BOTSWANA

By Roger Murray

Botswana remains politically stable and economically prosperous, with diamond mining continuing to underpin the economy and provide a steady flow of substantial foreign exchange earnings and government revenue. The ruling Botswana Democratic Party (BDP) under the leadership of President Festus Mogae was re-elected with a substantial majority in 1999 and barring a major political or economic crisis is set to continue in office for the foreseeable future. The strong global diamond market during 2000 significantly boosted Botswana's real growth and exports, although the prospects are less favourable for 2001. Real GDP growth is estimated at 6% for 2000/01 (statistical year beginning July 1), down from 7.7% in 1999/2000. Total exports were an estimated US$2.7 billion in 2000, virtually unchanged on the preceding year, when they had risen by 30%, with diamond earnings up by 12% to just under US$2.0 billion, easily maintaining Botswana's merchandise trade account surplus and current account surpluses.

The budget for the 2000/01 (April-March) fiscal year produced another substantial surplus of P1 billion, due to diamond revenue coming in at P7.6 billion out of total revenue of P13 billion compared with an expected P6 billion, due to the increased sales recorded in 2000. However, despite a further projected rise in diamond revenue to P8 billion in 2001/02, a budget deficit of some P500 million is forecast for 2001/02, due to a 20% increase in public spending, mainly for health and infrastructural development, along with additional programmes to combat HIV/AIDS. The infection rate in Botswana is the highest in Africa at some 36% of the adult population. However, any reasonably small deficit would easily be financed out of accumulated surpluses with no threat to fiscal stability or domestic financial markets. Botswana continues to hold very large international reserves, totalling US$6.3 billion as of end-2000.

The mine labour force averaged 14,345 in 1999, down from 15,255 in the preceding year. This mainly reflected the cessation of major construction projects at Debswana mines rather than a fall in operating personnel. The expatriate proportion of the mine labour force temporarily increased in 1998 to 1,400 or 9% of the total, due to the extensive use of expatriate contractors for the Orapa expansion and Jwaneng Aquarium projects. With the completion of these projects by the end of 1999 the expatriate labour force decreased to 1,187 or 8% of the total mine labour force. HIV/AIDS has become a serious problem at most major mines, and Debswana Diamond Co. (Debswana), the 50:50 joint venture between De Beers and the government, identified the disease as a stand-alone strategic issue in 2000 previously it was subsumed in the general health, safety and environment programme. To extend the productive lives of employees living with HIV/AIDS, Debswana is providing anti-retroviral therapy, paying 90% of the costs of treatment for each employee and one legally married spouse who is also HIV-positive.

Diamonds

The strategic partnership between Botswana and the De Beers group was deepened during 2000 in several ways. The existing sales agreement between Debswana Diamond Co. (Debswana), the 50:50 joint venture between De Beers and the government which produces all the country's diamonds, and De Beers' Diamond Trading Co. (DTC) was renewed for a further five years. In return for the exclusive entitlement to purchase Debswana's diamonds, De Beers is contractually committed to buy all the company's production, regardless of variations in volume or quality. However, this would not rule out stockpiling unsold diamonds in times of global market weakness. Debswana completed a strategic review in 2000 and aims to become the global benchmark diamond producer, with the target of producing 30 Mct annually by 2004 by efficiency improvements using working capital.

Even more significantly, Debswana has increased its stake in the De Beers group, by participating in DB Investments (DBI) the vehicle formed by Anglo American and the Oppenheimer family to acquire the whole of the share capital of De Beers, through DBI's combined cash/share offer for the De Beers Centenary/De Beers Consolidated Mines linked units. The take-over was completed in May 2001, and Debswana holds a 10% stake in DBI, double the equity interest which it previously held in the issued share capital of De Beers. DBI's major shareholders are Anglo American and Central Holdings (CHL representing the Oppenheimer family), each with 45%. Although on the surface Debswana as minority shareholder would seem set to remain junior partner, the latter is in fact well-placed to exercise a major influence, not least because Botswana is by far the group's greatest source of diamonds, both by volume and by value.

In addition, as DBI had to raise the value of its initial offer to win over the minority shareholders, Debswana took up an 11% stake in the CHL subsidiary holding its interest in DBI apparently because the Oppenheimer family's liquid financial resources were insufficient providing Debswana with an effective 15% holding, and the Botswana Government 7.5%, in DBI/De Beers. Debswana will not only receive an enhanced share of the De Beers' group profits; a company statement on the takeover described the benefits as also including greater influence in De Beers' management, creation of a strategic partnership with Anglo American (via 7 million shares now held by Debswana in the former), and the resulting diversification of its investment base. The main link between Debswana and Anglo/De Beers is the former company's managing director, Louis Nchindo, previously the long-standing representative of Anglo American in Botswana, although appointments to the main De Beers board are expected to remain government officials.

Production from the three mines operated by Debswana totalled 24.65 Mct in 2000, up 15% on the preceding year. This was almost entirely due to the volume increase in production from Orapa of 3.1 Mct to 12.2 Mct, at a lower average grade of 82.9 ct/100 t compared with 95.0 ct/100 t in 1999. Highlights of the year included the completion of the Orapa 2000 expansion project, with the formal opening of the No.2 recovery plant by President Mogae in May 2000. The plant attained its full rated capacity during the September quarter of 2000 and along with its slurry disposal system is now fully operational. Ore recovery at both plants totalled 14.7 Mt, a significant rise over the previous year's throughput, of which just over a quarter was sourced from surface stockpiles. In the December quarter of 2000, the Debswana board decided to proceed with a new small mine centred on the nearby BK9 group of kimberlite pipes. This followed the completion of a revalidation exercise during the year, to update a 1998 feasibility study. A mining licence has been granted by the government on the standard terms under the revised Mines and Minerals Act, with construction commencing during 2001 and the first diamonds due to be produced during the final quarter of 2002. Including the BK kimberlites, Orapa's total reserves (probable, indicated and inferred) total 320 Mct, with a current life-of-mine of 29 years as an open-pit operation at current production levels. Its indicated reserves were more than doubled in the latest resource estimates (see table). Debswana mineral resources and reserves are classified according to the rules for public reporting in South Africa, as defined by the South African Mineral Resource Committee (SAMREC), in the SMREC code.

Diamond recoveries at Jwaneng, near Kanye, rose marginally by just under 100,000 ct to 11.5 Mct in 2000 despite flooding of the open-pit floor after heavy rains in the March quarter of the year. All of the water had been pumped out by mid-year and remedial work has been carried out to prevent the pit from being flooded again. There was a slight reduction in grade to 124.3 ct/100 t, compared with 125.8 ct in 1999. The completed automated recovery plant (CARP) and the fully integrated sort house (FISH), which uses the latest X-ray machines and automated sorting technology, were commissioned during the year at a cost of P360 million. However, the plant is not yet operating at full capacity due to certain technical and operational problems which are still being dealt with, although it has processed all the concentrate produced by the mine since May 2000. The sort house, which does away with any direct human handling of diamonds, is designed to deal with all diamonds produced by both the Jwaneng and Orapa mines. The mine has total reserves of 413 Mct at the 1996 reserve classification, sufficient for a further 29 years mining as an open pit at current output levels.

Output from Letlhakane rose by 81,000 ct at 958,715 ct in 2000, at a higher grade of 27.3 ct/100 t compared with 25.6 ct/100 t in 1999. Of the total 3.51 Mt of ore treated, 29% was derived from the stockpiles. Although tonnage treated was 2% higher than in 1999 it was still 3% below target for the year, reflecting wet ore caused by heavy rains in the early part of the year, problems with primary crusher linings and an unscheduled replacement of the crusher motor shaft. However, the mine achieved record manpower productivity levels in 2000. Major repairs were carried out to the waste shovels in the third quarter of 2000 after a period of poor performance and the waste ore fleet has been supplemented to ensure stripping targets are met from 2001 onwards. Mine reserves total 16 Mct sufficient for a further 13 years' mining at current production rates.

Reflecting the increased output in 2000, Debswana's sales revenue rose by 12% to P10.1 billion (US$1.98 billion) compared with the preceding calendar year, while gross profits rose by 11% to P8.9 billion. Retained profits as at December 31, 2000, were P1.2 billion, while the cash profit available to the two shareholders, the government and De Beers Centenary, was up 9% at P6.2 billion. Debswana's managing director, Louis Nchindo, stated that 100% of mine production and some diamonds from the stockpile were sold during 2000. Diamonds sold totalled 25.7 Mct compared with production of 24.6 Mct.

Exploration for diamonds by both De Beers Prospecting Botswana (DeBot) and other mining firms continued at high levels during 2000. The Gope Exploration Co., a 50:50 joint venture between De Beers and Canada's Falconbridge Exploration, was granted a retention licence under the new Mines and Minerals Act, 1999. This applies

Debswana Ore Reserves, 2000

	Mt	Mct	Grade[a]
Probable reserves	**349**	**221**	-
Orapa	274	159	58
Jwaneng	44	40	91
Letlhakane	9	2	21
Indicated resources	**84**	**38**	**-**
Orapa	106	37	35
Jwaneng	14	4	29
Letlhakane	6	2	31
Total [b]	**1,003**	**749**	**-**
Orapa[c]	653	320	49
Jwaneng[d]	288	413	144
Letlhakane[e]	63	16	26

a Ct/100 t.
b Includes inferred resources.
c At a bottom cut-off size of 1.65 mm (same for all mines), a planning revenue of US$47/ct and to a depth of 660 m; incorporates the BK kimberlites at an average mining feasibility revenue of US$120/ct.
d At a planning revenue of US$108/ct and to a depth of 720 m; all Jwaneng figures reflect the 1996 reserve classification with valuation drilling continuing to upgrade to the 1999 reserve classification.
e At a planning revenue of US$191/ct and to a depth of 480 m.
Source: De Beers *Annual Reports 2000.*

for an initial three years and covers the GO25 kimberlite located in the Central Kalahari Game Reserve (CKGR), where an evaluation completed in 1999 indicated the resource would only be marginally profitable. DeBot activities mainly concerned reconnaissance and early-stage follow-up prospecting.

Firestone Diamonds, a company listed on the Alternative Investment Market (AIM) in London, has continued to make progress with its evaluation of the potential of the Mopipi area, located some 50 km west of the Orapa mine. The concession covers some 2,000 km², including 1,900 km² (Mopipi south and west) in which Firestone owns a 50% interest, with options to earn a 75% interest and acquire a 100% interest in the much smaller Mopipi central and Mopipi north areas. A high-density soil sampling programme covering the entire project area was completed during 2000 with the aim of confirming results on targets identified to date, with some 200 samples taken from which kimberlitic indicator minerals were recovered and evaluated. Several clusters contained very high indicator mineral counts, with one returning 88 grains of kimberlitic pyrope garnet, the highest count recovered so far, indicating that the originating kimberlites are diamondiferous. A clear white macro diamond weighing 0.02 ct was also recovered from one of the target areas, and as it is rare for this to occur, the discovery provided further evidence of a diamondiferous kimberlite source. Analysis of the dispersion pattern of the indicator minerals has correlated well with existing ground geological mapping, providing for high priority drilling targets. Drilling will commence once the sampling programme has been completed and the results analysed; Firestone considers the results obtained to date to be highly significant and as kimberlites almost always occur in clusters believes the indications for the discovery of a new kimberlite field are good.

Base Metals

Favourable metal prices, during most of 2000, especially for nickel, benefited the Selebi-Phikwe copper/nickel/cobalt mine operated by BCL, a subsidiary of Botswana RST (BRST). In consequence, the company was able to finance its capital expenditure and replacement programmes without further recourse to the emergency funding loan facility (EF) available from its major shareholders, Anglo American, De Beers Consolidated Mines, their associated companies (AAC) and the government. Despite a further drop in output of metal in matte, BCL's sales revenue increased by 39% to P578 million (US$113 million) in 2000.

Production of metal in matte declined by 13% to 29,932 t in 2000, (34,388 t in 1999), as head grades were lower than expected at the Phikwe mine and the tonnage of ore hoisted was down at both Phikwe and the Selebi mine, totalling 3.2 Mt (3.3 Mt in 1999). Production of all three metals converted into matte from concentrates copper, nickel and cobalt were lower than in 1999. While the flash furnace remained in satisfactory condition following its complete overhaul in 1995, surface operations were for the second successive year adversely affected by breakdowns and problems in both the concentrator and the smelter and, pending the next complete overhaul, certain refurbishments are being carried out to improve performance of the surface plants. During a 12-day smelter shut down in August 2000 essential repairs to the reaction shaft of the flash furnace and removal of build-up in the waste heat boiler were successfully completed, while the ageing fleet of mining diesel equipment was also upgraded. However, delays were experienced with fully commissioning the project funded by the European Union (EU) Sysmin facility to replace the float cells in the concentrator, and the predicted improvements in nickel recoveries are now only expected to materialise during 2001.

At Phikwe, work on deepening ore extraction below the 880 m level the Tertiary Sub-Incline project (TSI) experienced further difficulties owing to the main contractor failing to achieve the required shaft-sinking progress. Efforts to resolve the situation were unsuccessful, and a dispute was declared, with the contractor replaced and the matter referred to arbitration. Contingency plans to safeguard future production at Phikwe are stated to be well advanced.

Metal sales totalled 30,978 t in 2000 (15,813 t copper, 14,909 t nickel and 256 t cobalt), a 7% fall on the 33,296 t sold in the preceding year. During 2000, while shipments of metal in matte to Centametall (Centa) for refining in Zimbabwe proceeded satisfactorily, shipments to Falconbridge International's Kristiansand refinery in Norway were restricted by metal production not being sufficient to supply both refiners with their full requirements; a reversal of the situation prevailing in the previous year when Kristiansand was fully supplied. This reflects the commencement of new toll smelting arrangements with Centa for Tati Nickel Mining Co. (TNMC) ores and concentrates (see below). These have operated successfully as did new refining arrangements with Centa and the relevant agreements were finalised in 2000 and were due to be signed during 2001.

The increased sales revenue and weakening of the pula against the US dollar provided for a P82 million operating profit in 2000, up from P31 million in the previous year, and with once again no royalty being paid to the government, the profit before deferred royalty, interest and unrealised exchange rate fluctuations rose substantially to P94 million, compared with P79 million in 1999. However, the overall loss for the year after deferred royalty of P31 million, deferred interest of P482 million and unrealised exchange losses of P1.1 billion, was P1.5 billion, more than double the P597 million loss in 1999. This was mainly due to a sharp increase in unrealised exchange losses in 2000. The consequence is a further increase in BCL's accumulated losses to P8.9 billion (US$1.7 billion). Given this extremely high burden of group debt, BCL's directors have reiterated their view that it is not envisaged that dividends will ever be paid.

Remaining mineable *in situ* ore reserves were extensively reviewed during the year, and have been recalculated in conformity with South Africa's SAMREC code. Total mineral resources (inferred, indicated and measured) were 69 Mt as at December 31, 2000, down from 74 Mt as calculated for a year earlier, equivalent to recoverable tonnages of 609,000 t of copper metal and 550,000 t of nickel metal, at average grades of 0.89% Cu and 0.80% Ni. Mineral reserves (proved and probable) totalled 27 Mt as at December 31, 2000. These comprised measured and indicated resources, modified to produce an estimate of economically mineable material allowing for dilution and losses during mining. Proved reserves totalled 12.4 Mt, of which 9.5 Mt were at Phikwe, for recoverable tonnages of 85,000 t of copper and 75,000 t of nickel, with probable reserves of 16.6 Mt, of which 7.1 Mt were at Phikwe. Total recoverable tonnages (proven and probable) totalled 232,000 t of copper and 226,000 t of nickel at average grades of 0.86% Cu and 0.84% Ni. The highest grades (proved reserves) for both metals are located at Selebi North, 0.83% Cu and 0.96% Ni, with the highest copper grade, 1.30%, at the main Selebi mine, and the highest nickel grade, 1.05%, at the Phikwe Southeast Extension.

Although BCL is continuing to restrict capital spending to essential 'stay in business' expenditure to maintain capacity production levels and to secure long-term mining operation, including the Phikwe TSI project, the amounts involved are relatively substantial. Capital spending requirements in 2001 are estimated at P163 million, of which P36 million has so far been approved by the BCL board, up from P79 million in the preceding year. Apart from mine development, the other major area of expenditure is the smelter, where a new drying plant is to be erected to handle processing of an increased quantity of copper/nickel concentrate to be delivered by Tati Nickel Mining Co. (TNMC) from 2002.

Expenditure in 2000 was partly funded by drawdowns under the existing Sysmin loan facility from the European Union (EU), via an onlending agreement between the government and BCL designated in pula, along with an EU grant to Botswana designated in euro. The Sysmin funds will fund some P19 million of 2001 capital and replacement expenditure, which will exhaust the balance of the remaining funds under the existing facility. A general banking facility, equivalent to the lower of P25 million or 80% of the value of certain unsold matte, was renewed for a further year from December 31, 2000, when cash drawdowns totalled P8.9 million.

BCL remains committed to its ongoing programme of major capital expenditure to deepen the mines, and also needs to accumulate funds to finance the next major overhaul of the smelter. But it will only be possible to finance these requirements out of operating cash flow if metal prices, particularly nickel, remain firm over the next few year the directors state. The success of a new application to the European Union (EU) for further Sysmin funding, along with a positive outcome of the current arbitration with the original shaft sinking contractor, are also vital. However, the Sysmin application has been delayed, with a consultant appointed to appraise the request. In addition, there is an undrawn EF facility of P150 million. As an interim funding measure, the payment of interest in 2001 has been deferred, as was the case in the previous year, pending the prior repayment of the P122 million in loan principal drawn down to date.

BCL will be custom smelting larger quantities of copper-nickel concentrate produced by the Selkirk and Phoenix mines of Tati Nickel Mining Co. (TNMC) from 2002, as that company is raising output capacity to the equivalent of 12,500 t/y of metal in matte. The expansion programme has focused on the open-pit Phoenix mine and includes a new 3.6 Mt/y wet concentrator; some US$62.5 million is being invested in the project, which will double capacity by 2002. Related to the ongoing output expansion at TNMC, Canada's Falconbridge and Switzerland's Centametall have agreed to take up to 11,000 t/y of nickel in matte. TMNC is owned by Anglo American (43%) LionOre Mining International (42%) and the government (15%).

Other Minerals

Soda ash and coal continue to be the other minerals produced in significant volumes at present. Production of soda ash and salt by Botswana Ash (Botash) were both substantially higher in 1999 than in the previous year. Soda ash output attained an all time high of 234,000 t, 20% above the 1998 level, while salt output rose by 9% to 233,000 t. Coal production from Morupule Colliery was 945,000 t in 1999, up from 928,000 t in the preceding year. All the coal produced is consumed locally, with BCL, Botswana Power Corp. (BPC) and Botash the major consumers.

Prospecting for gold continued during 2000 although with one promising exception all deposits located to date are not economic at prevailing gold prices. The Somerset mine owned by local firm Joren was the only producer, with an output of 7.5 kg of gold bullion in 1999. However, in May 2001 Australia's Gallery Gold announced it had located a large deposit at Mupane, southeast of Francistown, with plans to develop a mainly open-pit mine with a capacity to produce 100,000 oz/y over ten years, by the end of 2002. The partially drilled-out orebody had shown a proven resource of 557,000 oz and with more drilling a potential deposit of 1 Moz was expected according to Gallery managing director Keith McKay, and the area has good potential for the discovery of further deposits. Gold grades were described as high, and expected to average 3.5 g/t in the open pit and 6 g/t in the area with potential for underground working. Gallery planned to list on the Botswana stock exchange and make a new share issue as part of its arrangements for project financing later in 2001. A scoping study on the size of a mainly open-pit mine and plant providing real Botswana production costs is under way, which will be followed by an engineering study. However, a definite go-ahead for the project will not take place until completion of the drilling programme has established a 1 Moz resource.

Agate Botswana and Masa Semi-Precious Stones remain the country's only two licensed producers and dealers. The two companies sold a total of 84 t in 1999, more than double the figure for 1998, reflecting increased overseas market demand. Production of crushed stone rose substantially in 1999, due to an increase in large civil works, mainly road projects, around the country. In 1999 the 15 operating quarries produced 1.5 million m³ of crushed stone, up 47% on the previous year.

Botswana Mineral Production
(t except where stated)

	1999	**2000**
Diamonds ('000 ct)	21,348	24,635
of which Orapa	9,070	12,200
Value[a] (US$ million)	2,131	2,228
Copper-nickel matte	34,388	29,932
Value[a] (US$ million)	90	113
Copper	18,239	16,304
Nickel	15,820	13,417
Cobalt	329	211
Soda ash	233,600	na
Salt	233,100	na
Coal	945,300	na
Crushed stone (m³)	1,466,000	na

[a] Export value.
Na Not available.
Source: De Beers Group; Botswana RST; Department of Mines.