



# ***GEORGE MUNICIPALITY***

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## ***Annual Water Services Development Plan Performance- and Water Services Audit Report***

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**as directed by the Water Services Act (Act 108 of 1997) and the Regulations relating to Compulsory National Standards and Measures to Conserve Water**

***FY 2017/2018***  
***5 March 2019***

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**GEORGE MUNICIPALITY**



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## **GEORGE MUNICIPALITY**

### **ANNUAL WSDP PERFORMANCE AND WATER SERVICES AUDIT REPORT FOR 2017/2018**

#### **EXECUTIVE SUMMARY**

George Municipality is required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Regulations relating to compulsory national standards and measures to conserve water", as issued in terms of sections 9(1) and 73(1)(j) of the Water Services Act, to report on the implementation of its WSDP during each financial year and to include a water services audit in such an annual report.

Section 62 of the Water Services Act requires the Minister to monitor every WSI in order to ensure compliance with the prescribed national standards. This regulation requires a WSA to complete and submit a WSDP Performance- and Water Services Audit Report every financial year.

The WSDP Performance- and Water Services Audit is designed to monitor the compliance of the WSA and other WSIs with these regulations. The Water Services Act allows the audit to be used as a tool to compare actual performance of the WSA against the targets and indicators set in their WSDP. The WSDP Performance- and Water Services Audit also assists local communities and DWS to assess how well WSAs are performing relative to their stated intentions and their capacity.

The WSDP Performance- and Water Services Audit Report will give an overview of the implementation of the Municipality's previous year's WSDP, for the 2017/2018 financial year, and can be seen as an annexure to George Municipality's Annual Report. The Annual Report is compiled as required by the Local Government: Municipal Systems Act, Act no 32 of 2000 (Section 46) and the Local Government: Municipal Finance Management Act, Act no 56 of 2003 (Section 121).

**Availability of the Water Services Audit Report:** The WSDP Performance- and Water Services Audit Report is a public document and must be made available within four months after the end of each financial year and must be available for inspection at the offices of the WSA. It is also recommended that the document be placed on the Municipality's website and that copies of the document be placed at the public libraries. The WSDP Performance- and Water Services Audit Report also needs to be made available to the Minister of the DWS, the Minister of the Department of Cooperative Governance, the Province and to SALGA, as required by the Water Services Act, 1997.

**The WSDP Performance- and Water Services Audit Report include the following detail information:**

- The Municipality's performance with regard to their KPIs for water and sewerage services for the 2017/2018 financial year, as included in the Municipality's SDBIP.
- The Municipality's Performance with regard to DWS's Blue and Green Drop Assessments. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. Green drop status is awarded to those WWTWs that comply with 90% criteria on key selected indicators on waste water quality management.
- DWS's Scorecard for assessing the potential for WC/WDM efforts in the Municipality.
- Information to be included in a WSDP Performance- and Water Services Audit as stipulated in regulations under section 9 of the Water Services Act, "Guidelines for Compulsory National Standards" and also required by DWS's 2014 WSDP Performance- and Water Services Audit Report guidelines.
- Information on the implementation of the various WSDP activities, as included under the WSDP Business Elements in DWS's WSDP guidelines.

The following water and sanitation related investigations were successfully completed during the last financial year.

- The WSDP Performance- and Water Services Audit Report for the 2016/2017 financial year was finalised and approved by Council as part of the Annual Report.
- George Municipality continues with the implementation of their Drinking Water Quality and Effluent Quality Sampling Programmes (Both Operational and Compliance Monitoring). Sample results are loaded on a monthly basis onto DWS's IRIS and GDS. All the WTWs and WWTWs are also registered on the IRIS and GDS websites. The effluent discharged by the industrial consumers is also monitored by George Municipality on a monthly basis.
- The Water and Sewer Master Plans for the various distribution and drainage systems are updated on a quarterly basis by GLS Consulting. GLS Consulting provides an extensive specialist service related to the optimal analysis, planning and management of water distribution and sewer reticulation systems. The Master Plans are also worked through with the personnel of the Civil Engineering Services Directorate.
- Pipe Replacement Programmes (PRPs) were done during March 2018 for both the water distribution networks and the sewer drainage networks.
- The Asset Register was updated to include all the water and sewerage capital projects completed during the 2017/2018 financial year.

The Municipality also received the following awards / acknowledgements:

- The upgrades to the Kleinkrantz WWTW in Wilderness received the best Water Engineering project award at the SAICE Regional Engineering Excellence Awards.
- The following awards were received from the Department of Water and Sanitation:
  - The Herolds Bay WWTW received the 2017 award for the Best Waste Water Pond System.
  - The Outeniqua WWTW Laboratory received the 2017 award for the Best Internal Wastewater Laboratory.
  - The Wilderness WTW received the 2017 runner-up award for the Best WTW.
  - The Kleinkrantz WWTW received the 2017 runner-up award for the Best WWTW.
- The Municipality's overall Blue Drop score came down from 98.12% for 2012 to 82.77% for 2014. Two key issues have impacted on the municipal compliance. The Haarlem and Uniondale systems that were transferred from the Eden District Municipality have been included in the George Local Municipality assessment for the first time and secondly a change in personnel has impacted the ongoing maintenance of information.

The overall 2014 Risk Rating for George Municipality is 34%, which translates into the 7<sup>th</sup> best performance in the Western Cape. The risk value is based on Process Control RR, Drinking Water Quality RR and Risk Management RR, with scores above 50% (medium to critical risks) for Process Control in 3 of the 4 systems.

- George Municipality is also performing very well with regard to wastewater quality management, to the extent where the Gwaing (91.24%), Herolds Bay (94.90%) and Kleinkrantz (90.46%) WWTWs and drainage systems were awarded Green drop status by the DWS for their 2013 assessment. The Municipality received a Green Drop Score of 79.88% for the Outeniqua system, 82.84% for the Haarlem system and 80.26% for the Uniondale system. **The Municipality's overall Green Drop Score was 84.90%.**

The CRRs stayed the same for two of the systems (Gwaing and Herolds Bay) and increased for the other four systems (Outeniqua, Kleinkrantz, Uniondale and Haarlem) during the 2013/2014 Green Drop Progress Reporting in 2014. The Municipality is cautioned to guard against losing the steady gains made in improving their systems since 2011. The upgrading and maintenance projects listed at all treatment facilities will stretch positively into the desired improvements. The Municipality should also pay attention to improving supervisor competencies in the Outeniqua and Kleinkrantz systems, while the process controller competencies should be improved in all systems. The wastewater capacity should also be increased urgently in Haarlem and Uniondale.

- 100% MIG expenditure in the previous financial year from the DLG.

#### Quantity of Water Services Provided (Water Balance)

Detail water balance models are in place for each of the distribution systems in George Municipality's Management Area. These models include the volume of raw water abstracted from the various resources, the treated volume supplied from the WTW (System Input Volume) and the billed metered and unbilled unmetered consumption for each of the distribution systems. The volume and percentage of water losses were also calculated from the available data. The flows at each of the WWTWs are also recorded by the Municipality.

#### Water Services Delivery Profile

The number of consumer units per category or user type is available for each of the distribution systems. All the formal households in the urban areas of George Municipality's Management Area are provided with water connections inside the erven. Informal areas are supplied with shared services as an intermediary measure. George Municipality is committed to ensure that at least basic water and sanitation services are provided to those households in the rural areas with existing services still below RDP standard.

#### Cost Recovery and Free Basic Services

A detail step block tariff system (6 steps) is implemented by George Municipality. This tariff system discourages the wasteful or inefficient use of water. It is expected that this tariff structure will continue to be implemented in the future. The sustainable supply of potable water is however becoming an ever increasing challenge.

The first six (6) kl of water is provided free to all residential consumers. George Municipality's tariffs support the viability and sustainability of water supply services to the poor through cross-subsidies (where feasible). Free basic water and sanitation services are linked to the Municipality's Indigent Policy and all indigent households therefore receive free basic water and sanitation services. This implies that either the equitable share is used to cover this cost, or higher consumption blocks are charged at a rate greater than the cost in order to generate a surplus to cross-subsidies consumers who use up to six (6) kilolitres per month.

The operational and maintenance budget of the last five financial years for water and sewerage services is summarised in the table below:

Summary of operational and maintenance budget for water and sewerage services for the last six years					
Expenditure / Income	Actual 17/18	Actual 16/17	Actual 15/16	Actual 14/15	Actual 13/14
<b>Water Services (Water Purification - 535, Water Distribution - 848 and Filtration Plant - 836)</b>					
Expenditure Water Purification	R59 240 342-48	R65 654 160-54	R58 584 934-54	R52 364 045-67	R48 307 528-00
Expenditure Water Distribution	R84 071 859-20	R90 476 213-12	R103 724 739-83	R94 786 489-86	R63 091 387-00
Expenditure Filtration Plant	R340 543-54	R448 808-52	R203 807-26	R224 179-85	R299 383-00
<b>Nett Expenditure</b>	<b>R143 652 745-22</b>	<b>R156 579 182-18</b>	<b>R162 513 481-63</b>	<b>R147 374 715-38</b>	<b>R111 698 298-00</b>
Income Water Purification	(R24 625 232-55)	(R32 078 821-97)	(R7 452 241-84)	(R1 806 039-46)	(R190 067-00)
Income Water Distribution	(R160 758 023-86)	(R158 405 614-32)	(R172 902 842-49)	(R155 480 179-67)	(R117 734 519-00)
Income Filtration Plant	(R0-00)	(R0-00)	(R0-00)	(R0-00)	(R0-00)
<b>Income</b>	<b>(R185 383 256-41)</b>	<b>(R190 482 436-29)</b>	<b>(R180 355 084-33)</b>	<b>(R157 286 219-13)</b>	<b>(R117 924 586-00)</b>
<b>(Surplus) / Deficit before Appropriations</b>	<b>(R41 730 511-19)</b>	<b>(R33 903 254-11)</b>	<b>(R17 841 602-70)</b>	<b>(R9 911 503-75)</b>	<b>(R6 226 288-00)</b>
Appropriations	(R0-00)	(R0-00)	(R8 302 841-12)	(R7 591 394-65)	(R9 244 093-00)
<b>(Surplus) / Deficit after Appropriations</b>	<b>(R41 730 511-19)</b>	<b>(R33 903 254-11)</b>	<b>(R26 144 443-82)</b>	<b>(R17 502 898-40)</b>	<b>(R15 470 381-00)</b>
<b>Sewerage Services (Sewerage Mainlines and Pump Stations - 521, Water Contamination Control - 563 and Laboratory Services - 564)</b>					
Expenditure Sewerage Mainlines & PS	R79 298 990-56	R85 386 448-20	R98 268 230-84	R95 618 634-91	R84 216 999-00
Expenditure Water Contamination Control	R35 882 120-72	R33 334 077-09	R28 662 201-53	R27 684 665-97	R24 784 168-00
Expenditure Laboratory Services	R3 215 602-82	R2 980 029-45	R2 843 363-68	R1 212 129-66	R1 073 917-00
<b>Nett Expenditure</b>	<b>R118 398 714-10</b>	<b>R121 700 554-74</b>	<b>R129 773 796-05</b>	<b>R124 715 430-54</b>	<b>R110 075 084-00</b>
Income Sewerage Mainlines & PS	(R164 489 943-91)	(R145 576 112-10)	(R149 296 762-39)	(R166 183 380-66)	(R151 758 788-00)
Income Water Contamination Control	(R34 643 348-59)	(R4 514 530-00)	(R11 013 997-25)	(R18 813 448-45)	(R11 429 265-00)
Income Laboratory Services	(R60 644-86)	(R56 629-93)	(R166 086-71)	(R0-00)	(R0-00)
<b>Income</b>	<b>(R199 183 935-36)</b>	<b>(R150 147 272-03)</b>	<b>(R160 478 848-35)</b>	<b>(R184 996 829-11)</b>	<b>(R163 188 053-00)</b>
<b>(Surplus) / Deficit before Appropriations</b>	<b>(R80 797 221-26)</b>	<b>(R28 446 717-29)</b>	<b>(R30 703 050-30)</b>	<b>(R60 281 398-57)</b>	<b>(R53 112 969-00)</b>
Appropriations	(R0-00)	(R0-00)	R14 915 063-92	R45 317 730-14	R30 497 447-00
<b>(Surplus) / Deficit after Appropriations</b>	<b>(R80 797 221-26)</b>	<b>(R28 446 717-29)</b>	<b>(R15 787 986-38)</b>	<b>(R14 963 668-43)</b>	<b>(R22 615 522-00)</b>
<b>(Surplus) / Deficit for Water and Sewerage Services before Appropriations</b>	<b>(R122 527 732-45)</b>	<b>(R62 349 971-40)</b>	<b>(R48 544 653-00)</b>	<b>(R70 192 902-32)</b>	<b>(R59 339 257-00)</b>
<b>(Surplus) / Deficit for Water and Sewerage Services after Appropriations</b>	<b>(R122 527 732-45)</b>	<b>(R62 349 971-40)</b>	<b>(R41 932 430-20)</b>	<b>(R32 466 566-83)</b>	<b>(R38 085 903-00)</b>

## Water Quality

George Municipality's Water Quality Policy Statement is as follows:

***"George Municipality will at all times, when reasonably possible, provide drinking water that is safe, palatable and aesthetically appealing. Drinking water should not contain chemical, microbial or any other substances that is deleterious to health. The water produced will comply for at least 99% of the time with the microbiological requirements, 95% of the time with Class I and 97% of the time with Class II drinking water quality standards as specified in the latest SANS 241 national standard for drinking water."***

An Operational and Compliance Water Quality and Final Effluent Quality Monitoring Programme, which meets the requirements of SANS:241 and the DWS's Blue and Green Drop sampling criteria are implemented by the Municipality.



The operational water sampling programmes of George Municipality complies with the minimum monitoring requirements of SANS:241-2: 2015 (Table 1: Minimum monitoring for prescribed process risk indicators) for the various WTWs and distribution systems. The table below indicates the compliance of the monthly E.Coli monitoring frequency in the water distribution systems of George Municipality, in terms of the minimum requirements of SANS:241-2: 2015 (Table 2). The period assessed was for samples taken from July 2017 to June 2018.

George Municipality's compliance of the monthly E.Coli monitoring frequency in the water distributions systems in terms of the minimum requirements of SANS 241-2:2015 (Table 2).			
Distribution System	Population served	Required number of monthly samples (SANS 241-2:2015: Table 2)	Number of monthly E.Coli samples taken by Municipality during 2017/2018
George and Wilderness *	194 462	38.9	36.7
Uniondale **	5 248	2	12.8
Haarlem **	2 522	2	8.7

Note: \* Exclude samples taken at the George Old and New WTW and the Wilderness WTW

\*\* Include samples taken at the WTW

The number of monthly E.Coli samples taken by the Municipality for the George / Wilderness distribution system will be more than the required number of samples, as indicated in the above table, if the samples taken at the WTWs are taken into account. The number of monthly E.Coli samples taken for the Uniondale and Haarlem distribution systems is more than the required number of samples.

The percentage compliance of the water quality samples taken over the period July 2017 to June 2018, with regard to the five SANS:241:2015 categories, are summarised in the table below for the various distribution systems.

Percentage compliance of the water quality samples for the period July 2017 to June 2018					
Distribution System	Acute Health Microbiological	Acute Health Chemical	Chronic Health	Aesthetic	Operational Efficiency
George	100.0%	100.0%	100.0%	99.5%	99.4%
Wilderness	98.5%	100.0%	100.0%	98.4%	97.3%
Uniondale	100.0%	100.0%	99.4%	95.6%	92.9%
Haarlem	100.0%	100.0%	99.5%	89.0%	85.0%

The overall percentage compliances of the final effluent samples taken over the period July 2017 to June 2018 at the various WWTWs are as follows:

Percentage microbiological, chemical and physical compliances of the final effluent samples taken over the period July 2017 to June 2018			
WWTW	Microbiological	Chemical	Physical
Outeniqua	78.7%	71.8%	58.9%
Gwaing	89.8%	100.0%	85.7%
Kleinkrantz	91.7%	96.3%	100.0%
Herolds Bay	100.0%	100.0%	99.0%
Uniondale	100.0%	100.0%	100.0%
Haarlem	100.0%	100.0%	100.0%
<b>Overall Percentage Compliance</b>	<b>93.5%</b>	<b>91.7%</b>	<b>89.0%</b>

All industrial effluent discharge into the sewer system of George Municipality is monitored. Water Services By-laws, with regard to the discharge of industrial effluent into the sewer system, are also in place and all industrial consumers formally apply for the discharge of industrial effluent into the sewer system. The quality of the industrial effluent discharged by industrial consumers into George Municipality's sewer system is monitored through a comprehensive sampling programme.

**WC/WDM**

The vision of George Municipality's WDM Strategy is as follows:

**"George Municipality commits itself, within reason and as far as practically possible, to uphold and continually impose the WDM measures currently in place and to impose new measures where WDM can be further improved"**

The implementation of a WDM Strategy by George Municipality and measures to reduce household's water demand were successful and has reduced the overall water requirement of the towns drastically. The overall percentage of water losses for George Municipality for the 2017/2018 financial year was 27.0% (System Input – Authorised Consumption).

The table below gives a summary of the water losses for the various distribution systems in George Municipality's Management Area.

Water losses for the various distribution systems							
Distribution System	Area of Losses	Unit	17/18	Record : Prior (Ml/a)			
				16/17	15/16	14/15	13/14
George	Treatment	Volume	1 292.431	661.091	1 226.708	1 403.163	1 372.137
		Percentage	10.7%	5.0%	9.3%	11.6%	11.9%
	Internal Distribution	Volume	2 832.077	3 726.401	2 903.983	2 070.323	1 788.208
		Percentage	26.4%	29.4%	24.4%	19.4%	17.6%
	Treatment and Internal Distribution	Volume	4 124.508	4 387.492	4 130.691	3 473.486	3 160.345
		Percentage	34.3%	32.9%	31.4%	28.8%	27.4%
	Internal Distribution	ILI	2.28	3.06	2.44	1.78	1.56
Uniondale	Treatment	Volume	13.827	13.178	15.899	19.930	15.449
		Percentage	4.8%	4.4%	5.3%	6.3%	6.8%
	Internal Distribution	Volume	100.201	111.552	115.544	111.893	50.288
		Percentage	36.7%	39.1%	40.4%	37.8%	23.8%
	Treatment and Internal Distribution	Volume	114.028	124.730	131.443	131.823	65.737
		Percentage	39.8%	41.8%	43.6%	41.7%	29.0%
	Internal Distribution	ILI	2.96	3.37	3.66	5.00	2.46
Haarlem	Treatment	Volume	18.994	13.671	15.111	31.310	20.178
		Percentage	9.8%	6.7%	7.3%	14.9%	10.5%
	Internal Distribution	Volume	93.363	95.400	100.534	96.190	84.620
		Percentage	53.3%	50.3%	52.1%	53.6%	49.3%
	Treatment and Internal Distribution	Volume	112.357	109.071	115.645	127.500	104.798
		Percentage	57.9%	53.7%	55.5%	60.5%	54.6%
	Internal Distribution	ILI	6.05	6.18	6.42	7.01	5.60
TOTALS	Internal Distribution	Volume	3 025.641	3 933.353	3 120.061	2 278.406	1 923.116
		Percentage	27.0%	29.9%	25.2%	20.5%	18.2%
	Treatment and Internal Distribution	Volume	4 350.893	4 621.293	4 377.779	3 732.809	3 330.880
		Percentage	34.8%	33.4%	32.1%	29.7%	27.8%

Note: Infrastructure Leakage Index (ILI) for Developed Countries = 1 – 2 Excellent (Category A), 2 – 4 Good (Category B), 4 – 8 Poor (Category C) and > 8 – Very Bad (Category D)

**Category A** = No specific intervention required.

**Category B** = No urgent action required although should be monitored carefully.

**Category C** = Requires attention

**Category D** = Requires immediate water loss reduction interventions

### Water Services Infrastructure Management

George Municipality updated their current Asset Register during the 2017/2018 financial year. The CRC, DRC, RUL and Age distribution of the water and sewerage infrastructure in George Municipality's Management Area is summarised in the table below (June 2018):

Summary of water and sewerage infrastructure assets included in George Municipality's Asset Register (June 2018)					
Asset Type		CRC		DRC	%CRC / DRC
Water Infrastructure		R603 662 679		R356 634 573	59.08%
Sewerage Infrastructure		R533 324 396		R358 026 645	67.13%
Remaining Useful Life					
Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Water Infrastructure	R110 802 557	R127 011 795	R324 430 272	R39 333 926	R2 084 129
Sewerage Infrastructure	R116 974 641	R88 410 040	R175 135 399	R143 524 964	R9 279 350
Age Distribution					
Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Water Infrastructure	R110 529 100	R307 873 376	R122 250 173	R21 876 423	R41 133 609
Sewerage Infrastructure	R225 044 055	R176 466 182	R72 107 934	R27 200 649	R32 505 578

The previous table means that 40.92% of the value of the water infrastructure has been consumed. The asset renewal needs for the water infrastructure assets over the next 10 years is R23.781 million per year. The reinvestment required is R110.802 million in the first 5 years and R127.011 million in the second 5-year period. The age of 6.8 % of the water infrastructure assets is greater than 20 years.

The previous table means that 32.87% of the value of the sewerage infrastructure has been consumed. The asset renewal needs for the sewerage infrastructure assets over the next 10 years is R20.538 million per year. The reinvestment required is R116.974 million in the first 5 years and R88.410 million in the second 5-year period. The age of 6.1% of the sewerage infrastructure assets is greater than 20 years.

One of the key challenges of George Municipality is to identify adequate funds for the rehabilitation and maintenance of the existing infrastructure, which is critical to ensure the sustainability of the services that are provided by the Municipality.

### Associated Services

All the schools and medical facilities in George Municipality's Management Area are supplied with adequate water and sanitation services.

### Water Resources

George Municipality continues to actively plan for the augmentation of their existing water resources for the systems where the future water requirements will exceed the safe yields of the existing resources or the allocations. The table below gives an overview of the years in which the annual water requirement is likely to exceed the sustainable yield from the various resources.

Years in which the annual water requirement will exceed the sustainable yield from the various resources				
Distribution System	Total sustainable Yield or Allocation (x 10 <sup>6</sup> m <sup>3</sup> /a)	Annual Growth on 2017/2018 requirement (1.5% or 2.5%)	Annual Growth on 2017/2018 requirement (3.5% or 4.5%)	WSDP Projection Model
George / Wilderness	21.050 (Yield)*	2039 (2.5%)	2029 (4.5%)	> 2042
Uniondale	0.697 (Allocation)	> 2042 (1.5%)	> 2042 (3.0%)	> 2042
Haarlem	0.230 (Allocation)	2028 (1.5%)	2022 (3.0%)	> 2042

Note \* Include Malgas Pumping Scheme



The short, medium and long term options evaluated through the George Bulk Water Supply Study, to augment the supply to George, include the following:

Short, medium and long term source augmentation options	
Proposed Option	Comment
<b>Short to Medium Term Augmentation Options</b>	
Water Demand Management	Already implemented
Refurbishment of Kaaimans River Weir	Already implemented
Malgas River Pumping Scheme	Already implemented
First Phase of the Re-use of Treated Effluent	Already implemented
Raising of GRD Spillway	Planning in progress
<b>Medium to Longer Term Augmentation Options</b>	
Second Phase of the Re-use of Treated Effluent	Will be considered
Proposed Malgas Dam	Being considered
<b>Longer Term Augmentation Options</b>	
Proposed Maalgate Dam	Feasible, if land acquisition issues can be resolved
Proposed Upper Kaaimans River Dam	Not feasible due to potential excessive environmental impacts
Desalination	Not yet cost effective
Groundwater	Being considered but requires further investigation

### Institutional Arrangement Profile

George Municipality is the official WSA for the entire Municipal Management Area and act as the WSP for the whole area. The Municipal personnel is continuously exposed to training opportunities, skills development and capacity building at a technical, operations and management level in an effort to create a more efficient overall service to the users. A Workplace Skills Plan is compiled every year and the specific training needs of the personnel, with regard to water and wastewater management are determined annually.

George Municipality's Vulnerability Index for 2018 was indicated as 0.50 "Moderate Vulnerability" in the "2018 Municipal Services Strategic Assessment (MuSSA) for Western Cape Province" Report. The areas of concern evident from the 2018 assessment are:

- Staff Skill Levels (Technical) (40.0%)
- Technical Staff Capacity (Numbers) (45.0%)
- Financial Asset Management (30.0%)

It is important for George Municipality to focus on the rehabilitation and maintenance of the existing water and sewerage infrastructure. The Operation and Maintenance budget allocated towards the rehabilitation and maintenance of the existing water and sewerage infrastructure needs to be increased. A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing infrastructure. In the case of the operations and maintenance of the systems, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the systems remain in good condition. The Municipality needs to continue to use the updated Water and Sewer Master Plans to guide all future water and sewerage infrastructure planning.

### Social and Customer Services Requirements

A comprehensive Customer Services and Complaints system is in place at George Municipality and the Municipality has maintained a high and a very consistent level of service to its urban water consumers. After hour emergency requests are being dealt with by the control room on a twenty four hour basis. Requests are furthermore captured on an electronic mail or works-order system to ensure execution thereof.

The Water Safety Plans of George Municipality were last updated during 2013/2014 and includes an Improvement / Upgrade Plan. The purpose of the Improvement / Upgrade Plan is to address the existing significant risks where the existing controls were not effective or absent.

Barriers implemented by George Municipality against contamination and deteriorating water quality include the following:

- Participate in Catchment management and water resource protection initiatives.
- Protection at points of abstraction such as river intakes and dams (Abstraction Management).
- Correct operation and maintenance of WTWs (Coagulation, flocculation, sedimentation and filtration).
- Protection and maintenance of the distribution systems. This includes ensuring an adequate disinfectant residual at all times, rapid response to pipe bursts and other leaks, regular cleaning of reservoirs, keeping all delivery points tidy and clean, etc.

Three other important barriers implemented by George Municipality against poor quality drinking water that are a prerequisite to those listed above are as follows:

- A well informed Council and municipal managers that understand the extreme importance of and are committed to providing adequate resources for continuous professional operation and maintenance of the water supply system.
- Competent managers and supervisors in the technical department who are responsible for water supply services lead by example and are passionate about monitoring and safeguarding drinking water quality.
- Well informed community members and other consumers of water supply services that have respect for water as a precious resource.

## **GEORGE MUNICIPALITY**

### **ANNUAL WSDP PERFORMANCE AND WATER SERVICES AUDIT REPORT FOR 2017/2018**

#### **BACKGROUND**

##### **Appointment**

IX Engineers was appointed by George Municipality to assist them with the compilation of their WSDP Performance- and Water Services Audit Report, which forms part of their annual report for the 2017/2018 financial year. The purpose of the WSDP Performance- and Water Services Audit Report is to report on the implementation of George Municipality's previous year's WSDP, for the 2017/2018 financial year.

The DWS developed the "Annual Water Services Development Plan Performance- and Water Services Audit Report" template during 2014, to assist Municipalities with the drafting of their reports. IX Engineers RSA agreed with George Municipality to follow this template as far as possible.

##### **Purpose**

George Municipality is required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Regulations relating to compulsory national standards and measures to conserve water", as issued in terms of sections 9(1) and 73(1)(j) of the Water Services Act, to report on the implementation of its WSDP during each financial year and to include a water services audit in such an annual report.

Section 62 of the Water Services Act requires the Minister to monitor every WSI in order to ensure compliance with the prescribed national standards. This regulation requires a WSA to complete and submit a water services audit every year. The water services audit is designed to monitor the compliance of the WSA and other WSIs with these regulations. The Water Services Act allows the audit to be used as a tool to compare actual performance of the WSA against the targets and indicators set in their WSDP. The purpose of the water services audit is as follows:

- To monitor compliance with the Act and these regulations;
- To compare actual performance against targets contained in the WSDPs.
- To identify possibilities for improving water conservation and water demand management.

The WSDP Performance- and Water Services Audit Report will give an overview of the implementation of the Municipality's previous year's WSDP, for the 2017/2018 financial year, and can be seen as an annexure to George Municipality's Annual Report. The Annual Report is compiled as required by the Local Government: Municipal Systems Act, Act no 32 of 2000 (Section 46) and the Local Government: Municipal Finance Management Act, Act no 56 of 2003 (Section 121). The WSDP Performance- and Water Services Audit Report contain the following detail information:

- The Municipality's performance with regard to their KPIs for water and sewerage services for the 2017/2018 financial year, as included in the Municipality's SDBIP.
- The Municipality's Performance with regard to DWS's Blue and Green Drop Assessments. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. Green drop status is awarded to those WWTWs that comply with 90% criteria on key selected indicators on waste water quality management.
- DWS's Scorecard for assessing the potential for WC/WDM efforts in the Municipality.
- Information to be included in a WSDP Performance- and Water Services Audit as stipulated in regulations under section 9 of the Water Services Act, "Guidelines for Compulsory National Standards" and also required by DWS's 2014 WSDP Performance- and Water Services Audit Report guidelines.
- Information on the implementation of the various WSDP activities, as included under the WSDP Business Elements in DWS's WSDP guidelines.

## A. WATER SERVICES AUTHORITY PROFILE

### A.1. Map of Water Services Authority Area of Jurisdiction

George Municipality is located in the Garden Route Region of the Western Cape, as indicated on the figure below.



Figure A.1.1: Location of George Municipality in the Western Cape

The figure below gives an overview of George Municipality's Management Area and the settlements located in the Area.

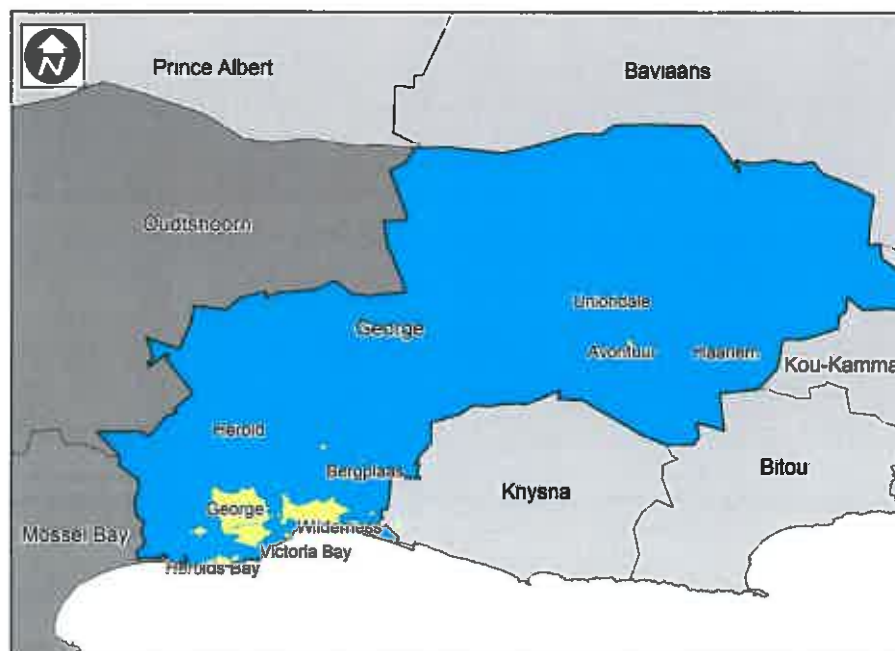


Figure A.1.2: George Municipality's Management Area



The various schemes supplied with bulk water by George Municipality are discussed in more detail under Section A.3. The existing water and sewerage infrastructure of the various distribution systems are indicated on the Aerial Maps included in the Municipality's detail WSDP documents (Module 2).

## A.2. Water Services Administration and Organization

George Municipality is the WSA for the entire Municipal Management Area. George Municipality's Organogram for Water and Sanitation Services is included in Annexure E. The table below gives the contact details of the persons responsible for water services management and planning within George Municipality.

Table A.2.1: Water Services Administrative Structure	
<b>Accounting Officer</b>	
Designation	Municipal Manager
Name	Mr Trevor Botha
Telephone Nr.	044-801-9067
Fax Nr.	044-801-9105
Cell Nr.	N/A
Email	<a href="mailto:tbotha@george.gov.za">tbotha@george.gov.za</a>
<b>WSA Manager</b>	
Designation	Director: Civil Engineering Services
Name	Mr Reginald Wesso
Telephone Nr.	044-801-9260
Fax Nr.	044-873-3862
Cell Nr.	082-521-2039
Email	<a href="mailto:rwesso@george.gov.za">rwesso@george.gov.za</a>
<b>WSP Manager</b>	
Designation	Deputy Director: Water and Sanitation Services
Name	Mr Henry Jansen
Telephone Nr.	044-801-9352
Fax Nr.	044-873-3862
Cell Nr.	082-829-3608
Email	<a href="mailto:hkjansen@george.gov.za">hkjansen@george.gov.za</a>
<b>WSDP Manager</b>	
Designation	Civil Engineering Technician
Name	Mr Marius Swart
Telephone Nr.	044-801-9267
Fax Nr.	044-873-3862
Cell Nr.	082-241-9000
Email	<a href="mailto:mswart@george.gov.za">mswart@george.gov.za</a>
<b>IDP Manager</b>	
Designation	Manager IDP and PMS
Name	Dr Sandile Lingani
Telephone Nr.	044-801-9075
Fax Nr.	044-801-9083
Cell Nr.	076-413-6876
Email	<a href="mailto:slingani@george.gov.za">slingani@george.gov.za</a>

### A.3. Water Services Overview

George Municipality is situated within the newly established Breede-Gouritz Water Management Area (WMA) and is located within the Garden Route District of the Western Cape Province, in which the following municipalities are also located:

- Hessequa Municipality;
- Mossel Bay Municipality;
- Oudtshoorn Municipality;
- Kannaland Municipality;
- Bitou Municipality; and
- Knysna Municipality

George Municipality consists of 25 individual wards, and is the only WSA within the George Municipality's Management Area. The Municipality is also the Water Services Provider (WSP). The former Eden District Management Area, which constitutes of Uniondale, Haarlem and other smaller rural settlements also forms part of the newly demarcated municipal area after the Local Government Elections of 18 May 2011. George Municipality's Management Area includes the following towns and **Water Distribution Systems**:

- The City of George, the village of Herolds Bay and the coastal resorts of Victoria Bay, Kleinkrantz and Wilderness National Park – **George / Wilderness System**

Bulk raw water supply to the George / Wilderness system is from the following water resources.

#### Garden Route Dam (GRD) and Swart River Dam

The GRD was completed in 1979 on the Swart River downstream of its confluence with the Kat River. The GRD currently has a storage capacity of 9.03 million m<sup>3</sup> and a historic firm yield of 13.4 million m<sup>3</sup>/a. The current Full Supply Level of 179.34m (above mean sea level) could be raised by between 2m and 3m.

A second dam, the Swart River Dam, exists further upstream on the Swart River. This dam was the original source of supply for the town, supplying the WTWs directly by gravity. Due to its small size compared to the GRD, it contributes relatively little and its pipeline has fallen into disuse. At present, the dam is leaking and its outlet works are in a poor state. It is not currently being used to support the GRD in directly supplying the WTWs. However, it is actively making releases into the downstream river and so into the GRD.

#### Kaaimans River

Flow from the Kaaimans River can be diverted into the GRD via the diversion of water at the Kaaimans weir via a 35 Ml/d pump station. The pump station was once active prior to the construction of the GRD, but fell into disuse due to the ample supply from the new dam in its early years. The weir and the pump station were however rehabilitated during 2008/2009. Instead of supply directly to the WTWs, as was previously the case, it now discharges its flow into the headwater of the GRD.

#### Touw River

The Touw River provides raw water abstracted from a natural weir straight to the Wilderness WTW.

#### Outeniqua Reclamation Plant

The first phase of the Outeniqua Reclamation Plant was completed. The reclamation plant treat the sewage effluent from the Outeniqua WWTW to a standard complying with national and international water quality standards. The treated effluent is pumped to the GRD, where it is blended with the raw water before being abstracted and pumped to the WTW. The first phase allows for 10 Ml/d, which will be followed by an additional 5 to 10 Ml/d for Phase 2 in the short to medium term. The 10 Ml/d pump station will later be upgraded to 20 Ml/d and ultimately to 25 Ml/d (the pipeline was designed to accommodate 35 Ml/d) when incorporating the effluent from the Gwaing WWTW.

### Malgas River Pumping Scheme

The Malgas Pumping Scheme was commissioned during 2012 and consists of an off-channel off-take just upstream of the existing Witfontein low level bridge, with a 6.3km 500mm dia GRP pipeline to the WTW. A pump station was constructed at the off-take. The additional yield from this source is approximately 2 400 MI.

- The village of Uniondale – **Uniondale System**

Bulk water supply to Uniondale is from the Holdrif River (a tributary of the Kammanassie River), which flows past the town. The town also has an allocation from the Haarlem Dam.

- The village of Haarlem – **Haarlem System**

Bulk raw water is supplied to Haarlem from the Haarlem Dam.

The table below gives an overview of the major water infrastructure components, for the various distribution systems, in George Municipality's Management Area.

A.3.1: Existing main water infrastructure (Resources and WTWs)			
Water Distribution System	Bulk Supply	WTWs and Treatment Processes	
	(Resources)	WTW	Capacity in MI/d
George / Wilderness	Garden Route Dam, Swart River Dam, Kaaimans River (Weir), Malgas River (Weir) and Boreholes	Old George WTW	25.000
		New George WTW	20.000
	Touw River (Weir)	Ebb & Flow WTW	1.700
Uniondale	Holdrif River (Weir)	Uniondale WTW	1.500
Haarlem	Haarlem Dam	Haarlem WTW	1.000

A.3.2: Existing main water infrastructure (Reticulation, pump stations and reservoirs)					
Water Distribution System	Water Distribution Networks	Number of Water PS		Reservoirs and Water Towers	
		Raw Water	Potable Water	Number of Reservoirs & Water Towers	Total Storage in MI
	km	Number of PS	Number of PS		
George / Wilderness	896.654	6	16	31	51.026
Uniondale	62.297	-	2	8	1.200
Haarlem	27.593	-	1	4	2.450

The table below gives an overview of the major sewerage infrastructure components, for the various drainage systems, in George Municipality's Management Area.

A.3.3: Existing main sewerage infrastructure					
Sewer Drainage Systems	WWTWs and Treatment Processes			Sewer Drainage Network	Number of Sewer PS
	Hydraulic Capacity	Organic Capacity	Treatment Processes		
	MI/d	kg COD/d		km	
Gwaing	11.000	10 450	Activated Sludge and BNR	850.134	112
Outeniqua	15.000	15 000	Activated Sludge		
Kleinkrants	2.500	2 208	Activated Sludge		
Herolds Bay	0.300	210	Oxidation Pond System		
Uniondale	1.000	640	Activated Sludge	11.011	3
Haarlem	0.100	Unknown	Activated Sludge	3.397	1

The Community Survey of 2016 from Statistics South Africa estimate the 2016 population for George Municipality at 208 237 persons and the permanent households at 62 722, at an average household size of 3.3 persons per household.

The 2017/2018 population was estimated by applying an annual growth rate of 2.68% to the 2011 Census population figure. The current population figures and the annual population growth percentages used in the WSDP Performance- and Water Services Audit Report are aligned with the figures used in DWS's GeoDatabase. The future estimated annual population growth percentages, as listed in the table below, were agreed with the Municipality during January 2014.

Table A.3.4: Annual population growth percentages per distribution system	
Town	Annual Pop Growth %
George / Wilderness	2.80%
Unlondale	2.50%
Haarlem	1.00%
Farms	2.0%
<b>Total</b>	<b>2.68%</b>



The tables below give an overview of the projected population and permanent number of households and the water and sanitation service levels in George Municipality's Management Area.

Table A3.5: Water Services Overview (Water)											
Settlement Type	2011/2012		2017/2018		Water category						
	Households	Population	Households	Population	Adequate: Formal	Adequate: Informal	Adequate: Shared Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs
					Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal				
<b>URBAN</b>											
<b>Metropolitan Area</b>					Adequate			Below RDP			None
<b>Sub-Total</b>	0	0	0	0							
<b>Formal Town</b>					Adequate			Below RDP			None
<i>George and Wilderness</i>	42,211	147,881	51,564	181,514	P		P				
<i>Uniondale</i>	1,094	4,429	1,275	5,160	P		P				
<i>Haarlem</i>	597	2,376	616	2,450	P		P				
<b>Sub-Total</b>	43,902	154,686	53,454	189,124							
<b>Townships</b>					Adequate			Below RDP			None
<b>Sub-Total</b>	0	0	0	0							
<b>Informal Settlements</b>					Adequate			Below RDP			None
<i>George and Wilderness</i>	4,222	16,888	3,237	12,948		P					
<i>Uniondale</i>	24	96	22	88		P					
<i>Haarlem</i>			18	72		P					
<b>Sub-Total</b>	4,246	16,984	3,277	13,108							
<b>Working towns &amp; service centres</b>					Adequate			Below RDP			None
<b>Sub-Total</b>	0	0	0	0							
<b>Sub-Total: (Urban)</b>	48,148	171,670	56,731	202,232							
<b>RURAL</b>											
<b>Rural / Farming</b>					Adequate			Below RDP			None
<i>Farms</i>	5,186	21,136	5,821	23,724	P		P				P
<b>Sub-Total</b>	5,186	21,136	5,821	23,724							
<b>Informal Settlements</b>					Adequate			Below RDP			None
<i>Farms</i>	217	868	264	1,056							P
<b>Sub-Total</b>	217	868	264	1,056							
<b>Sub-Total (Rural)</b>	5,403	22,004	6,085	24,780							
<b>TOTAL</b>	53,551	193,674	62,816	227,012							

Table A3.6: Water Services Overview (Sanitation)

Settlement Type	2011/2012		2017/2018		Sanitation category									
	Households	Population	Households	Population	Adequate: Formal	Adequate: Informal	Adequate: Shared Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs	Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal
<b>URBAN</b>														
<b>Metropolitan Area</b>					Adequate							Below RDP		None
<b>Sub-Total</b>	0	0	0	0										
<b>Formal Town</b>					Adequate							Below RDP		None
<i>George and Wilderness</i>	42,211	147,881	51,564	181,514	P		P							
<i>Uniondale</i>	1,094	4,429	1,275	5,160	P		P							
<i>Haarlem</i>	597	2,376	616	2,450	P		P							
<b>Sub-Total</b>	43,902	154,686	53,454	189,124										
<b>Townships</b>					Adequate							Below RDP		None
<b>Sub-Total</b>	0	0	0	0										
<b>Informal Settlements</b>					Adequate							Below RDP		None
<i>George and Wilderness</i>	4,222	16,888	3,237	12,948		P							P	
<i>Uniondale</i>	24	96	22	88		P								
<i>Haarlem</i>			18	72		P								
<b>Sub-Total</b>	4,246	16,984	3,277	13,108		P								
<b>Working towns &amp; service centres</b>					Adequate							Below RDP		None
<b>Sub-Total</b>	0	0	0	0										
<b>Sub-Total: (Urban)</b>	48,148	171,670	56,731	202,232										
<b>RURAL</b>														
<b>Rural / Farming</b>					Adequate							Below RDP		None
<i>Farms</i>	5,186	21,136	5,821	23,724	P		P							P
<b>Sub-Total</b>	5,186	21,136	5,821	23,724										
<b>Informal Settlements</b>					Adequate							Below RDP		None
<i>Farms</i>	217	868	264	1,056		P							P	
<b>Sub-Total</b>	217	868	264	1,056										
<b>Sub-Total (Rural)</b>	5,403	22,004	6,085	24,780										
<b>TOTAL</b>	53,551	193,674	62,816	227,012										

## B. WSDP PERFORMANCE REPORT

### B.1. WSDP Reference and Status

George Municipality's previous WSDP was updated for the 2013/2014 financial year and was approved by Council. The table below gives an overview of the Municipality's WSDP status.

Table B.1.1: WSDP and Reporting Reference						
Nr	WSDP Title and Reference	Status	Date	WSDP Year	Financial Year	Reporting year
1	Water Services Development Plan, Module 1, 2 and 3	Drafted:	Mar 2013	Year 1	2015/2016	Year -2
		Comment submit:	Apr & May 2013	Year 2	2016/2017	Year -1
		Finalised:	29 May 2013	Year 3	2017/2018	Year 0
		Adopted:	29 May 2013	Year 4	2018/2019	Year 1
		Published:	29 May 2013	Year 5	2019/2020	Year 2

#### Legend:

<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Past Financial Years
<span style="background-color: white; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Previous Financial Year (financial year of reporting)
<span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Future Years

### B.2. Performance on Water Services Objectives and Strategies

The IDP is the Municipality's single most strategic document that drives and directs all implementation and related processes. The Municipality's budget is developed based on the priorities, programmes and projects of the IDP, after which a Service Delivery Budget Implementation Plan (SDBIP) is developed, to ensure that the organisation actually delivers on the IDP targets.

The SDBIP is the process plan and performance indicator / evaluation for the execution of the budget. The SDBIP is being used as a management, implementation and monitoring tool that assists and guide the Executive Mayor, Councillors, Municipal Manager, Senior Managers and the community. The plan serves as an input to the performance agreements of the Municipal Manager and Directors. It also forms the basis for the monthly, quarterly, mid-year and the annual assessment report and performance assessments of the Municipal Manager and Directors.

Finally, the Annual Report, of which the Water Services Audit Report forms a part, records the success or otherwise of the previous year's implementation.

The table below gives an overview of the Municipality's performance on the water and sanitation objectives and strategies per WSDP topic.

Table B.2.1: Performance on Water Services Objectives and Strategies per WSDP Topic														
Nr	Objective	Key Performance Indicator	Inclusion (yes/no)	WSDP Year 1		WSDP Year 2		WSDP Year 3		WSDP Year 4		WSDP Year 5		
				FY 1 Target	FY 1 Actual	FY 2 Target	FY 2 Actual	FY 3 Target	FY 3 Actual	FY 4 Target	FY 4 Actual	FY 5 Target	FY 5 Actual	
WSDP Topic 1: Administration														
WSDP Topic 2: Demographics														
WSDP Topic 3: Service Levels														
	New water connections within 10 working days of application received by Department	% of connections within the required timeframe	No	Yes	92.4%	90.0%	91.3%	90.0%	80.7%	90%	80.7%	90%	90%	62%
	New sewerage connections within 10 working days of application received by Department	% of connections within the required timeframe	No	Yes	95.0%	95.0%	95.0%	90.0%	90.0%	90%	90%	90%	90%	90%
WSDP Topic 4: Socio economic														
WSDP Topic 5: Water Services Infrastructure														
	Rehabilitate and upgrade Water - Networks in terms of the approved capital budget by 30 June.	% of budget spend at 30 June	No	Yes	85.0%	100.0%	85.0%	85.0%	85.0%	85%	85%	85%	85%	88%
	Rehabilitate and upgrade Water-Purification in terms of the approved capital budget by 30 June.	% of budget spend at 30 June	No	Yes	85.0%	85.0%	100.0%	85.0%	85.0%	85%	85%	85%	85%	85%
	Rehabilitate and upgrade the Sewerage Networks in terms of the approved capital budget by 30 June.	% of budget spend at 30 June	No	Yes	85.0%	100.0%	100.0%	85.0%	85.0%	85%	85%	85%	85%	85%
	Rehabilitate and upgrade the Sewerage Treatment Works in terms of the approved capital budget by 30 June	% of budget spend at 30 June	No	Yes	85.0%	100.0%	100.0%	85.0%	85.0%	85%	85%	85%	85%	78%
	Complete the construction a 12.5 M reservoir at the George Water Works by 30 June 2018	Reservoir construction completed	No	Yes								1	0	
	Commence with the construction of the Garden Route Dam wall and spill way raising and spend budget by 30 June 2018	% spending of approved budget	No	Yes								95%	9.6%	
WSDP Topic 6: Operation Maintenance														
	Achieve Blue Drop status per supply system	Number of awards received	No	No	2	2	-	-	-	-	-	-	-	-
	90% Compliance to general standards with regard to waste water outflow by 30 June	% compliance to general standards by 30 June	No	Yes		90.0%	96.0%	90.0%	95.3%	90%	95%	90%	88%	
	95% water quality level obtained as per SANS 241 physical and micro parameters by 30 June.	% water quality level by 30 June	No	Yes		95.0%	97.2%	95.0%	100.0%	85%	100%	95%	98%	
	Ensure that SHE representatives of the sub-district submit monthly inspection reports w.r.t Health and Safety to the Director for acknowledgement on or before the 15th of each month. (Water Services)	# of inspection reports submitted to the Director, to ensure the safety of all personnel and to protect the municipality from legal actions.	No	Yes								12	11	
	Ensure that SHE representatives of the sub-district submit monthly inspection reports w.r.t Health and Safety to the Director for acknowledgement on or before the 15th of each month. (Sanitation Services)	# of inspection reports submitted to the Director, to ensure the safety of all personnel and to protect the municipality from legal actions.	No	Yes								12	11	



George Municipality: Annual WSDP Performance- and Water Services Audit Report for 2017/2018

Table B-2.1: Performance on Water Services Objectives and Strategies per WSDP Topic														
Nr	Objective	Strategy	Key Performance Indicator	Initiation (yes/no)	WSDP Year 1		WSDP Year 2		WSDP Year 3		WSDP Year 4		WSDP Year 5	
					WSDP IDP	FY 1 Target	FY 1 Actual	FY 2 Target	FY 2 Actual	FY 3 Target	FY 3 Actual	FY 4 Target	FY 4 Actual	FY 5 Target
WSDP Topic 7: Associated services														
WSDP Topic 8: Conservation and Demand management														
	Pipe bursts repaired within 48 hours from when reported		% repaired within the required timeframe	No	Yes	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%	98%	95%	95%
	Planned replacement of water meters in terms of available budget		Number of meters replaced	No	Yes	800	1128	800	1,158	800	800	800	800	805
	Replacement of water mains subject to available funds in the budget		Length of pipe replaced (meters)	No	Yes	2000	2000	2,000	2,561	2,000	3,120	3,120	2	1.44
	Limit water network losses to less than 15% by 30 June.		% Water network losses by 30 June	No	Yes	15.0%	12.6%	15.0%	15.8%	25.0%	24.6%	25.00%	24.59%	25%
	Respond to Collaborator items within 10 working days - Water Services		% Items responded to within 10 working days	No	Yes								80%	73%
	Respond to Collaborator items within 10 working days - Sanitation Services		% Items responded to within 10 working days	No	Yes								80%	80%
WSDP Topic 9: Water Resources														
WSDP Topic 10: Financial profile														
WSDP Topic 11: Institutional Arrangements profile														
	Annual completion of the Regulatory Performance Measurement System by the end of June		% completed	No	Yes	1	1	100.0%	100.0%	100.0%	100.0%	100%	100%	90%
	Submit the Water Services Audit Report by the end of October in terms of Section 18(1) of the Water Services Act.		Report submitted	No	Yes			1.0%	1.0%	1.0%	1.0%	1.0%	1	0
WSDP Topic 12: Social and Customer service requirements														
	Sewerage blockages cleared within 48 hours from when reported		% repaired within the required timeframe	No	Yes	98.0%	98.0%	98.0%	97.9%	98.0%	98.0%	98%	95%	95%
WSDP Topic 13: Needs development plan														
Legend:														
	Past Financial Years													
	Previous Financial Year (financial year of reporting)													
	Future Years													

Legend:

	Past Financial Years
	Previous Financial Year (financial year of reporting)
	Future Years

The following water and sanitation related investigations were successfully completed during the last financial year.

- The WSDP Performance- and Water Services Audit Report for the 2016/2017 financial year was finalised and approved by Council as part of the Annual Report.
- George Municipality continues with the implementation of their Drinking Water Quality and Effluent Quality Sampling Programmes (Both Operational and Compliance Monitoring). Sample results are loaded on a monthly basis onto DWS's IRIS and GDS. All the WTWs and WWTWs are also registered on the IRIS and GDS websites. The effluent discharged by the industrial consumers is also monitored by George Municipality on a monthly basis.
- The Water and Sewer Master Plans for the various distribution and drainage systems are updated on a quarterly basis by GLS Consulting. GLS Consulting provides an extensive specialist service related to the optimal analysis, planning and management of water distribution and sewer reticulation systems. The Master Plans are also worked through with the personnel of the Civil Engineering Services Directorate.
- Pipe Replacement Programmes (PRPs) were done during March 2018 for both the water distribution networks and the sewer drainage networks.
- The Asset Register was updated to include all the water and sewerage capital projects completed during the 2017/2018 financial year.

The Municipality also received the following awards / acknowledgements:

- The upgrades to the Kleinkrantz WWTW in Wilderness received the best Water Engineering project award at the SAICE Regional Engineering Excellence Awards.
- The following awards were received from the Department of Water and Sanitation:
  - The Herolds Bay WWTW received the 2017 award for the Best Waste Water Pond System.
  - The Outeniqua WWTW Laboratory received the 2017 award for the Best Internal Wastewater Laboratory.
  - The Wilderness WTW received the 2017 runner-up award for the Best WTW.
  - The Kleinkrantz WWTW received the 2017 runner-up award for the Best WWTW.
- The Municipality's overall Blue Drop score came down from 98.12% for 2012 to 82.77% for 2014. Two key issues have impacted on the municipal compliance. The Haarlem and Uniondale systems that were transferred from the Eden District Municipality have been included in the George Local Municipality assessment for the first time and secondly a change in personnel has impacted the ongoing maintenance of information.

The overall 2014 Risk Rating for George Municipality is 34%, which translates into the 7<sup>th</sup> best performance in the Western Cape. The risk value is based on Process Control RR, Drinking Water Quality RR and Risk Management RR, with scores above 50% (medium to critical risks) for Process Control in 3 of the 4 systems.

- George Municipality is also performing very well with regard to wastewater quality management, to the extent where the Gwaing (91.24%), Herolds Bay (94.90%) and Kleinkrantz (90.46%) WWTWs and drainage systems were awarded Green drop status by the DWS for their 2013 assessment. The Municipality received a Green Drop Score of 79.88% for the Outeniqua system, 82.84% for the Haarlem system and 80.26% for the Uniondale system. **The Municipality's overall Green Drop Score was 84.90%.**

The CRRs stayed the same for two of the systems (Gwaing and Herolds Bay) and increased for the other four systems (Outeniqua, Kleinkrantz, Uniondale and Haarlem) during the 2013/2014 Green Drop Progress Reporting in 2014. The Municipality is cautioned to guard against losing the steady gains made in improving their systems since 2011. The upgrading and maintenance projects listed at all treatment facilities will stretch positively into the desired improvements. The Municipality should also pay attention to improving supervisor competencies in the Outeniqua and Kleinkrantz systems, while the process controller competencies should be improved in all systems. The wastewater capacity should also be increased urgently in Haarlem and Uniondale.

- 100% MIG expenditure in the previous financial year from the DLG.

### B.3. Status of Water Services Projects

George Municipality completed the following water and sewerage capital projects during the last financial year.

**Table B.3.1: Water Services Projects Status and Performance**

Nr	Project Title and Description	Inclusion		Total Project Cost R'000	Year 0 Performance - FY2017/18			Funding Source(s)	Project Category/Type	Planned Period		Project Status	Actual Completion Year
		WSDP	IDP		FY Budget R'000	Expended R'000	%			From FY	To FY		
1	Thembalethu UISP - Water	Yes	Yes	R7,839	R1,508	R962	64%	Grant	Water	2013/14	2018/19	In Progress	-
2	Installation of meters	Yes	Yes	R1,788	R400	R339	85%	CRR	Water	2015/16	2020/21	In Progress	-
3	Provision of Water Tanks	Yes	Yes	R511	R51	R51	100%	CRR	Water	2013/14	2020/21	In Progress	-
4	Water network rehabilitation	Yes	Yes	R20,154	R2,573	R2,654	103%	CRR	Water	2013/14	2018/19	In Progress	-
5	Telemetry and loggers	Yes	Yes	R991	R153	R153	100%	CRR	Water	2015/16	2020/21	In Progress	-
6	Golden Valley: Provision of services	No	Yes	R762	R645	R642	100%	Grant	Water	2016/17	2018/19	In Progress	-
7	Equipment TLB Caterpillar	No	Yes	R793	R1,200	R793	66%	EFF	Water	2017/18	2017/18	Completed	2018
8	Water Trucks	No	Yes	R778	R810	R778	96%	EFF	Water	2017/18	2017/18	Completed	2018
9	Isuzu water tanker truck	No	Yes	R754	R770	R754	98%	EFF	Water	2017/18	2017/18	Completed	2018
10	Tools and equipment	No	Yes	R281	R58	R20	35%	CRR	Water	2015/16	2020/21	In Progress	-
11	Raising Garden Route Dam	Yes	Yes	R1,399	R7,816	R747	10%	Grant	Water	2014/15	2020/21	In Progress	-
12	Water treatment works - Reservoir	Yes	Yes	R38,952	R19,000	R18,950	100%	Grant	Water	2016/17	2020/21	In Progress	-
13	Instrumentation	No	Yes	R1,167	R200	R68	34%	CRR	Water	2013/14	2020/21	In Progress	-
14	Telemetry	Yes	Yes	R944	R200	R66	33%	CRR	Water	2013/14	2020/21	In Progress	-
15	Tools and equipment	No	Yes	R112	R30	R11	36%	CRR	Water	2015/16	2020/21	In Progress	-
16	Airconditioning pump stations	No	Yes	R45	R200	R45	22%	CRR	Water	2017/18	2017/18	Completed	2018
17	Haarlem Waterworks Office Building	No	Yes	R4	R500	R4	1%	CRR	Water	2017/18	2017/18	Completed	2018
18	Unionsdale / Haarlem: Reservoir	No	Yes	R0	R500	R0	0%	CRR	Water	-	-	-	-
19	Malgas water pump station: Rehabilitation	No	Yes	R1,890	R1,966	R1,890	96%	CRR	Water	2017/18	2017/18	Completed	2018





**Table B.3.1: Water Services Projects Status and Performance**

Nr	Project Title and Description	Inclusion		Total Project Cost R'000	Year 0 Performance - FY2017/18			Funding Source(s)	Project Category / Type	Planned Period		Project Status	Actual Completion Year
		WSDP	IDP		FY Budget R'000	Expended R'000	%			From FY	To FY		
20	Water Treatment Works - Reservoir	Yes	Yes	R25,242	R2,900	R242	8%	CRR	Water	2016/17	2020/21	In Progress	-
21	Protea Park sewerage line	No	Yes	R0	R230	R0	0%	Grant	Sewerage	-	-	-	-
22	Jetting machine - Sewerage	No	Yes	R785	R785	R785	100%	EFF	Sewerage	2017/18	2017/18	Completed	2018
23	Thembalethu UISP - Sewerage	Yes	Yes	R19,326	R4,409	R2,818	64%	Grant	Sewerage	2013/14	2018/19	In Progress	-
24	Sewerage network rehabilitation	Yes	Yes	R16,027	R1,460	R1,456	100%	CRR	Sewerage	2013/14	2017/18	Completed	2018
25	Upgrade access roads and fencing	Yes	Yes	R2,275	R475	R474	100%	CRR	Sewerage	2016/17	2020/21	In Progress	-
26	Upgrading of pump station	Yes	Yes	R4,537	R2,024	R1,602	79%	CRR	Sewerage	2014/15	2020/21	In Progress	-
27	Electrical switchgear - Pump station	Yes	Yes	R4,815	R185	R183	99%	CRR	Sewerage	2013/14	2020/21	In Progress	-
28	Super sucker	No	Yes	R2,649	R2,500	R1,934	77%	EFF	Sewerage	2016/17	2017/18	Completed	2018
29	Thembalethu UISP Bulk Sewer	Yes	Yes	R5,797	R6,000	R5,797	97%	Grant	Sewerage	2017/18	2017/18	Completed	2018
30	Tools and equipment	No	Yes	R182	R92	R48	52%	CRR	Sewerage	2016/17	2020/21	In Progress	-
31	Golden Valley: Provision of services	No	Yes	R2,269	R1,943	R1,915	99%	Grant	Sewerage	2016/17	2018/19	In Progress	-
32	Inspection camera - Sewerage	No	Yes	R145	R145	R145	100%	CRR	Sewerage	2017/18	2017/18	Completed	2018
33	Outeniqua 10 Ml addition - WWTW	Yes	Yes	R199,497	R1,500	R0	0%	CRR	Sewerage	2013/14	2019/20	In Progress	-
34	Gwaling Sewer Treatment	Yes	Yes	R2,825	R2,986	R2,822	94%	CRR	Sewerage	2016/17	2017/18	Completed	2018
35	Tools and equipment	No	Yes	R81	R10	R6	58%	CRR	Sewerage	2015/16	2017/18	Completed	2018
36	Upgrading of Laboratory	Yes	Yes	R0	R500	R0	0%	CRR	Sewerage	-	-	-	-
37	Case Tractor - Replacement	No	Yes	R0	R660	R0	0%	EFF	Sewerage	-	-	-	-
38	Gwaling - Reinstated 3.5 Ml	No	Yes	R5,014	R4,514	R4,514	100%	Grant	Sewerage	2017/18	2018/19	In Progress	-
39	Laboratory Instruments	Yes	Yes	R738	R250	R208	83%	CRR	Sewerage	2013/14	2017/18	Completed	2018
40	Telemetry	Yes	Yes	R1,752	R200	R193	97%	CRR	Sewerage	2013/14	2018/19	In Progress	-
41	Belt press refurbishment - Gwaling	Yes	Yes	R1,028	R200	R188	94%	CRR	Sewerage	2015/16	2017/18	Completed	2018
<b>Total</b>				<b>R374,145</b>	<b>R102,548</b>	<b>R78,031</b>	<b>76%</b>						

Note: Total Project Cost: Actual expenditure from 2013/2014 to 2017/2018 plus approved budgets for period 2018/2019 to 2020/2021

## B.4. Past Financial Year Water Services Projects Impact Declaration

The impacts of the water and sewerage capital projects, which were implemented by George Municipality in the previous financial year, were as follows:

**Table 8.4.1: Past Financial Year Project Impact Declaration**

Nr	Project Title and Description	Project Category	Settlements which benefitted	Nr Beneficiaries		Impact Declaration
				Households	Population	
1	Thembalethu UISP - Water	Bulk water pipelines	Thembalethu	11310	52478	Provide higher level of water service to Thembalethu residents.
2	Installation of meters	Water reticulation	Management Area	225	788	Reduce NRW and ensure all water connections are metered.
3	Provision of Water Tanks	Basic services	Rural Areas	15	82	Provide basic water services in rural areas.
4	Water network rehabilitation	Reticulation	Management Area	Unknown	Unknown	Replace old sections of water network with regular pipe bursts. Reduce losses.
5	Telemetry and loggers	Other	Management Area	-	-	Efficient management of water distribution systems.
6	Golden Valley: Provision of services	Water reticulation	George	165	578	Provide higher level of water services to Golden Valley residents.
7	Equipment TLB Caterpillar	Other	Management Area	-	-	Efficient operation of systems.
8	Water Trucks	Other	Management Area	-	-	Efficient operation of systems.
9	Isuzu water tanker truck	Other	Management Area	-	-	Efficient operation of systems.
10	Tools and equipment	Other	Management Area	-	-	Efficient operation of systems.
11	Raising Garden Route Dam	Source	George	54801	194462	Increase safe yield of sources. Drought mitigation measures.
12	Water treatment works - Reservoir	Reservoir storage	George	10000 (Est)	35000	Ensure adequate reservoir storage capacity.
13	Instrumentation	Other	Management Area	-	-	Efficient operation of systems.
14	Telemetry	Other	Management Area	-	-	Efficient management and operation of systems.
15	Tools and equipment	Other	Management Area	-	-	Efficient operation of systems.
16	Airconditioning pump stations	Pump Stations	George	-	-	Ensure adequate operation of water pump stations.
17	Haarlem Waterworks Office Building	WTW	Haarlem	-	-	Improve Process Controllers working conditions at WTW
18	Uniondale / Haarlem: Reservoir	Reservoir storage	Uniondale	1297	5248	Ensure adequate reservoir storage capacity.
19	Malgas water pump station: Rehabilitation	Pump Stations	George	54801	194462	Efficient operation of raw water pump station.

**Table B.4.1: Past Financial Year Project Impact Declaration**

Nr	Project Title and Description	Project Category	Settlements which benefited	Nr. Beneficiaries		Impact Declaration
				Households	Population	
20	Water Treatment Works - Reservoir	Reservoir storage	George	10000 (Est)	35000	Ensure adequate reservoir storage capacity.
21	Protea Park sewerage line	Drainage network	George	Unknown	Unknown	Provide higher level of sanitation service to Protea Park residents.
22	Jetting machine - Sewerage	Other	Management Area	-	-	Efficient operation of sewerage drainage networks.
23	Thembalethu UISP - Sewerage	Drainage network	Thembalethu	11310	52478	Provide higher level of service to Thembalethu residents.
24	Sewerage network rehabilitation	Drainage network	Management Area	Unknown	Unknown	Replace old sections of the sewer networks in order to reduce blockages and possible spillages.
25	Upgrade access roads and fencing	Pump Stations	George	-	-	Improve security at sewer pump stations and easier access to the pump stations.
26	Upgrading of pump station	Pump Stations	Management Area	Unknown	Unknown	Efficient operation of sewer pump stations
27	Electrical switchgear - Pump station	Pump Stations	Management Area	Unknown	Unknown	Efficient operation of sewer pump stations
28	Super sucker	Other	Management Area	-	-	Efficient operation of sewerage drainage networks.
29	Thembalethu UISP Bulk Sewer	Drainage network	Thembalethu	11310	52478	Provide higher level of service to Thembalethu residents.
30	Tools and equipment	Other	Management Area	-	-	Efficient operation of sewerage drainage networks.
31	Golden Valley: Provision of services	Drainage network	George	165	578	Provide higher level of sanitation services to Golden Valley residents.
32	Inspection camera - Sewerage	Maintenance	Management Area	-	-	Efficient operation of sewerage drainage networks.
33	Outeniqua 10 Ml addition - WWTW	WWTW	George	18267	64820	Ensure compliance with General Limits for quality of effluent discharged from the WWTW and adequate treatment capacity to meet the future requirements.
34	Gwaing Sewer Treatment	WWTW	George	15000	52500	Ensure compliance with General Limits for quality of effluent discharged from the WWTW and adequate treatment capacity to meet the future requirements.
35	Tools and equipment	Other	Management Area	-	-	Efficient operation of sewerage drainage networks.
36	Upgrading of Laboratory	WWTW	Management Area	-	-	Ensure adequate operation and compliance sampling at the WWTWs. Compliance with General Limits for quality of effluent discharged from the WWTW and for proper Process Control at the WWTW.
37	Case Tractor - Replacement	Other	Management Area	-	-	Efficient operation of sewerage drainage networks.
38	Gwaing - Reinstate 3.5 Ml	WWTW	George	15000	52500	Ensure compliance with General Limits for quality of effluent discharged from the WWTW and adequate treatment capacity to meet the future requirements.
39	Laboratory instruments	WWTW	Management Area	-	-	Ensure adequate operation and compliance sampling at the WWTWs. Compliance with General Limits for quality of effluent discharged from the WWTW and for proper Process Control at the WWTW.
40	Telemetry	Other	Management Area	-	-	Efficient management and operation of the WWTW.
41	Belt press refurbishment - Gwaing	WWTW	Management Area	15000	52500	Ensure compliance with the sludge handling requirements at the Gwaing WWTW.
<b>TOTAL</b>				<b>228 666</b>	<b>845 932</b>	

## C. WATER SERVICES AUDIT REPORT

### C.1. Quantity of Water Services Provided (Water Balance)

The graph and table below gives a summary of the total bulk raw water supply to the various distribution systems within George Municipality's Management Area.

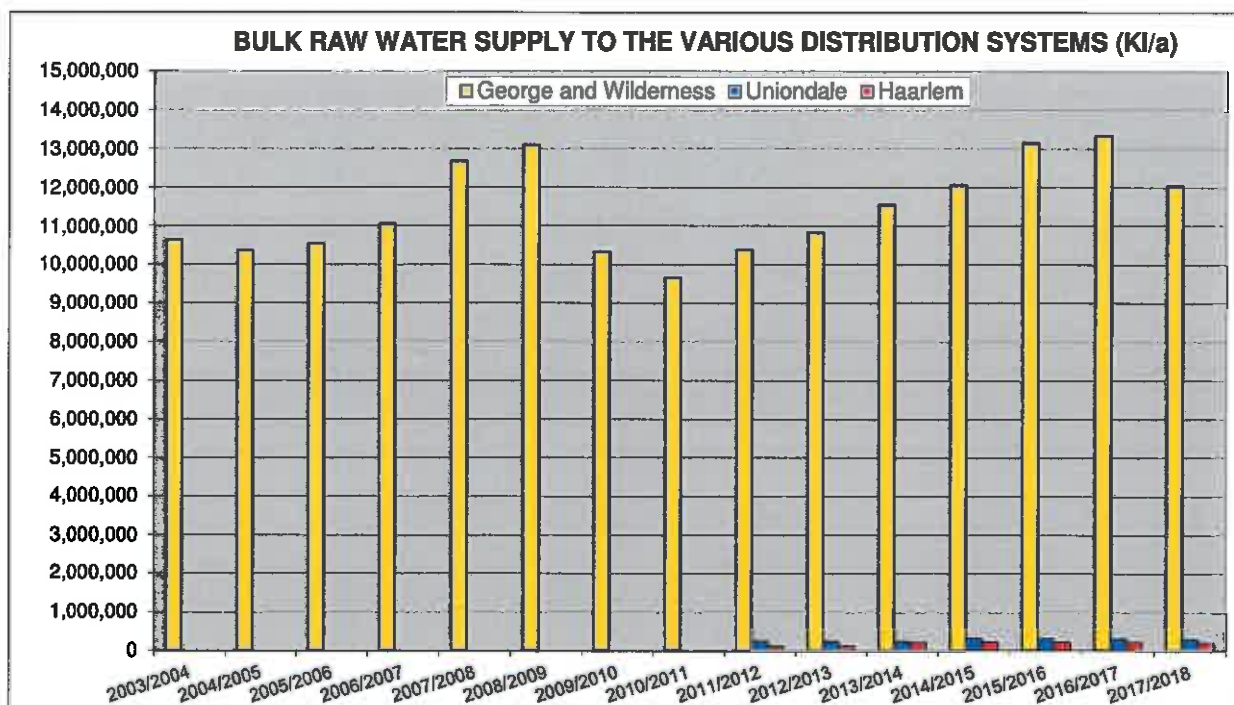


Figure C.1.1: Bulk raw water supply to the George/Wilderness, Uniondale and Haarlem systems

The table below gives a summary of the total bulk raw water supply to the various towns within George Municipality's Management Area.

Distribution System	Source	17/18	Record : Prior (M/a)				
			16/17	15/16	14/15	13/14	12/13
George / Wilderness	Swart and Kaaimans Rivers (GRD)	11 472.853	12 825.832	12 781.539	11 557.084	11 177.349	10 525.817
	Touw River	327.185	343.092	357.273	400.345	300.680	295.959
	Groundwater	232.461	174.346	-	92.424	70.265	-
Sub Total		12 032.499	13 343.270	13 138.812	12 049.853	11 548.294	10 821.776
Uniondale	Haarlem Dam and Holdrif River	286.582	298.451	301.614	316.304	226.366	219.840
Haarlem	Haarlem Dam	194.084	203.230	208.222	210.763	191.801	117.250
<b>Total</b>		<b>12 513.165</b>	<b>13 844.951</b>	<b>13 648.648</b>	<b>12 576.920</b>	<b>11 966.461</b>	<b>11 158.866</b>

The graph below gives an overview of the annual system input volume and water losses for the various distribution systems in George Municipality's Management Area.

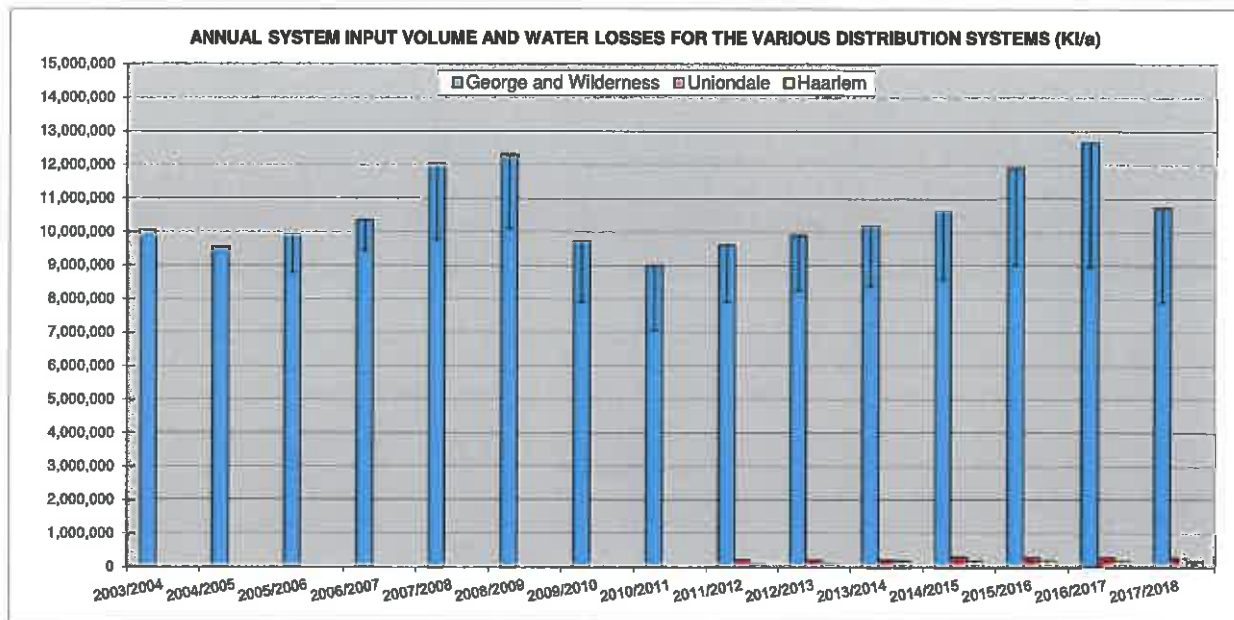


Figure C.1.2: System Input Volume and water losses for the George/Wilderness, Uniondale and Haarlem systems.

#### Volume of water used by each user sector:

The figure below gives an overview of George Municipality's overall water usage per Sector for the various financial years.

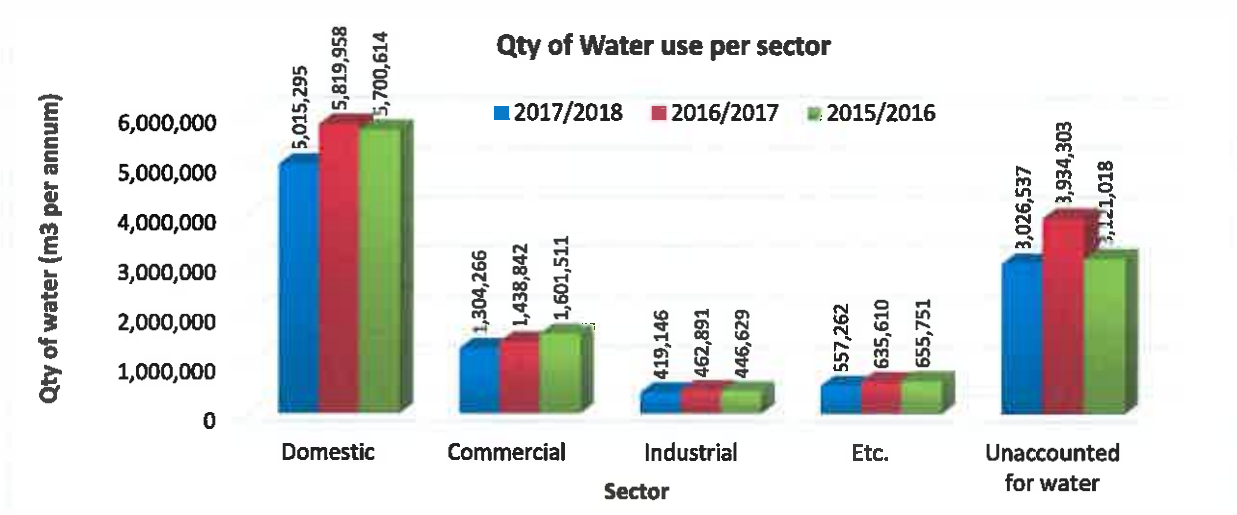


Figure C.1.3: Quantity of water services provided / water balance



The table below gives an overview of the volume of water services provided / water balance for all the distribution systems in George Municipality's Management Area.

Table C.1.2: Quantity of Water Services Provided / Water Balance								
WSDP Ref. #	Regulations Ref. #	Description	m <sup>3</sup> per annum			Ml/d		
			Year 0	Year - 1	Year - 2	Year 0	Year - 1	Year - 2
			FY2017/18	FY2016/17	FY2015/16	FY2017/18	FY2016/17	FY2015/16
		RAW WATER						
7.2.1		Surface water purchased	194,084	203,230	208,222	0.53	0.56	0.57
7.1 / 7.2.2		Surface water abstracted	12,319,081	13,641,721	13,440,426	33.75	37.37	36.82
7.1 / 7.2.3		Ground water abstracted	0	0	0	0.00	0.00	0.00
7.2.14		Effluent recycled	0	0	0	0.00	0.00	0.00
7.2.4		less Raw water supplied to others	0	0	0	0.00	0.00	0.00
7.2.5		Sub-Total: Raw Water supplied	12,513,165	13,844,951	13,648,648	34.28	37.93	37.39
	10.2 (g) (i)	BULK WATER SUPPLY						
7.2.6		Volume of water treated	11,187,913	13,157,011	12,390,930	30.65	36.05	33.95
7.2.7	10.2 (a) (ii)	Purchased treated water	0	0	0	0.00	0.00	0.00
7.2.7A		Ground water not treated	0	0	0	0.00	0.00	0.00
7.2.6A		less Treated water supplied to others	0	0	0	0.00	0.00	0.00
		Sub-Total: System Input Volume	11,187,913	13,157,011	12,390,930	30.65	36.05	33.95
		WATER CONSUMPTION						
7.2.8.1		Billed Metered:	7,295,969	8,357,301	8,404,505	19.99	22.90	23.03
	10.2 (a) (i)	Domestic	5,015,295	5,819,958	5,700,614	13.74	15.95	15.62
	10.2 (a) (i)	Commercial	1,304,266	1,438,842	1,601,511	3.57	3.94	4.39
	10.2 (a) (i)	Industrial	419,146	462,891	446,629	1.15	1.27	1.22
	10.2 (a) (i)	etc.	557,262	635,610	655,751	1.53	1.74	1.80
7.2.8.2		Billed Unmetered	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Domestic	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Commercial	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	Industrial	0	0	0	0.00	0.00	0.00
	10.2 (a) (i)	etc.	0	0	0	0.00	0.00	0.00
7.2.8.3		Unbilled Metered	0	0	0	0.00	0.00	0.00
7.2.8.4		Unbilled Unmetered	865,407	865,407	865,407	2.37	2.37	2.37
	10.2 (g) (i)	Sub-Total: Authorized consumption	8,161,376	9,222,708	9,269,912	22.36	25.27	25.40
		UNACCOUNTED FOR WATER						
7.3.1		Raw water bulk loss	1,325,252	687,940	1,257,718	3.63	1.88	3.45
7.2.3/7.2.4		Billing losses	865,407	865,407	865,407	2.37	2.37	2.37
7.2.5		Apparent losses	453,981	590,145	468,153	1.24	1.62	1.28
7.2.5.1		Illegal connections	90,796	118,029	93,631	0.25	0.32	0.26
7.2.5.2		Inaccurate meters	211,858	275,401	218,471	0.58	0.75	0.60
7.2.5.3		Data errors	151,327	196,715	156,051	0.41	0.54	0.43
7.2.6		Real losses	2,572,556	3,344,158	2,652,865	7.05	9.16	7.27
	10.2 (g) (ii)	Sub-Total: Unaccounted for water	3,026,537	3,934,303	3,121,018	8.29	10.78	8.55
		WASTEWATER TREATMENT						
7.2.9	10.2 (a) (iii)	Total received at WWTW	6,808,051	6,656,356	8,108,113	18.65	18.24	22.21
7.2.11		Total discharged	5,446,441	5,325,085	6,486,490	14.92	14.59	17.77
7.2.13		Returned to environment	5,310,280	5,191,958	6,324,328	14.55	14.22	17.33
7.2.14		Recycled	136,161	133,127	162,162	0.37	0.36	0.44
	10.2 (a) (iv)	Quantity of water supplied not discharged to WWTWs	1,353,325	2,566,352	1,161,799	3.71	7.03	3.18

Graphs of the water usage per sector for the various distribution systems within George Municipality's Management Area are included as part of the water balance models in Annexure A. The table below gives a summary of the information.

Table C.1.3: Quantity of water used by each user sector (Ml)						
Town	Year	Residential	Business	Industrial	Other	Total
George	07/08	5 214.885	1 520.370	451.330	802.639	7 989.224
	08/09	5 594.955	1 437.222	580.587	708.161	8 320.925
	09/10	4 364.763	1 104.860	605.533	503.636	6 578.792
	10/11	4 200.445	1 013.916	517.767	460.014	6 192.142
	11/12	4 761.894	1 711.667		575.256	7 048.817
	12/13	4 960.788	1 785.858		642.519	7 389.165
	13/14	5 126.164	1 431.157	339.736	625.485	7 522.542
	14/15	5 248.740	1 422.900	415.349	623.971	7 710.960
	15/16	5 486.784	1 577.371	446.629	631.930	8 142.714
	16/17	5 604.286	1 409.967	462.891	613.227	8 090.371
Uniondale	17/18	4 818.074	1 275.742	419.146	529.622	7 042.584
	11/12	149.867	40.213	0	14.516	204.596
	12/13	133.101	27.212	0	7.494	167.807
	13/14	128.250	25.685	0	6.272	160.207
	14/15	144.709	25.987	0	13.192	183.888
	15/16	128.723	24.039	0	16.838	169.600
	16/17	130.234	28.824	0	14.092	173.150
Haarlem	17/18	123.958	28.415	0	19.635	172.008
	11/12	77.602	0.006	0	1.175	78.783
	12/13	85.802	5.684	0	4.540	96.026
	13/14	78.132	0.424	0	8.104	86.660
	14/15	74.403	1.080	0	7.421	82.904
	15/16	85.107	0.101	0	6.983	92.191
	16/17	85.438	0.051	0	8.291	93.780
TOTAL	17/18	73.263	0.109	0	8.005	81.377
	06/07	5 003.407	1 567.598	500.241	729.254	7 800.500
	07/08	5 214.885	1 520.370	451.330	802.639	7 989.224
	08/09	5 594.955	1 437.222	580.587	708.161	8 320.925
	09/10	4 364.763	1 104.860	605.533	503.636	6 578.792
	10/11	4 200.445	1 013.916	517.767	460.014	6 192.142
	11/12	4 989.363	1 751.886		590.947	7 332.196
	12/13	5 179.691	1 818.754		654.553	7 652.998
	13/14	5 332.546	1 457.266	339.736	639.861	7 769.409
	14/15	5 467.852	1 449.967	415.349	644.584	7 977.752
	15/16	5 700.614	1 601.511	446.629	655.751	8 404.505
	16/17	5 819.958	1 438.842	462.891	635.610	8 357.301
	17/18	5 015.295	1 304.266	419.146	557.262	7 295.969

### Quantity of effluent received at the WWTWs (Ml/a):

All the WWTWs in George Municipality's Management Area are supplied with bulk flow meters, except Haarlem WWTW. The table below gives an overview of the annual volume of effluent received at the various WWTWs. The monthly flows and rainfall measured at the various WWTWs are included in Annexure A.

Table C.1.4: Volume of effluent received at the various WWTWs						
WWTW	17/18	Record : Prior (Ml/a)				
		16/17	15/16	14/15	13/14	12/13
Outeniqua	3 377	3 760	5 183	4 937	5 423	4 341
Gwaing	2 899	2 369	2 400	2 932	2 961	2 484
Herolds Bay	49	55	69	56	57	52
Kleinkrantz	233	238	258	177	219	213
Uniondale	221	201	166	131	47 *	101 *
Haarlem	28 *	33 *	32 *	29 *	30 *	34 *
<b>Total</b>	<b>6 807</b>	<b>6 656</b>	<b>8 108</b>	<b>8 262</b>	<b>8 737</b>	<b>7 225</b>

Note: \* Effluent received at the Uniondale and Haarlem WWTW was estimated from the Billed Metered Consumption data

### Quantity of treated effluent returned to the water resource system:

All effluent discharged into the Municipal sewer system is treated at the existing WWTWs and the current effluent re-use practices are as follows:

Table C.1.5: Current effluent re-used practices at the various WWTWs	
WWTW	Current effluent re-used practices
Outeniqua	Treated effluent is returned to the Garden Route dam through the new Reclamation Plant.
Gwaing	Irrigation
Herolds Bay	No re-use, all treated effluent evaporates and no returns are made to any Water Resource System.
Kleinkrantz	No re-use, discharged onto the sand dunes adjacent to the WWTW
Uniondale	Irrigation of lucern fields by farmer
Haarlem	Irrigation by farmer