

THE MINERAL INDUSTRY OF

NAMIBIA

By George J. Coakley

Namibia is located on the southwest coast of Africa between South Africa and Angola. The 825,418-square-kilometer country had an estimated population of 1.65 million in 1998 and a gross domestic product (GDP) per capita of about \$4,100 based on purchasing power parity. In 1998, the mineral industry of Namibia provided about 43% of exports and 20% of the country's GDP. Diamonds remained the center of the mining industry in Namibia, followed by uranium, for which Namibia ranked as the world's fourth largest producer. Namibia was also the largest producer of salt in Africa. The minerals industry experienced significant setbacks with the long mining tradition at Tsumeb Corp. Ltd.'s copper and lead operations coming to an end with its sudden closure in early 1998 by its owner Gold Fields Ltd. of South Africa and an official liquidation in early 1999. The sole lithium producer NamLithium Mines (Pty.) Ltd. became insolvent and abandoned operations in June 1998. The owners of the Otjisondu Manganese Mines shut down suddenly owing to weak prices and loss of Asian markets. In early 1999, Shell Exploration and Production BV of the Netherlands and the South African power company Eskom withdrew from the proposed \$850 million development of the Kudu gasfield and powerplant. The Government's proactive policies, however, continued to encourage new entrants in copper, diamond, petroleum and natural gas, and zinc.

Namibia produced a range of metallic and industrial minerals. During 1998, production declines were seen in most metals with the exception of zinc owing to the closure of Tsumeb. (See table 1.) Production levels of most industrial minerals increased compared with those of 1997, with significant increases in fluorspar (+76%) and salt (+9%). The value of all mineral exports declined to \$626 million¹ in 1998 compared with \$727 million in 1997. Lower export revenues were partially offset internally by a 28% devaluation of the Namibian dollar, which was pegged to the South African rand. Of the \$626 million in mineral exports in 1998, diamonds accounted for 70%; the category of "uranium and others," 19.9%; zinc, 4%; gold, 3.2%; and copper-lead-silver, 2.5% (Murray, 1999).

Commodity Review

Metals

Copper-Lead-Zinc.—In a surprise move, Gold Fields closed down all mining and smelting operations in Namibia and laid

off around 2,000 workers at the Tsumeb mine tailings retreatment area and at the Khusib Springs, the Kombat, and the Otjihase Mines on April 16, 1998. The closure action was made with no advance notice to Gold Fields employees, triggering grievances and legal actions by the Mineworkers Union of Namibia and the Government of Namibia that took several months to resolve. The company was officially liquidated in March 1999. The Government continued with efforts to attract new investors to take over the Tsumeb operations.

In other copper developments, Namibia Copper Joint Venture (Pty.) Ltd., a partnership between Namibia Copper Mines Inc. (80%) of the United States and the Australian firm, Great Fitzroy Mines NL (20%), put its efforts to develop the Haib porphyry copper deposit in southern Namibia on hold pending improved copper market conditions and its evaluation of 1998 work done to reassess ore reserves. The company had previously reported the Haib deposit to have a minable resource of 604 million metric tons (Mt) of 0.341% copper. On the basis of a 1997 feasibility study, costs to develop the Haib open pit mine and associated solvent extraction/electrowinning facilities, with an annual output of more than 100,000 metric tons (t) of cathode copper, 530 kilograms of gold, and 880 t of molybdenum concentrate, were estimated to be \$560 million (Namibia Copper Joint Venture (Pty.) Ltd., 1998).

Imcor Tin (Pty.) Ltd., which operated the Rosh Pinah zinc-lead-silver mine, produced a zinc and a lead-silver concentrate. Contained zinc output increased by 4% to 42,142 t in 1998 compared with that of 1997. Contained lead increased 4% to 13,303 t with contained silver up 21% from 5 to 6 t. Following an agreement between Imcor's principal owners, Iscor Ltd. of South Africa and PE Minerals, a new 50-50 joint-venture operating company to be named Rosh Pinah Zinc Corp. will be established by mid-1999 and based in Windhoek; PE Minerals was a consortium of Namibian and Malaysian businessmen who held the mineral rights to the Rosh Pinah Mine. In a separate but related action during 1998, Iscor purchased the 65% interest not already owned by Iscor in the Zinc Corporation of South Africa Limited (Zincor) smelter from the shareholders, Gold Fields, New Wits Ltd., and Vogelstruisbult Metal Holdings Limited, for \$43 million. Rosh Pinah zinc concentrates were exported to the Zincor smelter in South Africa for refining, while the lead concentrate had been toll refined at Tsumeb, which had been closed. Exploration in 1997 had proven sufficient ore reserves to extend the life of the mine from 3 years to 12 years.

In a potentially major zinc sectoral development, Reunion Mining plc. of the United Kingdom completed exploration

¹Where necessary, values have been converted from Namibian dollars to (N) to U.S. dollars at the rate of N5.9=US\$1.00 for 1998.

drilling and a feasibility study on the Skorpion zinc deposit, 20 kilometers (km) north of the Rosh Pinah Mine, in November 1998. Rights to the property were held by the Anglo American plc subsidiary Erongo Mining and Exploration Co. Ltd. By completing the favorable feasibility study, Reunion earned a 60% interest in the property. In turn, in April 1999, Anglo American bought Reunion Mining and took over 100% control of Skorpion. The purchase of Reunion coincided with Anglo's acquisition of the Black Mountain zinc mine and the Gamsberg zinc deposit in South Africa, giving Anglo added leverage in establishing a major zinc mining and smelting operation in the region. The feasibility study at Skorpion confirmed fully diluted proven reserves of 17.5 Mt grading 10.4% zinc and a further probable reserve of 2 Mt grading 7.6% zinc. Reserves would support a capital investment of \$280 million to mine 1.5 million metric tons per year (Mt/yr) of ore and to produce 150,000 metric tons per year (t/yr) of special high-grade refined zinc during the first 7 years, with a total mine life of 14 years (Murray, 1999).

Gold.—The Navachab gold mine accounted for more than 95% of total national gold production. The ore treatment plant at Navachab was upgraded during 1997 to increase throughput to 1.3 Mt/yr. The mine's parent company, AngloGold Ltd. of South Africa, was evaluating the feasibility of accessing ore below the current open pit design and extending the mine life by some 12 years. A decision was expected in March 1999.

Uranium.—Rossing Uranium Ltd., which was owned by Rio Tinto Plc of the United Kingdom, was the fourth largest producing uranium mine in the world, contributing about 9% of world supply in 1998. Faced with an extended weak market, it continued to operate at about 75% of capacity. Rossing played an important part in the Namibian economy, expending more than \$50 million per year in Namibia on wages, taxes, goods, and services and accounting for about 15% of mineral exports and about 10% of all other exports.

Industrial Minerals

Diamond.—Developments in 1998 may lead to an increase in diamond production from 1.4 million carats per year to about 2 million carats per year by yearend 1999. New investment in current operations by De Beers Marine (Pty.) Ltd. (Debmarmine) and Ocean Diamond Mining Holdings Ltd. (ODM) of South Africa and startup of new offshore diamond mining operations by the Canadian companies Namibian Minerals Corp. (Namco) and Diamond Fields International Ltd. (DFI) contributed to this increase. In November 1998, the National Assembly began drafting a new Diamond Law aimed at deregulating and decriminalizing the purchase, sale, and import/export of diamonds. The new law could end De Beers control over Namibian diamond marketing.

In 1998, production of diamonds increased by 4% to 1.47 million carats, slightly more than one-half from marine sources. Namdeb Diamond Corp. (Pty.) Ltd. (Namdeb), a joint venture of De Beers Consolidated Mines Ltd. of South Africa and the Namibian Government, accounted for 1.28 million

carats of this output; about 61% came from onshore mining on its concession, which covers nearly 130 km of the coastal strip northwards of the Orange River. The 6% drop in Namdeb's production in 1998 was in response to weak demand and a 74% quota of normal diamond deliveries by De Beers Central Selling Organization. In 1998, Namdeb treated 26 Mt of beach sand materials and recovered 705,500 carats at a grade of 2.7 carats per 100 t. Namdeb indicated that onshore reserves were more than sufficient for its current (1998) 10-year mine planning cycle but that production was set to be reduced progressively from 2003 when mining will shift to dump retreatment, dredging, and smaller operations (Murray, 1999).

Debmarmine, a subsidiary of the South African-based De Beers Consolidated, handled offshore marine mining for Namdeb and produced 497,128 carats of diamonds in 1998. Their concession extended from Oranjemund to Luderitz and up to 200 km into the Atlantic Ocean. Debmarmine operated six mining vessels off Namibia, including the newly commissioned *Gariiep*, which is equipped with a new crawler technology designed to mine low-grade sea bottom material. De Beers Consolidated's \$12 million diamond cutting and polishing plant at Okahandja became operational in early 1998.

Namco, a United Kingdom-based firm listed on the Toronto and Namibian stock exchanges, began commercial mining of diamonds in February 1998 on its offshore Koichab prospect in Luderitz Bay. In December 1997, Namco took delivery of NamSSol, a 120-t underwater mining crawler, which is operated from the mining vessel *MV Kovambo*. The NamSSol crawler, operating 20 hours per day during an expected life of 10 years, will deliver a slurry containing 18% solids to the processing plant on the *Kovambo*. The processing plant can treat 50 metric tons per hour with an expected recovery of 90% of the diamonds. The success of the crawler in 1998 led Namco to order a second, enhanced NamSSol II crawler that will be delivered by yearend 1999 and will permit an increase in production capacity to more than 300,000 carats per year. Namco produced 100,100 carats of diamonds, 95% of which were gem quality, for the year ending December 31, 1998. The average price was \$134 per carat received in fourth quarter 1998 sales. Stone size ranged from 0.1 to 10.3 carats with an average size of 0.33 carat. The company anticipates increasing output to 200,000 carats in 1999 (Namibian Minerals Corp., 1999).

ODM commissioned a new offshore mining and sampling vessel the \$7 million *Ivan Prinsep* in February 1999, contributing to an increase in diamond production to 63,074 carats for the year ending March 31, 1999. ODM's average diamond prices declined by 12%, to an average of \$166 per carat, for a turnover of \$10 million. ODM's mining fleet also included the *MV Namibian Gem* and the *Oceandia* that are exploiting concessions covering an area around the 12 islands off the Namibian coast from Luderitz. A new real-time sonar visualization system on the *MV Namibian Gem* allowed ODM to increase productivity by recovering similar amounts of diamonds from areas 30% smaller than previous mining sites. The addition of the *Ivan Prinsep* should help ODM increase production to more than 100,000 carats per year within 2 years (Mining Journal, 1999).

Nora Exploration Inc. of Canada had interests in several offshore marine mining joint ventures. It held a 43% interest and an option to acquire the remaining 53% interest in Otjua Minerals (Pty.) Ltd. Otjua Minerals held the contract with Namdeb to develop its offshore Otjua concession, which had an inferred resource of 3.35 million carats. Nora generated about \$1 million in diamond sales during its financial year ending August 31, 1998, but operated at a loss and was reevaluating its sampling and mining methodologies. Nora held a 40% interest in and an option to acquire up to 80% of a joint venture with Namibian Gemstones Mining Corp. (Pty.) Ltd. Namibian Gemstones had the rights to 23 deepwater concessions, representing the second largest marine diamond concession in southern Africa. Nora was evaluating the results of a major geophysical survey of 9,000-square-kilometer (km²) portion of the concession completed by the Council for Geosciences of South Africa during 1998. Nora was also negotiating joint ventures with Woduna Mining Holdings (Pty.) Ltd. on the 1,000-km² offshore Block J concession and with Karas Mineral Holding (Pty) Ltd. on its 900-km² offshore Block N (Nora Exploration Inc., 1998, Annual report for 1998, accessed November 30, 1999, at URL <http://www.nora.com/>).

DFI and its subsidiary Diamond Fields Namibia (Pty) Ltd. began exploration on its Luderitz offshore diamond mining concessions in 1998 and in October contracted Debmarine to conduct sampling and test mining by using Debmarine's mining vessel *MV Coral Sea*. DFI recovered 4,484 carats from its first-phase sampling program with an average size of 0.38 carat, which sold for an average value of \$164 per carat. The average sample grade was 1.28 carats per square meter.

Trans Hex International Ltd., the Canadian diamond exploration subsidiary of the South African parent company Trans Hex Group Ltd., continued exploration on Block 9 of its Northbank, Orange River property. The commencement of bulk sampling at the Northbank Project was delayed by the legal action of the surface rights owner, but the ruling of the arbitration commission cleared most of the impediments, and excavation of the first bulk sampling site was expected to begin in mid-1999. The Northbank property had a drill-indicated resource of 30 million cubic meters of gravel deposited in a 4-km by 900-meter paleochannel. Trans Hex continued parallel exploration for diamonds on its Skeleton Coast project with little success in 1998 (Trans Hex International Ltd., May 25, 1999, THI today announced the results of its operations for the fiscal year ending March 31, 1999, press release, accessed December 22, 1999, at URL <http://www.transhex.com/projects-fr.htm>).

Other companies active in diamond exploration during 1998 included the Australian companies Mount Burgess Gold Mining Co. NL and Kimberlite Resources Pty. Ltd. in the Tsumkwe region in northeast Namibia near the Botswana border and Kalahari Mining NL and Straits Resources Ltd. of Australia. The Russian diamond producer, Almaz Rossii-Sakha, signed an agreement to explore for diamonds near the Kalahari Desert on the Botswana border and for offshore marine deposits.

Fluorspar.—In 1997, Okorusu Fluorspar (Pty.) Ltd. was

proceeding with its planned expansion to increase capacity to 80,000 t/yr of acid-grade fluorspar by 1999. Progress in 1998 was reflected by a 76% increase in production compared with that of 1997 to 40,683 t of fluorspar (Mark Dawe, Okorusu Fluorspar (Pty.) Ltd., oral commun., 1999)

Salts.—In 1998, production of industrial and refined sodium chloride salt increased by 9% to 536,480 t. Salt and Chemicals (Pty.) Ltd. was the primary producer, accounting for 434,200 t.

Mineral Fuels

In February 1998, the Government issued an Energy Policy White Paper that set a goal of meeting 75% of peak demand for electricity from domestic sources by 2010. Electricity consumption in 1998 was estimated to be 0.6 billion kilowatt hours. The two main projects designed to help to meet this goal were the Kudu natural gas project and the Epupa hydroelectric dam. Namibia was dependent on outside investment to meet this target.

The Kudu gasfield was held by Shell Exploration and Production Namibia B.V. (75%), Texaco Namibia Resources (15%), and Energy Africa Ltd. (10%). Estimates by Namibia's national electricity company NamPower indicated that this field contained reserves of 280 billion cubic meters of low-sulfur natural gas and could achieve gas flow rates in excess of 2.1 million cubic meters per day. Intensive seismic studies indicate the potential for up to 283 billion cubic meters, sufficient to power a 2,000-megawatt (MW) powerplant for more than a century (U.S. Embassy, Pretoria, South Africa, 1996). Other reports indicated that Shell and the Kudu Field's other operators felt that these reserve estimates may be too optimistic and that Kudu recoverable gas reserves were more on the order of 56 billion cubic meters. In May 1997, NamPower reached an agreement with Eskom to build a 750-MW combined cycle powerplant at Oranjemund that will use Kudu natural gas reserves. The Shell partnership was to finance the \$350 million development of the Kudu gasfield and share the \$500 million cost of building the powerplant with NamPower and Eskom (Mbendi Information Services (Pty.) Ltd., March 25, 1998, Namibia—Oil industry profile—Upstream, accessed September 22, 1998, at URL <http://mbendi.co.za/indy/oilg/oilgnaus.stm>). The project had a major setback by early 1999 when Shell and Eskom withdrew their participation.

The proposed Epupa Dam project called for a 660-MW hydroelectric dam to be built on the Kunene River on the Angolan/Namibia border at a cost of \$540 million. Conflicts with Angola on the site of the dam, potential population dislocations, environmental impacts, and financing remained as problems.

Prior to opening up the Third Petroleum Licensing Round for bidding on open exploration acreage on October 1, 1998, the Government passed the Petroleum Law Amendments Act of 1998, which introduced a number of new incentives, including reduction of royalties on the value of oil and gas production from 12.5% to 5%, a reduction of the petroleum income tax from 42% to 35%, 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 25%.

Outlook

The rash of mine closures in 1998 have put a damper on the long tradition of mining in Namibia. A reopening of the traditional diamond regions in the south to exploration for other mineral commodities and the renewed interest in offshore and mainland mineral exploration opportunities by foreign investors, however, has given hope for a new generation of mineral and energy projects in Namibia. Proposed new diamond, copper, and zinc mines and the potential for new value added manufacturing or metal-processing industries may keep the mineral sector a central part of the economy of Namibia for the foreseeable future. The Government’s ability to attract new investment and 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, including the Caprivi Strip, could see Walvis Bay become 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.

For more extensive coverage of the legislative framework, environmental issues and infrastructure of the minerals industry of Namibia, see the 1997 Minerals Yearbook, Volume III, Mineral Industries of Africa and the Middle East.

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Major Sources of Information

- Association of Prospectors and Miners of Namibia
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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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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/ 2/

(Metric tons unless otherwise specified)

Commodity	1994	1995	1996	1997 3/	1998 3/
METALS					
Antimony, sodium antimonate (47% Sb):					
Gross weight	29	--	16	--	--
Sb content	14	--	8 e/	--	--
Arsenic, white, 99% arsenic trioxide	2,775	1,661	1,559	1,297 r/	175
Beryl concentrate	--	--	--	--	--
Cadmium metal, refined	19	15 e/	14	2	--
Cesium, pollucite, gross weight e/	5	--	--	--	--
Copper:					
Mine output, concentrate (28% to 30% Cu):					
Gross weight	97,900	81,646	57,095	66,879 r/	22,819
Cu content	28,400	22,530	14,845	17,879 r/	6,500
Metal, blister 4/	30,100	29,799	16,659	24,997 r/	8,014
Gold kilograms	2,445	2,394	2,145	2,417 r/	1,882
Lead:					
Mine output, concentrate (30% to 32% Pb):					
Gross weight	43,800	57,105	58,197	32,378	24,295
Pb content	13,917	16,084	15,349	13,577	13,303
Metal, refined, primary 4/	23,800	26,752	8,588	1,530 r/	236
Manganese, mine output, concentrate (44% Mn):					
Gross weight	--	95,385	92,647	39,671	--
Mn content	--	43,004	40,765	17,455	--
Silver, mine output, Ag content of concentrate kilograms	62,000	69,000	42,352	41,000 r/	23,000
Tin, mine output, concentrate (61% to 67% Sn):					
Gross weight	6 e/	--	--	--	--
Sn content	4 e/	2	--	--	--
Uranium, U ₃ O ₈ content of concentrate	2,235	2,366	3,188	3,775 r/	3,257
Zinc, mine output, concentrate (49% to 54% Zn):					
Gross weight	64,568	59,290	69,689	72,816 r/	78,670
Zn content	33,400	30,209	35,873	39,658 r/	42,142
INDUSTRIAL MINERALS					
Cement e/	20,000	20,000 r/	50,000 r/	100,000 r/	150,000
Diamond:					
Gem e/ thousand carats	1,312 3/	1,382 3/	1,402	1,345 e/	1,394 e/
Industrial e/ do.	--	--	--	71 e/	73 e/
Total do.	1,312	1,382	1,402	1,416	1,467
Fluorspar, acid grade (97% CaF ₂)	52,226	36,889	32,285	23,160 r/	40,683
Gypsum e/	121	--	--	--	2,596
Lithium minerals:					
Amblygonite	5 e/	3	46 r/	75	--
Lepidolite	90 e/	106	355	275	--
Petalite	650 e/	2,502	1,571	669	--
Total	745 e/	2,611	1,972 r/	1,019	500
Salt	356,965	303,986	355,868 r/	492,780	536,480
Semiprecious stones:					
Agate	175	115	150	175	161
Amethyst	338	5	19	23	--
Chrysocolla kilograms	6,500	--	--	--	900
Diopase do.	50 e/	--	--	--	--
Garnet	--	--	--	5	429
Quartz, crystal e/	50	--	15	--	--
Rose quartz	170	200	190	220	454
Sodalite	1,143	465	383	1,598	--
Tourmaline kilograms	600 e/	--	437 r/	53	--
Stone, sand and gravel:					
Dolomite	--	--	5,401	7,635	7,940
Granite	11,585	4,518	5,218	6,675	6,665
Marble	12,061	16,935	12,673 r/	13,743	9,020
Quartz e/	350	--	--	--	--

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	1994	1995	1996	1997	1998
INDUSTRIAL MINERALS--Continued					
Sulfur, pyrite concentrate:					
Gross weight (49% to 51% S)	121,634	103,140	90,735	94,585	28,174
S content	60,000 e/	51,330	45,338	46,476	12,855
Wollastonite	1,309	967	248 r/	194	267

e/ Estimated. r/ Revised.

1/ Estimated data are rounded to three significant digits.

2/ Table includes data available through December 30, 1999.

3/ Reported figure.

4/ Includes products of imported concentrate.

TABLE 2
NAMIBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		African Portland Cement	Otjiwarongo, near Windhoek	150,000.
Copper		Tsumeb Corp. Ltd. (Gold Fields Namibia Ltd., 66%)	Khusib Springs Mine Tsumeb smelter	15,500 copper in concentrate, 60,000 blister copper.
Do.		do.	Kombat Mine, 50 kilometers south of Tsumeb	10,000 copper in concentrate.
Do.		Otjihase Mine (Tsumeb Corp. Ltd., 70% JCI/Ltd., 30%)	Otjihase Mine, near Tsumeb	18,000 copper in concentrate.
Diamond	thousand carats	Namdeb Diamond Corp. (Pty.) Ltd. (De Beers Centenary AG, 50%; Government, 50%)	Mines near Oranjemund; Elizabeth Bay Mine, 25 kilometers south of Luderitz; and marine operations	1,500.
Do.	do.	Namibian Minerals Corp. (NAMCO)	Marine operations offshore Luderitz and Hottentots Bay	200 (300+ by 2000).
Do.	do.	Ocean Diamond Mining Holdings Ltd. (NAMCO, 50.8%)	Marine operations offshore Luderitz	80 (100 by 2000).
Do.	do.	Trans Hex International Ltd.	Northbank, Orange Rriver	
Do.	do.	Diamond Fields Namibia (Pty.) Ltd.	Marine operations offshore Luderitz	5 (sampling stage).
Do.	do.	Nora Exploration Inc.	Otjua offshore concession	8 (sampling stage).
Fluorspar		Okorusu Fluorspar (Pty.) Ltd. (Solvay Group, 100%)	Okorusu, 48 kilometers north of Otjiwarongo	50,000, 98% calcium fluoride; 80,000 by 1999.
Gold		Erongo Mining and Exploration Co. Ltd. (Anglo American Corp., 67.5%, Inmet Mining Corp., 20%, Randgold Ltd., 10%)	Navachab Mine near Karibib	3.
Lead		Tsumeb Corp. Ltd. (Gold Fields Namibia Pty. Ltd., 66%)	Tsumeb (Ausmelt) smelter (closed in 1998)	24,000 lead bullion.
Do.		Rosh Pinah Zinc Corp. (Isacor Ltd., 50%; PE Minerals, 50%). Formerly Imcor Tin (Pty.) Ltd.	Rosh Pinah Mine, 80 kilometers northeast of Oranjemund	15,000 lead in concentrate.
Lithium		NamLithium Mines (Pty.) Ltd. (Kloeckner; Matramco)	30 kilometers south of Karibib (closed in June 1998)	1,500 concentrate.
Manganese		Otjosondo Manganese Mines Ltd. (Cranford Namibia Pty. Ltd., 100%)	Otjosondu, 160 kilometers north- east of Windhoek (closed in 1998)	100,000 ore with 45% manga- nese content.
Salt		Salt and Chemicals (Pty.) Ltd. (Sentrachem, 100% ?)	Walvis Bay brine pans	450,000.
Do.		Salt Company (Pty.) Ltd. (private, 100%)	Swakopmund	150,000.
Stone	cubic meters	Karibib Mining and Construction Co. (Namibia) Ltd. (private, 100%)	Marble quarry at Karibib Granite quarry	2,500, 600.
Uranium		Rossing Uranium Ltd. [Rio Tinto plc, 68.6%; Cogema (France), 10%]	Rossing, 30 kilometers east of Swakopmund	5,000 uranium oxide.
Zinc		Rosh Pinah Zinc Corp. (Isacor Ltd., 50%; PE Minerals, 50%)	Rosh Pinah Mine, 80 kilometers northeast of Oranjemund	45,000 zinc in concentrate.