

Provincial Best Performer

Mookgophong Local Municipality and Polokwane Local Municipalities share the position as best performing municipality in Limpopo Province:

Polokwane:

- ✓ 68.2% Municipal Green Drop Score
- ✓ 100% improvement on 2009 Green Drop status
- ✓ 100% of plants in low and medium risk positions
- ✓ 53% Site Inspection Scores

Mookgophong:

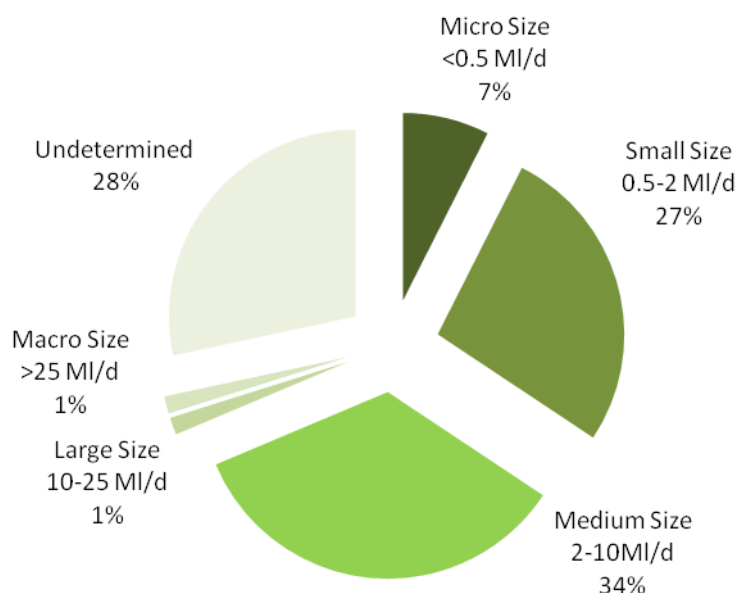
- ✓ 68.2% Municipal Green Drop Score
- ✓ 100% improvement on 2009 Green Drop status
- ✓ 100% of plants in low and medium risk positions
- ✓ 58% and 61% Site Inspection Scores



Introduction

Wastewater services delivery is performed by eleven (11) Water Services Authorities in Limpopo via an infrastructure network comprising of 67 wastewater collector and treatment systems.

Distribution of WWTPs in Limpopo



A total flow of 123 ML/day is received at the 67 treatment facilities, which has a collective hydraulic design capacity of 150 ML/day (as ADWF). This means that 82% of the design capacity is taken up by the current operational flows, leaving a 18% to meet the future demand without creating new capacity. However, the findings of the Green Drop assessment suggest that a significant portion of surplus capacity might not be 'readily available', as result of inadequate maintenance and operational deficiencies at lower capacity municipalities.

	MICRO SIZE <0.5 Mℓ/day	SMALL SIZE 0.5-2 Mℓ/day	MEDIUM SIZE 2-10 Mℓ/day	LARGE SIZE 10-25 Mℓ/day	MACRO SIZE >25 Mℓ/day	Undetermined	Total Mℓ/day
No of WWTPs	5	18	23	1	1	19	67
Total Design Capacity (Mℓ/day)	1.8	14.8	97.1	11.7	25	19	150.4
Total Daily Inflows (Mℓ/day)	0.6	3.5	93.0	8	18	48	123.2

*ADWF = Average dry Weather Flow

WWTP = Wastewater Treatment Plants

Provincial Green Drop Analysis

Analysis of the Green Drop assessments and site inspection results indicate that performance vary from excellent to unsatisfactory. A total of **100% municipalities** were assessed during the 2010/11 Green Drop Certification.

GREEN DROP COMPARATIVE ANALYSIS			
Performance Category	2009	2010/11	Performance trend
<i>Incentive-based indicators</i>			
Number of municipalities assessed	4 (31%)	11 (100%)	↑
Number of wastewater systems assessed	7	67	↑
Average Green Drop score	18%	24.3%	↑
Number of Green Drop scores ≥50%	0 (100%)	10 (15%)	↑
Number of Green Drop scores <50%	6 (100%)	57 (85%)	↑
Number of Green Drop awards	0	0	→
Average Site Inspection Score	N/A	21%	N/A
PROVINCIAL GREEN DROP SCORE	N/A	24%	N/A

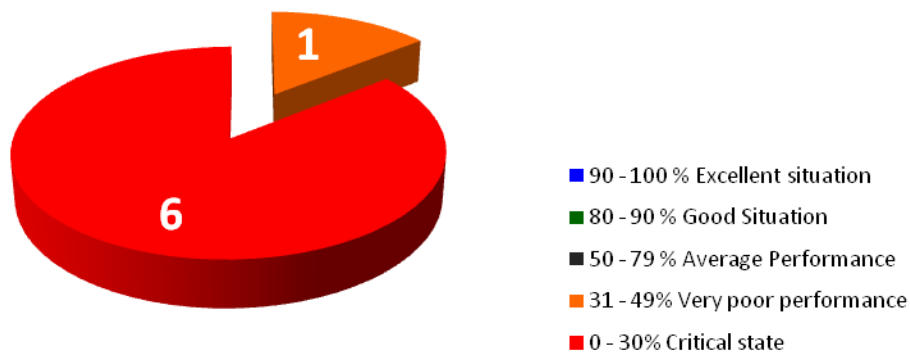
N/A = Not applied

↑ = improvement, ↓ = digress, → = no change

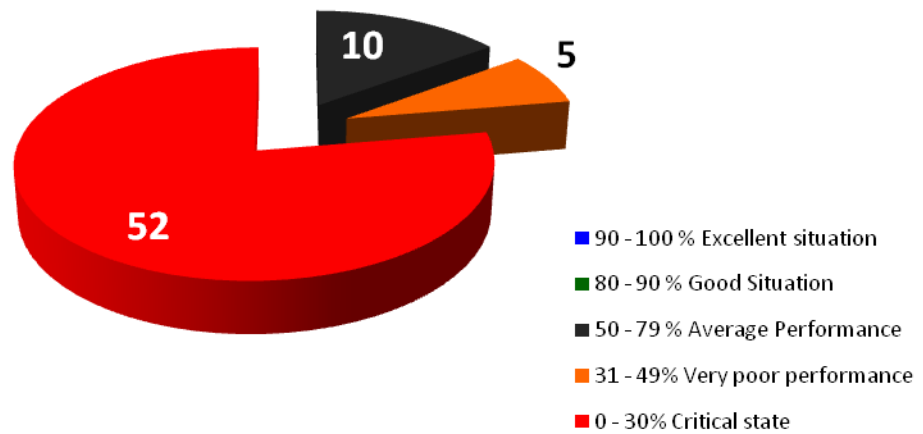
The 100% assessment coverage included a total of 67 wastewater systems for Limpopo. This assessment coverage serves as affirmation that awareness and renewed commitment by municipal management is forthcoming, although it lags slightly behind the more progressive provinces. Through the current Green Drop process, municipalities are renewing their operational baselines and reprioritise their plans with the primary objective of raising the current performance status in terms of municipal wastewater management. The incentive-based regulatory approach succeeds to act as a positive stimulus to facilitate improved performance and public accountability, whilst establishing essential systems and processes to sustain and measure gradual improvement.

Whereas only no system obtained Green Drop scores ≥50% in 2009, 10 systems obtained more than 50% in the current Green Drop cycle. The majority of systems (57) lies in the lower scoring bracket of <50%, indicating that much needs to be done to raise the performance standard in the Province. The average GDC score increased from 18 to 24%, showing an improvement on averages. The regulatory opinion is that performance of the Province as a whole is weak, as reflected by the average Municipal Green Drop Score of 24%.

Green Drop Assessment Results: 2009



Green Drop Assessment Results: 2010 / 11



When comparing 2010/11 Green Drop results with 2009, the following trends are observed:

- ✓ 60 more systems were assessed in 2010 (7) compared to 2009 (67)
- ✗ 0 systems achieved Green Drop Certification, indicating that no systems are considered 'excellent' (>90%)
- ✓ 100% of assessed systems were in 'very poor to critical' in 2009 compared to 85% in 2010/11
- ✓ 0% systems were in 'average performance state' in 2009 compared to 15% in 2010/11.

Provincial Risk Analysis

The Green Drop requirements are used to assess the entire value chain involved in the delivery of municipal wastewater services, whilst the risk analyses focus on the treatment function specifically.

CUMULATIVE RISK COMPARATIVE ANALYSIS			
Performance Category	2009	2010/11	Performance trend
<i>Risk-based indicators</i>			
Highest CRR	18	22	↑
Average CRR	14	16	↑
Lowest CRR	8	7	↓
Average Design Rating (A)	18.8	18.6	↓
Average Capacity Exceedance Rating (B)	4.2	4.7	↑
Average Effluent Failure Rating (C)	6	7.8	↑
Average Technical Skills Rating (D)	3	2.7	↓
AVERAGE % DEVIATION FROM maximum-CRR	77.7	85.0	↓

N/A = Not applied

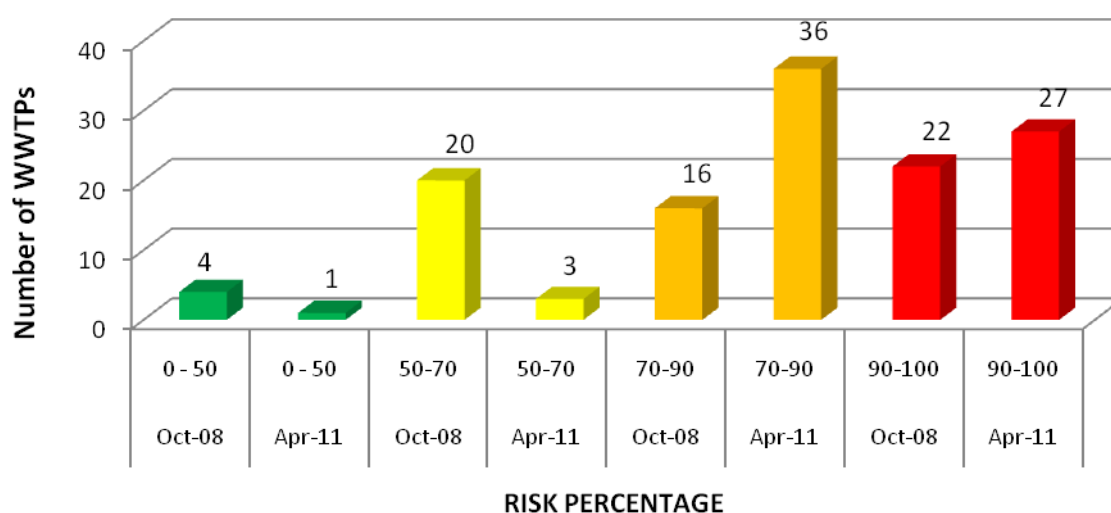
↑ = digress, ↓ = improvement, → = no change

From the above table, it can be observed that the Province has been unsuccessful in stalling the apparent digress in wastewater treatment performance. The highest CRR increased from 18 to 22, which lifts the average CRR from 14 to 16. This is an alarming trend that indicates that efforts need to be up-scaled and a different strategy need to be deployed in the Province to stall (and turnaround) plants that continue to slide into higher risk positions. These municipal treatment plants are clearly identified in this Chapter under “*Regulatory Impression*”.

The CRR analysis further points out that insufficient effort has been made to address the four risk elements in the Province. Most Provinces show at least one pertinent area of improvement, e.g. technical skills were addressed in Free-State, capacity has been created in Gauteng, etc. However, Limpopo requires fundamental and pragmatic planning to start to move in a positive direction pertaining to the treatment of wastewater. It is possible that the overall improvement in Green Drop trends might signify the beginning of a turnaround for treatment facilities as well. Unfortunately, water resources and public health will suffer whilst the Province gears itself to commence with higher urgency to close the gaps.

The following trend bar-chart paints a bleak picture for wastewater treatment in Limpopo. Most of the plants have moved into high and critical risk position. Only **4 plants** in the entire Limpopo still reside in low and medium risk space, with all other **63 plants** in high- and critical risk landscape. This trend is beyond disquieting and raises serious regulatory alarms. Experience has learnt that the cost and specialist resources are much higher to address critical risk scenario, compared to earlier interventions when detecting early warning signals of a plant moving into distress. A different strategy and turnaround plan would be required for Limpopo to recover from this atrocious state.

Risk Profile: CRR as % of CRRmax



% Deviation = CRR/CRR(max) TREND	90 – 100% Critical risk WWTPs	
	70 - <90% High Risk WWTPs	
	50-<70% Medium risk WWTPs	
	<50% Low Risk WWTPs	

As all plants, except 4, reside in **high and critical risk** boundaries, and therefore this Report will not publish the full list. It suffices to say that the only plants that do not present an immediate public and environmental risk within their areas of service are:

- Modimolle WWTP (Modimolle LM)
- Naboomspruit WWTP (Mookgophong LM)
- Tzaneen (Mopani LM)
- Warmbaths (Bela Bela LM)

The following summary indicates the level of risk incurred by each LM, whereas Vhembe DM takes the top position with regard to municipal average CRR variation position. Mookgophong is the only WSA which does not hold a high- or critical risk position in Limpopo.

Priority	WSA Name	Average CRR/CRRmax % deviation
1	Vhembe DM	90%
2	Mopani DM	88%
3	Mogalakwena LM	88%
4	Greater Sekhukhune DM	87%
5	Capricorn DM	81%
6	Lephalale LM	80%
7	Bela Bela LM	80%
8	Modimolle LM	75%
9	Thabazimbi LM	74%
10	Polokwane LM	73%
11	Mookgophong LM	50%

	Critical risk
	High risk
	Medium risk

Conclusion

The Green Drop results for 2010-2011 indicate that municipal wastewater management in Limpopo is not in a good state and is not on par with national benchmarks. Most of the treatment plants have moved in high- and critical risk state, which will require strategies and interventions of unusual nature, with resources to back up any plans. The regulatory opinion is that performance of the Province as a whole is weak, as reflected by the average Municipal Green Drop Score of 24%. Limpopo Province is therefore taking a position as one of the lower performing provinces on the Provincial Performance log.

The positive message from the Green Drop results is that a definitive awareness momentum is building and all municipalities are on board with their performance portfolios. The 100% assessment coverage has resulted in a confirmed baseline, from where progress can now be monitored and positive pressure be applied. The viewpoint of the regulatory is straightforward: “a municipal authority is in power to serve and render services of quality to its communities; if it fails continuously to do so, regulatory intervention will resort to all means necessary to bring resolve to unacceptable situations”.

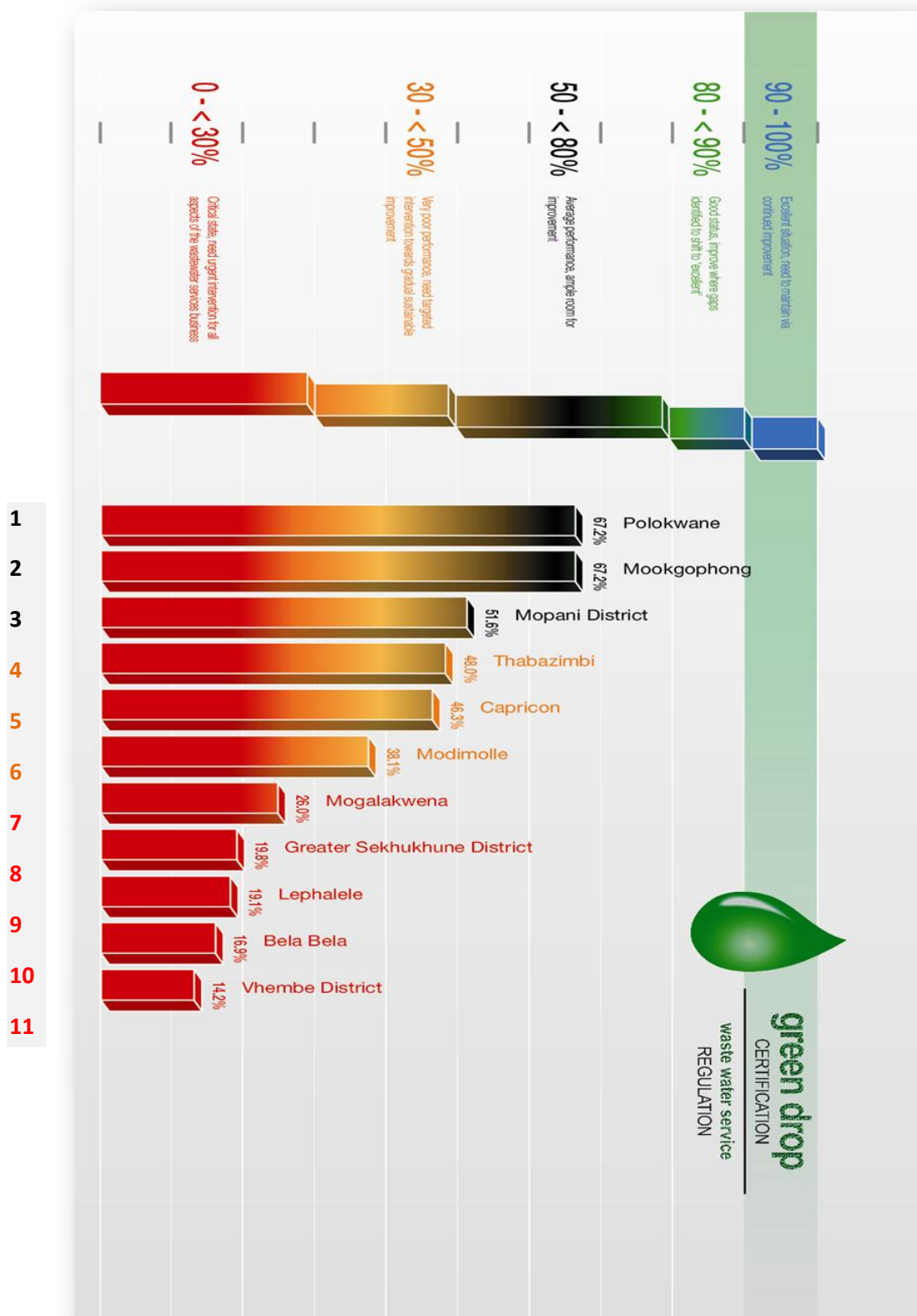
No Green Drop Certificates are awarded in the Province of Limpopo.

“If you are to achieve excellence in big things, you develop the habit in little matters. Excellence is not an exception, it is a prevailing attitude”

Charles R. Swindoll

Performance Barometer

The following log scale indicates the various positions that municipalities hold with respect to their individual Municipal Green Drop Scores:



Performance Area	Systems	Pienaarsrivier	Radium	Warmbaths
Process Control, Maintenance & Management skills		38	68	55
Monitoring Programme		0	60	60
Credibility of Sample Analyses		0	55	25
Submission of Results		0	0	25
Wastewater Quality Compliance		5	5	0
Failure Response Management		14	0	0
Bylaws		20	20	20
Treatment & Collector Capacity		0	0	18
Asset Management		15	15	15
Bonus Scores		0	0	0
Penalties		3	3	3
Green Drop Score (2011)		2.4% (↑)	21.2% (↑)	17.3% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	3.2
Treatment Capacity (ML/d)		NI	NI	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		16	16	11
% i.t.o. Maximum Risk Rating		88.9% (↑)	88.9% (↑)	61.1% (→)

NI - No information NA- Not assessed

Regulatory Impression

The Bela Bela Local Municipality has performed unsatisfactory during the Green Drop assessments indicating that the wastewater services are not being managed according to the expectations of the regulation programme. The Green Drop requirements are largely not being met, resulting in an overall municipal score of 16.9%. The most prominent gaps are to be found across all aspects of wastewater management in the case of the Pienaarsrivier system. Whilst Radium and Warmbath shows a slightly elevated GDC score, the gaps are still pertinent in scientific services (sampling, submission of results, data credibility, effluent quality), as well as management systems such as incident response management, planning, systems and procedures aspects, as well as Bylaw enforcement and asset management. The lack in monitoring persist on almost all levels, ranging from plant operations and repairs logging to daily flow measurements to financial aspects. As result of the non-monitoring in effluent quality, all 3 plants fail on the critical criterion of % compliance to national legislation, and thereby continue pose a significant risk to the receiving environment and public health.

The fact that Bela Bela submitted its existing evidence on practice and compliance to be assessed, is significant and encouraging. The regulatory view point is that the WSA should use this undesirable baseline and inadequate performance to identify the key gaps in its water services delivery function and to address those in a risk-based approach. In doing so, such action will be rewarded by an improved score in the GDC 2011/12 cycle. In terms of the municipality's risk profile, the CRRs show continued digress in 2 of the 3 treatment plants. Both Pienaarsrivier and Radium are in **high risk** space, which compound the low municipal score and unsatisfactory findings of the technical inspection.

The Regulator is not satisfied with the overall performance of wastewater services management in Bela Bela. The WSA is to submit a Corrective Action Plan to DWA within 30 days of release of the Green Drop Report.

Green Drop Findings:

1. Three of the 3 wastewater treatment works does not monitor flow and are unable to measure if the plant capacity is still sufficient for the daily operational flow.
2. The continued functioning of these works is completely unsustainable, and in the absence of a registered skilled team with appropriate resources, planning should revolve around robust basic technology which could deliver upon the required effluent quality standards.
3. None of the 3 plants could present sufficient monitoring records on operational, compliance and catchment monitoring.
4. Inadequate scientific services are a major shortcoming, and include aspects of data credibility, submission of results and the 0-5% effluent quality non-compliance.
5. In such circumstances as described above, it is disconcerting that no incident response management is in place, as the WSA will not have the means or preparedness to deal with emergency or disaster events.
6. The lack of asset management and planning of collection and treatment infrastructure is a major shortcoming for all systems in Bela Bela.

Site Inspection Score

Warmbaths 16%

The Warmbaths treatment plant was inspected to verify the green Drop findings:

- The plant is in a poor state, with foul odours, burnt grass prevents easy plant access. This type of ground maintenance is associated to a lack of equipment and budgetary constraints
- The consulting firm did not respond to the WSA's requests to provide site O&M Manuals
- No operational monitoring equipment is available – monthly samples are taken for compliance monitoring – rendering the process controllers without means to make process adjustments
- Flow meter is available at the inlet works and is not calibrated or functional since 14-07-2010
- Primary settling are hugely compromised by dysfunctional pumps – situation ongoing for >4 months and the tanks have turn anaerobic and septic. The sump is also sludge up.
- Three biofilters in place: 1st biofilter has been recently constructed, but has never worked; 2nd biofilter is not operating effectively; 3rd is not operating due to the broken motor which pumps effluent to the division box to the biofilter. Subsequently, all flow is diverted to one biofilter, resulting in an overloaded filter with poor effluent quality
- In addition, the biofilters' civil structure are not good and not well maintained - severe cracks
- Four humus tanks are functional but not producing good quality effluent
- Return activated sludge pumps are not functioning
- No disinfection is taking place, as the previous practice of chlorine chips were discontinued and never replaced with 'something effective'
- Despite the good civil structural condition of the anaerobic digesters, both reactors have been out of commission for 4 years – as result of the sludge mixers not being repaired
- No sludge drying beds exist, thus leaving the plant with NO MEANS of sludge handling - sludge are discharged to open land and sacrificially buried.



Unmaintained state of primary settling tanks (left) and dysfunctional (newly constructed) biofilter (right) - result in substandard effluent quality being discharged to the receiving environment

Municipal Green Drop Score:

46.3%

Performance Area	Systems	Alldays	Semwabarwana	Lebowakgomo
Process Control, Maintenance & Management skills		20	18	63
Monitoring Programme		0	14	49
Credibility of Sample Analyses		60	81	91
Submission of Results		0	0	25
Wastewater Quality Compliance		20	20	20
Failure Response Management		0	0	0
Bylaws		70	70	40
Treatment & Collector Capacity		43	70	50
Asset Management		57	85	85
Bonus Scores		1.5	1.5	8.3
Penalties		0	0	0
Green Drop Score (2011)		28.8% (↑)	38.0% (↑)	51.0% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	10%
Treatment Capacity (MI/d)		0.6	0.45	3
Operational % i.t.o. Capacity		NI (assume >100%)	140%	167%
Cumulative Risk Rating (CRR)		14	13	17
% i.t.o. Maximum Risk Rating		77.8% (↓)	72.2% (→)	94.4% (↑)

NI - No information

NA- Not assessed

Regulatory Impression

The Capricorn Local Municipality has performed unsatisfactory during the Green Drop assessments indicating that the wastewater services are still not being managed according to the expectations of the regulation programme. However, the municipality is to be commended for presenting their evidence to gain insight into their performance as gauged against the Green Drop requirements. When analysing the municipal score of 46.3%, specific aspects can be identified to address the low GDC scores in a prioritised manner. The results indicate that the main shortcomings being technical skills, hydraulic overload of systems, monitoring and effluent quality compliance. The lack of essential managerial procedures such as incident response protocol and bylaw implementation is disconcerting.

Steps taken by Capricorn to secure funding for plant upgrades and implementation of technical assessment findings are positive developments. Robust technologies that do not employ high sophistication levels and specialist control knowledge may be the most appropriate match to the current WSA capabilities.

The regulator is concerned about the continued negative trend for the Lebowakgomo treatment plant, which is now moving towards a **critical risk** position (CRR_{max}). This is mostly due to the 167% overload of the plant, resulting in poor effluent quality.

Green Drop Findings:

1. Two of the 3 wastewater treatment plants operate in excess of its design capacity, whilst one plant is not monitoring operational flows. The continued functioning of these works is unsustainable.
2. Three out of 3 treatment plants do not have adequate monitoring of process and compliance points in place. This transgression is further compounded by having a poor record of submission to the water authority.
3. 20% compliance against the requirement dealing with 'Compliance' translates to substandard quality effluent being discharged to the environment.
4. Underlying above symptoms and evidence of poor performance, is possibly the lack of skilled staff at all plants, but more so at the smaller Alldays and Semwarbawana plants.

Site Inspection Score

Lebowakgomo 58%

Site inspection of the Lebowakgomo plant confirms the Green Drop findings(WSP Lepelle Nkumpi LM):

- The terrain is in a reasonable condition with grass burnt, clean buildings, organised supervisor office and adequate visitor's access control
- No maintenance records and limited operational recording in place
- Samples are sent to Polokwane Laboratory, but operational equipment has been acquired for the upgraded plant and existing practice is said to improve in future
- The assessors found the supervisor to have a fair knowledgeable on the process and plant
- However, limited process control takes place on the activated sludge plant – attempts are made to maintain the sludge age at 30 days via daily sludge wasting
- Sludge drying beds are not properly maintained, and sludge are not classified
- Plant is overloaded, and upgrade to 6 ML/day ASP is planned.



Inadequate process control, with severe scum formation and short circuiting in the anaerobic basin of the activated sludge reactor

Disinfection taking place - final effluent channels are clean and clear of solids

Municipal Green Drop Score:

19.8%

Performance Area	Systems	Marble Hall (WSP: Ephraim Mogale LM)	Elandskraal (WSP: Ephraim Mogale LM)	Leeuwfontein /Mokganyaka (WSP: Ephraim Mogale LM)	Burgersfort (WSP: Greater Tubatse LM)
Process Control, Maintenance & Management skills		5	30	30	24
Monitoring Programme		0	0	0	100
Credibility of Sample Analyses		46	0	0	100
Submission of Results		0	0	0	0
Wastewater Quality Compliance		10	0	10	10
Failure Response Management		36	50	50	85
Bylaws		40	20	0	40
Treatment & Collector Capacity		8	28	8	8
Asset Management		35	20	60	40
Bonus Scores		6	0	0	9.9
Penalties		0	3	0	3
Green Drop Score (2011)		23.4% (↑)	11.8% (↑)	20.8% (↑)	47.9% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (MI/d)		5.6	0.5	5.6	1.5
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		22	14	14	16
% i.t.o. Maximum Risk Rating		95.7% (↑)	77.8% (↓)	77.8% (→)	88.9% (↓)
Performance Area	Systems	Steelpoort (WSP: Greater Tubatse LM)	Mapodile (WSP: Greater Tubatse LM)	Meckleberg (WSP: Greater Tubatse LM)	Penge (WSP: Greater Tubatse LM)
Process Control, Maintenance & Management skills		45	5	10	25
Monitoring Programme		40	0	0	0
Credibility of Sample Analyses		85	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		10	0	0	0
Failure Response Management		100	45	50	23
Bylaws		46	40	0	0
Treatment & Collector Capacity		8	0	0	20
Asset Management		85	30	75	95
Bonus Scores		9.9	3	0	0
Penalties		3	0	0	0
Green Drop Score (2011)		51.5% (↑)	14.5% (↑)	17.3% (↑)	21.0% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (MI/d)		0.3	NI	NI	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		13	18	14	17
% i.t.o. Maximum Risk Rating		72.2% (↓)	100% (→)	77.8% (↑)	94.4% (↓)

Performance Area	Systems	Tubatse Ponds (WSP: Greater Tubatse LM)	Jane Furse /Glen Cowie (WSP: Makhuduthamaga LM)	Nebo (WSP: Makhuduthamaga LM)	Phokwana (WSP: Makhuduthamaga LM)
Process Control, Maintenance & Management skills		5	0	5	5
Monitoring Programme		0	0	0	0
Credibility of Sample Analyses		0	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		0	0	0	0
Failure Response Management		23	23	23	34
Bylaws		0	0	40	40
Treatment & Collector Capacity		8	8	8	8
Asset Management		45	20	52	75
Bonus Scores		0	0	0	0
Penalties		0	0	3	0
Green Drop Score (2011)		10.3% (↑)	6.0% (↑)	10.3% (↑)	17.9% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (ML/d)		1.5	1	0.5	0.5
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		17	18	15	15
% i.t.o. Maximum Risk Rating		94.4% (↑)	100% (→)	83.3% (↑)	83.3% (↓)
Performance Area	Systems	Groblersdal (Greater Elias Motsoale LM)	Roosenekaal (Greater Elias Motsoale LM)	Dennilton (Greater Elias Motsoale LM)	
Process Control, Maintenance & Management skills		78	63	75	
Monitoring Programme		85	85	0	
Credibility of Sample Analyses		100	100	70	
Submission of Results		0	0	0	
Wastewater Quality Compliance		10	5	0	
Failure Response Management		50	50	23	
Bylaws		40	40	0	
Treatment & Collector Capacity		28	18	38	
Asset Management		74.5	65	20	
Bonus Scores		6	0.9	0	
Penalties		3	3	0	
Green Drop Score (2011)		51.2% (↑)	40.7% (↑)	20.0% (↑)	
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	
Treatment Capacity (ML/d)		NI	0.4	1	
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	
Cumulative Risk Rating (CRR)		16	13	16	
% i.t.o. Maximum Risk Rating		88.9% (↑)	72.2% (↑)	88.9% (→)	

<i>Performance Area</i>	<i>Systems</i>	Motetema (Greater Elias Motsoale LM)	Hlogotlou/Monsterlus (Greater Elias Motsoale LM)
Process Control, Maintenance & Management skills		10	20
Monitoring Programme		0	0
Credibility of Sample Analyses		70	70
Submission of Results		0	0
Wastewater Quality Compliance		0	0
Failure Response Management		23	23
Bylaws		0	40
Treatment & Collector Capacity		8	18
Asset Management		20	50
<i>Bonus Scores</i>		0	0
<i>Penalties</i>		0	3
Green Drop Score (2011)		10.5% (↑)	16.0% (↑)
Green Drop Score (2009)		NA-0%	NA-0%
Treatment Capacity (Ml/d)		2.5	0.5
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		18	15
% i.t.o. Maximum Risk Rating		100% (↑)	83.3% (↑)

NI - No information

NA- Not assessed

Regulatory Impression

Greater Sekhukhune District Municipality is commended for taking the 1st step in submitting evidence for assessing the municipal wastewater services performance, as gauged against the Green Drop requirements. Regrettably, the WSA performed unsatisfactory, as is evident by 19.8% municipal score, indicating that wastewater management falls short of the expectations of the regulation programme. Apart from a limited number of individuals from the respective municipal teams that came well prepared with appropriate evidence to the assessment, the overall submission was marked by disorderly presentation with uncertainty as to the roles of the specific team members and the WSP. A huge task lies ahead of the DM to coordinate and align services delivery and team focus to work towards an improved performance. Diligence and decisive programme management would be required on the part of the DM to ensure cohesion and development of the pockets of potential already existing in the LMs, before progress would be made in a gradual and sustainable way.

The lower lying Green Drop scores present evidence of severe institutional challenges to manage its wastewater services. Of particular concern is that the most basic information, i.e. flow measurement, design capacity and monitoring of process and compliance streams are not in place. "To measure is to know...." meaning that that the poor effluent compliance will continue to persist until basic and essential monitoring is implemented. For this to occur, the DM will have to redress the technical and scientific competency within the service provision unit.

On a positive note, if >50% scores can be achieved the 1st round GDC assessment for Groblersdal and Steelpoort, some inherent structures and know-how is already present to inform a gradual and sustainable improvement of the remainder systems. The submissions by the Greater Motsoale- and Elias Tobatse LMs are acknowledged and the team is encouraged intensify their efforts. A risks-based approach would be best suited to focus the WSA/WSP and address key priorities with adequate and appropriate resource mobilisation.

From a regulatory viewpoint, Sekhukhune wastewater services pose a significant risk to public health and the environment. This statement is not only based in the lower Green Drop scores, but also in the fact that **ALL treatment plants** (17) reside in **high and critical risk** space. Eight of these plants are continuing along a path of increased risk (↑), whilst the following plants have entered a **maximum CRR of 100%**: Motetema, Jane Furse and Mapodile. The attention of municipal administration and governance are required to mobilise appropriate resources to warrant a positive turnaround towards the Green Drop 2011/12 assessments. The Regulator trusts that this undesirable baseline will motivate the municipality to rectify its status without further hesitation or excuse. Regulatory action is herewith triggered.

Green Drop Findings:

1. Not one of the 17 wastewater treatment plants has actual flow data from which the operational capacity can be calculated. For this reason, it is assumed that all plants are exceeding its design capacity.
2. Fourteen of the 17 plants, do not have adequate monitoring programmes in place, and thereby do not monitor the impact of their processes on the environment and down-stream use. This presents a major vector route that holds high risk to public health and the receiving environment.
3. On the premises of the above 'no information' basis, future planning are severely compromised and sustainable solutions may not be forthcoming under the present circumstances. Significant skills, planning and infrastructure investment are required, and preference should be taken towards robust basic technology when considering the apparent lack of management, planning, maintenance and operational practices.
4. In the majority of systems, the WSA could not provide any proof of monitoring records, operation and maintenance rosters, operating procedures, legal authorisation of the plants, technical audits or budget and expenditure records to support a positive Green Drop score. Thus the findings of the general transgression against all Green drop requirements are considered a significant and severe risk.

The Regulator is not satisfied with the overall performance of wastewater services management in Greater Sekhukhune. The WSA is to submit a Corrective Action Plan to DWA within 30 days of release of the Green Drop Report.

Site Inspection Score

Groblersdal	35%
Marble Hall	26%

The Marble Hall and Groblersdal plants were found in the following condition:

- Overall appearance of the plants are fare, but upon closer inspection the work environment is unhygienic, unmaintained, poor worker facilities and negligence of mechanical-electrical equipment
- At Marble Hall, a flowmeter is in place and readings taken daily 7h00, which contradicts the 'No Information' status reported during the assessment. At Groblersdal, a meter is in place, but not used
- No evidence of procedures, manuals, log sheets or site registers were found at any of the sites
- The oxidations ponds are in poor condition, screenings are passing into the pond, sludge build up, foul odour from the septic pockets in the ponds are evident
- Upgrades are taking place at Groblersdal, but it is unclear what data supports or informs the size and technology to be upgraded to
- No sludge handling facilities are in place and sludge are discharged in an open space behind the oxidation ponds
- No disinfection of the final effluent takes place, no sampling is done to confirm the quality of the discharged effluent.

Municipal Green Drop Score:

19.1%

Performance Area	Systems	Paarl	Zongesien	Witpoort
Process Control, Maintenance & Management skills		38	65	3
Monitoring Programme		15	25	0
Credibility of Sample Analyses		3	3	0
Submission of Results		35	35	0
Wastewater Quality Compliance		0	0	0
Failure Response Management		0	0	0
Bylaws		30	30	30
Treatment & Collector Capacity		53	33	38
Asset Management		35	65	35
Bonus Scores		0	0	0
Penalties		0	0	0
Green Drop Score (2011)		19.1% (↑)	25.4% (↑)	10.8% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%
Treatment Capacity (MI/d)		4	0.5	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		16	13	14
% i.t.o. Maximum Risk Rating		88.9% (↑)	72.2% (↓)	77.8% (↓)

NI - No information

NA- Not assessed

Regulatory Impression

The Lepalele Local Municipality has performed unsatisfactory during the Green Drop assessments indicating that the wastewater services are not being managed according to the expectations of the regulation programme. The Green Drop requirements are largely not being met, resulting in an overall municipal score of 19.1%. The most prominent gaps to impede on Lepalele's performance are the lack of monitoring of flow and wastewater quality, indicating a significant lack of technical (operational) and scientific competencies. This transgression reaches into technical managerial areas as well, as is evident from the lack in the processes, systems and procedures i.e. incident response management, Bylaws enforcement and asset management. As result of the above inadequacies, all 3 plants fail on the critical criterion of % compliance to national legislation, and thereby continue pose a significant risk to the receiving environment and public health.

On a positive note, Lepalele's decision to submit evidence on wastewater practice and compliance for Green Drop assessment, is highly encouraging. ESKOM also owns and operates a plant (Marapong) in Lepalele and provides analytical services to the WSA. Inclusion of ESKOM in the turnaround plan of Lepalele would be a positive development, and the Green Drop Inspectors will monitor this development during 2011/12.

Analysis of the WSA's risk profiles of the treatment facilities shows that all 3 plants still remain in **high risk** space, with the Paarl plant moving steadily (↑) into critical risk space. Once a system enters critical and high risk landscape, the required resources to reverse the situation is costly and intensive. The regulatory view point is that the WSA would use this undesirable baseline and under-performance to

identify the key gaps in its water services delivery function and to address those in a risk-based approach. It would assist the WSA to study the GDC criteria and be prepared to maximise the assessment value and experience.

Green Drop Findings:

1. Three of the 3 wastewater treatment works does not monitor flow and are unable to measure if the plant capacity is still sufficient for the daily operational flow.
2. The continued functioning of these works is unsustainable, and in the absence of a registered skilled team with appropriate resources, planning should revolve around robust basic technology which could deliver upon the required effluent quality standards.
3. None of the 3 plants could present sufficient monitoring records on operational, compliance and catchment monitoring.
4. Inadequate scientific services are a major shortcoming, and include aspects of data credibility, submission of results and evidently the **0%** effluent quality non-compliance for all 3 treatment plants.
5. In such circumstances as described above, it is disconcerting that no incident response management is in place, as the WSA will not have the means or preparedness to deal with emergency or disaster events.
6. The lack of asset management and planning of collection and treatment infrastructure is a major shortcoming for all systems in Lepalele.

The Regulator is not satisfied with the overall performance of wastewater services management in Lepalele. The WSA is to submit a Corrective Action Plan to DWA within days 30 of release of the Green Drop Report.

Site Inspection Scores

Zongesien	29%
Paarl	65%

The Paarl plant was inspected to verify the findings of the Green Drop assessments:

- At time of inspection of the Paarl plant, the personnel was attending to clean-up of a spillage – this incident was not guided by an incident response protocol or severity level that triggers reporting or action and was handled according to the discretion of the ground staff
- Upon inspection, both plants were found to have a functional flow meter of which flows are recorded daily – this contradicts the “No information” provided by WSA management during the Green Drop assessments
- No operational monitoring equipment or practice is in place at either plants
- Degritting efficiency at the inlet works is compromised at the Paarl plant by accumulation of grit in the grit channels – this deficiency will shortly be impacting on the primary settling tanks.
- At Zongesien, the situation has already reached a critical stage and the grit channels are fully blocked with a high-grit septic feed to the primary settling tanks
- The above carry-over of grit and silt to the Zongesien oxidation ponds is evident by way of the poor condition of the system – completely silted and severe shortcutting is evident with no planning in place to desludge or clean. Poor treatment efficiency can be expected as result of the unsatisfactory practice
- No process control is taking place on the activated sludge process or the oxidation ponds systems and the efficiency cannot be determined
- No disinfection taking place despite the availability of a chlorination facility and sufficient stock at the Paarl plant.

Performance Area	Systems	Modimolle	Vaalwater/Mabatlane
Process Control, Maintenance & Management skills		48	0
Monitoring Programme		75	40
Credibility of Sample Analyses		100	100
Submission of Results		0	0
Wastewater Quality Compliance		15	0
Failure Response Management		0	0
Bylaws		40	40
Treatment & Collector Capacity		93	0
Asset Management		10	40
Bonus Scores		3.75	3.75
Penalties		3	3
Green Drop Score (2011)		43.3%(↑)	20.3%(↑)
Green Drop Score (2009)		12%	6%
Treatment Capacity (ML/d)		3.5	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		11	16
% i.t.o. Maximum Risk Rating		61.1%(↓)	88.9%(↓)

NI - No information

NA- Not assessed

Regulatory Impression

The Modimolle Local Municipality has performed unsatisfactory during the Green Drop assessments indicating that the wastewater services are not being managed according to the expectations of the regulation programme. The Green Drop requirements are largely not being met, resulting in an overall municipal score of 38.1%.

However, both wastewater systems assessed showed a marked improvement when compared to the 2009 results. The municipality is applauded for implementing the necessary changes. It is the regulatory view that Modimolle will identify the key gaps from the 2010/11 assessment and implement further changes to ensure further improvement in the upcoming GDC 2011/12 cycle. The most prominent gaps are to be found in the above table where '0-40%' scores were assigned. This would translate to prioritising monitoring of effluent streams, flow monitoring at both plants, submission of results (GDS will suffice), incident response management and asset management. Of great importance is the weighted "effluent quality compliance" requirement, which is the cumulative result of all wastewater business processes being in place.

It is encouraging to note the areas of progress, including the development of a stormwater management plan and water demand management plan, the implementation of the Technical Report with time-bound outputs and budget, as well as the existence of Bylaws (still lack implementation).

Trend analysis of the Modimolle results indicates the following:

- Positive trends are noticed for both wastewater systems (↑) in terms of the Green drop results

- Positive trends (↓) are confirmed for Modimolle and Vaalwater/Mabatlane treatment plants – this means that the Modimolle plant has move out of high risk area, unfortunately the Vaalwater plant still remain a regulatory concern as long as it resides in **high risk** space.

Green Drop Findings:

1. Two of the 2 wastewater treatment works does not monitor flow and are unable to measure if the plant capacity is still sufficient for the daily operational flow. Also, the Vaalwater plant does not have a confirmed or calculated design capacity.
2. The continued functioning of sanitation systems are not sustainable in the absence of a registered technical skilled team, backed by sufficient and appropriate resources. For now, any planning should revolve around robust basic technology which could deliver upon the required effluent quality standards.
3. Two of 2 plants need to optimise the monitoring regimes. Transgression is also noted regarding the lack of submission of results to the Department of Water Affairs.
4. 0-15% effluent quality compliance for both treatment plants are a serious deficiency that impacted negatively on the municipal score.
5. In such circumstances as described above, it is disconcerting that no incident response management is in place, as the WSA will not have the means or preparedness to deal with emergency or disaster events.
6. The lack of asset management and planning of collection and treatment infrastructure is a major shortcoming.

Site Inspection Score

Modimolle 72%

The Modimolle treatment facility was inspected to verify the Green Drop findings:

- The plant appeared to be neat and reasonably well maintained
- Contrary to the evidence presented before the assessment panel, a flow meter was on site and flow readings recorded
- The inlet works are reasonably well maintained, with adequate screening and grit removal
- Not all aerators are functional on the activated sludge reactor, which compromises treatment efficiency
- Basic process control is in place, but is limited – no use of sludge age, recycle, DO or F:M ratios, however use is made of MLSS as process adjustment parameter
- Disinfection takes place, but limited control is found.

Municipal Green Drop Score:

26.0%

Performance Area	Systems	Mokopane (old & new)	Segagapen	Mosodi	Rebone Ponds
Process Control, Maintenance & Management skills		87	48	48	8
Monitoring Programme		31	0	0	0
Credibility of Sample Analyses		25	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		0	0	0	0
Failure Response Management		0	0	0	0
Bylaws		100	100	100	100
Treatment & Collector Capacity		97	78	78	70
Asset Management		23	30	30	30
Bonus Scores		0	0	0	0
Penalties		3	0	0	0
Green Drop Score (2011)		28.1% (↑)	22.0% (↑)	22.0% (↑)	17.3% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (Ml/d)		10 (4.2+4.8)	0.5	NI	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		15	13	17	18
% i.t.o. Maximum Risk Rating		83.3% (↑)	72.2% (→)	94.4% (→)	100% (→)

NI - No information

NA- Not assessed

Regulatory Impression

The Mogalakwena Local Municipality has performed unsatisfactory during the Green Drop assessments, indicating that the wastewater services are not being managed according to the expectations of the regulation programme. The Green Drop requirements are largely not met and result in a low overall municipal score for the Mogalakwena (26.0%).

The residual shortcomings in performance is most pertinent in the areas of monitoring (flow and effluent quality), data submission and the credibility thereof, compliance to legal requirements and the absence of incident response management. Asset management practices have also not been established within the institution and financial elements need to be elevated with the Chief Financial Officer (i.e. ring-fencing, tariffs, volumetric unit costing). From this analysis, Mogalakwena can identify the critical gaps first, and take a risk-based approach to rectify the high-risk areas in a time-bound and output specific approach. A key measurable to any plan or resource application need to be effluent quality compliance and checks to verify operation and maintenance capabilities.

On a positive note, the municipality is commended for taking the first step to present their wastewater services portfolio for assessment, as gauged by the Green Drop Certification requirements. The WSA is also commended for the progress noted in terms of Bylaw implementation and for converting some of the plans to action in the field. The following Assessor Impression is recorded: "...the WSA was reasonably well prepared, although all systems and processes are not in place as yet. The WSA under assessment displays a positive attitude and take their wastewater business seriously. Photos were presented by the team champion, providing evidence that significant progress has been made between the period of assessment and confirmation of the GDC. Work is already being done in the field whilst the GDC assessments were taking place, and is set for

continuance leading into GDC 2011/12. The WSA impressed the Assessors with their potential and will to achieve GreenDrop status - which will evidently realise if they continue along their path of commitment and action. The biggest weakness is the lack of monitoring and compliance measurement...."

For now, the situation in Mogalakwena is considered critical from a regulatory view and holds high risk to public health and the environment. All plants are already in **high-and critical risk** positions, with Rebone having reached **100% risk** disposition (CRR_{max}).

Green Drop Findings:

1. Four of 4 wastewater treatment plants cannot measure its impact on receiving water and natural resources, as result of the absence in monitoring. This transgression reaches beyond effluent quality monitoring, and include volumetric (flow) metering as well.
2. Three of 4 systems do not have an adequate technical and registered skills base in place and plant are not classified or authorised.
3. Four of 4 systems do not achieve the required submission, credibility proof and subsequent effluent quality compliance (0%).
4. No incident response management is in place for any of the systems
5. Lastly, the absence of a risk-based approach and adoption of integrated asset management principles, result in good infrastructure not being valued and maintained to reach its expected useful life. This is bound to place an additional burden on the municipal budget when reactive repairs and premature replacements will have to be done to ensure an acceptable service level.

The Regulator is not satisfied with the overall performance of wastewater services management in Mogalakwena. The WSA is to submit a Corrective Action Plan to DWA within 30 days of release of the Green Drop Report.

Site Inspection Score

Mokopane 41%

The Mokopane plant was inspected to verify the Green Drop findings:

- The plant' overall appearance was negative, terrain unkept, buildings not maintained, offices dirty and unpleasant, unhygienic working conditions
- Inlet works unclean and screenings removed and dumped in trench – poor control evident
- Flow meter in place and functional on new plant
- Primary tanks being maintained, decommissioned temporary
- 50% of old plant aerators not functional, one of new plant aerators not function – on activated sludge plant
- No disinfection taking place, no records for chlorination in place
- Sludge drying beds unkept and not maintained.

Since the technical site inspection, Mogalakwena made determined efforts to improve the plant. The following photographic evidence shows the painting of pipe work, the improved maintenance and use of the sludge drying beds and improved process control at the plant. Readers will receive an update on progress after the GDC 2011/12 inspection cycle.



Performance Area	Systems	Mookgophong (Naboomspruit)
Process Control, Maintenance & Management skills		60
Monitoring Programme		85
Credibility of Sample Analyses		100
Submission of Results		100
Wastewater Quality Compliance		48
Failure Response Management		28
Bylaws		55
Treatment & Collector Capacity		65
Asset Management		73
Bonus Scores		8.1
Penalties		0
Green Drop Score (2011)		67.2% (↑)
Green Drop Score (2009)		NA-0%
Treatment Capacity (ML/d)		3
Operational % i.t.o. Capacity		63%
Cumulative Risk Rating (CRR)		9
% i.t.o. Maximum Risk Rating		50% (↓)

NI - No information

NA- Not assessed (Roedtan Ponds – ownership to be confirmed)

Regulatory Impression

The Mookgophong Local Municipality has exceeded expectations during the Green Drop assessments, as indicated by the municipal score of 67.2%. This is a fairly good entry score for a 1st time assessment and the municipality is commended for the strong motivation presented. Although a positive Green Drop trend and risk position is confirmed, a number of shortcomings can be identified to assist the municipality to identify and address performance gaps: the small technical team is heavily reliant on consulting expertise and care must be taken to build capability and competency within the WSA sanitation department; monitoring regime must be expanded and effluent quality compliance need to improve from the current 48%; the plant is at 63% operational capacity and can be expected to improve treatment efficiency; management aspects must be addressed (asset management, incident response, bylaws, planning). The ownership of Roedtan must be confirmed as a matter of priority, and any other non-municipal systems must be regulated under the municipal Bylaws.

Green Drop Assessor impression: "...the WSA was reasonably well prepared and supported by a specialist professional. The presence of a multi-disciplinary team would have benefited the WSA, especially in terms of aspects related to budget control and asset management. All systems and processes are not in place, but early indicators are that the WSA will have the most important systems in place and operational for 12 months and longer by the 2011 assessment cycle. Longer term planning and dedicated resources (skill and funds) are some of the key requirements to ensure steady progress in wastewater services. Management involvement and strengthened planning will assist this progress. Uncertainty exists regarding the ownership of one of the plants that is being maintained by the municipality and need to be resolved with the DM. The WSA under assessment displays a positive attitude, but a proactive approach and management support is key to future success..."

Green Drop Findings:

1. One of 1 wastewater treatment works does not have the required staff registration and plant classification confirmed (Class D) in place, training lacking.
2. Low compliance to effluent quality limits is achieved and unresolved issues regarding effluent quality specification by DWA need to be resolved. Catchment monitoring and sludge classification need to be included with monitoring regime.
3. No incident response management is in place, as the WSA will not have the means or preparedness to deal with emergency or disaster events.
4. The sanitation masterplan of 2004 is outdated and need to be updated – plans need to be dated with outputs that would warrant effluent quality compliance and sustainable services delivery (especially O&M capability). When updated, implementation must be driven and a results orientated approach must be adopted by the municipality.

Site Inspection Score

Mookgopong 53%

The Mookgopong plant was inspected to verify the Green Drop findings:

- The terrain is well kept, garden is neat, lawn cut
- Proper access control with a locking gate
- No personnel could be interviewed and buildings locked, hence limited evidence presented to substantiate process control and maintenance records (municipal sport function - meeting)
- Settling, activated sludge processes, clarification functional, no operational monitoring verified
- No disinfection taking place – effluent used for irrigation, this practice should be investigated being a potential vector route
- Active and varied bird life present.

Municipal Green Drop Score:

51.6%

Performance Area	Systems	Giyani (WSP: Greater Giyani LM)	Nkowankowa (WSP: Greater Tzaneen LM)	Lenyenye (WSP: Greater Tzaneen LM)	Tzaneen (WSP: Greater Tzaneen LM)
Process Control, Maintenance & Management skills		83	90	10	90
Monitoring Programme		0	100	0	70
Credibility of Sample Analyses		10	70	61	91
Submission of Results		0	75	0	75
Wastewater Quality Compliance		5	88	0	100
Failure Response Management		34	75	16	61
Bylaws		0	100	100	100
Treatment & Collector Capacity		48	30	40	35
Asset Management		0	75	45	89
Bonus Scores		0	0	0	6
Penalties		0	0	0	0
Green Drop Score (2011)		18.4% (↑)	77.9% (↑)	21.9% (↑)	84.3% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (Ml/d)		2.1	4.5	1	24
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		15	13	17	7
% i.t.o. Maximum Risk Rating		83.3% (↑)	72.2% (↑)	94.4% (↑)	30.4% (↓)
Performance Area	Systems	Shilubane (WSP: Greater Tzaneen LM)	CN Phathundi (WSP: Greater Tzaneen LM)	Namkgale (WSP: Baphlaborwa LM)	Lulekani (WSP: Baphlaborwa LM)
Process Control, Maintenance & Management skills		0	0	28	33
Monitoring Programme		0	0	50	50
Credibility of Sample Analyses		0	0	25	25
Submission of Results		0	0	0	0
Wastewater Quality Compliance		0	0	0	16
Failure Response Management		0	0	55	55
Bylaws		0	0	0	0
Treatment & Collector Capacity		0	0	70	0
Asset Management		0	0	30	30
Bonus Scores		0	0	0	0
Penalties		0	0	0	0
Green Drop Score (2011)		0% (→)	0% (→)	21.5% (↑)	24.3% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (Ml/d)		NI	NI	6.3	3.5
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		18	18	22	17
% i.t.o. Maximum Risk Rating		100% (→)	100% (→)	95.7% (↑)	94.4% (↑)

Performance Area	Systems	Phalaborwa (WSP: Baphalaborwa LM)	Kgapane (WSP: Greater Lethaba LM)	Senwamokgope (WSP Greater Lethaba LM)	Modjadjiskloof (WSP Greater Lethaba LM)
Process Control, Maintenance & Management skills		38	17	0	0
Monitoring Programme		50	0	0	0
Credibility of Sample Analyses		25	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		16	0	0	0
Failure Response Management		55	0	0	0
Bylaws		0	0	0	0
Treatment & Collector Capacity		35	40	0	0
Asset Management		0	0	0	0
Bonus Scores		0	0	0	0
Penalties		0	0	0	0
Green Drop Score (2011)		23.8% (↑)	5.7% (↑)	0% (→)	0% (→)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%	NA-0%
Treatment Capacity (MI/d)		4.5	5.7	NI	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		17	17	18	18
% i.t.o. Maximum Risk Rating		94.4% (↑)	94.4% (↑)	100% (→)	100% (→)

NI - No information

NA- Not assessed

Regulatory Impression

The Mopani District Municipality wastewater services portfolio is varied in its content – ranging from ‘good performance’ (Tzaneen and Nkowankowa systems) to ‘unsatisfactory’ (6 systems), whilst a zero performance base has been presented for four remainder systems.

Mopani is commended for taking the 1st step in presenting evidence for assessment against the stringent requirements of the Green Drop Certification programme. As result, an overall positive trend for all systems is recorded, as the status of each system is now confirmed (↑). The WSA has also adopted a risk-based approach which will be developed into a full W₂RAP to assist with prioritised implementation against key risk areas. The good performing Tzaneen and Nkowankowa systems indicated the necessary capability (although stretched) is inherently present to replicate the good practice to the lower scoring systems.

The municipal Green Drop score of 51.6% indicated that wastewater services are not being managed consistently and according to the expectations of the regulation programme. Transgressions such as the no-flow information suggest that the municipality has not been able to raise its performance up to standard, as is evident from the risk-based trends analysis which places all plants (except Tzaneen) in **high- and critical risk** position.

The situation in Mopani is considered fragile and will hold the attention of the regulator until all systems are on par with the good performance of Tzaneen. The WSA is presented with a valuable opportunity to identify the shortcomings from the assessment, and to improve upon these areas as part of a gradual and sustainable improvement plan for Mopani.

Green Drop Findings:

1. Twelve out of 12 treatment plants do not monitor incoming flows systems and will therefore not have a quantified basis from where to make decisions pertaining to future planning or plant operational optimisation.
2. As result of the above, 11 of the systems had inadequate plans for collector and treatment infrastructure in place, including the Tzaneen system.
3. Ten plants do not monitor effluent quality and will not be able to control their processes or measure compliance.
4. Only 2 of 12 plants have positive scores for effluent quality compliance.
5. Asset management is not institutionalised, as is evident by the fragmented evidence provided for plant audits, financial ring-fencing, pumpstation maintenance, and asset registers and condition. The exceptions being Nkowankowa and Tzaneen.

The Regulator is not satisfied with the overall performance of wastewater services management in Mpoani. The WSA is to submit a Corrective Action Plan to DWA within 30 days of release of the Green Drop Report.

Site Inspection Score

Lenyenye	6%
Tzaneen	91%
Phalaborwa	34%
Ga-Kgapane	15%

Four plants were inspected to verify the Green Drop findings and scores.

During the assessment for the Phalaborwa system, the WSA presented completed logsheets as evidence of the operational monitoring, to include measurement of pH and residual chlorine on a daily basis. Upon site inspection, the following was found:

- The results presented complied with General Limits - however the site visit indicates that there monitoring equipment could not be utilised as the pH reagents were depleted
- In addition, no chlorine was being dosed on the day of the site inspection and the Process Controller indicated that chlorine was not being delivered for an extended period
- Further evidence showed that maintenance problems with the clarifier have resulted in sludge carry-over into the final effluent which will decrease the final effluent quality. Therefore all compliance data presented must be critically evaluated to ensure that the final effluent quality reflects the situation on the plant.

The regulator views the possible misrepresentation of evidence in serious light and further investigation will be undertaken.

The GA-Kgapane plant is being upgraded and refurbished, overall appearance is distressing:

- On day of inspection, flow meters, sludge pumps, chlorination units, inlet screens, drying beds and digesters were not in operation
- Flow meter in place, not operated since 2009
- The plant presents a definite health risk as it is located in the middle of a middle class suburb within close proximity of residential households
- Effectively, no operation is taking place during the upgrade period and no monitoring is taking place to ensure continued treatment to a minimum standard effluent quality
- No chlorination taking place.



PST has not been desludged for an extended period, due to breakdown of sludge pumps. Sludge build-up is compromising the down-stream treatment units

The Leyenye plants inspection confirmed that the oxidation ponds are currently being extended:

- A new pumpstation and a series of aerobic/anaerobic ponds are under construction
- The current ponds are in a serious state of neglect with 4 pond bypassed, breakdown in walls, sludge build-up and no chlorination of final effluent
- The oxidation ponds are in the middle of a suburban area and are used as a short-cut route due to the lack of access control and inadequate fencing
- Poor effluent quality is discharged as result of inadequate treatment during upgrading of the plant, presenting a significant risk to public health and the environment, given that the receiving resource is the sensitive Lethaba River which flows into the Kruger National Park.



4 of 7 ponds operational – overloaded and producing poor effluent quality at point of discharge – pipes between ponds broken

Contrary to the previous three plants, the Tzaneen plant was found to be well maintained and operated by competent personnel:

- The plant is fenced and has a gate that is locked
- Unit processes are well maintained except one clarifier that is operating below operational capacity resulting in reduced flow and consequent build-up of algae
- The chlorination facility is well maintained and locked at all times - adequate backup of chlorine gas and standby chlorinator
- Safety and warning signs are displayed and operators have full PPE and protective clothing.



Tzaneen plant is a prime example of a well maintained and operated plant

Municipal Green Drop Score:

67.2%

Performance Area	Systems	Mankweng	Polokwane	Seshego
Process Control, Maintenance & Management skills		87	86	60
Monitoring Programme		40	75	65
Credibility of Sample Analyses		48	70	48
Submission of Results		100	100	100
Wastewater Quality Compliance		10	20	10
Failure Response Management		75	64	75
Bylaws		85	85	85
Treatment & Collector Capacity		75	75	93
Asset Management		90	95	90
Bonus Scores		9.3	10.2	12
Penalties		3	0	3
Green Drop Score (2011)		62.0% (↑)	69.7% (↑)	65.4% (↑)
Green Drop Score (2009)		38%	38%	38%
Treatment Capacity (MI/d)		8	25	11.7
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		17	20	17
% i.t.o. Maximum Risk Rating		73.9% (↑)	71.4% (↑)	73.9% (→)

NI - No information

NA- Not assessed

Regulatory Impression

The Polokwane Local Municipality has raised its performance significantly from the 2009 assessment (↑) and is commended for this superb team effort. The municipal score of 67.2% indicate that the municipality is certainly moving into a position of strength, but is as yet not meeting the expectations of the regulation programme.

The most pertinent gaps that will ensure further positive movement include the optimisation of the monitoring regime, implementation of flow measurement, data credibility and compliance to effluent quality discharge standards. Room for improvement is also noted for Bylaws enforcement, incident response management and capacity planning for collection and treatment infrastructure.

Polokwane is however commended for the good work done on institutionalising good practice asset management and achieving 100% submission of results, including GDS capturing. The WSA is also committed to training of technical staff, but voiced some frustration with the SETA processes.

The positive trends in GDC scores are unfortunately not supported when doing an in-depth analysis of the wastewater treatment component of the business. Trend analysis of the treatment plants indicate a negative trend with all 3 plants in **high risk** positions, compounded by the upwards risk movement of the Mankweng and Polokwane plants (↑).

Green Drop Findings:

1. Three out of 3 wastewater treatment plants do not have comprehensive monitoring and quality control (credibility) procedures in place
2. None of the 3 systems have flow measurement in place
3. None of the 3 treatment plants comply with effluent quality discharge standards
4. Two of 3 systems do not have adequate planning for collector and treatment infrastructure in place
5. Lastly, the absence of a risk-based approach and integrated asset management practices result in good infrastructure not being valued and maintained to reach its useful lifespan.

Site Inspection Score

Polokwane	58%
Seshego	61%

The Polokwane and Seshega treatment facilities were inspected to verify the Green Drop assessment findings. The Polokwane plant is reasonably well maintained, with room for improvement:

- Screen under repairs, flows recorded but some of the meters defunct
- Biofilters receive uneven flow, blockages and pooling evident
- Overload of activated sludge plant possible, operational parameters limited
- Clarification not effective – solids carry-over, scum formation, overload possible
- Disinfection taking place, efficiency uncertain as result of high solids and ammonia content of final effluent
- Maturation ponds severely silted – reduced capacity
- Sludge drying beds in good condition
- Anaerobic digestion efficiency not monitored, sludge not classified.

The Seshego plant's overall appearance is not satisfactory:

- Sludge spillage remains have not been cleared
- Site workers display optimistic attitudes and positive workplace satisfaction
- Flow meter in position but not always functional – to be replaced under DWA contract
- Community fish breeding project ongoing – fenced off
- Grit accumulation and pooling on biofilter impede on treatment efficiency – refurbishment project planned to address some of the shortcomings
- Very poor sludge handling practice and facilities – scheduled for upgrade, high risk to environment
- Anaerobic digesters operational, but limited process control or efficiency testing.



Staff busy with routine operational duties at the Seshego plant

Municipal Green Drop Score:

48.0%

Performance Area	Systems	Thabazimbi	Rooiberg	Northam
Process Control, Maintenance & Management skills		50	28	8
Monitoring Programme		50	40	25
Credibility of Sample Analyses		70	70	70
Submission of Results		0	25	50
Wastewater Quality Compliance		20	8	10
Failure Response Management		4	42	42
Bylaws		20	20	20
Treatment & Collector Capacity		78	60	60
Asset Management		30	30	30
Bonus Scores		12.6	15.1	13.2
Penalties		0	3	3
Green Drop Score (2011)		52.0% (↑)	44.6% (↑)	41.1% (↑)
Green Drop Score (2009)		NA-0%	NA-0%	NA-0%
Treatment Capacity (MI/d)		2.55	NI	NI
Operational % i.t.o. Capacity		157%	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		14	13	13
% i.t.o. Maximum Risk Rating		77.8% (↑)	72.2% (↑)	72.2% (↓)

NI - No information

NA- Not assessed

Regulatory Impression

The Thabazimbi Local Municipality is commended for submitting evidence for assessment of the past year's wastewater services performance, as gauged against the Green drop requirements. Regrettably, the WSA has performed unsatisfactory during the Green Drop assessments indicating that the wastewater services are not being managed according to the expectations of the regulation programme. The Green Drop requirements are largely not met and result in a low overall municipal score for Thabazimbi (48.0%). The gaps range from technical skill levels, qualitative and quantitative monitoring, data submission and effluent non-compliance. Management systems are not sufficiently established to support the WSA along a gradual and sustainable path of improvement. Managerial areas that require attention include Bylaw enforcement, incident response management, asset management (including ring-fenced financial reporting).

On a positive note, the municipality has commenced with infrastructure and technical audits and implementation of the findings. The Thabazimbi treatment plant is already overly stretched in terms of the hydraulic load, whilst flow data is not available for the other 2 plants. From these results, the WSA are in a position to identify the critical gaps first, and take a risk-based approach to rectify the high-risk areas in a phased approach over short-medium term future.

For now, the situation in Thabazimbi is considered to be under control, but warrant close monitoring by the regulator to ensure that plans are brought to fruition. Until such time, the Thabazimbi wastewater services are regarded to hold high risk to public health and the environment. All plants are already in **high risk** space, with Thabazimbi and Rooiberg both showing increased risk profiles (↑).

Green Drop Findings:

1. Three out of 3 wastewater treatment plants cannot measure its impact on receiving water and natural resources, as result of the inadequacy in monitoring regimes and poor submission rates to the regulator. This transgression reaches beyond effluent quality monitoring, and include volumetric (flow) metering at the Northam plants as well.
2. None of the 3 systems had a technical skills base that has been registered with the Department of Water Affairs - and confirmed to comply with Regulation 2834. Plants are also not classified.
3. Lastly, the absence of a risk-based approach and adoption of integrated asset management principles, result in infrastructure not being valued and maintained to achieve its intended useful lifespan. This is bound to place an additional burden on the municipal budget when reactive maintenance and premature replacements will have to be done to ensure an acceptable service level.

Site Inspection Score

Thabazimbi

61%

The technical inspection confirmed the Green Drop findings:

- The plant is neat and well maintained even though it is operating above design capacity. Grass is cut and maintained
- The plant is very well managed and the process controllers are very enthusiastic and possess good knowledge on how the plant operates. The plant is well maintained despite being overloaded
- Good opportunity exist to broaden the responsibility of the Water Quality Officers to assist with process control aspects
- The inlet works is well operated and flow meters in place – the accuracy and positioning of the flow meters warrant further inspection
- Four out of 4 aerators were in working conditions on the activated sludge plant - however, the process efficiency were not supported by any form of operational measurement or control (no DO, sludge age analysis, MLSS, etc).
- The trickling filter is in poor condition, with the centre seal ruptured causing most of the settled sewage to short-circuit the biofiltration treatment process
- Final effluent quality compromised via funding/procurement difficulties to purchase chlorine
- Sludge drying beds and anaerobic digestion are well maintained, although efficiency could improve by implementing process control, sludge classification and pre digester
- Potential risk to the Crocodile river were raised as serious concerns by the Green Drop inspectors - include the functionality of the raw sewage dam, handling of waste activated sludge, the further lying sludge drying beds and disposal of sludge. The proposal W₂RAP approach would assist to identify and rate these risks, and the assessors will assess this aspect during the upcoming Green Drop 2011/12 assessment.



Thabazimbi Process Controllers take immense pride in the orderly and well maintained inlet works and pumpstations

Municipal Green Drop Score:

14.2%

Performance Area	Systems	Louis Trichardt (WSP: Makhado LM)	Waterval (WSP: Makhado LM)	Hlanganani (WSP: Makhado LM)	ElimOrbal (WSP: Makhado LM)
Process Control, Maintenance & Management skills		75	40	43	73
Monitoring Programme		0	20	0	10
Credibility of Sample Analyses		0	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		0	0	0	0
Failure Response Management		25	11	11	11
Bylaws		30	30	30	30
Treatment & Collector Capacity		28	15	0	15
Asset Management		18	18	18	18
Bonus Scores		3	1.5	0	1.5
Penalties		0	0	0	0
Green Drop Score (2011)		19.9% (↑)	14.3% (↑)	9.5% (↑)	16.5% (↑)
Green Drop Score (2009)		8%	NA-0%	8%	NA-0%
Treatment Capacity (ML/d)		5	2.5	NI	0.8
Operational % i.t.o. Capacity		500%	600%	NI (assume >100%)	188%
Cumulative Risk Rating (CRR)		16	16	17	13
% i.t.o. Maximum Risk Rating		88.9% (↓)	88.9% (→)	94.4% (↓)	72.7% (→)
Performance Area	Systems	Siloam (WSP: Makhado LM)	Makhado (WSP: Makhado LM)	Vuwani (WSP: Makhado LM)	Vleifontein (WSP: Makhado LM)
Process Control, Maintenance & Management skills		43	43	43	43
Monitoring Programme		0	0	0	0
Credibility of Sample Analyses		0	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		0	0	0	0
Failure Response Management		11	11	11	11
Bylaws		30	30	30	30
Treatment & Collector Capacity		15	0	0	0
Asset Management		18	18	18	8
Bonus Scores		0	0	0	0
Penalties		0	0	0	0
Green Drop Score (2011)		11.0% (↑)	11.0% (↑)	9.5% (↑)	8.0% (→)
Green Drop Score (2009)		8%	8%	8%	8%
Treatment Capacity (ML/d)		NI	NI	NI	NI
Operational % i.t.o. Capacity		NI (assume >100%)	NI (assume >100%)	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		14	17	17	17
% i.t.o. Maximum Risk Rating		77.8% (↓)	94.4% (↓)	94.4% (→)	94.4% (→)

Performance Area	Systems	Thohoyandou (WSP: Thulamela LM)	Malameule (WSP: Thulamela LM)	Mhinga (WSP: Thulamela LM)	Tsifulannanie (WSP: Thulamela LM)
Process Control, Maintenance & Management skills		48	78	33	43
Monitoring Programme		0	0	0	0
Credibility of Sample Analyses		0	0	0	0
Submission of Results		0	0	0	0
Wastewater Quality Compliance		0	0	0	0
Failure Response Management		11	11	11	11
Bylaws		30	30	30	30
Treatment & Collector Capacity		8	28	10	0
Asset Management		33	33	33	33
Bonus Scores		6.8	1.5	1.5	0
Penalties		3	0	0	0
Green Drop Score (2011)		15.3% (↑)	20.5% (↑)	13.3(↑)	11.8% (↑)
Green Drop Score (2009)		20%	20%	NA-0%	20%
Treatment Capacity (Ml/d)		6	2.5	NI	NI
Operational % i.t.o. Capacity		217%	120%	NI (assume >100%)	NI (assume >100%)
Cumulative Risk Rating (CRR)		21	16	17	17
% i.t.o. Maximum Risk Rating		91.3% (→)	88.9% (↑)	94.4% (↓)	94.4% (↓)
Performance Area	Systems	Mutale (WSP: Mutale LM)	Musina (WSP: Musina LM)	Nancefield (WSP: Musina LM)	
Process Control, Maintenance & Management skills		18	28	20	
Monitoring Programme		0	0	0	
Credibility of Sample Analyses		0	0	0	
Submission of Results		0	0	0	
Wastewater Quality Compliance		0	0	0	
Failure Response Management		11	11	11	
Bylaws		0	0	0	
Treatment & Collector Capacity		0	70	15	
Asset Management		23	43	33	
Bonus Scores		0	0	0	
Penalties		0	0	0	
Green Drop Score (2011)		6.3% (↑)	17.3% (↑)	9.5% (↑)	
Green Drop Score (2009)		20%	NA-0%	NA-0%	
Treatment Capacity (Ml/d)		NI	1.9	3	
Operational % i.t.o. Capacity		NI (assume >100%)	105%	100%	
Cumulative Risk Rating (CRR)		18	17	16	
% i.t.o. Maximum Risk Rating		100% (→)	94.4% (↑)	88.9% (↑)	

NI - No information

NA- Not assessed

Regulatory Impression

The Vhembe District Municipality performed unsatisfactory as is evident by the municipal score of 14.2%. The Green Drop assessment results indicated that Vhembe's wastewater services management does not meet the expectations of the regulation programme.

The overall submission by the WSA was marked by disorderly presentation and uncertainty as to the roles of the WSA. A lack of ownership and accountability transpired from Vhembe's management approach. The asset transfer process between DWA and the WSA is being used to divert focus from the work at hand. As part of the asset transfer process, a number of systems are being upgraded and expanded. However, the procurement, design, technology options and contract management do not instil a sense of confidence with the Regulator, when regarding the manner in which these projects are handled. This includes the project that deals with water use licenses applications. The assessment team raised serious concerns about the uncontrolled manner in which the upgrade projects are handled (e.g. Makhado and Thohonyandou). This report triggers regulatory action to commence.

The lack of monitoring on the side of the WSA is but one example of lack of responsibility observed. Audit sampling by the Department of Water Affairs carries too much weight and is used to argue asset ownership aspects, instead of focussing on the business of safe and responsible wastewater services provision within the municipal area. The assessor's general observation concludes the regulatory viewpoint; "... good people are on the ground and viable potential and opportunities exist for the region, but management capability hampers progress and rather creates new challenges...".

A huge task lies ahead of the DM to coordinate and align services delivery and team focus to work towards an improved performance. For this to take effect, strong and decisive leadership and deliberate intervention from provincial or municipal governance levels will be required.

The lower lying Green Drop scores present evidence of severe institutional challenges to manage its wastewater services. Of particular concern is that the most basic information, i.e. flow measurement, design capacity and monitoring of process and compliance streams are not in place. The planned and current upgrades projects is questioned, as no apparent basis is in place to inform even a basic upgrade or refurbishment project. The lack of basic design information, such as sizing of reactors, load determination, and process design to remove nitrogen and phosphorus to the required legal limits, will not assist to take processes forward and will certainly not render any upgrade decision making feasible or sustainable. The desktop Green Drop assessment as well as the physical site inspections attested to this fact and concern.

From a regulatory viewpoint, Vhembe wastewater services pose a significant risk to public health and the environment. This statement is not only based in the disappointing poor Green Drop scores, but also in the fact that **ALL treatment plants** (15) reside in **high and critical risk** space. The Regulator trusts that this undesirable baseline will motivate the municipality to rectify its status without further excuse or deviation. Regulatory action is herewith triggered.

The Regulator is not satisfied with the overall performance of wastewater services management in Vhembe. The WSA is to submit a Corrective Action Plan to DWA within 30 days of release of the Green Drop Report.

Green Drop Findings:

1. Eight of the 15 wastewater treatment plants do not take flow measurements at site from which the operational capacity can be calculated. It is assumed that all plants are exceeding its design capacity.
2. The remainder 7 of 15 plants are hydraulically overloaded by as much as 5-6x the design capacity. This is no small feat to achieve such gross negligence of public assets.

3. Various upgrade projects is undertaken to rectify the shortcomings, however, no plans or design rationale (except for Musina) could be provided to support the decision taken against these capital extensive upgrades
4. Fifteen out of 15 systems do not have qualitative monitoring, scientific credible data, or compliance submission to the regulator in place. No plans are in place to address these deficiencies in the short term future. This transgression translates to a 0% compliance for effluent quality and sludge management at all treatment plants. This situation presents a major vector route that holds high risk to public health and the receiving environment.
5. On the premises of the above 'no information' basis, planning are severely compromised and sustainable solutions are not be forthcoming under the present circumstances. Significant skills, planning and infrastructure investment are required, and preference should be taken towards robust basic technology when considering the apparent lack of management, planning, maintenance and operational practices.

The overall Vhembe Green Drop findings mark a disappointing low for wastewater services performance in Limpopo Province, with the only exception being the pockets of positive and willing staff on the ground that is prepared to make positive contributions.

Site Inspection Scores

Waterval	81%
Louis Trichardt	27%
Elim Orbal	71%
Thohoyandou	52%
Malumele	65%

The planned inspection schedule was extended to include 5 plants, in order to confirm the findings of the Green Drop assessors. The team concluded that the evidence presented by the WSA did not do justice to the work taking place on the ground. It is difficult to conclude whether this mismatch is as result of poor preparation by the WSA for the assessments and/or WSA being unaware of the practices and work taking place in the field.

The Louis Trichardt plant is in a poor condition, which is a combination of the dilapidated state of the existing infrastructure as well as the construction work that is currently undertaken:

- Entire flow is diverted to one biofilter, which is overloaded and unable to cope with the load. Effluent is transferred to oxidation pond which is not overflowing at time of inspection
- The remainder of the plant is under construction, including a new disinfection facility
- Contractors sleep in puma stations, open manholes, a number of occupational and safety hazards and contraventions noticed on contract work

The Thohoyandou plant is severely overloaded and neglected:

- Limited operational monitoring equipment is available and some not in working condition.
- Operators unaware of the application of the 'compliance standards' put on the wall
- Monitoring and repairs logbooks in place, but not interpretation or process control effected
- Biofilters, clarifiers, ponds and anaerobic digesters overloaded and no sludge return / recycle not functional. Biofilters shows uneven flow distribution, high flow velocities on some filters, others dry.

The following observations have reference to Elim Orbal, Malumele and Waterval treatment plants:

- Staff is being innovative in making gardens and keeping the terrain neat and orderly. Staff shows commitment and pride in their plant and work
- Limited operational logsheets, maintenance is reactive and focus on repairs and problem solving rather than maintenance – 'run to failure' practice

- Limited monitoring equipment and no process control, as staff have limited process knowledge. However, they use indicative chlorine testing on final effluent, plus SVI at Waterval, as well as physical observations to control processes
- Members of public fish in the ponds and presents a huge security threat to the Elim Oral staff when access is denied
- Flow meters at both plants replaced in last 12 months and daily flow taken, no calibration, accuracy must be checked at Malumele
- The basic maintenance and operations of the plants is satisfactory. Infrastructure is old, but functional and in good condition – clarifiers is well cleaned and produce clear effluents
- Disinfection is taking place, although dosing rates and safety aspects require attention
- Sludge drying beds cleaned and well maintained. Dry sludge stockpiled on sites. Difficulties in dewatering activated sludge – improved process control needed
- Anaerobic digestion of sludge functional at Malumele, but again not process control or efficiency analysis
- Safety representative is seen to play a positive role at Waterval by keeping the staff ‘on their toes’.

Left: Daily flow meter readings recorded by plant personnel. Poor condition of electrical panel alongside meter

Middle: repairs to aeration discs. No process control of sludge age.

Right: chlorine dosing controlled at 1-1.5 mg/l

