



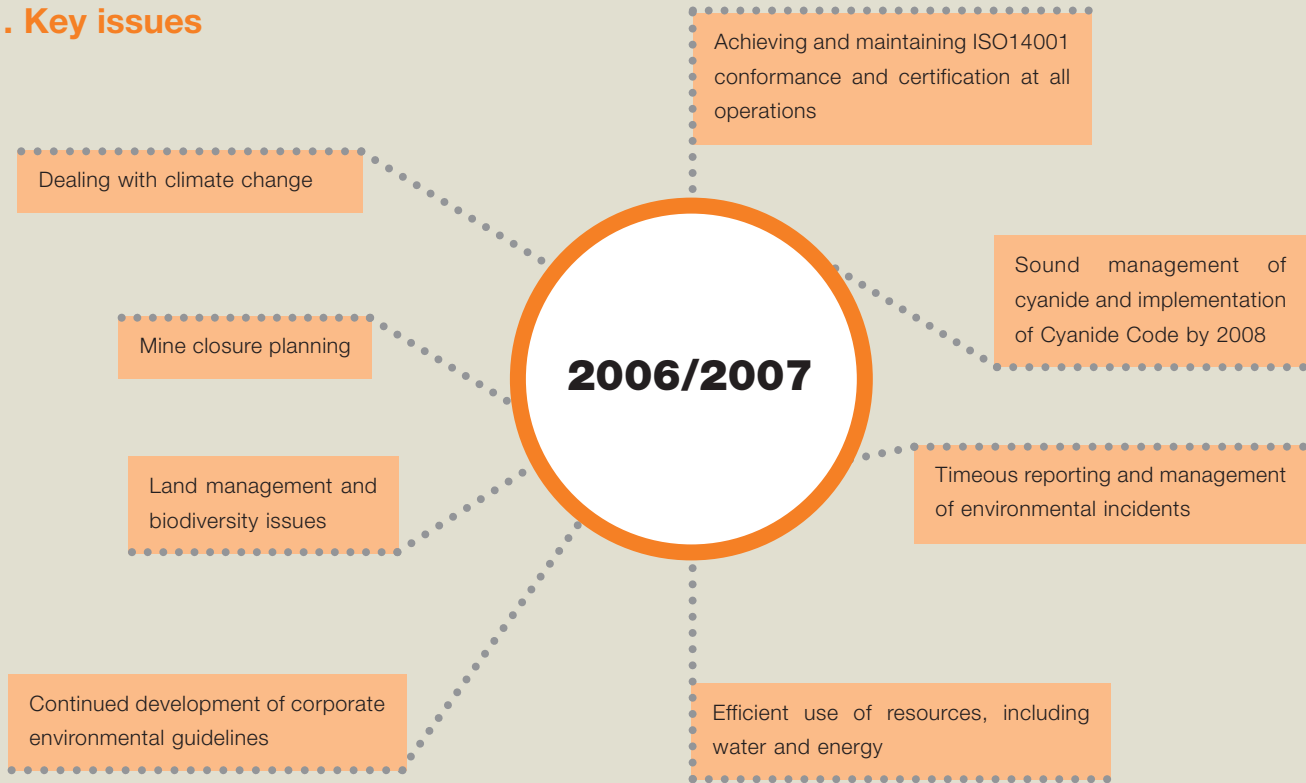
Good stewardship – environment



Contents

1	Key issues	80
2	Living our values	80
3	Our scorecard	82
4	Review 2006	83
5	Case studies	101
6	Objectives 2007	103

1. Key issues



2. Living our values

AngloGold Ashanti is committed to working in an environmentally responsible way. One of our core values relates to our relationships with and the impact we have on communities in which we do business, namely:

We strive to form partnerships with host communities, sharing their environments, traditions and values. We want communities to be better off for AngloGold Ashanti having been there.

Our business principle 'AngloGold Ashanti and the environment' serves as our group environmental policy; it guides the way we do business and enables us to live our values, specifically relating to our environmental impact.

About ISO14001



AngloGold Ashanti and the environment

1. We recognise that the long-term sustainability of our business is dependent upon good stewardship in both the protection of the environment and the efficient management of the exploration and extraction of mineral resources.
2. We will comply with all applicable environmental laws, regulations and requirements.
3. We are committed to establishing and maintaining management systems to identify, monitor and control the environmental aspects of our activities.
4. The company will ensure that financial resources are available to meet its reclamation and environmental obligations.
5. The company will ensure that its employees and contractors are aware of this policy as well as their relevant responsibilities.
6. We will conduct audits to evaluate the effectiveness of our environmental management systems.
7. We are committed to communicating and consulting with interested and affected parties on environmental aspects of our activities and to making this policy available to the public.
8. We will work to continually improve our environmental performance and prevent pollution from our operations.
9. The company will participate in debate on environmental matters at international, national and local levels.

ISO14001: The International Standards Organization (ISO) is a voluntary, not-for-profit network of national standards institutes from 146 countries, with a central secretariat in Geneva. ISO14001 focuses on environmental management systems and was first published in 1996.



3. Our scorecard

In our Report to Society 2005, we set a number of objectives that we wanted to achieve in 2006 and we report on these in our scorecard below.

Objectives 2006	Performance 2006
<p>Achieve ISO14001 certification at all operating mines by the end of December 2006.</p>	<p>By the end of December 2006, certification of conformance to the ISO14001:2004 standard was achieved or maintained by 19 out of 21 operations, as well as a number of ancillary support services.</p>
<p>Develop a series of environmental guidelines to direct and continue to improve environmental performance across the company.</p>	<p>Five environmental guidelines have been drafted, for air quality, water management, land management, chemical usage and waste management. It is expected that these will be adopted in 2007. Other guidelines will continue to be developed such as incident reporting, biodiversity and mine closure planning.</p>
<p>Establish targets for a reduction in water use, energy consumption and carbon emissions.</p>	<p>Targets have been set at an operational level and vary from site to site depending on specific operational conditions and circumstances. Establishing targets is a key element of the implementation of ISO14001.</p>
<p>Continue to improve environmental data gathering systems in accordance with GRI reporting requirements.</p>	<p>Progress that has been made is evident in the detailed GRI matrix that may be found on our website at www.aga-reports.com/GRI.htm. Further development and refinement of our systems are required to provide comparable data generation and seamless data flow. The process of aligning data gathering systems thus remains a priority.</p>
<p>Formally integrate biodiversity considerations in the environmental management programmes of the company.</p>	<p>The South African operations have completed Phase 1 of a biodiversity assessment and Phase 2 is under way. <i>(See case study www.aga-reports.com/06/biodiversity.htm).</i> Brazil has established a 729 hectare private natural forest reserve to conserve Atlantic Forest (see page 100). In Australia, specialist studies have commenced on the Tropicana Lease. Where relevant, biodiversity is included as an element of the ISO14001 environmental management system implemented within the company. The ICMM's Good Practice Guidelines need to be more widely rolled out within the organisation.</p>

ENVIRONMENT

Objectives 2006	Performance 2006
Participate in the ICMM's mine closure project and review the company's processes on the basis of emerging good practice.	AngloGold Ashanti continues to participate in this project aimed at understanding and improving current environmental and social practices related to mine closure. A group-wide review of mine closure planning will be undertaken in 2007.
Maintain the environmental incident reporting system.	Reporting system has been maintained.

4. Review 2006

We report our performance in 2006 against our business principles.

Business principle 1: We recognise that the long-term sustainability of our business is dependent upon good stewardship in both the protection of the environment and the efficient management of the exploration and extraction of mineral resources.

Environmental policy and strategy within AngloGold Ashanti is overseen by the Board Committee on Safety, Health and Sustainable Development, which meets on a quarterly basis. The committee comprises three non-executive directors: Bill Nairn (chairman), James Motlatsi and Simon Thompson; as well as chief executive officer Bobby Godsell and chief operating officers, Neville Nicolau and Roberto Carvalho Silva. Members of management are invited to participate in these meetings.

During the year, the board committee considered and reviewed the company's environmental policy and – apart from a number of minor changes in wording – endorsed it as remaining appropriate to the company. Where there are site-specific environmental policies, directing each operation in accordance with local conditions and regulations, these are required to be consistent with the company's environmental policy.

The heads of the environmental discipline in each of the company's various regions around the world participate in an Environmental Steering Committee, which identifies and debates critical environmental issues facing the company, and develops appropriate company responses to these challenges. An in-house environmental workshop, which drew 47 environmental professionals from across the group, together with invited specialists, was held in September 2006 in South Africa. These meetings are a crucial means of obtaining information about the environmental performance of the operations, sharing good practice experiences across the group, strengthening professional support networks and improving communication and awareness of environmental issues within the company.

At an operational level, management of environmental issues and compliance with company policy and government regulations is largely a line function. Line management is, in turn, supported by on-site environmental professionals, who ensure that the company fulfils its obligations to act in an environmentally responsible manner, while at the same time achieving efficient and effective management of its mineral resources.



ENVIRONMENT



The company faces a wide range of environmental challenges, and not purely of an operational nature. At the global level, and particularly in North America, concerns about the environmental impact of mining need to be addressed through responsible mining practices and engagement. Government regulation of the mining industry continues to increase in response to public sentiment in the various jurisdictions. Financial institutions, particularly those that are signatory to the Equator Principles, have, with the recent revision of the International Finance Corporation's Safeguard Policies, strengthened their requirements around loan financing. There are also numerous voluntary international initiatives aimed at addressing issues such as climate change, biodiversity, preventing pollution, securing human rights and ultimately, achieving sustainable development. AngloGold Ashanti is carefully considering these initiatives and formulating company responses including those initiatives in which it chooses to become involved. (See the *Ethics and Governance* Section on page 22).

The nature of the challenges facing the company differs from site to site, and varies through the different stages of the gold production process. In accordance with an ISO14001 requirement, each site has an Aspects Register which defines its main environmental aspects and associated risks. The company's environmental priorities are reflected in the corporate environmental objectives for 2007.

Business principle 2: We will comply with all applicable environmental laws, regulations and requirements.

While the group's business principles and environmental policy guide the way in which we identify, manage and mitigate the impact that we have on the environment, all operations are naturally subject to the environmental laws, rules and regulations of the various countries in which they operate. Where these laws are not well-developed, or indeed do not exist, our operations are also guided by the company's business principles, environmental policy, environmental guidelines and good practice. The company is committed to assisting governments at both a national and local level in developing legislation that is appropriate and effective. (See case study: *Improvements in environmental incident reporting system in Mali*, – www.aga-reports.com/06/incident-reporting.htm).

The group-wide implementation of ISO14001 carries with it an obligation to maintain a legal register which identifies all the laws, regulations and other obligations with which an operation is expected to comply and requires that this information is readily available to operating staff. From a corporate perspective, this assists in providing assurance that the operations are meeting their obligations.

Cyanide Code

The code is a voluntary industry initiative developed under the auspices of the United Nations Environment Programme (UNEP) and the ICMM to:

- promote responsible management of cyanide used in gold mining;
- enhance the protection of human health; and
- reduce the potential for environmental impacts.

See www.cyanidecode.org for further information

ENVIRONMENT

No fines were recorded during the year in respect of environmental issues as defined by our Board reporting requirements. In addition, a number of environmental licences and permits were granted with none being retracted on the basis of environmental performance.

In Brazil, the legal action filed by the Nova Lima District Attorney against Morro Velho (the forerunner of AngloGold Ashanti Mineração) concerning the health impact of arsenic on communities living close to old tailings deposits continues. The preliminary report confirmed no evidence of contamination of the Nova Lima population being attributable to the old tailings deposits. Three of the six old tailings deposits in question have already been rehabilitated and work continues on the other three. (See case study: *Rehabilitation of old tailings deposits at Nova Lima, Report to Society 2004.*)

Business principle 3: We are committed to establishing and maintaining management systems to identify, monitor and control the environmental aspects of our activities.

and

Business principle 6: We will conduct audits to evaluate the effectiveness of our environmental management systems.

Implementing ISO14001

In March 2005, AngloGold Ashanti's Executive Committee took a decision that all AngloGold Ashanti operating mines (that is, those not in closure mode or due for closure) should, by December 2006, hold certification to the ISO14001 International Environmental Management System standard. By the end of December 2006, AngloGold Ashanti had achieved ISO14001 certification for 19 of its 21 operations, that is, excluding Navachab in Namibia and Yatela in Mali. Navachab mine is expected to be certified by the end of March 2007 and Yatela mine, which was previously scheduled for closure but whose life has now been extended, will seek certification by December 2007.

The ISO14001 certification is a significant advance in the company's environmental management because it assures, both from corporate governance and from a public perspective, that:

- each operation maintains a legal register which identifies all of the law, regulations and other obligations with which the operation is expected to comply, and that this information is readily available to operating staff;
- each operation maintains an Aspects Register which identifies the significant environmental aspects of its activities and their associated risks;
- plans are in place to address these environmental priorities and operational risks;
- resources and responsibilities have been assigned to managing these plans;
- objectives and targets have been set and will be regularly monitored; and
- a system is in place which can be continually improved, to ensure better environmental performance.

AngloGold Ashanti recognises that certification does not necessarily guarantee good operational performance and that the challenge will now be to ensure that the system helps deliver the required on-the-ground results. In addition, the system can be subject to independent assurance for improved corporate governance and other purposes. (See case study: *Implementing ISO14001 at AngloGold Ashanti, page 142.*)



Implementing the Cyanide Code

AngloGold Ashanti was party to the development of the International Cyanide Management Code for the Manufacture, Transport and Use of Cyanide in the Production of Gold and was one of the first signatories to the code in November 2005. (See box on page 92). Companies that are signatories to the code must have their operations audited by an independent third party to demonstrate their compliance with the code.

The International Cyanide Management Institute (ICMI), which will guide and manage the implementation of the code, was formed during the year. AngloGold Ashanti is represented both on the organisation's board and on its Industry Advisory Group.

Environmental risk management and incident reporting

AngloGold Ashanti's environmental professionals participate in incident investigation and risk management processes at a group and operational level. Key environmental risks are identified as part of the company's overall risk profile and are reported accordingly. (See *Annual Report 2006: Risk management on pages 107 to 123*.)

AngloGold Ashanti's incident reporting protocol enables the company to identify and to manage the risks and impacts of environmental incidents, as well as their associated costs. Operations provide the appropriate level of information necessary to advise management and the board of the nature and occurrence of important incidents and developments. In line with this protocol, a major environmental incident report must be made within 24 hours to the corporate office. A summary of reportable incidents and major developments within each region is presented at the quarterly Safety, Health and Sustainable Development Board Committee meetings.

An environmental incident is defined as 'an event, action or non-conformance with a procedure that results, or has the potential to result, in an adverse impact on the surrounding environment; or any event, action or occurrence which is contrary to the AngloGold Ashanti business principles'. Major incidents are reported to the Board. A major incident is defined as one which could affect the company's reputation or which results in a cost to the company exceeding \$100,000 including fines, compensation, clean-up, loss of production, anticipated litigation costs, etc.

The number of environmental incidents reported to the board during the year was at a similar level to 2005. The implementation of ISO14001 has led to increased scrutiny and awareness of incidents at an operational level.

What are environmental incidents?

ENVIRONMENT

Environmental incident report 2006

Operation	Date and nature of incident	Action taken
Ghana		
Obuasi	Coral Snake rock dump material was eroded as result of heavy rain, flooding Ahansowodea on 24 April 2006 .	Immediate clean-up was undertaken. Final closure design for this facility has been moved forward.
	On 3 October 2006 , slurry spillage occurred at Aboagyekrom, a suburb in Obuasi, with negative impact on the environment and affected property.	A pipe replacement programme was instituted which includes regular inspections of pipeline wear. The communication between dam operators and the Tailings Treatment Plant personnel was improved.
	On 20 November 2006 an incident occurred as a result of galamsey (artisanal miners) activities when a tailings pipe was deliberately punctured, causing the contents to spill into the environment. The spillage affected land, vegetation and the Nyam River.	Regular checks along the length of pipelines were instituted and security around tailings facilities strengthened.
Guinea		
Sigiri	On 10 August 2006 a CIP tank overflowed, resulting in about 3,500m ³ of slurry overflowing the bund and being released to the surrounding environment.	The spill was detoxified with hydrogen peroxide and cleaned up. No injuries or faunal fatalities occurred.

- matters which, by law, must be reported to government agencies;
- matters which, by law, are subject to fines and/or penalties;
- environmental impacts which are, by their very nature, either extensive or likely to have long-term effects;
- cyanide-related incidents;
- tailings dam failures;
- spillages or leakages with impact beyond the company's designated containment areas – of tailings materials, hydro carbons, acids and other chemicals;
- emissions beyond permitted levels, for example, atmospheric and effluent releases;
- dust emissions which may impact on the company's reputation; and
- wildlife mortalities and land clearing activities which may impact on the company's reputation.



Environmental incident reporting (continued)

Operation	Date and nature of incident	Action taken
<p>South Africa TauTona Mine</p>	<p>Three incidents occurred (15 February, 16 February and 11 March 2006) on surface and underground resulting in the release of 12,300kg of refrigerant R134a (a greenhouse gas) after the failure of condenser tubes.</p> <p>The 1A refrigerant plant tripped on low evaporator pressure resulting in approximately 1,550kg of R134a refrigerant being discharged into the atmosphere.</p>	<p>Changes have been made to condenser tubes at all refrigeration plants to ensure that this does not occur again.</p> <p>Extensive repairs have been undertaken.</p>
<p>Mine Services (West Wits)</p>	<p>On 14 November and 20 December 2006, respectively, the North Boundary Dam overflowed, due to heavy rainfall in the catchment area and discharged the water into the Wonderfonteinspruit, via the Blyvooruitzicht Canal.</p>	<p>Samples of discharged water were taken and analysed to determine water quality. Subsequently, the dam operating philosophy was reviewed and opportunities for minimising water levels are being explored, including de-silting to restore the full retention capacity and pumping of water to an alternate storage.</p>
<p>Metallurgy – Vaal River</p>	<p>Five incidents occurred (10 and 24 January; and 1, 23 and 27 February 2006) when the Bokkamp Dam, a process water storage and return water dam overflowed towards the Vaal River after heavy rainfall.</p>	<p>A R40 million project to increase the capacity of storage dams in the area has begun and will be completed in 2008. (See case study: <i>R40 million dam being constructed to avoid contamination of Vaal River</i> www.aga-reports.com/06/Bokkamp.htm).</p>
	<p>Ambient air quality monitoring station near the East Gold Acid and Flotation (EGAF) plant recorded sulphur dioxide concentration in excess of the SANS daily average guideline in January and again in June 2006.</p>	<p>Mechanical modifications to the stripper resulted in drastic reduction in sulphur dioxide emissions. After the June incident, an on-line stack emission monitor was installed for proactive emissions' management during future plant shutdown and startup operations. (See case study: <i>Tenfold reduction in SO₂ emissions at Vaal River Gold Acid Plant</i> www.aga-reports.com/06/SO2-emissions.htm).</p>

ENVIRONMENT

Environmental incident reporting (continued)

Operation	Date and nature of incident	Action taken
	In October 2006 the daily average of SO ₂ emissions from the EGAF plant, as measured by the in-line stack analyser, exceeded the Registration Certificate's stack emission limit of 40g/s on two occasions, and again on one occasion in December 2006 . (The certificate allows for total emissions of 55g/s – 40g/s for stack emissions and 15g/s for fugitive emissions over a 24 hour period.)	Total plant emissions have been significantly reduced following the re-engineering of the weak acid stripper and resultant improved SO ₂ removal from calcine water. With these improvements, the operation achieved the Registration Certificate's average 24-hour period limit of 55g/s for total emissions.
	On 1 February 2006 , AEL and Queen Mary return process water storage dams overflowed towards the Vaal River and Schoonspruit after heavy rainfall over a period of two weeks.	Control mechanisms were investigated and have been implemented.
Ergo	Severe erosion damage, after heavy rainfall, to construction works on side slopes of Daggafontein and Brakpan tailings facilities on 7 January, 12 February and 20 March 2006 .	Alternative operation procedures have been implemented to finalise these earthworks.
	Excessive dust blew off the Brakpan Tailings Storage Facility (TSF) into the neighbouring community because of strong winds (21 May 2006).	The 540mt facility is being rehabilitated for final closure according to a detailed, approved closure plan.
	15 December 2006 – A densitometer (an instrument used to measure slurry densities), was stolen from a radiation store at the Salvage Yard, Ergo. The densitometer contains a radioactive source as it uses radiation in its measurements and as such, could constitute a health threat if not properly disposed of.	After notifying the police, the Department of Health and relevant authorities, company representatives visited local scrap dealers to request their assistance in tracing the items and discuss the potential risks of radiation exposure from incorrect handling of the equipment.
Sustainable Development Operations	A large fire took place in a vacant area adjacent to the Mispah TSF threatening the TSF vegetation on 1 June 2006 .	Future timing of annual controlled fire break burning programmes have been revised.
Mali		
Sadiola	A slurry pipeline leak resulted in an area of approximately 20m ² being covered with tailings outside of the tailings facility fence.	The plant was immediately stopped, the spill cleaned up and deposited on the TSF.





Business principle 4: The company will ensure that financial resources are available to meet its reclamation and environmental obligations.

In line with its business principle and in terms of host country legislation, AngloGold Ashanti provides for rehabilitation and final closure of its operations during the operating life of the mine. (Rehabilitation refers to the process of reclaiming mined land to a pre-determined, post-mining use.) While final closure costs may only be fully determined at the time of closure, as at 31 December 2006 the total estimated liability amounted to \$482.5 million (2005: \$337.7 million). Depending on the laws of the various countries in which it operates, the company may or may not be required to provide assurance that these obligations will be met. The means by which this assurance is provided differs. For example in South Africa, the company maintains a Rehabilitation Trust Fund; in Ghana, a cash deposit is required and in the US, various reclamation bonds and letters of credit used are provided.

At the international level, mine closure planning remains a focal area of the ICMM's work programme. The recently established project on 'integrated mine closure' addresses the integration of social, economic and environmental aspects in the closure process and will seek to develop good practice guidance around these issues. AngloGold Ashanti is participating in this process. The methodologies that are currently employed on the various sites have not been uniform owing to varying jurisdictional requirements and site-specific closure planning practices.

Closure plans are usually developed in advance of any mining being undertaken and are considered as part of the economic feasibility of any project. However, for many of AngloGold Ashanti's older operations, closure plans had to be specifically developed. All of our operations now have closure plans which are reviewed and updated on a regular basis to take cognisance of operational conditions and developments, legislative requirements, international protocols and technological developments and advances in good practices. Our auditors have increasingly sought the advice of independent consultants to ensure that we have properly identified our overall liabilities for closure. Over time we intend to develop a more uniform approach to closure planning and accounting and audit all operations for conformance.

Because of international accounting practices and reporting requirements, the manner in which these liabilities have been provided differs from the way in which it was reported in the 2005 report. Long-term environmental closure obligations comprising decommissioning and restoration are based on the group's environmental management plans, in compliance with the current environmental and regulatory requirements. The provision for decommissioning represents the cost that will arise from rectifying damage caused before production commenced. The provision for restoration represents the cost of restoring site damage after the commencement of production.

Business principle 5: The company will ensure that its employees and contractors are aware of this policy as well as their relevant responsibilities.

Historically, training and awareness has been undertaken by including environmental issues in site-based induction programmes, and regular communication activities such as posters, newsletters, intranet sites, etc. However, ISO14001 requires a much more considered approach. Employees who perform tasks that have the potential to cause a significant environmental impact are required to be competent on the basis of appropriate education, training and/or experience. The operation is required to demonstrate, through the presence of records, that it has identified its significant environmental aspects, and assigned roles and responsibilities in managing these. It also has to show that it has provided the necessary training and awareness, not only to prevent

ENVIRONMENT

Rehabilitation and decommissioning liabilities

Region	2006		Total (\$ million)	2005 (\$ million)
	Rehabilitation (\$ million)	Decommissioning (\$ million)		
Argentina	6.7	9.3	16.0	8.8
Cerro Vanguardia	6.7	9.3	16.0	
Australia	63.7	6.7	70.4	32.7
Sunrise Dam	26.6	5.3		
Boddington*	37.1	1.4		
Brazil	8.6	26.8	35.4	12.5
AngloGold Ashanti Brasil Mineração	7.5	22.6	30.1	
Serra Grande	1.1	4.2	5.3	
Corporate	2.1	0.0	2.1	-
Corporate	2.1	0.0	2.1	
Ghana**	20.4	24.6	45.0	47.1
Iduapriem	4.9	10.1	15.0	
Obuasi	13.5	14.5	28.0	
Bibiani	0	0	0	
Cluff Resources (Ghana)	2.0	0.0	2.0	
Guinea	15.1	13.3	28.4	8.5
Siguiri	15.1	13.3		
Mali	7.00	10.2	17.2	13.4
Morila	2.9	2.3	5.2	
Sadiola	2.9	3.0	5.9	
Yatela	1.2	4.9	6.1	
Namibia	3.0	1.7	4.7	3.0
Navachab	3.0	1.7		
South Africa	58.5	96.8	155.3	145.3
Great Noligwa	2.6	15.3	17.9	
Kopanang	3.1	18.6	21.7	
Tau Lekoa	1.2	6.6	7.8	
Moab Khotsong	3.6	15.7	19.3	
TauTona	3.3	13.7	17.0	
Savuka	0.5	4.9	5.4	
Mponeng	2.0	13.8	15.8	
Legacy Projects – VR	9.1	7.2	16.3	
Legacy Projects – WW	1.2	0.9	2.1	
Ergo	31.9	0.1	32.0	
Tanzania	22.5	34.3	56.8	44.1
Geita	22.5	34.3	56.8	
USA	48.1	3.0	51.1	22.3
CC&V	48.1	3.0		
Total	255.7	226.7	482.4	337.7

* The Boddington operation was re-opened during the year

** The Bibiani mine in Ghana was sold during the year

Decommissioning costs are provided for at the present value of the expenditures expected to settle the obligation, using estimated cash flows based on current prices. When this provision gives access to future economic benefits, an asset is recognised and included within mining infrastructure. The unwinding of the decommissioning obligation is included in the income statement. The estimated future costs of decommissioning obligations are regularly reviewed and adjusted as appropriate for new circumstances or changes in law or technology. The estimates are discounted at a pre-tax rate that reflects current market assessments of the time value of money. Gains from the expected disposal of assets are not taken into account when determining the provision.

Gross restoration costs are estimated at the present value of the expenditures expected to settle the obligation, using estimated cash flows based on current prices. The estimates are discounted at a pre-tax rate that reflects current market assessments of the time value of money. Restoration costs (anticipated) are accrued and expensed over the operating life of each mine using the units-of-production method based on estimated proved and probable mineral reserves. Expenditure (actual) on ongoing restoration costs is brought to account when incurred. Increases in the provision are charged to the income statement as a cost of production.

incidents, but to illustrate the benefits of improved personal performance. Contractors are generally required to undergo site-specific induction and refresher training. In line with the company's implementation of ISO14001, a far more comprehensive approach to training has thus been developed at an operational level.

Business principle 7: We are committed to communicating and consulting with interested and affected parties on environmental aspects of our activities and to making this policy available to the public.

Cyanide Code

The code is a voluntary industry initiative developed under the auspices of the United Nations Environment Programme (UNEP) and the International Council of Mining and Metals (ICMM) to:

- promote responsible management of cyanide used in gold mining;
- enhance the protection of human health; and
- reduce the potential for environmental impacts.

See www.cyanidecode.org for further information

Cyanide Workshop steers and supports Code implementation at AngloGold Ashanti

In November 2006, AngloGold Ashanti hosted a Cyanide Workshop which was attended by cyanide code champions (senior metallurgists) and other staff from across the world. Also in attendance were prominent industry representatives including cyanide auditors, producers, suppliers and an ICMI Board member. The purpose of the meeting was to review progress in implementing the code, confirm the schedule for certification of the company's operations and deliberate technical difficulties associated with compliance. The meeting was addressed by senior executives of the company, including the CEO, indicating the commitment by the company to comply with the Code.

Examples of the issues and challenges discussed include:

- results of research undertaken by Australian Centre for Mineral Extension and Research (ACMER) (*See Report to Society 2005*) in Australia and Mali with regards to the protection of wildlife around tailings dams;
- difficulties associated with cyanide monitoring in a hyper-saline environment;
- the availability of independent ICMI auditors;
- problems associated with the formation of ponds on heap leach areas;
- the transport of cyanide and certification of transport companies;
- plans to reduce residue weak acid dissociable (WAD) cyanide to below 50 ppm;
- mine closure planning and the requirements of the code in this respect; and
- community consultation, emergency response planning and procedures.

AngloGold Ashanti's anticipated cyanide code certification schedule is shown alongside.

Feedback from the delegates during and at the end of the workshop was positive. In particular, the regional cyanide champions were afforded an opportunity to establish networks and contacts within the group, with suppliers, auditors and the ICMI. Importantly the cyanide champions were able to benchmark their regions against the other regions within the company and identify innovations to take back and implement at their own operations.



Mine	Audit date/Proposed cyanide code audit date
July 2007	Australia – Sunrise Dam
Q1, 2007	South Africa – Mponeng, Savuka, Kopanang, Great Noligwa, East Gold Plant
	US – CC&V
Q3, 2007	Brazil – Queiroz Plant, Corrego do Sitio, Serra Grande
	Argentina – Cerro Vanguardia
Q4, 2007	Mali – Sadiola, Yatela, Morila
Q1, 2008	Tanzania – Geita
	Namibia – Navachab
Q3, 2008	Ghana – Iduapriem
	Guinea – Siguiri
Q4, 2008	Ghana – Obuasi

ENVIRONMENT

Communication and consultation with interested and affected parties is an integral part of the way in which we do business. This process is frequently mandated by local legislation. *AngloGold Ashanti's approach is documented largely in the community section of this report on page 102.*

In respect of environmental issues specifically, much communication is carried out through official regulatory channels, supported by participation in a variety of local and regional forums. Apart from involvement in bodies such as the Chamber of Mines of South Africa, the Minerals Council of Australia and the National Mining Association in the United States, a number of our operations – particularly in Africa – have initiated annual stakeholder forums which provide an opportunity for communities to raise issues of concern and promote ongoing dialogue.

Business principle 8: We will work to continually improve our environmental performance and prevent pollution from our operations.

Key indicators of environmental performance for AngloGold Ashanti are:

- the use and management of cyanide;
- efficient use of resources, including water and energy;
- mine closure planning and the rehabilitation of disturbed lands; and
- the prevention of pollution, through proper waste management, and hazardous waste management practices

In recent years, increasing attention has also been focused on issues relating to:

- climate change and greenhouse gas emissions; and
- biodiversity

These and other issues have been considered by the Board Sub-committee, as well as executive and operational management.

Cyanide

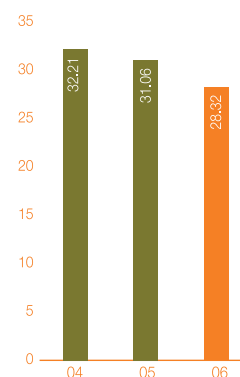
The use of cyanide is a key component of the gold recovery process. While AngloGold Ashanti is aware of the possible negative impacts of cyanide, the company believes that responsible use is an important component in achieving the viability of orebodies and in sustaining gold mining operations. *(See section on Implementing the cyanide code on pages 87 and 96).*

While it may be argued that the more cyanide is used, the greater the risk of environmental harm, this is overly simplistic. The efficiency with which cyanide is used, measured against ounces of gold produced, is also an imperfect measure as different ore types require varying concentrations of cyanide for optimal recovery. Nonetheless, this information is provided in the table overleaf.

Total cyanide use decreased by 8.8% in 2006 to 28,319,714kg (2005: 31,059,555kg; 2004: 32,211,096kg).



Cyanide usage – Group
(000kg)





Cyanide usage

Operation	Usage (kg)		*Efficiency cyanide usage per ounce of production (kg/oz)	
	2006	2005	2006	2005
Argentina				
Cerro Vanguardia	533,333	560,000	2.30	2.46
Australia				
Sunrise Dam	1,720,074	1,671,651	3.70	3.67
Brazil				
AngloGold Ashanti Mineraçao	1,377,000	1,071,000	1.56	4.28
Serra Grande	280,000	288,500	1.44	1.50
Ghana				
Obuasi	4,924,014	4,047,000	12.72	10.35
Iduapriem	1,128,000	1,378,000	5.75	6.72
Guinea				
Siguiri	² 1,461,000	3,354,000	4.85	11.61
Mali				
Morila	2,324,000	2,082,000	4.49	3.18
Sadiola	³ 2,848,800	5,369,000	5.70	12.15
Yatela	964,000	846,000	2.73	3.45
Namibia				
Navachab	908,000	814,441	10.56	10.05
South Africa				
West Wits	1,477,355	1,311,609	1.27	1.15
Vaal River	3,845,447	3,773,248	2.76	2.46
Tanzania				
Geita	2,965,870	2,497,400	9.63	4.07
USA				
CC&V	2,562,821	1,995,806	9.06	6.05
Group	28,319,714	31,059,555	4.26	4.33

⁽¹⁾ Reduction in consumption was the result of changeover from ultra-fine milling process to sulphide roasting process for sulphide gold recovery.

⁽²⁾ Reduction in consumption is attributed to changeover from heap leaching gold processing to CIL and a change in pH control philosophy.

⁽³⁾ Reduction in consumption attributed to a significant decrease in the ratio of sulphide ore processed.

* Based on 100% of production.

AngloGold Ashanti focuses much attention on preventing pollution by managing the concentration of residual cyanide in waste streams. Compliance with the Cyanide Code provides a comprehensive assurance of good management and acceptable mitigation of risk.

Efficient use of resources, including water and energy

The mining industry by its very nature is a significant user of natural resources and commodities and the consumption of fuel, electricity and water can significantly affect the total cost of mining. AngloGold Ashanti has plans in place to improve the efficient use of resources and our over-arching philosophy is that this optimisation is best managed at site level where staff understand the requirements of the

ENVIRONMENT

operation and can identify needs and reduce wastage. Thus, environmental targets are also established by the individual mines to reflect the priorities and risks unique to each operating unit. Owing to variations in site conditions, as well as mining and treatment processes, resource use efficiencies differ greatly between operations and it is therefore difficult to establish any meaningful company-wide benchmarks.

Water management

Water management and the prevention of pollution (particularly groundwater seepage) remain key concerns across all operations, although the issues are very region specific (for example, issues in high rainfall areas are very different to those in arid areas). There are two main themes in water management: water consumption and water quality (which includes issues such as acid rock drainage and discharges from tailings dams).

Some of the most significant water management issues within the company are:

- In South Africa, apart from improving and maintaining compliance with water permit conditions, water quality improvements are being driven by the impending Waste Discharge Charge System (WDCS). The WDCS is a pricing strategy designed by the Department of Water and Forestry to improve national water use efficiencies and financially penalise the dischargers of poor-quality water. A number of water quality management challenges are being addressed by AngloGold Ashanti's South African operations, perhaps the most significant of which is the separation of clean and dirty water catchments on our older sites, some which date back almost 50 years. This often entails a macro scale redesign of drainage infrastructure that was built when water quality requirements were lax when compared to today's stringent standards (See case study: *R40 million dam being constructed to avoid contamination of Vaal River – www.aga-reports.com/06/TSF-upgrade.htm*). A second but equally important water quality challenge is the management of groundwater seepage from tailings facilities, where short and long-term engineered solutions, including phytoremediation, are being investigated. (See case study – *Report to Society 2004*).
- Recent media attention has focused on the state of the Wonderfonteinsspruit, which flows from the north of AngloGold Ashanti's West Wits operations, towards Potchefstroom. The issue is contamination of the water resource, with specific focus on radioactive sediment which has been deposited in the watercourse over an extended period of time by a number of mining companies, including abandoned and closed mines. Naturally-occurring rock in this region contains uranium and other radioactive isotopes. The catchment area includes the workings of a number of mining companies, all with waste rock dumps, tailings dam and associated plant infrastructure. The extent of damage to the stream has yet to be properly quantified, and a number of mining companies – including AngloGold Ashanti – have agreed to form and participate in an action group to address the various issues raised by the community and others. AngloGold Ashanti has in recent years reduced the amount of overflow from the North Boundary Dam during periods of high rainfall into the Wonderfonteinsspruit and has – over the past seven years – spent around R7 million on a stormwater separation system to do this. This system includes the construction of a stormwater channel which diverts rainwater falling in the nearby West Wits Village and allowing it to flow directly to the Wonderfonteinsspruit. A further project, currently in progress, will increase the process water storage capacity by using the thickener tanks at a redundant West Wits process plant.
- At Obuasi, water-related issues were identified as highly significant in the strategic review of the operation completed towards the end of 2005. Management of discharges from the tailings dams and stormwater control around the plants will be among the most important elements in the implementation of the environmental management system. (See case study:



Social and environmental legacies at Obuasi on page 128).

- In Brazil, water quality monitoring results show that the clean-up of old arsenic bearing tailings materials – an ongoing project – has resulted in a significant improvement in riverine water quality. (See case study: *Report to Society 2005*).
- In Colorado, proposed legislative changes will significantly restrict water quality requirements which may result in the need to introduce water treatment process plants and with it, an increase in associated mining costs.

Total fresh water usage at AngloGold Ashanti operations in 2006 amounted to 79,653,998m³. (2005: 81,805,608m³; 2004: 90,363,232m³).

Climate change

AngloGold Ashanti has, as a member of the ICMM, committed to the ICMM's position on climate change. This position states that ICMM members:

- Recognise the significance of climate change as a global issue, requiring a global response;
- Have made progress in improving energy efficiency at their operations to reduce greenhouse gas (GHG) emissions;
- Recognise scientific evidence which shows that to protect the global climate system, sustained reductions in GHG are necessary.
- Recognise the need for clean, reliable and affordable energy for sustainable development, particularly for economic development and improving social welfare in developing countries;
- Will:
 - Continue to meet or exceed government standards;

- Monitor and report GHG emissions consistent with international standards and through the Global Reporting Initiative (GRI);
- Reduce GHG emissions as measured in absolute terms or per unit of production or through improved energy efficiency.

AngloGold Ashanti has appointed an in-house working group to consider climate change taking into consideration the moral/environmental, economic, political, reputational and practical considerations of this issue.

The issue was also debated at the 2006 Environmental Workshop and we are looking to the development of a way forward for, firstly, collection of GHG emissions data and then, secondly, a plan of action to reduce GHG emissions.



ENVIRONMENT

The following table reports on the efficiency of fresh water usage by AngloGold Ashanti in 2006:

Fresh water usage

Operation	Usage (m ³) per annum		*Efficiency – water usage per ounce of production (m ³ /oz)	
	2006	2005	2006	2005
Argentina				
Cerro Vanguardia	939,647	*964,307	4.05	4.23
Australia				
Sunrise Dam	2,254,970	*2,319,654	4.85	5.10
Brazil				
AngloGold Ashanti Mineração	3,371,455	3,827,904	13.93	15.31
Serra Grande	367,920	388,944	1.90	2.03
Ghana				
Obuasi	13,620,000	15,670,000	35.19	40.08
Iduapriem ⁶	100,000	100,000	0.51	0.49
Guinea				
Siguiri	2,939,059	3,717,191	9.76	12.86
Mali				
Morila	2,240,689	2,236,373	4.33	3.41
Sadiola	8,508,907	6,543,000	17.02	14.80
Yatela	12,894,880	12,079,736	36.53	49.30
Namibia				
Navachab	938,000	1,031,554	10.91	12.74
South Africa				
West Wits	8,530,177	8,200,289	7.36	7.19
Vaal River	18,567,997	18,884,489	13.32	12.30
Tanzania				
Geita	2,348,666	4,268,816	7.63	6.96
USA				
CC&V	2,031,631	1,573,411	7.18	4.77
Group	79,653,998	81,805,668	11.97	11.42

⁽⁴⁾ Correction to previously published 2005 data, where a number of recycle streams were included.

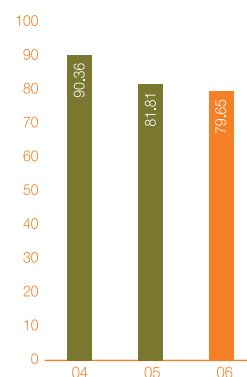
⁽⁵⁾ Correction to previously published 2005 data, where CTD recycled water was included.

⁽⁶⁾ Estimate of annual groundwater abstraction, nil abstraction from other sources.

* Based on 100% of production



Water usage (000m³/per annum)



Energy management

AngloGold Ashanti's mining activities require significant amounts of energy, which is drawn from a variety of sources, but which are predominantly fossil-fuel generated. Given both the cost, and greenhouse gas emissions, it is in the company's best interests to both minimise and ensure the most efficient use of energy that is used.

AngloGold Ashanti has been monitoring the debate around the renewable energy market, including the use and trading of renewable energy certificates. The company does not envisage conventional energy sources being wholly replaced with renewable energy sources, it is involved in the generation of some of its own renewable energy. These renewable energy options include down-shaft generators in the deep South African mines (*See Report to Society 2005*) and hydro-electric facilities in Brazil. (*See case study: Hydro-electric power generation in Brazil – www.aga-reports.com/06/hydro-electric.htm*). Alternative energy sources explored in 2006 include the use of wind power generation, as well as the conversion of the powerhouse to LNG at Sunrise Dam in Australia (*See case study: Wind power at Sunrise Dam – www.aga-reports.com/06/SDGM-windpower.htm*). Some wind-powered options have also been investigated at CC&V in Colorado. On an experimental basis, the company is also investigating the possible use of biodiesel fuels as alternatives to conventional petroleum sources.

AngloGold Ashanti's total energy consumption from all sources was 29,798,654GJ in 2006. (2005: 28,210,286GJ and 2004: 31,203,528GJ.)

Dust management at Vaal River Sulphur Paydam

Efforts to control dust emissions from the Vaal River sulphur paydam, which is being reclaimed to recover pyrite and gold, have been subject to further scrutiny during 2006. (*See case study in Report to Society 2005: Dust management at Vaal River.*)

The binding agent ligno-sulphonate, which was sprayed on the surface of the dam during 2005, was found to be ineffective during the rainy season because it is water-soluble. Further research was carried out during 2006 on a number of alternative dust suppressants, the most effective of which was determined to be ridge ploughing. Instead of using ligno-sulphonate which dissolved in the heavy rains, contour ridge ploughing is now being used to create ridged mounds on the flat surface of the dam, thereby also making it less susceptible to wind disturbance.

In respect of dust suppression on the paydam's road surfaces, trials were carried out during 2006 on the use of waste ash from the

boilers at the South Uranium Plant. The study revealed that the ash becomes hard when water is applied to its surface, making it an ideal road cladding substance. Following analysis, it has subsequently been approved by the Nuclear Energy Corporation of South Africa (NECSA) and accredited laboratories as an environmentally safe dust suppression agent. Ash has already been deposited at the sulphur paydam, ready for application in 2007.

With regards to monitoring, single dust buckets to monitor emissions have been increased from 17 to 23 and two more wind directional buckets (to ascertain from which direction the dust emanates), have been installed, bringing their total to six. These monitoring mechanisms will be key in determining the dust contribution from mines to the north and east of the paydam – although the extent of this can only be confirmed after monitoring over an entire seasonal cycle has been completed.

ENVIRONMENT

The following table reports on the efficiency of energy usage by AngloGold Ashanti:

Total energy usage

Operation	Energy usage (GJ)		*Efficiency – energy usage per ounce of production (oz)	
	2006	2005	2006	2005
Argentina				
Cerro Vanguardia	208,599	215,718	0.90	0.95
Australia				
Sunrise Dam	2,275,396	2,149,981	4.89	4.73
Brazil				
AngloGold Ashanti Mineração	499,693	501,401	2.06	2.01
Serra Grande	221,004	205,903	1.14	1.07
Ghana				
Obuasi	1,945,707	1,891,882	5.03	4.84
Iduapriem	286,007	354,783	1.46	1.73
Guinea				
Siguiri	1,959,489	⁷ 1,995,135	6.51	6.90
Mali				
Morila	2,382,446	2,494,728	4.60	3.81
Sadiola	1,014,217	887,232	4.14	2.01
Yatela	⁸ 1,303,928	449,771	3.69	1.84
Namibia				
Navachab	235,961	183,284	2.74	2.26
South Africa				
West Wits	6,203,944	6,322,597	5.35	5.55
Vaal River	7,424,668	7,329,634	5.33	4.78
Tanzania				
Geita	2,538,335	1,899,936	8.24	3.10
USA				
CC&V	⁹ 1,299,258	1,328,301	4.59	4.03
Group	29,798,654	28,210,286	4.48	3.94

* Based on 100% of production.

* Includes non-product uses on site such as mine accommodation and laboratories, but excludes Ergo, corporate offices and exploration activities.

⁽⁷⁾ Correction to previously published 2005 data, where fuel used for mobile equipment was excluded.

⁽⁸⁾ Increase on 2005 attributed to pit deepening and expansion activities.

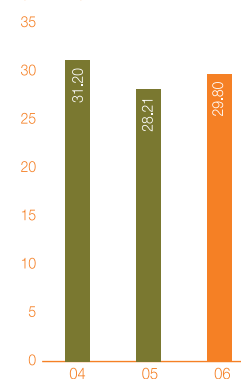
⁽⁹⁾ Includes energy derived from secondary use of spent oils that were burnt for heating.

Greenhouse gas emissions and global warming

Climate change has become an increasingly contentious issue globally. A position has been rigorously debated within the ICMM and by virtue of its membership, AngloGold Ashanti is party to and supportive of this position. (See page 96). The issue continues to be discussed at the highest levels within the company, while at the same time operations are seeking to improve energy efficiencies to curb our contribution to carbon emissions. The company has also participated in discussions around the development of the carbon market and is considering ways in which it could meaningfully participate.



Total energy usage (000GJ)



Biodiversity

The threat to biodiversity as a result of habitat destruction and other human related causes has been a high profile international environmental issue for many years. Through the ICMM we have been engaged in a formal dialogue with the IUCN (World Conservation Union). A significant output from this dialogue has been the recent publication of 'Good Practice Guidance for Mining and Biodiversity'. The best practice guidance is designed to integrate biodiversity considerations through all stages of the mining lifecycle, from exploration, through environmental impact assessments (EIAs), to operations and eventually rehabilitation and closure. To date, most of our corporate efforts have been focused on the development of this material in a practical form.

Biodiversity has not been a priority issue for our operations although potentially this could directly affect our future access to land and to capital. The global conservation estate has now grown to cover some 13% of the world's land surface and 0.5% of the world's oceans; much of this in remote wilderness areas which are of direct interest to minerals exploration.

Since its inception, the ICMM has been pursuing a course of open and constructive dialogue with the IUCN. After consultation with its membership, and as a demonstration of good faith immediately prior to the World Parks Congress (in September 2003), the ICMM made a public statement acknowledging that there may be special areas within the world that may be considered 'off limits' to mineral development included a commitment not to mine or explore in existing World Heritage Sites. In June 2005, our exploration staff completed an exercise comparing our current exploration and mining leases with the UNEP_WCMC's (World Conservation Monitoring Centre) database of protected areas. A number of areas of overlap were identified.

There are no overlaps between our exploration projects and existing World Heritage Sites, but the Asacha joint venture project in Kamchatka, Russia borders on a World Heritage Site. There are also some overlaps with IUCN listed protected areas, particularly in Colombia and Tanzania. In Ghana, the issue of mining in protected forest reserves remains a sensitive issue. In Brazil, the status of the Atlantic Forest ecosystems, where the majority of our South American mines are located, continues to be a significant concern. In 2006, 34 hectares of Atlantic Forest were affected by mining activities, including those of the Cuiabá Expansion project for the establishment of a new tailings storage dam. This land clearing process was compensated by the creation of a natural reserve (RPPN – Private Natural Forest Reserve) totalling 729 hectares on Cuiabá mine property. The area consists of Atlantic Forest in an excellent state of preservation. This supplements the companies' existing contributions to areas such as the Mata Samuel de Paula reserve at Nova Lima (*see case study: Preserving natural forests – Mata Samuel de Paula reserve at Nova Lima*). In the USA and Australian operations, our focus has been assessing the possible occurrence of rare and endangered species on our mining leases.

In the course of the ICMM – IUCN dialogue, the mining industry has been working to improve its relationship with the international conservation community, seeking to reduce the number of land disputes and demonstrating that it is capable of carrying out its business in a responsible manner and contribute positively to the conservation of the world's biodiversity. The 'Good Practice Guidance for Mining and Biodiversity' details how this is possible. While AngloGold Ashanti has done some work in the area, it acknowledges that still more needs to be done and will – during

ENVIRONMENT

2007 – be seeking to work, in partnership with respected conservation organisations, on a strategy to help us roll out further programmes at our operations. The emphasis of these efforts needs to lie at the local operational level where tangible results can be achieved.

Business principle 9: The company will participate in debate on environmental matters at international, national and local levels.

AngloGold Ashanti is committed to participating in the debate on environmental matters at an international, national and local level. The group actively participates in the ICMM and the Global Reporting Initiative (GRI) of which it is an organisational stakeholder. *(See the section on Ethics and Governance on page 20 for further information.)*

Andrew Mackenzie is the company's representative on the Environmental Stewardship and Biodiversity Working Group of the ICMM. The environmental stewardship work programme is aimed at enhancing the industry's environmental performance. Because of the nature of the mining and minerals industry, much of its work is carried out in parts of the world which boast rich natural resources and are often environmentally sensitive. We have a duty of care to ensure our industry behaves in a sustainable way, to ensure we continue to reap the benefits of the earth's wealth without damaging its sensitive ecosystems. Alongside this aim is the need to work effectively with governments and local communities in order to make sure that environmental criteria do not restrict future access to mineral and metals wealth. In line with the Sustainable Development Framework, ICMM's members are obliged to contribute to the conservation of biodiversity and integrated approaches to land use planning as well as respect legally designated protected areas. The taskforce is currently working on projects in the following areas:

- biodiversity good practice and offsets;
- integrated mine closure planning;
- financial assurance;
- land use planning;
- IFC/World Bank Environment, Health and Safety Guidelines; and
- IUCN protected areas system review.

5. Case studies

Sunrise Dam invests in wind power

This case study details the implementation of a wind-powered pump at Sunrise Dam, the effects it has had on the operation and the future possibilities and relevance for this method of power in the surrounding areas. *(See www.aga-reports.com/06/SDGM-windpower.htm).*



LNG-fuelled power generation at Sunrise Dam

This case study reviews the transition of Sunrise Dam's reliance on diesel-powered electricity to LNG as a cost-effective and environmentally-friendly alternative. *(See www.aga-reports.com/06/LNG-SDGM.htm).*



R40 million dam being constructed to avoid contamination of Vaal River

Remedial action is under way to contain spillages from the Bokkamp Dam, a return water dam that receives water from the West Complex tailings storage facility at the Vaal River operations in South Africa. Much of the spillage flows into the Vaal River resulting in a breach of environmental legislation. A new storm water containment dam is now in the process of construction in order to accommodate excess water from the Bokkamp Dam. (See www.aga-reports.com/06/Bokkamp/htm).



Tenfold reduction in SO₂ emissions at Vaal River Gold Acid Plant

Sulphur dioxide (SO₂) emissions have been substantially reduced at Vaal River's East Gold Acid Flotation (EGAF) plant, which produces sulphuric acid for the uranium leach process. This has been achieved mainly through improved efficiencies of the weak acid SO₂ stripper tower, coupled with stricter control of plant emissions by way of a permanent stack monitor and a rigorous internal management procedure. The reduced emissions resulted in the awarding of a permanent registration certificate from the North West Chief Pollution Officer in 2006. (See www.aga-reports.com/06/SO2-emission.htm).



Biodiversity assessment in SA

AngloGold Ashanti's biodiversity assessment, which started in 2005 with a desktop study, entered its second phase in 2006 when the data collected the previous year underwent a verification process. Expert teams made field trips in and around the Vaal River and West Wits operations to identify fauna and flora species at the various biodiversity management units, with a view to implementing a more rigorous management and monitoring programme. (See www.aga-reports.com/06/biodiversity.htm).



Improvements in environmental incident reporting system in Mali

A more streamlined environmental incident reporting system has been established at AngloGold Ashanti's Sadiola and Yatela mining operations in Mali, in collaboration with the company's joint venture partners. Following a meeting between the environmental departments of both operations and other key stakeholders, a blueprint for a more cost and time efficient environmental incident reporting system was agreed on. (See www.aga-reports.com/06/incident-reporting.htm).



CC&V receives State of Colorado recognition

The State of Colorado's Department of Public Health and Environment recently recognised CC&V's accomplishment in protecting the environment with a Bronze Achiever award in its Environmental Leadership Programme. (See www.aga-reports.com/06/CC&V-award.htm).



ENVIRONMENT

CC&V Gold Mining Company evaluates wind power

Cripple Creek & Victor Gold Mining Company's Cresson Mine, situated in the State of Colorado, United States of America, is currently investigating various forms of alternative energy including biodiesel and wind power. (See www.aga-reports.com/06/CC&V-windpower.htm).



The use of hydro-electric power in Brazil

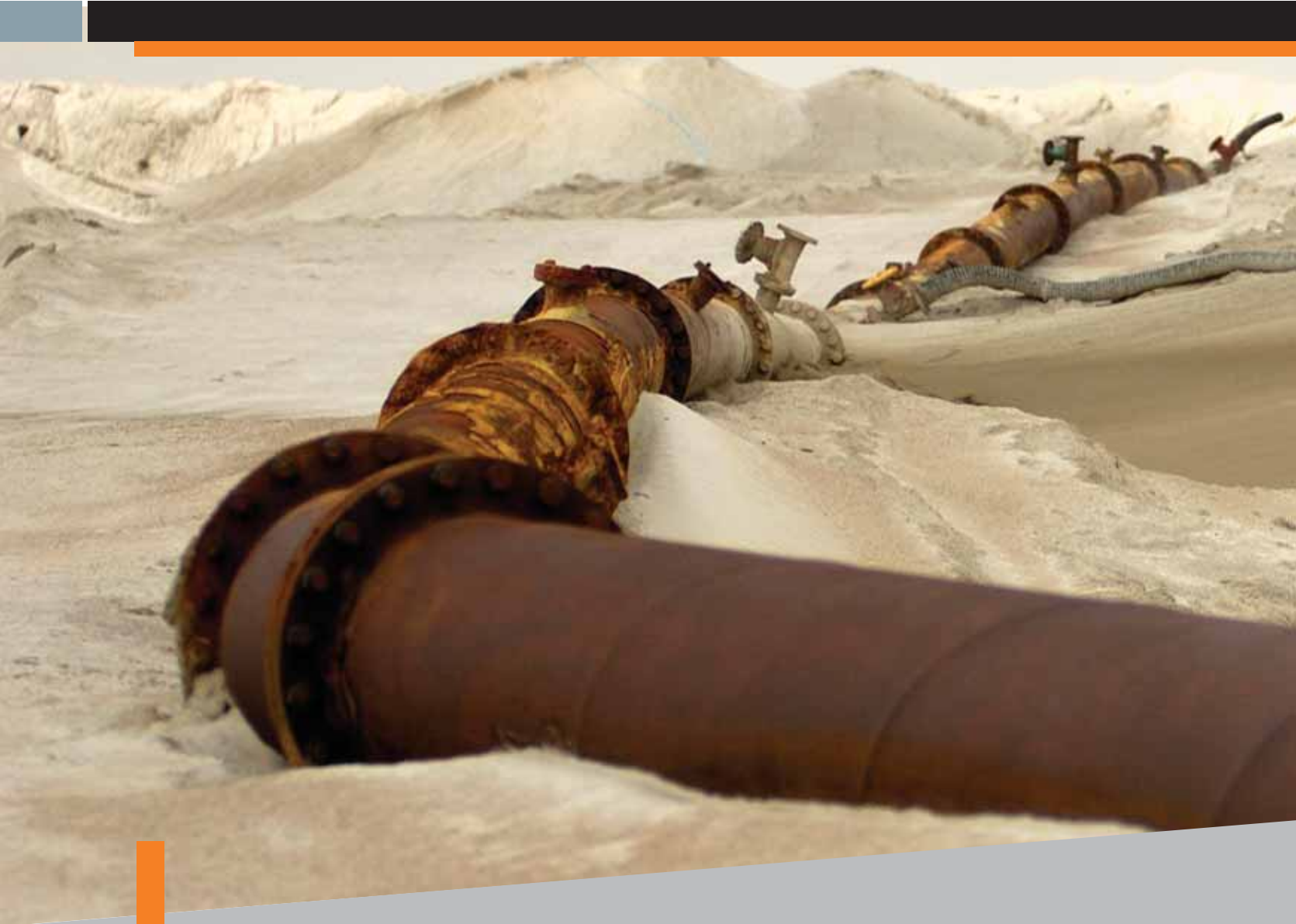
Hydro-electric power, widely accepted as environmentally friendly because of its lack of emissions of greenhouse gases and other pollutants, has been in use at AngloGold Ashanti's Brazilian operations since 1900. The three dams which provide the water for the system also offer an attractive environment for a range of sporting activities for the local community. (See www.aga-reports.com/06/hydro-electric.htm).



6. Objectives

The following objectives have been set for 2007:

- To complete certification of all outstanding operations to the ISO14001 standard, and to extend the ISO14001 certification requirement to exploration activities so that these are certified by the end of December 2007.
- To continue the development and implementation of a series of environmental guidelines to direct and improve the company's environmental performance.
- To test, in association with appropriate external organisations, the use of the ICMM's Good Practice Guidelines in promoting the management of biodiversity-related issues within the company from exploration, through operation to closure.
- To improve mine closure planning practices, through a review of current processes, comparison with international good practice and development of an appropriate guideline.
- To continue to improve environmental data-gathering systems, and to produce this data in such a way as to allow meaningful comparison across the company's operations, and facilitate the setting of targets, corrective management action and reporting of environmental performance across the company.
- To extend the use of geographical information systems (GIS) across the African region as a way in which to support the improvement of environmental performance.
- To develop a system that will recognise and reward environmental performance within the organisation.



Implementing ISO14001 at AngloGold Ashanti

In March 2005, AngloGold Ashanti's Executive Committee took the decision to pursue ISO14001 certification for all its operating mines in support of a strategic recommendation made by the group environmental management team. A target was set by the committee that all operations should achieve certification by the end of 2006.

Says Andrew Mackenzie, Manager: Corporate Environmental Affairs at AngloGold Ashanti, "Our decision was based on an ever-increasing need to implement a single and comparable system across operations not only for management purposes, but also for ensuring compliance with environmental laws and regulations. We also believed that this across-the-board implementation would assist us in identifying, prioritising and managing company-related environmental issues, as well as respond to the ever-increasing requirements of environmental reporting. Additionally, the internal and external verification processes that are required will provide greater comfort in our risk management and corporate governance processes. It also allows us to transfer staff, both



operational and environmental professionals, between sites knowing that their familiarity with the system will enable them to deal with the relevant environmental issue from the word go.”

During 2004 gap analyses were undertaken at every operation to determine the degree to which the former environmental management systems (EMSs) were aligned with ISO14001. By this stage, six operations – Cerro Vanguardia in Argentina, AngloGold Ashanti Mineração and Serra Grande in Brazil, Bibiani and Iduapriem in Ghana and Geita in Tanzania – were already ISO14001 certified and hence there was some experience and reassurance that this was indeed the right path to follow. (Note that the Bibiani mine was sold at the end of 2006).

By year end 2006, all but one mining operation (Navachab in Namibia) had been audited and achieved or been recommended for certification. (See list overleaf).

Implementing ISO14001 at AngloGold Ashanti cont.

ISO14001:2004 certification at AngloGold Ashanti*

Country	Operation	Date achieved	Certified by	Valid until
Argentina	Cerro Vangaurdia	July 2002	National Quality Assurance (USA)	June 2008
Australia	Sunrise Dam	December 2006	Lloyd's Register Quality Assurance	December 2009
Brazil	AngloGold Ashanti Mineração	March 2004 (Re-issued in May 2006)	National Quality Assurance (USA)	May 2007
	Córrego do Sitio	December 2006	National Quality Assurance (USA)	December 2009
	Serra Grande	March 2004 *(Reissued in May 2006)	National Quality Assurance (USA)	March 2007
Ghana	Iduapriem	January 2004 *(Reissued in November 2006)	DLIQ Certification Services	November 2009
	Obuasi	December 2006	DLIQ Certification Services	December 2009
Mali	Sadiola	November 2006 (certification recommended)	DLIQ Certification Services	November 2009
	Morila	November 2006 (certification recommended)	DLIQ Certification Services	November 2009
South Africa	Moab Khotsong Great Noligwa Tau Lekoa Mine Kopanang Mine Sustainable Development operations Sustainable Development properties Sustainable Development Operations East Rand Africa Underground region metallurgy Savuka Mine Mponeng Mine TauTona Mine Mine services – Vaal River Mine services – West Wits Properties – high density	December 2006 (certification recommended)	DQS (Germany)	December 2009
Tanzania	Geita	July 2001	DLIQ Certification Services	January 2007
USA	CC&V	December 2006	Orion Register	December 2009
	AngloGold Ashanti North America Inc (Denver Corporate Office)	December 2006	Orion Register	December 2009

Note: Yatela mine, which was previously scheduled for closure, but whose life has been extended, will seek certification by 31 December 2007.

Navachab mine in Namibia is scheduled for its second stage audit in March 2007

Additional business entities within AngloGold Ashanti's South Africa operations that will be pursuing ISO14001 certification during 2007 are: AngloGold Ashanti Health, Commercial Services and AngloGold Training and Development Services.

Implementing ISO14001 at AngloGold Ashanti cont.

“This is an excellent achievement,” says Andrew Mackenzie. “When we started this process we knew that we had set a ‘stretch’ target, and were pleasantly surprised when almost all operations and business entities actually achieved the desired result. All credit must be given at an operational level where there has been massive support for the process, despite some initial resistance.”

When questioned about this resistance, Mackenzie explained that this was not significant and related mainly to concerns about ever-increasing corporate governance requirements and perceived bureaucracy; the fact that achieving certification appeared to be a very daunting task, and that many people did not realise how closely aligned their previous environmental management systems were with ISO14001 and concerns relating to resources (time, money and staff).

“While the costs relating to the actual auditing processes were indeed new, many of the other costs have simply been absorbed into the operating costs where indeed they were already being incurred; this was just a way of ensuring that they contributed to the refinement of reasonably good existing management systems. Admittedly though, during the course of the year, there has been an enormous amount of time spent on training and on developing awareness of the systems across the operations (and not just within the environmental discipline). In some cases additional resources, and staff, had to be assigned to enhance the capacity of environmental departments that may have been under-resourced.

The fact that such a system requires the involvement and commitment of just about everyone at an operational level has certainly helped to improve the level of environmental awareness within the company. The challenge, says Mackenzie, is the fact that certification is just the start of the process and not the end. There is clear recognition that certification does not guarantee good environmental performance, but it does provide a system for assessing the environmental risks and establishing a baseline from which an operation can begin, in its particular context, to demonstrate ongoing, or continual improvement. In fact, maintaining certification is perhaps even more onerous than obtaining it.

ENVIRONMENT

Case study



LNG-fuelled power generation at Sunrise Dam

AngloGold Ashanti Australia's Sunrise Dam gold mine is located in an extremely remote and arid area, on the eastern shore of Lake Carey, 770 kilometres north-east of Perth and 200 kilometres from Kalgoorlie. Obtaining energy that is both cost-effective and environmentally-friendly has been an important challenge for the company and an area in which it has made significant strides in 2006.

Sunrise Dam has, since 1994 relied on an on-site standalone diesel fuel operated powerhouse, which generates electricity supply for the underground mine, the processing plant, other surface infrastructure and the camp facility. The powerhouse is run and maintained by Energy Generation (Pty) Limited, a 100% subsidiary of Wesfarmers Group, one of Australia's largest public companies. The plant comprises 22 Cummins generators each with a capacity of 1MW; and two 1.5MW Deutz generators. Maximum demand of the powerhouse is 18.1MW. Daily power production averages 14 to 14.5MW.

During 2006 an alternative fuel source for the powerhouse was investigated and reviewed as the rising price of diesel had increased the costs of operating the powerhouse. A sensible solution to Sunrise Dam's power requirements was identified when Wesfarmers announced the development of a 175 tons per day liquefied natural gas (LNG) plant in Perth. This resulted, in 2006, in Sunrise Dam signing a LNG Power Purchase Agreement with Energy Generation (Pty) Ltd and thereby becoming a foundation customer for the LNG plant

LNG will be trucked to Sunrise Dam where the power station diesel engines will be replaced with engines which operate on natural gas.

The application of LNG to provide natural gas for power generation at a remote mine site is unique and provides a platform for Sunrise Dam to reduce its greenhouse gas emissions, while at the same time reducing the costs associated with gas pipelines and diesel fuel.



ENVIRONMENT

Case study

Liquefied natural gas is created by chilling natural gas to minus 160°C, which converts the gas to a liquid. At this temperature, the gas is reduced to 1:600th of its original volume, making it cost efficient to transport over a long distance where natural gas pipelines do not exist. LNG is transported by specially designed cryogenic (having extremely low temperatures) road tankers and stored in double walled steel with an extremely efficient insulation between the walls. Pressure in the tanks is very low and usually less than 35kpa.

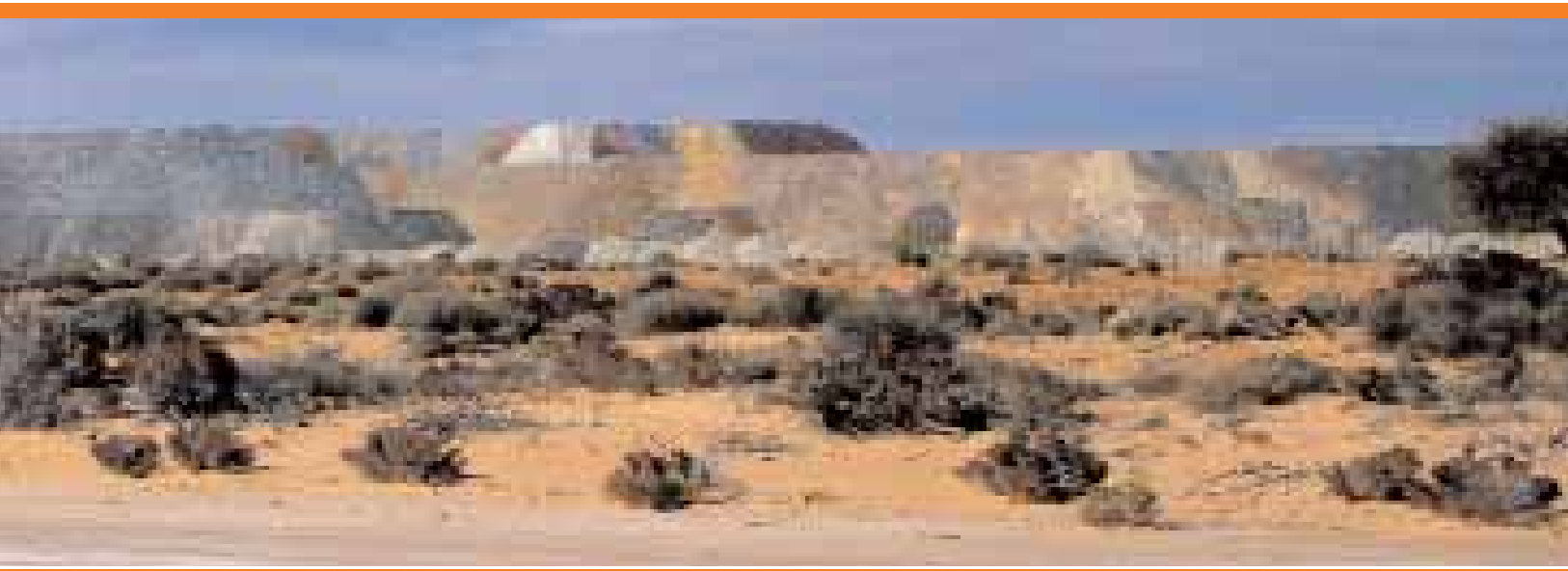
LNG is odourless, colourless, non-corrosive and non-toxic – all properties which render it a safer, cleaner alternative to diesel-fueled power. When vapourised, LNG only burns in concentrations of 5% to 15% when mixed with air. Neither LNG nor its vapour can explode in an unconfined environment.

At current prices LNG is substantially less expensive than diesel fuel. An added advantage is that it is an indigenously-sourced fuel, which is not subject to fluctuations in the oil price and currency exchange rates.

On an energy equivalent basis, LNG has a substantial environmental benefit, as it is the cleanest burning fossil fuel available. Results from the study undertaken by AngloGold Ashanti Australia indicate that the conversion of the powerhouse to LNG will result in greenhouse gas emissions reducing by 18% to 20%. Further environmental benefits flowing from the use of LNG are:

- a reduction in the particulates emitted (dust);
- zero effect on groundwater supplies; and
- a 50% reduction in noise levels of engines driven by LNG.

During 2007 the storage facility on site, which consists of four containers known as bullets, will be constructed and installed. In addition, 12 diesel sets will be replaced. It is planned that a minimum of 85% of Sunrise Dam's power requirements will be produced with LNG. The powerhouse is scheduled for conversion to LNG by the first quarter of 2008.



ENVIRONMENT

Case study



Sunrise Dam invests in wind power

Sunrise Dam Gold Mine in Western Australia operates a 3.8 million tonne per annum processing plant from which it produces over 450,000 ounces of gold per year. The tailings (or waste material) generated from the processing plant is stored in a Centrally Thickened Discharge Tailing Storage Facility (TSF). The TSF covers approximately 320 hectares with a current holding capacity of 33 million tonnes. Sunrise Dam's energy policy is to use renewable energy whenever possible, as exemplified by the solar-powered pumps which operate in the trench system. In 2006, Sunrise Dam investigated and introduced another renewable energy source – wind power – and its implementation could lead to further alternative energy developments at Sunrise Dam and other remote mine sites in the future.

The continuous monitoring of the ground water levels, and the flora and fauna surrounding the TSF, forms an essential part of Sunrise Dam's environmental management programme. The hyper-saline ground water at Sunrise Dam means that water levels must be actively managed and constantly kept at a minimum level of 5 metres below ground level. This minimises salt migration to the surface and the consequent deterioration of the surface vegetation. The TSF is surrounded by a network of about 3.2 kilometres of trenches through which water is pumped to maintain the underground water table levels. The trenches slope towards the pumping stations and recovered groundwater is pumped by the solar-powered pumps to the processing plant. The system of trenches covers more than half the diameter of the TSF, with the remaining area containing a number of dewatering bores that activate when the water table rises.

In 2005 a study was undertaken to evaluate the effectiveness of using wind power generation to supply power to a bore pump with a design capacity of 360 kilolitres per day. Although solar panels are used to power a portion of the pump system, they only pump small volumes of water. The power needed for the remaining area would have required a large number of solar panels and hence the decision to investigate an alternative method. The technology required to directly power the bore pump from a wind turbine did not exist in Australia. Sunrise Dam, in conjunction with Westwind, a company that manufactures wind turbines and has a direct alliance with Murdoch University in Perth, developed a control system to operate a 5.5kW pump. This is the first time in Australia that a stand-alone control system has been successfully developed, installed and operated. The system has been in operation for the past year.

The economic viability of the wind electric system is one of its key strengths – it compares favourably in cost effectiveness with a traditional diesel power generator. Theoretically, a 5.5kW pump would require a 30KVA generator, which would consume approximately 42,000 litres of fuel per year and would incur additional costs in maintenance. In contrast, a wind turbine power system has no operational costs and has minimal maintenance costs in comparison to traditional power sources.

The design of the wind electric power system was developed with potential further application in similar circumstances as a driving factor. The mining industry in Western Australia operates in remote areas, where good quality water is a scarce commodity and is often pumped over long distances to meet mine site requirements. The positive impact that has been achieved through this project demonstrates that this technology can be applied in other water scarce remote areas which have an adequate wind source. The independent electric control system brings a low maintenance, high capacity pumping solution to any remote site with sufficient wind source that does not have a developed electricity supply. Although the technology was developed for this mine, its potential for broader applications in industries that require a renewable and clean power source is vast.



ENVIRONMENT

Case study

The use of hydro-electric power in Brazil

Hydro-electric power is derived from the potential energy of dammed water driving water turbines and generators: the energy extracted from water depends not only on volume but on the difference in height between the source and the water outflow. The area surrounding the city of Nova Lima in Brazil, centre of AngloGold Ashanti's South American operation is located in the central Brazilian foothills with numerous natural springs, offering ideal territory for hydro-electric power generation.

The Rio de Peixe energy system was built in 1900, by the first superintendent of the Saint John del Rey Mining Company (predecessor to Mineração Morro Velho, which was in turn acquired by AngloGold in 1998). Built to provide energy for the gold plant and community, the system is still operational and supplies all the energy required to operate the Queiroz plant in Nova Lima. 100% of the power for this operation is drawn from hydro-electric power and the system is situated on land owned and maintained by the company.

The Rio de Peixe system today is not only a source of energy but provides an example of an excellently preserved ecosystem. The three small dams – Lagoa Grande, Codorna and Miguelão – provide enough water to generate approximately 59,000 MW/h. Lagoa Grande, also called Lagoa dos Ingleses, is the largest reservoir, and, with its harbour, hosts a number of recreational activities that are available to local communities, such as water skiing and canoeing. The water in the dams is of a high quality, being free of waste contamination and industrial effluents.

The preservation of the Rio de Peixe energy system has economic as well as environmental advantages. Licences for new hydro-electric dams are subject to increasingly stringent requirements in terms of Brazilian legislation involving such aspects as community relocation, suggesting a future scenario in which access to energy will be critical to a company's competitive position.

AngloGold Ashanti Mineração potentially also stands to benefit from the carbon finance provisions of the Kyoto Protocol. Hydro-electric power does not emit pollutants such as carbon dioxide (CO₂), and therefore does not contribute to global warming. The Kyoto Protocol, which was signed at the UN Council on climate change at Kyoto, Japan, in 1997 and became effective in February 2005, makes provision for 'carbon finance': the protocol sets clear limits on the amounts of greenhouse gases (such as CO₂) a country may emit. However, to avoid imposing inflexible emission targets that are unlikely to be met, carbon finance establishes the necessary market structures to trade the right of emission of a unit of greenhouse gas as a commodity.



ENVIRONMENT

Case study



Biodiversity assessment in South Africa

As part of its commitment to the conservation of biodiversity in the areas of its operations, where mining operations may have an impact on plants, animals and ecosystems, AngloGold Ashanti has embarked on a biodiversity assessment at its South African operations. The assessment, which is being carried out in two phases, aims to determine the range of biodiversity at the West Wits and Vaal River operations and to establish a conservation programme, especially for rare and endangered species.

Phase 1 of the assessment started in 2005 and consisted of a desktop study, using a number of resources to hand – aerial photography, source documents, red data lists, national and provincial databases, and information from the South African National Biodiversity Institute (SANBI), (established under the National Environmental Management: Biodiversity Act 10 of 2004). The conceptual phase examined what biodiversity types are likely to exist in specific biodiversity management units, which were previously identified at each of the operations based on the dominant vegetation and fauna.

Phase 2 of the programme, which started in 2006, is verification of the data collated in Phase 1. This is being carried out by biologists who make regular field trips to identify fauna and flora species at the biodiversity management units.

“Certain climatic conditions are necessary to carry out some of the biodiversity surveys, for example, some fauna become more active in warm, wet weather,” says Tembeka Dambuza, biodiversity co-ordinator for environmental management at AngloGold Ashanti’s South African operations. As a result, seasonal studies are being carried out over a period of a year from mid-2006 to mid-2007.

A soil study was completed during 2006 to determine the soil types which influence the variety of flora and fauna prevalent in the area. Vegetation and flora studies, which are still in progress, began at the same time to identify as many vegetation and plant species as possible in a given location and within a set time frame. More than 20 plant species were identified during a period of an hour, in surroundings which range from a rocky outcrop, to a river bank to a pan. It was during routine induction of the botanists at the West Wits operations that an unidentified plant was spotted. Team members preserved a sample and forwarded it to the National Herbarium, the fourth largest herbarium in the southern hemisphere and part of SANBI, for identification. The species has been classified as the *Ebracteola wilmaniae* (L. Bolus) species, belonging to the Mesembryanthemum genus. Although not yet categorised as threatened, the species is viewed as rare.

Other finds have been of common varieties – for example, *Gazania* was found at Vaal River and West Wits and the red-hot poker at West Wits. Although the red-hot poker is not on the red data list, its population has shown a severe decline in recent years as a result of its collection and habitat destruction. With the large populations found at West Wits, a programme to propagate the species may form part of the future biodiversity management programme.

In October 2006 the aquatic team started surveying flora and fauna in the Vaal River and its tributaries. The red data listed largemouth yellowfish is already part of a conservation programme under AngloGold Ashanti’s current biodiversity management programme, and funding has been provided for a joint study by the universities of Pretoria and Johannesburg on the genetics of the yellowfish (See *Report to Society 2004: Yellowfish project – a partnership with concerned fishermen.*)



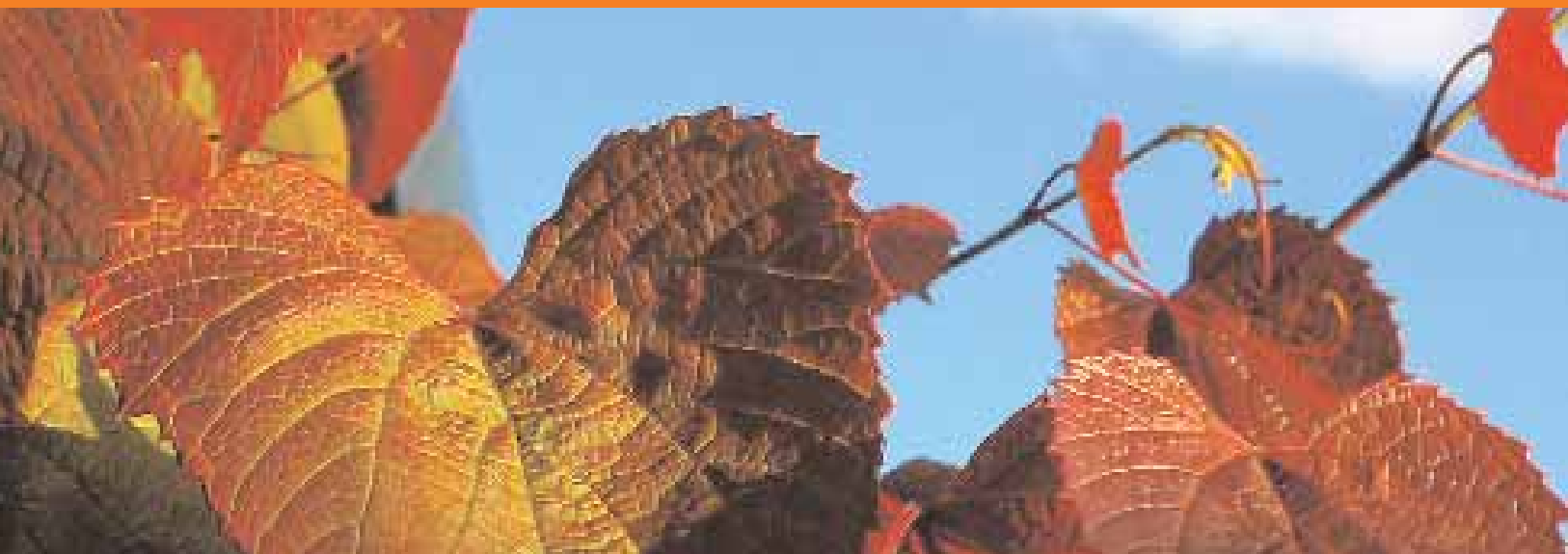
ENVIRONMENT

Case study

Reports on the team's findings are forwarded to the environmental management department based at the Vaal River operation. Once Phase 2 is complete, a comprehensive biodiversity picture of the two operations will emerge, providing an important tool in mapping the way forward. Each business unit will be responsible for managing its own biodiversity programme, based on the findings of the study.

"We want to be proactive in dealing with biodiversity issues, and with the information that comes out of the assessment, we will be better placed to implement rigorous management and monitoring programmes," says Dambuza, who sees the study as a vehicle to lead AngloGold Ashanti into a wide range of other projects, chief of which would be public environmental awareness. With a background in environmental sciences and education, she is passionate about sharing information. Equally important, Dambuza says, are public opinions and perceptions on biodiversity: for example, vegetation that has no intrinsic value to AngloGold Ashanti may be of medicinal value to a villager or a traditional herbalist. In this respect, it would be useful to apply a value rating after examining ecological, cultural, scientific and aesthetic aspects.

It is hoped that the biodiversity assessment methodology may have broader application within the company, forming a possible blueprint for a systematic programme of processes and procedures at other AngloGold Ashanti operations, and replacing a current piecemeal approach to biodiversity management.



ENVIRONMENT

Case study



R40 million dam being constructed to avoid contamination of Vaal River

The West Complex tailings storage facility (TSF) is the repository for slurry produced from the gold extraction process at the Vaal River operations. Covering an area of 209.35 hectares, almost 133 million tonnes of slurry have been deposited on the TSF to date. To ensure dam stability, the water is drawn off and reticulated to a return water dam, the Bokkamp Dam, from where it is piped to the central spillage return water dam before transfer to the Kopanang gold plant for re-use in the gold extraction process.

While the design volume of the Bokkamp dam is 79,000m³, significant overflows from the Bokkamp water system occur annually, mainly owing to high quantities of rain water captured on the TSF during storm events. This excess water from the Bokkamp dam spills into the Vaal River - about 1,500m from the dam - contributing to the degradation of the quality of ground and surface water, and results in a breach of the mine's exemption granted by the Department of Water Affairs and Forestry (DWAF) in terms of not allowing water discharges from this facility.

The Bokkamp dam has been subject to a number of overflow incidents (See Report to Society 2005), which continued into 2006, notably between 10 January and 13 March, when overflows occurred following unusually high rainfall levels, and on one occasion measuring more than 140 millimetres overnight. Although the spills into the Vaal River are limited to the Vaal River lease area, they could potentially affect other land and water users downstream.

Corrective action is now under way to stop the water spillages into the Vaal River, by way of the construction of a new storm water containment dam to provide for excess storm water capacity and to allow for a controlled return water flow from the West Complex to the existing Bokkamp return water dam. This follows the completion of an environmental impact assessment (EIA), which is in the process of being revised to address comments received from all relevant government stakeholders, who have been part of the upgrade process from the outset.

Construction of the R40 million project has already started with the delivery of new pipes. Upgrading of the existing pipeline infrastructure started in January 2007, before construction of the new storm water dam proceeds in May 2007. The bulk of the project should be complete by the end of 2007 in time for commissioning in 2008. Final completion is expected in the latter half of 2009.



ENVIRONMENT

Case study

Tenfold reduction in SO₂ emissions at Vaal River Gold Acid Plant

The Vaal River East Gold Acid and Flotation (EGAF) plant, which produces sulphuric acid (H₂SO₄) for the uranium leach process, has successfully reduced its sulphur dioxide (SO₂) emissions tenfold, and, on 1 August 2006 received a permanent registration certificate from the North West Department of Agriculture, Conservation, Environment and Tourism (DACET) for the facility (see box below: *About sulphur dioxide*). SO₂ is produced during the conversion of sulphur from pyrite to H₂SO₄ in the calcining stage of the acid production process. The spent gases produced during calcining are passed via scrubbing equipment before being vented to the atmosphere.

The production process resulting in the emission of SO₂ is known as a 'scheduled process' (one which is listed in the second schedule of the Act, with the potential of releasing noxious or offensive gases). SO₂ emissions are also regulated by the new Air Quality Act, which came into effect on 11 September 2005, partly replacing the now defunct Atmospheric Pollution Prevention Act of 1965. Through the South African National Standards (SANS), the new Act sets guidelines for ambient air quality management and stipulates limits for common pollutants. Nonetheless, the process of emitting SO₂ is still governed by the Atmospheric Pollution Prevention Act until it is absorbed into the new legislation.

At the EGAF plant, SO₂ emissions have been significantly reduced by modifications to the weak acid SO₂ stripper tower, first reported in the Report to Society 2005 (See case study in Report to Society 2005: *Complying with stringent new air quality legislation in South Africa*.) During 2005, a provisional registration certificate was granted by the chief air pollution control officer (CAPCO), on condition that permanent registration is achieved within one year.



Dust management at Vaal River Sulphur Paydam

Efforts to control dust emissions from the Vaal River sulphur paydam, which is being reclaimed to recover pyrite and gold, have been subject to further scrutiny during 2006. (See case study in Report to Society 2005: *Dust management at Vaal River*.)

The binding agent ligno-sulphonate, which was sprayed on the surface of the dam during 2005, was found to be ineffective during the rainy season because it is water-soluble. Further research was carried out during 2006 on a number of alternative dust suppressants, the most effective of which was determined to be ridge ploughing. Instead of using ligno-sulphonate which dissolved in the heavy rains, contour ridge ploughing is now being used to create ridged mounds on the flat surface of the dam, thereby also making it less susceptible to wind disturbance.

In respect of dust suppression on the paydam's road surfaces, trials were carried out during 2006 on the use of waste ash from

the boilers at the South Uranium Plant. The study revealed that the ash becomes hard when water is applied to its surface, making it an ideal road cladding substance. Following analysis, it has subsequently been approved by the Nuclear Energy Corporation of South Africa (NECSA) and accredited laboratories as an environmentally safe dust suppression agent. Ash has already been deposited at the sulphur paydam, ready for application in 2007.

With regards to monitoring, single dust buckets to monitor emissions have been increased from 17 to 23 and two more wind directional buckets (to ascertain from which direction the dust emanates), have been installed, bringing their total to six. These monitoring mechanisms will be key in determining the dust contribution from mines to the north and east of the paydam – although the extent of this can only be confirmed after monitoring over an entire seasonal cycle has been completed.

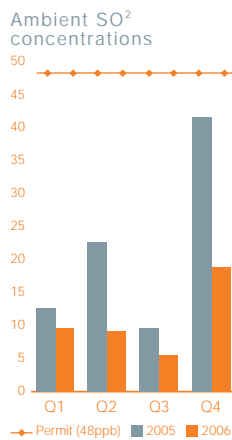
ENVIRONMENT

Case study



Until modifications were made to the weak acid SO₂ stripper tower in July 2006, there had been a number of SO₂ emissions which exceeded the SANS daily ambient guideline limit of 48 parts per billion (ppb) or an ambient limit of 125 micrograms per cubic metre (µg/m³) as determined by the Department of the Environment and Tourism (DEAT). The latter is the individual limit specified in order to receive a registration certificate or permit by the CAPCO. It is calculated by dispersion modelling which stipulates how much SO₂ may be emitted into the environment – this in turn is determined by a number of factors, for example, velocity, stack height, stack diameter, geographical location and atmospheric conditions.

Point source emissions from the stack, which are easier to monitor, have been set by the CAPCO at 40 grams per second (g/s). Fugitive emissions (those which do not emanate from a point source) from the thickener (a tank where water is removed from the slurry) and plant leakages are set at 15g/s.



While there is still concern around fugitive emissions, AngloGold Ashanti's South African operations has brought its total emissions from a high of 491.2g/s in February 2006 to 54.2g/s in October 2006, below the permitted total emissions limits of 55g/s.

Says Wessel Van der Westhuizen, senior safety, health and environment officer for occupational hygiene at Vaal River: "The improved efficiency of the weak acid SO₂ stripper tower has been crucial in reducing emissions. This result has also been complemented by stricter control of plant emissions through a permanent stack monitor that gives continuous readings so that we can regulate and manage our emissions. There is also an internal management procedure that covers all the requirements of monitoring, which means that remedial steps can be actioned immediately when limits are exceeded. Ongoing focus is being placed on the management of fugitive emissions by improving total plant efficiency and minimizing leakages.

About sulphur dioxide



About sulphur dioxide

Sulphur dioxide (SO₂) is a colourless gas with a sharp odour. It is produced from the burning of fossil fuels (coal and oil) and the smelting or heating of mineral ores that contain sulphur in an oxygenated atmosphere.

When sulphur dioxide combines with water, it forms sulphuric acid, which is the main component of acid rain. When acid rain falls it can cause deforestation, acidify waterways to the detriment of aquatic life and corrode building materials and paints.

Sulphur dioxide can affect the respiratory system, lung functioning and irritate the eyes, leading to coughing, mucus secretion, aggravation of asthma and chronic bronchitis. Exposure to sulphur dioxide also makes people more prone to respiratory tract infections.

ENVIRONMENT

Case study

Improvements in environmental incident reporting in Mali

In seeking to uphold its values wherever it does business, AngloGold Ashanti has sought to make a significant contribution to environmental legislation in Mali. In terms of the country's Mining Code (Decree 99-225), Malian legislation stipulates that all environmental incidents must be reported immediately to the mining regulatory authorities. However, the legislation never provided any guidelines with regard to the categorisation of incidents in terms of their seriousness and possible impact on the environment. As a result, mining companies found themselves in the position of reporting all incidents, irrespective of their impact and frequently included minor incidents such as small oil spillages in a workshop. This system is inefficient: the need to report very minor incidents often hampers the smooth running of operations and causes delays in reporting from companies and creates administrative pressure for the authorities. It also does not provide a true reflection of what needs to be addressed.

To deal with this, AngloGold Ashanti and its joint venture partners (IAMGOLD Corporation, the International Finance Corporation and the Malian government at Sadiola and IAMGOLD and the Malian government at Yatela) have taken a proactive step in developing, in conjunction with the regulating authorities in Mali, a more practical procedure for environmental incident reporting which specifies what type of incident should be reported, as well as when and how it should be reported.

The environmental departments of both Sadiola and Yatela mines initiated a meeting on 18 October 2006 with representatives of the governor of the regional capital Kayes; the regional heads of geology and mines; water affairs and conservation and sanitation and nuisance control; and the mayor and sous-préfet (the civil servant in charge of local executive power) of the Sadiola Commune, both of whom represent the communities who live in the vicinity of the mines. The aim was to streamline the environmental incident reporting procedure to the Malian regulatory authorities.

A point of departure for the discussions was the initial reporting and categorisation of environmental incidents already established by the environmental departments of the Sadiola and Yatela operations, which range from major to minor.

Category 1 incident: This category of incident is classified according to the distance travelled by the pollution, its extent and environmental impact. Such an incident would breach the mine's containment area and encroach into public access areas or could cause medium- to long-term environmental damage. A further measure would be the remedial costs – which would be in the region of \$100,000 or more including payment of penalties and loss of resources. An exceptional type of category 1 incident is one which involves animal or bird fatalities due to cyanide poisoning. (See case study in Report to Society 2005: *Using cyanide responsibly at CC&V.*) All category 1 incidents are reported to joint venture partners and stakeholders.

Category 2 incident: An incident of lesser concern than category 1, and where the release of pollutants remains within the confines of the operational area. These incidents are deemed to be localised and with short term impact. They are managed internally and are reported in the mine's monthly and annual monitoring report, both of which are circulated to the joint venture partners.



ENVIRONMENT

Case study

Category 3 incident: These are generally small and minor spillages of pollutants within the operational area and which cause only temporary environmental damage. Wildlife fatalities, which are unrelated to mining and processing activities, fall under this category. The reporting procedure is as for category 2.

Also discussed at the meeting were some of the challenges that presented when having to report environmental incidents to the authorities. They included the following:

- regional regulatory offices are located some 70 km from the operational sites, exacerbated by the fact they are served by poor feeder roads;
- regional regulators tend to make a cursory inspection of the incident site and do not conduct their own investigation;
- site visits must be preceded by a formal invitation to each level of authority, after which team members are chosen and dispatched, resulting in delays. Indeed site visits are often carried out long after remedial action has been taken; and
- environmental incident site visits are costly, since mines are obliged to fund the cost of each regulatory visit to site, approximating \$700 a day. (In 2005 when Sadiola mine recorded 123 incidents, 90% of which were minor, site visits cost the mine in the region of \$86 000.)

Following a debate on the implementation of a new environmental incident reporting system that was both practical and cost-effective, agreement was reached on the categorisation of minor and major incidents and at which level incidents need to be reported.

Incident Category	Description	Example	Reporting frequency
Minor	Particular pollutant spillage from the slimes dam or any other area where mining activity is taking place.	Cyanide or polluted water spillage in a contained area.	To be reported monthly to the regional director of geology and mines (Kayes) through the incident registers; and in the mine monthly environmental reports.
	Light pollutant spillage inside the normal operating area	Spillage of 10 litres of oil in workshop area or any other site where mining activities take place	
Major	Spillage that extends outside the operating zone; significant quantity and damage of pollutant; Ground water contamination	Leak of cyanide delivery pipeline to the heap leach pads or any cyanide solution spillage.	To immediately inform the authorities and invite the regulators from the regional technical departments to evaluate and investigate the incident, in conjunction with mine representatives.
	Wildlife fatality resulting from toxic chemical poisoning regardless of the size and number.	Any bird or animal fatality as a result of contact with cyanide.	



ENVIRONMENT

Case study

Once a blueprint for improved environmental incident reporting was agreed on between government and AngloGold Ashanti and its joint venture partners, the meeting further proposed that the new reporting system be introduced and adopted at other mining operations in the Kayes region, namely Loulo mine (owned jointly by Randgold Resources Ltd and the Malian government) and Tabakoto mine (owned by Nevsun Resources Ltd).

One of the main advantages of the new system is its cost-effectiveness in that the site visits are now limited to major incidents, which in turn reduces the amount of time spent on co-ordinating visits.

At the same time AngloGold Ashanti hopes that these developments will pave the way for better communication between all mining companies and regulators, who see the benefit of liaising with the operations and surrounding communities.



ENVIRONMENT

Case study



CC&V receives State of Colorado recognition

The State of Colorado Department of Public Health and Environment (CDPHE) recently acknowledged the efforts of Cripple Creek & Victor Gold Mining Company (CC&V) in protecting the environment with a Bronze Achiever award in its Environmental Leadership Programme. The award recognises facilities that have made significant achievements in improving the environment of Colorado.

To qualify for the Bronze Achiever, the facility must have met various environmental criteria including a record of not having incurred serious environmental damage over a period of time. In addition, pollution prevention measures must be in place on the site, beyond those required by regulatory agencies. CC&V was recognised for achievements in three areas – recycling used oil, voluntary reclamation and community programmes.

During the construction of the new truck maintenance shop it was noted that maintenance of the new fleet of 300 tonne capacity haul trucks would result in an increase of used crankcase oil. In addition, the large shop used for maintenance of these vehicles, would be expensive to heat. The solution was the installation of boilers capable of burning used oil as a fuel source. The system eliminates the need for purchasing heating fuel, and solves disposal issues for the used oil. The savings will eventually offset the cost of the boilers, which are specially designed to minimise air emissions.

The award also recognises CC&V's efforts to demolish and clean up an abandoned processing facility, the Cameron Plant. The site had been abandoned, and reclamation was never completed by the operator. CC&V worked with a local contractor and the Colorado Division of Minerals and Geology Abandoned Mined Land Programme to complete the cleanup. The plant was removed, all salvageable scrap metals were recycled and the site was cleared of other waste, debris and trash that had accumulated over the years.

Ongoing efforts to enhance the long-term sustainability of the region has led to the development of CC&V's relationship with the Southern Teller County Focus Group (STCFG). CDPHE documented the range of projects completed by the STCFG in cooperation with CC&V. It has been shown that the close proximity of historic and active mining could provide sites to attract tourists to the area, and educate them about the changes in mining technology since gold was discovered in 1891. Six trails have been developed on CC&V's property, along with interpretive signage. Several historic structures have been preserved as well.

The Bronze Achiever award is a one year award for entities that operate in Colorado and voluntarily seek designation. The applicants, as CC&V has, must demonstrate areas of achievement which go beyond compliance. Environmental Resources Manager for CC&V, Gary Goodrich, congratulated the employees of CC&V for their hard work.

ENVIRONMENT

Case study

CC&V Gold Mining Company evaluates wind power

Plans are currently under way to evaluate the possibility of harnessing the energy of the strong winds which always seems to be blowing at Cripple Creek & Victor Gold Mining Company's Cresson Mine (CC&V).

Environmental technician Gary Horton recently contacted the United States Department of Energy's Clean Cities Programme to assist the mining company with research. The Clean Cities Programme supports research and implementation of practices that contribute to the reduction of petroleum consumption. Horton gathered information on various forms of alternative energy including biodiesel and wind.

The National Renewable Energy Lab (NREL) and US Department of Energy jointly sponsor the Wind Powering America Programme. Wind is a clean, inexhaustible energy source, and is one of the fastest growing energy sources in the world. The State of Colorado Office of Energy Management and Conservation loaned CC&V anemometers to study the wind potential for CC&V, in cooperation with these and other agencies.

Three towers equipped with recording anemometers and wind direction sensors have been installed along the western edge of the district. The anemometers will gather information for one year in order to provide a representative database for wind energy in the district. The data will be interpreted at the University of North Dakota. "At the end of one year we will be able to determine if any of the sites are feasible for wind generation. We will need to generate a steady nine miles per hour for our use" Horton explains. "There may even be an opportunity for participation with the communities of Victor, Cripple Creek, and Teller County."

"To meet CC&V's needs we'd look at four or five 1MW windmills 300 feet tall," Horton said. "Wind is the easiest way to work with alternative energy; it is easier and cheaper than solar."

As the wind energy project progresses CC&V continues to explore other sources of alternative energy for the mine site such as solar power and biodiesel.

