RESPONSIBLY MANAGING THE ENVIRONMENT

Comprehensive environmental improvement plans were put in place for each of our three mines

CHALLENGES

- Delays of critical environmental authorisations
- Non-aligned regulations on wetlands protection
- Sishen mine issued with a Section 93 environmental management directive

HIGHLIGHTS

- All mines ISO 14001 certified
- Achieved savings in energy consumption of 74,091GJ and greenhouse gas emissions of 13,632tCO_2e
- Concurrent rehabilitation prioritised with more than 40ha shaped
- Kumba admitted to the Global 500 and JSE Top 100 Carbon Disclosure Leadership indices

MATERIAL ISSUE 4: DELIVERING A SUSTAINABLE FUTURE

Kumba recognises that, by their very nature, mining operations affect the environment. Our approach to minimising our impact is based on prevention and mitigation: prevention through ensuring that our operations are efficient and careful users of input resources, and that we minimise our physical footprint; and mitigation by ensuring that rehabilitation and restoration of our environmental surrounds are performed regularly throughout our mines' lives and after their closure.

In January 2013 comprehensive environmental improvement plans were put in place for each of our three mines establishing focus areas and strategic objectives within them. The focus areas were:

- Climate-change, energy and resource management
- Land management: biodiversity, land use and rehabilitation

We strive to comply fully with environmental regulations and report fully and voluntarily on the environmental impacts of our operations.

Our efforts did not go unrecognised in 2013. For the first time since 2009 when we first participated in the Carbon Disclosure Project's Climate Response Programme, we achieved inclusion in the Global 500 and JSE Top 100 Carbon Disclosure Leadership indices. Kumba achieved a 98% score (2012:88%).

MANAGEMENT AND COMPLIANCE

Environmental compliance is material to Kumba and we have EMPs approved by the DMR, and integrated water use licences (IWULs) are in place at all of our operations. The IWULs for Thabazimbi and Kolomela mines are in the process of being amended to include new activities. As part of these EMPs we carry out internal audit processes on a continual basis to ensure our compliance with all relevant legislation and regulations.

At the end of 2013, 21 business-critical environmental authorisations were awaiting approval by various government departments. We continue to engage with the DMR and other government departments in that regard.

Kumba received two environmental directives during 2013, but no fines for non-compliance were issued. At Thabazimbi mine the DMR asked for an increase in financial provisions in respect of possible pit slope failure, necessitating a reduction in the slope angles of the pit wall. The ultimate result is an increase in the ratio of waste to ore mined and a related increase in mine operating costs. Sishen mine was also issued with an MPRDA Section 93 environmental directive towards the end of 2013, which raised a number of environmental non-compliance issues. The mine has responded to the DMR and addressed the issues raised.

ISO 14001 CERTIFICATION

Kolomela mine was awarded its ISO 14001 certification in July 2013, while Sishen and Thabazimbi mines retained their ISO 14001 certification in 2013.

We aim to ensure that we retain our certification and continually improve our environmental management performance.

INCIDENTS AND INCIDENT REPORTING

At Kumba, protecting the environment is uppermost among our operating considerations. Our environmental reporting mechanisms are aligned with those of the ISO 14001 management system, an alignment that serves us well in raising environmental awareness at all our operations.

We classify environmental incidents in line with guidance provided by our major shareholder, Anglo American plc. In increasing order of severity, environmental incidents fall into five classification levels:

- Level 1: Insignificant, with very little or no impact
- Level 2: Of minor significance or impact and able to be addressed by internal personnel
- Level 3: Of moderate or medium impact and confined to the individual mine's lease area. These are incidents that may call for external assistance in cleaning up
- Level 4: Major, high-impact incidents that extend beyond the mine's boundaries and which call for extensive clean-up operations requiring external help and resources
- Level 5: Catastrophic incidents with the potential to cause extensive and long-lasting environmental damage with clean-up requiring considerable external assistance

There were no level 3 to 5 environmental incidents at Kumba's mines in 2013. A total of six level 2 incidents were, however, reported throughout our operations. These involved localised spillages of hydrocarbons, a burst tailings pipeline, and the destruction of protected trees. All these incidents were investigated and appropriate corrective and preventive actions were implemented.

CONSERVING RESOURCES

Though extensive, our principal resource, the ore we mine, is not unlimited. Apart from the absolute physical limits to our ore bodies there are also environmental and financial limits. We cannot continue to mine if our costs exceed our revenues – but we obviously cannot continue to mine if our operations contribute to excessive environmental degradation.

Conserving and optimising the use of our primary process materials is therefore an essential component of our operations. These are the materials consumed in the production process that do not constitute part of our final product.

While we seek to minimise the absolute size of our environmental footprint we are expanding our ore production – an expansion into deeper extensions of our ore bodies that calls for an increasing ratio of waste stripped to ore produced. More overburden or waste has to be removed for every tonne of ore mined with an associated increase in the intensity of usage of process materials. Their careful use therefore forms part of our operating strategy as well as being one of the measures used in setting performance contracts and in determining the responsible employees' and managers' remuneration.

During 2013 Kumba was driving and monitoring the group-wide ECO$_2$MAN programme that not only helps to set CO$_2$e emission and energy reduction targets but also provides enhanced understanding of our energy use and the potential for energy savings.

01 Load and haul operations around the Western ramp area of the Leeuwfontein pit at Kolomela mine.

RESPONSIBLY MANAGING THE ENVIRONMENT CONTINUED

Rock mined and ore processed

	Total tonnes mined			Waste mined			Final product		
Mt	2013	2012	2011	2013	2012	2011	2013	2012	2011
Sishen mine	208.8	171.6	165.0	167.8	133.5	119.0	31.0	33.7	38.9
Kolomela mine	67.5	43.5	34.6	54.3	33.5	30.3	10.8	8.5	1.5
Thabazimbi mine	27.2	32.2	45.9	26.4	31.1	44.2	0.6	0.8	0.9
Group	**303.5**	**247.3**	**245.5**	**248.5**	**198.1**	**193.5**	**42.4**	**43.0**	**41.3**

Process materials used

	Diesel (Ml)			Explosives (000t)		
	2013	2012	2011	2013	2012	2011
Sishen mine	163.1	123.4	113.6	61.0	57.0	–*
Kolomela mine	33.8	24.5	16.8	41.7	16.6	–*
Thabazimbi mine	10.9	10.9	11.6	6.1	7.5	–*
Group	**207.8**	**158.8**	**142.0**	**108.8**	**81.1**	**–***

* Values not recorded

Process materials used

	Lubricants (000l)			Tyres (t)		
	2013	2012	2011	2013	2012	2011
Sishen mine	6,095.0	4,830.3	7,280.7	1,890.0	1,785.0	1,896.0
Kolomela mine	500.3	165.9	103.6	241.0	234.8	144.0
Thabazimbi mine	173.5	305.1	160.9	146.6	23.5	192.0
Group	**6,768.8**	**5,301.3**	**7,545.2**	**2,277.6**	**2,043.3**	**2,232.0**

ENERGY CONSERVATION A PRIORITY

Kumba is aligned with the Anglo American Group's energy and climate-change strategy that emphasises improvements to energy performance and the reduction of energy consumption and associated direct and indirect greenhouse gas (GHG) emissions. We continue to manage the short-term strategy and the risks associated with climate change in a phased approach. In the short term Kumba continues to focus on implementing and improving energy and GHG emissions management through the ECO_2MAN process. The group policy is that of reducing energy consumption against a business as usual (BAU) baseline. The projected BAU baseline has been calculated from 2011 to 2020 taking into consideration factors such as LoM plans and growth projects. The BAU projection assumes no efficiency improvement in energy usage.

Our approach, however, does not focus exclusively on direct mining operations but extends into the non-mining parts of our operations and into our communities. The homes we provide to employees are equipped with solar water-heating equipment.

Kumba had installed a total of 2,333 domestic solar water heaters by the end of 2013 in the towns of Kathu and Postmasburg. This is a carbon offset initiative (approximate carbon emission saving of 5,262tCO_2e) with an estimated average energy saving of 6kWh per installation per day for the occupants, and contributes towards energy reduction targets for the national electricity grid.

Several new energy-efficiency initiatives were identified during 2013 at our mines through the ECO_2MAN programme.

An initiative with long-term impact on productivity and asset optimisation was identified at Sishen mine. The project involves amendments to the programmable logic controller program to monitor and control clarified water pumps, screens and conveyor belts, depending on the status of vibrating feeders and incoming ore feed. This will reduce unnecessary running of equipment.

Kumba also completed the implementation of 15 energy-saving projects between Kolomela, Sishen and Thabazimbi mines during 2013, as detailed on the next page.

Energy saving initiatives undertaken or completed during 2013

Location	Project	Energy saving potential (GJ/year)	Carbon emission saving potential (tCO_2e/year)	Project status
Sishen mine	Diesel energy and emissions management system	27,632	2,050	Implemented Diesel savings due to mining interventions and operational efficiency at Sishen mine.
Sishen mine	Optimisation of quaternary crusher operation with variation in feed stockpile levels	2,044	585	Implemented
Sishen mine	Compressed-air leak detection	586	168	Implemented
Sishen mine	Optimise process module operation	2,673	765	Implemented
Sishen mine	Reduce power requirements for the water supply for the direct reduction/ direct reduction shipping plant	155	44	Implemented
Sishen mine	Control the spray water on the coarse and fine lines (gravity feed)	15,888	4,546	Implemented
Sishen mine	Solar water heaters for houses in town	6,524	1,867	Implemented
Sishen mine	Stop conveyor belts running empty at jig dewatering bunkers	1,362	390	Implemented
Sishen mine	Load delivery vehicle replacement programme (fuel saving)	5,779	429	Implemented
Sishen mine	Quaternary screening house control optimisation	2,727	780	Implemented
Sishen mine	Removal of bypass from distribution boards	660	189	Implemented
Sishen mine	Efficiency improvement for new offices/ building	88	25	Implemented
Kolomela mine	Solar water heaters for houses in town	5,676	1,624	Implemented
Thabazimbi mine	Hot seat swapping – shift change	270	20	Implemented
Thabazimbi mine	Diesel fleet replacement – haul trucks	2,027	150	Implemented

01 Thabazimbi mine is assisting a group of community farmers in growing bamboo to offset the mine's carbon footprint. Pictured are two of the beneficiaries, Dorah Mothupi, and Ivan Mphela.

02 The bamboo will be sold to manufacture a variety of household products sustainably.

01

02

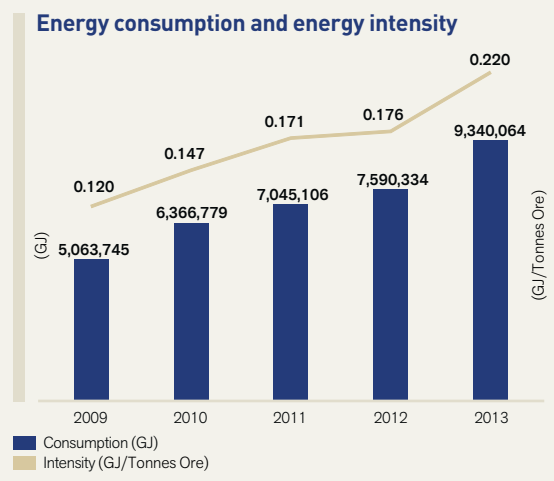
RESPONSIBLY MANAGING THE ENVIRONMENT CONTINUED

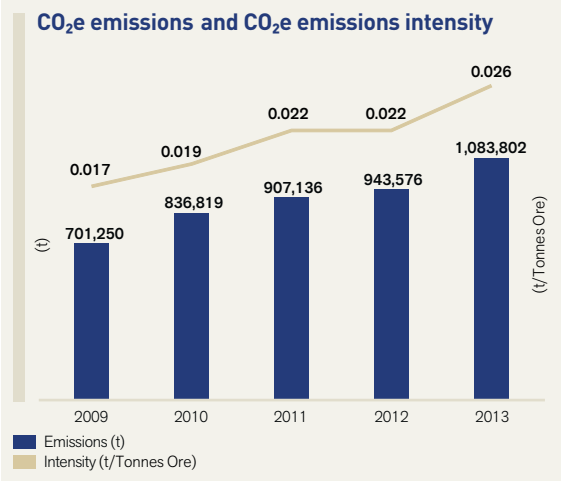
Kumba's targeted savings for 2013 were 271,834GJ of energy and 39,549tCO_2e of GHG emissions. Between 2009 and 2013 completed energy-saving initiatives resulted in total savings of 133,394GJ of energy and 30,574 tCO_2e, of which annual savings of 74,091GJ and 13,632tCO_2e were achieved in 2013. Achievable savings have been forecast in terms of completed and approved projects as well as opportunities still at the conceptual stage.

Kumba contracted specialist measurement and verification (M&V) companies at Sishen, Kolomela and Thabazimbi mines to verify energy savings from implemented projects. Each Kumba mining operation has appointed an energy champion or engineer who leads a multi-disciplinary site energy team that manages and tracks progress on M&V plans, implements energy-saving projects, reviews BAU projections, and raises energy efficiency and climate-change awareness through targeted communication campaigns for employees.

Energy consumption

Million GJ	2013	2012	2011
Energy consumed from fossil fuels (Direct)			
Sishen mine	5.92	4.51	4.16
Kolomela mine	1.23	0.89	0.64
Thabazimbi mine	0.39	0.39	0.42
Group	**7.54**	**5.79**	**5.22**
Energy consumed from electricity purchased (Indirect)			
Sishen mine	1.52	1.53	1.64
Kolomela mine	0.18	0.16	0.07
Thabazimbi mine	0.10	0.10	0.10
Group	**1.80**	**1.79**	**1.81**
Total energy consumed (Direct and indirect)			
Sishen mine	7.44	6.04	5.80
Kolomela mine	1.40	1.05	0.72
Thabazimbi mine	0.50	0.50	0.53
Group	**9.34**	**7.59**	**7.05**





GHG emissions totalled 1,083,802tCO_2e in 2013, an increase of 15% on 2012's 943,576tCO_2e. The total energy consumed by Kumba rose by 23% in absolute terms from 7,590,344GJ in 2012 to 9,340,064GJ in 2013, mainly as a result of a 25% increase in total waste stripping across the group as well as ramp-up at the Kolomela mine. The intensity of CO_2e emissions was 0.026 tonnes per tonne of ore produced, and the intensity of energy consumption was 0.220GJ per tonne of ore produced in 2013. Other GHGs such as methane or CFCs (aerosols) are not emitted as a normal part of our operations.

Our focus areas for 2014 will include the review of BAU projections; implementation of planned energy efficiency projects across the three operations; tracking and monitoring energy and carbon performance against targets; M&V of implemented energy-saving projects through specialist companies and internal reporting procedures; and identification of new energy and GHG emissions saving initiatives.

CO_2e emissions

Mt CO_2e	2013	2012	2011
Total Scope 1 emissions (direct - fossil fuels)			
Sishen mine	0.44	0.33	0.31
Kolomela mine	0.09	0.07	0.05
Thabazimbi mine	0.03	0.03	0.03
Group	**0.56**	**0.43**	**0.39**
Total Scope 2 emissions (indirect - electricity purchases)			
Sishen mine	0.44	0.44	0.31
Kolomela mine	0.05	0.05	0.02
Thabazimbi mine	0.03	0.03	0.03
Group	**0.52**	**0.52**	**0.36**
Total Scope 1 and 2 emissions			
Sishen mine	0.88	0.77	0.78
Kolomela mine	0.14	0.11	0.07
Thabazimbi mine	0.06	0.06	0.06
Group	**1.08**	**0.94**	**0.91**

Scope 3 emissions*

Tonnes CO_2e	2013	2012	2011
Source			
Purchased goods and services	300,118	224,205	73,998
Capital goods	20,460	11,780	–**
Fuel and energy-related emissions not included in Scope 1 and Scope 2	179,093	90,955	–**
Upstream transportation and distribution	172	–**	–**
Waste generated in operations	102	187	11,668
Business travel	1,337	2,183	2,234
Employee commuting	8,014	–**	–**
Downstream transportation and distribution	4,006,340	3,866,663	2,573,088
Processing of sold products	100,220,022	101,148,881	23,072,870
End of life treatment	631,486	640,624	–
Total Scope 3 emissions	**105,367,144**	**105,990,704**	**–****

* Scope 3 emissions not reflected in the table are not applicable

** Not recorded

RESPONSIBLY MANAGING THE ENVIRONMENT CONTINUED

WATER

Our mines are located in semi-arid areas with scarce water resources. We rely on groundwater abstraction, predominantly from boreholes, in line with our IWULs. Ironically we are a major source of water in the Northern Cape, as our open pits produce water for use by our operations and local communities. Water is, therefore, a crucial environmental consideration and our focus is on water management through careful use, conservation and recycling.

While we are aware of the security issues linked to water availability, at present there are no concerns for our operations. During 2013 our mines drew 16 million m^3 of water from boreholes of which 53% was used for our primary activities, representing 203 litres per tonne (2012: 205 litres per tonne) produced.

Through an initiative developed in 2013 we operate aquifer recharge projects at Kolomela and Sishen mines as a means of mitigating any declines in water tables and their effects on agriculture and the biosphere.

Excess clean water derived from dewatering at Sishen and Kolomela open pits is delivered to the local Gamagara municipality to be reticulated to the towns of Kathu, Sesheng, and Dingleton and to Sedibeng Water which supplies the towns of Postmasburg, Olifantshoek, Hotazel and Black Rock as well as the farming community linked to the Kalahari East Water User Association's pipeline. In addition we have well-established agreements with the Thabazimbi and Sishen municipalities to use their treated sewage effluent in our mines' operational processes. Effectively, we take in poor quality water and deliver that of good quality.

Water consumption

000m³	2013	2012	2011
Water used for primary activities			
Sishen mine	6,145	5,402	5,902
Kolomela mine	1,248	2,276	755
Thabazimbi mine	1,197	1,141	1,521
Group	**8,590**	**8,819**	**8,178**
Water used for non-primary activities			
Sishen mine	1,291	958	633
Kolomela mine	–	–	–
Thabazimbi mine	767	258	305
Group	**2,058**	**1,216**	**938**
Water re-used/recycled in processes			
Sishen mine	4,021	3,491	4,278
Kolomela mine	448	535	197
Thabazimbi mine	124	14	147
Group	**4,593**	**4,040**	**4,622**
Water intensity (water used in primary activities (litres per kilotonne of production))			
Sishen mine	20	16	15
Kolomela mine	12	27	–
Thabazimbi mine	191	139	169
Group	203	205	198
Percentage of water re-used/recycled in relation to water used for primary activities (%)			
Sishen mine	65	65	72
Kolomela mine	36	24	26
Thabazimbi mine	10	1	10
Group	53	46	57

Water abstraction by source

	Potable water from external source			Non-potable water from external source			Groundwater			Waste/second-class water			Total		
000m³	2013	2012	2011	2013	2012	2011	2013	2012	2011	2013	2012	2011	2013	2012	2011
Sishen mine	36	186	181	1	7	49	7,220	5,555	5,812	1,410	1,369	1,551	8,667	7,117	7,593
Kolomela mine	–	–	209	–	–	–	1,265	1	753	–	–	231	1,265	1	753
Thabazimbi mine	80	61	–	–	–	–	1,111	1.042	1,261	61	91	–	1,251	1,194	1,701
Group	**116**	247	390	**1**	7	49	**9,596**	6,598	7,826	**1,471**	1,460	1,782	**11,183**	8,312	10,047

Water-saving initiatives undertaken or completed during 2013

Operation	Projects	Water saving potential (million m³ per year)
Sishen mine	Dust suppression	5.55
Sishen mine	Improved level control of gland water sump	0.03
Thabazimbi mine	Improvement of relative density of tailings; increased recycling and fill-point improvements	0.17
Kolomela mine	Dust suppression	1.92
Kolomela mine	Recycling of wash-bay water; dual flush toilets; aerated plumbing; and water-wise gardens	0.01
Group		**7.68**

Dewatering due to mining activities is a concern for local farmers who profess that it lowers the area's water table and affects their grazing and farming activities. Our approach to the issue is non-confrontational and seeks to establish sound neighbourly relations based on allaying the farmers' concerns. As part of a continuing process we have:

- Provided alternative grazing or grazing subsidies
- Provided infrastructure that allows affected farmers to withdraw water from the Sedibeng Water pipeline
- Drilled and equipped boreholes that feed into existing farm water reticulation systems
- In extreme, temporary cases, trucked water to where it has been needed

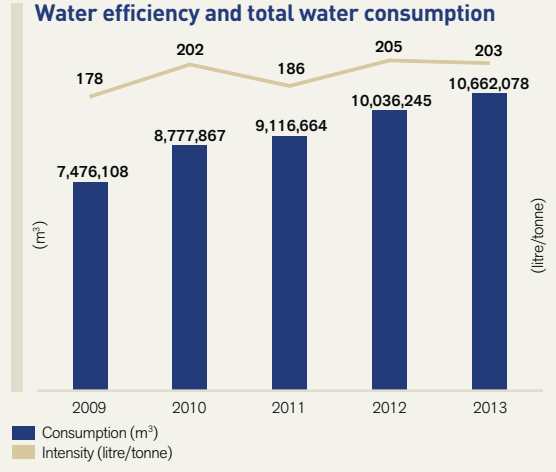
While these interventions might be seen as temporary solutions, we have engaged with local farmers regarding scientific approaches to address specific concerns. Among the concerns were claims of impairment of aquifers and of surface water flow in the Gamagara River after heavy rainfall.

Geological evaluation by independent researchers revealed that there were sinkholes, also called swallets, in the river – holes that allow streams to disappear underground. During 2013 we continued to investigate ways in which these swallets could be rehabilitated so as to allow water to flow in the river during rainy periods. We are confident that practical solutions will be found that address farmers' concerns.

We have sent water samples from boreholes suspected of being polluted by nitrates from Sishen mine for testing at accredited laboratories. Permanent monitoring systems are in place to assess the quality of water in and outside the perimeter of our mines.

During 2013 our water-management initiatives gave rise to water savings of 7.7 million m³, against our water savings target of 2.5 million m³. The bulk of the water savings in 2013 resulted from dust suppression-related projects. Water-saving initiatives will continue.

Water efficiency and total water consumption



RESPONSIBLY MANAGING THE ENVIRONMENT CONTINUED

RESPONSIBLE LAND MANAGEMENT

Biodiversity

Kumba strives to achieve the highest standards of environmental care to minimise the impact of our operations on the environment as well as the flora and fauna on the 82,086ha of land we had under management at the end of 2013, as well as on land adjacent to our own. This managed area represented an increase from 2012 (64,796ha).

All our mines have biodiversity action plans (BAPs) devised with our parent company, Anglo American plc, in conjunction with Fauna & Flora International. In addition they all have closure plans, the most developed of which is at Thabazimbi where the mine's life expectancy is less than that of Sishen and Kolomela. The closure plans are updated regularly. Thabazimbi mine's closure planning has been modified to take into account the operational life extension programme being implemented.

Kolomela mine's BAP which was completed in the middle of 2013 identified 350 plant, 160 bird and 16 reptile protected species. The mine's major challenge is that of protecting vulnerable wetlands and, during 2013, we worked on strategies to provide offset land. Kolomela mine has been liaising with the Department of Agriculture, Forestry and Fisheries in this regard.

Sishen mine has a specific biodiversity challenge: that of ensuring the Kathu protected forest remains undisturbed and unaffected by mining. There have been claims that our mine dewatering has affected the Camel Thorn trees but research into the matter by the Council for Scientific and Industrial Research has thus far been inconclusive.

Sishen mine has provided approximately 2,600ha of offset land to compensate for that affected by its mining. Fencing of the offset area was completed in 2013 while the re-introduction of various animal species and the eradication of alien and invasive plant species is on-going.

Thabazimbi mine has offset areas that are fenced and where the re-introduction of various animal species continued throughout 2013. This was accompanied by the start of our programme to re-introduce grass cover and to limit bush encroachment.

EFFLUENTS AND WASTE

Effluents are not a material challenge at our mines as we recycle and re-use as far as possible. We do not discharge dirty water into the environment. Our focus is more on management of mineral and non-mineral waste, particularly the mineral waste at our mines' waste-rock dumps and tailings storage facilities.

Our efforts are directed towards minimising the handling of mineral waste and rehabilitating the dumps by planting local species. Among the challenges we faced are those associated with the risk of slope or berm failures at our disposal sites.

Our management of non-mineral waste, particularly that of a hazardous nature, begins with sorting on site then contracting disposal out to specialist waste-disposal operators who are carefully monitored for compliance with all relevant environmental legislation. All our waste is disposed of in South Africa with none being exported.

Oil spillages are a critical factor and, in 2013, we initiated a programme for measuring their quantities and the costs of remediation. In 2013 we experienced a level 2 incident involving spillage of transformer oil and remedial action was taken.

Our mines also contribute towards recycling and the disposal of household and commercial waste generated by local communities.

MITIGATING DUST

The creation of dust is an inescapable consequence of mining in arid areas and we have tried and tested means of limiting and mitigating it. Each of our mines has air-quality management plans that are reviewed and, if necessary, improved regularly.

Each of our mines has dust-monitoring programmes that measure air-borne nuisance dust and PM10 particulate matter – suspended matter with a diameter of less than 10 microns and which is known to have adverse impacts on health. The monitoring not only helps ensure that our mines comply with air quality legislation, but also helps allay the concerns of farmers and other neighbours that mining has given rise to a significant deterioration in air quality.

Land disturbed by mining activities

Hectares	Total land under management in 2013	Land disturbed to date
Sishen mine	46,638	6,193
Kolomela mine	32,793	3,000
Thabazimbi mine	2,655	1,620
Group	**82,086**	**10,813**

Water spraying is among the older methods used for controlling dust on roads, but it is not always effective and is costly considering the arid areas in which we mine. After extensive research we now treat our primary roads with a biodegradable bitumen-based emulsion that has a useful life of at least a year. Secondary roads, principally those in our open pits and whose configurations change comparatively quickly, are treated with an environmentally safe dust suppressant that acts as an emulsifier on the road surface.

Apart from roads used extensively by haulage equipment, Kumba's other major sources of dust are the mines' ore and waste transfer points. Where possible, these transfer stations are enclosed to contain dust. Water sprays are also installed to reduce fugitive dust emissions.

For further information on our dust mitigation please see the case study on integrated air quality monitoring at Kolomela mine on page 94 of this report.

Environmental management objectives for 2014

Kumba's environmental management focus in 2014 will be on further enhancing our performance in the following areas:

- Land management, biodiversity management and rehabilitation, with a special focus on concurrent rehabilitation
- Increasing general environmental management awareness among all employees, focusing on improving reporting environmental incidents and the sharing of lessons learned from incident investigations
- Remediation and pollution prevention, focusing on waste management, dust management and the management of legacy issues and cumulative environmental impacts
- Energy and GHG emissions management, focusing on the identification of new energy saving and efficiency improvement opportunities
- Water management, focusing on the identification of new water saving and efficiency improvement opportunities

01 Bowsers spray haul routes with water to combat dust in the mining areas at Thabazimbi mine.

02 Kito Moyo and Amo Hlungwani are electricians working on the construction of the UHDMS pilot plant at Sishen mine. The plant is used to test new technologies for beneficiating products from low-grade ores.

01

02

RESPONSIBLY MANAGING THE ENVIRONMENT CONTINUED

INTEGRATED AIR-QUALITY MONITORING AT KOLOMELA MINE

Dust emissions are carefully monitored in the Leeuwfontein pit at Kolomela mine and strategies are in place to counter excessive dust formation.

Dust is an unavoidable consequence of mining, especially in the semi-arid areas that are home to Kumba's open pits.

Measuring dust

Late in 2010, when the Northern Cape had no full-spectrum dust-monitoring facilities and Kolomela mine was in its infancy, we initiated air-quality monitoring starting with two measuring stations. The intention was to obtain scientific evidence of the region's normal air quality to provide a baseline for determining mining's impact. We were particularly interested in measuring the range of sizes of dust particles, especially nuisance dust that remains suspended in the air and PM10 – particulate matter with a diameter of less than 10 microns that can contribute to pulmonary problems. The measuring programme was also implemented to ensure that Kumba complies with its legal obligations regarding dust emissions, as well as to help manage its effects.

In order to improve the reliability of the information collected, a further three stations were later added with one being erected in collaboration with the DEA. This was the first station in the province to which the department had full access. Kolomela mine provides the DEA with data from its other stations too; this has helped to build confidence between the mine and the department. In 2013 Kolomela mine participated in the training of the DEA staff in monitoring procedures.

Dust suppression

Traditionally water has been the primary way of suppressing dust. However, this is not always a preferred choice in a semi-arid region. Furthermore, using water to suppress dust in our processing plants can have the unintended consequence of blocking some equipment with mud.

The mine's successful solution to dust thrown up by mobile equipment operating on permanent roads outside the pit has been to apply an environmentally friendly product which contains no hazardous chemicals. The product helps to create a dust-free road and, after its application, the road remains dust- and mud-free for two to three months and is functional in all weather conditions.

There are many benefits to having dust-free roads including better visibility, increased safety, and tyre life extension of up to 30%. Kolomela mine uses approximately 120l/m^2 of water on treated roads compared to 1,500l/m^2 needed on untreated roads annually.

All secondary roads, principally those in the pit, are treated with a product of blended emulsified co-polymers and ionic modifiers. This is water-soluble and, when sprayed onto a road, forms a durable surface by binding small dust particles to form larger, heavier ones that are less prone to becoming airborne. The use of both these products has delivered water savings at Kolomela mine of 1,518,500m^3 in 2013 which translates to a R2.2 million cost saving.

Managing other hot-spots

Transfer points, buffer stockpiles and blending areas are particular dust hot-spots. All of them have been enclosed to help contain the dust, while water sprays have been installed to wet the material so as to suppress airborne dust inside the enclosure.

Buffer stockpiles and blending areas that are particularly difficult to cover have dust-measuring gauges and are equipped with chemical sprays and ionising units, both of which bind small dust particles.

We have established that significant dust is also generated from conveyor belts that feed buffer stockpiles and blending beds. Studies and strategies to deal with this dust will continue through 2014. Electronic measuring systems will be introduced throughout the plant in 2014 to provide a more accurate assessment of dust fallout.

For more information, visit
www.angloamericankumba.com

EFFECTIVE BIO-MONITORING PROGRAMME AT KOLOMELA MINE

A magnificent sunset in the Kalahari. Kumba is committed to protecting the biodiversity at its mining sites and has extensive programmes in place to measure the impact of operations on the environment.

Kolomela may be a young mine but when it comes to its environmental legacy, the mine has decidedly long-term strategies. The objective is to mitigate any effects mining may have on the environment during the mine's operational life and after its closure. Kolomela mine is dedicated to leaving behind a positive legacy. This is what motivates its EMP – a plan that demonstrates the mine's commitment to reducing the ecological impacts of its operations.

In 2010 local commercial farmers voiced concerns about the possible effects that dewatering at Kolomela mine would have on their livelihoods. The mine promptly responded and enlisted the help of the University of the Free State to monitor the situation, believing that scientific proof would enable appropriate action plans to be implemented and enable tracing of the environmental impacts of the mine over its life. The independent monitoring plan helped allay the farmers' apprehensions and provided the basic information to enable the mine's management to make informed environmental management decisions.

When Kolomela mine's bio-monitoring programme began in 2010 it covered the following modules:

- Grazing capacity
- Pan health
- Pan invertebrates
- Mammals

Monitoring continued throughout 2010 while Kolomela mine was still under construction. These results were used as a baseline for all further monitoring. During 2011 gaps were identified and we realised the need to improve the bio-monitoring programme.

Bush encroachment – an increase in the number of indigenous trees and bushes due to human interference – was added to the monitoring schedule, as was the monitoring of terrestrial invertebrates, birds and reptiles.

Soil and groundwater studies were also undertaken with 100 soil moisture-monitoring devices being used to measure effects of dewatering. During the monitoring process vegetation samples are sent to the South African National Biodiversity Institute. This allows the national database to be updated accordingly.

Kolomela mine has also developed a constructive relationship with the University of the Free State which co-ordinates the monitoring and has the expertise to carry out the work, aided by access to a complete environmental knowledge-base. Masters students run the monitoring programmes supervised by their professors. This relationship is beneficial both to the students and to Kolomela as the mine receives and can make use of reliable environmental information while the students are able to publish papers based on actual research.

During 2014 the monitoring programme will be extended to include a study that aims to determine a factual water balance for selected vegetation species. Equipment will be inserted into the selected tree species' stems to measure the water flow. This will then be linked to soil-moisture levels, run-off and rainfall data to determine a fairly accurate water balance. This will allow Kolomela mine to better understand the interdependencies of these species in terms of rainfall and deep groundwater resources.

Kolomela mine uses the information gathered to make informed business decisions. The bio-monitoring programme has the support of several government departments.

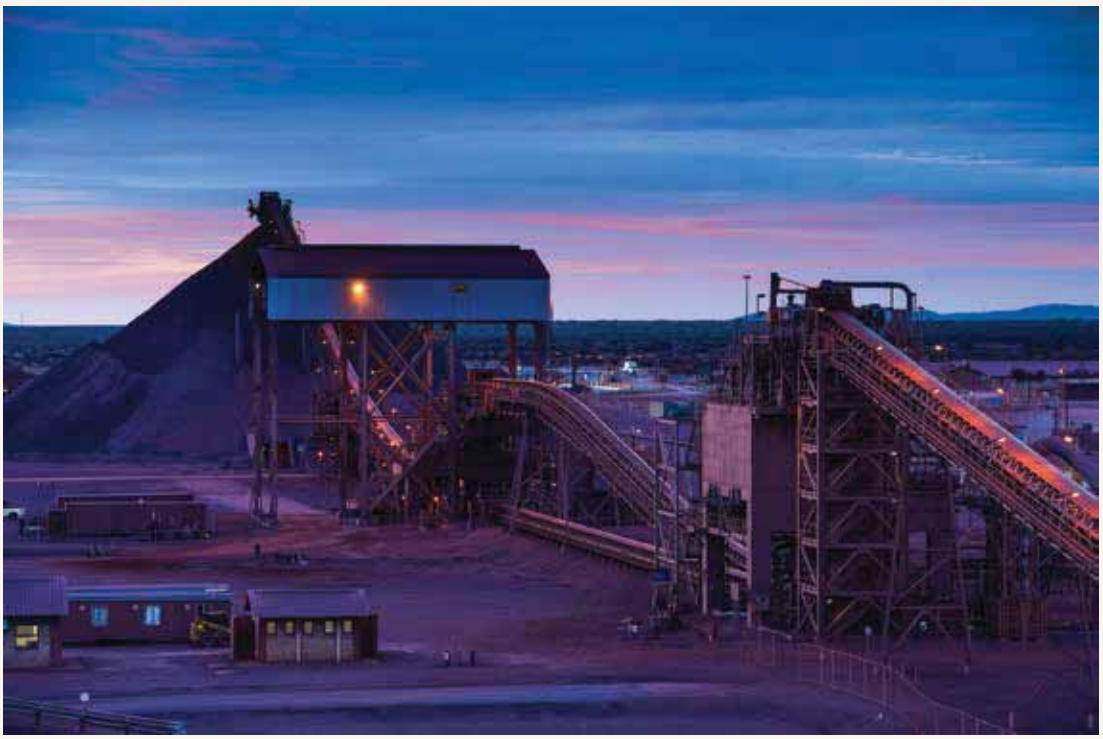
The bio-monitoring programme used at Kolomela mine to monitor the integrity of the eco-system is not site-specific and can be used at any mining operation.

A large number of protected Camel Thorn trees and Shepherd's trees grow on site. There were also three Namaqualand Fig trees that grew within the mining area. We tried to preserve the three fig trees, 10 Shepherd's trees and 10 Camel Thorn trees by relocating them. Unfortunately, despite our best efforts, only 20% of the Camel Thorn and Shepherd's trees survived the transplant. Many valuable lessons on the relocation of trees were, however, learnt. To our knowledge, Namaqualand Fig trees had never been successfully moved before. This didn't deter Kolomela mine in its efforts to save them. Explosives were used to blast the three Namaqualand Fig trees out of iron ore rock to loosen their roots and the trees were then successfully transplanted.

For more information, visit
www.angloamericankumba.com

RESPONSIBLY MANAGING THE ENVIRONMENT CONTINUED

KOLOMELA MINE ACHIEVES ISO 14001 CERTIFICATION



Another day comes to an end with the sun setting over the Kolomela mine production train.

Kolomela mine was awarded its ISO 14001 certification in July 2013. The mine and its people were justifiably proud that during the certification audit only six minor issues requiring improvement were raised. An internal audit will now be carried out at the mine every 12 months, as well as a surveillance audit by the certification body. A full certification audit will take place every three years. Kolomela mine is confident of retaining its certification.

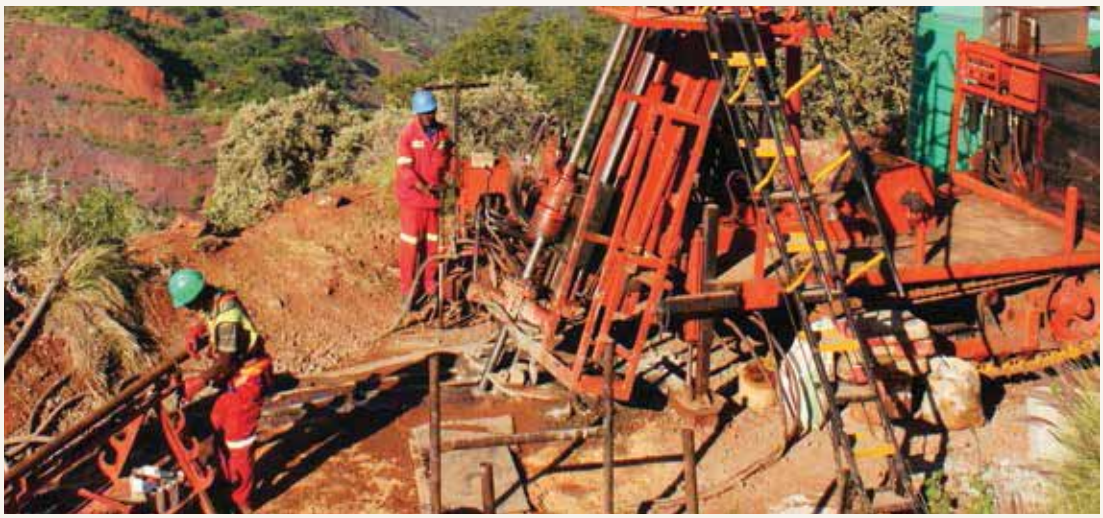
Kumba's internal environmental management demands compliance with ISO 14001 requirements. These were incorporated into all operating procedures. The challenge faced by Kolomela mine was to establish a new culture aligned with the mine's own practices. This process was assisted, to an extent, by the significant number of employees who were already familiar with procedures and management systems.

To establish its own procedures Kolomela mine developed a robust, easy-to-use practical system driven by simple, non-negotiable standards. They are explained in a five-page document that includes a one-page flow diagram that summarises procedures, making for easy reading and comprehension.

Certification is important to Kolomela mine as it demonstrates credible independent third-party endorsement of the mine's efforts towards ensuring the application of procedures and necessitates steady environmental management performance improvement.

For more information, visit
www.angloamericankumba.com

EXCELLENCE IN EXPLORATION



An exploration team at work in the mountains of Thabazimbi.

For many years Kumba's exploration arm did not have formal safety, health and environmental standards for exploration drilling programmes and for environmental management. Each mine and exploration drilling site compiled their own standards. Although our parent company, Anglo American plc, has established and implemented its Anglo Fatal Risk Standards (AFRS), drill rigs and ancillary equipment for exploration operations were not adequately addressed. Kumba's extensive exploration activities in the Northern Cape province would therefore put the exploration team at risk of injuries on remote sites with little infrastructure and support.

Exploration drilling and associated activities are further complicated by the fact that they are often undertaken on privately owned farms thus heightening Kumba's social and sustainability commitments and responsibilities.

Between 2010 and 2013 the Northern Cape exploration environmental management team compiled and implemented an EMP for top-soil management and rehabilitation of exploration drill holes and sites. The financial and social benefits, as well as values in cost and risk reduction, are evident from the environmental financial quantum's review over the three years. Although the social and sustainable benefits of minimising and mitigating impacts to the surrounding community are a cost that cannot be measured, it is a value Kumba's exploration team considers a top priority. The EMP has been well received by the Department of Water Affairs and the Department of Environmental Affairs, as well as the DMR.

From a safety and health perspective, the increase in drilling-related incidents throughout the drilling industry worldwide spurred the need for a formal drilling safety standard. In 2012 the first Kumba exploration drilling safety standard was compiled. In 2013 Kumba enforced compliance to the drilling safety standard on all its exploration sites. The standard addresses people, systems and equipment requirements, and is aligned with the AFRS strategy. It also includes pre-deployment assessments of drill rigs allowing for modifications to take place immediately. Non-AFRS compliant rigs are not deployed to our sites, which significantly reduces transportation costs. Pre-mobilisation assessments are conducted once rigs arrive on site further reducing time delays and ensuring that all aspects are addressed and signed off.

Although the initial strategy was to only focus on exploration drilling, this standard has since been adopted for operational drilling (for example, blast-hole drilling) at the three Kumba mines.

Since January 2013, three drilling forums have been initiated, sponsored and led by Kumba's exploration division, to which exploration drilling contractors and owner's teams are invited to review equipment, as well as to consider legal and operational aspects and to ensure continual improvement and benchmarking. These forums were extended to all our mines to promote learning and information sharing. The most recent was the techno-legal forum held in January 2013, which was well attended and set a benchmark of expectation for our exploration efforts.

The drill safety standard and EMP are included in commercial agreements with all contractors. This ensures standardisation for all drilling contractors.

During 2013 exploration safety officers were appointed and deployed for each region and there has been an increase in incident reporting. Improved strategies and plans have since been implemented. There has been a notable shift from a contractor management relationship to business partnership.

Kumba exploration also implemented a formal visible felt leadership process, which focuses on people. The collaboration of structured safety, health and environmental management, management visibility and improved communication has resulted in significant improvements. Not one LTI has occurred since the implementation of these initiatives.

For more information, visit
www.angloamericankumba.com