



Environmental *quality and protection*

The Constitution grants all South Africans the right to live and work in an environment that is not harmful to their health or wellbeing. A safe and healthy environment benefits all industries and all citizens, and enhances quality of life. DEAT's environmental quality and protection programmes and policies define the standards of a non-harmful environment, and ensure that these standards are upheld through legislation and enforcement to prevent pollution and ecological degradation

The Bill of Rights guarantees that everyone has the right:

- to an environment that is not harmful to their health or wellbeing; and
- to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development.

Policy and legislative development

Prior to 1994, there was no adequate policy or legislative framework in place to address problems related to issues such as pollution and waste that impacted disproportionately on poor and black communities.

Environmental issues were mainly identified with nature conservation and what are today known as 'green' issues. Matters such as waste management, pollution control and environmental impact management were neglected to a large extent.

According to the White Paper on Environmental Management (1997), 'environment' refers to the conditions and influences under which any individual or thing exists, lives or develops. These conditions and influences include the following:

- The natural environment, including renewable and non-renewable natural resources such as air, water, land and all forms of life
- The social, political, cultural, economic, working and other factors that determine peoples' place in, and influence on, the environment
- Natural and constructed spatial surroundings, including urban and rural landscapes and places of cultural significance, ecosystems and the qualities that contribute to their value

The legislative framework governing environmental management was characterised by fragmented and outdated legislation with inadequate enforcement mechanisms. As a result, urbanisation and industrialisation in South Africa have impacted negatively on the quality of life of the urban poor and those living in dense settlements. Poor air quality, deficient waste management, inadequate water and sanitation systems, and lack of access to electricity and other

The natural environment should be protected for future generations.



essential services have compounded environmental problems.

Although advances have been made in the policy and legal framework, major implementation challenges remain, together with the need to assert the value of environmental regulations, and to address major skills and capacity problems.

The central pillars of NEMA are the following:

- Quality in environmental decision-making
- Cooperative governance in the environmental sector
- The role of civil society in environmental governance
- The constitutional imperative to respect, protect, promote and fulfil the environmental right in the Bill of Rights

In the past 15 years, major strides have been made in addressing environmental issues as part of an overall thrust towards the achievement of social justice, democracy and sustainable development. The environmental right of all citizens, as contained in the Bill of Rights, meant that environmental issues became seen as an integral element to be addressed in the democratic transition.

The development of environmental management legislation since 1994 can be summarised as follows:

- The Consultative Environmental Policy Process (CONNAPP) (1994 to 1996) marked the initial democratisation of environmental governance in South Africa. This policy development process was characterised by high levels of participation by representatives from government, industry, non-governmental organisations, community-based organisations and the labour movement. It resulted in a framework for sustainable environmental management.

- The White Paper on Environmental Management (1997), which was a product of CONNEPP, represented a new national blueprint for environmental governance in the democratic South Africa. It set out the vision, principles, strategic goals and objectives, as well as regulatory approaches for environmental management in South Africa.
- The National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998), which developed out of the White Paper and established the concepts of participatory, cooperative and developmental governance in environmental management. It established principles for environmental management and provides for structures to facilitate these.
- The National Environmental Management Amendment Act, 2003 (Act No 46 of 2003), which dealt with compliance and enforcement and provides for environmental management inspectors (EMIs).
- The National Environmental Management Amendment Act, 2004 (Act No 8 of 2004), which streamlined the process of regulating and administering the impact assessment process. Chapter 5 of the act laid down procedures with which the Minister or MEC, as the case may be, must comply before listing or delisting an activity.
- The National Environmental Management Amendment Act, 2008 (Act No 62 of 2008), which empowers the Minister of Minerals and Energy to implement environmental matters in terms of the National Environmental Management Act, 1998, in so far as it relates to prospecting, mining, exploration or related activities; aligns environmental requirements in the Mineral and Petroleum Resources Development Act (MPRDA), 2002 (Act No 28 of 2002), with NEMA (1998) by providing for the use of one environmental system and by providing for environmental management programmes; and further regulates environmental authorisations.
- The National Environmental Impact Management Strategy (2009) develops a strategy that moves from an environmental impact management (EIM) system that

is solely reliant on environmental impact assessment (EIA) to a dispensation where use is made of a variety of instruments in an integrated manner.

Tools that have been developed to assist the implementation of the abovementioned legislation in respect of pollution, air quality, waste management and environmental impact management include the following:

- The Environment Impact Assessment (EIA) Regulations (1997), which regulate procedures and criteria, as contemplated in Chapter 5 of NEMA, for the submission, processing, consideration and decision of applications for environmental authorisations of activities and for matters pertaining thereto. The Minister has just published draft revised EIA Regulations, under section 24(5) of the NEMA, 1998, for public comment.
- The National Waste Management Strategy (1998 to 2000), which presents government's strategy for integrated waste management for South Africa.
- The Integrated Pollution and Waste Management Policy (2000), which presents government's policy on pollution prevention, waste minimisation, impact control and remediation.
- The National Environmental Management: Air Quality Act (2004), which provides the basis for setting ambient air quality and emission standards and reforms the law regulating air quality by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development.
- The National Air Quality Management Framework (2007), which provides mechanisms, systems and procedures to attain compliance with ambient air quality standards by providing national norms and standards for the control of emissions, as well as air quality monitoring, management planning and information management.
- The National Environmental Management: Waste Act, 2008 (Act No 59 of 2008),

which reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution; provides for national norms and standards for regulating the management of waste by all spheres of government; and provides for the licensing and control of waste management activities.

Future legislation that is in the pipeline includes the Air Quality Framework Amendment and the National Waste Management Strategy, to be finalised in 2009.

Pollution and waste management

Historically, South Africa followed an end-of-pipe waste management approach, which focused on the disposal of waste at landfills. A new approach was required, emphasising waste avoidance and bringing South Africa in line with international best practice in waste management. The environmental risks associated with landfill operations, reduced land availability for new landfills, and the valuable resources discarded at landfills that can be recycled (like glass, metal, paper and some types of plastic) have made the end-of-pipe approach inconsistent with DEAT's sustainable development commitments.

The call for world action on the environment and increased international efforts towards sustainable development at the Earth Summit in Rio de Janeiro in 1992 established an agenda (Agenda 21) that formed the broad context for pollution prevention and waste minimisation in South Africa. Subsequently, South Africa has become a signatory to a number of multilateral environmental agreements, including the Basel Convention (governing the transboundary movement of hazardous waste), the Stockholm Convention (controlling persistent organic pollutants) and the Rotterdam Convention (requiring prior informed consent for certain hazardous chemicals and pesticides in international trade).

Policy developments in waste and pollution management have their foundation in the Environment Conservation Act (Act No 73 of 1989). This resulted in the development of the following implementation tools:

- Waste disposal permits in terms of section 20 of the act
- The Plastic Bag Regulations, which prohibit the manufacture, trade and commercial distribution of certain types of plastic bags
- The Asbestos Regulations, which prohibit the use, manufacture, import and export of asbestos and asbestos-containing materials
- The Waste Tyre Regulations, which regulate the management of waste tyres

The review of environmental legislation in 1996 by the department gave rise to an integrated pollution and waste management policy and the National Waste Management Strategy that was developed in 1999. This strategy emphasised the need to move away from the treatment and disposal of waste and to rather start preventing and minimising it.

In 2001, the department convened a Waste Summit, which produced the Polokwane Declaration. This declaration contains a statement of commitment by all stakeholders in the waste industry to meet environmental performance targets, and set a foundation for joint action in the sector and commitment to the objectives of the Integrated Pollution and Waste Management Policy.

The targets for waste management in South Africa, as contained in the Polokwane Declaration, are as follows:

- Reduce the volume of waste generated by 50% by 2012.
- Reduce the volume of waste being disposed of by 25% by 2012.
- Develop a plan for zero waste by 2022.

This was followed in 2003 by the hosting of a successful waste summit, in collaboration with the Department of Provincial and Local Government (DPLG), where waste management challenges were addressed at local government level.

Over the last 15 years, there have been successful cases dealing with pollution and waste. A landmark for environmental justice was the case of Thor Chemicals, one of various companies in the late 1980s that were importing huge quantities of toxic waste to South Africa. It was extracting mercury by incineration from waste coming from all over the world. It had built up large stockpiles of highly toxic mercury waste, and allegedly intended to recycle the mercury. Late in 1989, environmental activists discovered large quantities of mercury leaking from Thor Chemicals' plant in Cato Ridge near Durban into the Umgeni River, which registered some of the highest mercury pollution levels ever recorded, placing the health of those living in a nearby informal settlement at serious risk.

The plant has now been closed down and the site has been rehabilitated.

The disposal of asbestos presented a similar problem. Although the import, export and use of asbestos or asbestos-containing materials or waste has been prohibited through the promulgation of the Asbestos Regulations in 2008, the extent of secondary asbestos pollution in the country is being mapped and programmes for the rehabilitation of these sites are underway.

Another problem that has been inherited from the past was that of the stockpiling of obsolete pesticides by farmers. This problem applies to other African countries as well. In response to the need to dispose of these pesticides in an appropriate manner, the World Bank has provided funding for the African Stockpiles Project. The pilot programme to collect obsolete stock, which was launched in Limpopo in conjunction with the Department of Agriculture, has been completed and DEAT is currently developing a proposal to ship this stock back to Europe, and to transfer the responsibility of managing obsolete pesticides to industry.

In order to deal with the waste management challenges, the department launched the development of the National Environmental Management: Waste Bill in 2005 as subsidiary legislation that seeks to give legal effect to the White Paper on Integrated Pollution and Waste Management. The Waste Bill was signed into law by President Kgalema Motlanthe in March 2009. The Waste Bill specifically provides for the following: institutional arrangements for waste management that outline the roles and responsibilities of all spheres of government in respect of waste management, strategic and planning frameworks, as well as norms and standards for waste management, obligations relating to various aspects of waste management, licensing of waste management activities, compliance monitoring and enforcement, and related administrative matters.

The Waste Act will repeal the Environmental Conservation Act and all the regulations passed under that act will be considered regulations passed under the Waste Act. As the Waste Act is framework legislation, it will be supported by regulations. The Minister and MECs are given powers to make different sets of regulations to deal with various aspects of waste management.

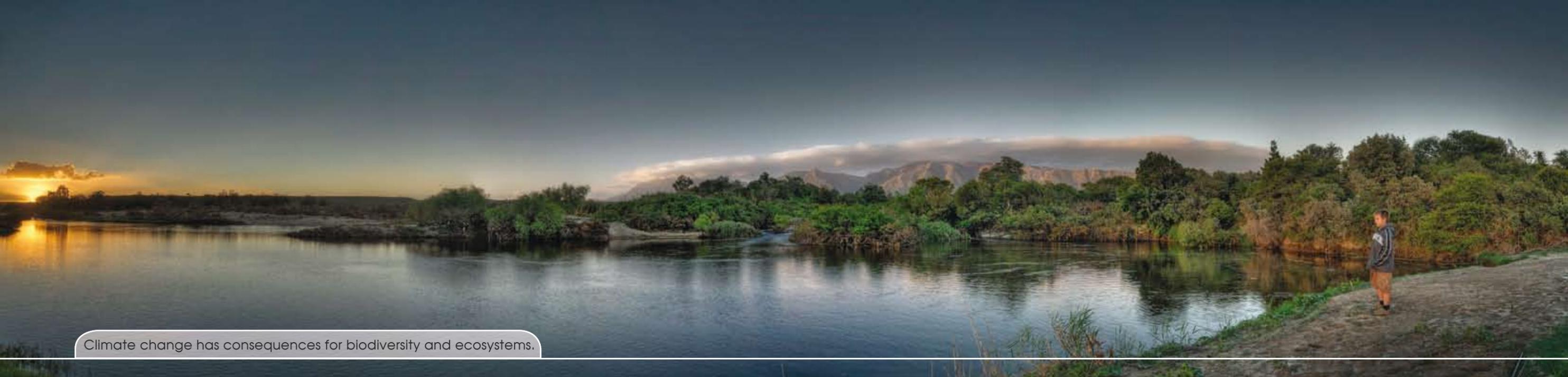
In an effort to promote the implementation of integrated pollution and waste management, the function of the licensing of waste disposal sites was transferred from the Department of Water Affairs and Forestry. With this transfer, DEAT inherited a permitting backlog of 580 waste disposal sites in 2006. A strategy to deal with the backlog has been developed, while the processing of landfill permitting applications and the delisting of waste have improved.

The challenge of municipalities considering waste management to be a low priority, due to a lack of capacity, as well as the lack of effective cost-recovery that leads to the unsustainable provision of waste management services and the lack of long-term planning in respect of waste infrastructures will be dealt with during the implementation of the Waste Act.

The Department has a Memorandum of Understanding (MoU) with the Glass Recyclers Association of South Africa. The objective of the MoU is to establish a glass recycling company that is responsible for promoting the reuse and recycling of glass in South Africa. As a result, the glass industry has been reporting annually with regard to glass that can be recycled.

The Department has also developed a policy on waste incineration and the co-processing of waste as alternative fuel. This policy document presents the framework in which the following waste management options shall be implemented in South Africa: the incineration of general and hazardous waste in dedicated incinerators or other high-temperature thermal treatment

Pollution threatens health and wellbeing.



Climate change has consequences for biodiversity and ecosystems.

technologies, including but not limited to pyrolysis and gasification ('incineration'), and the co-processing of selected general and hazardous wastes as alternative fuels or raw materials in cement production ('co-processing').

To measure the success of the implementation of policies and strategies, the department has developed a waste information system that will be implemented nationally. The Waste Act makes it mandatory to report waste information to the waste information system. This will assist the department in tracking progress with the implementation of the waste legislation.

Climate change

Climate change is the natural cycle through which the earth and its atmosphere to accommodate the change in the amount of energy received from the sun. The climate goes through warm and cold periods, taking hundreds of years to complete one cycle. Changes in temperature also influence the rainfall, but the biosphere is able to adapt to a changing climate if these changes take place over centuries. Unfortunately, human intervention is currently causing the climate to change too fast. Climate models predict that the mean air temperature over South Africa will increase by an estimated 2°C over the next century. Plants and animals

may not be able to adapt as quickly to this 'rapid' climate change as humans can, and, therefore, the whole ecosystem is in danger.

Climate change is considered to be the most significant global environmental issue facing humanity today. Since 1994, South Africa has become a signatory to a number of multilateral environmental agreements, including the Vienna Convention and Montreal Protocol on the Protection of the Ozone Layer, the United Nations Framework for Climate Change Control (UNFCCC) and its Kyoto Protocol to reduce emissions of greenhouse gases.

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) concluded that global temperatures are rising. This is caused largely by human activities. With increases in global average temperature, major changes in ecosystem structure and function are projected, with predominantly negative consequences for biodiversity and ecosystems.

The department, through its International Cooperation Unit, participates at an international level in discussions around issues related to climate change, particularly as they relate to the country's obligations towards the UNFCCC and its Kyoto Protocol. Comprehensive policy research has been undertaken to inform South Africa's

negotiations on climate change up to December 2009. This was followed by stakeholder consultation and international negotiations to build a new international regime and collaboration on climate change.

Over the past 15 years, South Africa has adopted a number of proactive climate change positions. The Climate Change Response Strategy, launched in October 2004, focuses on the cross-cutting nature of climate change and came up with action proposals for the different spheres of government, business and civil society, as well as programmes aimed at regional integration supporting NEPAD's initiatives.

The Department of Minerals and Energy (DME) has the legal mandate to oversee the clean development mechanisms (CDMs) in South Africa. Attracting CDM investment is regarded as a competitive process, which mirrors efforts to attract foreign direct investment. Beyond the environmental objectives of the convention, CDM presents South Africa with an opportunity to assist in meeting varied domestic objectives. The key areas of interest for South Africa relating to CDM are to utilise it to leverage foreign investment (and create employment opportunities) in the sectors that may be able to achieve emission reductions, utilise CDM investment to promote various policy initiatives that could also contribute

to emission reductions, and use CDM to leverage the transfer of technology that could underpin the achievement of policy objectives relating to increased competitiveness and value addition.

Long-term Mitigation Scenarios were established in 2007 after Cabinet had mandated a national process of building scenarios of possible greenhouse gas (GHG) emission futures, informed by the best available research and information to help South Africa to define not only its position on future commitments under international treaties, but also shape its climate policy for the longer-term future. South Africa, just like the rest of the world, is vulnerable to the impacts of climate change. At the same time, it emits high quantities of greenhouse gases. South Africa is the biggest GHG emitter on the African continent. Climate change poses a notable threat to the country's ideal for a sustainable development growth path and poverty alleviation efforts. Although South Africa is still a developing economy, its dependence on coal-driven energy sources and the energy-intensive nature of the economy have resulted in an extremely high carbon emission level per unit of GDP compared to most developing countries.

During March 2009, the department hosted a successful National Climate Change

Summit in partnership with the Department of Science and Technology. This followed on the Cabinet Lekgotla of July 2008, which provided clear policy directions for a national climate change response strategy. The purpose of the summit was to provide all key climate change response stakeholders with an update on the most recent climate change research and other current South African initiatives and interventions, and to provide a platform for all key stakeholders to discuss and agree on a framework for a national Climate Change Response Policy.

The summit succeeded in its objectives, as illustrated by the fact that all key climate change response stakeholders left the summit with a common understanding of the most recent climate change research initiatives and interventions. A detailed policy framework was broadly supported, and the roles and responsibilities of sector departments in respect of the development of the sector policy components of the sectoral implementation plans were agreed on. All policy development timelines and milestones were agreed on, and the implications and intentions of all policy directions were understood.

The climate change summit and its related outcomes are part of a process that is due to culminate in 2012 with the introduction of legislative, regulatory and fiscal packages, which will give effect to the White Paper for National Climate Change Response, due to be gazetted in December 2010.

Air quality management

Historically, air quality management was regulated by the Air Pollution Prevention Act (Act No 45 of 1965). This act followed the outdated approach of focusing on each industrial stack, and set non-binding guidelines on emissions. It did not recognise the fact that air pollution knows no boundaries and that its effects extend beyond the single source of emission.

The National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004) reformed the law regulating air quality by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development, making provision for national norms and standards to regulate air quality monitoring. It adopted the 'airshed' approach to manage the entire receiving environment and the collective effects of emissions, rather than just single emission sources. It followed an ambient air quality management approach, protecting the air that we breathe.

Since the publication of the Integrated Pollution and Waste Management Policy in 2000, government has been implementing the National Air Quality Management Programme (NAQMP) 2000 – 2010. The programme is divided into four phases, with each phase providing the foundation and/or input into the next phase. The NAQMP provided a starting point for the development of the National Framework for Air Quality Management, which was established on 11 September 2007. Phase I of this framework has focused on translating the Integrated Pollution and Waste Management Policy into a strategy and an initial implementation action plan for air quality management for the country. Phase II (the transition phase) will be concluded with the repeal of the old Atmospheric Pollution Act on 11 September 2009 when the new Air Quality Act will be brought into full effect. Phase III (the capacity development phase) and Phase IV (the maintenance and review phase) will follow.

Since this Air Quality Act came into effect in 2004, a number of air quality monitoring networks have been established across the country. Two national priority areas have been identified (in the Vaal Triangle and the Highveld) and industrial emission reduction plans are already under implementation. A partnership has been formed with the South African Weather Service (SAWS) to develop and maintain a national South African Air Quality Information System (SAAQIS) to store

and archive air quality data collected by various monitoring entities in the country. The SAAQIS is an essential resource in improving the country's air quality. Some 84 government ambient air quality monitoring stations are in place, of which 11 are DEAT stations. The air pollution permits of the top polluters (the industries responsible for over 80% of industrial emissions) have all been reviewed. Over 300 officials have been trained as government air quality managers (165 officials participated in the 2008 Air Quality Governance Lekgotla from a baseline of 30 in 2005).

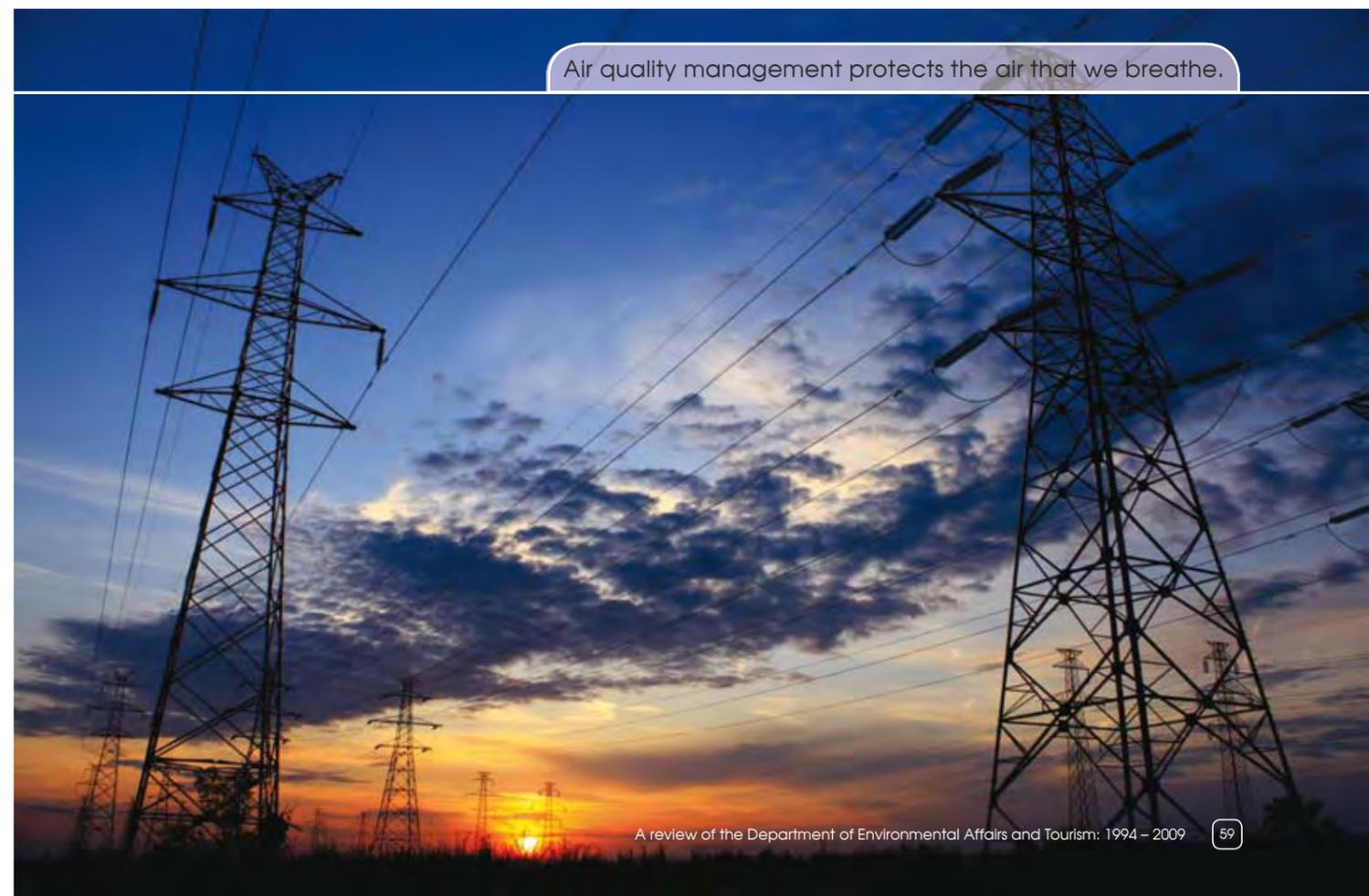
Certain lessons can be learned from the implementation of these policies to drive future activities. In terms of air quality management, this relates to the supreme importance of intergovernmental coordination and cooperation across all three spheres of government. Although there is capacity in some municipalities, the smaller rural local governments have significant capacity constraints, which need to be addressed to ensure the successful implementation of the act.

South African Weather Service

The South African Weather Service (SAWS) is an agency of the Department of Environmental Affairs and Tourism. It is the authoritative voice for weather and climate forecasting in South Africa, gathering meteorological, climatological and atmospheric observation data from across South Africa and the surrounding oceans (up to Antarctica) to provide forecasting and warning services in order to protect lives and property, as well as for disaster mitigation and the detection and monitoring of climate change.

The SAWS plays a critical role in the aviation industry in terms of safety. It fulfils the government's international obligations under the Convention of the International Civil Aviation Organisation (ICAO) by providing specialised weather forecasting and climate information services to international civil aviation. Under the Safety of Life at Sea (SOLAS) Convention, it has an obligation to issue weather forecasts to the international maritime

Air quality management protects the air that we breathe.



industry over the ocean area that South Africa assumes responsibility for (MET AREA VIII). It also carries out the country's international obligations in terms of the United Nations Framework Convention for Climate Change (UNFCCC), serves on the Intergovernmental Panel on Climate Change (IPCC), as well as the Convention to Combat Desertification and the Montreal Protocol on Substances that Deplete the Ozone Layer. As a member of the National Committee on Climate Change (NCCC), it plays a valuable role in advising policy-makers on climate change.

When South Africa was welcomed back into the international arena in 1994, the World Meteorological Organisation (WMO) requested the then South African Weather Bureau to resume responsibility for the Regional Telecommunications Hub and the Specialised Regional Meteorological Centre in southern Africa. The International South Atlantic Buoy Programme became a reality and the first official seasonal forecasts were issued.

The South African Weather Bureau became a public entity in 2001 with the promulgation of the South African Weather Service Act (Act No 8 of 2001). Its name changed to the South African Weather Service, reporting to the Minister of Environmental Affairs and Tourism. Its vision for the future is to provide superior and relevant meteorological products and services, and to contribute to economic development in South Africa and the subregion.

The SAWS provides public good services across the country. These are of particular importance to an economic sector such as agriculture, which relies on seasonal forecasts to ensure successful food production.

Commercial services are provided to the aviation, construction and insurance industries, organisers of sporting events, the retail sector and many other industries that require value-added weather information to ensure profitability.

Its research enables it to develop commercial products such as specialised meteorological

services, automatic weather stations and automatic rainfall stations that it manufactures for its internal and external use. These products are also sold to private companies and other meteorological services in the region. It ensures excellence in its forecasting processes by using cutting-edge technology and the best numerical prediction models available. The SAWS plays a major role in improving aviation safety and efficiency on the African continent by providing tailor-made products for the aviation industry. Through the regulated tariff income, the SAWS has managed to increase the cost recovery revenue from the aviation industry by 14% over the past five years.

The past 15 years have seen various highlights in terms of research and development. The installation of a numeric weather prediction model sourced from the United Kingdom has aided weather forecasting significantly and allowed the SAWS to provide weather forecasts at a 12 kilometre resolution for southern Africa. A long-range forecasting group has been established that is aimed at improving seasonal weather forecasts for the region to warn against potential droughts or above-normal rain during the next summer season. Long-term monitoring of greenhouse gases is undertaken at the Cape Point Global Atmospheres Watch station. This is one of the 24 stations in the world that are recognised by the WMO, and forms part of the international research and monitoring network.

The SAWS was the principal partner in the multi-institutional South African National Precipitation Research and Rainfall Enhancement Programme. This programme is recognised as a world leader in the technology of rainfall enhancement through cloud seeding, and the SAWS has contributed significantly to the development of this technology using hygroscopic flares. The SAWS primarily uses Meteosat Second Generation (MSG) satellites from the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) in support of its services. These satellites provide enhanced temporal and spatial resolution

data of clouds and weather over the whole of Africa, including South Africa.

The value of weather services around the world cannot be over-estimated. According to international studies, governments yield a return of more than 2 000% when it comes to investing in national meteorological services. The SAWS is no exception. It plays a critical role in developing the South African economy, the southern African region and international scientific weather and climate cooperation, mainly through the WMO. International collaboration has yielded excellent results in terms of applied research and project management.

Countries around the world acknowledge the value of cooperating in the collection of weather data, and sharing information and climate data remains one of the most sought-after services. As weather knows no borders or boundaries, so weather-related disasters in other areas also affect South Africa. The SAWS plays an important role in assisting SADC countries with observational data. By 2010, meteorological services in South Africa will have been in existence for 150 years. The longest rainfall record in the country dates back to 1840. As one of only two specialised regional meteorological centres in Africa, the forecasting, research and observation skills of the country's meteorologists are frequently used to issue severe weather warnings, advisories or forecasts for neighbouring countries. This has already contributed significantly to improved warning systems in the region.

Weather and climate are critical elements in any modern decision-making process and the risks involved in weather- and climate-related phenomena are substantial. Advanced accurate warning systems, together with adequate disaster reduction and mitigation systems to ensure the safety of life and property, enable the agency to prevent or mitigate disasters in cases of weather-related hazards like floods producing rainfall and high fire-risk weather. In response to these needs, the SAWS – in collaboration with a

number of partners – has developed disaster risk reduction decision-making systems and applications. These include an integrated early warning system, a flash flood guidance system and the southern African Severe Weather Forecast Project (SWFP).

Since 2006, the SAWS National Forecasting Centre in Pretoria has been providing infrastructure, technology, skills and effective use of various forecasting tools for the southern African SWFP. Through this project, it provides forecasting guidance on severe weather to other southern African countries that could be effectively used by their local weather services. The SWFP was established as a joint venture between the WMO and five countries in the SADC region, and has been extended to the whole of southern Africa. The floods that occurred in Angola, Malawi, Zambia, Zimbabwe and the northern parts of Botswana in 2007/08 were therefore well anticipated, and the disaster management centres were able to take the necessary steps to minimise the loss of life and property associated with flooding. Many south-east African countries, such as Zimbabwe, reported positively on the value of these guidance forecasts.

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Disaster risk reduction systems such as these assist in promoting sustainable development in the subregion by aligning the agency's strategic objectives with those of the Millennium Development Goals to halve poverty by 2015. The use of drought monitoring systems benefits the agricultural sector by improving the success of agricultural crops to ensure food for the nation and poverty reduction.

The development of an integrated global observation system that can be used by any country around the world will reduce uncertainty in climate analysis and predictions. According to the WMO, the challenge lies in developing a single integrated observation plan for the world's oceans, land and atmosphere that everyone can support. This challenge is addressed by encouraging the full and open sharing of data between countries. Satellite observations contribute greatly to global atmosphere and climate monitoring, while locally, technology such as weather radars, automatic weather stations, and upper-air and rainfall measurements are used on a daily basis as part of the observation process. The SAWS makes use of its own observation networks, while also performing high-level scientific research and developing an international standard by cooperating internationally with regard to the global observation network.

As a participant in the global observation network, the SAWS collects, processes, quality controls and disseminates weather information for national and international use. It also runs numerical prediction models on the movement of weather patterns, which also give indications of climate change. It

has an extensive, technologically advanced observations network and infrastructure, which comprises various surface, atmospheric, maritime and aviation-related observation sources. This includes observations at its 21 regional offices, as well as two remote island stations and the research vessel, *SA Agulhas*, which provides surface and upper-air observations.

The SAWS has more than 1 470 manual and automatic rainfall stations, more than 230 manual and automatic weather stations, 12 upper-air stations performing upper-air accents daily, two ozone measurement stations, a radar network consisting of 12 weather radar systems, and 19 lightning detection sensors. It is in possession of a state-of-the-art lightning detecting network (LDN) with a detection efficiency greater than 90% and a location accuracy of less than 700 m over the country. This information is very effective when used for insurance, sporting activities, power utilities and communication-related companies. In addition, SAWS supports safety of life at sea, annually deploys around 50 weather buoys over a large section of the ocean and receives sea surface temperature data and marine observations from voluntary observing vessels. SAWS also

facilitates the receipt of 1.2 million wind and temperature observations from commercial aircraft flying over Africa and over southern Africa in particular.

The SAWS has a well-respected research division that covers research related to nowcasting and the use of satellite and radar technology, numerical weather prediction, seasonal forecasting, climate change studies and long-term monitoring of trace and greenhouse gases. It operates an airborne research facility with aircraft equipped to conduct cloud studies and air-quality measurements.

In monitoring climate change, the SAWS maintains the National Climate Database, which entails collecting and updating data from a wide range of stakeholders in order to produce, in combination with its own data, a national climatological database. The challenges presented by climate change over a longer period and climate variability experienced in the short to medium term require a comprehensive intervention. Given the benefit and potential impact of such an intervention, it is particularly important to utilise the climate change research of the SAWS as a flagship initiative to address short-term viability and long-term sustainability.

The SAWS is one of the major contributors to the Wind Atlas Project, to which it will apply the outputs of the climate modelling data as a critical input to determine the extreme wind climate of South Africa. This involvement came about through SAWS's current reassessment of extreme wind statistics for South Africa, specifically relevant to the built environment. Also, with the high resolution of spatial and temporal observational data at its disposal, the SAWS will play a crucial role to validate the results of the climate modelling data.

The SAWS generates and makes available essential environmental information, products and services in support of the government's strategic initiatives related to air quality and renewable energy resources. One of the most pressing environmental health challenges facing both the developed and developing

world is the issue of air quality. Unacceptable concentrations of cancer-causing pollutants have been measured in and around many industrial centres. The Air Quality Act provides for the setting of standards – both for the quality of the air that we breathe and for what may be released into the atmosphere. To support air quality initiatives, the SAWS has been working in partnership with DEAT to establish the South African Air Quality Information System (SAAQIS). This system provides accurate, current, relevant and complete information for air quality decision-making. Data from the SAAQIS is also incorporated into the national database. Renewable energy initiatives have also been supported by entering into a research and development initiative with the South African National Energy Research Institute (SANERI).

Since 2002, meteorological organisations and weather services in the southern African region have investigated a constitution that will finalise the formation of the Meteorological Association of Southern Africa (MASA), which falls under the SADC desk. In July 2007, the constitution was accepted, with the SAWS as the chair and official secretariat, thereby strengthening the strategic leadership role that South Africa plays in the SADC region. MASA is envisaged to be particularly instrumental in regional cooperation to address challenges faced by the regional meteorological community.

In addition to the critical role it plays in developing the southern African economy, the SAWS contributes to capacity development in South Africa, thus assisting in the reduction of the rising skills shortage. The SAWS's recent accreditation with the Transport Sector Education Training Authority (TETA) is an added accomplishment. It has also been nominated by the WMO to provide specialist training to meteorologists from other countries (not just in the SADC region) through its Specialised Meteorological Training Centre. It is engaged in negotiations with the WMO and other role-players to become an WMO-accredited regional meteorological training organisation

Extreme weather patterns influence climate change.

for South African forecasters, as well as forecasters in the SADC region and beyond.

As a learning organisation, the focus of the SAWS is on innovation and creating a pool of meteorologists, climatologists, atmospheric scientists, technologists and researchers who can provide accurate weather information, not only for South Africa, but for the entire region. It has successfully trained 230 weather observers and meteorologists over the past nine years. It has been recognised as a Centre of Excellence by the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). This was particularly due to the training that it provides in the utilisation of Meteosat Second Generation (MSG) satellites and remote sensing.

Specific meteorological training is also provided in cooperation with tertiary institutions such as the universities of Pretoria, Zululand and the Witwatersrand. Over the past few years, the SAWS has been working in partnership with the University of Pretoria to provide bursaries for the training of BSc Honours students in Meteorology. Upon completion of their training, these candidates are employed at the SAWS.

As it approaches the future, the SAWS recognises the critical role it has to play in providing services that will enhance national resilience to the huge natural variability in weather and climate for which the region is known.

Environmental Impact Management

Policy developments in environmental impact management (EIM) have their foundation in the Environment Conservation Act (Act No 73 of 1989). This act authorised the Minister of Environmental Affairs and Tourism to identify, by regulation, certain activities that could not be undertaken without prior consideration of their environmental impacts.

In 1997, following several years of inter-departmental negotiations, the first EIA Regulations were issued. South Africa took a

proactive step towards better environmental protection through the implementation of environmental impact assessments (EIAs) to regulate the environmental impacts of identified new development activities with the potential to harm the environment. Where development had previously been seen as being contradictory to environmental management, the EIA process established a procedure to mitigate the potentially negative environmental impacts of all significant new developments, thereby ensuring that development took place in harmony with the environment. This entailed active public involvement and stakeholder engagement, and provided government with the necessary information to make informed decisions about developments and how their impacts could be controlled.

As beneficial as EIAs were for environmental quality, inadequacies were identified during the implementation of these regulations, which hampered the national priorities of economic growth and job creation. The post-1994 evolution in environmental legislation therefore rendered these regulations outdated and inadequate. In order to establish mechanisms in the EIA system for cooperation and coordination, new regulations were passed in 2006, which put time frames on authorisation processes.

In order to establish a wider approach to the enforcement of the regulations, the National Environmental Management Amendment Act was passed in 2008. This act was driven by a need to improve the efficiency and effectiveness of the EIM system. It makes improved provision for cooperative governance and for environmental management instruments other than EIA, including exclusions based on norms and standards, as well as the adoption of existing norms and standards and the development of new ones. It makes provision for the integration and alignment of regulatory processes, while also strengthening the use of spatial environmental management instruments in EIM. The act empowers the Minister of Minerals and Energy to implement

environmental matters in terms of NEMA in so far as it relates to prospecting, mining, exploration or related activities, and aligns the environmental requirements in the Mineral and Petroleum Resources Development Act (MPRDA) with NEMA.

A number of strategically important programmes have been developed to implement EIM policies. The EIA administration system has been improved through the implementation of the National Environmental Authorisations System (NEAS), a web-based system that tracks the progress on all EIA applications in the country. Capacity and support is provided to provincial and national users, and more than 350 EIA administrators have been trained in EIA administration.

Mechanisms have also been developed for improved cooperative governance and stakeholder support. The development of environmental management frameworks (EMFs) will enable the speeding up of the processing of applications, and may even facilitate possible exclusions, as they will provide environmental decision-making information on potential development areas. A total of 13 EMFs are already being developed to monitor development patterns.

Additional systems and tools that facilitate effective and efficient EIM include the guidelines, policies, norms and standards, and information services that have been developed.

The implementation of these policies has certain impacts. For example, EIAs conducted for about 62 000 development activities have enabled government to make informed decisions on these applications. Some 15% of authorised projects are subjected to formal compliance monitoring. Priorities for the future include the strengthening of intergovernmental coordination and cooperation. Authorities should guard against over-regulating and overloading administrative systems with regulatory processes that do not add value. It is clear that the integration of regulatory processes is possible.

The development of the National Environmental Impact Management Strategy and Action Plan to implement the Amendment Act is the main priority for 2009 and 2010. Efforts will be made to ensure that applications are processed within regulated time frames at both national and provincial level, while still focusing on improving the



efficiency of the EIA system. During 2008, 85% of the EIAs processed by DEAT and 68% of those processed in the provinces were done within the prescribed time frames. Less than 10% of DEAT's EIA decisions are challenged through appeals, and the vast majority of appeals are overruled (the departmental decision is upheld or partially upheld).

Future developments in terms of EIM related to EIA and other regulatory mechanisms can be expected from 2010 onwards. The EIM strategy development process might result in further developments to provide possible future policy direction. The main aims of this process are to improve the efficiency and effectiveness of the EIM system, diversify instruments to be used in EIM to include instruments other than EIA (such as risk assessment and cost-benefit analysis), engage in mining-related environmental management matters (such as the closure and rehabilitation of derelict and ownerless mines), diversify governance models (including integrated permitting, co-regulation and self-regulation), place more emphasis on strategic (and spatial) planning instruments, and transform the sector. The objective, however, remains to ensure that substantial detrimental impacts on the environment, caused by development and development patterns, are avoided.

Where they cannot be avoided, they should be mitigated and managed. Sector-specific policies may need to be considered.

Regulatory services

The National Environmental Management Act (NEMA) and Specific Environmental Management Act (SEMA) provide government with greater powers to fight environmental injustice. Regulatory services include the development and implementation of compliance, monitoring and enforcement strategies, systems and tools, the development of capacity and providing support to national, provincial and local government.

An important aspect of the first amendment to NEMA, the National Environmental Management Amendment Act of 2003, which deals with compliance and enforcement, is the provision that is made for environmental management inspectors (EMIs). This act confers a wide range of powers on EMIs to investigate environmental crimes. They therefore have the power to conduct routine compliance inspections, and have the power of non-commissioned police officers, including powers of entry, search and seizure, and powers of arrest. Only the Minister of

Environmental Affairs and Tourism or Members of Executive Councils (MECs) in charge of environmental affairs can appoint EMIs.

The role of EMIs, also referred to as the 'Green Scorpions', is not only to investigate offences committed in terms of environmental legislation, but also to investigate breaches, among others, in terms of conditions of permits or other authorisations issued in terms of NEMA or other acts relevant to environmental management. They are officials from various national, provincial and municipal government departments, designated by the Minister or MEC to monitor compliance with and enforce national environmental legislation.

Officials can only be appointed as EMIs once they are qualified. This involves the completion of six months of rigorous training and the awarding of a certificate designating them as EMIs. A national curriculum has been developed for the training of EMIs. The department has negotiated with three tertiary institutions (the University of South Africa, the University of Pretoria and the Cape Town University of Technology) to offer this training as a programme recognised by the South Africa Qualifications Authority (SAQA). A total of 145 officials from national, provincial and local government enrolled at the three institutions. These officials all wrote their examination at the end of the year and 132 passed. The establishment of trained EMIs have already resulted in improved efficiency and effectiveness in compliance monitoring and the enforcement of environmental legislation, as well as increased environmental awareness among stakeholders. By 31 March 2009, 975 EMIs were registered on the database.

Training is also provided for magistrates and prosecutors to ensure clear understanding of the environmental legal issues. The Justice College of the Department of Justice and Constitutional Development has approved terms of reference for a Magistrates'

Benchbook. A prosecutor's manual, which has been distributed to all regional offices of the National Prosecuting Authority (NPA), and an authorisation manual were launched at the third Environmental Compliance and Enforcement Lekgotla in 2009. A standard operating procedure has been signed between the South African Police Service (SAPS) and DEAT. The purpose of the standard operating procedure is to improve and align the processing of environmental cases by members of the SAPS and EMIs.

The department has been involved in several investigations into prioritised non-compliance with the departmental mandate, including investigations arising from strategic compliance monitoring and enforcement projects of the Chief Directorate: Regulatory Services. Of the 57 investigations conducted, the top ten have been prioritised for investigation and criminal and/or administrative enforcement. These include investigations such as those into the Airports Company of South Africa (ACSA) fuel spill of 2006, and the illegal storage and dumping of medical waste by several companies.

Comprehensive case dockets are compiled with legally admissible evidence for each and every investigation. Since the beginning of 2008, five criminal dockets have been handed over for prosecution, and the NPA now holds 19 finalised criminal dockets. The main challenge for the department in this regard is the fact that the prosecution of cases is determined by prioritisation issues within the NPA.

Intergovernmental coordination and cooperation are an important component of the department's compliance and enforcement activities. Although the integration of regulatory processes is possible, legally defensible and enforceable permits, licences and records of decision are needed. Capacity-building in terms of compliance monitoring and enforcement in the three spheres of government is one of the main priorities for 2009 and 2010.



Environmental management inspectors enforce environmental legislation.