

5. Water Services Infrastructure Profile

With service level targets set, associated flows identified within the context of the resource constraint and possibilities for reducing demand investigated, the WSA is in a position to assess whether its existing infrastructure is sufficient to meet future demand. This section covers:

- Existing infrastructure;
- Schemes to be transferred;
- Schemes to be rehabilitated; and
- New infrastructure to be built.

5. Water Services Infrastructure Profile

5.1 Water Services Infrastructure

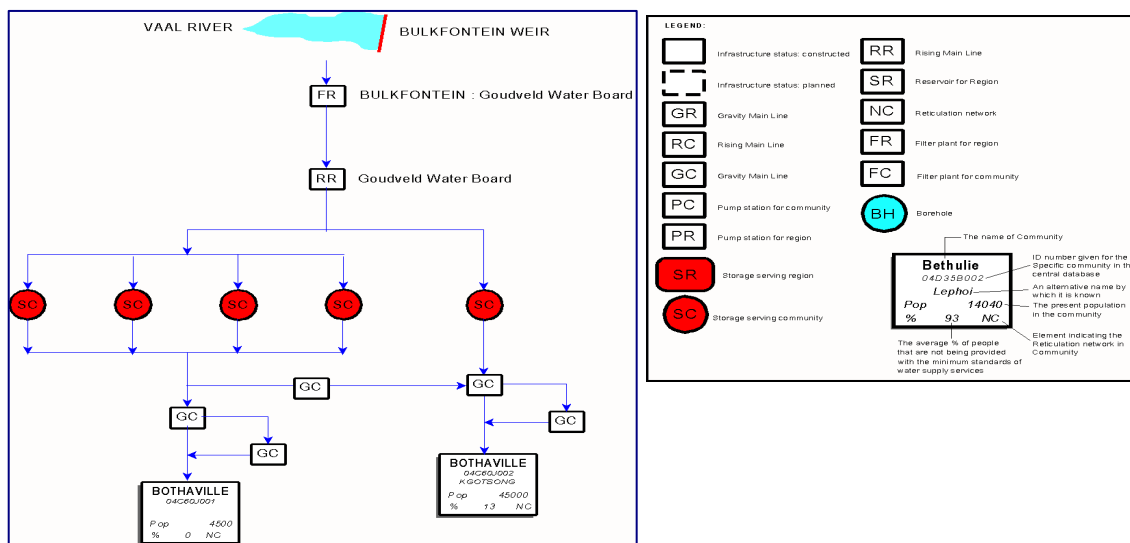
5.1.1 Situation Assessment (Water Services Infrastructure)

5.1.1.1 Existing infrastructure

- Supporting diagram and text should be given for existing infrastructure.

The existing bulk and connector infrastructure is to be shown on the map and a diagrammatic representation should be included (see example of diagrammatic representation in figure below). With the new demarcations, considerable effort will need to be expended on gathering data on existing infrastructure. It is often useful to have statistics in this regard and a schedule of all bulk infrastructures is important. This could include all bulk water supply infrastructure and all wastewater works. On the water supply side such a schedule could include:

- Capacity of the abstraction system
- Type of abstraction (e.g. diesel driven borehole; electricity driven pump from dam)
- Capacity of treatment works
- Length of bulk reticulation



Reporting details for infrastructure

To determine the suitability and adequacy of existing infrastructure, it is necessary to assess the individual components within each scheme. The assessment will be focused on:

- Ownership (to inform the transfer process from national government to local authorities)
- Asset description & value (for auditing purposes & to inform the transfer process)
- Component type (e.g. building material or process type)
- Supply capacity (both the used and available capacity)
- Present operational status (to inform management, training and capacity programs)

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5.1.1.3 Existing groundwater infrastructure

Boreholes

COMPONENT NAME	Borehole						
COMPONENT I.D.	No.1						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						75m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							Unknown
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date	Unknown						
Lifespan		20					
Replacement			R				
Annual Maintenance Value				R			

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5.1.1.3 EXISTING GROUNDWATER INFRASTRUCTURE: Ubuntu Municipality.

Boreholes

COMPONENT NAME	Borehole						
COMPONENT I.D.	No 2						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						42m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							Unknown
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date							
Lifespan							
Replacement			R.....				
Annual Maintenance Value				R			

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5.1.1.3 EXISTING GROUNDWATER INFRASTRUCTURE: Ubuntu Municipality.

Boreholes

COMPONENT NAME	Borehole						
COMPONENT I.D.	No3						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						75m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							Unknown
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value@	Costs @	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date	Unknown						
Lifespan		20					
Replacement			R				
Annual Maintenance Value				R			

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5.1.1.3 EXISTING GROUNDWATER INFRASTRUCTURE: Ubuntu Municipality.

Boreholes

COMPONENT NAME	Borehole						
COMPONENT I.D.	No 4						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						36m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							Unknown
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value@	Costs @	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date	Unknown						
Lifespan		20					
Replacement			R				
Annual Maintenance Value				R			

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5.1.1.3 EXISTING GROUNDWATER INFRASTRUCTURE: Ubuntu Municipality.

Boreholes

COMPONENT NAME	Borehole						
COMPONENT I.D.	No 5						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						50m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							Unknown
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA			WSA			
Current Operator							
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date	Unknown						
Lifespan		20					
Replacement			R				
Annual Maintenance Value				R			

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5.1.1.3 EXISTING GROUNDWATER INFRASTRUCTURE: Ubuntu Municipality.

Boreholes

COMPONENT NAME	Borehole						
COMPONENT I.D.	No 6						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						60m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							know nun
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date	Unknown						
Lifespan		20					
Replacement			R				
Annual Maintenance Value				R			

Boreholes

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COMPONENT NAME	Borehole						
COMPONENT I.D.	No 7						
	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
Quality tested			Yes				
Depth measured						80m	
Borehole yield monitored						Yes	
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
Replacements Needed							Unknown
What needs to be refurbished						Unknown	
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value			
Date	Unknown						
Lifespan		20					
Replacement			R				
Annual Maintenance Value				R			

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5.1.1.4 Existing pump stations infrastructure

5.1.1.6 EXISTING PUMPSTATIONS INFRASTRUCTURE: Ubuntu Municipality.

COMPONENT NAME	Pump room						
COMPONENT I.D.	No 1						
SCHEME NAME	Richmond						
OPERATIONS	Tariff	Number	Number	Number	Never	Yes	No
Operating hours p/day		24					No
Are there any Standby Pumps			1				
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					Unknown		
What needs to be refurbished						Unknown	
What replacements needed							Unknown
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value@	Costs @	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R100 000,00				
Annual Operations Cost				R15 000			
Annual Maintenance Cost					R7 500		
TYPE and CAPACITY	Number	Meter	M/Litre	Speed	P/Supply	Structure	Develop
Number of pumps	6						
Pumping head (m)		Unknown					
Discharge rate (mega litre p/day)			Unknown				
Motor speed				Unknown			
Type of power supply					Unknown		
Super Structure						Unknown	
Future Development Capacity							Unknown
Pump Station/Room Output							Unknown

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5.1.1.6 EXISTING PUMPSTATIONS INFRASTRUCTURE: Ubuntu Municipality.

COMPONENT NAME	Pump room						
COMPONENT I.D.	No.1						
SCHEME NAME	Loxton						
OPERATIONS	Tariff R	Number	Number	Number	Never	Yes	No
Operating hours p/day		24					
Are there any Standby Pumps			1				
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					Unknown		
What needs to be refurbished						Unknown	
What replacements needed							Unknown
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner							
Future Operator							
ASSET ASSESSMENT	Date	Years	Value@	Costs @	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R100 000,00				
Annual Operations Cost				R10 000.....			
Annual Maintenance Cost					R5 000.....		
TYPE and CAPACITY	Number	Meter	M/Litre	Speed	P/Supply	Structure	Dev %
Number of pumps	1						
Pumping head (m)		Unknown					
Discharge rate (mega litre p/day)			Unknown				
Motor speed				Unknown			
Type of power supply					elect		
Super Structure						Brick/steel	
Future Development Capacity							Unknown
Pump Station/Room Output							Unknown

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5.1.1.5 Existing reservoir infrastructure

5.1.1.8 EXISTING RESERVIORS INFRASTRUCTURE: Ubuntu Municipality.

COMPONENT NAME	Concrete						
COMPONENT I.D.	No1						
SCHEME NAME	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
What is Storage factor (daily,)	Unknown						
Quality Tested			Yes				
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					0		
What needs to be refurbished						Unknown	
What replacements needed							Unknown
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			110 00,00				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value	Capacity		
Date	Unknown						
Lifespan		20					
Replacement			R110 000 ,00				
Annual Maintenance Value				Unknown			
Type: Steel tank on stand							
: Concrete Reservoir					300kl		

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5.1.1.8 EXISTING RESERVIORS INFRASTRUCTURE: Ubuntu Municipality.

COMPONENT NAME	4XPlastic Tanks X10 000liters each						
COMPONENT I.D.	No 2						
SCHEME NAME	Loxton						
OPERATIONS	Daily	Weekly	Monthly	Annually	Never	Yes	No
What is Storage factor (daily,)	Unknown					Yes	
Quality Tested			Yes				
Abstraction recorded						Yes	
Abstraction registered						Yes	
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					Unknown		
What needs to be refurbished						Unknown	
What replacements needed							Unknown
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R400 000,00				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Date	Years	Value	Value	Capacity		
Date	Unknown						
Lifespan		20					
Replacement			R400 000,00				
Annual Maintenance Value				Unknown			
Type: Plastic tanks on stand					40 000ltrs		
: Concrete Reservoir							

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5.1.1.6 Existing bulk pipeline infrastructure

5.1.1.7 EXISTING BULK PIPELINE INFRASTRUCTURE: Ubuntu Municipality.

COMPONENT NAME							
COMPONENT I.D.							
SCHEME NAME	Loxton						
OPERATIONS	Tariff R	Number	Number	Number	Never	Yes	No
Is there Leakage Control						Yes	
Illegal Connections to Date		0					
Illegal Connections Formalized			0				
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition	Yes						
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					Unknown		
What needs to be refurbished						Unknown	
What replacements needed							Unknown
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner							
Future Operator							
ASSET ASSESSMENT	Date	Years	Value®	Costs ®	Costs		
Date Constructed	Unknown						
Expected Lifespan		20					
Estimated Replacement Value			R250 186				
Annual Operations Cost				Unknown			
Annual Maintenance Cost					Unknown		
TYPE and CAPACITY	Type	Avg Dia	Avg Dis	Above	Below	River	Road
Pipe Material (most common)	PVC 9						
Average Diameter		110mm					
Average Discharge rate (%) p/sec							
Tot. Length above Ground				0 km			
Tot. Length Below Ground					5.1km		
Tot. length River Crossing						0	
Tot. length Road Crossing							0

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5.1.1.7 Existing reticulation infrastructure (by supply zone)

5.1.1.9 EXISTING RETICULATION INFRASTRUCTURE: Ubuntu Municipality.

COMPONENT NAME							
COMPONENT I.D.							
SCHEME NAME	Loxton						
OPERATIONS	Tariff R	Number	Number	Number	Never	Yes	No
Billing System						Yes	
Tariff (Block definition)	Unknown						
No of illegal connections to date		0					
No of illegal connections formalized			0				
No of vandalism at Service points				0			
FUNCTIONALITY	Good	Poor	Operate	Yes/No	Breakages	Refurb	Replace
Physical condition		Yes					
Infrastructure maintained			Yes				
Spares available				Yes			
Number of Breakages p.a.					1 p.a		
What needs to be refurbished							
What replacements needed					7 km of	asbestos	pipeline
INSTITUTIONAL STATUS	Owner			Operator			
Current Owner	WSA						
Current Operator				WSA			
Future Owner		0					
Future Operator		0					
ASSET ASSESSMENT	Date	Years	Value@	Costs @	Costs		
Date constructed	Unknown						
Expected Lifespan							
Estimated Replacement Value			R7.5m				
Annual Operations Cost							
Annual Maintenance Cost					R30 000		
TYPE and CAPACITY	Density	Population	Housing	Access	Capacity		
Household Density	234						
Population Served		728					
Housing Layout			Urban				
Level of Service: Access:				100%			
Future Development Capacity					Unknown		

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5.1.1.10 Existing sanitation Infrastructure

- Complete the following structure

Level of service	No. of sanitation units
VIP toilets	22
Other dry sanitation toilets	22
Septic tanks	
Bulk sewer	
New wastewater treatment works or to be upgraded	
Infrastructure for desludging and pit emptying	

5.1.1.11 existing sewage treatment works infrastructure

General information	STW1	STW2	STW ?
Component name	0	0	0
Component ID	0	0	0
Scheme name	0	0	0
Institutional status			
Current owner	N/A		
Current operator	N/A		
Future owner / WSA (If applicable)	N/A		
Future operator / WSP (If applicable)	N/A		
Asset assessment			
Date constructed	N/A		
Expected total lifespan	N/A		
Estimated replacement value	N/A		
Annual operating cost	N/A		
Annual maintenance cost	N/A		
Type (process) & capacity			
Type of plant (i.e. Activated sludge / Bio-filter / Oxidation Ponds)	N/A		
Design Capacity - Hydraulic Load (Ml/day)	N/A		
How much capacity is still available for development? (%)	N/A		
Design Capacity - Organic Load (COD kg/day)	N/A		
How much capacity is still available for development? (%)	N/A		
Inlet meter (type)			
Operation			
Total volume of water received and treated per year (Ml)	N/A		
Operating hours per day	N/A		
Discharge into (description of source)	N/A		
Discharge volume (Ml/annum)	N/A		
Volume of effluent recycled (Ml/annum)	N/A		
Applications of recycled effluent (i.e. irrigation, mining, etc)	N/A		
Effluent control (by whom)	N/A		
Permitted effluent (Ml/annum)	N/A		
Solid waste disposal (m ³ /annum)	N/A		

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Sludge produced (m ³ /annum)	N/A		
How often is water quality monitored? (daily, weekly, monthly, annual, never)	N/A		
What laboratory is used?	N/A		
% Of the time that effluent is chlorinated	N/A		
Functionality			
Describe the physical condition (in operation, poor, good)	Good		
How well is the infrastructure maintained? (none, infrequent, demand, planned)	Demand		
Are spare parts readily available? (Yes/No)	Yes		
Number of breakages / failures per year			
What needs to be refurbished? (cost)			
What needs to be replaced? (cost)			

- Provide a plan for Integration of Health and Hygiene education into sanitation infrastructure delivery. The plan should also identify the institution responsible for implementing H&HE
- Assessment of risk of ground water pollution from VIP toilets
- Assessment of the geotechnical conditions before construction of VIP toilets

5.1.1.11 Existing Asset Management Assessment

The focus on improvement of levels of service through creating new infrastructure at great cost results often in overlooking the importance of the development and implementation of sound asset management practices. Through the assessment of this important function water service authorities are enabled to identify areas of concern and it should form the base for the development of an asset management plan. Neglecting the implementation of best practice operational and maintenance procedures would result in ineffective service delivery and shortened life span expectancy of assets. Additional capital expenditure for refurbishment or replacement will eventually be unavoidable.

The two important aspects of asset management under consideration are:

- Operations
- Maintenance

In order to provide the required level of service for both the operational and maintenance functions, it is essential to assess both the operations and maintenance functions in terms of the elements described in the table.

Assessment forms have been designed and included in the relevant clauses to be completed. The table below serves as guideline to do this high level assessment and defines the assessment criteria.

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Element Description		Assessment criteria
Resources	Staff	<ul style="list-style-type: none"> • Sufficient staff numbers • Competency level of staff at all levels • Level of service provided by staff • Empowerment and training: <ul style="list-style-type: none"> ○ Adequately trained for position ○ Safety regulation ○ Commitment • Responsibility allocation (organisational structure) and acceptance thereof
	External resources	<ul style="list-style-type: none"> • Need for external resource providers • Competency level and value for money • Management and control over these providers
	Materials	<ul style="list-style-type: none"> • Adequate materials provisioning • Store management: <ul style="list-style-type: none"> ○ Sufficient stock kept ○ Stock control ○ Delivery time
	Tools & equipment	<ul style="list-style-type: none"> • Adequate tools and equipment provided • Control and maintenance
	Transport	<ul style="list-style-type: none"> • Adequate transport provisioning • Control: <ul style="list-style-type: none"> ○ Log sheets ○ Vehicle maintenance ○ Fuel consumption ○ Trip authorisation
	Budget	<ul style="list-style-type: none"> • Adequate budget provided • Budget control • Identification and documentation of needs • Budget preparation and motivation
Information	Manuals	<ul style="list-style-type: none"> • Existence of manuals (operation/maintenance or manufacturer) • Record keeping/safekeeping and control • Utilisation of manuals by staff
	As-built information	<ul style="list-style-type: none"> • Existence of as-built drawings • Existence of important reports e.g. designs reports etc. • Record keeping/safekeeping and control • Accessibility of information • Updating of records

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	Asset register	<ul style="list-style-type: none"> • Existence of an asset register • Maintenance/updating of asset register • Accessibility of information • Control over assets • Stock taking
	Contingency and safety plan	<ul style="list-style-type: none"> • Compliance to safety requirements • Safety equipment and maintenance thereof • Existence of safety plan where required • Existence of contingency plan where required
Activity control	Policies & Procedures	<ul style="list-style-type: none"> • Existence of procedures for all activities • Existence of policies - standardisation, quality, operational and maintenance, etc. • Correctness of procedures - if in place
	Record keeping	<ul style="list-style-type: none"> • Existence of record keeping system • Processing of data • Actions activated
	Quality control	<ul style="list-style-type: none"> • Quality management plan • Quality assurance • Quality control <ul style="list-style-type: none"> ○ Inspections ○ Control charts ○ Trend analysis • Process adjustment and rework • Quality improvement
Management	Risk management	<ul style="list-style-type: none"> • Risk management planning • Risk identification • Risk probability and impact assessment • Risk response planning • Risk monitoring and control
	Reporting	<ul style="list-style-type: none"> • Production and activity reporting <ul style="list-style-type: none"> ○ Completeness ○ Evaluation and action activation • Management reporting <ul style="list-style-type: none"> ○ Completeness ○ Evaluation and action activation • Performance monitoring

Provision has been made to assess:

Status quo - the current situation on each component of the water distribution system will be evaluated/assessed in terms of the list above. The following criteria is applicable:

N/R - Not required

Z - zero compliance (if there are no capacity/resources or information)

1 - Below minimum requirement

2 - Minimum requirement

3 - Above minimum requirement

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"Minimum requirement" is considered to be a good judgement of what is required to ensure proper operation and maintenance that could be maintained given the specific conditions and infrastructure.

Impact - Secondly the impact on having access to the resources/ information or capability listed should be assessed in terms of the importance for providing operational and maintenance services on each component.

Criteria applicable:

- F - Fatal
- M - Medium
- L - Low
- No - No impact

This high level assessment could form the basis for the compilation of the operation and maintenance plans.

5.1.1.11.1 Assessment of Existing Operations

- Complete the following operational assessment form:

5.1.1.11.2 Assessment of Existing Maintenance

- Complete the following maintenance assessment form:

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5.1.1.11 Schemes to be transferred: water

Transfer of DWAF schemes to municipalities is currently a major issue facing municipalities in terms of water services. Post 1994, many schemes from the old "homeland" governments were transferred to DWAF. These schemes (and any others built post '94) need to be transferred to the WSA's within whose are of jurisdiction the schemes are located. Transfer of schemes has major operation and maintenance implications and these needs to be factored into the planning process. The minimum reporting requirements for such schemes are shown in the table below.

Complete the following structure:

Description	Name	Settlement Type	Transferring from	Transferring to	Proposed date for transfer
N/A					

In order to adequately plan for such transfers there are a number of other issues that need to be reported on in the text that accompanies the tables. This information is required to complete other tables within the WSDP as indicated in the brackets below.

Supporting text:

- How much water is supplied by each scheme (required in order to complete the water resource profile)?
- Number of consumer units served (required in order to complete the service level profile)
- Staffing levels
- Associated institutional and management arrangements (required in order to complete institutional and management arrangements)
- Associated income and expenditure (required in order to complete the finance section).

5.1.1.12 Schemes to be transferred: sanitation

Complete the following structure:

Description	Name	Settlement Type	Transferring from	Transferring to	Proposed date for transfer
N/A					

Supporting text: Similar information to that required for water should be supplied.

5.1.1.13 Schemes to be rehabilitated

Priority should be given to rehabilitating existing infrastructure as this generally makes best use of financial resources and can achieve an increased in (operational) service level coverage most rapidly. A list of schemes requiring rehabilitation should be included with the year when it is planned to undertake the work.

Complete the following structure:

Scheme Name	Component Name	Refurbishment Needs	Feasibility checked (Y/N)	Scheduled Date	Estimated Cost
N/A					

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5.1.2 Future Trends And Goals (Water Services Infrastructure)

- Provide statistics and comments on the future trends and goals for the following

5.1.2.5 New Infrastructure to be built

The decisions taken with regard to service levels drive the need for infrastructure. Based on the total projected water demand figures and the potential benefits of implementing water conservation/water demand strategies, the capacity of the existing infrastructure can be assessed. If it is not adequate to deal with the flows over the planning period, provision needs to be made for expanding the infrastructure.

In order to complete the section on finances, an analysis of future infrastructure to be built needs to be undertaken whereby future costs are calculated.

There is a strong opportunity to impact on new consumers in terms of WC/WDM because it is easier to impact on the new rather than fixing the old. Opportunities in reducing water demand of new consumers include selecting appropriate levels of service for different communities, specification of efficient plumbing fittings, efficient reticulation design practices and the use of pre-payment meters.

It should also be noted that new sanitation infrastructure (sewage works) need to be licensed and the license applications must be made to DWAF prior to the construction of the new works or the extension of existing works.

- Information to be reported in the text:
 - Whether master planning has been carried out or not. If not, the basis upon which infrastructure expansion arrangements are proposed should be stated.

5.1.2.6 Future internal and connector infrastructure

Internal and connector water and sanitation infrastructure arrangements are related to service level targets.

- Complete the following structure:

Type of Scheme	Component	Short description	Feasibility checked (Y/N)	Scheduled Date	Estimated Cost

5.1.2.3 Future bulk water supply infrastructure

Planning for future requirements needs to be done on the basis of a master planning study in conjunction with a WC/DM strategy which investigates options on the basis of their economic, technical, environmental and social suitability and cost. If a master plan and a WC/WDM strategy has been carried out this should be stated. If it has not been done the basis upon which infrastructure expansion arrangements are proposed should be stated.

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- Complete the following structure:

Type of Scheme	Component	Short description	Feasibility checked (Y/N)	Scheduled Date	Estimated Cost

5.1.2.4 Future bulk sanitation infrastructure

The process for dealing with sanitation infrastructure is similar to that proposed for water supply. However, in this case organic loads need to be dealt with as well as flows. Treatment works capacity needs to be measured in terms of both these criteria. Also, particular reference needs to be made regarding the arrangements made for pit/tank emptying and treatment of sludge removed from pits or septic tanks.

- Complete the following structure:

Type of Scheme	Component	Short description	Feasibility checked (Y/N)	Scheduled Date	Estimated Cost

Note: Identifying projects for the provision of new infrastructure can only be done once all the other components are addressed. For this reason the list of projects is the last component of the WSDP.

- Also provide future trends and goals for infrastructure other than mentioned above.

- Complete the following structure:

Proposed New Infrastructure	Resources available to perform function (Yes/ No/ N/A)			
	Budget	Bylaws	Infrastructure	Personnel
1. New infrastructure to be built				
2. Future internal & connector				
3. Future bulk water supply				
4. Future bulk sanitation				

5.1.2.5 Asset Management Plan

It is essential for any service delivery organisation to compile an Asset Management Plan (AMP) to ensure efficient, effective and optimal management, operation and maintenance of all assets - which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. The purpose of the AMP is to:

- Ensure the operation and maintenance functions are well planned
- Demonstrate responsible management
- Justify and communicate funding requirements
- Service provisioning complies to regulatory requirements

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5.1.2.5.1 Operational Plan

Based on the assessment made on the operations and maintenance functions, it is proposed that each component of the infrastructure be reviewed individually in terms of the resources, information, activity control as well as management requirements as indicated in the table provided. The operations assessment done should highlight the areas of priority. Provisions have been made for a brief description of the status quo, requirements and action plan to be put in place to achieve the set requirements.

		Function	Status quo	Requirements (to comply with basic requirements)	Action Plan
COMPONENT DESCRIPTION:	RESOURCE	Staff			
		External resources			
		Materials			
		Tools & Equipment			
		Transport			
		Budget			
	INFORMATION	Manuals			
		As-built information			
		Safety plan			
	ACTIVITY CONTROL	Procedures			
		Record keeping			
		Quality control			
	MANAGEMENT	Risk management			
		Reporting			

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5.1.2.5.2 Maintenance Plan

Based on the assessment made on the operations and maintenance functions, it is proposed that each component of the infrastructure be reviewed individually in terms of the resources, information, activity control as well as management requirements as indicated in the table provided. The maintenance assessment done should highlight the areas of priority. Provisions have been made for a brief description of the status quo, requirements and action plan to be put in place to achieve the set requirements.

	Function	Status quo	Requirements (to comply with basic requirements)	Action Plan
COMPONENT DESCRIPTION:	- Staff			
	• Condition monitoring			
	• Planned Maintenance			
	• Unplanned Maintenance			
	- External resources			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Materials			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Tools & equipment			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Transport			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
- Budget				
• Condition monitoring				

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	• Planned maintenance			
	• Unplanned maintenance			
	- Manuals			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- As-built information			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Safety plan			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Procedures			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Record keeping			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Quality control			
	• Condition monitoring			
	• Planned maintenance			
	• Unplanned maintenance			
	- Risk management			
	• Condition monitoring			
	• Planned maintenance			

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	<ul style="list-style-type: none">• Unplanned maintenance			
	- Reporting			
	<ul style="list-style-type: none">• Condition monitoring			
	<ul style="list-style-type: none">• Planned maintenance			
	<ul style="list-style-type: none">• Unplanned maintenance			

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5.1.3 Strategic Gap Analysis (Water Services Infrastructure)

- Comment on the evaluation of statistics provided for all elements discussed under Future Trends and Goals.
- Indicate Implementation Problems and Gaps on the specific elements.

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5.1.4 Implementation Strategies (Water Services Infrastructure)

- For Water Services Infrastructure discuss the situations assessment and Future trends and goals under the following:
 1. Basic Services
 2. Higher Level, associated services and economic growth
 3. Effective water resource management
 4. Social and Environmental (health) issues
 5. Effective Management

- Also provide strategies to address the gaps in relation to 1-5.