

PERFORMANCE



BENCHMARKING UMGENI WATER'S PERFORMANCE

Umgeni Water potable water was benchmarked against the quality of potable water produced by 22 Norwegian municipalities for the period October 2007 to January 2008. For the purpose of comparison, the population served by respective plants was used as a common frame of reference.

E.coli was used as the microbiological indicator for assessing the quality of water produced, as follows:

Good performance	Poor performance
100% of the population served are supplied with drinking water without <i>E.coli</i>	> 10% or > 1 000 persons are supplied with water containing any <i>E.coli</i>

Several assumptions were made in order to perform this benchmarking exercise:

- the number of inhabitants used in the Norwegian benchmarking report was regarded as similar to population served
- the Quality Index criterion, i.e. 1 = Best score, was regarded as Good performance.

Table 13: Benchmarking results

UMGENI WATER			NORWAY MUNICIPALITY BENCHMARKING		
UW Waterworks	Population served	Performance	Norway municipality	No. of inhabitants connected	Performance
Durban Heights	2,5 million	☺	-	-	-
Wiggins	1,2 million	☺	-	-	-
Midmar	975 000	☺	-	-	-
DV Harris	258 000	☺	15	225 228	☺
Hazelmere	200 000	☺	8	102 125	☺
Amanzimtoti	170 000	☺	13	154 400	☺
Umzinto	58 500	☺	18	56 085	-
Craigeburn	30 000	☺	1	33 017	☺
Mtwalume	23 500	☺	5	23 600	☺
Ixopo	11 000	☺	11	49 650	☺
Ogunjini	7 000	☺	22	6 100	-

-: benchmarking could not be undertaken since all 22 municipalities were serving populations of less than 1 million, and/or due to unavailability of data

For the period under review, Umgeni Water's waterworks produced water of acceptable quality that compares favourably with the quality of water produced by municipalities of similar plant capacity in Norway.

ENVIRONMENTAL PERFORMANCE

Two core values underpin the organization's environmental performance. The first is conservation of our natural resource base and second involves minimizing the adverse impacts of our activities to our natural and social environments.

These have in turn been supported by the following strategies in the year under review:

- Development of institutional capacity to find ways to minimize our resource use and develop best practice in environmental governance
- Monitoring of Umgeni Water activities and the minimizing of stresses on our natural environmental systems (air, water, land: eco-efficiency)
- Identification of human health and security risks associated with Umgeni Water activities and installation of monitoring and emergency response procedures
- Participation in science and technology projects to contribute toward innovation in the water treatment and wastewater management field. To this end Umgeni Water strives to keep abreast of the evolving science in climate change in order to put in place appropriate responses to fulfill our mandate as the bulk potable water supplier for the Umgeni Water area.

INSTITUTIONAL CAPACITY FOR ENVIRONMENTAL MANAGEMENT

Umgeni Water has an ongoing commitment to the environmental awareness and training of staff to discharge their responsibilities in environmental management. All Umgeni Water staff are required to develop individual development plans for their own professional development, which has allowed many Umgeni Water employees to access environmental management training in various fields.

	UW Responsible person	Environmental management responsibility
Chief Executive Officer <i>Legal accountability for environmental management at UW</i>	General Managers	Oversees the development of policies, allocation of budget and approval of strategic frameworks for environmental management
	Area Managers <ul style="list-style-type: none"> • Inland • Coastal 	Implements GM Operations directives in environmental management through Systems Managers and is the liaison with external organizations (various levels of government) on issues of mutual interest, including environmental
	Systems Managers <ul style="list-style-type: none"> • Northern Area • Wiggins/ Inanda • Durban Heights/Nagle • Msunduzi/ Sisonke • Midmar • Southern Area 	Responsible for implementation of environmental management systems and plans at UW sites/waterworks and wastewater works
	Asset Manager	Responsible for environmental compliance and implementation of environmental management of reservoirs, workshops and pipelines
	Water and Environment Services Manager	Responsible for development of UW environmental policies and plans
	Water and Environment Services Scientists	Develops plans and provides guidance in environmental monitoring and investigations in IWRM, infrastructure development and water quality
	Water and Environment Services Officers	Provides routine support for environmental monitoring and investigations in IWRM, infrastructure development and water quality
	Water and Environment Education	Organizes environmental awareness and education both internally and externally
	SSHEQ coordinators	Manages and implements day-to-day implementation of environmental management at systems level
	Manager Property and Security Services	Directs requirements for security at UW properties
	Manager Health	Directs health management of staff at all UW sites
	UW staff	Carry out UW Operations, Corporate Services, Financial Services and Scientific Services in accordance with UW Sustainability Policy and Environmental Management Plans

Several components contribute to Umgeni Water's Environmental Management Framework, including: the Sustainability Policy, the Corporate Environmental Sustainability Plan and robust systems for environmental management from Boardroom to shop floor.

Corporate environmental management policies

While the Sustainability Policy developed in the 2006/07 financial year continues to guide the activities of the organization at a high level, the Operations Division has initiated the development of an Operations Safety Health Environment and Quality Policy to guide the day-to-day activities of the Operations Division. This policy will come into effect in the 2008/09 financial year.

Umgeni Water Corporate Environmental Sustainability Plan

The first Umgeni Water Corporate Environmental Sustainability Plan was developed during the past year, and provides direction for environmental management for the organization. While the initial framework was developed in the Water and Environment section of the organization, a collaborative approach with the various Divisions and sites of the organization ensured that the product was supported at various levels of the organization.

The plan included the identification of major environmental threats, environmental indicators and targets for the various Umgeni Water systems. These indicators, listed below, were introduced to all sites across the organization and form the basis for monitoring environmental performance over the past year:

- Air quality
- Eco-efficiency: energy use, water (natural resource) use, materials (chemical) usage
- Greenhouse gas emissions
- Waste management
- Environmental health
- Water quality management
- Biodiversity management
- Natural disaster response
- Environmental governance
- Innovation in science and technology
- Heritage conservation.

While baseline data for most variables at Umgeni Water sites were collected during the past year, an agreement on and finalization of the corporate environmental targets is pending. It is anticipated that the final targets will provide the framework for future environmental performance reporting.

Environmental management systems

Over the past year the Umgeni Water Operations Division undertook to develop, implement and maintain a standardised integrated Safety, Health, Environmental and Quality Management System (SHEQ), based upon the requirements of the ISO 9001:2000 Quality Management System (QMS), ISO 14001:2004 Environmental Management System (EMS), and OHSAS 18001:2007 (OHS) Occupational Health and Safety Management System.

The SHEQ coordinators and other personnel from this division underwent extensive training in the development of the Integrated SHEQ Management System for Umgeni Water, and started the implementation of the system and development of documentation while training. A GAP analysis was undertaken of all sites in order to determine the objectives of system integration, while a format to determine significant aspects and hazards has been finalised. The Operations Division SHEQ coordinators and line

management will work toward completing the development of the necessary documentation and implementation of the monitoring requirements for this integrated system during the year ahead.

PERFORMANCE INDICATORS

Umgeni Water conducts regular compliance audits at all operations sites and facilities. These audits are conducted by the Water Quality and Environment Section, which prepares independent reports to the Executive and provides feedback/support to operations staff for continuous improvement. External audits are conducted by the SABS as a standard condition for maintaining the ISO 9001 Certification. These audits are based on the Occupational Health and Safety (OSH) Act requirements.

Air pollution

Air pollution occurs when the air contains gases, dust, fumes or odour in harmful amounts. There are few processes in the Umgeni Water operations that create emissions that could lead to health or environmental risk. Nevertheless, most Umgeni Water treatment works monitor indoor air quality at plants due to the potential health impacts on workers.

A single chlorine leak was reported for the financial year. The chlorine leak was detected by the internal leak detection systems and contained before it could pose a risk to staff and the environment.

Outdoor air impacts associated with vehicles in use

Fossil fuel combustion, particularly as it occurs in motor vehicles, has been identified as the largest contributor to air pollution in the world. As an indicator used to monitor the organizational impacts on air quality, Umgeni Water monitors:

- the amount of fuel consumed in the organization's vehicle use per kilolitre of water produced
- the distance travelled per kilolitre of product produced
- the number of fleet vehicles in use in Umgeni Water.

During 2007/08 the number of fleet vehicles remained the same as the previous financial year at 191 fleet vehicles. The distance per kilolitre of product decreased from 55×10^{-6} to 50×10^{-6} due to the increased water sales. (See figure 8).

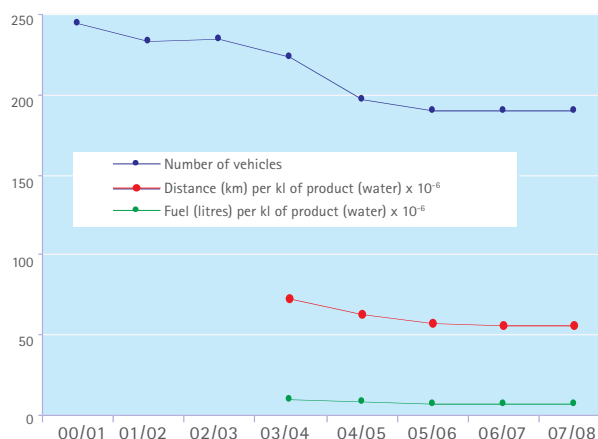


Figure 8: (Trends in vehicle fuel consumption per kl of water)

Greenhouse gas emissions

Umgeni Water contributes indirectly to CO₂ emissions largely through electricity consumption. In the period under review, there was a marked increase in energy consumption owing to the extended pumping requirements at the Mooi/Umgeni River Transfer Scheme. During the 2006/07 financial year, 149 pump days at the Mearns Weir were recorded, compared to 264 pump days during the 2007/08 year.

There was a 79% increase in respect of utilisation of emergency pumps at Wiggins by pumping water from Inanda dam in response to water stress in the upper Umgeni catchment. The operating rules for the Umgeni River system were agreed upon with DWAF and the key conservation measures were to utilise more water from Inanda dam and allowing as much water to be caught in dams in the upper catchment and allow for environmental release. This increase in pumping has a significant impact on increasing the energy use by the organization, and in turn contributes adversely toward greenhouse gas emissions.

Reduction of greenhouse gas emissions from treatment processes

Performance in reducing greenhouse gas emissions was considered poor during the 2007/08 period. This is almost entirely due to the failure of the methane gas collection and handling systems at the Darvill Wastewater Works digesters. While some of the gas continued to be collected and used to power part of the process, for most of the year the excess gas could not be burned due to a number of problems with the flare system. Also, for much of the time, methane produced in one of the main digesters (approximately 150 m³/hour) could not be captured, but was emitted direct to atmosphere. The possibility of direct use of the

excess methane at Darvill was given further consideration during the year, but the potential remains too low for cost-effective use with currently available technology.

Biodiversity and reducing ecosystem stress

One of Umgeni Water's main impacts on the natural environment could occur in the process of extracting raw water from the river systems. The National Water Act (Act No 36 of 1998) makes provision for the 'Reserve' in order to contribute to both the quality and quantity of water in the resource, and therefore the sustainability of the resource.

International guidelines suggest that at least 30% of the average annual flow of a stream must remain in place for the stream and related ecosystems to maintain ecological health. Umgeni Water monitors both the quality and quantity of water at the inflow and outflow of the impoundments from where the main water abstractions occur. The results of this monitoring are presented in the two figures below.

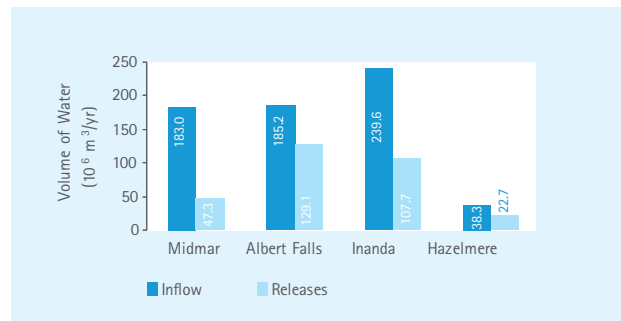


Figure 9: Volume of water released as a proportion of inflow

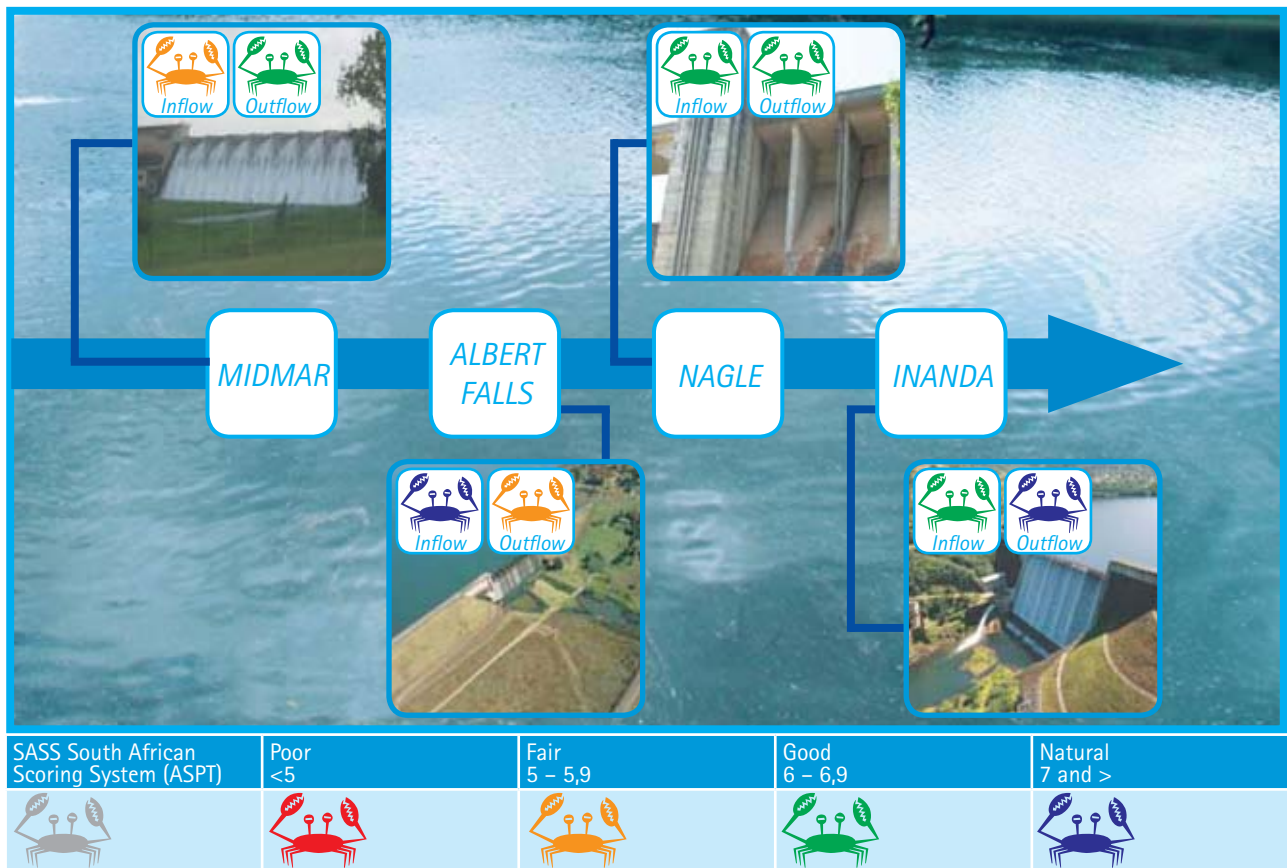


Figure 10: Quality of water as monitored by SASS in our river systems

In terms of the releases from the main abstraction impoundments, it is noted that Albert Falls Dam (70%), Inanda Dam (45%) and Hazelmere Dam (59%) do meet the international recommendation to release 30% of average annual inflow for meeting the needs of the downstream ecological reserve. While timing of releases and quality of water released also play a part in the maintenance of the downstream ecology, in terms of average annual volumes released the potential impacts on the biodiversity of these aquatic ecosystems due to water quantity changes is minimized. However, it is noted that the release from Midmar Dam is only 26%, which suggests that insufficient water is being released from this dam to maintain a healthy downstream ecosystem.

Umgeni Water carries out a quarterly hydro-biological assessment of the river immediately upstream and downstream of the dams managed or owned by Umgeni Water. The results of these assessments are summarized in Figure showing the SASS river system monitoring. It should be noted that despite the less than acceptable releases in terms of volume from Midmar Dam, the SASS analysis indicates that the quality/diversity of the riverine biota may be regarded as good.

In most instances the riverine ecology downstream is as good as or better than at the inflow to dams, one exception being Albert Falls Dam. In this instance, the dam has not spilled in the past year although the water level in the dam has steadily increased from 70% full to 83,6% full. Releases from the dam are largely scoured from the dam bottom where water oxygen levels are anoxic.

Waste management at Umgeni Water

Land contamination by excess waste is a global environmental concern. Umgeni Water has in the past relied on the assimilative



Electronic Waste at Umgeni Water Head Office

capacity of its landfill sites to dispose of all non-hazardous waste. Landfill sites are rapidly filling and opportunities to open new sites remain scarce. Effective waste management is the only reasonable corporate response.

The Umgeni Water Sustainability Policy encompasses a commitment to promote the reduction, reuse and recycling of waste material by the organization, and to this end site specific waste management strategies have been developed. The waste generated at sites can be grouped according to the following waste streams:

- Non-hazardous: domestic waste; scrap metals; glass; plastic; paper
- Hazardous: oils/solvents; sewage sludge; medical waste; laboratory waste
- Electronic: computers; fluorescent tubes; printer cartridges; batteries; other electronic devices.

All hazardous waste is treated and disposed of safely in authorized landfill sites by accredited contractors. In terms of recycling, only paper is currently recycled, although there are plans in place to recycle plastic and electronic waste. The latter is a significant concern for Umgeni Water since during the past two years most employees have had a computer upgrade, resulting in a large quantity of e-waste which needs to be addressed. A corporate e-waste task team was established in 2007 to investigate and recommend solutions.

While there is currently no specific legislated requirement regarding e-waste management in South Africa to serve as guidance, the organization is in the initial stages of developing an e-waste management policy to respond to this growing concern. A Disposal Committee has been established and a disposal plan formulated to assist in avoiding stockpiling of disposable items such as computers. The Disposal Committee is tasked to ensure that assets are disposed of in a cost-effective and environmentally friendly manner. Umgeni Water will ensure continuous involvement with the e-WASA (Electronic Waste Association of South Africa) initiatives.

While a baseline quantifying the amount of waste generated in Umgeni Water was established, the confidence in the data is low and it has been agreed that the target for the forthcoming year is to:

- establish a waste measurement process to ensure uniformity across sites
- implement waste separation more effectively
- establish a waste recycling process for all sites.

The South African Waste Management Bill, which is expected to become law in the coming year, seeks to reduce the amount of waste that is generated and, where it is generated, to ensure that waste is recycled, re-used or recovered in an environmentally sound manner before being safely treated and disposed of. In light of this, Umgeni Water is working toward addressing the requirements of this Bill in the management of its waste stream.

Eco-efficiency

Eco-efficiency for Umgeni Water relates to water, energy and

materials use per kilolitre of water produced. By monitoring these trends over a period of time, it is possible to check whether input resources have increased or decreased during that period to indicate eco-efficiency. Umgeni Water uses the following indicators:

- energy consumption
- water consumption
- materials consumption.

Energy consumption

The majority of Umgeni Water activities rely on electricity from the national grid as the primary energy source. Umgeni Water is committed to reducing its energy consumption through monitoring energy use at all sites and maximizing the energy efficiency of all operations.

The increase in energy consumption was largely attributed to:

- increased water demands from customers leading to increased production for most treatment plants
- extended inter-basin pumping by the Mooi/uMgeni River Transfer Scheme from Mearns Dam on the Mooi River to meet water demands in the uMgeni River catchment.

Durban Heights Waterworks and Wiggins Waterworks are the largest power users in the coastal area. Power consumption at Wiggins Waterworks is largely due to the high-lift pump station and the ozone plant. An automatic power factor correction unit has been installed at Wiggins Waterworks Substation A, which supplies the ozone plant with electricity. The high-lift pump station pumps have individual power factor correction capacitors for each motor.

Umgeni Water is also in the process of changing the perimeter security lighting to energy-efficient lighting, with the first phase currently being installed. This involves changing security lights, which are on for approximately 12 hours a day, to 56 W energy-saving lamps, representing a saving of 110 880 kWh per month.

The electricity consumption at Durban Heights Waterworks is largely due to the shaft pumps, KwaDabeka pumps and the Pinetown pumps. Power factor capacitors have been installed at all these pump stations, and investigations are underway into changing wherever possible to energy-saving lamps.

Other energy savings initiatives include:

- Installation of geyser timers;
- Installation of solar heaters

These initiatives are expected to yield some electricity savings.

Water consumption

During the 2007/08 financial year a total of 411 574 MI/day of potable water was produced from 423 921.22 MI/day of raw water. This translates to an average of 5% loss in production for the financial year, with significant losses being observed at Durban Heights Waterworks. Umgeni Water has recently developed a Water Demand Management Strategy and one initiative of that strategy encompasses leak detection and reducing unaccounted-for water in our systems.

Materials consumption

While reducing the amount of chemicals used in water treatment and wastewater treatment works has the potential to reduce total operational costs, as well as the impact the organization has on our natural resource base, the quantity of chemicals used in these treatment processes is largely dependent on the quality of raw water and effluent received. To this end Umgeni Water has a bifocal approach, which includes:

- optimizing treatment processes where possible and varying the abstraction level in the dam in order to select water of acceptable quality
- influencing decisions around land-use and potential catchment developments that could impact on the quality of water received. Various catchment management activities are undertaken, and Umgeni Water continues to support the development of the Catchment Management Agencies largely through the facilitation of and attendance at catchment management forums at a local level.

During the 2007/08 financial year the amount of chemicals per product decreased (South Coast data excluded). This reduction reaffirmed Umgeni Water's commitment to the objective of reducing the chemical use in treatment processes.

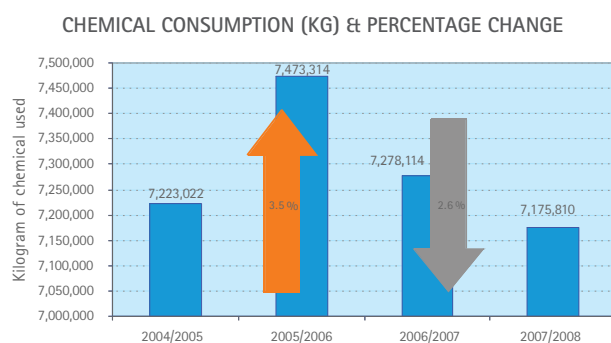


Figure 11: Chemical Consumption (these values exclude the South Coast data)

Aquatic weed threats

Alien aquatic weeds, especially Water Hyacinth (*Eichhornia crassipes*), Water Lettuce (*Pistia stratiotes*) and Kariba Weed (*Salvinia molesta*) are all a serious ongoing threat to our raw water supplies as there are no natural predators. They cause a wide range of problems to both water quantity and quality. Mechanical and chemical interventions have proved unsustainable and expensive and, as a result, Umgeni Water's Engineering and Scientific Services Department has over the past years implemented a number of successful bio-control interventions for Water Lettuce and Kariba Weed.

During the 2006/07 year sections of Albert Falls Dam and the Mgeni inflow to the dam, as well as Ixopo Dam and McKenzie Farm dam on the Xobho River, were invaded by aquatic alien weeds. During the current financial year the Ixopo system has been kept essentially weed-free as a result of past bio-control work, but work on the Albert Falls problem is ongoing.

Early re-introduction of large amounts of the bio-control undertaken in spring 2007 proved effective and reduced the extent of the problem. In both catchments, the risk of re-colonization

remains high as the plants have been known to reappear after all the weevils have died out. By contrast, the control and eradication of Water Hyacinth still relies on traditional methods and its presence poses a major risk to our water resources.

Pollution monitoring and response

A few minor pollution events took place from Umgeni Water treatment plants during the past year, but none posed risks to human health and security:

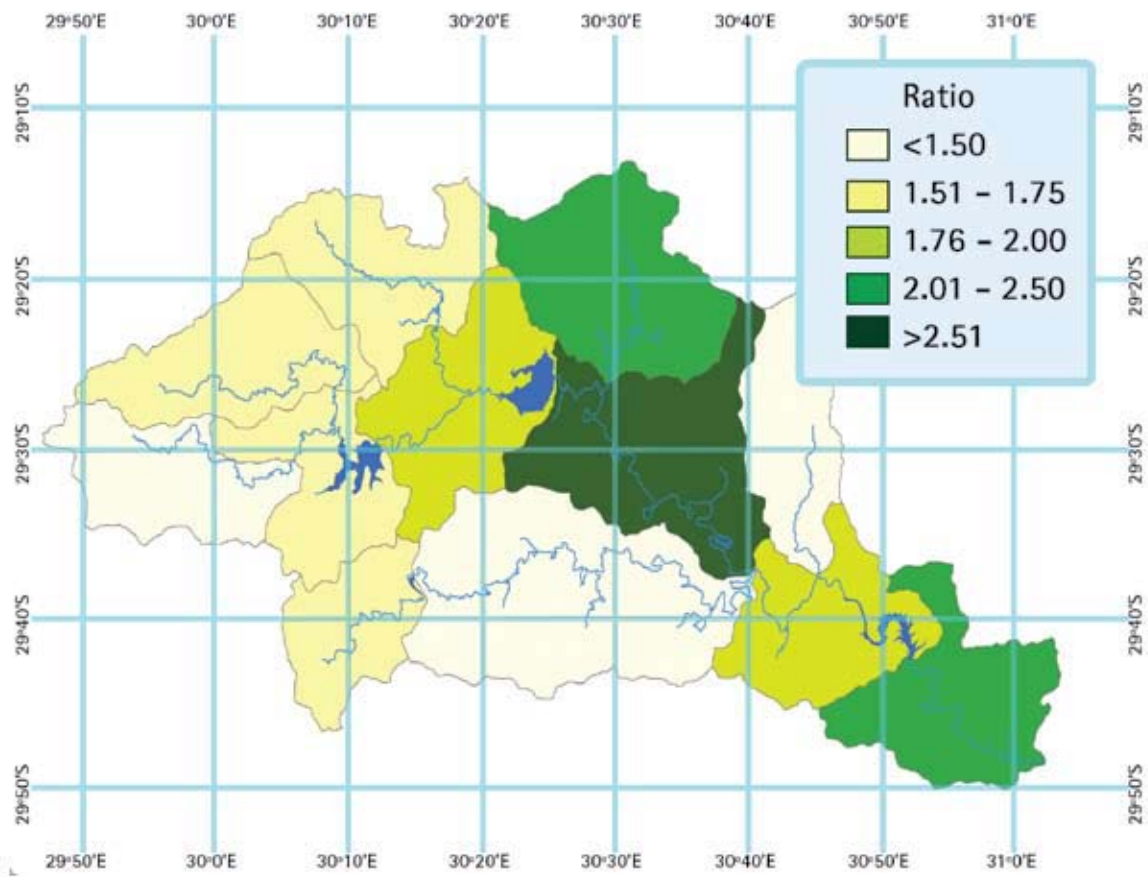
- At Darvill, a spillage of digested sludge occurred due to overflowing of a storage vessel, but as the area around the digesters has been designed for containment, all the sludge was recovered.
- At Hazelmere Waterworks, ongoing severe problems with operation of the water treatment residue centrifuge resulted in some discharge of treatment solids to the Mdloti River at times. While this is not ideal, monitoring has confirmed there was minimal effect on water quality or on the more sensitive aquatic organisms downstream.
- DV Harries Waterworks holds a permit to discharge sludge from a sludge holding tank to the municipal sewer. Isolated incidents of supernatant overflow from this tank were noted in the year under review. This was due to failure of the automatic discharge system. These entered the nearby stream, however the miniSASS tests conducted did not show any impact. Investigations were conducted on the system and remedial measures are to be instituted accordingly.

Case study: Quantifying the hydrological impacts of climate change Clear evidence exists to support the notion that the climate is changing globally and that this will have an amplified effect on water resources. This will impact on the ability to supply potable water at acceptable assurance levels. Consequently, the potential risks associated with climate change have been included in the top three risks facing Umgeni Water in its 5 year corporate business plan.

For the past two years, Umgeni Water has been working towards quantifying the possible impact of this risk on its main supply catchment, viz. the Mgeni System. This involved setting up a daily hydrological model at a finer resolution than ever before to simulate the impact of current and future climate scenarios on water resources. To enable this to happen, data describing rainfall patterns, land cover and its water use patterns, irrigation, reservoir abstractions, wetlands, soils, and evaporation were configured as a base scenario in the hydrological model. Three rainfall simulations from a General Circulation Model (GCM) and increased evaporation rates have been added to the base scenario to simulate future water resource scenarios in a changing climate. Notwithstanding the acknowledgement that several aspects of the modelling process are still rudimentary and need improvement, the results do indicate several trends.

Preliminary indications from this first analysis are that streamflow will generally increase, mainly in the currently relatively drier, low flow winter months by up to 2,6 (see figure) and even 5,3 fold by 2065 and 2100 respectively, thereby resulting in a smooth supply of streamflow all year round. Higher increases are observed in catchments on main rivers and major tributaries due to accumulation of water throughout the catchment, particularly the Nagle management catchment. Indications are that generally there will be less year-on-year variation in flows under future climate scenarios, suggesting that streamflows are projected to become less variable, and therefore more predictable, especially in the key Nagle management catchment. This projected decline in variability could be partly attributable to lower variability in intra-annual streamflows as a result of increases in streamflows in the low flow winter months. The exceptions are the Lions and Mpendle management catchments where, by 2065, variability could increase. Several recommendations have emanated from this study. Firstly, and most importantly, it is imperative that the integrity of the configuration, and therefore the confidence in these results be improved by including other readily available General Circulation Model scenarios. Secondly, the hydrological scenarios presented here should be included in Umgeni Water's water yield and assurance of supply assessments to identify whether additional water resources, should they materialize, could be stored and used effectively. Thirdly, areas where streamflow increases are highest or where variability could increase, notably the Nagle, Lions and Mpendle management catchments, require further investigation to quantify any possible flood management requirements.

Lastly, in order for the results of this study to be effective, it is imperative that climate change be included in water resource development plans, operating rules and disaster risk management plans. This project resulted in several opportunities for collaboration including the School of Bioresources Engineering and Environmental Hydrology of the University of KwaZulu-Natal, the Swedish Meteorological and Hydrological Institute who will be providing continuous GCM data to the year 2100, and the University of Florida who are developing water quality aspects of the Mgeni configuration.



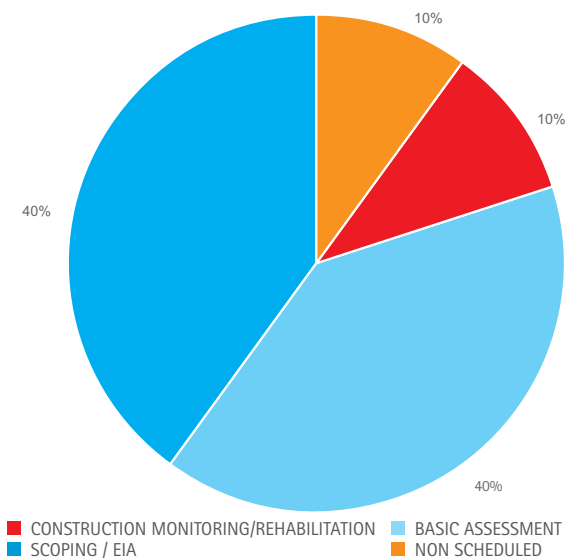
Ratios of future (2046-2065) to present climate mean annual accumulated streamflows, in the Mgeni System

ENVIRONMENTAL MANAGEMENT FOR INFRASTRUCTURE DEVELOPMENT

Umgeni Water has adopted integrated environmental management throughout the project lifecycle. While an overriding objective for this approach is to achieve compliance with the existing environmental legislation efficiently and cost-effectively, the approach has proved to contribute toward more sustainable water infrastructure development by enhancing environmental awareness of affected parties, local authorities, construction staff and other sectors, while minimizing the impacts on our environment and resource base. During the year under review environmental management was undertaken for various infrastructure projects.

In order to grow expertise in the environmental impact assessment field, Umgeni Water obtained exemption from the local authority, Department of Agriculture and Environmental Affairs, to carry out several in-house scoping studies and basic assessments. The figure below indicates the percentage of studies carried out internally.

TYPES OF ENVIRONMENTAL WORK IN WATER INFRASTRUCTURE PROJECTS



PERCENTAGE OF EIA'S CARRIED OUT IN-HOUSE

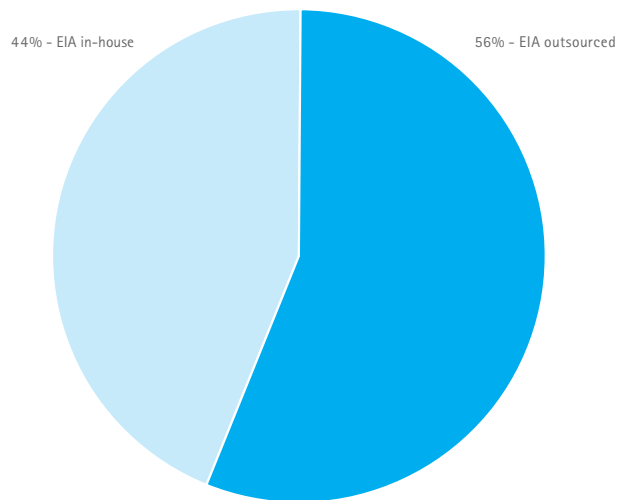


FIGURE 12: Percentage Environmental investigations conducted internally



With respect to the projects carried out internally, a Record of Decision from the Department of Agriculture and Environmental Affairs authorizing construction was obtained for four of the above projects in the past year.

Attention to rehabilitation on all projects, while costly, has allowed Umgeni Water to ensure that the environment is as good as or better than before construction commenced.

CLEANER PRODUCTION INITIATIVES

There are several Umgeni Water initiatives underway in various departments of Umgeni Water which consider options for improved treatment processes, reduction in resource use and finding ways to predict external environmental influences that may impact on our business.

An Eskom-driven Electricity Demand Side Management project introduced to the organization to consider energy-saving options was extensively reported on in the 2006/07 Annual Report, and a recommendation presented. However, Umgeni Water Operations chose not to proceed with the implementation of these recommendations as the level of mechanical risk was considered to be too high. The increased frequency of running a number of pumps simultaneously was considered to stress both the pumps and pipes, with a corresponding increase in wear rate, thus increasing maintenance costs and reducing the lifetime of the assets. The estimated saving of R200 000 per annum on electricity costs was considered inadequate to compensate for the increased risk of mechanical failure.

Case study: An investigation into clean technology and energy efficiency for Umgeni Water

The environmental impacts of power generation from coal and the recent power outages made it essential for Umgeni Water to investigate alternative energy to supplement the current supply. A study is currently underway to investigate clean technology and energy efficiency for Umgeni Water systems. The study aims to achieve the following objectives:

- Assess Umgeni Water's energy uses and classify them in terms of intensity
- Identify services, processes and activities that can produce energy

- Propose suitable and sustainable energy alternatives
- Undertake a cost-benefit analysis of the various energy alternatives
- Recommend specifications for energy-efficient measures for the existing infrastructure and new developments.
- The energy audits of Umgeni Water offices, dams, waterworks, wastewater works and conveyance systems have been undertaken and are now awaiting a report.

Case study: Consideration of alternate sources of water supply. Over the years, effective surface water development has become more difficult to achieve as available finite resources are being depleted and the simple and inexpensive surface water development options are utilized. Further to this, water resource planning has become more complex as alternate sources of water supply have become more viable and competitive. This has led to the need to assess a variety of options when any water resource planning is undertaken.

Umgeni Water's water resource planning is aligned to current best practice and is built on the principle of Integrated Resource Planning, which considers the elements of supply management and demand management concurrently to establish the appropriate combination which will provide a sustainable long-term solution at the lowest cost where benefits to society are maximized and impacts to the environment are minimized.

Water reuse (also known as the reclamation of wastewater) and desalination of seawater are two supply options that are becoming more prevalent, and accepted globally, as viable alternatives to the construction of dams. Besides the option of water demand management, these options have been identified in the 'Water Reconciliation Strategy Study for the KwaZulu-Natal Coastal Metropolitan Areas' currently being conducted by the Department of Water Affairs and Forestry, as being possible solutions to the region's future water requirements.

Umgeni Water is currently in the process of conducting a desalination pre-feasibility study in the eThekweni area, and a reclamation assessment of the eThekweni area is also to be

conducted in the near future. These studies are important as they will indicate either the viability, or the non-viability, of these alternate water supply options when compared to the Mkomazi Water Project, which is a proposed surface water development.

An assessment is also underway to determine the reclamation potential within the Msunduzi area. All of these investigations are still at preliminary stages, and if the results look promising then a decision will need to be taken as to whether further detailed investigations should be undertaken. Any further investigations will require a fair degree of stakeholder and public engagement to ensure the social acceptability of the projects.

BULK WASTEWATER TREATMENT AND DISPOSAL

Umgeni Water owns and operates two wastewater works, namely the Darvill Wastewater Works (WWW) serving the Msunduzi Local Municipality and the Ixopo Wastewater Works, serving the Sisonke District Municipality. Umgeni Water also operates several smaller plants on an agency basis.

The performance of the wastewater works operated, managed and/or owned by Umgeni Water was assessed through the monitoring of their final effluent discharged and assessment of compliance against their respective prescribed DWAF standards for effluent. The DWAF standards used to assess compliance were:

- Darvill Wastewater Works compliance was measured against DWAF General/Special effluent discharge standards and Exemption Permit 2045B.
- Howick Wastewater Works compliance was measured against DWAF General/Special effluent discharge standards and Exemption Permit 1887B.
- Ixopo Wastewater Works compliance was measured against DWAF General Authorization General Limits.
- Albert Falls North and South Wastewater Works compliance was measured against DWAF General Authorization General Limits.

The Darvill, Howick, Ixopo, Albert Falls North and South Wastewater Works achieved 84,5%, 73,7%, 75,5%, 62,1% and 54,2% compliance respectively. The overall effluent compliance for the financial year 2007/08 was 81.1 percent, which improved significantly compared to the 2006/07 financial year (see historical wastewater works compliances in Figure13).

The non-compliant results for this financial year were attributed to several factors: at Darvill Wastewater Works operational

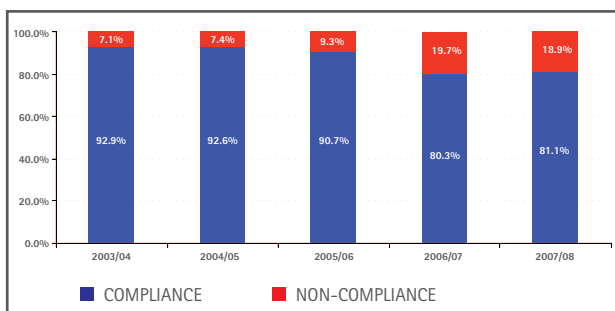


Figure 13: Historical effluent discharge compliance with standards
Note: 2006/7 Non compliance was reported incorrectly. This has been rectified in this annual report

problems, load-shedding, biologically-caused scum formation and ingress of rainfall to the Pietermaritzburg sewer network resulted in the effluent from the works not always meeting the required standards. Efforts were undertaken during the year to address these challenges and at times, water was released from Henley Dam to the uMsunduzi River in order to dilute the concentration of the problem effluent and minimize its impact on the receiving environment.

The non-compliant results recorded for Howick Wastewater Works were mainly bacteriological failures due to an undersized chlorine contact tank, and increasing this capacity remains critical. Plans developed to address this problem are under review and should be implemented in the very near future. At Ixopo Wastewater Works the non-compliant results were due to carryover of solids from a blocked clarifier affecting disinfection and suspended solids. The problem is currently being addressed.

The Albert Falls North and South Wastewater Works, both with the capacity to treat 10 to 20 Kl/day of influent, were not fully compliant with their legal requirements because of significant process equipment problems. Plans are well underway to completely refurbish the wastewater works, where the final effluent volume remained low and was directed to ponds to avoid impacts on the receiving environment.

The problems encountered and solutions undertaken at these wastewater works during the year were communicated to the Department of Water Affairs and Forestry, as the custodian of South African's water resources.

Table 14: Wastewater works compliance

2006/08 Wastewater works effluent quality target	2006/07 Performance	2007/08 Performance
>90% Effluent compliance	80,3%	81,1%

Wastewater sludge handling and disposal

Wastewater sludge disposal from Darvill, Ixopo, Howick and Albert Falls is monitored in terms of risk to the public and natural environment. The evaluation is based on planning, execution and monitoring of a sludge disposal programme at each works. Compliance at Darvill and Howick WWW has improved over the past year. However, compliance at Ixopo and small package plants remain poor.

Table 15: Sewage Sludge compliance

Year	Darvill	Ixopo	Howick	Small WWW sites (Albert Falls plants)
07 - 08	92	53	86	53
06 - 07	87	66	63	55
Excellent	Good	Acceptable	Poor	

Sewage sludge-related WWW assessment - overall % compliance in line with DWAF Guidelines (Permissible Utilisation and Disposal of Sewerage Sludge, 1997)

A new disposal site/area is in use for the Ixopo WWW sludge, and although not an environmental risk, this is not yet formalized and needs some attention, hence the reduced rating.



SOCIAL PERFORMANCE

EMPLOYMENT

The 2007/08 financial year was a successful year for the organization due to the development of the new Human Resources (HR) Strategy that forms a component of the Corporate Business Plan. The strategy document was developed following consideration of the operating environment and the organization's vision, mission, strategies and plans. It was discussed and finalized after input from the stakeholders within the organisation.

The strategy identified seven human resources focus areas, as indicated below, and developed specific objectives for each. These objectives were further translated into action plans in order to ensure they have the kind of people and people programmes

needed to implement the business plan. HR policies and procedures were reviewed and aligned to the HR Strategy, legislation and best practices. Focus areas included:

1. Workforce planning
2. Recruitment, retention and engagement of staff
3. Reward and recognition
4. Employment practices and systems
5. Work/life balance
6. Staff skills development
7. Communication and consultation.

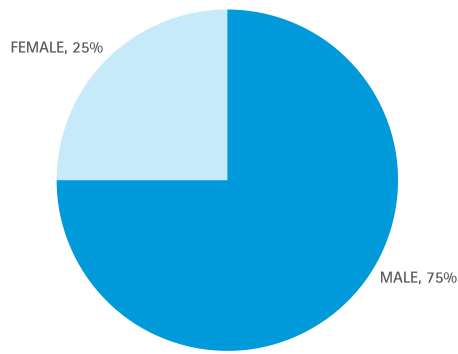
Staff complement

The organization employed a total number of 726 permanent employees during this reporting period. They were complemented by 19 contract staff, 10 inspectors-of-work and 18 In-Service and Graduate Trainees. Staff demographics according to race and gender are depicted in the table below

Table 16: Staff demographics

	MALE				FEMALE				GRAND
	Indian	African	Coloured	White	Indian	African	Coloured	White	TOTAL
Top management (02-03)		3						1	4
Senior management (04-05)	4	5	1	3	3	2	1		19
Professionally qualified and experienced specialists and mid-management (06-07)	30	39	5	20	14	26	1	6	141
Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents (08-12)	40	137	11	33	9	40	1	6	277
Semi-skilled and discretionary decision-making (13-16)	16	167	3	3	16	35	5	7	252
Unskilled and defined decision-making (17-18)		28				6			34
Total permanent	90	378	20	59	42	109	8	20	726
Non-permanent employees	6	21	2	8	1	9			47

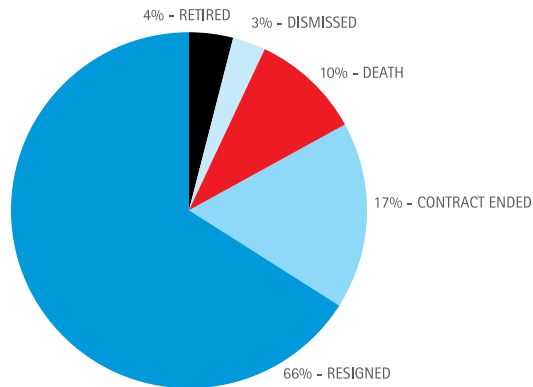
EMPLOYMENT STATUS BY GENDER



Staff Turnover

The organization experienced a staff turnover of 78 employees out of a staff complement of 773. This turnover translates to 10% against an industry benchmark of 13%.

LABOUR TURNOVER



LABOUR RELATIONS

All collective bargaining and discussions with the recognized union NEHAWU take place in the Management and Union Committee Forum in terms of the Collective Recognition Agreement between the parties. Matters of mutual interest are also deliberated in this forum. Meetings are scheduled on a quarterly or on a needs basis. The total number of employees belonging to NEHAWU is 485, of whom 419 fall within the bargaining unit and 66 outside

NEHAWU MEMBERSHIP FOR 2007/8 FINANCIAL YEAR

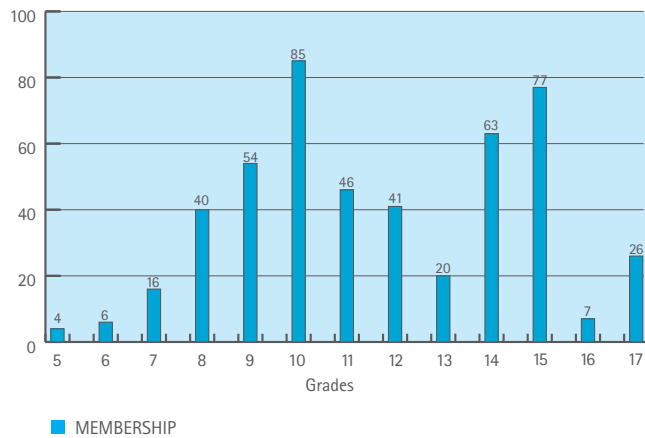


Figure 14: Umgeni Water employees belonging to NEHAWU according to grades

WELLNESS PROGRAMME

Umgeni Water subsidises contributions and membership of the medical aid fund is compulsory for all employees. In an effort to reflect Umgeni Water's commitment to the health and well-being of its employees, Umgeni Water's Wellness Programme together with the medical aid service provider, Bonitas medical aid organised a wellness event in February 2008.

Bonitas provided sponsorship, which enabled the participation of various service providers on the Wellness Day to render services ranging from education, awareness, counselling and preventative treatment of ailments. 75% of employees attended the event to experience the programmes offered on the day.

The Occupational Health Clinic at Umgeni Water renders a comprehensive occupational, preventative and curative care services programme, and access to the clinic is open to all Umgeni Water employees. All employees undergo pre-employment, annual and exit medical screening related to their work situation in order to detect occupational disease at an early stage.

HIV/ Aids management

Umgeni Water has reviewed and aligned its HIV/AIDS Policy to the best practice in HIV/AIDS management and new developments in legislation. The policy was first developed and adopted in 1991, before being revised in 2006. The ongoing Voluntary Counselling and Testing (VCT) Programme creates an opportunity for employees to understand current developments related to HIV/AIDS. The VCT Programme is managed by a team of Occupational Health Medical Practitioner and Occupational Health Nursing Practitioners, who conduct awareness campaigns and counselling, and provide advice to the infected and affected. The team also organizes activities for commemorating 'World AIDS Day', which is planned every year in line with the World Health Organization theme.

Due to the sensitive nature of HIV/AIDS and the confidentiality issues, it is not possible to keep a record of HIV/AIDS prevalence within the organization. However, through its partnership with Bonitas Medical Aid, Umgeni Water received a report detailing statistics related to HIV/AIDS in the organization. The Bonitas Medical Fund's registration reflected a registration of 6,5% of total members, which is below the national average of 11,3%. The age distribution of Umgeni Water indicates that a high number of these staff fall between the ages of 30 to 45 years, statistically the most affected age group.

TRAINING & DEVELOPMENT

Employee training and development provides the framework for helping employees to develop their personal and organizational skills, knowledge, and abilities. Human Resource Development provides opportunities for employee training, employee career development, performance management and development, coaching, succession planning, key employee identification, tuition assistance, and organization development.

Employee training and development is a key factor in meeting the organization's strategic, business and operational goals. During the reporting period 653 employees attended 29 technical, legal and generic courses.

The following list the most important forms of training and development programmes available at Umgeni Water:

- *Employee-assisted education programme.*

This gives financial assistance to all staff studies including Matric to MBA courses. During this reporting period 78 employees participated in and completed courses including, for example, B Tech in Human Resources, B Tech in Chemistry, Project Management, N3 Water Treatment as well as Masters in Business Leadership.

- *Job-specific training:*

Legal requirement training, involving safety-related training programmes that were also conducted during this reporting period. These training programmes create awareness and ensure compliance in terms of the Occupational Health and Safety Act.

- *In-service training.*

This is described as work-integrated learning that is a formal requirement for a learner to complete a desired qualification. In-service training is offered by companies that offer similar technical expertise. Eighteen learners have completed and graduated through this programme.

- *Operator Activated Sludge Skills Programme.*

Twenty-three Employees completed the Programme and submitted Portfolios of Evidence. The programme was a collaboration between Umgeni Water and Pro-Meetse Et Environmental Services Africa, which is accredited by Energy Seta. This programme aims at creating career paths for employees and providing opportunities to people who were previously disadvantaged.

A total of 659 (91% of staff) Individual Development Plans were linked to training programmes which took place during this reporting period.

DIVERSITY AND EQUAL OPPORTUNITY

Umgeni Water embraces the drive towards ensuring that the organization reflects a true representation of the country's demographics, and has adopted the practice and policies of Employment Equity in it's drive to achieve diversity and equal opportunity in the workplace.

The organizational employment equity status by age, race and gender as at the reporting period was as follows:

Board members - June 2008			
	Female	Male	Total
Asian		1	1
Black	3	5	8
Coloured			
White		1	1
Grand total	3	7	10

PERMANENT EMPLOYMENT STATUS BY AGE AND RACE

AGE GROUP	MALE					FEMALE					GRAND TOTAL
	ASIAN	BLACK	COLOURED	WHITE	MALE TOTAL	ASIAN	BLACK	COLOURED	WHITE	FEMALE TOTAL	
21-30		26	2		28	10	31	1	1	43	71
31-40	26	100	7	9	142	18	45	2	2	67	209
41-50	43	155	6	24	228	12	26	5	9	52	280
51-60	18	84	3	19	124	2	6		7	15	139
61-70	2	13	2	7	24	1	1		1	3	27
GRAND TOTAL	89	378	20	59	546	43	109	8	20	180	726
					75%					25%	100%

In compliance with the Employment Equity Act, Umgeni Water submits annually employment equity plans along with employment equity reports and income differential statements to the Department of Labour.

SUPPLY CHAIN MANAGEMENT

During the current year, the Government Supply Chain Management framework was adopted as best practice, and progress to date towards achieving full implementation is as follows:

- Approval of Supply Chain Management (SCM) policy and procedures
- In compliance with SCM framework, Bid committees have been established and their Terms of References have been approved. These are provided in the table below
- Introduction of a supplier performance management system. Supplier performance reviews are held to evaluate key performance indicators such as quality, delivery, service and cost reduction measures
- Classification of suppliers per business sector
- Review of SCM organizational structure to enhance efficiencies and improve response to customer requirements.

Table 17: SCM Committees

Committee	Responsibility
Bid Specification Committee	Approval of specifications and evaluation criteria
Bid Evaluation Committee	Evaluation of bids in line with approved criteria
Bid Adjudication Committee	Awarding of bids
Disposal Committee	Disposal of assets

Supplier development

Supplier development areas are identified through the supplier performance management system. Targeted initiatives aimed at supplier development are then introduced, i.e. suppliers requiring the same developmental intervention are grouped together and a supplier forum is held to directly deal with their requirements.

During the year under review, the following interventions were implemented:

- Shorter payment cycles to assist SMME's
- Meetings to discuss supplier performance improvements
- Supplier forum to explain Umgeni Water's SCM policy and procedures
- Referring suppliers to relevant organizations for assistance.

Challenges and opportunities

The key challenges and opportunities that will be addressed in the following financial year include:

- Standardization of contract documentation
- Business processes and guidelines to be refined to enhance the Supply Chain Management processes

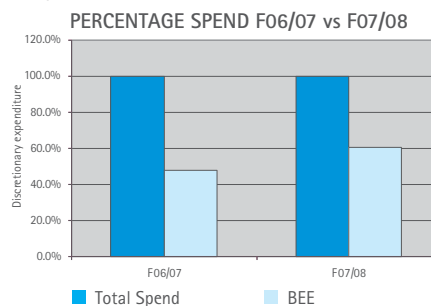
- The contracts management section to be enhanced to effectively deal with contact renewal and administration.

ECONOMIC PERFORMANCE

Other Economic indicators are reported in the financial report

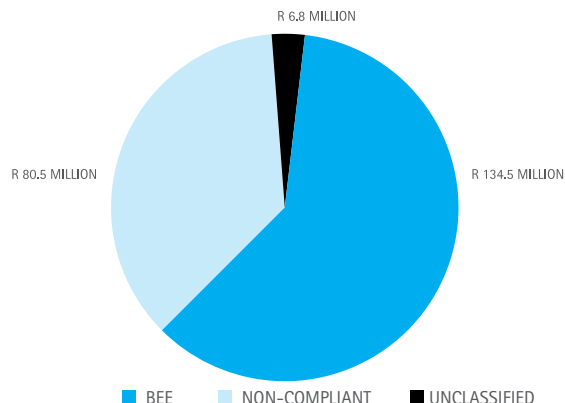
BLACK ECONOMIC EMPOWERMENT (BEE)

The BEE policy is being reviewed to align it to the Broad-based Black Economic Empowerment Codes of Good Practice. For tender evaluation purposes, Umgeni Water complies with the Preferential Procurement Policy Framework Act 5 of 2000, wherein points are awarded for women, Historically Disadvantaged Individuals (HDI) and disabled persons.



In order to measure the contribution to BEE per sector, Umgeni Water introduced the classification of suppliers per business sector. During the year under review, a target to achieve 55% of BEE spend against total procurement spend was set.

PERCENTAGE OF EIA'S CARRIED OUT IN-HOUSE



WORLD ENVIRONMENT DAY

5th JUNE 2008

Kick the CO₂ Habit. Towards a low Carbon economy

ASSESS WHERE YOU STAND AND MAKE A COMMITMENT TO:

DE-CARBON YOUR LIFE
Reduce Recycle Re-use

KICK THE CO₂ HABIT!

GET ENERGY EFFICIENT
Save Electricity
Save Water
Save the Environment

HEAD OFFICE
Continental Education Services
PO Box 11, Rosebank, 2190
Tel: 0212 841 514 / Fax: 0212 841 515

LIMPOPO
Limpopo Education Services
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Tel: 0212 841 514 / Fax: 0212 841 515

SABHAH HERIOTS
Limpopo Education Services
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