

WATER AND WASTEWATER QUALITY

Water and Wastewater Quality Performance at uMgungundlovu District Municipality

uMgungundlovu District Municipality as both Water Services Authority and Water Services Provider supply potable water to six local municipalities in its designated operational area. Potable water supplied to these LMs is monitored as per monitoring programme which is reviewed annually in line with water safety plan. The municipality has also six wastewater treatment works which are maintained by Umgeni Water on behalf of the District Municipality. Final effluent from these wastewater treatment works is also monitored as per the monitoring programme. Together with Umgeni Water, the municipality developed wastewater risk abatement plan so as to minimise the risk associated with poor performance of the wastewater treatment works. Both water and wastewater quality results are uploaded on monthly basis on Department of Water and Sanitation websites, which are <http://ws.dwa.gov.za/IRIS/mywater.aspx> and www.dwa.gov.za/dir_ws/gds for community, regulatory authorities and stakeholders to access.

Blue Drop certification

Since the inception of the Blue Drop certification programme, the municipality has been showing an improvement in the management of drinking water quality (Figure 1). In 2012, the municipality was successful to achieve Blue Drop status. Again in 2014, the municipality was able to retain its Blue Drop status through bulk water supply systems and this is an indication of commitment shown by the municipality towards better service delivery.

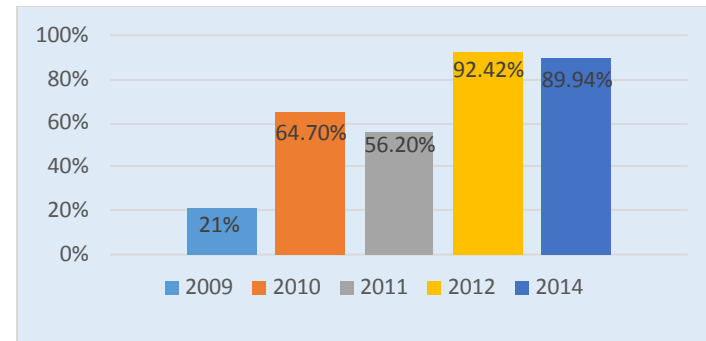


Figure 1: Municipal Blue Drop scores

Note: The last Blue Drop assessments were conducted in 2014.

Green Drop certification

There have been only three Green Drop assessments since it was introduced in 2008. Figure 2 below shows that after receiving the unfavourable score of 27% in 2009, best practices for wastewater quality management were put in place which resulted to an improved scores in the subsequent assessments. The municipality is working towards achieving Green Drop status in future.

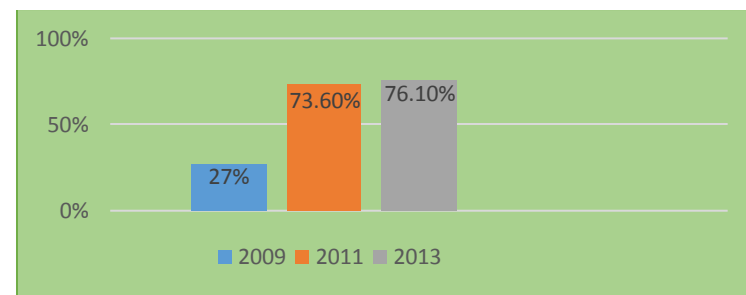


Figure 2: Municipal Green Drop scores

Note: The last Green Drop assessments was conducted in 2013

Water Quality Performance

Potable water quality is now required to comply with SANS 241:2015 that requires quality to be evaluated and reported against five categories which are Acute health microbiological, Acute health chemical, Chronic health chemical, Aesthetic and Operational. SANS 241:2015 classify drinking water quality supplied to the population of up to 100 000 as follows:

- Acute health microbiological -: Excellent ($\geq 97\%$), Good ($\geq 95\%$), Unacceptable ($< 95\%$).
- Acute health chemical -: Excellent ($\geq 97\%$), Good ($\geq 95\%$), Unacceptable ($< 95\%$).
- Chronic health chemical -: Excellent ($\geq 95\%$), Good ($\geq 93\%$), Unacceptable ($< 93\%$).
- Aesthetic -: Excellent ($\geq 93\%$), Good ($\geq 90\%$), Unacceptable ($< 90\%$).
- Operational -: Excellent ($\geq 93\%$), Good ($\geq 90\%$), Unacceptable ($< 90\%$).

Table 1: Portable water quality compliance (%) for water supply systems (January 2017 – December 2017)

Water Supply System	Acute Health Microbiological	Acute Health Chemical	Chronic Health Chemical	Aesthetic	Operational
Appelsbosch	99	-	94	98	90
Boreholes	97	100	96	100	98
Gomane	82	100	93	100	100
Impendle	84	100	100	100	92
Lidgetton	96	100	100	99	97
Makeni	94	100	99	92	70
Mpofana	100	100	100	100	97
Mtulwa	92	100	100	94	81
Ntanzu	100	-	-	100	100
Nzinga	96	100	100	98	81
Rosetta	100	100	98	98	99
Umgeni	99	100	100	100	99

Microbiological quality: - Water quality at Mtulwa, Makeni, Gomane and Impendle did not meet the requirements. The main cause for microbiological failure include power shortage, failure of dosing pumps, inadequate chlorine contact time and high raw water turbidity due to high rainfalls. In line with incident management protocol, when these failures were detected, corrective majors were put in place and resampling conducted to confirm the results. The municipality also conducted plant audits and water safety plan to improve the performance of these plants. Mtulwa and Makeni will be replaced by uMshwathi regional bulk water supply in near future for sustainable water supply. There are also plans for constructing Impendle bulk water supply scheme.

Chemical quality: - Gomane borehole has a problem of arsenic that exceeds acceptable limit. In response to this problem, the municipality installed arsenic removal system and is currently reducing the arsenic levels to an acceptable limits. Arsenic failure during the assessment period was due to operational issues and the problem was attended to. The plant is now closely monitored to ensure that water quality is always within acceptable limits. With regards to Appelsbosch plant, one sample was found to have slightly elevated manganese. In response to this, process was optimised to improve the performance of the plant.

Aesthetic quality: - With regards to aesthetic water quality, only Makeni plant that is below the acceptable limit due to iron that was detected and slightly elevated turbidity. The plant is currently being closely monitored. It should be noted that some of these failures were mainly due to heavy rains that contaminated the stream which is used for raw water abstraction. This plant will be decommissioned once uMshwathi bulk secondary scheme is completed.

Operational: - The operational compliance has shown an improvement comparing to 2016 assessment period. Some of noncompliance in Makeni, Mtulwa and Nzinga were due to elevated turbidity and aluminium. In response

to this, process is closely optimised and if water quality is found not to be suitable for human consumption, water is not distributed to the community till water quality improves to an acceptable standards. It should also be noted that sometimes elevated turbidity is due to burst pipes which contaminates water.

Wastewater Quality Performance

According to Green Drop requirements, effluent quality with a score of 90% and above is seen as compliance. Based on the overall score for performance of each wastewater treatment works, Mooi River, Howick and Richmond wastewater treatment works are the lowest in terms of the performance comparing to the rest of other plants. Each of them scored below 90% which indicates that interventions need to be put in place in order for them to improve their performance.

Table 2: Wastewater quality compliance against applicable discharge limits (January 2017- December 2017).

Wastewater Treatment Systems	Microbiological	Physical	Chemical
Appelsbosch	91%	97%	86%
Camperdown	75%	100%	96%
Cool Air	88%	100%	100
Howick	77%	89%	94%
Mooi River	88%	83%	94%
Richmond	54%	97%	92%

Mooi River wastewater treatment works is hydraulically overloaded. It is currently receiving influent above its design capacity. In spite of this, it should be noted that this plant has improved its performance comparing to the results

for the previous year. There are plans for upgrading this treatment works as a long term solution.

Non-compliance of Howick wastewater treatment works is due to insufficient aeration, cause by mixers, failure of aerators, high suspended solids carry over and scum in the chlorine contact tank. There are proposed plans for improving the performance of Howick wastewater works.

Performance of Richmond treatment works was affected by both operational issues and aging infrastructure. Poor design of chlorine contact time has led to poor disinfection process as there is no enough contact time. Poor performance of the clarifier has led to the carryover of the solids. In response to these problems, clarifier was repaired. There are plans for improving the performance of the chlorine contact tank and drying beds.