



IMPLATS  
Distinctly Platinum



# Sustainable Development Report 2017

Supplement to the Annual Integrated Report 30 June 2017

Our environmental policy commits the Group to demonstrating responsible stewardship of our natural resources and to mitigating the unavoidable environmental impacts of our mining activities with a particular focus on the following areas:

- Ensuring full compliance with regulatory requirements
- Promoting responsible water stewardship by minimising water use and water pollution
- Responding to climate change risks and opportunities, and promoting responsible energy management
- Minimising our negative impacts on air quality
- Managing our waste streams
- Promoting responsible land management and biodiversity practices

# conserving natural resources and mitigating impacts





## Environmental legal compliance

We engage with the South African and Zimbabwean regulatory authorities to ensure all applicable licences and permit applications are approved and in place and that where ever possible all requirements met. We report any deviations from regulatory conditions and limits in our authorisations, and we collaborate in a transparent manner with the authorities to address any compliance challenges that may arise. At our South African operations we use the IsoMetrix software to track legal compliance to licence conditions and progress on remedial actions. During the year, no fines or non-monetary sanctions for non-compliance with environmental regulations, licences or permits were imposed by authorities on any of our operations in South Africa or Zimbabwe.

This year, we undertook independent assessments of the environmental management plan (EMP) at Impala Rustenburg and at Marula, and submitted the results to the DMR. Impala Rustenburg increased its level of full compliance to commitments stipulated in its EMP, recording 26% minor non-compliances and 6% major non-compliances. A principal non-compliance related to the high number of tailings spillages on pipelines and their potential impact on the groundwater quality. Marula also increased its level of full compliance to commitments and recorded 23.9% partial compliance and

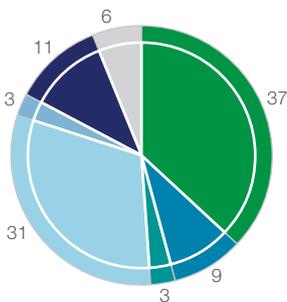
6.1% non-compliance. All non-conformances raised at the operations have been investigated and remedial actions taken.

The Zimbabwean operations have renewed their environmental licences and effluent discharge permits. Three new effluent licences were acquired for Zimplats.

### Environmental incidents

We have an established incident and non-conformity procedure to manage reporting, reviewing and remediating environmental impacts from incidents or substandard acts and conditions. We use a five-tiered scale to report on the impact of an environmental incident (an unplanned/unwanted event that affects the environment). The principal potential impacts of our activities on communities relate to the pollution of soil, surface water, ground water and air quality. We have not recorded a 'major' (Level 5) or 'significant' (Level 4) environmental incident at any of our operations since 2013. This year we recorded a 65% decrease in limited impact (Level 3) incidents, from 99 to 35; 98% of these were at Impala Rustenburg. This number remains high and we continue to strive for no Level 3 incidents. None of the reported incidents resulted in any lasting harm to the environment.

Level 3 incidents in 2017 (%)



Water wastage	0
Effluent and dirty water release	13
Tailings release	3
Energy waste	0
Excessive dust generation excluding point and fugitive emissions	0
Fugitive emissions	1
Point source air emissions	11
Waste management	0
Hydrocarbon management	1
Chemical management	0
Disturbance of historical and archaeological sites	0
Biodiversity management	0
Non-compliance with an authorisation	4
Non-conformance with internal standards	2
Other	0

Number of incidents
0
13
3
0
0
1
11
0
1
0
0
0
4
2
0

### Management systems

Our Impala Rustenburg, Impala Springs and Marula operations have retained certification for their ISO14001: 2004 environmental management systems (EMS), and are currently migrating to the ISO 14001:2015 standard. Zimplats and Mimosa have already been successfully certified against the new standard. All operations have environmental authorisations with the associated environmental management plans in place.

# Water stewardship

Water is our most significant environmental concern. The principal risks we face are increased water stress leading to potential operational disruptions, uncontrolled dirty water discharges into the environment, increasing costs associated with water supply and management, local community discontent and reputational risks.

Our strategy focuses on water consumption and quality management, and proposes a framework for operation-specific water conservation strategies, in line with our strategic commitment to reduce the use of potable water and increase recycled water usage.

## Water use licences and permits

Impala Rustenburg improved its level of compliance with its water use licence (WUL) from 55% in 2016 to 62% in 2017. Marula's compliance with its WUL was 51% in 2016. Marula's next compliance audit is scheduled for November 2017. Impala Rustenburg and Springs continue to experience delays in receiving an amended licence. We review and submit our Integrated Water and Waste Management Plans, and our Rehabilitation Strategy and Implementation Plans, to the Department of Water and Sanitation (DWS) annually.

## Water conservation and demand management

All our operations have demonstrated their commitment to water conservation and to improving water use efficiencies. We have not set targets for water withdrawal reductions. After two years of low rainfall the good rains this year have alleviated the water crisis at Rustenburg and Marula operations. Water management continues to receive particular focus at Impala Rustenburg, which accounts for 51% of the Group's total water consumption. The operation has scavenging boreholes that collectively supplied an average of 1.15MI/day. The operation is developing a water balance model with simulation capabilities to plan for wet and dry seasons. This will assist in

identifying options to improve and plan for future water storage and decrease any losses experienced. In parallel, the Rustenburg processing team initiated a pre-feasibility study to minimise the risks associated with water shortage. The investigations include options for sourcing and storage of potable water as well as storing of grey water.

We work closely with different stakeholders to ensure security of supply for our operations and the surrounding communities.

## Surface and groundwater monitoring

Surface and groundwater monitoring networks are being managed at each operation and we review our water risk assessments annually. Monitoring is ongoing at all predetermined points. Zimplats is exploring options to improve effluent quality through constructing wetlands at discharge points.

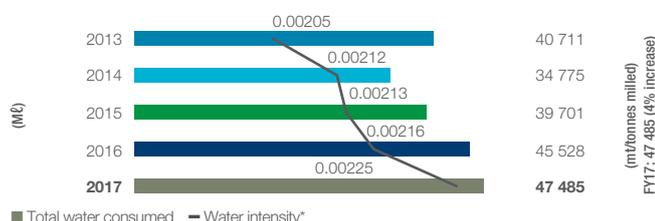
### Our 2017 performance

- Total water consumption, including water withdrawn and water recycled, increased by 4% year-on-year. (see table below)
- Unit consumption rate of water increased to 0.0023 MI/tonne of ore milled, from 0.0022 MI/tonne in 2016
- Total water recycling increased to 46%, up from 41% in 2016, with all operations exceeding the Group target of 40%
- 16 limited impact water-related incidents were recorded.

Details of the total water withdrawn, consumed and recycled at each of our operations, as well as our annual submission to the CDP Water Disclosure Project (2016 financial year review), are available on our website. [i](#)

Water consumption (MI)	2017	2016	2015	2014	2013
1) Water from water service providers or municipalities	8 901	10 160	9 576	7 515	8 851
2) Waste water from other organisations	3 301	3 762	3 104	2 313	2 598
3) Water from rivers	2 180	2 318	2 164	2 175	2 344
4) Water from dams	7 947	6 580	6 897	6 696	8 777
5) Water from ground water	3 380	3 883	3 634	2 667	2 870
<b>Water withdrawn (1 + 2 + 3 + 4 + 5)</b>	<b>25 709</b>	26 703	25 376	21 365	25 440
<b>Water internally recycled</b>	<b>21 776</b>	18 825	14 325	13 409	15 271
<b>Total water consumption</b>	<b>47 485</b>	45 528	39 701	34 775	40 711

## Water



\* Restated to include tonnes milled at Mimosa

## Energy management and climate change

We are progressively integrating climate change mitigation into our core business, and are aligning our processes with anticipated climate change and greenhouse gas (GHG) emission reduction policies and legislation. The potential impact of climate change on water supply is a key risk and we continue to implement mitigation measures for the organisation and communities. Security of energy supply and rising energy prices are also material risks for our operations in South Africa and Zimbabwe.

In South Africa, where the carbon tax policy has yet to be finalised and regulated, we continue to assess our potential carbon tax liability. Details of the climate change risks and opportunities for Implats can be found in our annual submission (CDP 2017 submission is based on 2016 financial year information) to the CDP Climate Change Programme, available at [www.cdproject.net](http://www.cdproject.net).

### Responsible energy management

Electricity consumption continues to account for around 70% of our total energy consumption (of which 50% is consumed at Impala Rustenburg), and almost 10% of our overall cash cost base. Our expansion into deeper mining operations that are

more energy intensive, coupled with the anticipated introduction of a carbon tax in South Africa, highlights the imperative of reducing and optimising our energy use.

Over the last five years, we have implemented various energy conservation initiatives. These include installing underground energy efficient lighting, optimising the use of underground compressed air systems, installing power factor correction equipment at Impala Rustenburg and Mimosa, and improving diesel performance management. Current initiatives focus on improving efficiencies in the shafts, notably energy efficient lighting installations and energy efficient motors. At Impala Rustenburg we upgraded the “ei Enterprise system” which is used for real-time energy consumption monitoring and trend analysis.

We have not set electricity consumption targets. We have conservative Group emissions reduction targets in place (see table below) and will develop specific targets once regulatory expectations are clarified. Our Mimosa operation has introduced a climate change strategy and policy, and is implementing measures to reduce the operation’s carbon footprint by 3% annually up to 2020.

### Implats absolute Scope GHG emissions reduction targets

Type of emissions	% of emissions in scope	% reduction from base year	Base year	Target year
Scope 1	20	2	2015	2017
Scope 2	80	5	2008	2020
Scope 2	80	35	2015	2030
Scope 2	80	63	2015	2040

### Fuel cell technology

We continue to work with government and academic institutions on the development of fuel-cell technologies that will utilise PGMs as alternative energy sources. Fuel cells provide electricity cleanly and quietly and will improve ventilation in underground mines and reduce heat, noise levels and emissions.

In developing applications for mobile mining equipment, we are currently evaluating proposals for the commercial development of a prototype fuel-cell (FC) driven load haul dumper (LHD) that will be tested at Impala Rustenburg 14 Shaft. Some of the advantages over a diesel fuelled LHD include zero diesel particulate matter, no carbon monoxide and at least a 40% reduction in CO<sub>2</sub> with negligible SO<sub>x</sub> and NO<sub>x</sub> formation.

Impala Springs has an operating FC forklift in its base metals refinery; the prototype with hydrogen refuelling station has been in operation since October 2015 and continues to perform beyond expectation. In the longer term, we plan to use fuel cells as the main source of energy for material handling and underground mining equipment.

Impala Springs is working towards taking its refinery off-grid through a phased approach and powering it with a carbon-neutral fuel source, initially with the installation of an 8 MW natural gas system. The project is at an advanced development stage and installation is expected by 2019; Implats has arranged a natural gas supply to the facility. The long-term goal is to use fuel cells to generate 22 to 30 MW of power.

These new applications are stepping stones in the implementation of our fuel cell development roadmap. This is a collaborative process between industry, government and academia in South Africa to develop fuel cell technologies and to stimulate a vibrant, sustainable local fuel cell sector. This includes fast-tracking the development of local manufacturing of fuel cells and componentry within a proposed special economic zone adjacent to the Refineries in the Springs region. The project in partnership with various government departments is a longer-term strategic investment to facilitate platinum beneficiation. The localisation strategy envisages partnerships with international manufacturers and in time, the backward integration of local South African sub-components.

### Data management

Each year we conduct a GHG emissions assessment to identify areas for mitigation and efficiencies. We continue to improve the quality of our emissions reporting, with an emphasis on improving the measuring of Scope 3 emissions. This will facilitate the availability of auditable data on energy savings from all operations. Scope 1 and Scope 2 emissions are audited. This year we developed a GHG handbook that provides a systematic approach to calculating our footprint across the Group.

### Our 2017 performance

- Total CO<sub>2</sub> emissions increased year-on-year, due to increased production at Impala Rustenburg and Zimplats, which respectively contributed 73% and 10% of total emissions. As a result we did not achieve our 2017 target of a 2% reduction in Scope 1 emissions from the base year 2015
- Most of the Group's GHG emissions (3.3 million tonnes) are associated with Eskom electricity usage, with the balance (0.4 million tonnes) associated with the direct use of coal, diesel, petrol and industrial burning oil
- Our emissions intensity (total tonnes of CO<sub>2</sub> per tonne of ore milled) was 0.1782, up from 0.1741 in 2016
- Our total energy consumption was 18 065 GJ (000), up from 17 328 GJ (000) in 2016.

Additional data on our direct and indirect GHG emissions and our energy use, by operation for each of the past five years, are provided in our performance tables online [D](#).

Climate change indicators	2017	2016	2015	2014
Scope 1 CO <sub>2</sub> emissions (direct – fossil fuels) (t000)	410	382	349	324
Scope 2 CO <sub>2</sub> emissions (indirect – electricity purchased) (t000)	3 299	3 286	3 002	2 714
Electricity purchased (MWh 000)	3 555	3 425	3 129	2 780
Direct energy (GJ 000)	5 269	4 998	4 671	4 386
Indirect energy (GJ 000)	12 797	12 330	11 266	10 008

\* Includes emissions as a result of business travel, employee commuting and downstream distribution. Reliable data only available since 2016



\* Restated to include tonnes milled at Mimosa



# Air quality management

The most significant air quality issue for the Group relates to the sulphur dioxide (SO<sub>2</sub>) emissions from our smelting and refining operations at Zimplats, Impala Rustenburg and Impala Springs.

## Licences and permits

Both Impala Springs and Impala Rustenburg are located in priority areas as promulgated by the National Environmental Management Air Quality Act and have the required air emission licences (AEL), valid until 2018 and 2019 respectively.

At Zimplats, air emission discharge points are licensed by the Environmental Management Agency in line with air pollution regulations. The current legislative SO<sub>2</sub> emission point source limit of 50mg/Nm<sup>3</sup> is considered virtually unattainable even with best practice abatement technologies. As such, Zimplats is operating in the red air emission licence category (issued for a discharge considered to present a high risk to the environment). A review of the air emission legislation has commenced and a draft air quality management standard has been finalised. The current air quality regulations prescribe limits for point source emissions and do not include ambient air or ground level concentration limits.

## Data management

We have further improved our atmospheric emissions data management systems to ensure that our South African operations are aligned with the requirements of the national atmospheric emissions inventory system (NAEIS). We report on the NAEIS for listed activities (smelter and refineries) and mining. GHG emissions will be reported for the first time by 31 March 2018.

## Air quality monitoring and management

We work towards managing our SO<sub>2</sub> emissions to the lowest possible levels and as a minimum to ensure that we are compliant with the limits set out in our AELs. We strive to maintain SO<sub>2</sub> emissions at Impala Rustenburg at less than 16 tonnes per day.

Extensive ambient air quality monitoring networks are in place at Impala Springs, Impala Rustenburg and Zimplats operations via ambient monitoring stations. These monitoring stations measure SO<sub>2</sub>, NO<sub>x</sub> and particulate matter and provide an indication of ambient air quality levels and associated trends. We report the results of the ambient monitoring to the relevant authority each quarter, and as and when requested. At Impala Rustenburg, due to the extent of the mine lease area, source allocation remains challenging as various factors can influence the ambient measured data. We investigate all SO<sub>2</sub> exceedances to determine the likelihood of our smelter operation being responsible.

Dust fallout is measured monthly at Impala Rustenburg, Marula, Mimosa and Zimplats. Results for the monitored facilities were all within specified permits conditions.

Zimplats has improved the reliability of its air quality monitoring system. We successfully set up a continuous emission monitoring system to monitor point source emissions from

our smelting operations. The unit measures point source particulate matter, SO<sub>2</sub>, pressure, velocity, stack temperature and stack flow. The calibration of the air monitoring network was successfully conducted during 2017. The operation is implementing a crusher dust suppression system project at its Ngezi concentrator to reduce dust emission from the operations. Sulphur emissions reduction feasibility studies at Zimplats are ongoing. The operation continues to operate on a red permit issued for a discharge considered to present a high risk to the environment from the Environment Management Agency (EMA) while we seek a long-term solution. Zimplats' sulphur abatement programme includes a proposed new furnace installation project and in the longer term, the installation of an acid plant.

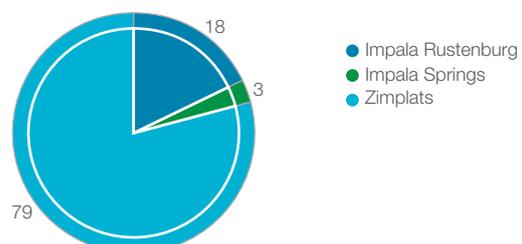
Impala Rustenburg forms part of the Multistakeholder Reference group for the Waterberg Bojanala Priority area and we participate in the Bojanala Industry task team.

## Our 2017 performance

- Direct SO<sub>2</sub> emissions were within the conditions of the AEL for our Impala Springs and Impala Rustenburg operations
- Impala Springs registered a non-compliance for particulate matter on the ammonium sulphate stack and for ammonia at the cobalt plant. The regulator is kept informed; two projects to address these non-compliances are expected to be completed by 2020
- Zimplats emitted an average 61 tonnes per day of SO<sub>2</sub> compared to 69 for the previous year. The decrease is attributed to a major planned shutdown conducted in 2017
- Direct Group emissions of SO<sub>2</sub> were 29 373 tonnes (2016: 31 392 tonnes). Our Zimplats operations contributed 80% of total direct SO<sub>2</sub> emissions, while Impala Rustenburg and Impala Springs operations contributed 18% and 3% respectively
- Indirect SO<sub>2</sub> amounted to 29 504 tonnes (2016: 27 355 tonnes) and indirect NO<sub>x</sub> amounted to 14 574 tonnes (2016: 14 435 tonnes)
- Total group SO<sub>2</sub> emissions amounted to 58 877 tonnes (2016: 58 747).

Further details on the SO<sub>2</sub> and NO<sub>x</sub> emissions at each of our operations over the past five years are provided online. [i](#)

## Direct SO<sub>2</sub> emission (%)



## Managing our waste

Our waste management activities across the Group seek, as a minimum, to ensure compliance with evolving legislative requirements relating to waste.

### Ensuring compliance

At the South African operations we focus on retaining our waste licences by ensuring compliance with statutory requirements and site-specific conditions. We have waste licences in place for Impala Rustenburg (landfill site and salvage yard) and the salvage yards at our Marula and Impala Springs operations. These operations undertake annual external compliance audits. All listed waste streams at our South African operations have been reclassified in accordance with regulations.

### Focus on waste recycling

In this context the term “recycling” is a generic term for waste streams that are re-used, recycled or recovered. Although predominately demand driven, we have maintained a strong focus on our levels of non-mineral waste (hazardous and

non-hazardous) recycling. We continue to investigate reuse and recycling opportunities as well as alternative disposal solutions for various waste streams.

We have not yet formulated waste reduction targets.

### Our 2017 performance

- We recycled 69% of waste generated, up from 68% in 2016
- Mineral tailings deposited totalled 21 258 kilotonnes
- Waste rock deposited on land totalled 869 kilotonnes
- Hazardous waste disposed of to landfill totalled 10 918 tonnes

Further data on the Group’s non-mineral waste (hazardous and non-hazardous) and mineral waste is provided online. 

## Land management and biodiversity

Our approach to land stewardship focuses on rehabilitation, while ensuring the protection of our water and biodiversity resources through the responsible management of mineral waste and hazardous substances.

### Rehabilitation

Ensuring effective rehabilitation is an important regulatory, financial and reputational issue for the Company. The closure liability of all mining operations is calculated annually and the financial provisions updated accordingly. We use innovative mine design and concurrent rehabilitation to reduce closure liabilities and improve rehabilitation outcomes. All tailings storage facilities have concurrent rehabilitation plans that include revegetation, dust management and water management. This year Impala Rustenburg operations have developed a strategic shaft closure methodology to assist in the decommissioning of non-operational units.

### Financial provision

In South Africa, the transitional period for compliance with new regulations pertaining to the financial provisions for prospecting, exploration, mining or production operations, has been extended. The South African mining operations are in the process of aligning their closure liability assessment protocols and methodology, and will strive to comply with all aspects of the regulations by the end of 2018. Zimplats has aligned its annual closure liability assessment with the South African

assessment methodology and their current focus is on developing detailed closure and rehabilitation plans.

### Rehabilitation monitoring and progress

Our rehabilitation activities are focused on ecosystem functionality, which is essential for sustainability beyond life of mine. We have maintained an active rehabilitation monitoring programme, using Landscape Function Analysis, at Impala Rustenburg’s rehabilitated opencast pits and at Marula’s rehabilitated tailings side slopes. Although the good rains this year partially alleviated the impact of the sustained drought, some of the rehabilitated opencast sites at Impala Rustenburg still require additional remediation. The success of the current rehabilitation plan at the Rustenburg tailings dam is being impacted by an increase in wind speed as the dam height increases. Given this issue, and the fact that our long-term climatic model indicates a possible decrease in annual precipitation, we recognise that we need to develop a more sustainable closure methodology as well as a supportive monitoring programme

At Zimplats, we have continued with open pit rehabilitation at Ngezi, as well as the revegetation of all new surfaces at the two tailings dams. The Mimosa operations do not have any opencast mining operations and rehabilitation is limited to the ongoing revegetation of the tailings side slopes.

# Land management and biodiversity

## Our 2017 performance

- A total of 71.2ha of disturbed land was rehabilitated
- Estimated rehabilitation liability for our operations totalled R1.9 billion
- Group rehabilitation provisions totalled R1.1 billion.

Additional data on our land management, by operation, is provided online. [i](#)

## Biodiversity

Given the potential of mining activities to impact habitats through land disturbance and pollution, biodiversity monitoring and management remains an important activity. We determine the biodiversity impacts of our mining operations through our EIAs, and manage these according to site-specific biodiversity management plans.

## Biodiversity management

Impala Rustenburg implemented a formal biodiversity management plan, informed by the Mining and Biodiversity Guideline developed by the South African National Biodiversity Institute (SANBI). Marula and Impala Springs have implemented site-specific biodiversity management plans. We plan to develop and implement strategic biodiversity management plans at all our operations.

At Impala Rustenburg, extensive alien and invasive weed control has been performed at the historic opencast sites. This year, we undertook additional alien and invasive species assessments at all the operational units at Impala Rustenburg and Impala Springs.

## Biodiversity sensitive areas

Zimplats and Impala Springs both operate close to biodiversity-rich areas. Impala Springs is near the Cowles Dam that feeds into the Blesbokspruit, a designated Ramsar Convention wetland of international importance that is deemed under threat. Although Impala Springs is not seen to have any direct impact on this ecosystem, it continues to partner in environmental education and conservation initiatives in the area. The Zimplats operation includes a leased 276ha section of rehabilitated, non-operational land within the Ngezi National Park's boundary.



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