THE MINERAL INDUSTRY OF

ZIMBABWE

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The Republic of Zimbabwe is a landlocked nation in southern Africa surrounded by Zambia to the north, Mozambique to the east, South Africa to the south, and Botswana to the west. It covers an area of 390,580 square kilometers (km^2) and supported a population of 11.4 million in 2001. For 2001, the gross domestic product (GDP) was $28 billion, and the per capita GDP was $2,450 based on 2001 purchasing power parity estimates. The real GDP growth rate for 2001 was a negative 6.5%. The economy has suffered severely during the past 3 years. Causal factors included weak international commodity prices, the pegged exchange rate, limited capital availability, high inflation, and fuel and hard currency shortages. Although the official exchange rate has been fixed at 55 Zimbabwe dollars (Z$) equal to 1 U.S. dollar, the parallel market exchange rate has been as much as six times higher. The Government's commitment of military support to the civil war in the Democratic Republic of the Congo [Congo (Kinshasa)] also was a sizable drain on extremely scarce national resources. The state-sanctioned involuntary expropriation of commercial farm lands threatened to spill over to the mining sector and sharply increased the political risk component of any new foreign investment (U.S. State Department, 2000§[1]). A high foreign debt and difficulty in meeting debt service payments created further problems for the country as the World Bank placed Zimbabwe on nonpayment status in October 2000 and the International Monetary Fund removed it from the list of countries eligible to borrow resources under the Poverty Reduction and Growth Facility in September 2001 (International Monetary Fund, 2001§; World Bank, 2001§).

The mineral industry was diverse with more than 35 mineral commodities produced from more than 1,000 mines, mostly small. Although economic conditions during 2000 and 2001 forced many smaller mines to close. The total value of mineral production, which is based on the official exchange rate, was about $722.5[2] million in 2001 with chromium and value-added ferroalloys accounting for 26.8%; gold, for 26.7%; nickel and cobalt, for 19.4%; coal, for 10.7%; asbestos, for 6.8%; and platinum group metals, for 4.8%. The actual current hard currency value of output, however, was estimated to be more realistically valued at about $300 million (Holloway, 2002). Gold was the most important commodity; output was valued at the official rate at approximately $193 million in 2001, which was down from $194 million in 2000 and $244 million in 1999 by value. The gold sector, which was the country's second largest export earner after tobacco, continued to suffer from the weakened economy and governmental policies, which included the Reserve Bank's announcement in June 2001 that it would increase its hard currency holdback of export proceeds to 40% from 25%. Production of gold declined to 18 metric tons (t) in 2001 compared with 27.7 t in 1999. The Reserve Bank hard currency restrictions also impacted other mining operations that produced commodity minerals that were fully exported, such as asbestos and chromium. Zimbabwe was a major contributor to the world supply of chrysotile asbestos, ferrochromium, and lithium minerals. Between 1999 and 2000, employment in the mining and quarrying sector declined to 45,000 workers from an estimated 60,000. During the political turmoil of 2001, about 20 mines, mostly gold and black granite, were temporarily occupied by "war veterans," and labor unrest led to several strike actions, the most serious being at the state-owned Zimbabwe Iron and Steel Company's (Ziscosteel) Kwekwe works (Holloway, 2002).

In addition to economic and political difficulties, Zimbabwe had one of the highest incidences of HIV/AIDS infection in the world; 33.7% of the adult population between 15 and 49 years old was infected by the end of 2001. This had a direct impact on the productivity of agricultural workers, which contributed to food shortages in the country. An estimated 200,000 deaths were attributed to AIDS in 2001, and since the beginning of the epidemic, more than 780,000 children have been orphaned (Joint United Nations Programme on HIV/AIDS, 2002§). The HIV/AIDS epidemic has had a significant impact on mining by adding substantially to direct and indirect labor costs as a result of absenteeism, lost productivity, medical treatment, and skill replacement.

Production and Trade

Between 2000 and 2001, production declined from -5% to more than -28% in the following major commodities: asbestos, blister and refined copper, diamond, gold, iron ore, lithium, and vermiculite (table 1). On the positive side, production increases of from 1% to 24% were noted in chromite, coal, cobalt, ferrochromium, nickel, platinum-group metals, and crude steel.

The International Monetary Fund estimated data for 2001 indicated that mineral and manufactured metal exports accounted for $482.2 million out of total exports of $1.72 billion for the year. Major exports included gold ($166.5 million), ferroalloys ($140.6 million), asbestos ($62.5 million), nickel ($37.6 million), and iron and steel ($4.6 million). The main export trade partners were, in order of importance, South Africa, China, the Netherlands, Japan, and Italy. Export earnings have been progressively declining since 1995 when a total of $736.6 million in minerals and manufactured metals were exported, although this can be attributed in part to declining commodity prices over this period. In 2001, imports

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

[2]Where necessary, values have been converted from Zimbabwe dollars (Z$) to U.S. dollars at the average exchange rate of Z$54.95=US$1.00 in 2001 and Z$43.29=US$1.00 in 2000.

of electricity and fuels, which included petroleum products, were valued at $391.7 million, or 23% of total imports valued at $1.71 billion. On the basis of percentage of import trade, Zimbabwe's major trading partners were, in order of importance, South Africa, the United Kingdom, Japan, and Germany. South Africa supplied 48% of all imported goods (International Monetary Fund, 2002§).

Commodity Review[3]

Metals

Copper.—Mhangura Copper Mines, which was owned by Zimbabwe Mining Development Corporation (ZMDC), closed its mine and smelter in late 2001 owing to high costs and a lack of copper concentrate feed for the smelter.

Ferroalloys.—Zimbabwe Alloys Mines Limited (ZimAlloys) closed its low-carbon ferrochrome production at Gweru in March 2001 and continued with its project to convert its Gweru smelter to high-carbon ferrochrome production. ZimAlloys, in which the Japanese companies Japan Metals and Chemicals Co. Ltd. and Mitsui and Co. Ltd. each held a 25% interest, operated the 40,000-t/yr low-carbon ferrochrome plant at Gweru.

Gold.—The gold sector was one of the most affected sectors of the industrial economy in 2001. All gold had to be sold to the central Reserve Bank of Zimbabwe with payment in local currency at a fixed rate, which was lower than the rate at which the companies could buy foreign exchange. This has put the gold sector at a disadvantage to other companies whose commodities can be exported for hard currency. Despite belated Government attempts during late 2001 to introduce a floor price for gold of Z$23,650 per ounce of gold (equivalent to $430 per ounce at the official exchange rate), about 40 significant gold mines had gone out of business by early 2002 (Holloway, 2002). These closures included the operations of Consolidated Trillion Resources Ltd., Delta Gold NL (now AurionGold NL.), Falcon Gold Ltd., and First Quantum Minerals Ltd.

Of the major gold producers in 2001, Ashanti Goldfields Co. Ltd. of Ghana, which was faced with some mechanical and operational problems, saw production decline to 3,193 kilograms (kg) of gold at the Freda-Rebecca Mine compared with 3,489 kg in 2000. Ashanti reported remaining measured and indicated mineral resources at the Freda-Rebecca Mine to be 15.1 million metric tons (Mt) at a grade of 2.5 grams per metric ton (g/t) gold, of which 5.4 Mt at a grade of 2.4 g/t gold was in the proved and probable ore reserve category (Ashanti Goldfields Co. Ltd., 2002§). Rio Tinto Zimbabwe (Pty) Ltd. produced 2,084 kg of gold in 2001 compared with 2,177 kg in 2000. Of the 2001 total, 75% came from the Renco Mine; 18% from the Patchway Mine; and 5% from reprocessing of the Cam Mine tailings dump. With the addition of new production from tailings reprocessing, Kinross Gold Corp. increased output at the Blanket Mine in 2001 to 1,231 kg of gold compared with 1,075 kg in 2000. Concerned with operating difficulties and foreign exchange restrictions, Kinross wrote down $12 million in assets of the Blanket Mine at yearend 2001 but was committed to keeping the mine open during 2002 (Kinross Gold Corp., 2002§).

Gold output at Independence Gold Ltd., which was owned by Lonmin plc., declined to 5,260 kg in 2001 from 5,889 kg in 2000. Independence Gold operated the Arcturus, the How, and the Shamva Mines; the Muriel Mine was closed in June 2001 (Lonmin plc, 2001§).

Cluff Mining plc operated the Maligreen gold deposit, which is located approximately 240 km southwest of Harare. During 2001, the Maligreen gold mine, which was a 50-50 joint venture with Pan African Mining, processed approximately 94,000 t of ore at a grade of 4.7 g/t; this yielded production of 388 kg of gold. The oxide operations were scheduled to cease in mid-2002 (Cluff Mining plc, 2002§).

Iron and Steel.—Production of crude steel at Ziscosteel operations decreased by 40% to 156,000 t in 2001 following a 3-day strike in August by 4,000 workers who were protesting for wage increases. The violent strike action led to the death of three workers and damaged the main blast furnace and other equipment, which took 3 months to return to operation. The Ziscosteel plant had the capacity to produce 800,000 metric tons per year (t/yr) of crude steel. Ziscosteel was also having problems paying its suppliers of coal (Wankie Colliery Co. Ltd.), iron ore (Buchwa Mine Iron Mining Co.), and electricity and transportation (Financial Gazette [Zimbabwe], 2001§).

Nickel.—Bindura Nickel Corp. (BNC), which was owned by Anglo American plc (52.9%), operated the Madziwa, the Shangani, and the Trojan nickel mines; a nickel smelter; and a nickel refinery. The Madziwa Mine was placed on a care-and-maintenance basis at yearend 2000; further exploration and evaluation continued in 2001. The Shangani Mine milled 961,000 t of ore at an average grade of 0.48% nickel; this yielded 3,388 t of nickel contained in concentrates. Flooding of the mine early in the year affected production. A new subincline shaft at the Shangani Mine was scheduled for commissioning during the first half of 2002. During 2001, the Trojan Mine milled 989,000 t of ore at an average grade of 0.62% nickel; this yielded 4,358 t of nickel contained in concentrates. The outputs represented increases during 2000 as the Trojan Mine completed deepening of its subvertical shaft and the partial modernization of its concentrator. The Bindura smelter and refinery increased production of nickel by 2% to12,889 t compared with that of 2000. About 42% of nickel production was from toll material, chiefly from Botswana. Bindura also produced 5,041 t of copper sulfide and 120 t of cobalt in cake. Combined measured and indicated and inferred resources at BNC were estimated to be 32.3 Mt at a grade of 0.64% nickel, of which 2.43 Mt at grade of 0.63% nickel was classified as proved and probable ore reserves (Bindura Nickel Corp. Ltd., 2002). Rio Tinto operated the Empress nickel refinery, which processed matte supplied from Botswana on a toll basis. The company toll refined 6,635 t nickel in 2001.

Platinum-Group Metals.—Platinum-group metals (PGM) production in 2001 increased to 5% from 1% compared with

[3]Revised July 29, 2003.

that of 2000 to 371 kg of platinum, 519 kg of palladium, and 42 kg of rhodium as Zimbabwe Platinum Mines Limited (Zimplats) commissioned its new Makwiro project near Ngezi at yearend 2001. Zimplats was a partnership between Delta Gold NL of Australia (51%) and Impala Platinum Limited of South Africa (Implats). In March 2001, Implats acquired for $30 million a 40% stake in the Ngezi-Hartley PGM assets of Delta Gold along the Great Dyke, which comprised the mothballed Hartley platinum mine, the Ngezi project, and the Selous Metallurgical Complex (SMC). Ngezi is located some 77 kilometers from the SMC. Zimplats incorporated the Ngezi project under Makwiro Platinum Mines (Private) Ltd. The Makwiro Mine was expected to be in full production by the end of 2002 and will produce 3,350 kilograms per year (kg/yr) of platinum, 2,550 kg/yr of palladium, 250 kg/yr of rhodium, 370 kg/yr of gold, and minor byproduct nickel and copper (Impala Platinum Holdings Ltd., 2002§).

ZCE Platinum (Pty) Ltd. (a partnership between Aquarius Platinum Ltd. of Australia and Implats, which acquired a 35% stake in 2001 for $30 million) operated the Mimosa Mine at the southern end of the Great Dyke. ZCE Platinum planned to increase its production at the Mimosa Mine to 2,115 kg/yr of platinum by 2003 from 466 kg/yr. Concentrates will be sent to Impala Refining Services in South Africa for treatment. The Implats expansion into Zimbabwe was part of its overall goal to increase corporate platinum production to 62,200 kg (2 million ounces) by 2006 (Impala Platinum Holdings Ltd., 2001§, 2002§).

Industrial Minerals

Asbestos.—African Associated Mines (Pvt) Ltd. produced chrysotile asbestos from its Gaths and Shabanie Mines and employed about 6,000 people. Production in 2001 was 136,000 t of asbestos valued at $49 million.

Lithium.—Bikita Minerals (Pvt) Ltd., which was owned by AMZIM Minerals Ltd, was one of the world's largest producers of lithium-bearing petalite. Production ranged from 36,000 to 38,000 t/yr of lithium minerals between 1999 and 2001. The company exported four grades of petalite, which included grades for container glass and tile, lithium, and spodumene concentrates.

Mineral Fuels

Wankie operated the country's only coal mine near Hwange. In 2001, production increased by 7% to 4.06 Mt. In 2001, the company suffered major loss financial losses, in inflation-adjusted terms, and was saddled with a nearly $33 million debt, based on the official exchange rate, from one of its two main customers, Ziscosteel. During 2001, Wankie saw an increase in coal sales to 1,432,619 t from 1,429,123 t. Sales of power station coal also increased to 2,318,799 t from 1,885,137 t. Coke sales dropped to 245,822 t from 411,409 t. Coke oven gas dropped to 27.1 million cubic meters from 29.5 million cubic meters (Insider [Harare], 2002§).

Zimbabwe has no domestic reserves of oil or gas and depended on coal, hydropower, and imports to meet its energy requirements. Like many African countries, firewood and charcoal were major sources of fuel, particularly for household cooking. The country no longer had a functioning oil refinery and has spent around $55 million per year to import petroleum products from South Africa. Fuel shortages resulting from the economic crisis in the country remained a major problem during the year (Mbendi Information Services, 2000§).

Infrastructure

Most of landlocked Zimbabwe's bulk commodities were moved by rail on the state-owned National Railways of Zimbabwe (NRZ). All major cities and industrial centers were linked to Botswana, Mozambique, South Africa, and Zambia by the NRZ. Petroleum products were piped through Mozambique via the Beira pipeline to Feruka and then moved west via the Mutare-Harare pipeline or trucked on Zimbabwe's 85,784-km road network. Additional petroleum products were imported via railroad tanker cars through South Africa.

Outlook

The short-term outlook for the mining sector was not favorable. Government intervention in the economy and in state-run industries has been a major contributor to the growing number of closed mines and suspended projects that are undermining the ability of the mining sectors to continue to generate more than 25% of Zimbabwe's foreign export earnings. External market forces and weak commodity prices have also had a serious impact on ferroalloys, gold, and steel. The natural resource endowment and a well-developed infrastructure remain in place. Until the Government can complete the privatization of its interests in the energy, mining, and rail sectors; repay the debts of the parastatal industries; and loosen its foreign exchange rules, attracting the open competition and entrepreneurship needed to stimulate the economy will be difficult.

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Major Sources of Information

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Bartholomew, D.S., 1990a, Base metal and industrial mineral deposits of Zimbabwe. Zimbabwe Geological Survey Mineral Resources Series No. 22, Harare, 154 p.
Bartholomew, D.S., 1990b, Gold deposits of Zimbabwe. Zimbabwe Geological Survey Mineral Resources Series No. 23, Harare, 75 p.
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TABLE 1
ZIMBABWE: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity		1997	1998	1999	2000	2001
METALS						
Chromite, gross weight	thousand tons	640	636	641 r/	668 3/	780
Cobalt, metal 4/		126	138	121 3/	79 3/	95
Copper:						
Mine output, concentrate, Cu content		4,993	2,941	4,511	2,104	2,057
Metal:						
Smelter output, blister/anode, primary e/		18,000	14,500 r/	14,500 r/	14,500	2,160 e/
Refinery output, refined/cathode, primary		13,000	11,000	10,000	10,200 r/	2,057
Gold	kilograms	24,156	25,175	27,666 3/	22,069 3/	18,050 3/
Iron and steel:						
Mine output, iron ore:						
Gross weight	thousand tons	479	372	599	451 3/	361
Fe content e/	do.	240	190	300	225 3/	180
Metal:						
Pig iron e/	do.	216	230	230	240	240
Steel, crude	do.	214	220	255 r/	258 r/3/	156
Ferroalloys:						
Ferrochromium	do.	235	241	248	246 3/	250
Ferrosilicon chromium	do.	17	21	16 r/	20	17
Nickel:						
Mine output, concentrate, Ni content		12,963	12,872	11,164	8,160 e/	10,120
Refinery output, refined metal						
Refined from domestic materials		10,300 5/	8,732	9,106 r/	6,678 3/	7,440
Toll refined from imported materials		7,346 5/	8,709	10,676 r/	12,931 3/	12,084
Total refined nickel metal		17,646	17,441	19,782	19,609	19,524
Platinum-group metals:						
Palladium	kilograms	245	1,855	342	366 3/	371
Platinum	do.	345	2,730	479	505 3/	519
Rhodium	do.	27	177	37 r/	40	42
Silver	do.	5,923	6,681	5,181 r/	3,799 3/	3,449
Tantalum, mine output, Ta content e/		1	6	1	1	7
INDUSTRIAL MINERALS						
Asbestos	thousand tons	145	123	115	152 3/	136
Barite		1,217	1,844	1,000 e/	5,032	7,464
Cement, hydraulic e/	thousand tons	1,100	1,100	1,000	1,000	1,000
Clays:						
Bentonite (montmorillonite)		121,283	135,785	140,000 e/	--	--
Other clays 6/		24,000	12,000	12,000	589	2,247
Diamond	carats	421,307	28,732	45,324	16,678 3/	15,000
Feldspar		2,254	2,241	2,250	2,059	1,055
Gemstones: e/						
Amethyst	kilograms	NA	NA	NA	10,376	840
Emerald	do.	1,000 e/	19,302	20,000 r/	33	57
Graphite		12,779	13,806	11,405 r/	11,838 3/	11,836
Kyanite		1,113	3,780	4,000 e/	10,970	9,682
Lithium minerals, gross weight		49,833	28,055	36,671	37,914 3/	36,103
Magnesite		13,050	4,321	5,356 r/	4,029	2,439
Mica		30	1,309	1,300 e/	--	--
Nitrogen, N content of ammonia		63,700	56,500	60,800 3/	58,400 3/	57,500
Perlite		--	--	5,356	5,000	5,000
Phosphate rock, marketable concentrate		94,000	91,000	126,000	77,662	86,611
Stone, sand and gravel:						
Granite		109,903	125,576	130,000 e/	130,000	385,532
Limestone	thousand tons	1,027	1,473	1,500 e/	1,500	3,799
Quartz 7/	do.	52	40 r/e/	40 r/e/	121 r/e/	28
Sulfur						
Pyrite:						
Gross weight		48,101	52,908	48,793	69,119	98,037
S content (32.6%)		15,700	15,250	15,900	22,530	31,960
Byproduct acid, metallurgical and coal process gas e/		5,000	2,500	2,500	2,500	2,000
Talc		1,023	1,039	1,000 e/	989	1,273
Vermiculite		14,841	14,804	13,898	16,215	11,632

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity		1997	1998	1999	2000	2001
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous	thousand tons	5,301	5,047	4,576	3,809 3/	4,064
Coke, metallurgical e/	do.	600	600	600	600	245

e/ Estimated. r/ Revised. -- Zero. NA Not available.
1/ Table includes data available through August 2002.
2/ Estimated data are rounded to no more than three significant digits; may not add to totals shown.
3/ Reported figure.
4/ "Metal" includes metal content of compounds/salts and may include cobalt recovered from nickel-copper matte imported for toll refining.
5/ Toll refined data includes all Empress Refinery production from Botswana imports and part of Bindura output.
6/ Includes fire clay.
7/ Includes rough and ground quartz as well as silica sand.

Sources: U.S. Geological Survey Minerals Questionnaire prepared by Zimbabwe Ministry of Mines and Energy; Zimbabwe Chamber of Mines