617	70,620 r/	75,747
Zn content		35,873	39,658	42,274	35,140 r/	40,266
INDUSTRIAL MINERALS						
Cement e/		50,000	100,000	150,000	150,000	150,000
Diamond:						
Gem e/	thousand carats	1,402	1,345 e/	1,394 e/	1,633 r/	1,542
Industrial e/	do.	--	71 e/	73 e/	-- r/	--
Total	do.	1,402	1,416	1,467	1,633 r/	1,542
Fluorspar, acid grade (97% CaF_2)		32,285	23,160	42,139	71,011 r/	66,129
Gypsum		--	--	2,596	1,250 e/	588
Lithium minerals:						
Amblygonite		46	75	--	--	--
Lepidolite		355	275	--	--	--
Petalite		1,571	669	--	--	--
Total		1,972	1,019	500	--	--
Salt		355,868	492,780	507,361	503,479 r/	542,948
Semiprecious stones:						
Agate		150	175	161	95	96
Amethyst	kilograms	19	23	--	--	4,850
Chrysocolla	do.	--	--	900	-- r/	--
Garnet	do.	--	5	429	-- r/	134
Quartz, crystal e/		15	--	--	--	--
Pietersite		--	--	--	--	20
Rose quartz		190	220	454	-- r/	74
Sodalite		383	1,598	--	429 r/	457
Tourmaline	kilograms	437	53	--	--	390
Stone:						
Dolomite		5,401	7,635	7,940	8,000 e/	--
Granite		5,218	6,675	6,665	5,866 r/	7,222
Marble		12,673	13,743	9,020	11,221 r/ e/	24,426
Sulfur, pyrite concentrate:						
Gross weight (49% to 51% S)		90,735	94,585	28,174	--	11,967
S content		45,338	46,476	12,855	--	5,704
Wollastonite		248	194	267	347	441

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

1/ Table includes data available through November 30, 2000.

2/ Includes products of imported concentrate.