

OPERATING PLATINUM GROUP METAL MINES IN SOUTH AFRICA, 2014

DIRECTORATE: MINERAL ECONOMICS



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PLATINUM GROUP METAL MINES
IN
SOUTH AFRICA, 2014

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Cover Picture: Ore being transported on a conveyor at Two Rivers Platinum mine.
Source: www.arm.co.za

Compiled by: Mr Donald O Moumakwa
Omphemetse.Moumakwa@dmr.gov.za

Issued by and obtainable from
The Director: Mineral Economics, Trevenna Campus,
70 Meintjies Street, Sunnyside, Pretoria, 0002, Private Bag X59, Arcadia 0007
Telephone 012 444-3537, Telefax 012 444 3134
Website: <http://www.dmr.gov.za>

DEPARTMENT OF MINERAL RESOURCES

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ABBREVIATIONS AND SYMBOLS

4E	platinum, palladium, rhodium, gold
6E	platinum, palladium, rhodium, ruthenium, iridium, gold
DMR	Department of Mineral Resources
FY	financial year
g/t	grams per ton
JV	joint venture
ktpm	kilo tons per month
LOM	life of mine
Moz	million ounces
Mt	million tons
n/a	information not available
pa	per annum
Pd	palladium
PGMs	platinum group metals (platinum, palladium, rhodium, ruthenium, iridium)
Pt	platinum
UG2	upper group 2 chromitite layer in the Bushveld Complex

1. THE OCCURRENCE AND PRODUCTION OF PLATINUM-GROUP METALS (PGMs) IN SOUTH AFRICA

In South Africa (SA), PGMs, together with the by-products gold, silver, chrome, nickel, copper and cobalt, occur in economic concentrations in three separate, extensive layered reefs associated with the mafic rocks of the Rustenburg Layered Suite of the Bushveld Complex. They are the Merensky Reef, the UG2 Chromitite Layer, and the Platereef. The PGMs occur as alloyed native metals, as platinoid minerals (e.g. sperrylite and braggite) and in copper, nickel, cobalt and iron-bearing sulphide minerals (e.g. pentlandite, pyrrhotite and chalcopyrite). Small quantities of PGMs are also produced as by-products from the gold deposits of the Witwatersrand Basin and from the copper ores of the Phalaborwa Complex. Furthermore, PGMs are produced as a by-product of nickel mining on the Uitkomst Complex in the Mpumalanga Province.

In 2013, PGMs in SA were recovered from 29 mining operations employing more than 190 000 workers, including contractors. The ore extracted from the mines is processed by concentrators onsite, before being further processed by smelters and refineries. Only Anglo Platinum (Amplats), Impala Platinum (Implats), Lonmin and Northam Platinum wholly own smelting and refining operations situated in SA. Northam, however, does not own PGMs refining facilities due to insufficient volumes of production. Instead, the company's PGMs concentrate is toll processed by a German company, Heraeus, with platinum and palladium refined in SA and other PGMs in Germany. Smelting and refining operations treat concentrates not only from companies' wholly owned operations, but also from joint ventures and third parties in the form of toll treatment contracts.

The PGMs' excellent catalytic qualities, resistance to corrosion, chemical inertness and high melting points render them most suitable for a number of specialist applications. The three main PGMs, platinum, palladium and rhodium, are used primarily in catalytic converters in emission control equipment. However, they also have other important specialised applications in the jewellery, investment, high technology, electrical, chemical and petroleum refining industries. As a result, the majority of refined SA PGMs production is sold to a diverse range of customers across various global destinations, most notably Asia and Europe, the largest markets in terms of catalytic converters and jewellery industries. Smaller portions are

consumed locally, almost entirely by the catalytic converters industry, and in North America in industrial applications.

This directory is aimed at providing a list of current PGMs producers in SA. Thus, the following section profiles only 23 operations as some mines (Union North, Khuseleka 2, Khomanani and Eland) have since been placed on long term care and maintenance, while others (Phalaborwa Mining and Indaba Diggings & Industry) produce very small amounts to be profiled. The profiles include location, ownership, reserves, output and labour, as well as future prospects. It should be noted that the production indicated refers to total production in 2013 as reported to the DMR, while labour refers to employment figures as they stood by the end of December 2013, also as reported to the DMR.

2. OPERATING PGMs MINES IN SA

<i>Controlling Company</i>	<i>Mine and Location</i>	<i>Ownership</i>	<i>Mining</i>	<i>Reserves</i>	<i>Output and Labour</i>	<i>Prospects</i>	<i>Contact Details</i>
<p>African Rainbow Minerals (ARM)</p> <p>ARM House 29 Impala Road Chislehurst Sandton 2146</p> <p>Tel: 011 779 1300 Fax: 011 779 1312</p> <p>www.arm.co.za</p>	<p>Nkomati mine. In the Machadodorp area, Mpumalanga province.</p>	<p>Managed as a 50/50 unincorporated JV with Norilsk Nickel Africa.</p>	<p>Underground and open pit primary nickel mining on the Uitkomst Complex.</p>	<p>Total Reserves: ~128.61 Mt 4E. LOM: To 2027.</p>	<p>42 000 Pt oz. 2 744 employees.</p>	<p>The focus remains further optimisation of maintenance practises, ore fragmentation and ore loading rates.</p>	<p>Trevor Visagie (HOD: Mine Planning) Tel: 013 712 8200</p>
	<p>Two Rivers Platinum. Near Steelpoort, Mpumalanga province.</p>	<p>ARM 55%, Implats 45%.</p>	<p>Underground mining on the UG2 reef.</p>	<p>Total Reserves: ~35.14 Mt 4E. LOM: To 2024</p>	<p>177 000 Pt oz. 3 375 employees.</p>	<p>Improved returns expected in 2014 from enhanced PGMs recoveries and chrome concentrate sales.</p>	<p>Adriaan de Beers (Mine Manager) Tel: 013 230 2800</p>
	<p>Modikwa Platinum mine. 25 km west of Burgersfort, on the border between Mpumalanga and Limpopo provinces.</p>	<p>Jointly managed 50/50 JV between ARM and Amplats.</p>	<p>Underground and small scale open pit mining on the UG2 reef.</p>	<p>Total Reserves: ~54.78 Mt 4E. LOM: To 2071</p>	<p>133 000 Pt oz. 5 008 employees.</p>	<p>Development of additional ore sources is on track.</p>	<p>Mandla Nxumalo (Mine Manager) Tel: 013 230 2000</p>
<p>Anglo American Platinum (Amplats)</p> <p>55 Marshall Street Marshalltown Johannesburg 2001</p> <p>Tel: 011 373 6111 Fax: 011 373 5617</p> <p>www.angloplatinum.com</p>	<p>Bathopele mine. Near Rustenburg, North West province.</p>	<p>Wholly owned by Amplats.</p>	<p>Fully mechanized underground mining, exclusively on UG2.</p>	<p>Total Reserves: ~41.1 Mt 4E. LOM: To 2026.</p>	<p>123 000 Pt oz. 1 593 employees.</p>	<p>Phase 4 decline extension project to be completed in 2014.</p>	<p>Benjamin Sekano (Production Manager) Tel: 014 598 3048</p>
	<p>Dishaba mine. Between Northam and Thabazimbi, Limpopo province.</p>	<p>Wholly owned by Amplats.</p>	<p>Underground mining on the Merensky and UG2 reefs.</p>	<p>Total Reserves: ~109.6 Mt 4E. LOM: To 2058</p>	<p>153 000 Pt oz. 5 278 employees.</p>	<p>The mine is expected to maintain current production levels.</p>	<p>JJ Joubert (General Manager) Tel: 014 784 1111</p>
	<p>Khuseleka mine. Near Rustenburg, North West province.</p>	<p>Wholly owned by Amplats.</p>	<p>Underground mining on the Merensky and UG2 reefs.</p>	<p>Total Reserves: ~6.5 Mt 4E. LOM: Beyond 2042</p>	<p>179 000 Pt oz. 4 482 employees.</p>	<p>Future mining activities to be reported under those for Thembelani mine.</p>	<p>Jaco Grobler (General Manager) Tel: 014 598 4200</p>
	<p>Mogalakwena Platinum mine. 30 km north-west of Mokopane, Limpopo province.</p>	<p>Wholly owned by Amplats.</p>	<p>Open-pit mining on the Platreef.</p>	<p>Total Reserves: ~1 635.9 Mt 4E. LOM: Beyond 2060.</p>	<p>373 000 Pt oz. 3 750 employees.</p>	<p>The mine is expected to maintain current production levels.</p>	<p>Ted Muhajir (General Manager) Tel: 015 418 2000</p>

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Amplats continued...	Siphumelele mine. 80 km north-west of Rustenburg, North West province.	Wholly owned by Amplats.	Underground Mining on the Merensky and UG2 reefs.	Total Reserves: ~25 Mt 4E. LOM: To 2025.	93 000 Pt oz. 3 329 employees.	The mine is expected to maintain current production levels.	Ivano Manini (General Manager) Tel: 014 598 9111
	Thembelani mine. Near Rustenburg, North West province.	Wholly owned by Amplats.	Underground Mining on the Merensky and UG2 reefs.	Total Reserves: ~19.9 Mt 4E. LOM: To 2039.	100 000 Pt oz. 4735 employees.	Production to increase to 150 koz Pt after inclusion of Kuseleka 1.	Philip Tobias (General Manager) Tel: 014 784 1111
	Tumela mine. Between Northam and Thabazimbi, Limpopo province.	Wholly owned by Amplats.	Underground Mining on the Merensky and UG2 reefs.	Total Reserves: ~41.8 Mt 4E. LOM: Beyond 2070.	237 000 Pt oz. 8 150 employees.	Output expected to increase to 260 koz Pt in 2014.	Peter van Dorssen (General Manager) Tel: 014 784 1001
	Union mine. 15 km west of Northam, in both the Limpopo and North West provinces.	Amplats 85%, Bakgatla ba Kgafela community 15%.	Underground mining on mostly UG2 and limited Merensky reefs.	Total Reserves (85%): ~49.2 Mt 4E. LOM: To 2030.	180 000 Pt oz. 8 153 employees.	The focus is on returning the mine to profitability while it is being prepared for sale.	Mathews Nzimande (General Manager) Tel: 014 786 1001
Aquarius Platinum SA 1 st Floor, Building 5 Harrowdene Office Park Western Service Road Woodmead 2191 Tel: 011 656 1140 Fax: 011 802 0990 aquariusplatinum.com	Kroondal mine. Near Rustenburg, North West province.	50/50 pooling-and-sharing agreement between Aquarius and Amplats. Managed by Aquarius.	Underground mining on the UG2 reef.	Total Reserves: ~21.18 Mt 4E. LOM: To 2023.	274 000 Pt oz. 8 763 employees.	Steady state production at K6 shaft scheduled for December 2015.	Abraham van Ghent (Mine Manager) Tel: 014 536 4000
Atlatsa Resources 4 th Floor 82 Grayston Drive Sandton 2146 Tel: 011 779 6800 Fax: 011 883 0863 www.atlatsaresources.co.za	Bokoni Platinum mine. 80 km south-east of Polokwane, Limpopo province.	Atlatsa 51%, Amplats 49%.	Underground and opencast mining on the Merensky and UG2 reefs.	Total Reserves: ~65.8 Mt 4E. LOM: To 2051.	97 000 Pt oz. 6 564 employees.	Long term expansion planned over two phases.	Dawid Stander (Mine Manager) Tel: 015 620 0007

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Impala Platinum No. 2 Fricker Road Illovo 2196 Tel: 011 731 9000 Fax: 011 731 9254 www.implats.co.za	Impala Platinum mine. Near Rustenburg, North West province.	Wholly owned by Impala Platinum.	Underground and opencast mining on the Merensky and UG2 reefs.	Total Reserves: ~252.18 Mt 4E. LOM: Beyond 2042.	752 000 Pt oz. 42 888 employees.	Programme under way to to extend lives of existing shafts and develop new ones.	Kobus Wagner (Planning Manager) Tel: 014 569 0000
	Marula Platinum mine. 50 km south of Burgersfort, Limpopo province.	Impala 73%, BEE partners 27%.	Underground mining on the UG2 reef.	Total Reserves: ~26.2 Mt 4E. LOM: To 2050.	81 000 Pt oz. 4 154 employees.	Output to be increased to 83 koz of Pt over the next 5 years.	Werner Louw (Operations Manager) Tel: 013 214 6438
Lonmin Platinum 1 st Floor 34 Melrose Boulevard Melrose Arch 2001 Tel: 011 218 8300 Fax: 011 218 8310 www.lonmin.co.za	Lonmin Marikana mine. In Marikana near Rustenburg, North West province.	Lonmin 82%, Incwala Resources 18%.	Underground and opencast mining on the Merensky and UG2 reefs.	Total Reserves: n/a LOM: n/a	825 000 Pt oz. 34 003 employees.	Future growth from underground operations to be generated from Karee and Middelkraal operations.	Victor Nagel (Manager: Life of Business) Tel: 014 571 2000
Northam Platinum 1 st Floor, 1A Albury Park Magaliezicht Avenue Dunkeld West 2196 Tel: 011 759 6000 Fax: 011 325 4795 www.northam.co.za	Booyendal mine. Near Mashishing, Mpumalanga province.	Wholly owned by Northam Platinum.	Underground mining on UG2.	Total Reserves: ~34.06 Mt 4E. LOM: Beyond 2083.	35 000 Pt oz. 2 112 employees.	Steady-state production expected by 2015.	Willie Theron (General Manager) Tel: 083 455 7119
	Zondereinde mine. South of Thabazimbi, Limpopo province.	Wholly owned by Northam Platinum.	Underground Mining on the Merensky and UG2 reefs.	Total Reserves: ~50.72 Mt 4E. LOM: To 2030.	231 000 Pt oz. 9 038 employees.	Increased volumes from deepening projects anticipated as ore reserve development progresses.	Danny Gonzalves (Mine Manager) Tel: 014 784 3000

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<p>Pan African Resources</p> <p>Office 101 Cnr Cradock and Biermann Ave Rosebank</p> <p>Tel: 011 243 2900 Fax: 011 880 1240</p> <p>www.panafricanresource s.com</p>	<p>Phoenix Platinum mine. Near Rustenburg, North-West province.</p>	<p>Wholly owned by Pan African Resources.</p>	<p>This is a CTRP recovering PGMs from tailing dumps, dams and current arising.</p>	<p>Total Reserves: ~5.38 Mt 4E. LOM: To 2031.</p>	<p>3 000 Pt oz. 52 employees.</p>	<p>Expected to produce 211 koz 6E over the 17 year life of the operation.</p>	<p>Bertin Mcleod (Plant Manager) Tel: 082 800 9273</p>
<p>Royal Bafokeng Platinum (RBPlat)</p> <p>37 High Street Block C Melrose Arch 2001</p> <p>Tel: 011 530 8000 Fax: 011 530 8039</p> <p>www.bafokengplatinum.c o.za</p>	<p>Bafokeng-Rasimone Platinum mine. In Phokeng near Rustenburg, North West Province.</p>	<p>RBPlat 67%, Amplats 33%.</p>	<p>Underground mining on the Merensky and UG2 reefs.</p>	<p>Total Reserves: ~51 Mt 4E. LOM: Beyond 2065.</p>	<p>202 000 Pt oz. 8263 employees.</p>	<p>Expansion of current operations is underway.</p>	<p>Neil Carr (Head of Projects) Tel: 083 321 1499</p>
<p>Sedibelo Platinum Mines</p> <p>6 Ecofusion Office Park 324 Witch-Hazel Avenue Highveld Park 0157</p> <p>Tel: 012 661 4280 Fax: 012 661 4139</p> <p>www.platmin.com</p>	<p>Pilanesberg Platinum mine. 80 km north west of Rustenburg, North West province.</p>	<p>Sedibelo Platinum 72.39%, Bakgatla Pallinghurst JV 25.96%.</p>	<p>Simultaneous open pit mining of the Merensky, UG2 and pseudo- reefs.</p>	<p>Total Reserves: ~90 Mt 4E. LOM: Beyond 2026.</p>	<p>60 000 Pt oz. 1 883 employees.</p>	<p>Scheduled to reach steady state monthly production of 20 koz 4E by end 2014.</p>	<p>Mpho Ramonotsi (Process Manager) Tel: 014 555 1800</p>

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Tharisa Minerals Eland House The Braes 3 Eaton Ave Bryanston 2191 Tel: 011 996 3500 www.tharisa.com	Tharisa mine. 35 km east of Rustenburg, North West province.	Wholly owned by Tharisa Minerals.	Open-pit chromite mining on the Middle Group Chromitite Layers.	Total Reserves: ~n/a LOM: To 2033 (open pit) and further 40 years underground.	38 000 Pt oz. Labour data n/a.	Transition to underground mining to commence in 2028.	Derek Baker (Head: Sustainable Development) Tel: 014 572 0714
Xstrata Plc Portion 27 Farm Waterval Rustenburg 0300 Tel: 014 590 2300 www.xstrataalloys.com	Mototolo mine. 30 km west of Burgersfort, Limpopo province.	A 50/50 JV between Amplats and XK Platinum Partnership. Managed by Xstrata.	Underground mining on the UG2 reef.	Total Reserves: ~6.8 Mt 4E (50%). LOM: To 2023.	139 000 Pt oz. 2 354 employees.	The mine is expected to maintain current production levels.	Andrew McClelland (Mine Manager) Tel: 013 230 4560

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