

Environmental performance



Highlights	<ul style="list-style-type: none"> • New group environmental policy developed and approved by the board. • Good levels of legal compliance reported. • Final commissioning of new and expanded air quality abatement equipment at the smelter in Rustenburg, which will more than halve SO₂ emissions in the future. • A reduction in fresh water consumption reported. • Group response to climate change developed. • Impala Rustenburg, Impala Springs and Zimplats retain ISO14001 certification. • Direct SO₂ emission reduction of 20%.
Disappointments	<ul style="list-style-type: none"> • Lack of progress in obtaining water licences.
Opportunities	<ul style="list-style-type: none"> • Continued implementation of ISO14001 to maintain highest levels of environmental practice. • SO₂ emissions from Impala Rustenburg to further decrease in the future. • Potential opportunities as a result of climate change to be investigated.

Management approach

Prospecting, mining, processing and refining operations inevitably have an impact on the environment. Implats is extremely mindful of this and has ensured that the strategies and processes required to minimise this impact are in place at all stages of the operations' life cycle, from prospecting to closure. Further, Implats plays a significant role in the recycling of its product.

While the management and day-to-day responsibility for environmental matters lies with the relevant managers at Implats' various operations, these operations are guided and supported by a corporate level environmental team, which has as its head a Group Safety, Health and Environment executive.

As a minimum, Implats ensures compliance with environmental legislation. Significant environmental issues are reported and considered at the company's executive meetings, comprising the senior leadership of the company. At the board level, the SHEQ Audit Committee has oversight of environmental matters, and environmental performance is reported to this committee on a quarterly basis. Site visits are undertaken on a regular basis by the SHEQ Audit Committee, while the group corporate environmental team conducts regular audits.

Environmental performance (continued)

Environmental harm is avoided or mitigated as far as is practical throughout the life cycle of mining operations

Environmental policy

A revised Implats group environmental policy was developed during the year, and signed by the CEO and approved by the board in November 2008. The policy is more focused on environmental matters than the previous integrated Health, Safety and Environment Policy. Its full implementation is being undertaken at an operational level, and communication with employees and contractors on this new policy has begun.

While the group aspires to zero harm as a fundamental vision, it is recognised that it is rarely possible to achieve this in the context of sustainable development, particularly in mining. It is considered though, that it is possible to achieve 'net' environmental zero harm, through social and environmental offsets which would give a net positive benefit rather than negative harm through the application of sustainability principles.

Environmental harm is avoided or mitigated as far as is practicable throughout the life cycle of mining operations through operational control and the application of sound environmental principles and practices, including:

- legal compliance;
- pollution prevention;
- implementation of the precautionary approach and duty of care;
- continual improvement in environmental performance; and
- ongoing rehabilitation.

ISO14001 certification

Operation	Date of initial certification	Most recent audits
Impala Rustenburg	May 2003	Recommended for recertification in May 2009
Impala Springs	May 2000	Recertified in January 2009; Surveillance in May 2009
Zimplats	SMC – October 2004 Ngezi Mine – November 2005	Recertified in September 2008
Mimosa	May 2007	Surveillance in December 2008
Marula	Marula is in the process of implementing an ISO14001 based EMS. An initial review (gap analysis) was undertaken in March 2009.	

Compliance

Implats' operations all have environmental management systems (EMSs), developed in accordance with the ISO14001 environmental standard (see table on page 138). Environmental management programmes are in place at all mining and prospecting areas, as required by the relevant mining legislation.

All but one operation (Marula) are certified as being compliant with ISO14001, with recertification audits having taken place in FY2009. Impala Springs, Impala Rustenburg and Zimplats were recertified during the year. All major and minor non-conformances had to be closed out before the recertifications were awarded. Impala Rustenburg was recommended for recertification in May 2009, provided that eight minor non-conformances are resolved by the end of August 2009. Rustenburg also received 14 commendations during this audit.

A gap audit was conducted at Marula (in respect of compliance with ISO14001). Several issues were raised during this audit which are receiving attention and will be addressed prior to Marula seeking external verification of its compliance with this standard during FY2010.

In line with its commitment to complying with legislation, regulations and its own EMSs, both internal and external audits are undertaken on a regular basis. A total of 109 internal audits and 5 external audits were undertaken during the year.

Internal environmental systems audits are conducted to ensure ongoing compliance with ISO14001 and the group's environmental management systems requirements. External legal compliance, ISO14001 certification, EMP compliance and other legislated audits are undertaken regularly.

No significant breaches of environmental laws, regulations or standards were reported by the group during FY2009, and no fines were imposed by the regulatory authorities in respect of environmental compliance. No critical level environmental incidents were reported.

Complaints received from the public are addressed as part of non-conformance management in the ISO14001 management systems for all operations other than Marula. At Marula, issues raised by communities are addressed under the auspices of the Marula Community Development Agency. Mimoso also receives complaints from the public via the human resources department and quarterly community liaison meetings.

Implats' operations all have
EMSs developed in
accordance with ISO14001

Environmental performance (continued)

In respect of environmental authorisations, the following is reported:

- Little progress has been made towards concluding water use licences at Impala Rustenburg, Impala Springs, Marula or Leeuwkop. Impala Springs and Marula have received a draft water use licence.
- All relevant authorisations for the Merensky project at Marula were obtained.
- Mimosa Mine was granted a licence for hazardous waste generation, use, recycle, storage, treatment and transportation in March 2009. This is in compliance with the Environmental Management (Hazardous Substances, Pesticides and other Toxic Substances) Regulation of 2007, in terms of Zimbabwean legislation. The list of hazardous substances includes petrol, diesel and chemicals used mainly in the laboratory.
- Impala Rustenburg received authorisation for the installation of diesel storage tanks at 11C shaft and for the installation of diesel and oil storage tanks for 12 shaft.
- A total of 21 solid waste and effluent disposal permits were applied for and granted to Zimplats during the course of the year.

Communication

Open and transparent communication with stakeholders continues to be a key objective for the group and a close alignment has been sought between the environmental teams and the newly formed stakeholder engagement unit. Hotlines, open days, newsletters and community liaison forums continue to form an integral part of the communication with stakeholders.

Performance in FY2009

Given the varying nature of mining, processing and refining operations and environmental circumstances across the operations within the group, it is understandable that the environmental priorities and the potential for environmental risk varies from site to site. Generally, however, Implats' environmental priorities are:

- improving resource usage (water and energy),
- reducing the group's carbon footprint,
- preventing pollution (air, water and land),

- instilling and ensuring good practice in respect of waste management, and
- responsible conservation and preservation of land under management.

Water management

Water is a scarce and valuable resource in Southern Africa. It is anticipated that supply could be further constrained in the future owing to the effects of climate change. The group's water management strategy involves the reduction of fresh water consumption where possible, increasing recycling and mitigating any negative impacts of its operations on local and regional water resources.

Water consumption

Implats is cognisant of the fact that, in Southern Africa, water is a scarce resource and programmes are in place to reduce and minimise consumption, and improve recycling. As far as it is possible, effluent water is re-used directly for mining, processing and refining operations.

To optimise water usage at the Rustenburg operations, a water conservation programme has been developed to include:

- maximising the recycling of water within the company's operations;
- using treated effluent from the Rustenburg Water Services Trust in the processing facilities; and
- recycling of water from the tailings operation. Additional stormwater storage dams at the tailings and UG2 concentrator operations are being constructed and will be completed in FY2010.

Measures in place to optimise water usage at Zimplats include:

- recycling water from tailings dam into the plant.
- storm water retention dam captures all water from the SMC plant area and re-channels it to the plant.
- run-off mine water is recycled from settling dams at the three underground mines at Ngezi, although there are no meters in place as yet to quantify the amount recycled back into the mine.

Open and transparent communication with stakeholders remains a key objective

Environmental performance (continued)

Water sources

- | | |
|-------------------|--|
| Impala Rustenburg | <ul style="list-style-type: none"> • Surface water – water from Rockwall Dam used at processing plant • Recycled water – water from the tailings dam and treated effluent from the Impala water care works re-used in processing plants • Groundwater – ingress water from various shafts; smelter boreholes will become operational in FY2010 • Waste water – effluent water received from Rustenburg Water Services Trust; • Fresh water – potable water from water services provider (Rand Water and Magalies Water) |
| Impala Springs | <ul style="list-style-type: none"> • Fresh water – potable water from water services provider • Recycled process water |
| Marula | <ul style="list-style-type: none"> • Surface water – water from water services provider, Lebolelo Water Scheme • Fresh water – Marula treats a portion of the water obtained from the Lebolelo water scheme for use as potable water • Recycled water from tailings dam |
| Mimosa | <ul style="list-style-type: none"> • Surface water – Mimosa Mine abstracts water from the nearby river • Fresh water – A portion of the water abstracted from the nearby river is used as potable water • Recycled water from tailings return dam |
| Zimplats SMC | <ul style="list-style-type: none"> • Surface water – abstracted from a Zimbabwe National Water Authority dam, the Manyame dam. A portion of this water is treated for potable water • Groundwater – dewatering of old mine portals |
| Zimplats Ngezi | <ul style="list-style-type: none"> • Surface water water is abstracted from a Zimbabwe National Water Authority (ZINWA) Manyame dam and the dewatering of the two old BHP Mine portals. Zimplats Ngezi operations' water supply is from the Ngezi River Weir and boreholes within the site |

To optimise water usage at Mimosa Mine, a second return water dam is being constructed, which will optimise the use of return water decanted from the active tailings dam.

Total water consumption by the group in FY2009 was 35.9 million kJ, a decrease of 9% on the previous year. Total water withdrawn amounted to 25.8 million kJ, a decrease of 0.7% on FY2008. In line with the group's strategy to reduce fresh water consumption, this parameter decreased during the year as further recycling initiatives took effect.

Impala Springs is currently investigating ways of optimising the recycling of water.

Total and fresh water consumption (1 000k l)*

Operation	Total water consumption			Total water withdrawn		
	FY2009	FY2008	FY2007	FY2009	FY2008	FY2007
Impala Rustenburg	24 894	29 530	24 608	18 843	19 812	16 715
Impala Springs	1 195	1 186	1 310	758	752	858
Marula	2 160	2 031**	2 174**	1 169	1 001	1 083
Zimplats	3 793	3 442***	2 078	2 685	2 386	930
Mimosa	3 885	3 286	2 972	2 328	2 019	2 138
Group	35 927	39 475	33 142	25 783	25 970	21 724

* Total water consumed includes various sources of water and recycled water.

* Total water withdrawn includes water from service providers, rivers, dams, groundwater and external recycled water.

** Marula: FY08 - 4 611 restated as 2 031

FY07 - 2 310 restated as 2 174

*** Zimplats: FY08 - 6 502 restated as 3 442

Recycled water used (1 000k l) and % total water consumed)

Operation	k l recycled			% total consumption		
	FY2009	FY2008	FY2007	FY2009	FY2008	FY2007
Impala Rustenburg	7 557	9 719	7 893	30	33	32
Impala Springs	438	433	457	37	37	35
Marula	991	1 030*	1 091***	46	51	50
Zimplats	1 109	1 056**	834	29	31	55
Mimosa	1 557	1 267	1 148	40	39	28
Group	11 652	13 505	11 423	32	34	34

* Marula: FY08 - 3 610 restated as 1 030

** Zimplats: FY08 - 4 116 restated as 1 056

*** Marula: FY07 - 1 227 restated as 1 091

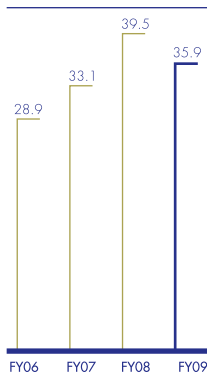
Group water withdrawn by source – FY2009 (1 000k l)

Water from service providers	11 982
Water from external recycling projects	3 829
Water from rivers, dams and groundwater	9 972
Total water withdrawn	25 783

Implats plays an active role in local water forums so as to constructively engage with neighbours and the authorities in optimising water usage. In FY2009, Marula participated in the Sekhukhune District Environmental Forum which focuses on, among other issues, water usage, and promotes the sharing of knowledge and information.

Environmental performance (continued)

Total water consumption
(1 000 000 k)



Impala Rustenburg actively participates in the water sub-committee of the Producers' Forum on the western limb which aims to ensure the optimal usage of water in the area.

Preventing pollution

Given the nature of mining operations (and particularly the use of explosives) the primary concern in respect of water pollution is the potential release of process water containing sulphates, chlorides and nitrates into receiving water bodies. None of Implats' operations are associated with acid mine drainage.

Groundwater and surface sampling is regularly undertaken at all operations. For the Impala Rustenburg operation, this data is fed into a regional groundwater model which is then used as a management tool for groundwater problem identification and mitigation design, should this become necessary.

Capital expenditure of R68.5 million has been allocated for water-related projects at the Rustenburg operations to be implemented over the period FY2009 to FY2012. R30 million was spent in FY2009.

As part of the company's project to improve water quality in receiving water bodies and to further minimise discharges, several new storm water control dams are under construction – at Impala Rustenburg's UG2 concentrator complex and the No 3/4 tailings dams. This project forms part of an initiative to clean the Rockwall Dam by minimising the inflow of contaminated process water and storm water. It is expected to be completed in FY2010. The design of the storm water control dams at the Mineral Processes' central concentrator is targeted for completion during FY2010.

Various projects to prevent and mitigate groundwater pollution will be finalised during FY2010. These include: the construction of cut-off trenches at the 14 shaft waste rock dump and sludge ponds; lining of the 16 shaft evaporation ponds and implementation of environmental engineering controls at the waste rock dump; and formalising an environmental standard for the construction, operation and closure of waste rock dumps.

An additional pond was also constructed at Impala's Refineries in Springs to manage effluent and prevent any spillages into water courses. The refineries do not discharge water into any water courses, although some effluent is released into the municipal sewer (with permission).

A second return water dam has almost been completed at Mimoso, at a cost of around \$1 million.

Energy management

The amount of energy available to and used by the company is a material issue. It has a bearing on the continuity of Implats' business and growth and on costs, and the energy used is a significant component of the company's greenhouse gas (GHG) emissions. Electricity costs have risen and are likely to rise significantly in coming years.

In early 2008, following a national electricity shortage, Eskom, the national power utility in South Africa, reduced the permanent electricity allocation to the mining industry by 5%. Implats worked closely with Eskom on demand-side management (DSM) programmes to effect this reduction in energy usage. Subsequently, electricity tariffs have risen by 24% in South Africa, and additional increases are anticipated in the coming year. In FY2009, the cost of electricity made up 6.5% of the company's operating costs excluding share based payments.

Integral to Implats' strategy to reduce its GHG emissions is the group's strategy to optimise energy consumption and energy efficiency.

The opportunity for reducing energy usage at the group's smelters and refineries is limited. Energy requirements here are largely fixed, and related to throughputs. In FY2008, a third furnace was commissioned at the Rustenburg operations so as to increase the group's capacity to smelt its concentrate, concentrate from other producers and the rising tonnages of spent autocatalysts. (Implats is one of the world's largest recyclers of autocatalysts, sourced largely from the United States). Implats' focus is therefore on optimising the energy efficiency of its mining operations.

During the year under review, Implats' total energy consumption, and hence GHG emissions, have continued to rise as the group continues to pursue its growth strategy despite a 10% decrease in gross refined platinum production. The increase in energy consumption is largely as a result of:

- the third furnace becoming fully operational, and
- mining operations becoming deeper and further from the shafts, resulting in greater energy requirements for transport and refrigeration.

Integral to Implats' strategy to reduce GHG emissions is the optimisation of energy usage and efficiency

Environmental performance (continued)

Implats' energy saving initiatives have achieved some benefits, although these have not yet been seen in total energy consumption figures. Many of the initiatives delivered substantial benefits to Eskom as a result of demand shifts (to off-peak hours) and the installation of appropriate scheduling and control mechanisms.

It is anticipated that these initiatives will deliver further improvements going forward but, given the group's expansion plans, the emphasis will remain in improving efficiencies rather than reducing absolute consumption.

A similar need exists in Zimbabwe. Severe power outages, combined with punitive electricity tariffs, provide significant financial incentives for power conservation strategies.

Mimosa Mine is in the process of installing solar water heating systems on low density residential houses and inverters as a result of power outages. Energy reductions will not be reflected on Mimosa Mine energy consumption as occupants of the low density houses pay their bills to the Zvishavane town council.

Implats established an internal Energy Initiative Working Group as far back as 2005, and has worked closely with Eskom since then on several demand-side management (DSM) initiatives. Among the initiatives investigated (and discussed further in the table on page 146) are projects related to:

- main fan stations;
- refrigeration systems;
- underground pumping systems;
- underground lighting;
- air compressor and reticulations systems; and
- hot water control systems for change houses and residences.

Other projects either underway or being considered are: purchase of high efficiency electric motors, closed loop water cooling towers on compressor plants (which require less pumping), replacement of bag house filters with cyclo filters on the intake of compressors (which reduces the restriction of air flow and increases compressor efficiency). The installation of alternative methodologies used in Impala Rustenburg water treatment works, for example, has reduced power requirements by 25%.

Impala's new shafts (16, 17 and 20 shafts) have been and are all being constructed with high-level specifications for energy efficiency and power management in terms of main fan stations, refrigeration systems, underground pumping systems, underground lighting, air compressor and reticulation systems, and hot water control systems for change houses and residences.



Environmental performance (continued)

Energy management initiatives at Impala Rustenburg

Project name and description

Main ventilation fan stations: This project involved the improvement in the central control of the main ventilation fans, as well as improved fan control.

Refrigeration systems:

Project involves improving central control, as well as thermal storage systems (ice stores, water dams and rock mass)

Underground pumping systems (1):

Project involves optimising pumping schedules.

Underground pumping systems (2):

Installation of mid-shaft dams (in place of surface dams), thereby reducing the energy required to pump to surface.

Underground pumping systems (3):

Project involves installation of mud presses underground, reducing energy required to pump mud to surface.

Underground lighting:

Project involves replacement of some 34 000 globes installed underground with compact fluorescent lighting.

Air compressor and reticulation systems:

Project involves improvement in central control and more efficient operating systems.

Hot water systems for change houses and residences:

Project involves implementation of heat pump technology.

Scope of project	Status
Project able to reduce electricity usage by some 7.4 MW between 18:00 and 20:00 (peak demand period). Total cost of capital for this project was R17.5 million, of which Impala contributed R1.3 million.	Completed
Expected load shifting and efficiency improvements of 1.3MW. Capital required of R29 million.	Proposal submitted to Eskom as a potential DSM project. Impala currently examining alternative funding.
Expected load shifting and efficiency improvements of 1.4MW on average. Total cost of project of R3.6 million.	Eskom has approved this DSM project and implementation is underway.
Load shifting improvements of 3.0MW on average from existing shafts. Capital cost requirements under investigation.	This model has been implemented at the new shafts (16, 17 and 20) and consideration is being given to retrofitting arrangements at existing shafts.
Load shifting potential and capital expenditure still to be determined.	This model has been implemented at the new shafts (16, 17 and 20) and consideration is being given to retrofitting at existing shafts.
Potential energy savings of 7 000MWh at a cost of R500 000.	Detailed surveys were undertaken. Key consideration to be given to illumination levels and replacement frequency. Proposal is under review and alternative suppliers are being sought.
Expected load shedding and efficiency improvements of 3.5MW on average.	Detailed surveys were conducted. Specific project proposals under development.
Load shedding opportunity is minimal. Capital cost of R1 million.	Detailed site metering and surveys were carried out and a project proposal is under development.

Environmental performance (continued)

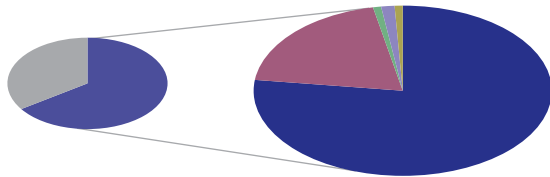
Total energy consumption (which includes direct and indirect energy) rose by 29% to 16 million GJ in FY2009. Energy consumption per ounce of platinum produced was 9.6GJ, an increase of 13.1% per platinum ounce produced. (See the diagram below).

Mimosa is currently working on cost-saving strategies that will reduce energy consumption and that can be adopted and implemented by various departments.

Total energy consumed (000 GJ)

Operation	FY2009	FY2008	FY2007
Impala Rustenburg	11 138	10 875	10 441
Impala Springs	2 554	2 520	2 789
Marula	637	613	472
Zimplats	1 413	1 587	1 468
Mimosa	646	540	491
Group	16 388	16 135	15 661

Breakdown of group energy consumption - FY2009 (Expressed as % of total GJ)



Total energy

Indirect	65.5%
Direct	34.5%

Direct energy

Coal	26.5%
Diesel	6.8%
Petrol	0.3%
IBO	0.5%
Sasol gas	0.3%

Climate change and greenhouse gas emissions

In April 2009, Implats embarked on a process to consider and address opportunities and risks to the group posed by climate change. As Implats operations are based in South Africa and

Zimbabwe, the group currently has limited exposure to legislation regulating GHG emissions, although this is expected to change in the future. South Africa, by virtue of its dependence on electricity generated from fossil fuels, is a significant global emitter of carbon dioxide.

The primary risks that the group faces as a result of climate change include physical risks, such as water and electricity supply shortages (and hence rising costs).

Given the 'clean' uses for its metals (from autocatalysis to fuel cells), the group anticipates that growing awareness of global warming and increased emission reduction legislation will present greater opportunities for the platinum industry. A focus on smaller, more energy efficient diesel vehicles to meet legislative requirements, will see the demand for PGMs in autocatalysts increasing.

Implats again participated in the Carbon Disclosure Project's (CDP) survey. The group's CDP7 Greenhouse Gas Emissions Questionnaire is available at www.cdproject.net.

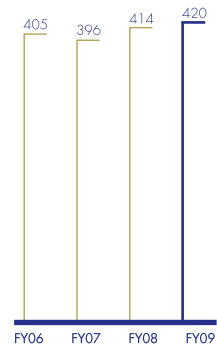
Integral to Implats strategy to reduce its GHG emissions, is the group's strategy to reduce and optimise its energy usage and improve energy efficiency (discussed above), as some 87% of its CO₂ footprint comprises secondary emissions from electricity consumption.

Total direct CO₂ emissions (as a result of burning fuel such as coal, diesel, petrol and gases) amounted to 420 410t, 1.5% higher than the previous year. Total indirect CO₂ emissions rose to 2 970 785t, 6% higher than in FY2008.

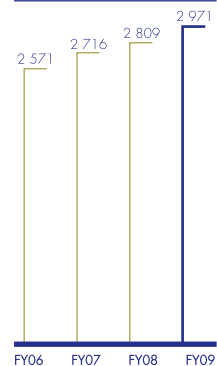
Sources of direct CO₂ emissions

	t	%
Petrol	3 754	0.9
Diesel	76 265	17.5
Coal	332 490	80.0
Sasol gas	2 541	0.5
IBO	5 360	1.2

Total direct CO₂ emissions (000t)



Total indirect CO₂ emissions (000t)



Environmental performance (continued)

Climate change indicators

	FY2009	FY2008	FY2007
Direct CO ₂ emissions (t)*	420 410	414 132	396 252
Indirect CO ₂ emissions (t)**	2 970 785	2 808 766	2 716 235
MWh of indirect energy (electricity purchased)	2 981 369	2 931 906	2 777 336
Direct energy (GJ)	5 655 207	5 579 858	5 661 377
Indirect energy (GJ)	10 732 929	10 554 861	9 998 410
Total energy (GJ)	16 388 136	16 134 719	15 659 787

* Direct CO₂ emissions as a result of burning fuel (coal, diesel, petrol, IBO, natural gas)

** CO₂ emissions from energy purchased

Air quality management

Sulphur dioxide (SO₂) emissions are the major air quality issue for the group's smelting and refining operations at Impala's operations in Rustenburg and Springs, and at Zimplats.

The ambitious SO₂ emission reduction strategy that the Impala Rustenburg operations embarked upon in 2006 reached a critical stage in FY2009. As part of the R830 million smelter upgrade, the upgraded acid and sulfacid plants were commissioned in August and September 2008 respectively. The tail gas (acid and sulfacid plant) and fugitive gas scrubbers were commissioned during February and March 2009. This strategy encompasses three critical components:

- meeting air quality standards;
- limiting visual emissions; and
- minimising occupational exposures.

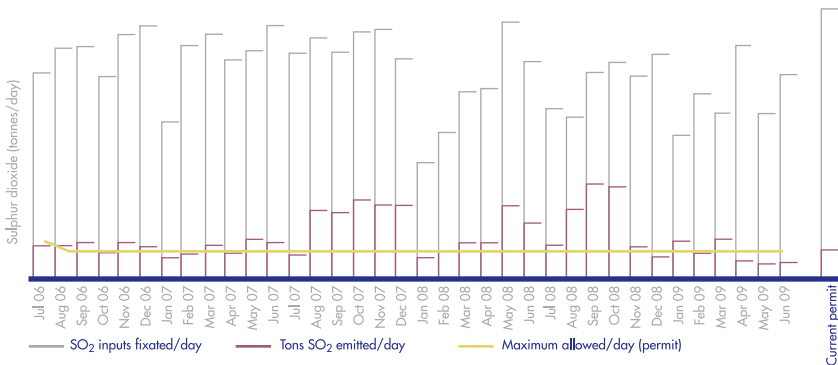
While there were a number of abnormal emissions to the atmosphere during the commissioning process as a result of plant shutdowns (in order to effect the upgrades and new installations), emission levels began to decline towards the end of the year and the full benefit of the installations should be felt in FY2010. Following the full commissioning of the new emission abatement equipment which formed part of the smelter upgrade project, the target for the smelting complex is less than 16t of SO₂ per day (against a previously allowable daily limit of 27.4t of SO₂). (See graph on page 153).

Total group direct SO₂ emissions in FY2009 amounted to 21 152t, a decrease of 20% on the prior year. SO₂ emissions and other significant emissions to air are reported in this section (chlorine, ammonia and NO_x). It should be noted, however, that different monitoring systems are in place at the different operations. At Impala Rustenburg and at Zimplats, SO₂ balances are calculated, while at Impala Springs the data has been collated from a specialist report. The figure for Impala Springs excludes fugitive emissions, which are included in the SO₂ balances calculated at the other two sites. The graph below shows the total amount of sulphur emitted into the atmosphere versus the total sulphur input. The difference results in the amount of sulphur fixated.

Total direct SO₂ emitted (tonnes)

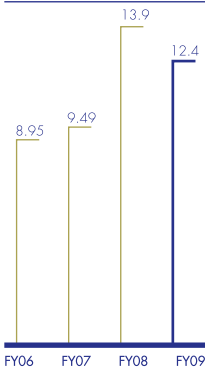
	FY2009	FY2008	FY2007
Impala Rustenburg	14 223	18 184	10 990
Impala Springs	455	342	475
Zimplats	6 474	7 951	7 820
Group	21 152	26 477	19 285

Total SO₂ fixated and emitted
(July 2006 – June 2009)

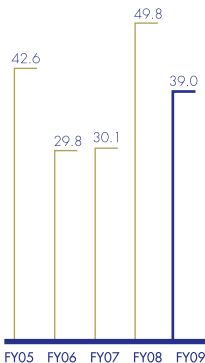


Environmental performance (continued)

**Total SO₂ emitted
kg/platinum oz**



**Average daily SO₂
emissions (t/day) for
Rustenburg operations**



The ambient monitoring network at Impala Rustenburg comprises three ambient monitoring stations that measure meteorological conditions, SO₂ and PM₁₀ (particulate matter smaller than 10 microns). Two additional SO₂ ambient monitoring stations were commissioned during the year. These stations were commissioned particularly to monitor ambient air quality during the commissioning periods of the upgraded smelter. In addition to the ambient stations, a comprehensive total dust fallout network is also maintained. Monitoring of ambient conditions is one of the management tools that can be used to identify and investigate trends.

Ambient air monitoring in the vicinity of the Refineries indicates only minor and infrequent exceedances against national ambient standards. Of concern to the Refineries is the high level of pollution in Springs. The Refineries fall within the Highveld Priority Area that was declared recently in terms of the National Environmental Air Quality Act. As a result, air quality management plans for this area will be a national priority and are currently being drawn up by the Department of Water and Environmental affairs.

At Marula, the PM₁₀ analysis of the fall-out dust in the vicinity of the mine is well below the standards set by the authorities. The major generators of dust are the tailings dam and dirt roads leading to the shafts and in the vicinity of the shafts. Marula has commissioned a dust suppression system (at a cost of R2.5 million) on the tailings dam to address the issue of windblown dust, which could cause a nuisance to the surrounding community.

The focus of the air quality management programme at Zimplats has been the restoration of the ambient air quality monitoring unit, as well as upgrading the dust fall out programme.

Fugitive dust from the active tailings dam at Mimosa remains a challenge and an objective is to minimise dust emission by implementing a dust suppression system.

Implats has phased-out the use and purchase of ozone-depleting substances; an audit to establish whether there are any potential ozone-depleting substances still in use will be undertaken in FY2010.

Material consumption

The efficient use of raw and input materials is promoted both from a cost and environmental conservation perspective. Non-renewable raw materials consumed are: rock mined and milled and slag treated, as well as liquid fuels, coal, explosives, oils,

grease and grinding media (steel balls). This is used in the PGM process for cobalt recovery. Timber used by the operations is sourced from sustainable forestry enterprises

Key production statistics

	FY2009	FY2008	FY2007
Ore milled (000t)	20 083	21 247	21 564
Tailings disposed of on tailings dams (000t)	20 333	19 162	17 413
Dump slag treated (000t)	235	365	302
Furnace and convertor slag generated and treated (000t)	842	903	842
Total slag treated (000t)	1 076	1 268	1 208
Platinum produced (000oz)	1 704	1 907	2 026

* 50% minimum tonnes milled

Land management, biodiversity and rehabilitation

The group has significant areas of land under management – around 94 237 ha in FY2009. Closure plans have been developed for Impala Rustenburg, Impala Springs, Marula and Zimplats.

Compiled initially in June 2006, Mimosa's mine closure plan is currently being reviewed to accommodate current strategic changes.

Open cast mining operations have historically taken place at Zimplats, Marula and Impala Rustenburg. Rehabilitation at Impala Rustenburg is undertaken concurrently with mining activities. At Zimplats, open cast mining ceased in October 2008 and rehabilitation work is currently underway.

Land under management – 30 June 2009

	Land under management (ha)	Disturbed areas rehabilitated in FY09 (ha)*
Impala Rustenburg	33 188	51
Impala Springs	239	–
Marula	5 720	–
Mimosa	6 590	–
Zimplats	48 500	305
Total	94 237	356

* Excludes rehabilitation of tailings dam side slopes

Environmental performance (continued)

During the process of mining, significant amounts of ore (that is minerals-bearing material) are brought to surface and processed to extract the precious metals. Waste rock and tailings (the slurry left behind when the minerals concentrate is sent on for further processing) are deposited on surface in waste rock dumps and tailings dams respectively.

Tailings dam management

Implats has standing contracts with civil engineering and environmental consultants to advise on all aspects of tailings dam management. This includes the design, construction, operation and closure of all their tailings dams. These contract agreements also include dam safety programmes, monitoring, audits and risk assessments.

Additional tailings dam management criteria implemented by most operations include:

- extensive surface and groundwater sampling programmes around their tailings dams.
- bi-annual biomonitoring programmes which assess the impact of the operations, including the tailings dam on downstream users at Impala Rustenburg.
- a new and improved revegetation method for tailings side slopes.
- a mandatory Code of Practice for Mine Residue Deposits which defines all the associated risks as well as the management thereof.

Implats applies an on-land impoundment disposal method for its tailings. Although high in salt load, the tailings, and in particular the seepage water from the tailings dams, are generally regarded as non-toxic. Various controls have been implemented to collect all decant water and to re-use it in the processing facility.

Given the high concentrations of salt, these dumps represent a potential source of ground and surface water contamination. Programmes which include landscaping and vegetation, as appropriate to the area of operation and designated land use are in place to minimise this impact. As far as it is possible, rehabilitation takes place concurrently with tailings deposition processes.

At Impala's Rustenburg operations, woodchips and sewage sludge from the Rustenburg operations continue to be collected for the manufacture of compost by Monontsha, a community-based business.

This is then used in the rehabilitation of the tailings dam slopes. In FY2009 a total of 31 469 hectares of the tailings side slopes have been cleared of alien vegetation and re-grassed with a mixture of indigenous grass species and the compost from the

Rehabilitation liabilities and provisions (R million)

Operation	Rehabilitation liability			Rehabilitation provision		
	FY2009	FY2008	FY2007	FY2009	FY2008	FY2007
Impala Rustenburg	520.3	540.2	498.8	288.6	227.0	213.4
Marula	66.3	69.7	63.1	32.9	36.2	21.1
Mimosa	32.2	13.7	102.2	16.6	9.7	87.3
Zimplats	122.0	121.9	11.6	99.1	51.2	8.3
Group	740.8	745.5	675.7	437.2	324.1	330.1

* Note these numbers reported are aligned with financial requirements and not environmental requirements

Monontsha project. (See the *Socio-economic development* section for further information on this project - page 123).

Rehabilitation

A significant rehabilitation project undertaken during the year at the Rustenburg operations was the rehabilitation of historical waste sites. The five historical sites were rehabilitated by the end of FY2009 at an approximate cost of R8 million covering a combined area of 29 hectares.

Impala Springs has decommissioned the Enhanced Evaporation Spray System and the site is now being rehabilitated using phytoremediation (using plants) techniques.

Group rehabilitation provisions and liabilities are indicated in the table on above.

Bio-diversity

Prior to their start, all prospecting, mining, processing and refining activities are subject to environmental impact assessments (EIA) that include an ecological impact assessment study. Management commitments in terms of the identified impacts/risks are therefore included in the EMP specific to the operation.

Biodiversity is considered in each operations' environmental management plan and is managed as an integral part of the environmental management systems. Other than Zimplats' Ngezi mine, none of the group's operations are located in protected areas or in areas of high biodiversity value. Ngezi is located in a national park. Red data species are located in the vicinity of the Marula operations and are considered in Marula's EMP.

Biodiversity is considered in each operations' environmental management plan

Environmental performance (continued)

The first phase in the development of a Biodiversity Action Plan has been completed for Impala Rustenburg. The programme will identify any threatened species and habitats and is designed to protect and restore biological systems within the mining area. It will require a partnership with the local authorities to work towards regional biodiversity targets. The plan will be fully implemented by FY2011.

At Zimplats, Marula and Mimosa, biodiversity-related issues are managed under the auspices of the respective EMSs.

Mimosa, which is not located in a protected area of high-biodiversity value, has a Resource Conservation Plan that focuses on wildlife habitats protection and flora conservation.

Impala Springs is a corporate trustee of the Blesbokspruit Environmental Centre, just outside Springs. The centre, which provides environmental education to schools and communities, is located near a wetland site.

Waste management

Waste management strategies have been implemented at all operations. To assist in the management and minimisation of waste, Implats is in the process of implementing a waste management module as part of the SAP management programme.

In 2004, Impala Rustenburg contracted a refurbishment and salvage management company to carry out the salvaging, reclamation, sorting and recycling of waste (see case study at www.implats.co.za). Final collection and transportation of hazardous waste is, however, carried out by another reputable waste contractor. Due to the special requirement for the handling and disposal of medical waste, all waste generated by Impala Medical Services is collected by a specialist external contractor.

Waste management strategies have been implemented at all operations

Impala Rustenburg also operates its own permitted general landfill site. The day-to-day operation of this site is managed by an external landfill operator. This site not only offers Impala full control over its general waste but also allows for further recycling to be conducted at the disposal site.

Impala Refineries in Springs generates three waste streams some of which are disposed of in landfills, namely salt generated by the Precious Metals Refinery crystalliser; and boiler ash and jarosite generated by the Base Metals Refinery. Crystalliser salts and jarosite are disposed at a permitted hazardous landfill site and the boiler ash is currently reused for brick-making.

Waste (t)

Non-mineral waste	Impala Impala				
	Rustenburg	Springs	Marula	Zimplats	Mimosa
Non-hazardous (landfill)	7 005	40	22	659	134
Non-hazardous (incineration)	0	0	0	0	0
Hazardous (landfill)	4 644	4 486	31	39	7
Hazardous (incineration)	7	0	0.008	206	0.9
Mineral waste					
Accumulated tailings	14 622	0	1 559 548	2 102 084	2 049 209
Tailings reprocessed	0	0	0	0	0
Surface waste rock	834 325	0	109 459	5 461 534	0

At Zimplats, permission was granted by the authorities for the construction of incinerators to burn hydrocarbon-contaminated material during FY2009. The SMC incinerator is now in operation, while the construction of the Ngezi facility is underway and will be commissioned in FY2010.

Mimosa implements an integrated waste management system that focuses on cleaner production, recycling, treatment and disposal of waste.

Objectives for FY2010

- Achieve continual improvements on the EMSs that are in place and retain ISO14001 certification. Obtain ISO14001 certification at Marula.
- Achieve and maintain regulatory compliance with all permits.
- Minimise waste generation and fully implement SAP waste management module
- Undertake energy investigations and optimise energy usage and in so doing, reduce carbon emissions.
- Investigate potential opportunities as a result of climate change to be investigated.
- Reduce water consumption, minimise the discharge of water into the environment and optimise recycling.
- Reduce dust and SO₂ emissions.
- Ensure closure plans are in place for all operations.
- Maintain communication with interested and affected parties, contractors and employees.