



Mining companies must go where the orebodies are, and one of the greatest unexploited platinum orebodies in the world is the Great Dyke in Zimbabwe. Its investments in Mimosa and Zimplats give Implats access to a significant resource and, by a considered, conservative and phased approach to a build-up in production, is developing one of the great platinum producing regions of the world. Herb Mashanyare is the Technical Director at Mimosa.

## Implats produced a record 1.961 Moz platinum during FY2004

## REVIEW OF OPERATIONS AND INTERESTS

### Introduction

Implats has four mining (mine-to-market) operations, Impala Platinum and Marula Platinum, located on the Bushveld Complex in South Africa, and Zimplats and Mimosa Platinum, on the Great Dyke in Zimbabwe. These operations, together with Impala Refining Services (IRS) which houses Implats' offtake and toll refining agreements, employed approximately 31 600 people and produced 1.961 Moz attributable platinum ounces (3.725 Moz PGMs) during FY2004.

Barplats, in which Implats had an 83.2% stake, was sold in May 2004 for R389 million, following the cessation of mining operations at Crocodile River, Barplats' wholly-owned operating subsidiary, in December 2003.

A detailed discussion on these issues as well as other matters pertaining to sustainable development can be found in the group's Corporate Responsibility Report 2004 to be published in October 2004.

### Impala Platinum

#### Key features of the year

- LTIFR improved by 13%
- Increase in cost per platinum ounce limited to 5.0%
- 4% increase in tonnes milled to 15.6 Mt
- 5% increase in platinum production to 1.090 Moz
- Concentrator recoveries rise to 83.2%
- Productivity per platinum ounce up 8%

Implats' primary mining operation, Impala Platinum, operates on the Impala lease area, on the western limb of the Bushveld Complex, north of the town of Rustenburg, North West Province, South Africa. In addition to the mining operation, Impala Platinum includes Mineral Processes, the group's smelting and concentrating plants, also located on the Impala lease area, and the Refineries, which includes both the base and precious metals refineries, in the town of Springs, Gauteng, South Africa.

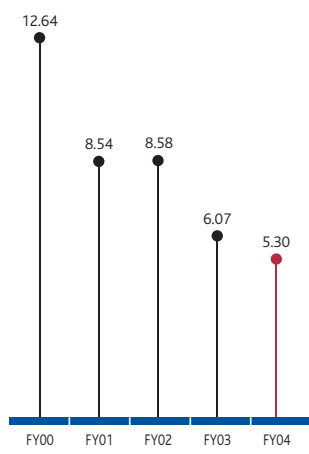
The Impala Platinum mining operation produces around 1.0 to 1.1 Moz platinum (1.9 to 2.0 Moz PGMs) annually. An essential element of Impala's 30-year life-of-mine plan is to maintain production at this level. With recent expansion programmes, both Mineral Processes and Refineries will have the capacity to process 2 Moz of platinum, with much of this additional spare capacity being utilised by IRS to process material from Implats' other managed operations and toll refining.

During FY2004, Impala reported record production of both 15.6 Mt milled and refined platinum production of 1.09 Moz. At the same time, increases in costs were well-contained. The cost per platinum ounce produced rose by only 5%, in spite of an increase in wages of 9.5%.

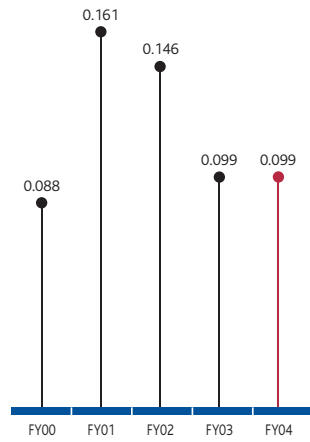
#### Safety, health and environment

**Safety:** Regrettably, eight fatal accidents occurred during the year of which six were caused by falls of ground. Intensified efforts regarding the safety and health of employees continued. LTIFR decreased by 13% year-on-year to 5.30 per million man hours, while the FIFR remained constant at 0.10 per million man hours.

A campaign to reduce the number and impact of falls of ground continued to deliver some improvement with fall of ground incidents decreasing by 6%. As part of this campaign, an underground fall of ground simulation centre was set up and during the course of next year, all



Impala – Lost time injury frequency rate (LTIFR) per million man hours



Impala – Fatal injury frequency rate (FIFR) per million man hours

employees will be exposed to this. The Tsiboga intervention (Tsiboga means “on the look out” in Tswana), which is based on the well-known Du Pont safety principles, continued. All shaft supervisors are now trained to conduct safety audits.

The Refineries had another satisfactory year with an LTIFR of 0.45. The Tsiboga programme continues to run well, with over 2 000 internal audits having been undertaken during the year.

**Health:** Pre-employment and exit medical examinations are undertaken for all employees and contractors. Noise-induced hearing loss and tuberculosis (TB) remain the primary occupational health challenges at Impala.

A hearing conservation programme, including annual audiometric testing of all

employees, has continued. A baseline risk assessment for noise was conducted to determine the noise levels that employees are exposed to. Some R6 million was spent during the year on fitting all employees with custom-made hearing protection devices.

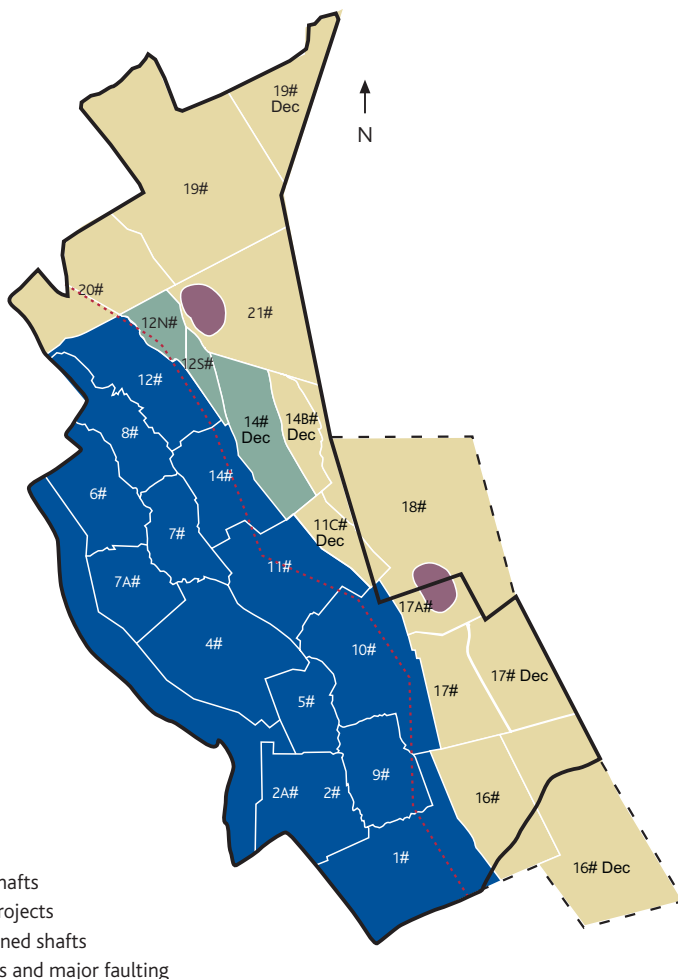
Pulmonary TB is classified as an occupational disease in terms of the regulations governing the South African mining industry. Of the total Impala workforce, 297 employees developed pulmonary TB during the year (289 in FY2003). The increase is attributed to HIV-positive individuals who are at a higher risk of contracting TB; 95% of TB patients are HIV-positive. World-class programmes are in place to combat the disease, including education, contact tracing, and directly observed treatment (DOT) regimes. These have been supported by the introduction of prophylactic TB treatment for HIV-positive employees and the inclusion of all contractor employees within the TB treatment programme.

**HIV/AIDS:** There was continued focus on HIV/AIDS education and management for employees, dependents and surrounding communities during the year. HIV test data collected by Impala Medical Services and modelling undertaken by external consultants indicates that the HIV-prevalence rate among employees on the Impala lease area has levelled off at around 16%, which is lower than levels for similar adult groups in the country as a whole. At the Refineries, 3.5% of employees are currently known to be HIV-positive.

Regrettably 75 employees (FY2003: 86 employees) died in service as a result of known AIDS-related illnesses during the year.

The cost of care of HIV-positive employees totalled R6.2 million in medical treatment during the year. Although Impala’s prevalence level is lower than that reported for adult populations around the country, the impact of HIV on the individual and the company cannot be underestimated. The major challenge remains overcoming the stigma associated with the disease, which would encourage more employees to undertake voluntary counselling and testing and to access treatment.

Location map of the Impala lease area



## Volumes were supported by mining 'white areas' – unmined remnants in old mining areas

**Environment:** Highlights of the year were the maintenance of the ISO 14001 certification and the significant reduction in SO<sub>2</sub> stack emissions as a result of the excellent performance of the Sulfacid plant. Prior to the commissioning of this plant in FY2003, SO<sub>2</sub> emissions averaged 37 t/day. At commissioning this decreased to 29 t/day and for FY2004, SO<sub>2</sub> emissions averaged less than 20 t/day, in line with scheduled process permit conditions.

The Environmental Impact Assessment for the Refineries expansion projects was successfully concluded during the year, and all environmental pre-requisites for the expansion have now been met. The Refineries maintained their NOSCAR status for the sixth year, and their NOSA 5-star safety grading for the twentieth year, an excellent achievement. In addition, the ISO 9001 and ISO 14001 certifications for quality and environmental systems were successfully maintained.

### Mining

Impala Platinum's mining operations cover an area of approximately 250 km<sup>2</sup> and include 13 shaft systems and five declines, of which two are currently at full production and three are in development.

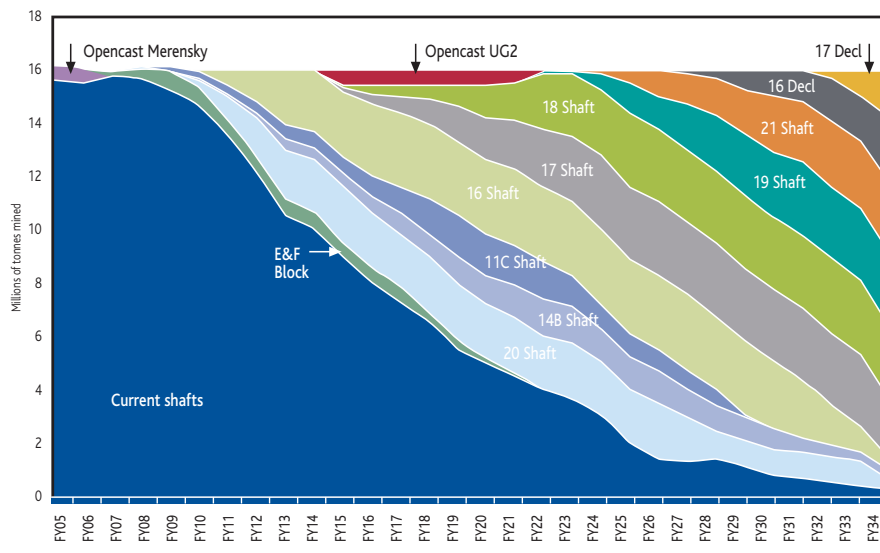
During FY2004, the record level of tonnes milled was largely a result of higher levels of output from both mechanized and opencast mining on the Merensky reef.

Among the best performing shafts were 4, 7, 7A and 12 shafts, with the latter increasing production due to mechanisation. In particular, opencast production rose by 32% to 711 000 t. Difficulties were experienced at 5 and 11 shafts where tonnes mined did not achieve business plan target. The complex geological structures at 11 shaft continued to be problematic and the reduced panel lengths, a consequence of tighter safety standards implemented in the ground control districts, also played a part in constraining production. At 5 shaft, which is nearing the end of its life, production was affected by decreasing ore reserves and a lack of available face.

The liquidation of the mining contractor responsible for semi-mechanized operations at 14 shaft had a temporarily adverse effect on production. New employees are being recruited and trained to manage and operate this section and production has since improved markedly.

Volumes were also supported by the increased mining of so-called white areas (unmined remnants in old mining areas). Much work has been done to identify and estimate the resources contained in the white areas and to convert these resources into proven reserves. This has enabled the identification of around 12 Mt (800 000 platinum ounces) of additional reserves.

Planned 30-year production profile by shaft



# IMPALA PLATINUM

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## Five-year key operating statistics

		FY2004	FY2003	FY2002	FY2001	FY2000
Tonnes milled	(000 t)	15 639	15 042	14 850	14 840	14 662
UG2 milled	(%)	46.1	45.7	53.6	49.6	50.6
Headgrade	(g/t 5PGE+Au)	4.91	5.06	5.05	4.90	4.97
Platinum production	(000 oz)	1 090	1 040	1 025	1 002	1 020
PGM refined production	(000 oz)	1 976	1 924	1 895	1 877	1 913
Total cost/tonne milled	(R/t)	280	265	239	213	189
	(\$/t)	40.8	29.4	23.6	28.0	29.8
Cost/platinum ounce refined	(R/oz)	4 023	3 832	3 459	3 156	2 711
	(\$/oz)	586	425	341	415	429
Net of revenue received for	(R/oz)	2 182	899	(708)	(1 879)	(510)
other metals	(\$/oz)	318	100	(70)	(247)	(81)
Cost/PGM ounce refined	(R/oz)	2 220	2 072	1 872	1 685	1 445
	(\$/oz)	323	230	185	221	229
Capital expenditure	(Rm)	1 197	1 079	1 009	978	732
	(\$m)	174	120	100	129	116
Total Impala labour complement	(000)	27.5	28.4	27.9	28.0	28.3
Productivity	(m <sup>2</sup> /panel man)	39.2	40.7	40.2	40.7	39.6
	(Ounces/employee)	40	37	37	36	36

There was an expected decline in the headgrade from 5.06 g/t to 4.91 g/t, largely because of changes in the ore mix with greater volumes originating from mechanized and opencast mining. Platinum content relative to PGM content increased with production rising to 1.090 Moz platinum and that of PGMs to 1.976 Moz.

The cash operating cost per ounce of refined platinum produced rose by 5.0% to R4 023/oz. The total cash cost per tonne rose by only 5.7%. On-mine costs were up 6.4% from R188/t mined to R200/t mined. Increases in the prices of steel, power and fuel were largely responsible for this rise in costs.

Productivity measured as centares per panel man decreased from 40.7 m<sup>2</sup> par panel man to 39.2 m<sup>2</sup> per panel man. This was a result of the reduced panel lengths which in turn was due to the implementation of tighter safety standards related to the fall of ground

safety programme. Overall platinum ounces per employee rose by 8% as a result of the decline in the number of support employees of around 900, higher mined volumes from less labour intensive areas (opencast and mechanized mining), and higher metallurgical recoveries.

### Planned mining projects

A major R5.3 billion capital expenditure programme on mining projects is currently underway at Impala, of which R3.5 billion had been spent by the end of the 2004 financial year, mostly on the development of the decline projects. This programme aims to maintain production from the lease area at between 1 Moz and 1.1 Moz of platinum annually and involves extending the lives of existing shaft systems and creating new access to deeper reserves. The second generation shafts, which extend to about 800 m below surface, are nearing the end of their working lives.

### Production

(000 t)	FY2004	FY2003	% change
Conventional mining			
Merensky	7 087	7 631	(7.1)
UG2	7 217	6 873	5.0
Mechanized mining (Merensky)	624	36	1 633.3
Opencast mining (Merensky)	711	538	32.3
<b>Total mining</b>	<b>15 639</b>	<b>15 042</b>	<b>4.0</b>

## The performance of the smelter exceeded expectations

The development of a series of decline shaft systems below the current third generation shafts, is progressing on schedule. Two out of the five declines are functioning at full production and a further two will reach full production in the next financial year.

As part of the 30-year production plan, 16 and 20 shafts were reviewed to optimize their mining plans. These plans will be presented to the Implats board for approval in September 2004. This follows in-depth and extensive investigation and feasibility studies which were undertaken during FY2004.

### Development of new technology

Mechanisation, particularly in hazardous areas, should enhance safety as the more dangerous, arduous work will be done with the aid of machines. This will reduce employee exposure in high-risk areas and enable the introduction of more effective support in the stope face.

The in-stope drill-jig allows for more accurate drilling and reduced drilling time, improved face advance per blast, as well as better initiation efficiencies and reduced blast damage to surrounding rock. Impala has engaged with representatives of the National Union of Mineworkers (NUM), to facilitate its introduction into the workplace. Progress on the hard-rock cutting technology project has been satisfactory and the dust problems that are being experienced are being addressed. Underground trials of the extra-low profile trackless equipment, which can operate at a mining height of less than 1.3 m, continued.

### Employee relations

A significant achievement of the period was the signing of a two-year wage agreement with all three recognized trade unions. Although some difficulties were experienced regarding the implementation of aspects of the agreement the rockdrill operators who embarked on an unprotected strike in June were re-engaged upon signing of a strike agreement with NUM. The grievances that triggered the strike are being addressed.

The company and NUM are currently in discussions to re-negotiate wages under the two-year agreement reached last year. That agreement provides for an increase of 1.5% above CPIX in the second year but allowed

either party to re-open negotiations on wages only should the resultant increases be less than 7.5% or more than 9%. CPIX for FY2004 was 5%, necessitating the re-opening of negotiations which are currently underway.

### Mineral Processes

Mineral Processes houses the group's concentrating and smelting operations, and processes ore and concentrate from both Impala's own mining operations and on behalf of IRS. Mineral Processes performed exceptionally well during the year with tonnes milled, recovery rates and smelter throughputs at record levels.

Tonnes milled for the year amounted to 15.6 Mt, 4% up on FY2003. Overall concentrator recoveries improved to give a record overall recovery rate, given the ore mix, of 83.2% for the year. This was largely the outcome of various process optimization initiatives undertaken at the UG2 plant and additional initiatives are in place to increase UG2 recoveries further in the coming financial year.

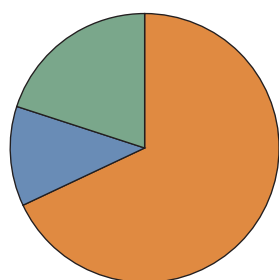
A full-scale high-energy tails scavenging plant at the tailings dam was commissioned in December 2003 and has proved capable of yielding an extra 10 000 oz of platinum annually. The plant treats current arising flotation tailings and will contribute 1% to the overall recovery rate in FY2005.

The performance of the smelter exceeded expectations, especially once the new No 6 dryer became operational. This, combined with record mining production, enabled Mineral Processes to process record gross output.

### Refineries

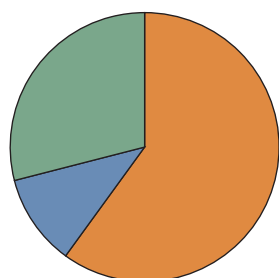
The Refineries excelled in all areas of operation. The all-time high gross refined platinum production reflected an increase of 17% on the previous financial year, and resulted in a decrease in gross costs per platinum ounce of 1% and a 2% decrease in gross cost per PGM ounce. The increased throughput was achieved in spite of certain process bottlenecks, which are being addressed through expansion capital. Metal recoveries and pipeline inventories were unchanged.

Capital expenditure was R1 197 million – 68% on mining, 12% at Mineral Processes and 20% at Refineries



■ Mining 68%  
■ Mineral Processes 12%  
■ Refineries 20%

Impala – Capital expenditure split FY2004



■ Mining 60%  
■ Mineral Processes 11%  
■ Refineries 29%

Impala – Capital expenditure split FY2005

**Impala lease area – cash operating costs**

		FY2004	FY2003	% change
Per tonne milled	(R)	280	265	(5.7)
	(\$)	41	29	(41.4)
Per PGM ounce	(R)	2 220	2 072	(7.1)
	(\$)	323	230	(40.4)
Per platinum ounce	(R)	4 023	3 832	(5.0)
	(\$)	586	425	(37.9)

At the Base Metals Refinery, the new mill is operating satisfactorily, the expanded second stage leach is being commissioned and the construction of an additional nickel sintering furnace has progressed well. The new 132kV sub-station (with interruption protection) has been operating since April and has resulted in the Refineries being spared the all too-frequent interruptions in power due to cable theft and power dips.

At the Precious Metals Refinery, an engineering, procurement and construction management contract has been signed for the second phase of the expansion and the early civil work has begun. This work focusses on control and the attenuation of gaseous and liquid effluent streams.

The first high-purity hydrogen gas was received from SASOL 1 plant at the end of March 2004. The conversion to piped hydrogen (as opposed to the on-site reforming of hydrogen-rich producer gas) has been a huge success and places the Refineries in a strong position for future expansion. Hydrogen consumption (used for the metallization of nickel and cobalt) declined immediately and there has been a virtual elimination of the venting of the greenhouse gas CO<sub>2</sub>, a by-product of the reforming process.

**Research and development**

As a significant user of ion-exchange technology in the refining of PGMs, the research and development programme has focussed on furthering the advantages of this technology. This has been a two-fold approach in both optimising existing ion-exchange resins, and exploring new, more efficient and cost-effective alternative ion exchange methods. Significant progress

has been made in this regard which will manifest itself in commercially advantageous systems within the next two years.

In addition, the programme aimed at further improving the Refineries' ability to recycle secondary materials internally (that were previously sent to external toll refiners at significant cost) has progressed with appreciable savings being realised.

**Capital expenditure**

Total capital expenditure for FY2004 was R1 197 million of which R814 million (68%) was on mining, R146 million (12%) on Mineral Processes and services, and R237 million (20%) on Refineries. Spend on mining was below budget as decisions relating to the planned 16 and 20 shafts were postponed as these projects were re-evaluated and optimized. Provided the plans for these shafts are approved by the board in September 2004, they are likely to come on stream in FY2009 and FY2011 respectively.

**Outlook**

Tonnes milled are expected to remain steady in the forthcoming year at around 16 Mt with attention being focussed operationally on improving headgrade, recoveries and productivity, in particular. Refined platinum production by Impala will increase to around 1.1 Moz for FY2005. Plans are in place to limit cost increases in line with inflation.

Capital expenditure on the Base Metals Refinery will be on the holistic expansion of that plant, while that on the Precious Metals Refinery will be to ensure that its expansion to 2 Moz complies with environmental legislation.

**Impala Platinum key statistics**

		FY2004	FY2003	% change
<b>Mining sales</b>	(Rm)	<b>7 679.2</b>	8 877.5	(13.5)
Platinum		<b>5 667.6</b>	5 826.2	(2.7)
Palladium		<b>711.5</b>	1 220.9	(41.7)
Rhodium		<b>422.0</b>	936.2	(54.9)
Nickel		<b>575.2</b>	545.1	5.5
Other		<b>302.9</b>	349.1	(13.2)
<b>Mining cost of sales</b>		<b>(4 495.9)</b>	(4 230.4)	(6.3)
On-mine operations		<b>(3 122.4)</b>	(2 824.3)	(10.6)
Concentrating and smelting operations		<b>(715.6)</b>	(624.9)	(14.5)
Refining operations		<b>(337.3)</b>	(312.3)	(8.0)
Amortisation of mining assets		<b>(481.5)</b>	(344.0)	(40.0)
Increase/(decrease) in metal inventories		<b>160.9</b>	(124.9)	(228.8)
<b>Gross profit from mining</b>		<b>3 183.3</b>	4 647.1	(31.5)
<b>(Loss)/profit from metal purchase transactions</b>	(Rm)	<b>(1.7)</b>	14.3	(111.9)
<b>Metal purchase sales</b>		<b>3 419.5</b>	2 463.2	38.8
– IRS		<b>3 187.5</b>	2 459.8	29.6
– Other		<b>232.0</b>	3.4	6 723.5
<b>Metal purchase cost of sales</b>		<b>(3 421.2)</b>	(2 448.9)	(39.7)
– IRS		<b>(3 176.8)</b>	(2 445.5)	(29.9)
– Other		<b>(244.4)</b>	(3.4)	(7 088.2)
<b>Gross profit</b>		<b>3 181.6</b>	4 661.4	(31.7)
Gross margin ex-mine	(%)	<b>41.5</b>	52.3	
Other operating expenses		<b>(210.6)</b>	(224.6)	6.2
<b>Sales volumes ex-mine</b>				
Platinum	(000 oz)	<b>1 070.5</b>	1 080.0	(0.9)
Palladium	(000 oz)	<b>471.9</b>	498.6	(5.4)
Rhodium	(000 oz)	<b>116.1</b>	154.9	(25.0)
Nickel	(000 t)	<b>7.1</b>	7.9	(10.1)
<b>Sales volumes metals purchased – IRS</b>				
Platinum	(000 oz)	<b>383.2</b>	273.7	40.0
Palladium	(000 oz)	<b>257.6</b>	179.5	43.5
Rhodium	(000 oz)	<b>49.0</b>	35.3	38.8
Nickel	(000 t)	<b>5.4</b>	3.7	45.9
<b>Sales volumes metals purchased – Other</b>				
Platinum	(000 oz)	<b>26.1</b>	–	
Palladium	(000 oz)	<b>–</b>	–	
Rhodium	(000 oz)	<b>11.2</b>	0.2	
<b>Prices achieved ex-mine</b>				
Platinum	(\$/oz)	<b>767</b>	596	28.7
Palladium	(\$/oz)	<b>219</b>	265	(17.4)
Rhodium	(\$/oz)	<b>519</b>	650	(20.2)
Nickel	(\$/t)	<b>11 758</b>	7 518	56.4
<b>Exchange rate achieved ex-mine</b>	(R/\$)	<b>6.92</b>	9.11	(24.0)
<b>Production ex-mine</b>				
Tonnes milled ex-mine	(000 t)	<b>15 639</b>	15 042	4.0
Platinum refined	(000 oz)	<b>1 090.3</b>	1 040.1	4.8
Palladium refined	(000 oz)	<b>501.2</b>	477.6	4.9
Rhodium refined	(000 oz)	<b>116.1</b>	134.3	(13.6)
Nickel refined	(000 t)	<b>6.9</b>	8.0	(13.7)
PGM refined production	(000 oz)	<b>1 975.5</b>	1 923.5	2.7
<b>Total cost</b>				
per tonne milled	(R/t)	<b>280</b>	265	(5.7)
	(\$/t)	<b>41</b>	29	(41.4)
per PGM ounce refined	(R/oz)	<b>2 220</b>	2 072	(7.1)
	(\$/oz)	<b>323</b>	230	(40.4)
per platinum ounce refined	(R/oz)	<b>4 023</b>	3 832	(5.0)
	(\$/oz)	<b>586</b>	425	(37.9)
net of revenue received for other metals	(R/oz)	<b>2 182</b>	899	(142.7)
	(\$/oz)	<b>318</b>	100	(218.0)
<b>Capital expenditure</b>	(Rm)	<b>1 197</b>	1 079	(10.9)
	(\$m)	<b>174</b>	120	(45.0)