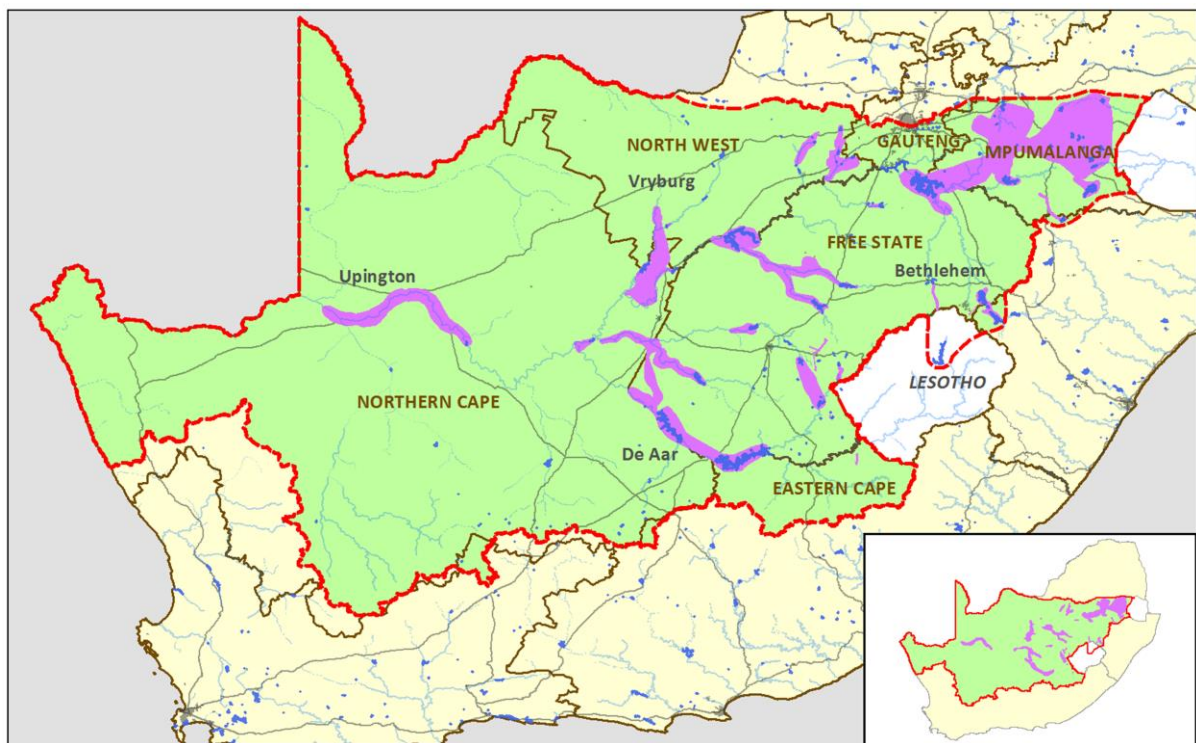


National Water Resources Infrastructure (NWRI)

Immovable Asset Management Plan

Central Operations Cluster

March 2017



WATER IS LIFE - SANITATION IS DIGNITY



water & sanitation

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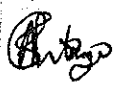


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EXECUTIVE SUMMARY

1. Introduction and Service Description

This document is an infrastructure Asset Management Plan (AMP) for the Central Operations Cluster, hereinafter referred to as the Cluster, of the National Water Resources Infrastructure (NWRI) branch of the Department of Water and Sanitation (DWS). It outlines a ten-year plan for the acquisition, operation and maintenance (O&M), renewal, upgrading, new capital investments, and disposal of the Cluster's immovable assets, aiming at maximising the assets' service delivery potential and benefits, and minimising their related risks and costs over the assets' life cycle.

This AMP was produced in accordance and compliance with the provisions of the Government Immovable Asset Management Act (GIAMA), Act No. 19 of 2007. In addition, the DWS is required to annually update this AMP, as contemplated in Section 12 of the GIAMA. This AMP is also aligned to other relevant South African legislation, DWS's strategic plan, and international standards such as ISO 55000.

1.1 Key Data Sources Used to Develop this AMP

The key sources of data used to develop this AMP are: NWRI Immovable Asset Register for the financial year 2015/16; NWRI Infrastructure Asset Hierarchy (latest version updated in the financial year 2013/14); Condition Assessment Audit of Irrigation Scheme Infrastructure – Scheme Reports for the Cluster, dated September 2016; financial information (obtained mainly from DWS Head Office and the Cluster Office); and face-to-face scheme visit interviews conducted with the relevant DWS personnel at cluster and national level. The overall confidence rating for the data used in the development of this AMP is four (4) on a rating scale of 1 to 5, which means some of the data used was derived.

1.2 Cluster Description and Location

The Central Cluster covers parts of the following provinces: Free State, Gauteng, KwaZulu Natal, Mpumalanga, Northern Cape and North West. It constitutes five area offices (Bloemfontein, Jericho, Potchefstroom, Standerton and Tugela-Vaal) and has 36 government water schemes.

1.3 Service Description

The primary service offered by the Cluster is the delivery of bulk raw water to its domestic and industrial (D&I), and irrigation water users (customers). Total raw water registered volume for the Cluster is 5 436.092 Mm³ per annum, of which 62.3% is for domestic and industrial, and 37.7% is for irrigation use.

2. Levels of Service

There are three key desired levels of service applicable to the Cluster's raw water supply service, namely: volume of raw water supplied; assurance level of raw water supply; and quality of raw water supplied. The first two fall under the direct responsibility of the Cluster's Operations unit; whilst 'quality of raw water supplied' falls under the responsibility of the Catchment Management Agency (CMA). The Cluster is expected to supply an annual total of: 3 386.934 Mm³ of raw water to D&I water users for which it assures 97% non-interruption; and 2 049.158 Mm³ to irrigation water users for which it assures 91%.

3. Future Raw Water Demand

Insight of the Cluster's future raw water demand helps in optimised planning for future upgrade and new capital needs (capital acquisitions), as contemplated in Sections 5 and 6 of the GIAMA. Figure 0.1 shows projected raw water demand for the Cluster, based on the Cluster's registered volumes for both domestic and industrial (D&I), and irrigation (IRR) water use. Ideally, the Cluster's future raw water demand determined by the DWS's Planning Office needs to take precedence; this will be addressed in the next update of this AMP.

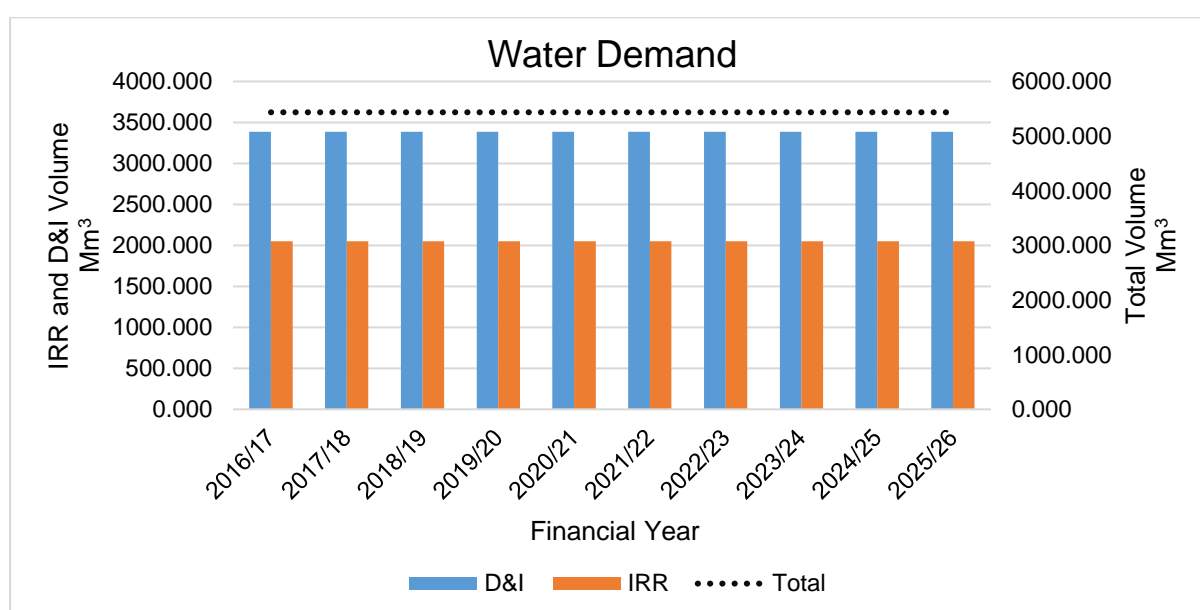


Figure 0.1: Projected raw water demand

4. Asset Details, Risk and Life Cycle Works

4.1 Asset Information

Table 0.1 shows the extent (number of asset components), acquisition cost, CRC, DRC and asset carrying values for the Cluster's assets per asset facility category. The Cluster's immovable assets have a total DRC and CRC of about R93.007 billion and about R101.698 billion, respectively. They can be grouped into two: infrastructure assets (with total DRC and CRC of about R80.884 billion and about R89.575 billion, respectively), and land (with a total

of about R12.123 billion for both DRC and CRC). The DRC/CRC ratio for infrastructure assets is about 90%, indicating that about 10% of the infrastructure asset base has been consumed so far.

For infrastructure assets, dams-related asset components have the highest CRC of about R31.520 billion, followed by canals, tunnels, pipelines and pump stations related asset components with CRC of about: R18.920 billion, R14.548 billion, R14.143 billion and R3.850 billion, respectively. A similar pattern is evident for DRC.

Table 0.1: Asset extent, acquisition costs, CRC and values

Asset Facility Category	No. of Asset Components	Acquisition Cost (R Million)	Asset Carrying Value (R Million)	CRC (R Million)	DRC (R Million)	DRC / CRC (%)
Borehole	2	1.04	0.72	2.88	2.56	88.96
Buildings	2 569	1 022.38	534.71	2 709.93	2 222.26	82.00
Canals	6 443	6 995.80	4 700.05	18 920.27	16 624.51	87.87
Dams	1 794	11 413.37	9 389.42	31 519.95	29 496.00	93.58
Measuring facilities	1 413	1 058.27	635.99	2 860.05	2 437.77	85.24
Pipelines	696	6 364.89	4 975.54	14 143.47	12 754.12	90.18
Power supply	101	34.42	21.39	79.94	66.91	83.70
Pump stations	2 258	1 663.49	1 117.34	3 849.84	3 303.69	85.81
Reservoirs	77	288.01	218.94	736.2	667.1	90.62
Roads	41	29.25	22.21	73.16	66.12	90.38
Telemetry	16	25.43	17.87	53.74	46.18	85.93
Tunnels	101	5 259.63	3 842.04	14 547.64	13 130.05	90.26
Water Treatment	49	28.13	16.82	77.80	66.50	85.47
Sub-total Infrastructure	15 560	34 184.12	25 493.05	89 574.83	80 883.76	90.30
Land - owned land	74	4 065.03	3 967.18	11 243.50	11 243.50	100.00
Land - servitudes	1 893	318.16	317.96	879.99	879.99	100.00
Sub-total Land	1 967	4 383.19	4 285.14	12 123.48	12 123.48	100.00
TOTAL	17 527	38 567.31	29 778.19	101 698.31	93 007.24	91.45

4.2 Risk Management and Asset Life Cycle Works

Key asset-related risks for the Cluster include: *condition risk* (failure by the asset to deliver the required service due to deteriorated physical condition); *capacity risk* (failure by the asset to deliver the required service as a result of it exceeding its design capacity/stressed); and *not in use / under-utilisation risk* (resulting in misallocation of resources, e.g. financial, human resources, material, etc.).

To minimise the abovementioned risks, and in order for the Cluster to meet its set levels of service and the projected future raw water demand, the following asset life cycle management activities and works are recommended for the Cluster in this AMP: appropriate and adequate

operation, maintenance and renewals (condition risk); upgrades and new capital investments (capacity risk); and disposals (not in use / under-utilisation risk).

- *Maintenance and Renewal Works:*

The Cluster has about 67% of its infrastructure asset components (with a total CRC of about R82.630 billion) in fair, good and very good conditions. Appropriate maintenance strategies, recommended and prioritised based on criticality and condition for each of these asset components in the individual scheme AMPs, have been summarised per asset facility category in this AMP.

The Cluster also has about 33% (with a total CRC of about R6.945 billion) in poor and very poor conditions. Appropriate renewal strategies, recommended and prioritised based on criticality and condition for each of these asset components in the individual scheme AMPs, have been summarised per asset facility category in this AMP. In addition, a prioritised list of the asset components, per scheme and per facility category, has been included in this AMP.

For those schemes that are not being operated and maintained by the DWS, it is crucial that the DWS makes regular inspections to be sure that the Cluster's assets are adequately maintained and renewed.

- *Upgrades and New Capital Works:*

Upgrade works are recommended for the Cluster's infrastructure asset components, about 2% and with a total CRC of about R2.337 billion, that are stressed (exceeding design capacity on utilisation, based on the Asset Register used in the development of this AMP). These are mainly: canals; dams; and pump stations related asset components. Such upgrade works are aimed at avoiding stress related failures, and to ensure the Cluster meets the required level of service. Such upgrade works are aimed at avoiding stress related failures, and to ensure the Cluster meets the required level of service. However, before such upgrade works are executed, it is imperative that the utilisation gradings (captured in the Asset Register) of the affected asset components are first verified to confirm the necessity of the upgrades.

Furthermore, the 2016 reports on the Condition Assessment Audit for irrigation infrastructure of 13 of the Cluster's schemes identified some canal-related upgrade works with a total acquisition cost of about R1.068 billion; these have been considered in this AMP.

- *Impairments and Disposals:*

There are some impaired asset components for the Cluster (mainly canals, buildings,

pump stations and measuring facilities related) with a total CRC of about R563 million. The DWS needs to take further steps on these asset components to determine appropriate disposal plans for them.

Furthermore, about 6% of the Cluster's infrastructure asset components (with a total CRC of about R4.115 billion) are under-utilised. These asset components, which are mainly canals, buildings, dams and pipelines related, could be candidates for disposal. The reasons for the under-utilisation need to be assessed and consideration made for decommissioning and disposal, where necessary.

Based on previous assessments and the Asset Register, the Cluster does not have any assets that are not in use and/or identified for disposal in the foreseeable future.

Noteworthy is that the quality and usefulness of an AMP is highly dependent on the completeness and accuracy of the asset register used in the development of the AMP. Accordingly, the abovementioned asset life cycle management activities and works recommended for the Cluster in this AMP are highly dependent on the asset component condition, criticality and utilisation gradings captured in the asset register used in the development of this AMP. As such, execution of the asset life cycle management activities and works need to be adapted in line with the prevailing situation on the ground. Refer to Section 6 of this Executive Summary regarding some recommendations on how to improve on the current NWRI immovable asset register.

5. Asset Life Cycle Financial Plan

Figure 0.2 present the Cluster's modelled identified optimal total cost requirement over the next 10 years.

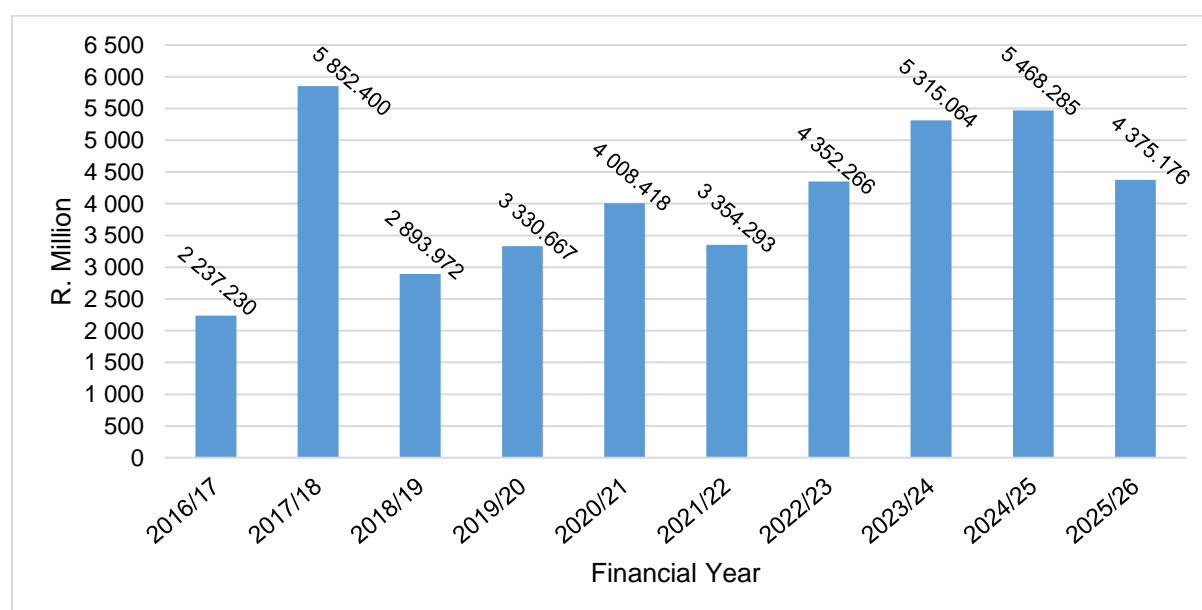


Figure 0.2: Modelled identified optimal total cost requirement per asset facility category

The Cluster's projected modelled optimal total cost requirements for the first three years (2016/17, 2017/18 and 2018/19) are about: R2.237 billion; R5.852 billion; and R2.894 billion, respectively. The relatively high cost in 2017/18 is attributed to high renewal, and upgrade and/or new capital cost requirements (R2.253 billion and R1.127 billion, respectively). Such spike, compounded by the current economic and financial constraints facing the country, present some implementation challenges for the Cluster's modelled identified optimal total cost requirement. As such, for implementation purposes, the identified optimal cost requirements for the Cluster are adjusted as presented in Tables 0.2 and 0.3, and Figure 0.3.

Table 0.2: Adjusted modelled optimal total cost requirement per cost component

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	2 237.229	2 373.105	2 517.816	2 662.734	2 830.398	3 001.805	3 183.463	3 375.744	3 582.036	3 799.276
Renewal	-	352.883	406.821	439.181	549.985	631.235	793.669	1 197.290	1 943.293	2 411.883
Upgrade & New	-	169.011	249.781	292.363	311.337	326.734	288.191	214.974	210.281	179.115
Disposal	-	-	-	-	-	-	-	-	-	-
Total	2 237.229	2 895.000	3 174.418	3 394.279	3 691.721	3 959.774	4 265.323	4 788.008	5 735.610	6 390.274

Table 0.3: Adjusted modelled optimal total cost requirement per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	151.756	216.574	234.730	240.703	291.146	322.092	326.865	313.949	321.995	322.231
WR: Canals	312.853	518.164	620.406	701.780	805.605	869.876	870.574	1 002.373	1 121.326	1 281.816
WR: Dams	218.424	320.794	349.645	361.264	390.469	408.747	487.356	501.256	526.509	581.209
WR: Power Supply	5.360	6.065	6.469	7.079	7.581	8.018	8.338	8.599	10.713	12.384
WR: Pump stations	1 037.900	1 122.139	1 192.454	1 274.886	1 360.682	1 475.359	1 592.936	1 682.396	1 805.868	1 921.949
WR: Reservoirs	5.889	6.331	6.724	7.100	7.531	7.973	8.439	8.927	41.395	58.990
WR: Roads and bridge	2.181	2.571	2.751	2.875	3.003	3.140	4.466	4.956	5.333	5.415
WR: Steel Pipelines	155.578	310.352	342.214	357.945	361.987	371.650	359.758	607.446	788.205	842.600
WR: Telemetry	2.945	3.179	3.378	3.565	3.778	3.997	4.266	4.519	4.794	5.071
WR: Tunnels	256.223	272.380	289.042	306.068	325.388	345.279	366.318	388.744	820.844	1 063.292
WR: Water Treatment	2.666	4.449	4.865	4.924	4.909	6.136	6.886	6.763	6.992	6.876
WS: borehole	0.201	0.214	0.227	0.240	0.255	0.270	0.403	0.455	0.491	0.501
WS: Measuring facility	85.253	111.790	121.514	125.851	129.387	137.237	228.717	257.625	281.146	287.940
Total	2 237.229	2 895.000	3 174.418	3 394.279	3 691.721	3 959.774	4 265.323	4 788.008	5 735.610	6 390.274

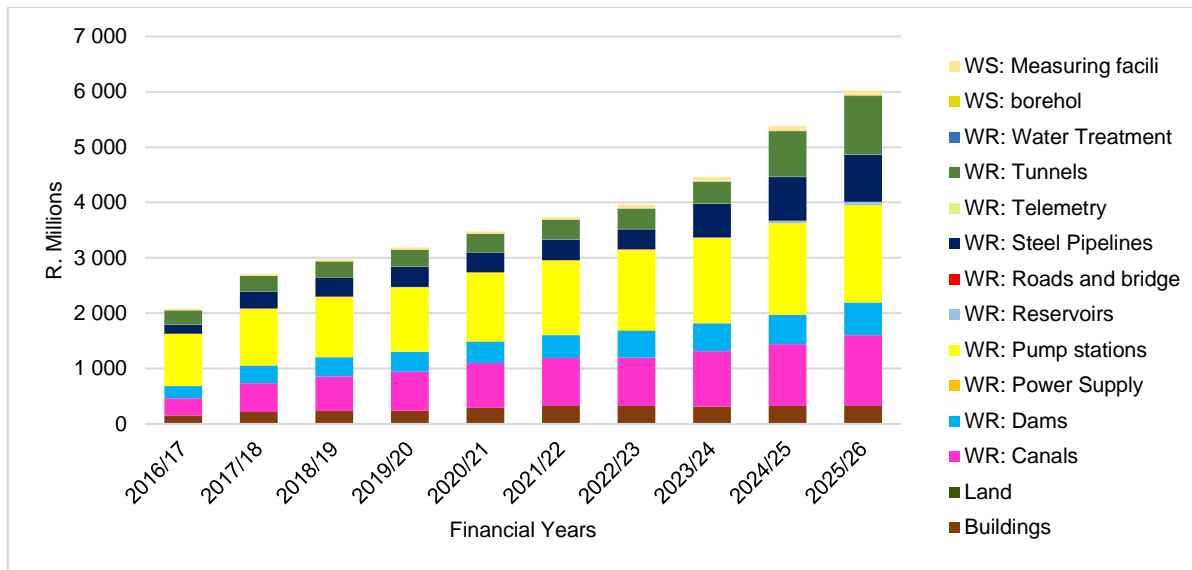


Figure 0.3: Modelled adjusted optimal total cost requirement per asset facility category

The Cluster's projected modelled adjusted optimal total cost requirements for the first three years (2016/17, 2017/18 and 2018/19) are about: R2.237 billion; R2.895 billion; and R3.174 billion, respectively. The projected total cost breakdown for the Cluster is as follows:

- The Cluster's projected optimal annual O&M cost requirement for the first three years (2016/17, 2017/18 and 2018/19) are: R2.237 billion; R2.373 billion; and R2.519 billion, respectively. Pump stations, Canals and Dams related asset components are among the major cost drivers in this Cluster.
- Optimal adjusted annual renewal cost requirement for the Cluster for the first three years (2016/17, 2017/18 and 2018/19) amounts about: R0, R352.883 million and R406.821 million, respectively. The projected renewals cost for 2017/18 is attributed to condition backlog from the past years. It is imperative that these adjusted renewals be given high priority in the year indicated.
- Optimal annual upgrades and new capital cost requirement for the Cluster for the first three years (2016/17, 2017/18 and 2018/19) are projected to be about: R0, R169.011 million and R249.781 million, respectively. Pipelines, canals and dams related asset components are the main cost drivers of upgrades.

The Cluster's projected optimal annual revenue requirements for the first three years (2016/17, 2017/18 and 2018/19) amount to about: R2.237 billion; R2.895 billion; and R3.174 billion, respectively. Over the projected 10-year period, the revenue which needs to be generated by the Cluster to fund the required immovable asset life cycle works varies between about R2.237 billion and about R6.390 billion. In the event that such revenue cannot be generated through user charges (an indication that the Cluster is not financially self-sustainable), external funding would need to be considered. Such funding can be in the form of fiscal support, cross subsidisation or debt raised through such institutions as TCTA.

6. Recommendations

Some of the key areas of concern, identified for this Cluster, and recommended improvement actions thereof are presented in Table 0.4.

Table 0.4: Recommended areas for improvement

No.	Area for Improvement	Issue Description	Recommended Action
1	Asset Information Management		
1.1	Asset Register as the indispensable key data source for AMP development	<p>The quality and usefulness of an AMP is highly dependent on the completeness and accuracy of the asset register used in the development of the AMP.</p> <p>Accordingly, the asset life cycle management activities and works (such as maintenance, renewals, upgrades and new capital, and disposals) recommended for the Cluster in this AMP are highly dependent on the asset component condition, criticality and utilisation gradings captured in the asset register used in the development of this AMP.</p> <p>However, during the AMPs review workshops conducted during the development of this AMP, the Cluster and scheme personnel did not fully concur with some of the asset component counts, condition as well as utilisation gradings; indicating the possibility of misalignment between the asset register and the prevailing situation on the ground.</p>	<p>The NWRI needs to urgently conduct physical asset verification and assessments (extent, condition, criticality, utilisation, etc.) for all its immovable assets and develop a comprehensive asset register, inclusive of all crucial asset component details, such as asset component sizes, material of construction, condition, criticality, utilisation, etc. Thereafter, the NWRI needs to conduct similar assessments at least every five years as contemplated in Section 13 of the GIAMA.</p> <p>The abovementioned asset assessments need to be conducted by adequately experienced professionals.</p>
1.2	Current Replacement Cost (CRC)	<p>Each and every asset component in the asset register needs to have a corresponding CRC. The CRCs are useful in the determination and projection of optimal asset life cycle management works, such as O&M, renewals, upgrades and new capital, etc., in line with international best practices.</p> <p>Ideally, the CRC of an asset component needs to be determined by multiplying the unit cost rate (cost per unit size, ideally obtained from suppliers) by the size of the asset component. Thus, the asset register needs to adequately capture such details as asset component sizes, material of construction, etc.</p> <p>However, such asset component details are not fully captured in the asset register used in the development of this AMP. As a result, the CRCs presented in this AMP were determined by adjusting the provided acquisition costs with PPI and an uncertainty factor; hence the projected optimal asset life cycle management costs may be on the conservative side.</p>	<p>The above-recommended assessments for the NWRI immovable assets need to adequately capture such asset component details as sizes and material of construction. This will enable the determination of more accurate CRCs, and consequently projection of more accurate optimal asset life cycle management costs.</p>

No.	Area for Improvement	Issue Description	Recommended Action
2	Financial Management		
2.1	O&M Costs reporting	The DWS is unaware of O&M costs currently being incurred by the Schemes being operated and maintained by other institutions, such as irrigation boards, water boards and water user associations, and no financial reports are being sent to DWS.	The DWS needs to liaise with the respective institutions and agree on frequent O&M reports, preferably on a quarterly basis.
2.2	O&M Costs splitting	O&M costs in the individual schemes are currently not being budgeted and recorded separately per asset facility category.	Budget for and record O&M costs: separately (separate operations from maintenance). Budget for and record O&M costs per asset facility category.
3	Risk Management		
3.1	Risk Management	<p>Risk (expected loss) is calculated by determining the product of the likelihood of the risk and the total amount of loss (impact) when the risk occurs: <i>Expected Loss (Risk) = Risk Likelihood x Total Loss (Impact)</i></p> <p>For this Scheme, however, risk likelihood per asset component was not captured in the Asset Register used in the development of this AMP. Hence, an in-depth risk analysis could not be conducted.</p>	Capture risk likelihood per asset component in the infrastructure asset register, so that the next update of this AMP can incorporate an in-depth risk analysis.

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GLOSSARY

Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
Asset	A resource controlled by the DWS as a result of past events and from which future economic benefits are expected to flow to DWS.
Asset Hierarchy	A framework for segmenting an asset base into appropriate classifications.
Asset Management	A process of decision making, planning and control over acquisition, use, safeguarding and disposal of assets to maximise their service delivery potential and benefits, and to minimize their related risks and costs over their entire life.
Asset Management System	A system (usually computerised) for collecting, analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan	Documented information that specifies the activities, resources and timescales required for an individual asset, or a grouping of assets, to achieve the organization's asset management objectives.
Asset Management Policy	The overall intentions and direction of an organisation related to the assets and the framework for the control of asset related processes and activities.
Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.
Asset Management Team	The team appointed by an organisation to review and monitor the corporate asset management improvement programme and ensure the development of integrated asset management systems and plans consistent with organisational goals and objectives.
An active market	a market in which all of the following conditions exist: <ul style="list-style-type: none"> • The items traded in the market are homogeneous • Willing buyers and sellers can normally be found at any time • Prices are available to the public
Asset carrying amount/value	The amount at which an asset is included in the statement of financial position after deducting any accumulated depreciation and any impairment losses thereon.
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, and construction, technical and financial information about each.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action
Critical Assets	Assets or assets components, that are identified as being critical in achieving the organisation's strategic objectives (note that assets can be safety critical, environmental critical or performance critical).
Current Replacement Cost	A measure of replacement value – the cost of replacing an existing asset with a modern asset of equivalent capacity.
Deferred Maintenance	Planned maintenance that has been deferred (backlog in maintenance).
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated Replacement Cost	A measure of current value of an asset, based on its current replacement cost less an allowance for deterioration of condition to date (based on the fraction of remaining useful life/expected useful life).
Depreciation	The systematic allocation of the depreciable amount of a physical asset over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.

Economic life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Expenditure-based cost	Projected cost based on historical actual expenditures.
EUL	Expected Useful Life of an asset
Facility	A complex asset comprising many assets (e.g. a hospital, water treatment plant, recreation complex, etc.) which represents a single management unit for financial, operational, maintenance or other purposes.
Geographic Information System	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
Impairment	The loss of future economic benefits or service potential of an asset over and above the systematic recognition of the loss of the asset's future economic benefits or service potential through depreciation.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognized 'ordinary' assets as components.
Key Performance Indicator	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Key performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Level of service	The defined service quality for a particular activity or service area against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life cycle	The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset i.e. from planning and design to decommissioning or disposal.
Lifecycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, and rehabilitation and disposal costs.
Maintenance	All actions necessary for an asset to achieve its expected useful life as near as practicable to its original condition, but excluding rehabilitation or renewal.
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.
Maintenance Standards	The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.
Objective	An objective is a general statement of intention relating to a specific output or activity. They are generally longer term aims and are not necessarily outcomes that managers can control.
Operating Expenditure	Expenditure necessary to provide services such as water catchment or water distribution. Examples of OPEX include staff costs, administration costs, consumables, maintenance and repairs and feasibility studies.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of the lifecycle costs of an asset.
Optimal cost	Cost determined based on established ratios of CRCs, and is deemed sufficient to cover all the expenditure requirements of an entity.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Planned Maintenance	Planned maintenance activities fall into 3 categories:

	<ul style="list-style-type: none"> ▪ Periodic – necessary to ensure the reliability or sustain the design life of an asset. ▪ Predictive – condition monitoring activities used to predict failure. ▪ Preventive – maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally, involves repairing the asset using available techniques and standards to deliver its original level of service (e.g. relining bulk raw water pipelines) without resorting to significant upgrading or replacement.
Renewal	Works to refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
Remaining Useful Life	The time remaining over which an asset is expected to be used.
Residual Value	The net amount which the entity expects to obtain for an asset at the end of its useful life after deducting the expected costs of disposal.
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine Maintenance	Day to day operational activities to keep the asset operating (e.g. repairing leaks) and which form part of the annual operating budget, including preventative maintenance.
Strategic Plan	Strategic planning involves making decisions about the long-term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long-term survival, value and growth of the organisation.
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Useful life	The period over which a depreciable asset is expected to be used. (GAMAP: Either (i) the period of time over which an asset is expected to be used by the entity, or (ii) the number of production or similar units expected to be detained from the asset by the entity).
Valuation	Estimated asset value, which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels or market value for lifecycle costing.
Yield	Water which can reliably be withdrawn from a water source at a relatively constant rate.

ABBREVIATIONS

AM	Asset Management
AMP	Asset Management Plan
AMIP	Asset Management Improvement Plan
AMS	Asset Management System
CAPEX	Capital Expenditure
CBM	Condition Based Maintenance
CPI	Consumer Price Index
CRC	Current Replacement Cost
DRC	Depreciated Replacement Cost
D&I	Domestic and Industrial
DWS	Department of Water and Sanitation
EUL	Expected Useful Life
GIAMA	Government Immovable Asset Management Act
GIS	Geographic Information System
GFMAM	Global Framework for Maintenance and Asset Management
GPS	Global Positioning System
GRAP	Generally Recognized Accounting Practices
GWS	Government Water Scheme
ISO	International Standards Organization
IAS	International Accounting Standards
IFMS	Integrated Financial Management System
IRR	Irrigation
KPI	Key Performance Indicator
LCC	Life Cycle Costing/Cost
MTEF	Medium Term Expenditure Framework
NWRI	National Water Resources Infrastructure
NWRIB	National Water Resources Infrastructure Branch
NWA	National Water Act
OPEX	Operating Expenditure
O&M	Operation and Maintenance
OSH	Occupational Health and Safety
PFMA	Public Finance Management Act
PPE	Property, Plant and Equipment
PPI	Producer Price Index
PM	Preventive Maintenance
PdM	Predictive Maintenance
RAMS	Reliability, Availability, Maintainability and Safety
RUL	Remaining Useful Life
RTF	Run to Failure
RCM	Reliability Centred Maintenance
WARMS	Water-Use Authorization and Registration Management System
WDCS	Waste Discharge Charging System
WMA	Water Management Area
WTE	Water Trading Entity

1. INTRODUCTION AND SERVICE DESCRIPTION

1.1 Overview

This document is a 10-year infrastructure Asset Management Plan (AMP) for the Central Operations Cluster, hereinafter referred to as the Cluster, of the National Water Resources Infrastructure (NWRI) branch of the Department of Water and Sanitation (DWS). This section begins with a brief background as well as the key sources of data used in the development of this AMP. It proceeds with outlining: the purpose of this AMP; and alignment of this AMP with the South African legislative framework, international standards, and the DWS's strategic plan. Finally, it indicates the physical location of the Cluster; highlights the service provided by the Cluster; and also, provides an overview of the Cluster's immovable assets.

1.2 Background

The NWRI is responsible for operating, maintaining and managing a number of raw water schemes spread throughout South Africa. The NWRI divided the country into four operational clusters: Northern; Eastern; Southern; and Central. Each cluster is responsible for a number of raw water schemes.

In 2010, the NWRI prepared the second set of infrastructure AMPs: one AMP for each of its four operational clusters, and one National AMP; hereinafter all referred to as the 2010 AMPs. However, the 2010 AMPs needed some updating and improvements, in view of the following:

- the 2010 AMPs were produced at a relatively high level of detail and ultimately needed to be improved in accordance and compliance with the provisions of the Government Immovable Asset Management Act (GIAMA), Act No. 19 of 2007.
- no AMP was prepared at the GWS level (the 2010 AMPs were only prepared at the Cluster and National levels).
- no analysis was done, and no life cycle works and strategies were prescribed at asset component level; and hence
- the 2010 AMPs only partially complied with the provisions of the GIAMA.

In addition, the DWS is required to annually update its AMPs, as contemplated in Section 12 of the GIAMA. It is against this background that this AMP has been prepared for NWRI's Central Operations Cluster operations as an update and improvement to the 2010 AMP.

1.3 Data Sources and Overall Data Confidence

1.3.1 Key Data Sources Used to Develop this AMP

The key sources of data used to develop this AMP are:

- *NWRI Immovable Asset Register* for the financial year 2015/16 (refer to Appendix A).
- *NWRI Infrastructure Asset Hierarchy* (latest version updated in the financial year 2013/14).
- *Condition Assessment Audit of Irrigation Scheme Infrastructure – Scheme Reports*, dated the 30th of September 2016.
- *financial (revenue and expenditure) information* (obtained from: the DWS Head Office; and the Central Cluster Office).
- *face-to-face scheme visit interviews* conducted with the relevant DWS Central Cluster operations personnel.
- *Other relevant NWRI documentation*, such as water use registrations records.

1.3.2 Data Confidence Rating

Table 1.1 shows the confidence grading criteria used for rating the data used in this AMP.

Table 1.1: Data confidence grading scale

Data Confidence Grade	Description	Margin of Error
5	Highly accurate Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment.	1 – 20 %
4	Minor inaccuracies Data based on sound records, procedures, investigations and analysis which is properly documented but has minor shortcomings; for example, the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.	21 – 30%
3	50% estimated Data based on sound records, procedures, investigations, and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade 1 or 2 data is available.	31 – 40%
2	Significant data estimated Data based on incomplete or outdated data, or conflicting data sets exists requiring the assessor to apply judgement as to which portions of data would be most appropriate.	41- 50%
1	All data estimated No written records, procedures or other supporting documentation available. Data based on unconfirmed verbal reports and/or cursory inspection and analysis	> 51%

Source: Adapted from DWS Valuation Guide (2008)

Table 1.2 summarizes the confidence rating for the data used to develop this AMP.

Table 1.2: Overall data confidence rating

Section of this AMP	Data Description	Data Confidence Rating	Reason for rating
1	Cluster location and service description	5	Data gathered during interviews and also obtained from other relevant NWRI documentation, such as the WARMS registrations (DW760).
2	Levels of service, performance measures, targets	4	Data obtained from DWS Raw Water Pricing Strategy; raw water supply agreements; and some data verified/provided by the DWS Central Cluster Team.
3	Future raw water demand	3	Future raw water demand based on registered volumes for irrigation and domestic and industrial water users. Actual raw water volumes could not be obtained.
4	Asset details	4	Required asset information that was not in the Asset Register was derived (see Section 4.2).
5	Financial information	4	Required financial information that could not be found was derived (refer to Sections 5 and 6).
Average Data Confidence		4	Minor inaccuracies, with 21 – 30% margin of error.

1.4 Purpose of this Asset Management Plan

The main purpose of this 10-year AMP is to enable the Cluster to effectively and efficiently manage its immovable assets, thereby enabling it to maximise its service delivery potential and benefits (delivering the desired levels of service to its clients), and to minimise related risks and costs over its immovable assets' entire life cycle. To this end, this AMP aims at achieving the following:

- Describing the service offered by the Cluster.
- Articulating the intended 'levels of service' relevant to this Cluster, and the performance measures and targets against which actual performance needs to be assessed.
- Analysing the Cluster's immovable assets and proposing appropriate asset life cycle activities/works aimed at making sure the Cluster's immovable assets meet: the levels of service (for supply of raw water) agreed with its clients; as well as the projected future raw water demand for the Cluster.
- Proposing a financial plan for the Cluster for the next 10 years.
- Identifying areas of improvement with regards to the DWS Asset Management practices, and providing appropriate recommendations thereof.
- Enabling the Cluster to make optimized asset creation, operation, maintenance, renewal, upgrade and disposal decisions; and
- Complying with the provisions of the GIAMA.

1.5 Legislative Framework, Policies, Strategies and Standards

This AMP has been developed in line with the laws of the Republic of South Africa, relevant DWS policies, strategies and guides, as well as relevant international standards. The legislative framework includes, but is not limited to:

- Constitution of the Republic of South Africa (Act No. 108 of 1997).
- National Water Act (No. 36 of 1998).
- Government Immovable Asset Management Act (GIAMA) No. 19 of 2007.
- Public Finance Management Act (PFMA) No. 1 of 1999.

The relevant DWS policies and strategies include:

- Immovable Asset Management Policy (2015).
- Disposal Policy for Immovable Assets (2015).
- Valuation Guide (2008).

The relevant international standards include:

- Generally Recognized Accounting Practice for Property, Plant and Equipment (GRAP 17).
- International Standard for Asset Management Systems (ISO 55000).
- International Infrastructure Management Manual.

1.6 Strategic Context

This AMP is aligned with the DWS's Strategic Plan, ensuring that the NWRIB's immovable assets are managed in a manner that fully supports the DWS's vision of delivering "equitable and sustainable water and sanitation that support socio-economic growth and development of the well-being of current and future generations". This AMP flows from and supports the DWS's Asset Management Policy, High-level Strategic Goals, Mission and Vision (refer to Appendix B).

1.7 Cluster Description and Location

The Central Cluster is part of NWRI Operations and includes parts of the following provinces: Free State, Gauteng, KwaZulu Natal, Mpumalanga, Northern Cape and North West, as shown in Figure 1.1. It constitutes five area offices (Bloemfontein, Jericho, Potchefstroom, Standerton and Tugela-Vaal) and has 36 government water schemes, as listed in Table 1.3.

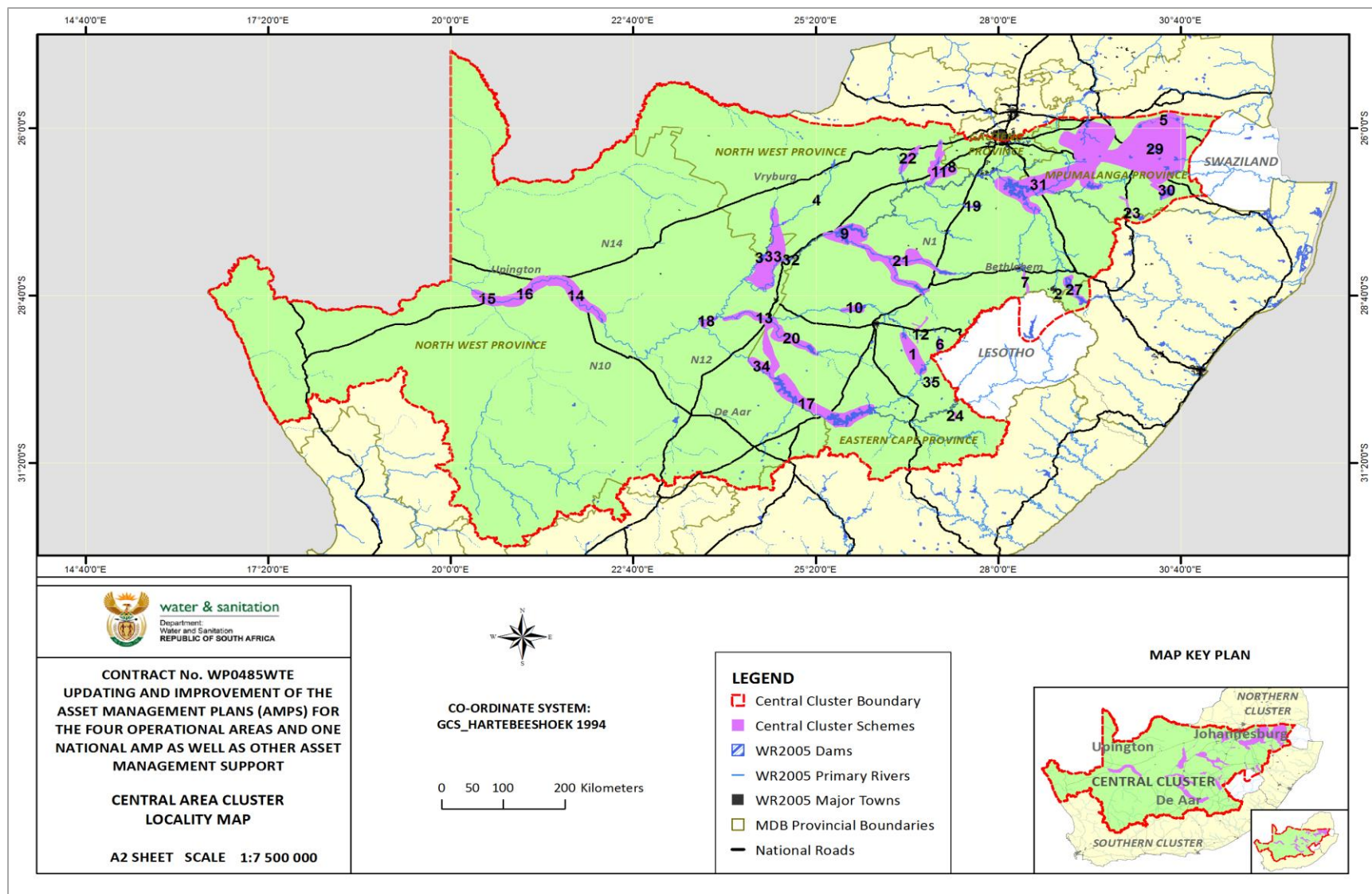


Figure 1.1: Locality map for the Central Operations Cluster

Table 1.3: Central Operations Cluster Schemes List

No.	Scheme Name	No.	Scheme Name
1	Caledon-Modder GWS	20	Riet River
2	Fika Patso & Metsi Matsho	21	Sand-Vet GWS
3	Harts River GWS (Spitskop Dam)	22	Schoonspruit GWS
4	Harts River GWS (Wentzel Dam)	23	Slang River GWS
5	Komati River GWS	24	Sterkspruit
6	Leeu River GWS (Armenia Dam)	25	Taung Dam
7	LHWP Delivery Tunnel North	26	ThabaN'chu Dams
8	Loopspruit (Klipdrift Dam)	27	Tugela-Vaal GWS
9	Middle Vaal GWS	29	Usutu River GWS
10	Modder River	30	Usutu Vaal Phase 2 GWS
11	Mooi River GWS	28	Usutu-Vaal GWS
12	Moutloatsi Setlogelo Groothoek Dam	31	Vaal Dam GWS
13	Orange Riet Canal	32	Vaalharts
14	Orange River (Boegoeberg Dam)	33	Vaalharts
15	Orange River (Kakamas)	34	Van Der Kloof
16	Orange River (Upington Islands)	35	Wittespruit (Egmont Dam)
17	Orange River GWS	36	VRESAP
18	Orange Vaal (Douglas Canals)	37	KWSAP
19	Rhenoster River		

1.8 Service Description and Assets Summary

The primary service offered by the Cluster is the delivery of bulk raw water to its domestic and industrial (D&I), and irrigation water users (customers). Total raw water registered volume for the Cluster is 5 436.092 Mm³ per annum, of which 62.3% is for domestic and industrial and 37.7% is for irrigation use as shown in Table 1.4.

Table 1.4: Raw water allocations per water user category

Water User Category	Total Registered Volume (Mm ³ pa)	% of Total Registered Volume
Domestic & Industrial	3 386.934	62.3%
Irrigation	2 049.158	37.7%
Total	5 436.092	100.00

The key stakeholders for the Cluster is shown in Appendix C. Table 1.5 shows the principal customers (in terms of registered raw water volumes) for the Cluster. Appendix D, Table D.1 shows registered raw water volumes per water use category.

Table 1.5: Principal water users

Principal Customer Name	Water User Category	Registered Water Volume (Mm ³ pa)
Secunda Synfuel DIV Of SCI	Domestic & Industrial	1143.600
Rand Water	Domestic & Industrial	1102.375
Eskom Holdings	Domestic & Industrial	618.547
Vaalharts Water User Association	Irrigation	361.437
Orange-Riet Water User Association	Irrigation	174.553
Total		3 400.512
<i>% of Total Cluster Registered Volume</i>		62.6%

Table 1.6 summarizes the immovable assets for Cluster as they appear in the Asset Register (refer to Appendix A) used in the development of this AMP. The Cluster's immovable assets have a total DRC and CRC of about R93.007 billion and about R101.698 billion, respectively. They can be grouped into two:

- infrastructure assets (with total DRC and CRC of about R80.884 billion and about R89.575 billion, respectively), and
- land (with a total of about R12.123 billion for both DRC and CRC).

For infrastructure assets, dams-related asset components have the highest CRC of about R31.520 billion, followed by canals, tunnels, pipelines and pump stations related asset components with CRC of about: R18.920 billion, R14.548 billion, R14.143 billion and R3.850 billion, respectively. A similar pattern is evident for DRC.

Table 1.6: Summary of the Cluster's immovable assets

Asset Facility Category	No. of Asset Components	CRC (R Million)	DRC (R Million)
Borehole	2	2.88	2.56
Buildings	2 569	2 709.93	2 222.26
Canals	6 443	18 920.27	16 624.51
Dams	1 794	31 519.95	29 496.00
Measuring facilities	1 413	2 860.05	2 437.77
Pipelines	696	14 143.47	12 754.12
Power supply	101	79.94	66.91
Pump stations	2 258	3 849.84	3 303.69
Reservoirs	77	736.2	667.1
Roads	41	73.16	66.12
Telemetry	16	53.74	46.18
Tunnels	101	14 547.64	13 130.05
Water Treatment	49	77.80	66.50
Sub-total Infrastructure	15 560	89 574.83	80 883.76
Land - owned land	74	11 243.50	11 243.50
Land - servitudes	1 893	879.99	879.99
Sub-total Land	1 967	12 123.48	12 123.48
TOTAL	17 527	101 698.31	93 007.24

To be noted is that the Asset Register (see Appendix A) used in the development of this AMP did not have sizes (e.g. lengths of canals, roads, etc.) on most of the asset components. Hence, asset sizes are not shown in Table 1.6.

1.9 Summary

This AMP is for the Central Operations Cluster which is part of the DWS's NWRI operations. Key data sources used in the development of this AMP include: the NWRI's immovable asset register; asset hierarchy; the 2016 Condition Assessment Audit of Irrigation Scheme Infrastructure - Scheme Reports for Southern Cluster operations; the Cluster's financial information (costs and revenue); face-to-face interviews conducted with the relevant Cluster personnel; as well as other relevant NWRI documentation.

The main purpose of this AMP is to enable the Cluster to effectively and efficiently manage its infrastructure assets, thereby enabling it to maximise its service delivery potential and benefits (delivering the desired level of service to its clients), and to minimise related risks and costs over its infrastructure assets' entire life cycle. This AMP is prepared in accordance with the provisions of the GIAMA, and is also aligned to: other relevant South African legislation; international standards; as well as the DWS's strategic plan.

The primary service offered by the Cluster is the delivery of bulk raw water to its domestic and industrial (D&I), and irrigation water users (customers). Total raw water registered volume for the Cluster is 5 436.092 Mm³ per annum, of which 62.3% is for domestic and industrial and 37.7% is for irrigation use.

The Cluster's immovable assets have a total DRC and CRC of about R93.007 billion and about R101.698 billion, respectively. They can be grouped into two: infrastructure assets (with total DRC and CRC of about R80.884 billion and about R89.575 billion, respectively), and land (with a total of about R12.123 billion for both DRC and CRC).

The next section highlights the levels of service expected from the Cluster, as well as the associated performance measures and targets for the Scheme.

2. LEVELS OF SERVICE, PERFORMANCE MEASURES & TARGETS

2.1 Overview

This section presents the levels of service, as well as the associated performance measures and targets, for the Central Operations Cluster. Understanding the levels of service for the Cluster assists in monitoring and managing the Cluster's infrastructure assets so as to ensure effective service delivery to its water users and, thus, leading to customer satisfaction.

2.2 Levels of Service, and Associated Performance Measures and Targets

In this AMP, 'levels of service' refers to the quality and quantity of the Cluster's service delivery, against which the Cluster's performance may be measured. As indicated in the preceding section, the key service delivered by the Cluster is the supply of raw water to its customers (irrigation, and domestic and industrial water users). The total raw water registered volume for this Cluster is 5 436.092 Mm³. Appendix D, Table D.1, shows the registered raw water volumes per water use category.

There are three key levels of service applicable to the Cluster's raw water supply service, namely:

- Volume of raw water supplied;
- Quality of raw water supplied; and
- Assurance level of raw water supply.

The above-listed levels of service are evident in the: raw water supply agreements with water users; and the DWS's Raw Water Pricing Strategy. The DWS's Catchment Management Area (CMA) is responsible for raw water registration/licensing. Two of the levels of service (volume of raw water supplied; and assurance level of raw water supply) fall under the direct responsibility of the Cluster (which is part of NWRI Operations); whilst the 'quality of raw water supplied' level of service falls under the direct responsibility of the CMA. As this AMP focuses on NWRIB, the 'quality of raw water supplied' level of service is not covered in subsequent text.

Table 2.1 presents the performance measures and targets (associated with each of the two levels of service for which the Cluster, as part of NWRI, is responsible), current performance, as well as the desired future performance targets.

Table 2.1: Levels of service, and associated performance measures and targets

Level of Service	Performance Measure	Performance Target (2015/16)	Current Performance (2015/16)	Desired Performance Targets (2016/17 – 2025/26)
Volume of raw water supplied	Number of agreements with water users in place	All water users have valid agreements in place (100%).	Could not be ascertained for some of the schemes.	All water users have valid agreements in place (100%).
	Volume of raw water supplied	Registered raw water volumes per annum: <ul style="list-style-type: none"> ▪ 3 386.934 Mm³ pa for domestic and industrial water users; ▪ 2 049.158 Mm³ pa for irrigation water users; ▪ 5 436.092 Mm³ pa Total. 	Actual raw water volumes supplied to D&I and irrigation water users could not be obtained.	Be able to meet the growth in demand (refer to Section 3),
	Asset Maintenance	No deferred maintenance.	There is some deferred maintenance (refer to Section 5.5).	No deferred maintenance.
	Water conveyance efficiency	Percentage of unaccounted for raw water during delivery: <ul style="list-style-type: none"> < 3% for pipes; <20% for canals. 	Could not be ascertained for some of the schemes.	Percentage of unaccounted for raw water during delivery: <ul style="list-style-type: none"> < 3% for pipes; <20% for canals.
Assurance level of raw water supply	Water supply assurance	<ul style="list-style-type: none"> ▪ 97% for domestic and industrial water users; ▪ 91% for irrigation water users. 	Could not be ascertained for some of the schemes.	<ul style="list-style-type: none"> ▪ 97% for domestic and industrial water users; ▪ 91% for irrigation water users.

2.3 Summary

There are three key desired levels of service applicable to the Cluster's raw water supply service: volume of raw water supplied; quality of raw water supplied; and assurance level of raw water supply. Volume of raw water supplied and assurance level of raw water supply fall under the direct responsibility of the Cluster operations; whilst quality of raw water supplied falls under the direct responsibility of the CMA. The Cluster is expected to supply an annual total of: 3 386.934 Mm³ of raw water to D&I water users for which it assures 97% non-interruption; and 2 049.158 Mm³ to irrigation water users for which it assures 91%.

In order to ensure that the Cluster provides the levels of service agreed with the water users, a number of asset life cycle management activities need to be executed, as outlined in Sections 4 and 5 of this AMP. The following section indicates the future raw water demand projections for this Cluster.

3. FUTURE RAW WATER DEMAND

3.1 Overview

This section highlights the Central Operations Cluster's projected raw water demand levels based on the past trend.

3.2 Raw Water Demand Projection

Insight of the Cluster's future raw water demand helps in optimised planning for future new and upgrade capital needs (capital acquisitions), as contemplated in Sections 5 and 6 of the GIAMA. Figure 3.1 shows projected raw water demand for the Cluster, based on the registered volumes for both domestic and industrial (D&I) and irrigation (IRR). Refer to Appendix D, Table D.2, for the data used to generate the graph in Figure 3.1. Ideally, the Cluster's future raw water demand determined by the DWS's Planning Office needs to take precedence; this will be addressed in the next update of this AMP.

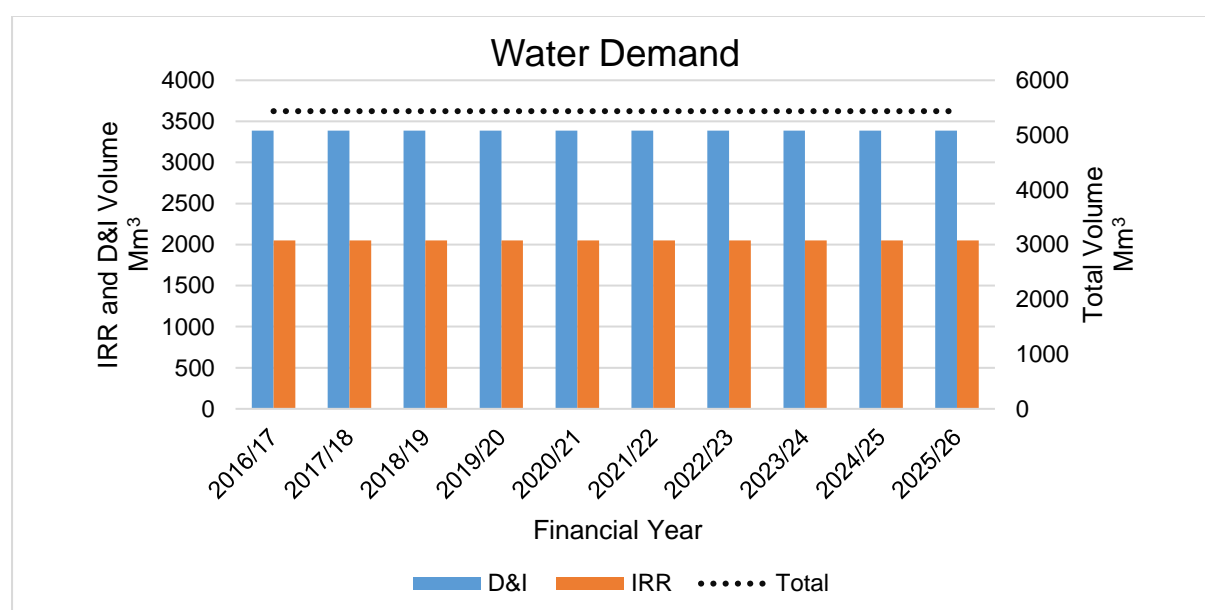


Figure 3.1: Projected raw water demand

3.3 Assumptions Made in Projecting Water Demand.

The main assumption made here is that there will be no major changes on the economic, political, demographic, settlement, irrigation, and domestic and industrial fronts affecting the Cluster. It is however important to note that in the event that there is a significant unforeseen change in any of these fronts, the projected raw water demand is bound to change. This calls for forward-looking planning where the Cluster needs to always keep track of changes

unfolding in these fronts, watching for changes that could significantly shift the current raw water demand, and consequently requiring upgrades or new capital or disposals of the Cluster's assets.

3.4 Sensitivity Analysis

Figure 3.2 shows possible scenarios from a sensitivity analysis; refer to Appendix D, Table D.3, for the data used to generate the graph.

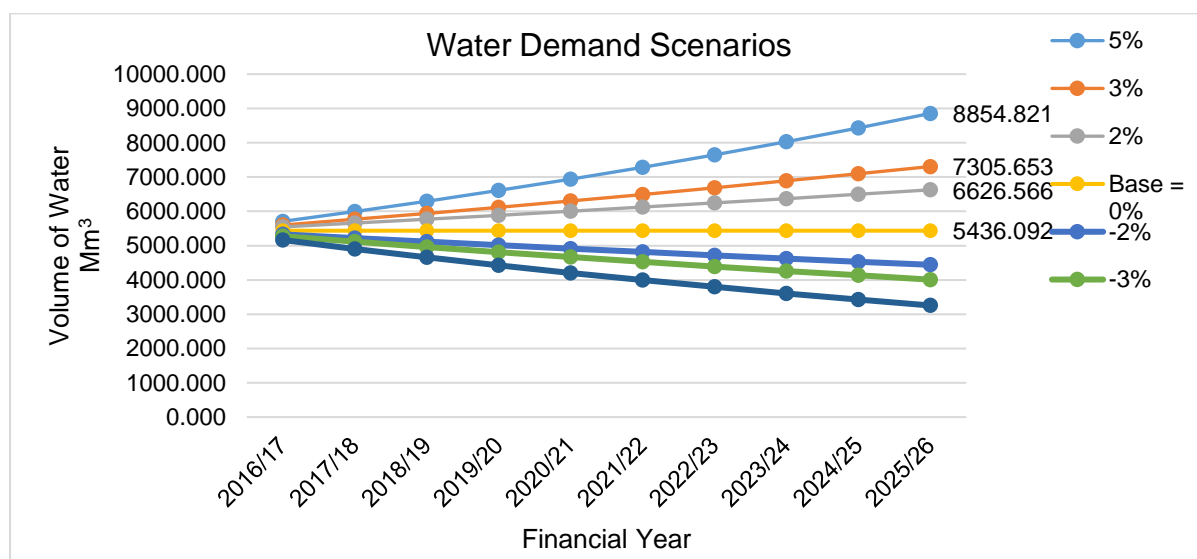


Figure 3.2: Future raw water demand sensitivity analysis

Ideally, the sensitivity graph in Figure 3.2 needs to be compared to the yields of the dams in the Cluster to ascertain whether or not the Cluster will be able to meet its projected raw water demand without the need for additional assets (new and/or upgrades). The next update of this AMP is expected to incorporate the dam yields.

3.5 Summary

The Central Operations Cluster's future raw water demand for the next 10 years is projected to be around 5 436Mm³. The main assumption made here is that there will be no major changes on the economic, political, demographic, settlement, irrigation, and domestic and industrial fronts affecting the Cluster. Ideally, the Cluster's future raw water demand determined by the DWS's NWRI Planning Office takes precedence. The next update of this AMP is expected to make use of such data.

In order for the Cluster to meet the future raw water demand projected in this section, the following Sections 4 and 5 highlight the accordingly required asset life cycle works and associated financial plan, respectively.

4. ASSET DETAILS, RISK AND LIFE CYCLE WORKS

4.1 Overview

This section begins with an analysis of the immovable asset details (e.g. extent, value, condition, criticality, utilisation, etc.) for the Central Operations Cluster. It then proceeds to discuss the associated risks, the works and strategies recommended for the Cluster to effectively and efficiently manage its assets throughout their life cycles in order to meet the levels of service agreed with its water users (see Section 2) and the projected future raw water demand (see Section 3).

4.2 Asset Information

The following subsections highlight the details (extent, value, condition, criticality and utilization) of the Cluster's immovable assets, based on the DWS's Immovable Asset Register for the 2015/16 financial year (refer to Appendix A).

The DWS Immovable Asset Management Policy (Section 6) and GRAP 17 (Section 11) prescribe the minimum asset register information, including: detail asset description (e.g. sizes, material of construction, etc.), EUL, RUL, impairments, and disposal (date, proceeds, and depreciation up to date of disposal). Where such information was incomplete in the asset register used in this AMP, the DWS Infrastructure Asset Hierarchy (latest version updated in 2013/14), the DWS's Immovable Asset Management Policy, Valuation Guide and the 2010 AMPs formed the basis for addressing the shortcoming. For instance:

- EULs were assigned based on the DWS Infrastructure Asset Hierarchy.
- RULs were determined using the age-based approach (and moderated by the condition-based approach).
- CRCs were determined by adjusting the provided acquisition costs with PPI and an uncertainty factor, and moderated using the CRCs reported in the 2010 AMPs, owing to the insufficient data on asset component sizes and material of construction.

4.2.1 Asset Extent and Values

Table 4.1 shows the extent (number of asset components), acquisition cost, CRC, DRC and asset carrying values for the Cluster's assets, split between scheme-specific and non-scheme specific.

Table 4.1: Asset extent, acquisition costs, CRC and values (scheme- and non-scheme-specific)

Description	No. of Asset Components	Acquisition Cost (R Million)	Asset Carrying Value (R Million)	CRC (R Million)	DRC (R Million)	DRC / CRC (%)
Scheme-Specific Infrastructure	14 323	33 446.87	25 054.08	87 651.03	79 258.25	90.42
Scheme-Specific Land	1 706	4 382.00	4 283.95	12 120.19	12 120.19	100.00
Sub-Total Scheme-Specific	16 029	37 828.87	29 338.03	99 771.22	91 378.44	91.59
Non-Scheme-Specific Infrastructure	1 237	737.25	438.97	1 923.79	1 625.51	84.50
Non-Scheme-Specific Land	261	1.19	1.19	3.29	3.29	100.00
Sub-Total Non-Scheme-Specific	1 498	738.44	440.16	1 927.09	1 628.80	84.52
Total	17 527	38 567.31	29 778.19	101 698.31	93 007.24	91.45

Table 4.2 shows the extent (number of asset components), acquisition cost, CRC, DRC and asset carrying values for the Cluster's assets per asset facility category.

Table 4.2: Asset extent, acquisition costs, CRC and values (per facility category)

Asset Facility Category	No. of Asset Components	Acquisition Cost (R Million)	Asset Carrying Value (R Million)	CRC (R Million)	DRC (R Million)	DRC / CRC (%)
Borehole	2	1.04	0.72	2.88	2.56	88.96
Buildings	2 569	1 022.38	534.71	2 709.93	2 222.26	82.00
Canals	6 443	6 995.80	4 700.05	18 920.27	16 624.51	87.87
Dams	1 794	11 413.37	9 389.42	31 519.95	29 496.00	93.58
Measuring facilities	1 413	1 058.27	635.99	2 860.05	2 437.77	85.24
Pipelines	696	6 364.89	4 975.54	14 143.47	12 754.12	90.18
Power supply	101	34.42	21.39	79.94	66.91	83.70
Pump stations	2 258	1 663.49	1 117.34	3 849.84	3 303.69	85.81
Reservoirs	77	288.01	218.94	736.2	667.1	90.62
Roads	41	29.25	22.21	73.16	66.12	90.38
Telemetry	16	25.43	17.87	53.74	46.18	85.93
Tunnels	101	5 259.63	3 842.04	14 547.64	13 130.05	90.26
Water Treatment	49	28.13	16.82	77.80	66.50	85.47
Sub-total Infrastructure	15 560	34 184.12	25 493.05	89 574.83	80 883.76	90.30
Land - owned land	74	4 065.03	3 967.18	11 243.50	11 243.50	100.00
Land - servitudes	1 893	318.16	317.96	879.99	879.99	100.00
Sub-total Land	1 967	4 383.19	4 285.14	12 123.48	12 123.48	100.00
TOTAL	17 527	38 567.31	29 778.19	101 698.31	93 007.24	91.45

As shown in Table 4.1, the Cluster has an immovable asset base consisting of: *infrastructure assets* (with a total of 15 560 asset components) and *land* (with a total of 1 967 asset components). The Cluster's immovable assets have a total DRC and CRC of about R93.007 billion and about R101.698 billion, respectively. They can be grouped into two:

- infrastructure assets (with total DRC and CRC of about R80.884 billion and about R89.575 billion, respectively), and
- land (with a total of about R12.123 billion for both DRC and CRC).

The DRC/CRC ratio for infrastructure assets is about 90%, indicating that about 10% of the infrastructure asset base has been consumed so far.

For infrastructure assets, dams-related asset components have the highest CRC of about R31.520 billion, followed by canals, tunnels, pipelines and pump stations related asset components with CRC of about: R18.920 billion, R14.548 billion, R14.143 billion and R3.850 billion, respectively. A similar pattern is evident for DRC.

Figure 4.1 shows the proportional distribution of the Cluster's asset components per asset facility category. The majority of the Cluster's asset components are canals, buildings, pump stations, land and dams related asset components (about 37%, 15%, 13%, 11% and 10%, respectively).

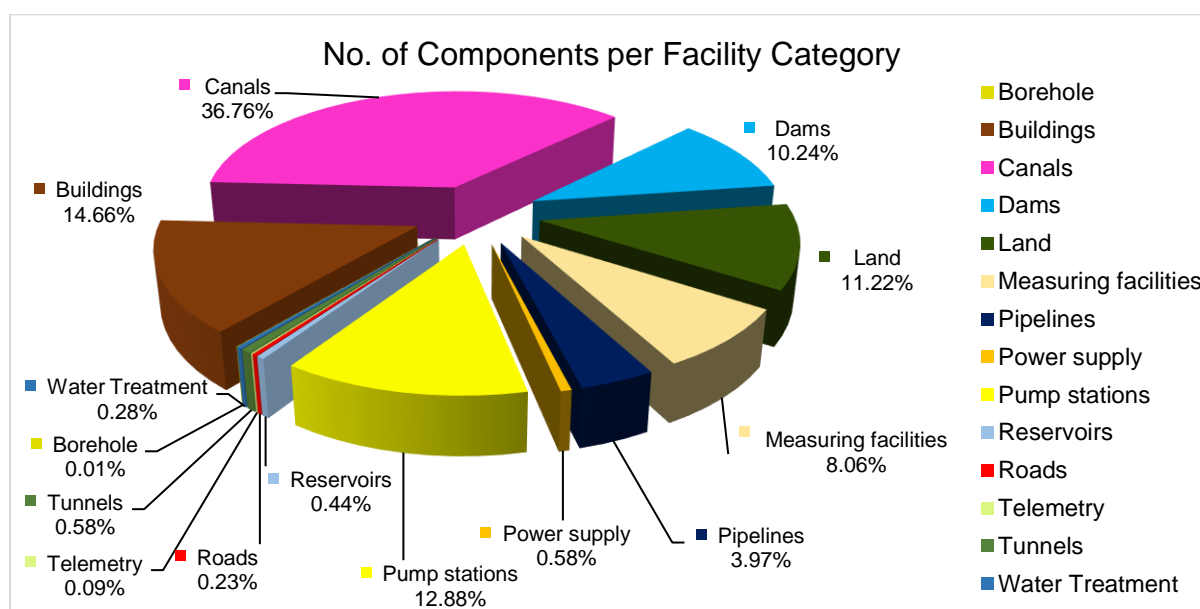


Figure 4.1: Proportion of asset components per asset facility category

Figures 4.2 and 4.3 show the associated proportions of the DRC and CRC per asset facility category, respectively.

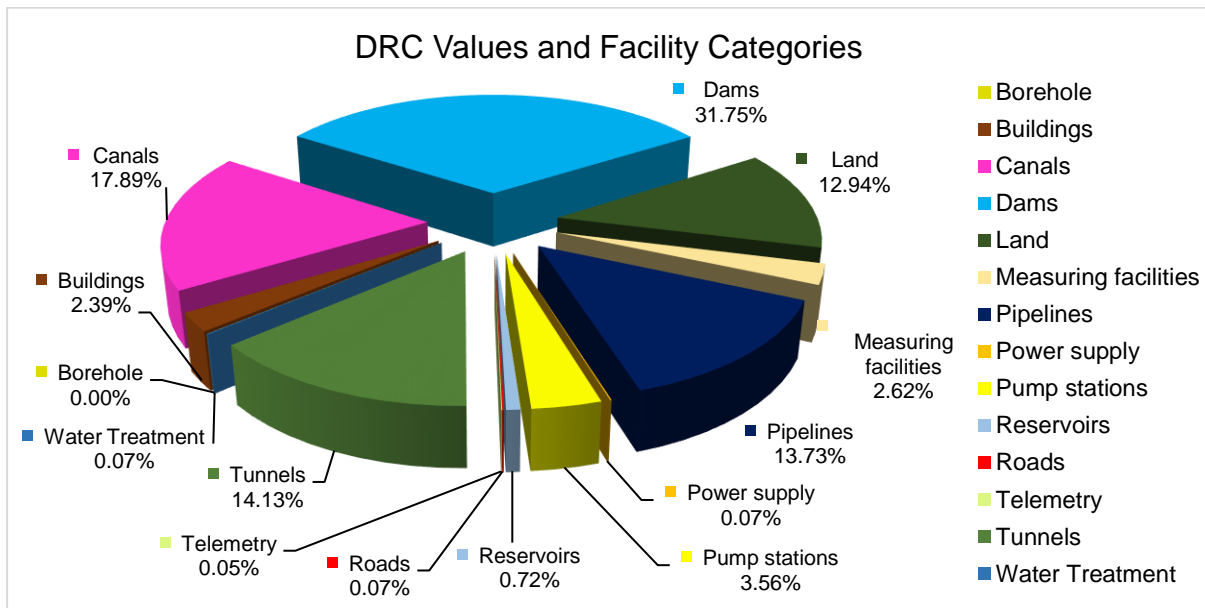


Figure 4.2: DRC per asset facility category

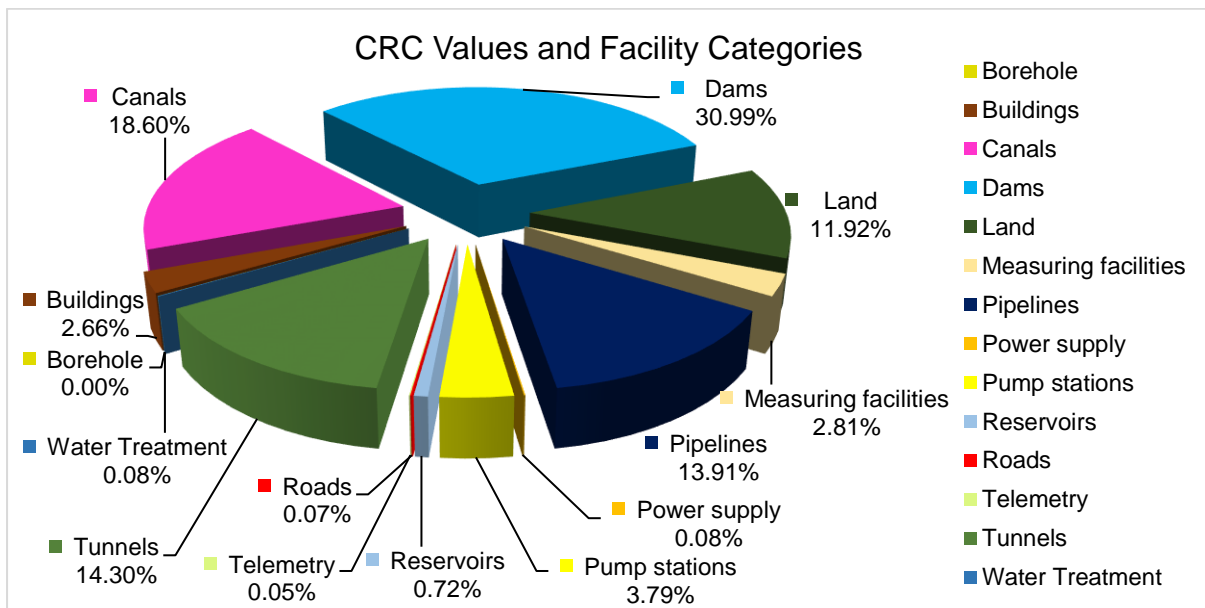


Figure 4.3: CRC per asset facility category

4.2.2 Asset Condition and RUL/EUL Ratio

Table 4.2 shows the asset condition grading criteria as well as the link between the condition grading and the RUL/EUL ratio range.

Table 4.3: Linking asset condition grades to RUL/EUL ratio range

Condition Grade	Description	Detailed Description	Indicative RUL/EUL
5	Very good	Sound structure, well maintained. Only normal maintenance required.	71 - 100%
4	Good	Serves needs but minor deterioration (< 5%). Minor maintenance required.	46 - 70%
3	Fair	Marginal, clearly evident deterioration (10-20%). Significant maintenance required.	26 - 45%
2	Poor	Significant deterioration of structure and/or appearance. Significant impairment of functionality (20-40%). Significant renewal/upgrade required.	11 - 25%
1	Very poor	Unsound, failed, needs reconstruction/replacement (> 50% needs replacement).	0 - 10%
0	Not Working	Unsound, failed, needs reconstruction/replacement (100% needs replacement).	0%

Source: Adapted from DWS Immovable Asset Management Policy (2015)

Asset Condition

Table 4.4 and Figure 4.4 show the proportion of condition grading for asset components per asset facility category. Appendix E, Table E.1, an expanded version of Table 4.4, shows the number of asset components in each condition grading.

- About 67% of the Cluster's infrastructure asset components are in fair, good and very good conditions. These include the two borehole and all tunnels related asset components. Also, the majority of buildings (about 58%), canals (about 71%), dams (about 73%), pipelines (about 87%), power supply (about 82%), pump stations (about 75%), reservoirs (about 94%), roads (about 78%), telemetry (about 81%), and water treatment (about 76%) related asset components fall under the same condition grading. All these asset components require appropriate maintenance to prevent them from deteriorating to poor and very poor condition.
- On the other hand, about 33% of the Cluster's infrastructure asset components have deteriorated to poor and very poor conditions. These include: the majority of measuring facilities (about 68%); and the minority of buildings (about 42%), canals (about 29%), dams (about 27%), pipelines (about 13%), power supply (about 18%), pump stations (about 25%), reservoirs (about 6%), roads (about 22%), telemetry (about 19%), and water treatment (about 24%) related asset components. These asset components need to be renewed to ensure they continue delivering the required service.

Table 4.4: Asset component condition grading proportions per asset facility category

Asset Facility Category	Condition Grading					Total
	1-Very Poor	2-Poor	3-Fair	4-Good	5-Very Good	
Borehole	-	-	50.00%	-	50.00%	100.00%
Buildings	9.07%	33.16%	29.74%	24.72%	3.31%	100.00%
Canals	0.90%	28.22%	50.69%	19.85%	0.34%	100.00%
Dams	3.18%	23.75%	38.46%	32.44%	2.17%	100.00%
Measuring facilities	1.13%	66.67%	22.15%	9.13%	0.92%	100.00%
Pipelines	0.43%	12.64%	51.44%	16.95%	18.53%	100.00%
Power supply	11.88%	5.94%	20.79%	43.56%	17.82%	100.00%
Pump stations	11.34%	13.29%	36.67%	20.46%	18.25%	100.00%
Reservoirs	2.60%	3.90%	33.77%	48.05%	11.69%	100.00%
Roads	2.44%	19.51%	41.46%	19.51%	17.07%	100.00%
Telemetry	-	18.75%	12.50%	-	68.75%	100.00%
Tunnels	-	-	65.35%	32.67%	1.98%	100.00%
Water Treatment	2.04%	22.45%	44.90%	26.53%	4.08%	100.00%
<i>All Cluster asset components</i>	<i>4.11%</i>	<i>28.64%</i>	<i>40.96%</i>	<i>21.47%</i>	<i>4.82%</i>	<i>100.00%</i>

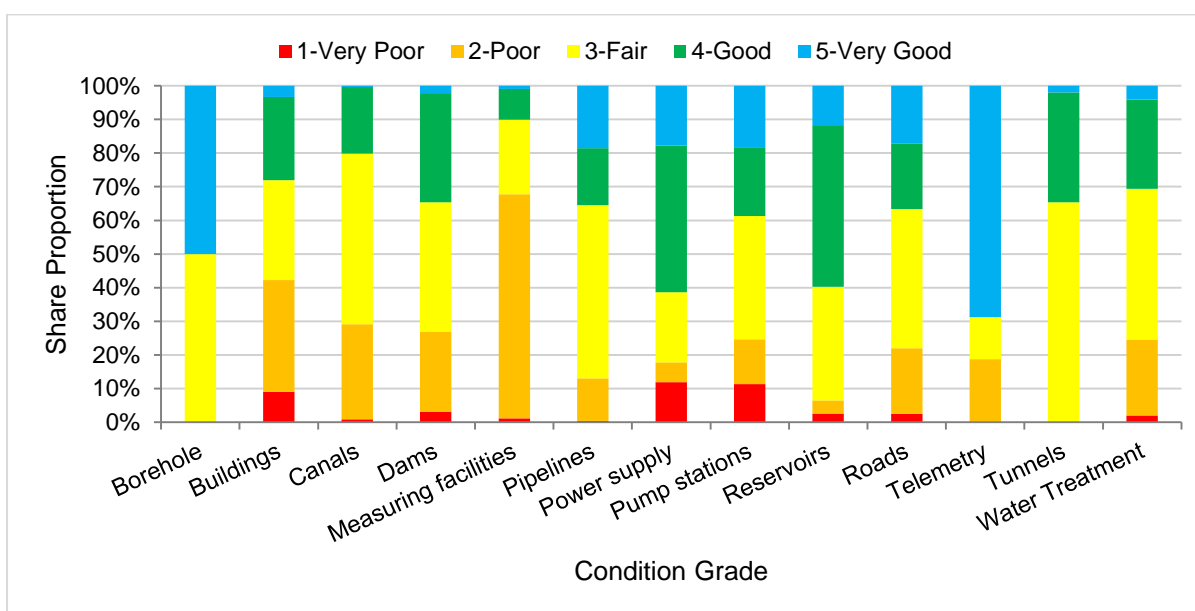


Figure 4.4: Asset component condition grading proportions per asset facility category

Figure 4.5 presents the overall condition grading of the Cluster's asset components indicating that, as also shown in Table 4.4: about 67% of the Cluster's infrastructure asset components are in fair, good and good conditions; while about 33% are in poor and very poor conditions.

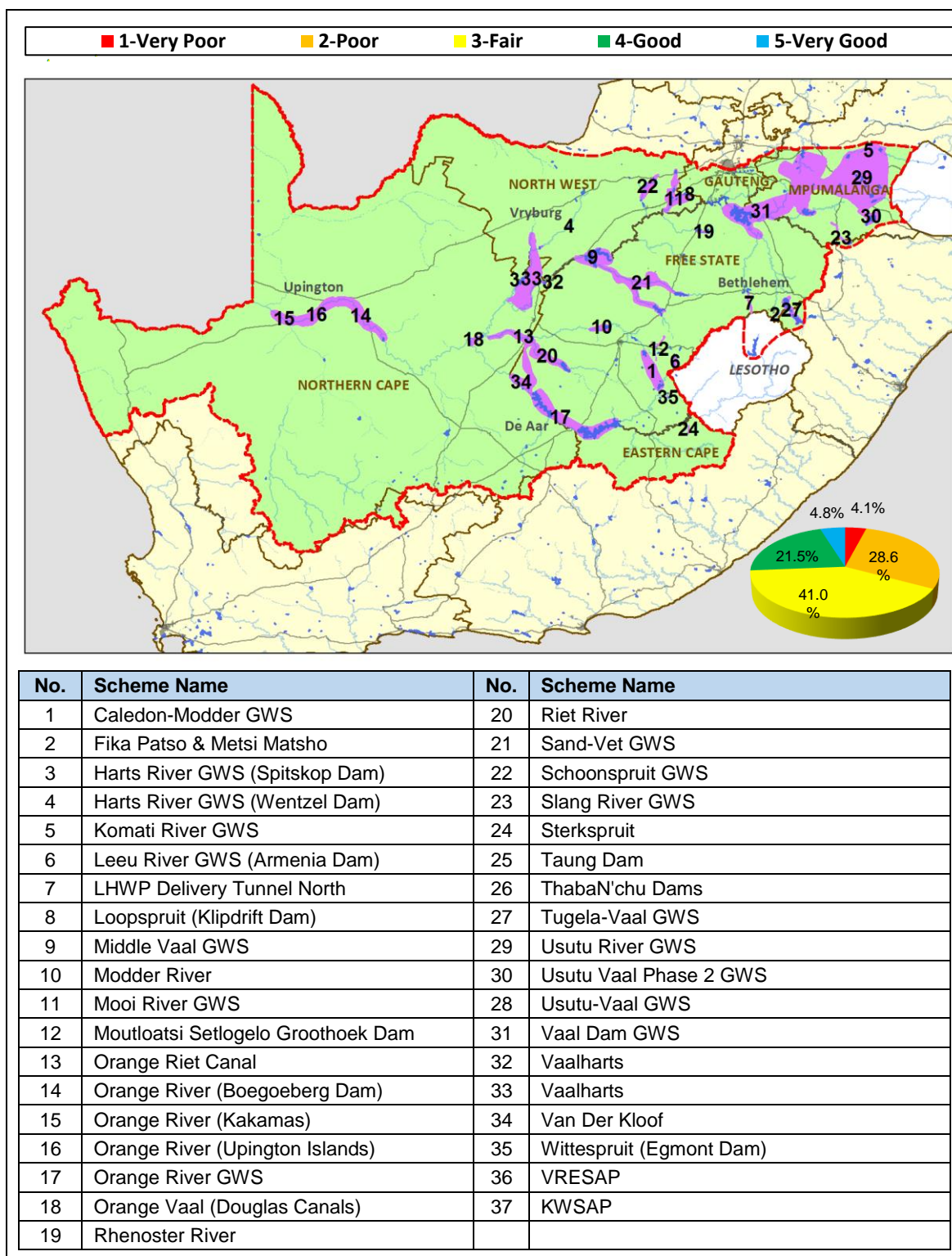


Figure 4.5: Asset condition grading proportions for the Cluster

Table 4.5 and Figure 4.6 present the CRCs of the Cluster's infrastructure asset components per condition grading and per asset facility category. Asset components that are in fair, good and very good conditions (representing about 67% of all the Cluster's infrastructure asset components, as shown in Table 4.4 and Figures 4.4 and 4.5) have a total CRC of about R82.630 billion; the main contributions coming from:

- dams-related asset components (representing about 73% of all dams-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R30.294 billion;
- canals-related asset components (representing about 71% of all canals-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R16.011 billion;
- all tunnels-related asset components (as shown in Table 4.4 and Figure 4.4) with a total CRC of about R14.548 billion; and
- pipelines-related asset components (representing about 87% of all pipelines-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R13.103 billion.

On the other hand, asset components that are in poor and very poor condition (representing about 33% of all the Cluster's infrastructure asset components, as shown in Table 4.3 and Figure 4.4) have a total CRC of about R6.945 billion; the main contribution coming from:

- canals-related asset components (representing about 29% of all canals-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R2.910 billion;
- dams-related asset components (representing about 27% of all dams-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R1.226 billion;
- pipelines-related asset components (representing about 13% of all pipelines-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R1.040 billion; and
- buildings-related asset components (representing about 13% of all buildings-related asset components, as shown in Table 4.4 and Figure 4.4) with a total CRC of about R0.913 billion.

Table 4.5: CRC per condition grading and per asset facility category

Asset Facility Category	Condition Grading vs CRC (R Million)					Total	% of Total CRC
	1-Very Poor	2-Poor	3-Fair	4-Good	5-Very Good		
Borehole			1.75		1.13	2.88	0.00
Buildings	138.24	774.89	938.20	703.90	154.71	2 709.93	3.03
Canals	66.22	2 843.34	8 131.94	7 673.01	205.76	18 920.27	21.12
Dams	174.56	1 051.14	10 534.68	19 650.07	109.49	31 519.95	35.19
Measuring facilities	34.66	457.98	1 614.38	686.15	66.89	2 860.05	3.19
Pipelines	75.02	965.17	4 001.50	3 562.55	5 539.22	14 143.47	15.79
Power supply	3.81	2.17	6.95	28.77	38.25	79.94	0.09
Pump stations	124.61	204.42	913.36	1 137.48	1 469.97	3 849.84	4.30

Asset Facility Category	Condition Grading vs CRC (R Million)					Total	% of Total CRC
	1-Very Poor	2-Poor	3-Fair	4-Good	5-Very Good		
Reservoirs	0.46	0.68	381.83	167.45	185.73	736.16	<i>0.82</i>
Roads	0.01	5.76	19.39	22.08	25.93	73.16	<i>0.08</i>
Telemetry		0.68	1.66		51.40	53.74	<i>0.06</i>
Tunnels			12 763.48	1 758.91	25.24	14 547.64	<i>16.24</i>
Water Treatment	0.28	21.20	27.27	21.39	7.66	77.80	<i>0.09</i>
Total	617.87	6 327.43	39 336.39	35 411.76	7 881.38	89 574.83	100.00
% of Total CRC	<i>0.69</i>	<i>7.06</i>	<i>43.91</i>	<i>39.53</i>	<i>8.80</i>	100.00	

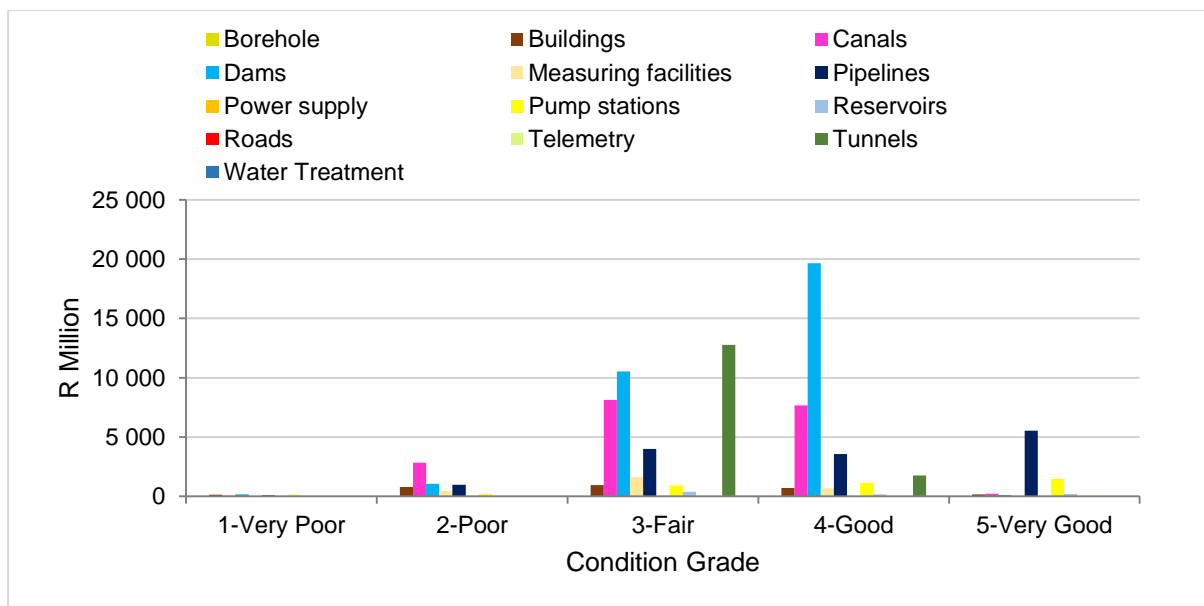


Figure 4.6: CRC per condition grading and per asset facility category

Asset RUL/EUL ratio

Table 4.6 and Figure 4.7 show the proportions of RUL/EUL ratio per asset facility category components. Appendix E, Table E.2, an expanded version of Table 4.6, shows the number of asset components in each RUL/EUL ratio range.

- About 67% of the Cluster's infrastructure asset components have RUL/EUL ratios in the 26% to 100% range. These include the two borehole and all tunnels related asset components. Also, the majority of buildings (about 58%), canals (about 71%), dams (about 73%), pipelines (about 87%), power supply (about 82%), pump stations (about 75%), reservoirs (about 94%), roads (about 78%), telemetry (about 81%), and water treatment (about 76%) related asset components fall under the same RUL/EUL ratio ranges. These asset components require appropriate maintenance to ensure they continue to meet the required service.
- On the other hand, about 33% of the Cluster's infrastructure asset components have RUL/EUL ratios of 25% and below. These include the majority of buildings (about 42%), canals (about 29%), dams (about 27%), pipelines (about 13%), power supply

(about 18%), pump stations (about 25%), reservoirs (about 6%), roads (about 22%), telemetry (about 19%), and water treatment (about 24%) related asset components. The RUL/EUL ratios of 25% and below mean that these asset components are nearing the end of their EULs; calling for asset component renewal to extend their useful lives.

Table 4.6: Asset component RUL/EUL ratio proportions per asset facility category

Asset Facility Category	RUL/EUL Ratio					Total
	0-10%	11-25%	26-45%	46-70%	71-100%	
Borehole	-	-	50.00%	-	50.00%	100.00%
Buildings	9.07%	33.16%	29.74%	24.72%	3.31%	100.00%
Canals	0.90%	28.22%	50.69%	19.85%	0.34%	100.00%
Dams	3.18%	23.75%	38.46%	32.44%	2.17%	100.00%
Measuring facilities	1.13%	66.67%	22.15%	9.13%	0.92%	100.00%
Pipelines	0.43%	12.64%	51.44%	16.95%	18.53%	100.00%
Power supply	11.88%	5.94%	20.79%	43.56%	17.82%	100.00%
Pump stations	11.34%	13.29%	36.67%	20.46%	18.25%	100.00%
Reservoirs	2.60%	3.90%	33.77%	48.05%	11.69%	100.00%
Roads	2.44%	19.51%	41.46%	19.51%	17.07%	100.00%
Telemetry	-	18.75%	12.50%	-	68.75%	100.00%
Tunnels	-	-	-	32.67%	1.98%	100.00%
Water Treatment	2.04%	22.45%	44.90%	26.53%	4.08%	100.00%
<i>All Cluster asset components</i>	<i>4.11%</i>	<i>28.64%</i>	<i>40.96%</i>	<i>21.47%</i>	<i>4.82%</i>	<i>100.00%</i>

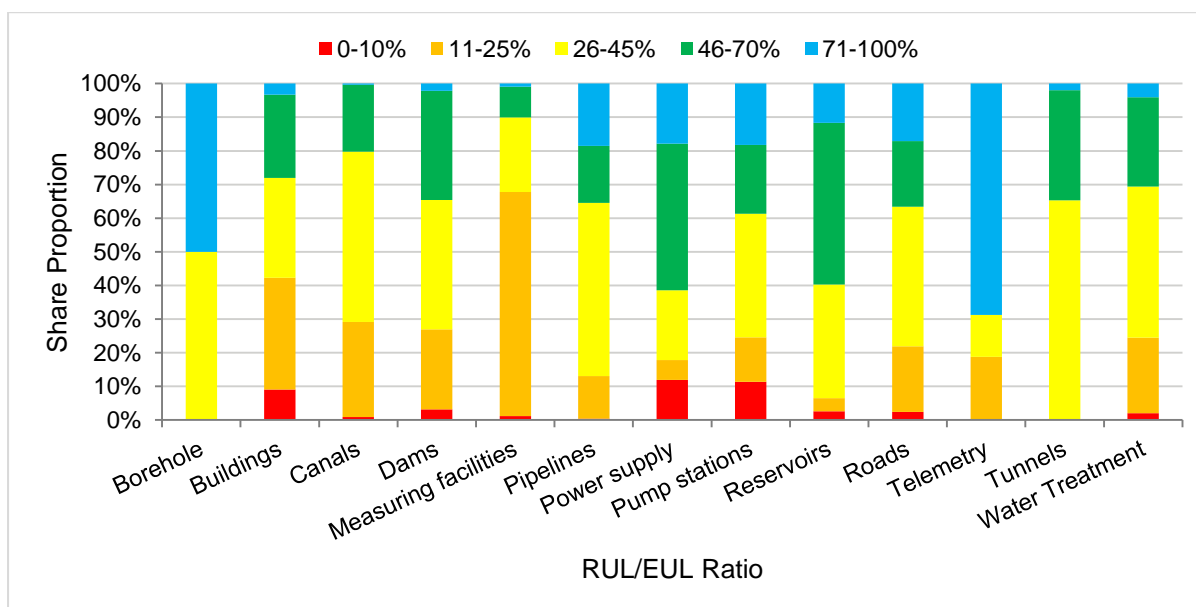


Figure 4.7: Asset component RUL/EUL ratio proportions per asset facility category

Table 4.7 and Figure 4.8 present the CRCs of the Cluster's asset components per RUL/EUL ratio range and per asset facility category. Asset components with RUL/EUL ratios in the ranges 26% to 100% (representing about 67% of all the Cluster's asset components, as shown in Table 4.6 and Figure 4.7) have a total CRC of about R82.630 billion; the main contributions

coming from:

- dams-related asset components (representing about 73% of all dams-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R30.294 billion;
- canals-related asset components (representing about 71% of all canals-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R16.011 billion;
- all tunnels-related asset components (as shown in Table 4.6 and Figure 4.7) with a total CRC of about R14.548 billion; and
- pipelines-related asset components (representing about 87% of all pipelines-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R13.103 billion.

On the other hand, asset components with RUL/EUL ratios of 25% and below (representing about 33% of all the Cluster's asset components, as shown in Table 4.6 and Figure 4.7) have a total CRC of about R6.945 billion; the main contribution coming from:

- canals-related asset components (representing about 29% of all canals-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R2.910 billion;
- dams-related asset components (representing about 27% of all dams-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R1.226 billion;
- pipelines-related asset components (representing about 13% of all pipelines-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R1.040 billion; and
- buildings-related asset components (representing about 13% of all buildings-related asset components, as shown in Table 4.6 and Figure 4.7) with a total CRC of about R0.913 billion.

Table 4.7: CRC per RUL/EUL ratio and per asset facility category

Asset Facility Category	RUL/EUL ratio vs CRC (R Million)					Total	% of Total CRC
	0-10%	11-25%	26-45%	46-70%	71-100%		
Borehole			1.75		1.13	2.88	0.00
Buildings	138.24	774.89	938.20	703.90	154.71	2 709.93	3.03
Canals	66.22	2 843.34	8 131.94	7 673.01	205.76	18 920.27	21.12
Dams	174.56	1 051.14	10 534.68	19 650.07	109.49	31 519.95	35.19
Measuring facilities	34.66	457.98	1 614.38	686.15	66.89	2 860.05	3.19
Pipelines	75.02	965.17	4 001.50	3 562.55	5 539.22	14 143.47	15.79
Power supply	3.81	2.17	6.95	28.77	38.25	79.94	0.09
Pump stations	124.61	204.42	913.36	1 137.48	1 469.97	3 849.84	4.30
Reservoirs	0.46	0.68	381.83	167.45	185.73	736.16	0.82
Roads	0.01	5.76	19.39	22.08	25.93	73.16	0.08
Telemetry		0.68	1.66		51.40	53.74	0.06
Tunnels			12 763.48	1 758.91	25.24	14 547.64	16.24
Water Treatment	0.28	21.20	27.27	21.39	7.66	77.80	0.09
Total	617.87	6 327.43	39 336.39	35 411.76	7 881.38	89 574.83	100.00
% of Total CRC	0.69%	7.06%	43.91%	39.53%	8.80%	100.00%	

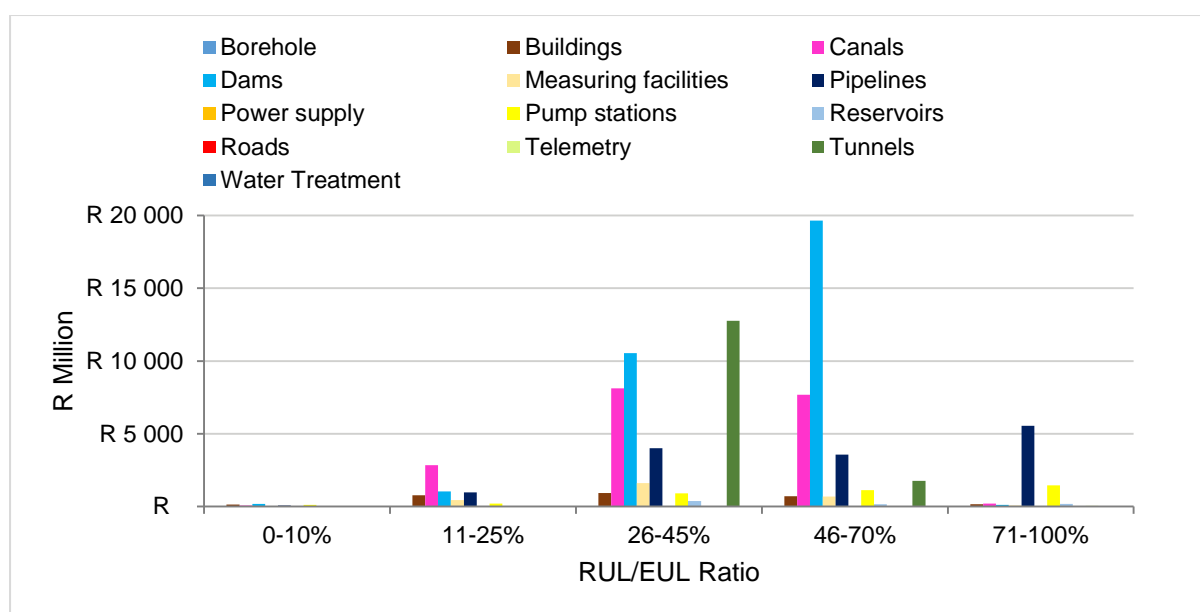


Figure 4.8: CRC per RUL/EUL ratio and per asset facility category

4.2.3 Asset Criticality

In this AMP, asset components are graded in terms of criticality according to the criteria listed in Table 4.8.

Table 4.8: Asset criticality grading criteria

Grade	Criticality Description	Consequence of Failure (Impact)	Qualitative Description
1	Very Low	Insignificant	Is readily absorbed under normal operating conditions.
2	Low	Minor	Can be managed under normal operating conditions.
3	Moderate	Moderate	Can be managed but requires additional resources and management effort.
4	High	Major	Will have a prolonged impact and extensive consequences.
5	Very High	Catastrophic	Irreversible and extensive impacts, or will significantly undermine business objectives.

Table 4.9 and Figure 4.9 show the proportions of the criticality grade per asset facility category. Appendix E, Table E.3, an expanded version of Table 4.9, shows the number of asset components in each criticality grade. For this Cluster:

- About 82% of the Cluster's asset components are in the moderate, high and very high criticality grades. These include: the two borehole related asset components; and the majority of buildings (about 66%), canals (about 98%), dams (about 79%), measuring facilities (about 65%), pipelines (about 99%), power supply (about 77%), pump stations (about 67%), reservoirs (about 73%), telemetry (about 81%), and tunnels (about 83%) related asset components. In the event of failure, these asset components will cause a moderate to catastrophic impact on the Cluster's ability to meet the required levels of service. Thus, these assets require appropriate maintenance and renewal to ensure they continue delivering the required service.
- On the other hand, about 18% of the Cluster's asset components are in the low and very low criticality grades. These include: the majority of roads (about 78%), water treatment (about 98%); and the minority of buildings (about 34%), canals (about 2%), dams (about 21%), measuring facilities (about 35%), pipelines (about 1%), power supply (about 23%), pump stations (about 33%), reservoirs (about 27%), telemetry (about 19%), and tunnels (about 17%) related asset components. In the event of failure, these asset components will cause a minor to insignificant impact on the Cluster's ability to meet the required levels of service.

Table 4.9: Asset component Criticality grading proportions per asset facility category

Asset Facility Category	Criticality Grading					Total
	1-Very Low	2-Low	3-Moderate	4-High	5-Very High	
Borehole	-	-	100.00%	-	-	100.00%
Buildings	14.95%	18.61%	51.23%	15.14%	0.08%	100.00%
Canals	0.87%	1.44%	97.10%	0.51%	0.08%	100.00%
Dams	-	21.46%	11.76%	49.50%	17.28%	100.00%
Measuring facilities	29.09%	6.16%	50.39%	14.37%	-	100.00%
Pipelines	0.14%	0.86%	43.82%	10.34%	44.83%	100.00%
Power supply	0.99%	21.78%	12.87%	47.52%	16.83%	100.00%
Pump stations	-	33.04%	14.61%	25.86%	26.48%	100.00%
Reservoirs	-	27.27%	57.14%	-	15.58%	100.00%
Roads	80.49%	9.76%	4.88%	2.44%	2.44%	100.00%
Telemetry	-	18.75%	43.75%	37.50%	-	100.00%
Tunnels	4.95%	11.88%	60.40%	5.94%	16.83%	100.00%
Water Treatment	-	97.96%	-	2.04%	-	100.00%
<i>All Scheme asset components</i>	5.73%	12.24%	59.51%	14.34%	8.19%	100.00%

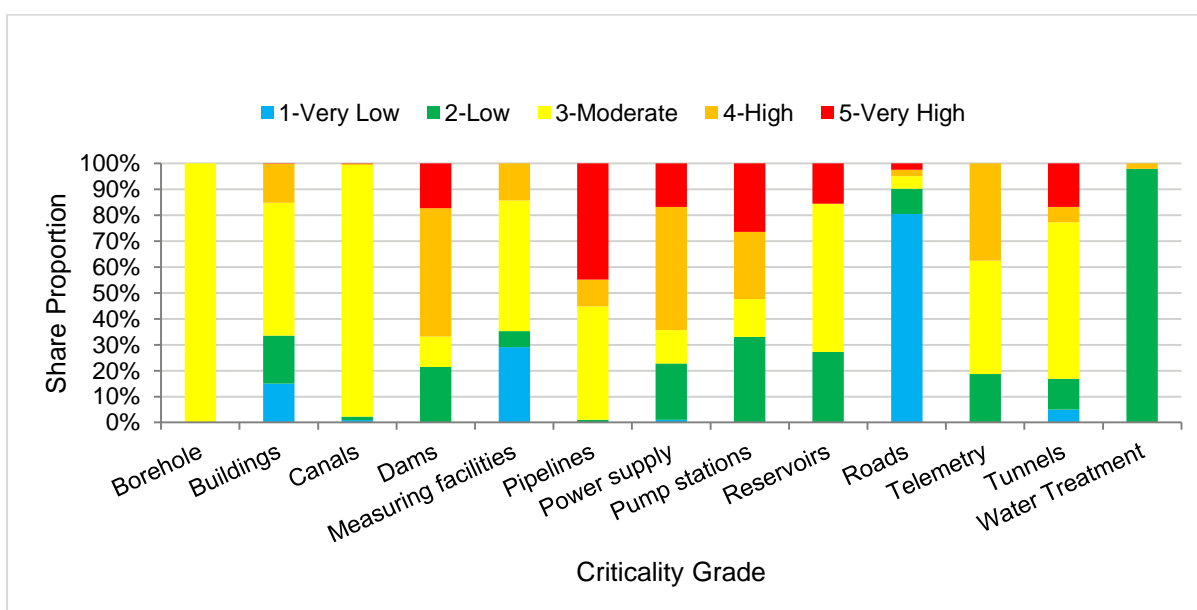


Figure 4.9: Asset component Criticality grading proportions per asset facility category

Figure 4.10 presents the overall criticality grading of the Cluster's asset components indicating that, as also shown in Table 4.9: about 82% of the Cluster's infrastructure asset components are in moderate, high and very high criticality grades; while about 18% are in the low and very low criticality grades.

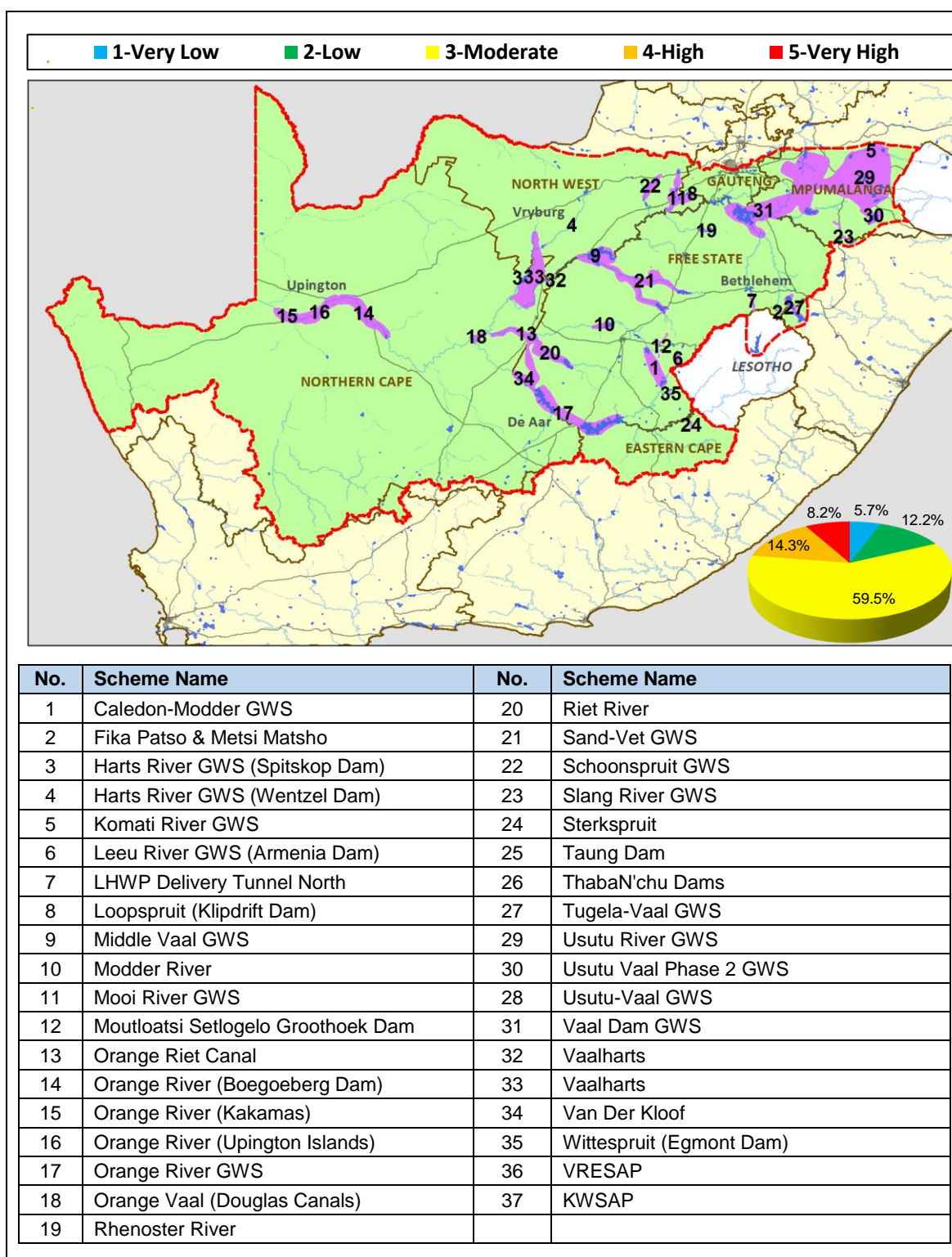


Figure 4.10: Asset criticality grading proportions for the Cluster

Table 4.10 and Figure 4.11 show the CRCs of the Cluster's asset components per criticality grading and per asset facility category. Asset components that are of moderate, high and very high criticality (representing about 82% of all the Cluster's asset components, as shown in Table 4.9 and Figures 4.9 and 4.10) have a total CRC of about R73.459 billion, with main contributions coming from:

- dams related assets (representing about 79% of all dams related asset components, as shown in Table 4.9 and Figure 4.9) with a total CRC of R19.542 billion;
- canals related assets (representing about 98% of all canals related asset components, as shown in Table 4.9 and Figure 4.9), with a total CRC of R17.888 billion;
- tunnels related assets (representing about 83% of all tunnels related asset components, as shown in Table 4.9 and Figure 4.9), with a total CRC of R14.467 billion; and
- pipelines related assets (representing about 99% of all pipelines related asset components, as shown in Table 4.9 and Figure 4.9) with a total CRC of R14.121 billion.

On the other hand, asset components that are of low and very low criticality (representing about 18% of all the Cluster's asset components, as shown in Table 4.9 and Figure 4.9) have a total CRC of about R16.116 billion, with the main contributions coming from:

- dams related asset components (representing about 21% of all dams related asset components, as shown in Table 4.9 and Figure 4.9) with a total CRC of about R11.978 billion;
- measuring facilities asset components (representing about 35% of all measuring facilities related asset components, as shown in Table 4.9 and Figure 4.9) with a total CRC of about R1.110 billion;
- canals related asset components (representing about 2% of all canals related asset components, as shown in Table 4.9 and Figure 4.9), with a total CRC of about R1.033 billion; and
- pump stations related asset components (representing about 33% of all pump stations related asset components, as shown in Table 4.9 and Figure 4.9), with a total CRC of about R894 million.

Table 4.10: CRC per Criticality grading and per asset facility category

Asset Facility Category	Criticality Grading vs CRC (R Million)					Total	% of Total CRC
	1-Very Low	2-Low	3-Moderate	4-High	5-Very High		
Borehole			2.88			2.88	0.00
Buildings	224.49	579.54	1 204.29	689.89	11.73	2 709.93	3.03
Canals	48.75	983.97	17 236.57	633.58	17.41	18 920.27	21.12
Dams		11 978.32	913.60	12 945.05	5 682.97	31 519.95	35.19
Measuring facilities	792.14	317.70	547.42	1 202.79		2 860.05	3.19
Pipelines	6.88	15.36	7 286.63	320.33	6 514.27	14 143.47	15.79
Power supply	0.38	7.20	35.09	23.58	13.69	79.94	0.09
Pump stations		893.98	741.86	1 349.54	864.45	3 849.84	4.30
Reservoirs		65.98	388.56		281.62	736.16	0.82
Roads	26.47	23.95	21.41	0.91	0.41	73.16	0.08
Telemetry		0.68	44.99	8.07		53.74	0.06

Asset Facility Category	Criticality Grading vs CRC (R Million)					Total	% of Total CRC
	1-Very Low	2-Low	3-Moderate	4-High	5-Very High		
Tunnels	15.08	65.25	5 677.83	186.91	8 602.57	14 547.64	16.24
Water Treatment		70.19		7.61		77.80	0.09
Total	1 114.19	15 002.11	34 101.12	17 368.26	21 989.14	89 574.83	100.00
% of Total CRC	1.24	16.75	38.07	19.39	24.55	100.00	

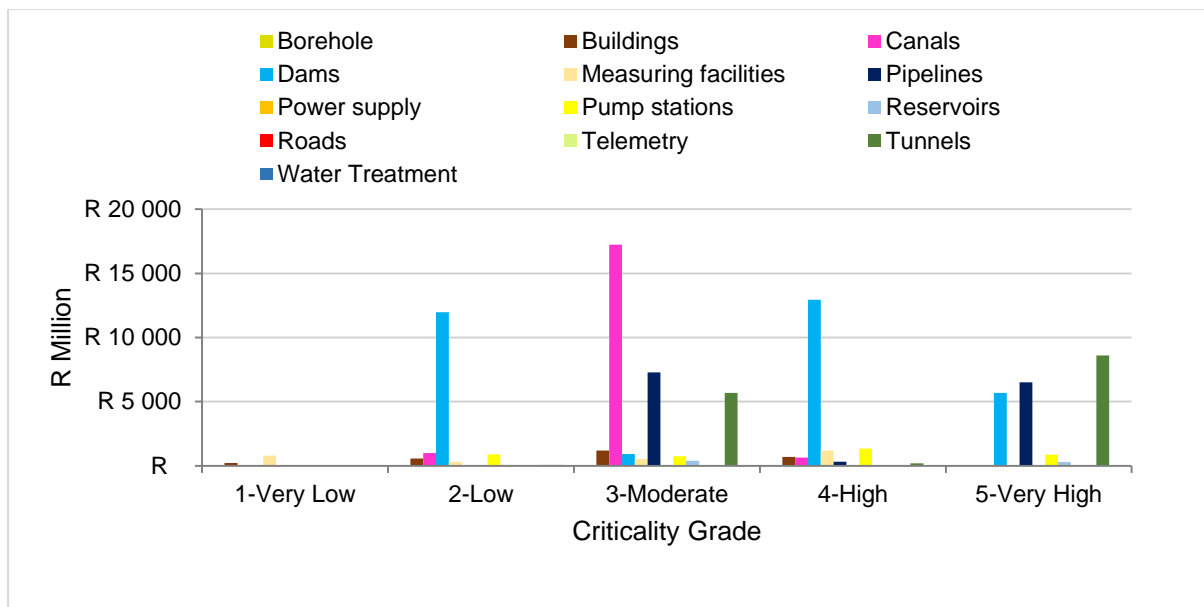


Figure 4.11: CRC per Criticality grading and per asset facility category

4.2.4 Asset Utilization

Assets are graded in terms of utilisation according to the criteria listed in Table 4.11.

Table 4.11: Asset utilisation grading criteria

Grade	Utilisation Description
0	Not in use
1	Strategic redundancy
2	Under-utilised
3	Moderate use
4	Approaching design capacity
5	Exceeding capacity/stressed

Table 4.12 and Figure 4.12 show the proportion of asset utilisation grading per asset facility category. Appendix E, Table E.4, an expanded version of Table 4.12, shows the number of asset components in each utilisation grade. For this Cluster:

- About 6% of the Cluster's asset components are under-utilised. These include:

buildings (about 5%), canals (about 9%); dams (about 5%); pipelines (about 11%), reservoirs (about 21%), roads (about 59%); telemetry (about 12.5%); and water treatment (about 16%) related asset components. The reasons for the under-utilisation need to be assessed and consideration made for decommissioning and disposal, where necessary.

- About 64% of the Cluster's asset components are 'approaching design capacity' in utilisation; which means that these asset components require continual monitoring and planning to avoid exceeding design capacity.
- About 2% of the Cluster's asset components are exceeding design capacity. These include: canals (about 2%); dams (about 5%); pump stations (about 4%); tunnels (about 2%); and water treatment related asset components. These asset components need to be upgraded to avoid stress related failures, and to ensure the Cluster meets the required level of service.

Table 4.12: Asset component Utilisation grading proportions per asset facility category

Asset Facility Category	Utilization Grading					Total
	1-Strategic redundancy	2-Under-utilised	3-Moderate use	4-Approaching design capacity	5-Exceeding capacity / stressed	
Borehole	-	-	100.00%	-	-	100.00%
Buildings	0.62%	4.75%	30.17%	64.42%	0.04%	100.00%
Canals	0.47%	9.44%	19.60%	68.66%	1.83%	100.00%
Dams	0.17%	4.79%	15.16%	74.86%	5.02%	100.00%
Measuring facilities	-	0.50%	7.57%	91.93%	-	100.00%
Pipelines	-	11.49%	43.53%	44.25%	0.72%	100.00%
Power supply	-	-	36.63%	63.37%	-	100.00%
Pump stations	4.92%	0.84%	57.22%	33.22%	3.81%	100.00%
Reservoirs	-	20.78%	11.69%	67.53%	-	100.00%
Roads	-	58.54%	29.27%	12.20%	-	100.00%
Telemetry	-	12.50%	0.00%	87.50%	-	100.00%
Tunnels	-	-	59.41%	38.61%	1.98%	100.00%
Water Treatment	-	16.33%	30.61%	44.90%	8.16%	100.00%
<i>All Scheme asset components</i>	1.03%	6.25%	26.65%	64.11%	1.97%	100.00%

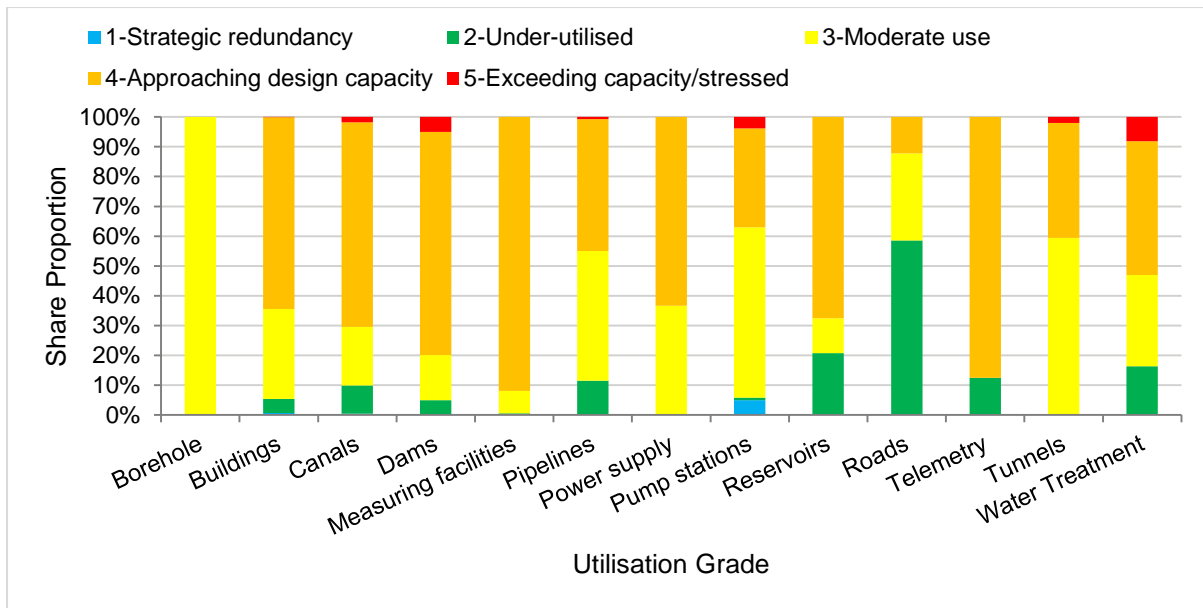


Figure 4.12: Asset component Utilisation grading proportions per asset facility category

Figure 4.10 presents the overall utilisation grading of the Cluster's asset components, in line with Table 4.9.

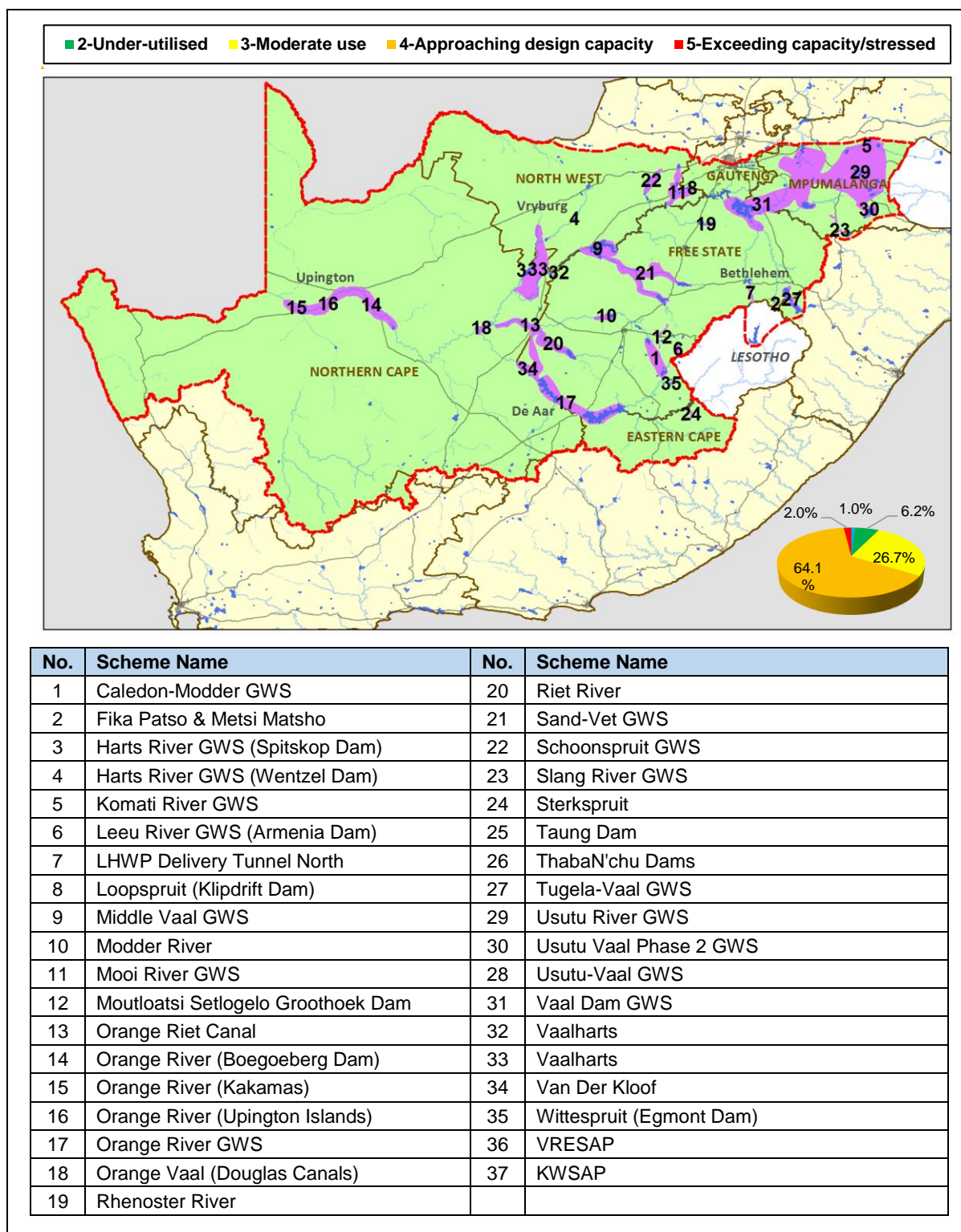


Figure 4.13: Asset utilisation grading proportions for the Cluster

Table 4.13 and Figure 4.14 show the CRCs of the Cluster's infrastructure asset components per utilisation grading and per asset facility category.

Under-utilised asset components (representing about 6% of all the Cluster's infrastructure asset components, as shown in Table 4.12 and Figure 4.12) have a total CRC of R4.115

billion, with the main contributions coming from:

- dams related asset components (representing about 5% of all dams-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R3.009 billion;
- canals related asset components (representing about 9% of all canals-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R463 million;
- reservoirs related asset components (representing 21% of all reservoirs-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R147 million; and
- buildings related asset components (representing 5% of all buildings-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R144 million.

Asset components that are stressed (exceeding design capacity on utilisation) (representing about 2% of all the Cluster's infrastructure asset components, as shown in Table 4.12 and Figure 4.12) have a total CRC of about R2.337 billion, with the main contributions coming from:

- canals related assets (representing about 2% of all canals-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R1.284 billion;
- pipelines related assets (representing about 0.72% of all pipelines-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R533 million; and
- dams related assets (representing about 5% of all dams-related asset components, as shown in Table 4.12 and Figure 4.12), with a total CRC of about R490 million.

Table 4.13: CRC per Utilization grading and per asset facility category

Asset Facility Category	Utilisation Grading vs CRC (R Million)					Total	% of Total CRC
	1-Strategic redundancy	2-Under-utilised	3-Moderate use	4-Approaching design capacity	5-Exceeding capacity / stressed		
Borehole			2.88			2.88	0.00
Buildings	24.43	144.21	981.21	1 560.05	0.03	2 709.93	3.03
Canals	14.88	462.68	7 421.49	9 737.51	1 283.71	18 920.27	21.12
Dams	0.10	3 008.94	3 970.44	24 050.19	490.27	31 519.95	35.19
Measuring facilities		51.50	575.90	2 232.66		2 860.05	3.19
Pipelines		256.73	3 515.48	9 837.78	533.48	14 143.47	15.79
Power supply			49.83	30.12		79.94	0.09
Pump stations	201.28	25.50	2 869.86	730.70	22.50	3 849.84	4.30
Reservoirs		147.06	84.62	504.47		736.16	0.82
Roads		6.48	33.46	33.22		73.16	0.08

Asset Facility Category	Utilisation Grading vs CRC (R Million)					Total	% of Total CRC
	1-Strategic redundancy	2-Under-utilised	3-Moderate use	4-Approaching design capacity	5-Exceeding capacity / stressed		
Telemetry		1.66		52.08		53.74	0.06
Tunnels			4 128.69	10 415.63	3.31	14 547.64	16.24
Water Treatment		10.68	37.18	26.39	3.55	77.80	0.09
Total	240.68	4 115.45	23 671.05	59 210.80	2 336.84	89 574.83	100.00
% of Total CRC	0.27	4.59	26.43	66.10	2.61	100.00	

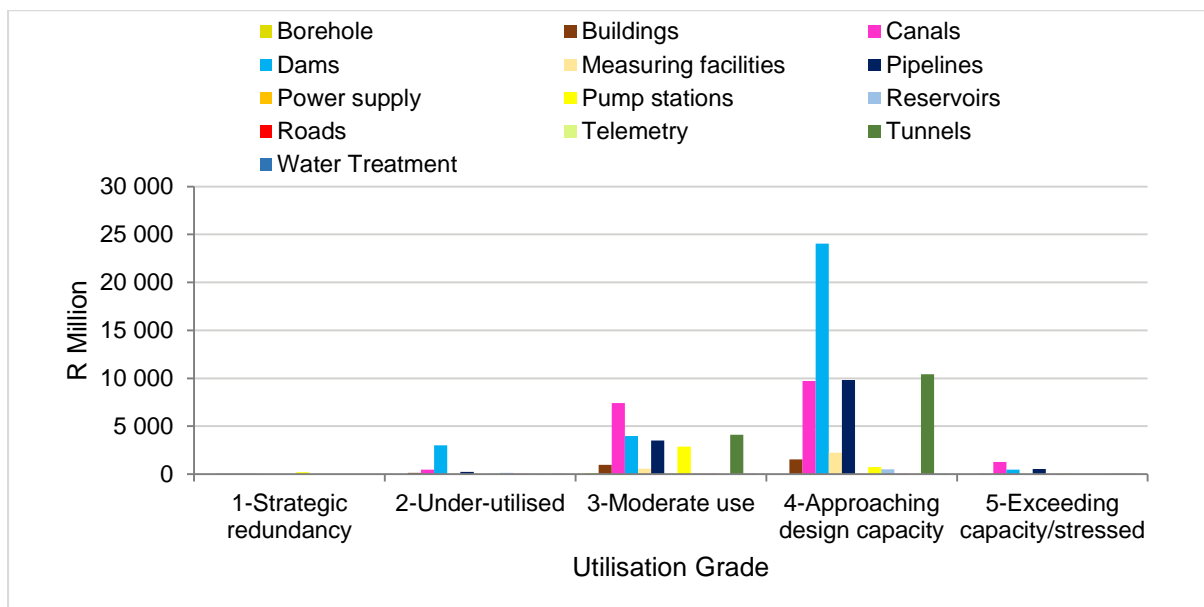


Figure 4.14: CRC per Utilization grading and per asset facility category

4.3 Risk Management

4.3.1 Risk Management Process

In this AMP, 'risk' refers to the possibility that an undesired outcome disrupts the service offered by the Cluster, resulting in the Cluster failing to meet its set levels of service. Risk management is, thus, an indispensable part of infrastructure Asset Management Planning and Implementation. Typically, the risk management process includes the following key steps:

- Identification of risk events and their impacts;
- Analysing the risks (identification of the risk drivers; determining their likelihoods; and calculating their expected losses);
- Prioritizing the risks, so that one can take appropriate action starting with the most devastating risks;
- Resolving the risks through taking some actions, e.g. avoiding, transferring or mitigating the risk; or redundancy measures; and
- Continual monitoring of risk resolution action plans, termination of successful action

plans, identification of new risks that, and initiation of new risk resolution action plans.

Risk (expected loss) is calculated by determining the product of the likelihood of the risk and the total amount of loss (impact) when the risk occurs:

$$\text{Expected Loss (Risk)} = \text{Risk Likelihood} \times \text{Total Loss (Impact)}$$

As indicated in Section 4.2.3 of this AMP, impact is related to criticality. For this Cluster, however, risk likelihood was not captured in the Asset Register (see Appendix A) used in the development of this AMP. Hence, an in-depth risk analysis could not be conducted. It is, thus, recommended that the DWS captures risk likelihood in its infrastructure asset register so that the next update of this AMP can address this short-coming.

4.3.2 The Cluster's Risks and Resolution Actions

Whilst cognisant of the presence of non-asset related risks (such as understaffing, vandalism, theft, etc.), this Cluster AMP focuses mainly on infrastructure asset-related risks. Table 4.13 shows some of the Cluster's key asset-related risks and associated risk resolution actions (aimed at reducing the risk likelihood) recommended in this AMP:

Table 4.14: The Cluster's asset risks and recommended resolution actions

No.	Asset Risk	Status for the Cluster	Recommended Risk Resolution Action
1	<i>Condition risk:</i> Failure by the asset to deliver the required service due to deteriorated physical condition.	About 33% of the Cluster's infrastructure asset components (with a total CRC of about R6.945 billion) have deteriorated to poor and very poor conditions. Refer to Section 4.2.2.	Implement renewal of the asset components to ensure they continue delivering the required service. Refer to Section 4.4.2 for the recommended renewal strategies per asset component.
		About 67% of the Cluster's infrastructure asset components (with a total CRC of about R82.630 billion) are in fair to very good conditions. Refer to Section 4.2.2.	Conduct appropriate maintenance to prevent the asset components from deteriorating to poor and very poor condition. Refer to Section 4.4.1 for the recommended maintenance strategies per asset component.
2	<i>Capacity risk:</i> Failure by the asset to deliver the required service as a result of it exceeding its design capacity/stressed.	About 2% of the Cluster's infrastructure asset components (with a total CRC of about R2.337 billion) are stressed (exceeding design capacity on utilisation). About 64% of the Cluster's infrastructure asset components (with a total CRC of about R59.211	Consider and implement appropriate upgrades and/or new capital investments to avoid stress related failures, and to ensure the Cluster meets the required levels of service. Refer to Section 4.4.3.

No.	Asset Risk	Status for the Cluster	Recommended Risk Resolution Action
		billion) are approaching design capacity in utilisation. Refer to Section 4.2.4.	
3	<i>Not in use / under-utilisation risk:</i> Misallocation of resources (e.g. financial, human resources, material, etc.).	About 6% of the Cluster's infrastructure asset components (with a total CRC of R4.115 billion) are under-utilised. Refer to Section 4.2.4.	Assess the reasons for non/under-utilisation and consider asset decommissioning and disposal of.

For generic risks typically associated with the different asset facility categories, refer to Appendix F.

4.4 Asset Life Cycle Works and Strategies

The key stages of an asset life cycle include: planning, design, procurement, construction, commissioning, operation, maintenance, renewal, upgrading and disposal. Thus, asset life cycle management involves decision making, planning and control over acquisition, operation, maintenance, renewal, upgrading, safeguarding and disposal of an asset to maximise its service delivery potential and benefits, and to minimise its related risks and costs over its entire life cycle (i.e. “cradle to the grave”).

In order for the Cluster to meet the levels of service agreed with its water users (see Section 2) and the projected future raw water demand (see Sections 3), the Cluster needs to accordingly carry out the following asset life cycle management activities and works:

- Operations and Maintenance;
- Renewals;
- Upgrades and new capital investments; and
- Disposals.

The associated expenditure requirements for each of the abovementioned activities are outlined in the Section 5 of this AMP.

Noteworthy is that the quality and usefulness of an AMP is highly dependent on the completeness and accuracy of the asset register used in the development of the AMP. Accordingly, the abovementioned asset life cycle management activities and works recommended for the Cluster in this AMP are highly dependent on the asset component condition, criticality and utilisation gradings captured in the asset register used in the

development of this AMP. As such, execution of the abovementioned asset life cycle management activities and works recommended for the Cluster (as detailed in the following subsections) need to be adapted in line with the realities on the ground. Refer to Section 6 regarding some recommendations on how to improve on the current NWRI immovable asset register.

Asset component maintenance and renewals works in this AMP have been prioritised using the criteria shown in Table 4.15. For example, renewal works priorities were set as follows: VH-NW (top priority); VH-VP; VH-P; H-NW; H-VP; H-P; M-NW; M-VP; and M-P, making sure that the asset components have not been marked for disposal.

Table 4.15: Asset criticality versus condition grading

Criticality Grade	Condition Grade					
	For Maintenance			For Renewals		
	5 Very Good (VG)	4 Good (G)	3 Fair (F)	2 Poor (P)	1 Very Poor (VP)	0 Not Working (NW)
1 Very Low (VL)	VL-VG	VL-G	VL-F	VL-P	VL-VP	VL-NW
2 Low (L)	L-VG	L-G	L-F	L-P	L-VP	L-NW
3 Moderate (M)	M-VG	M-G	M-F	M-P	M-VP	M-NW
4 High (H)	H-VG	H-G	H-F	H-P	H-VP	H-NW
5 Very High (VH)	VH-VG	VH-G	VH-F	VH-P	VH-VP	VH-NW

4.4.1 Operations and Maintenance (O&M)

Operations

Operations includes activities associated with the delivery of service (raw water supply) to the customers (water users) through the utilisation of the Cluster's immovable assets, which consume resources such as manpower, energy, chemicals and materials. Operations require two key resources: direct and indirect manpower and utilities (e.g. electricity, fuel and chemicals).

Operation of the Cluster's immovable assets needs to be done in line with the relevant O&M Manuals and Operating Rules.

Maintenance

Maintenance entails all actions necessary for retaining an asset as near as possible to its desired functional condition with normal wear and tear (achieving its expected useful life), but excluding renewal. Maintenance requires three key resources: direct and indirect labour/manpower; plant (movable assets, such as vehicles) and materials.

For those schemes that are not being operated and maintained by the DWS, it is crucial that the DWS makes regular inspections to be sure that the Scheme's assets are adequately maintained and renewed.

Asset maintenance works for Cluster's infrastructure assets are prioritized in the scheme AMPs according to asset component criticality and condition grading, as indicated in Table 4.15. The Cluster has about 67% of its infrastructure asset components in fair, good and very good conditions, as shown in Table 4.4 and Figures 4.5. These asset components require appropriate significant/improved maintenance to preventative and normal maintenance to prevent them from deteriorating to poor and very poor condition.

Figure 4.15 shows the proportions of these infrastructure asset components (in fair, good and very good conditions) per criticality-condition grading for the Cluster. Appendix E, Table E.5A shows the data table used to generate Figure 4.15.

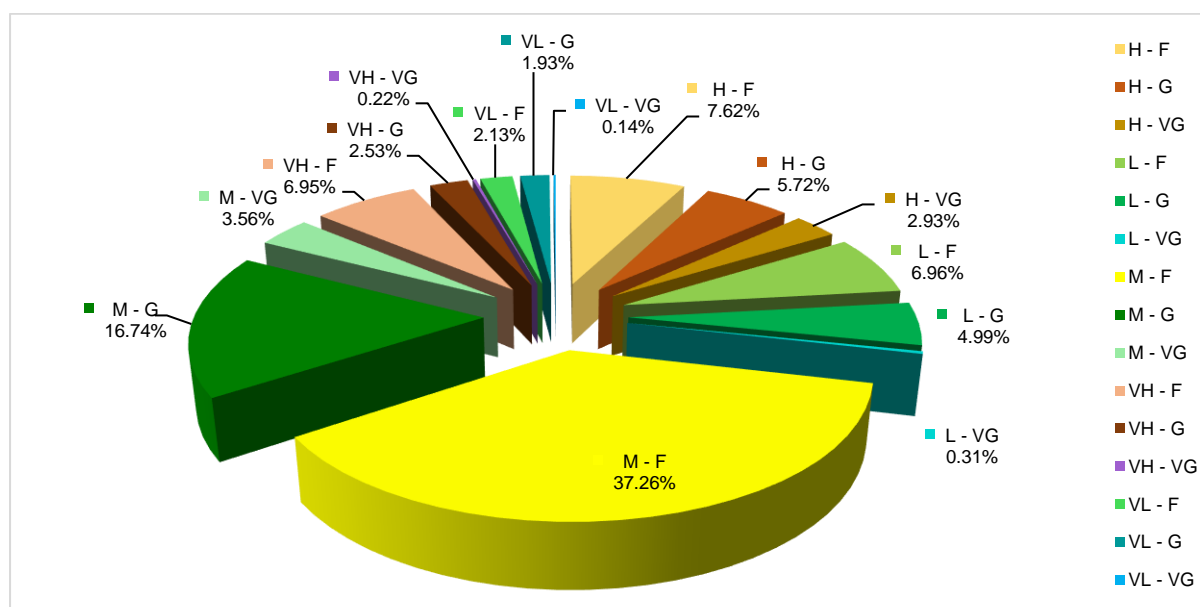


Figure 4.15: Asset component proportions per Criticality-Condition grading (maintenance)

The approximately 67% of the Cluster's infrastructure asset components (see Table 4.4 and Figures 4.5 and 4.15) that are in fair, good and very good conditions have a total CRC of about

R82.630 billion, as shown in Table 4.5 and Figure 4.16 (which shows the split of the total CRC per criticality-condition grading). Appendix E, Table E.5B shows the data table used to generate Figure 4.16.

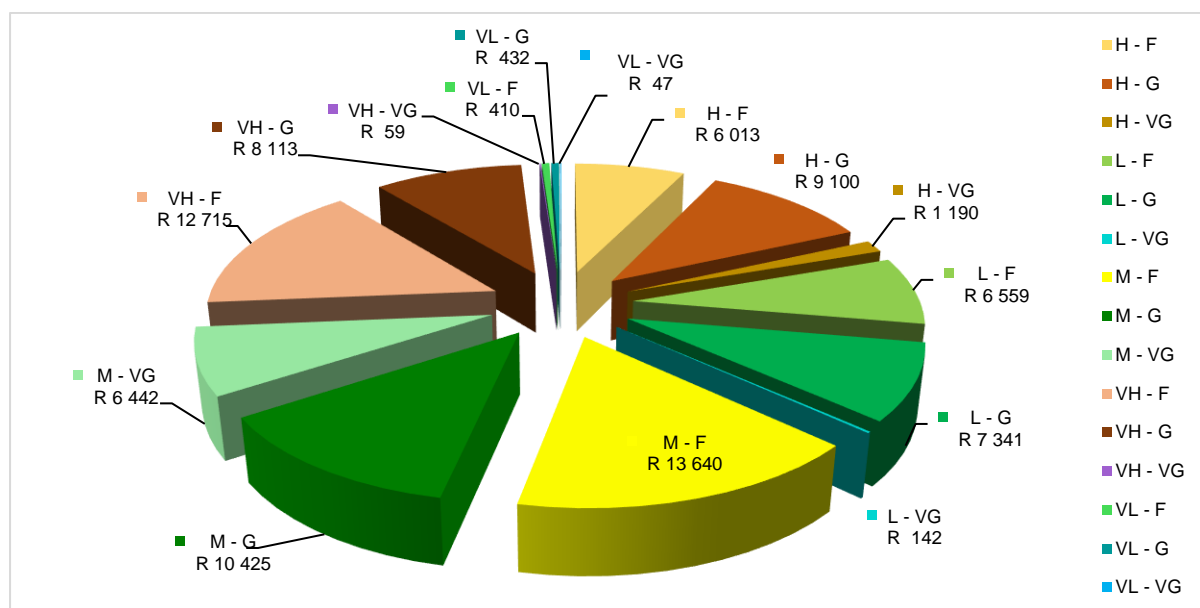


Figure 4.16: CRC (R million) per asset component criticality-condition grading (maintenance)

Appendix I, Table I.1 shows the maintenance strategies per asset component condition grading used in this AMP as well as in the individual scheme AMPs. For instance, asset components that are in very good condition require preventative and normal maintenance, whilst those that are in fair condition require significant/improved maintenance.

Table 4.16 summarises the Cluster's required maintenance works (number of infrastructure asset components per maintenance strategy and per asset facility category) for the first projected financial year.

Table 4.16: Maintenance works (asset components per maintenance strategy per asset facility category)

Asset Facility Category	Maintenance Strategy (No. of Asset Components)			Total
	Significant / improved	Target condition	Preventative and Normal	
Buildings	764	635	85	1 484
Canals	3 266	1 279	22	4 567
Dams	690	582	39	1 311
Measuring facilities	313	129	13	455
Pipelines	358	118	129	605
Power supply	21	44	18	83
Pump stations	828	462	412	1 702

Asset Facility Category	Maintenance Strategy (No. of Asset Components)			Total
	Significant / improved	Target condition	Preventative and Normal	
Reservoirs	26	37	9	72
Roads	17	8	7	32
Telemetry	2		11	13
Tunnels	66	33	2	101
Water Treatment	22	13	2	37
Total	6 373	3 340	749	10 462

Appendix I, Tables I.2 and I.3 show a split of the required maintenance works for the Cluster (shown in Table 4.16) between scheme specific and non-scheme specific asset components, respectively.

Appendix I, Table I.2 of the individual scheme AMPs present a prioritised list of all the infrastructure asset components requiring maintenance (the order of which would need to be followed when executing the works) and maintenance strategies assigned to them. The identified maintenance strategies for the Cluster's infrastructure asset components need to be implemented in line with the DWS Maintenance Policy, the DWS Maintenance Strategy, as well as the Operating and Maintenance Manual for the individual schemes.

Section 5.4.1 of this AMP shows the associated projected O&M costs for this Cluster.

4.4.2 Renewals

Asset renewals entails works to refurbish (electrical or mechanical), rehabilitate (civil) or replace an existing asset with another asset of equivalent capacity or performance capability.

The Cluster has about 33% of its infrastructure asset components in poor and very poor conditions, as shown in Table 4.4 and Figures 4.5. These asset components need to be renewed, failure of which poses a high risk to the delivery of services to its customers as well as its environment.

Figure 4.17 shows the proportions of these infrastructure asset components (in poor and very poor conditions) per criticality-condition grading for the Cluster. Appendix E, Table E.6A shows the data table used to generate Figure 4.17.

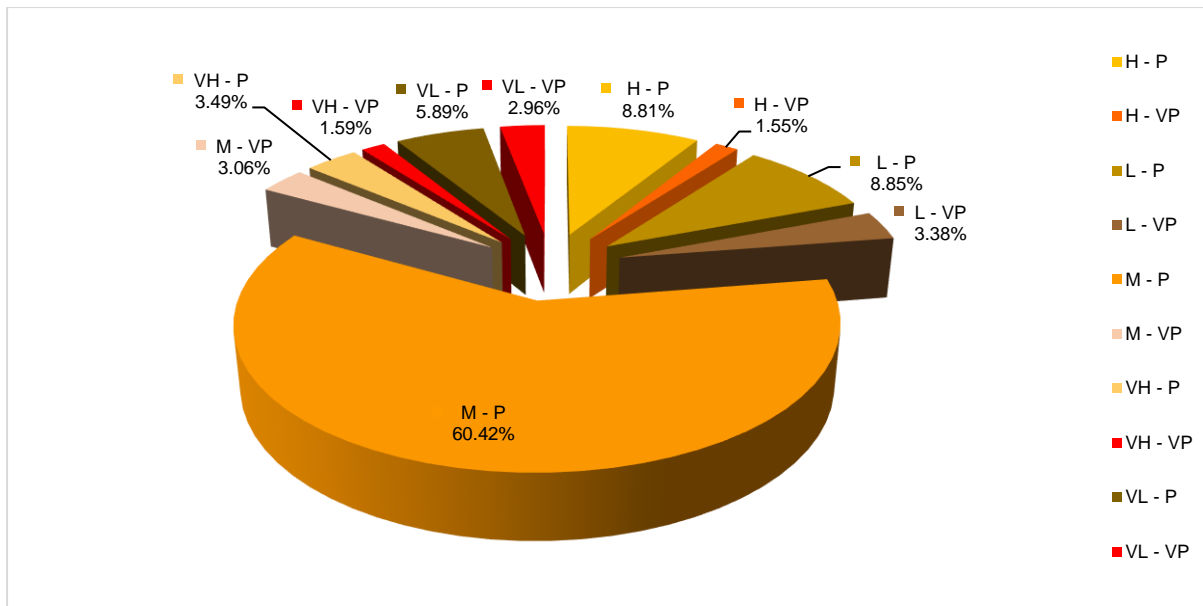


Figure 4.17: Asset component proportions per Criticality-Condition grading (renewals)

The approximately 33% of the Cluster's infrastructure asset components (see Table 4.4 and Figures 4.5 and 4.17) that are in poor and very poor conditions have a total CRC of about R6.945 billion, as shown in Table 4.5 and Figure 4.18 (which shows the split of the total CRC per criticality-condition grading). Appendix E, Table E.6B shows the data table used to generate Figure 4.18.

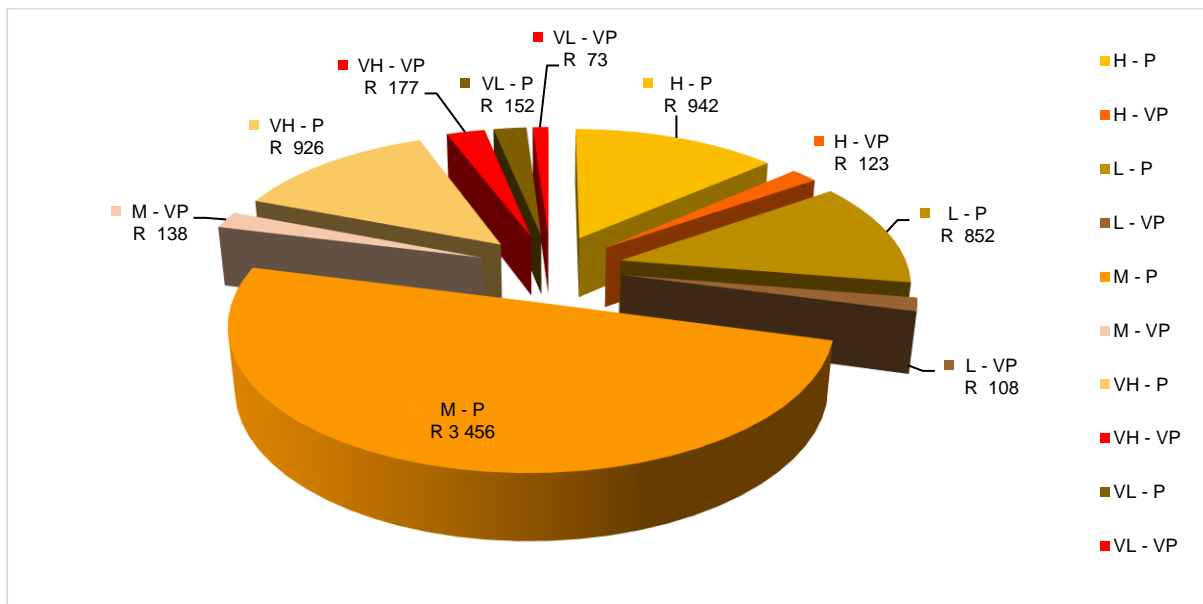


Figure 4.18: CRC (R million) per asset component criticality-condition grading (renewals)

Appendix J, Table J.1 summarises the renewal strategies per asset condition grading used in this AMP as well as in the individual scheme AMPs. Table 4.17 summarises the Cluster's required asset renewals works for the first projected financial year; it shows the number of

asset components per renewals strategy per asset facility category.

Table 4.17: Renewals works (asset components per renewals strategy per asset facility category)

Asset Facility Category	Renewal Strategy (No. of Asset Components)		Total
	Stop operating immediately and renew the asset	Significantly renew	
Buildings	181	846	1027
Canals	56	1 804	1 860
Dams	46	423	469
Measuring facilities	9	940	949
Pipelines	2	88	90
Power supply	8	6	14
Pump stations	219	292	511
Reservoirs	2	3	5
Roads	1	8	9
Telemetry	0	3	3
Water Treatment	0	10	10
Total	524	4 423	4 947

Appendix J, Tables J.2 and J.3 show the required renewals works for the Cluster for the first projected year (shown in Table 4.17) split between scheme-specific and non-scheme-specific asset components, respectively.

Appendix J, Table J.4 present a prioritised list (the order of which would need to be followed when executing the works) of all the Cluster's asset components that are in poor and very poor conditions, per scheme and per asset facility category, and the associated renewal strategies assigned to them. To be noted is that such renewal works priorities are based solely on criticality and condition grading (as indicated in the Asset Register – see Appendix A) of the asset components. Before any renewal work can commence, it is imperative that a further analysis is conducted to ascertain the feasibility of the renewal work and any impact the renewal work might have on other asset components. For example, renewal work on canal excavation is likely to affect the associated canal lining.

Table 4.18 summarises the Cluster's required asset renewals works (total number of asset components requiring renewal per asset facility category) for each of the projected ten years.

Table 4.18: Renewals works (asset components per asset facility category)

Asset Facility Category	Renewal (No. of Asset Components) per Projected Financial Year									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Boreholes	-	-	-	-	-	1	-	-	-	-
Buildings	1 027	-	1	713	14	21	-	-	-	-
Canals	1 860	-	1 008	1 118	-	251	418	83	725	12
Dams	469	-	41	227	15	308	-	-	185	72
Measuring facilities	465	36	1	-	51	236	4	32	4	1
Pipelines	90	-	88	125	50	4	83	48	1	4
Power Supply	14	-	8	8	2	-	-	8	5	-
Pump stations	511	-	251	184	269	130	37	85	112	72
Reservoirs	5	-	-	3	3	4	-	21	4	-
Roads and bridge	9	-	-	-	-	17	-	-	-	-
Telemetry	3	-	-	-	-	1	-	-	-	-
Tunnels	-	-	5	1	5	3	2	25	-	-
Water Treatment	10	-	-	-	12	9	-	-	-	-
Total	4 947	36	1 403	2 379	421	985	544	302	1 036	161

Section 5.4.2 of this AMP shows the associated projected asset renewal costs for this Cluster.

4.4.3 Upgrades and New Capital

The Cluster's future raw water demand projection as well as asset utilisation grading determine the need for either increasing or decreasing the Cluster's asset extent, functional performance or capacity (done through asset upgrades or new capital developments).

An analysis of the asset utilisation grading (obtained from the Asset Register – see Appendix A and Section 4.2.4) per asset component revealed that about 2% of the Cluster's infrastructure asset components (with a total CRC of about R2.337 billion) are stressed (exceeding design capacity on utilisation). These are mainly: canals; dams; and pump stations related asset components, as shown in Table 4.19. These asset components need to be upgraded to avoid stress related failures, and to ensure the Cluster meets the required level of service. However, before such upgrade works are executed, it is imperative that the utilisation gradings (captured in the Asset Register) of the affected asset components are first verified to confirm the necessity of the upgrades.

Table 4.19: Utilisation-based upgrade works (asset components exceeding capacity in utilisation)

Asset Facility Category	No. of Assets Exceeding capacity / stressed	CRC (Million)
Borehole	-	
Buildings	1	0.03
Canals	118	1 283.71
Dams	90	490.27
Measuring facilities	-	
Pipelines	5	533.48

Asset Facility Category	No. of Assets Exceeding capacity / stressed	CRC (Million)
Power supply	-	
Pump stations	86	22.50
Reservoirs	-	
Roads	-	
Telemetry	-	
Tunnels	2	3.31
Water Treatment	4	3.55
Total	306	2 336.84

Appendix K, Table K.2 shows a split of the required utilisation-based upgrade works for the Cluster (shown in Table 4.19) between scheme-specific and non-scheme-specific asset components.

Appendix K, Table K.3 shows a list of all the Cluster's infrastructure asset components per scheme and per asset facility category that are exceeding their design capacities (stressed), and, thus, require upgrading.

The 2016 reports on the Condition Assessment Audit for the irrigation infrastructure of 13 schemes (Leeu River (Armenia Dam), Mooi River, Orange Riet Canal, Orange River (Boegoeberg Dam), Orange River (Kakamas), Orange River (Upington Islands), Orange Vaal (Douglas Canals), Rhenoster River, Riet River, Sand-Vet, Schoonspruit, ThabaN'chu Dams, and Van Der Kloof) in the Cluster identified some canal-related upgrade works with a total acquisition cost of about R1.068 billion; these have been considered in this AMP. For a summary of the required upgrades and new capitals works for the Cluster, refer to Appendix K, Table K.4.

Section 5.4.3 of this AMP shows the associated upgrades and new capital costs for the Cluster.

4.4.4 Impairments and Disposals

Impairments

Asset impairment is the loss of future economic benefits or service potential of an asset over and above the systematic recognition of the loss of the asset's future economic benefits or service potential through depreciation. As a result, the carrying value of assets needs to be reduced where there is evidence that the value has become over-stated due to unexpected events or circumstances (depreciation caters for normal consumption of the assets, through normal wear and tear).

Impairment causes an acceleration of one or more of the following failure modes: condition, functional performance, utilisation, or obsolescence. As such, an asset may be impaired based on: condition (e.g. vandalism, theft, poor maintenance, etc.), functional performance (e.g. siltation of dams), utilisation (under-utilisation), or obsolescence (e.g. spare parts no longer available).

For the Cluster, some asset components (hydropower, dams, buildings and treatment works related asset components) were impaired as per the DWS Annual Review of Impairment and Useful Life - NWRIB Immoveable Assets 31 March 2016 report. Furthermore, the Cluster has some infrastructure asset components with zero asset carrying values (according to the Asset Register), which implies that they are either fully depreciated or fully impaired. In this AMP, these infrastructure asset components with zero asset carrying values are being treated as impairments. Altogether, Cluster's impaired asset components (mainly canals, buildings, pump stations and measuring facilities related) have a total CRC of about R563 million, and are summarised per asset facility category in Table 4.20. The DWS needs to take further steps on these asset components to determine appropriate disposal plans for them.

Table 4.20: Impaired asset components per asset facility category

Asset Facility Category	No. of impaired asset components	CRC (R million)
Buildings	81	85.04
Canals	108	69.13
Dams	22	81.67
Pipelines	3	28.12
Power Supply	11	4.59
Pump stations	59	49.78
Reservoirs	8	26.16
Water Treatment	3	1.36
Measuring facilities	44	217.04
Total	339	562.89

Appendix L, Table L.2 shows a split of the impaired asset components for the Cluster (shown in Table 4.20) between scheme-specific and non-scheme-specific asset components.

Appendix L, Table L.3 presents a list of all the Cluster's infrastructure asset components, per scheme and per asset facility category, that have zero asset carrying values, and are here considered to be impaired.

Disposals

Asset disposal entails termination of the DWS's control over the asset; and needs to be done in line with the DWS Disposal Strategy for Immovable Assets.

An analysis of the asset utilisation grading (obtained from the Asset Register – see Appendix A and Section 4.2.4) per asset component revealed that about 6% of the Cluster's infrastructure asset components (with a total CRC of about R4.115 billion) are under-utilised. These are mainly canals, buildings, dams and pipelines related asset components, as shown in Table 4.21. These asset components could be candidates for disposal. The reasons for the under-utilisation need to be assessed and consideration made for decommissioning and disposal, where necessary.

Table 4.21: Asset components that are under-utilised

Asset Facility Category	No. of Asset Components Under-Utilised	CRC (R million)
Borehole	-	
Buildings	122	144.21
Canals	608	462.68
Dams	86	3 008.94
Measuring facilities	7	51.50
Pipelines	80	256.73
Power supply	-	
Pump stations	19	25.50
Reservoirs	16	147.06
Roads and bridge	24	6.48
Telemetry	2	1.66
Tunnels	-	
Water Treatment	8	10.68
Total	972	4 115.45

Appendix L, Table L.3 shows a split of the under-utilised asset components for the Cluster (shown in Table 4.21) between scheme-specific and non-scheme-specific asset components.

Appendix L, Table L.4 presents a list of all the Cluster's asset components, per scheme and per asset facility category, that are under-utilised.

Based on previous assessments and the Asset Register (refer to Appendix A) used in the development of this AMP, the Cluster does not have any assets that are not in use and/or identified for disposal in the foreseeable future.

4.5 Summary

The Central Operations Cluster has an immovable asset base consisting of: infrastructure assets (with a total of 15 560 asset components) and land (with a total of 1 967 asset components). The majority of the Cluster's asset components are canals, buildings, pump

stations, land and dams related asset components (about 37%, 15%, 13%, 11% and 10%, respectively).

The Cluster's immovable assets have a total DRC and CRC of about R93.007 billion and about R101.698 billion, respectively. They can be grouped into two: infrastructure assets (with total DRC and CRC of about R80.884 billion and about R89.575 billion, respectively), and land (with a total of about R12.123 billion for both DRC and CRC). The DRC/CRC ratio for infrastructure assets is about 90%, indicating that about 10% of the infrastructure asset base has been consumed so far.

For infrastructure assets, dams-related asset components have the highest CRC of about R31.520 billion, followed by canals, tunnels, pipelines and pump stations related asset components with CRC of about: R18.920 billion, R14.548 billion, R14.143 billion and R3.850 billion, respectively. A similar pattern is evident for DRC.

Key asset-related risks for the Cluster include: condition risk (failure by the asset to deliver the required service due to deteriorated physical condition); capacity risk (failure by the asset to deliver the required service as a result of it exceeding its design capacity/stressed); and not in use / under-utilisation risk (resulting in misallocation of resources, e.g. financial, human resources, material, etc.). To minimise these risks, and in order for the Cluster to meet its set levels of service and the projected future raw water demand, the following asset life cycle management activities are recommended for the Cluster in this AMP: appropriate and adequate maintenance and renewals (condition risk); upgrades and new capital investments (capacity risk); and disposals (not in use / under-utilisation risk).

The Cluster has about 67% of its infrastructure asset components (with a total CRC of about R82.630 billion) in fair, good and very good conditions; and about 33% (with a total CRC of about R6.945 billion) in poor and very poor conditions. Appropriate maintenance and renewal strategies, respectively, recommended and prioritised based on criticality and condition for these asset components in the individual scheme AMPs, have been summarised per asset facility category in this AMP.

Upgrade works are recommended for the Cluster's infrastructure asset components, about 2% and with a total CRC of about R2.337 billion, which are stressed (exceeding design capacity on utilisation). These are mainly: canals; dams; and pump stations related asset components. Such upgrade works are aimed at avoiding stress related failures, and to ensure the Cluster meets the required level of service. However, before such upgrade works are

executed, it is imperative that the utilisation gradings (captured in the Asset Register) of the affected asset components are first verified to confirm the necessity of the upgrades.

Furthermore, the 2016 reports on the Condition Assessment Audit for irrigation infrastructure of 13 of the Cluster's schemes identified some canal-related upgrade works with a total acquisition cost of about R1.068 billion; these have been considered in this AMP.

The Cluster has some impaired asset components (mainly canals, buildings, pump stations and measuring facilities related) with a total CRC of about R563 million. The DWS needs to take further steps on these asset components to determine appropriate disposal plans for them.

Furthermore, about 6% of the Cluster's infrastructure asset components (with a total CRC of about R4.115 billion), mainly canals, buildings, dams and pipelines related, are under-utilised. These asset components could be candidates for disposal. The reasons for the under-utilisation need to be assessed and consideration made for decommissioning and disposal, where necessary.

Based on previous assessments and the Asset Register used in the development of this AMP, the Cluster does not have any assets that are not in use and/or identified for disposal in the foreseeable future.

Noteworthy is that the quality and usefulness of an AMP is highly dependent on the completeness and accuracy of the asset register used in the development of the AMP. Accordingly, the abovementioned asset life cycle management activities recommended for the Cluster in this AMP are highly dependent on the asset component condition, criticality and utilisation gradings captured in the asset register used in the development of this AMP. As such, execution of the abovementioned asset life cycle management activities and works recommended for the Cluster need to be adapted in line with the realities on the ground. Refer to Section 6 regarding some recommendations on how to improve on the current NWRI immovable asset register.

The next section presents a ten-year financial plan associated with the asset life cycle management activities discussed above.

5. ASSET LIFE CYCLE FINANCIAL PLAN

5.1 Overview

This section presents the Central Operations Cluster's ten-year projected optimal financial requirements that are necessary to fund the asset life cycle works identified in Section 4, and it answers the questions of 'when' and 'for how much' of those works. Asset life cycle works costs are discussed per asset facility category; a further zoom in is made on optimum revenue requirement, past and future potential renewal backlog, as well as infrastructure asset movement over the ten-year period, all in alignment to Section 4.4.

5.2 Financial Projection Assumptions

Key assumptions underpinning financial projections in this AMP are:

- Growth Factors: Expenditure and/or Revenue were grown by:
 - *Inflation rate* of 6.8% in 2016/17, 6.2% in 2017/18, 5.9% in 2018/19, and 5.6% in 2019/20 as provided for in the South African National Treasury 2016/17 MTEF Technical Guidelines on budgeting. Thereafter, a four-year moving average rate was used; and
 - A *progressive factor* averaging 0.9% in 2016/17, 1.7% in 2017/18 and 2.4% in 2018/19 as projected in the 2016/17 South African National Treasury Budget Review. Thereafter, a three-year moving average rate was used.
- Growth Factor for PPE related values.
 - Average PPI of about 7.1% was used to adjust for PPE related monetary values.
- New capital costs are a function of growth in water demand beyond the existing raw water yield of the Cluster.
- Upgrade costs are a function of either growth in water demand beyond the existing raw water yield of the Cluster or of asset utilisation, or both.
- Renewal Capital Expenditure are a function of accumulated depreciation from the last date of renewal and a price adjustment equivalent to: the engineering professional fees; construction preliminary and generals (P&Gs); construction contingency reserves as well as the projected PPI in the particular year renewal work will be carried out.
- Once renewal work is determined, there will be at least one-year provision for planning and resource mobilization.
- Straight line depreciation method was used for the projections.
- The modelled optimal O&M costs per asset facility category, in this AMP, are proportions of the CRCs derived for the year 2015/16; where the following sources formed the basis for the splitting ratios:
 - Guidelines for Infrastructure Asset Management in Local Government 2006– 2009

(Department of Provincial and Local Government, 2006).

- Maintenance Accounting Framework for immovable assets under the custodianship of National and Provincial Department of Works (Department of Public Works, 2015).
- Monitoring and Evaluation Protocol for immovable assets under the custodianship of National and Provincial Department of Works (Department of Public Works, 2015).
- Operations and maintenance costs of rural water supply schemes in South Africa (Gibson, 2010).

Owing to the base on which the costs are estimated (CRCs, which also relied on cost of acquisition in the Asset register), which on its own is an estimate, and owing to limited information on asset components to allow for market consultation, the reported figures are presumed to be on the conservative side.

5.3 Optimal Total Cost Requirement

5.3.1 Identified Optimal Total Cost Requirement

Table 5.1 presents the Cluster's modelled identified optimal total cost requirement, in light of asset life cycle works discussed in Section 4.4, per cost component (i.e., O&M (inclusive of direct and indirect labour costs); renewal works; upgrades and new capital; as well as asset disposal) for the 10-year period, where incurred. These costs are made up from scheme and non-scheme specific asset components. Non-scheme specific asset components are found under these categories: Hydrometry Free State, Hydrometry Gauteng, and Hydrometry Northern Cape.

- The Cluster's projected modelled optimal total cost requirements for the first three years (2016/17, 2017/18 and 2018/19) are about: R2.237 billion; R5.852 billion; and R2.894 billion, respectively.
- The relatively high cost in 2017/18 is attributed to high renewal, and upgrade and/or new capital cost requirements (R2.253 billion and R1.127 billion, respectively).
- Table 5.2 and Figure 5.1 show the optimal annual total cost requirement per asset facility category; where pump stations-related assets are the main cost drivers.

Table 4.22: Modelled identified optimal total cost requirement per cost component

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	2 237.230	2 373.105	2 517.815	2 662.733	2 830.399	3 001.806	3 183.462	3 375.744	3 582.037	3 799.275
Renewal	-	2 352.553	6.705	379.070	955.976	248.266	1 143.413	1 924.550	1 842.693	575.901
Upgrade & New	-	1 126.743	369.453	288.864	222.044	104.221	25.391	14.771	43.554	-
Disposal	-	-	-	-	-	-	-	-	-	-
Total	2 237.230	5 852.400	2 893.972	3 330.667	4 008.418	3 354.293	4 352.266	5 315.064	5 468.285	4 375.176

Table 4.23: Modelled identified optimal total cost requirement per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	151.756	531.642	170.789	180.858	501.506	220.820	233.242	228.984	242.977	257.713
WR: Canals	312.853	1 573.918	712.489	794.607	1 008.695	509.387	588.701	1 281.429	604.664	913.199
WR: Dams	218.424	825.714	254.872	282.873	435.340	295.090	699.234	329.579	349.719	505.062
WR: Power Supply	5.360	8.215	6.033	8.311	7.301	7.254	7.627	8.088	14.151	9.990
WR: Pump stations	1 037.900	1 242.295	1 168.069	1 346.537	1 357.422	1 558.924	1 643.930	1 593.352	1 738.527	1 802.562
WR: Reservoirs	5.889	6.806	6.628	7.009	7.455	7.907	8.387	8.886	115.862	10.007
WR: Roads and bridge	2.181	4.033	2.454	2.596	2.759	2.926	9.063	3.291	3.492	3.703
WR: Steel Pipelines	155.578	1 133.860	175.090	290.677	248.038	259.064	224.885	1 331.769	472.936	264.769
WR: Telemetry	2.945	3.488	3.315	3.506	3.726	3.952	4.385	4.444	4.716	5.002
WR: Tunnels	256.223	275.755	288.357	308.089	324.691	345.076	366.429	389.146	1 771.046	435.119
WR: Water Treatment	2.666	13.634	3.001	3.173	3.373	9.653	6.585	4.023	4.269	4.528
WS: borehole	0.201	0.214	0.227	0.240	0.255	0.270	0.866	0.304	0.322	0.342
WS: Measuring facility	85.253	232.827	102.649	102.191	107.856	133.970	558.932	131.769	145.604	163.181
Total	2 237.230	5 852.400	2 893.972	3 330.667	4 008.418	3 354.293	4 352.266	5 315.064	5 468.285	375.176⁴

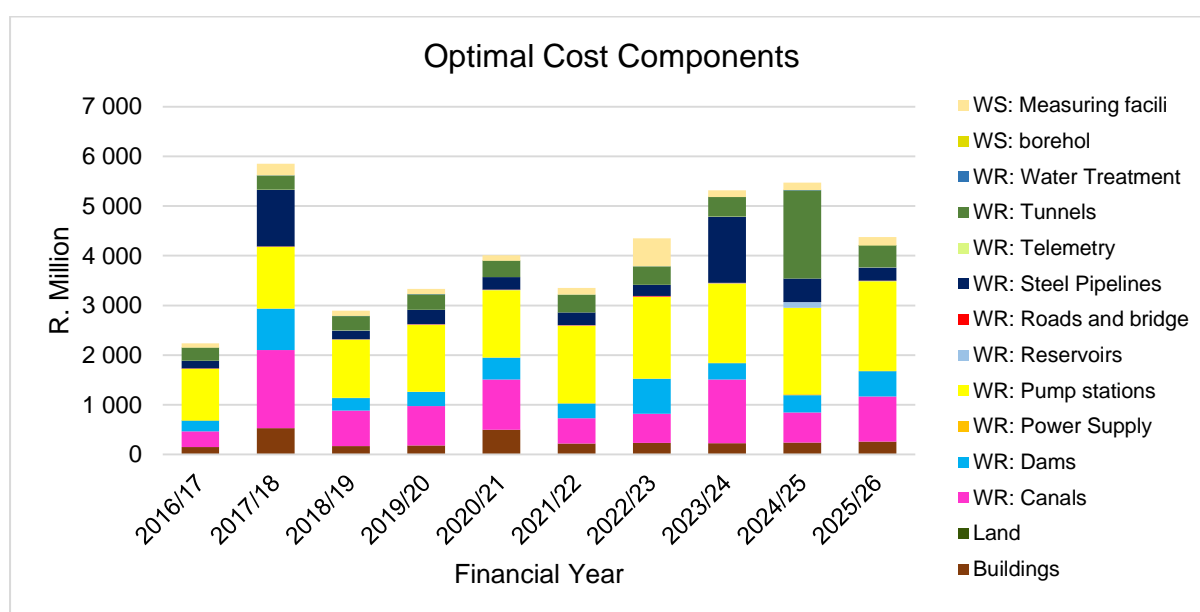


Figure 4.19: Modelled identified optimal total cost requirement per asset facility category

The spike and significant increase in the modelled identified optimal total cost requirement for the financial years 2017/18, evident in Figure 5.1, (emanating mainly from the modelled identified optimal renewal, and upgrades and/or new capital cost requirements), compounded by the current economic and financial constraints facing the country, present some implementation challenges for the Cluster's modelled identified optimal total cost requirement. As such, for practical implementation purposes, the identified optimal cost requirements for the Cluster are adjusted as indicated in the following subsection.

5.3.2 Implementation Plan for Identified Optimal Cost requirements

Table 5.3 presents the Cluster's modelled adjusted optimal total cost requirement per cost component (i.e., O&M (inclusive of direct and indirect labour costs); renewal works; upgrades and new capital; as well as asset disposal) for the projected 10-year period, where incurred.

- The Cluster's projected modelled adjusted optimal total cost requirements for the first three years (2016/17, 2017/18 and 2018/19) are about: R2.237 billion; R2.895 billion; and R3.174 billion, respectively, as presented in Table 5.3.
- Table 5.4 and Figure 5.2 show the projected modelled adjusted optimal total cost requirement per asset facility category; where dams, canals, measuring facilities, buildings and pipelines related asset components are the main cost drivers.
- The cost requirement, per cost component, and per facility category (shown in Tables 5.3 and 5.4) are separated between scheme and non-scheme specific, and are also given per scheme, as shown in Appendix H, Tables H.1 to H.5.

Table 4.24: Modelled adjusted optimal total cost requirement per cost component

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	2 237.229	2 373.105	2 517.816	2 662.734	2 830.398	3 001.805	3 183.463	3 375.744	3 582.036	3 799.276
Renewal	-	352.883	406.821	439.181	549.985	631.235	793.669	1 197.290	1 943.293	2 411.883
Upgrade & New	-	169.011	249.781	292.363	311.337	326.734	288.191	214.974	210.281	179.115
Disposal	-	-	-	-	-	-	-	-	-	-
Total	2 237.229	2 895.000	3 174.418	3 394.279	3 691.721	3 959.774	4 265.323	4 788.008	5 735.610	6 390.274

Table 4.25: Modelled adjusted optimal total cost requirement per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	151.756	216.574	234.730	240.703	291.146	322.092	326.865	313.949	321.995	322.231
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	312.853	518.164	620.406	701.780	805.605	869.876	870.574	1 002.373	1 121.326	1 281.816
WR: Dams	218.424	320.794	349.645	361.264	390.469	408.747	487.356	501.256	526.509	581.209
WR: Power Supply	5.360	6.065	6.469	7.079	7.581	8.018	8.338	8.599	10.713	12.384
WR: Pump stations	1 037.900	1 122.139	1 192.454	1 274.886	1 360.682	1 475.359	1 592.936	1 682.396	1 805.868	1 921.949
WR: Reservoirs	5.889	6.331	6.724	7.100	7.531	7.973	8.439	8.927	41.395	58.990
WR: Roads and bridge	2.181	2.571	2.751	2.875	3.003	3.140	4.466	4.956	5.333	5.415
WR: Steel Pipelines	155.578	310.352	342.214	357.945	361.987	371.650	359.758	607.446	788.205	842.600
WR: Telemetry	2.945	3.179	3.378	3.565	3.778	3.997	4.266	4.519	4.794	5.071
WR: Tunnels	256.223	272.380	289.042	306.068	325.388	345.279	366.318	388.744	820.844	1 063.292
WR: Water Treatment	2.666	4.449	4.865	4.924	4.909	6.136	6.886	6.763	6.992	6.876
WS: borehole	0.201	0.214	0.227	0.240	0.255	0.270	0.403	0.455	0.491	0.501
WS: Measuring facility	85.253	111.790	121.514	125.851	129.387	137.237	228.717	257.625	281.146	287.940
Total	2 237.229	2 895.000	3 174.418	3 394.279	3 691.721	3 959.774	4 265.323	4 788.008	5 735.610	6 390.274

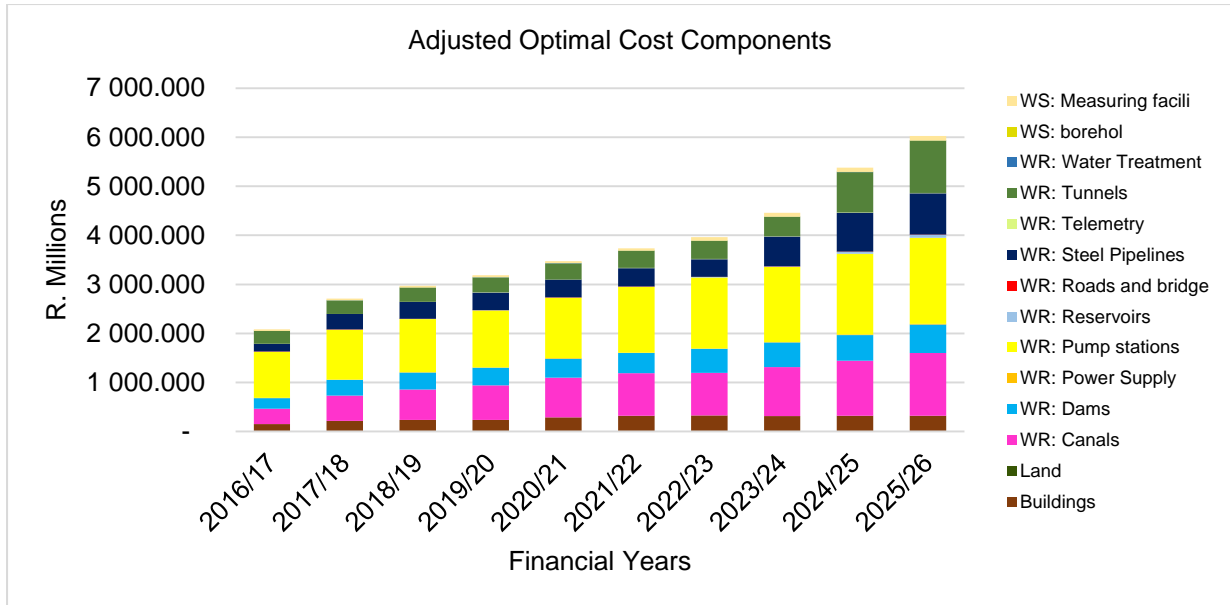


Figure 4.20: Modelled adjusted optimal total cost requirement per asset facility category

5.4 Costs Breakdown

5.4.1 Operations and Maintenance (O&M)

Optimally funding asset maintenance ensures that an asset will retain, or be restored to, a state in which it can perform its function. Table 5.3 and Figure 5.2 show the Cluster's optimal O&M cost requirements, in light of works discussed in Section 4.4.1, per asset facility category:

- The Cluster's projected optimal annual O&M cost requirement for the first three years (2016/17, 2017/18 and 2018/19) are: R2.237 billion; R2.373 billion; and R2.519 billion, respectively. Pump stations, Canals and Dams related asset components are among the major cost drivers in this Cluster.
- O&M costs were further modelled to stand separately between operations (O) and maintenance (M) costs (per asset facility category), and were further separated between scheme and non-scheme specific, and are also given per scheme, refer to Appendix I, Table I.4 to I.6.

Table 4.26: Optimal O&M cost per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	151.756	160.973	170.789	180.619	191.992	203.619	215.941	228.984	242.977	257.713
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	312.853	331.854	352.090	372.356	395.802	419.771	445.174	472.063	500.911	531.289
WR: Dams	218.424	231.690	245.818	259.966	276.336	293.071	310.806	329.579	349.719	370.929
WR: Power Supply	5.360	5.686	6.033	6.380	6.781	7.192	7.627	8.088	8.582	9.103
WR: Pump stations	1 037.900	1 100.935	1 168.069	1 235.300	1 313.084	1 392.603	1 476.878	1 566.081	1 661.785	1 762.567
WR: Reservoirs	5.889	6.247	6.628	7.009	7.451	7.902	8.380	8.886	9.429	10.001
WR: Roads and bridge	2.181	2.313	2.454	2.596	2.759	2.926	3.103	3.291	3.492	3.703

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WR: Steel Pipelines	155.578	165.027	175.090	185.168	196.827	208.747	221.380	234.751	249.097	264.204
WR: Telemetry	2.945	3.124	3.315	3.506	3.726	3.952	4.191	4.444	4.716	5.002
WR: Tunnels	256.223	271.784	288.357	304.954	324.156	343.787	364.592	386.613	410.239	435.119
WR: Water Treatment	2.666	2.828	3.001	3.173	3.373	3.577	3.794	4.023	4.269	4.528
WS: borehole	0.201	0.214	0.227	0.240	0.255	0.270	0.287	0.304	0.322	0.342
WS: Measuring facility	85.253	90.430	95.945	101.467	107.856	114.388	121.310	128.637	136.498	144.776
Total	2 237.230	2 373.105	2 517.815	2 662.733	2 830.399	3 001.806	3 183.462	3 375.744	3 582.037	3 799.275

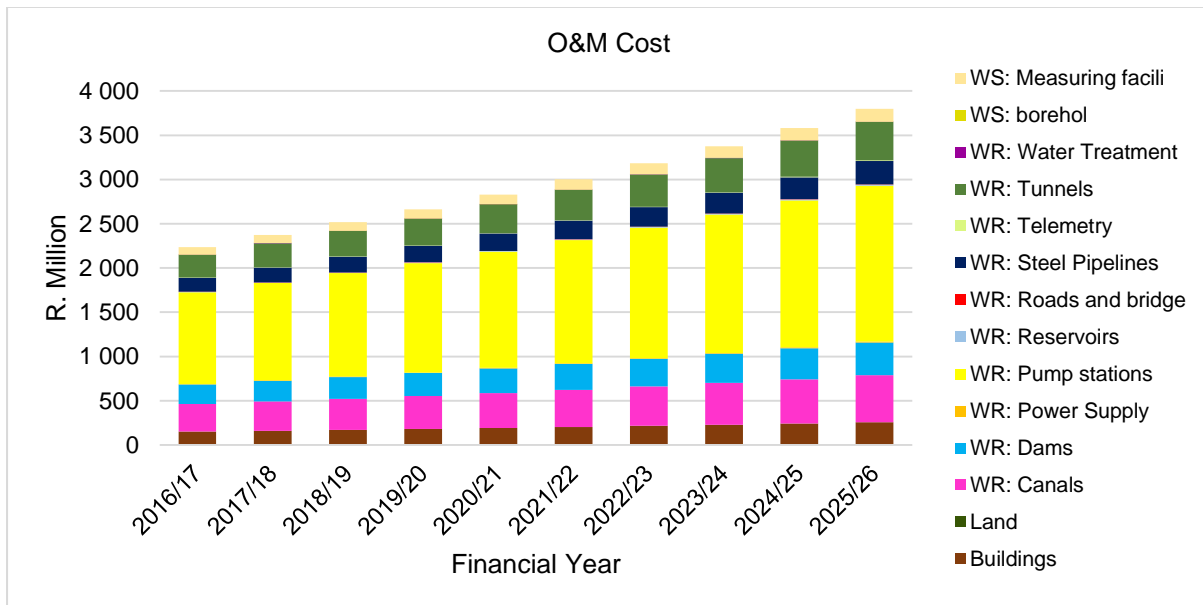


Figure 4.21: Modelled optimal O&M cost per asset facility category

5.4.2 Renewals

Renewal works on existing assets are meant to enable the Cluster to retain the service potential or the life of the asset to that which it had originally. Hence, the necessity of optimally funding such renewals, where identified.

Table 5.6 and Figure 5.4 show the Cluster's modelled optimal annual renewal cost requirements, in light of the works discussed in Section 4.4.2:

- Optimal adjusted annual renewal cost requirement for the Cluster for the first three years (2016/17, 2017/18 and 2018/19) amounts about: R0, R352.883 million and R406.821 million, respectively.
- The projected renewals cost for 2017/18 is attributed to condition backlog from the past years. It is imperative that these adjusted renewals be given high priority in the year indicated.

A provision of at least one year for planning and resources mobilization is made from the time

renewal work is identified and associated cost budgets determined to the time the renewals are done (as shown in Table 5.6 and Figure 5.4). For example, renewals for 2017/18 were actually identified in 2016/17. For the list of asset component identified for renewal and associated component renewal budgets, refer to relevant Scheme AMPs.

The cost requirement per facility category (shown in Table 5.4) are separated between scheme and non-scheme specific, and are also given per scheme, refer to Appendix J, Tables J.5 to J.7.

Table 4.27: Adjusted Optimal renewal cost per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	-	55.598	63.938	60.082	99.152	118.471	110.923	84.964	79.017	64.517
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	-	122.199	140.529	151.984	199.910	215.476	214.354	369.570	458.291	609.096
WR: Dams	-	67.042	77.098	75.841	91.667	95.929	160.716	160.967	167.496	203.169
WR: Power Supply	-	0.379	0.436	0.699	0.800	0.826	0.711	0.511	2.131	3.281
WR: Pump stations	-	19.517	22.444	37.764	45.511	80.631	112.115	112.252	139.814	155.545
WR: Reservoirs	-	0.084	0.096	0.091	0.080	0.071	0.059	0.041	31.966	48.989
WR: Roads and bridge	-	0.258	0.297	0.279	0.244	0.214	1.363	1.665	1.841	1.712
WR: Steel Pipelines	-	65.303	75.098	86.353	89.339	93.606	81.760	333.739	504.953	551.995
WR: Telemetry	-	0.055	0.063	0.059	0.052	0.045	0.075	0.075	0.078	0.069
WR: Tunnels	-	-	-	0.470	0.668	0.998	1.331	1.865	410.373	627.996
WR: Water Treatment	-	1.089	1.253	1.176	1.032	2.118	2.739	2.502	2.516	2.190
WS: borehole	-	-	-	-	-	-	0.116	0.151	0.169	0.159
WS: Measuring facility	-	21.360	25.569	24.384	21.531	22.849	107.407	128.988	144.648	143.164
Total	-	352.883	406.821	439.181	549.985	631.235	793.669	1 197.290	1 943.293	2 411.883

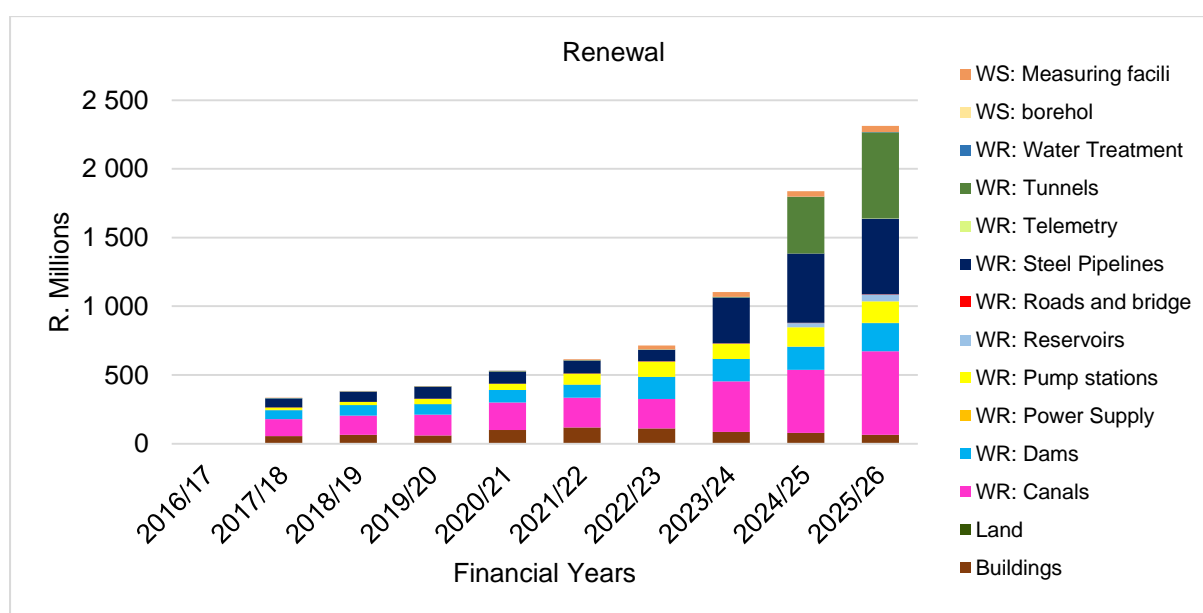


Figure 4.22: Adjusted Modelled optimal renewal cost per asset facility category

5.4.3 Upgrades and New Capital

As indicated in section 4.4.3. Table 5.5 and Figure 5.5 show the upgrade and/or new capital projects costs requirements for the Cluster.

- Optimal annual upgrades and new capital cost requirement for the Cluster for the first three years (2016/17, 2017/18 and 2018/19) are projected to be about: R0, R169.011 million and R249.781 million, respectively.
- Pipelines, canals, and dams related asset components are the main cost drivers of upgrades.

The cost requirement per facility category (shown in Table 5.5) are separated between scheme and non-scheme specific, and are also given per scheme, refer to Appendix K, Tables K.4 to K.6.

Table 4.28: Adjusted Modelled optimal upgrades and new capital cost per asset facility category

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	-	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001
WR: Canals	-	64.110	127.787	177.440	209.893	234.629	211.047	160.739	162.124	141.431
WR: Dams	-	22.062	26.729	25.457	22.466	19.747	15.833	10.710	9.294	7.111
WR: Pump stations	-	1.687	1.940	1.822	2.087	2.125	3.943	4.063	4.269	3.837
WR: Steel Pipelines	-	80.022	92.026	86.424	75.821	69.296	56.618	38.956	34.155	26.401
WR: Tunnels	-	0.596	0.685	0.643	0.564	0.494	0.395	0.267	0.231	0.177
WR: Water Treatment	-	0.532	0.612	0.574	0.504	0.441	0.353	0.238	0.207	0.158
Total	-	169.011	249.781	292.363	311.337	326.734	288.191	214.974	210.281	179.115

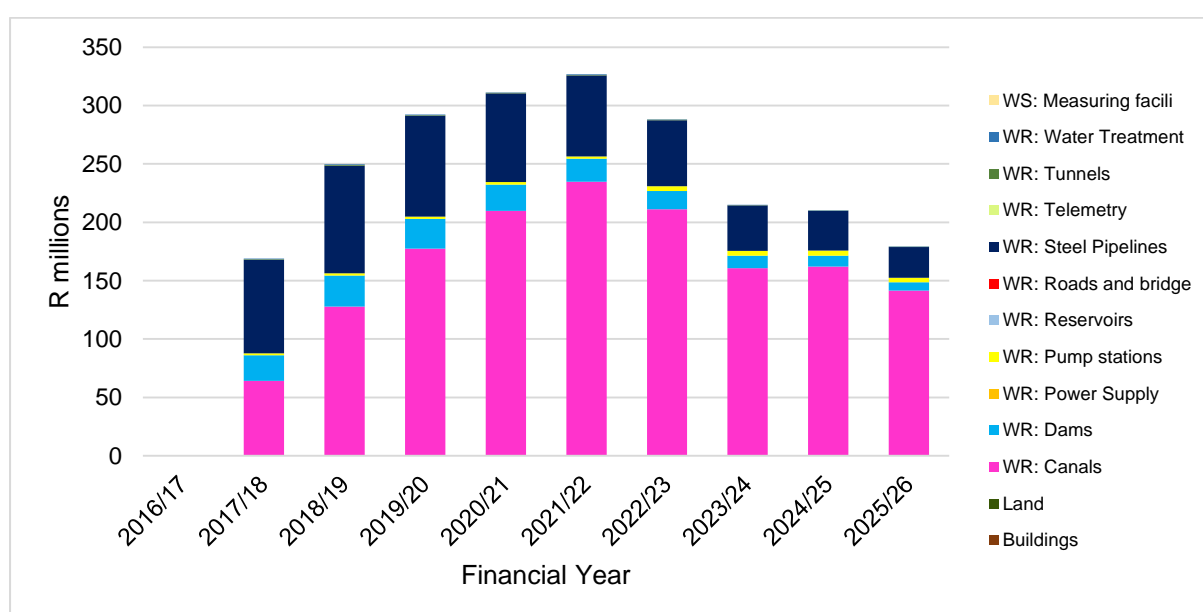


Figure 4.23: Adjusted Modelled upgrade and/or new capital cost per asset facility category

5.5 Impairments and Disposals

The Cluster does not currently have assets that are out rightly impaired, and scheduled for disposal. However, as indicated in Section 4.4.4:

- There are some assets that were classified as impaired (those with opening zero asset carrying value), with total CRC of about R586.36 million which could be candidates for disposal. For a total number of these asset components, per facility category and the respective CRCs, refer to Appendix L, Table L.2.
- There are some assets that are 'underutilised', with total CRC of about R4.115 billion which could also be candidates for disposal. For a total number of these asset components, per facility category and the respective CRCs, refer to Appendix L, Table L.3.

5.6 Backlog (Deferred Maintenance and Deferred Renewals)

'Backlog' (or Deferred Maintenance and Deferred Renewals) is "The value of maintenance and renewal work that has not been done when it should have been – in order to meet the prescribed levels of service". If maintenance and renewal work is not carried out at the optimum time in the asset lifecycle:

- the assets will deteriorate further;
- the maintenance or renewal work that will have to be done later may be more extensive and expensive (in real terms) than it would have been if it had been carried out at the optimum time;
- the asset may not be able to continue to perform to its original design capacity or performance standard, or to deliver the specified levels of service, and, if the work continues not being done, may ultimately be unable to provide the required service altogether.

Figure 5.4 depicts the projected potential renewal backlog for the Cluster. This backlog is a direct mirror image of the projected renewals because a delay or part spending of the renewal budget would lead to renewal backlog on those particular assets.

- The amount (about R2.4 billion) recorded for 2016/17 in Figure 5.4 is backlog on maintenance and/or renewals that were supposed to have been done in the previous year(s), because if maintenance and renewals were optimally done, no asset component in the current year could be in poor or very poor condition.
- It is important that this backlog be cleared as per the adjusted renewal costs

The backlog per facility category (shown in Figure 5.4) are separated between scheme and non-scheme specific, and are also given per scheme, refer to Appendix J, Tables J.4 and J.6.

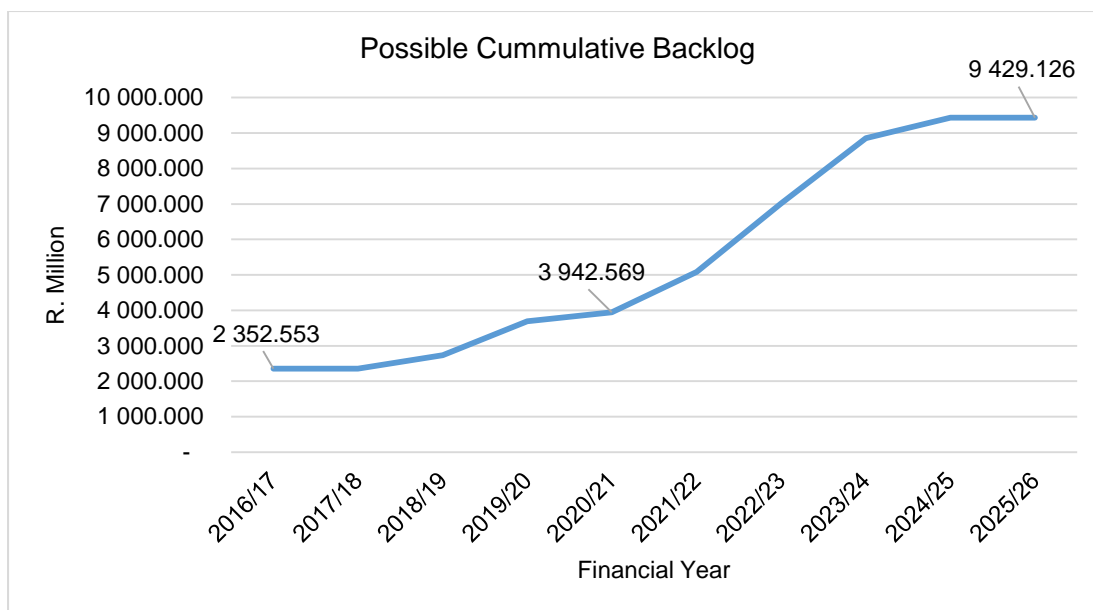


Figure 4.24: Possible cumulative backlog

5.7 Funding Requirements

Table 5.8 and Figure 5.7 present the modelled optimal revenue requirements necessary to sustain the Cluster. For the Cluster to be able to cover all its cost requirements, its revenue needs to be at least equivalent to the modelled revenue.

The Cluster's projected optimal annual revenue requirements for the first three years (2016/17, 2017/18 and 2018/19) amount to about: R2.237 billion; R2.895 billion; and R3.174 billion, respectively. Over the projected 10-year period, the revenue which needs to be generated by the Cluster to fund the required immovable asset life cycle works varies between about R2.237 billion and about R6.390 billion. In the event that such revenue cannot be generated through user charges (an indication that the Cluster is not financially self-sustainable), external funding would need to be considered. Such funding can be in the form of fiscal support, cross subsidisation or debt raised through such institutions as TCTA.

Table 4.29: Modelled optimal revenue requirement

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Modelled Ideal Revenue requirement	2 237.229	2 895.000	3 174.418	3 394.279	3 691.721	3 959.774	4 265.323	4 788.008	5 735.610	6 390.274

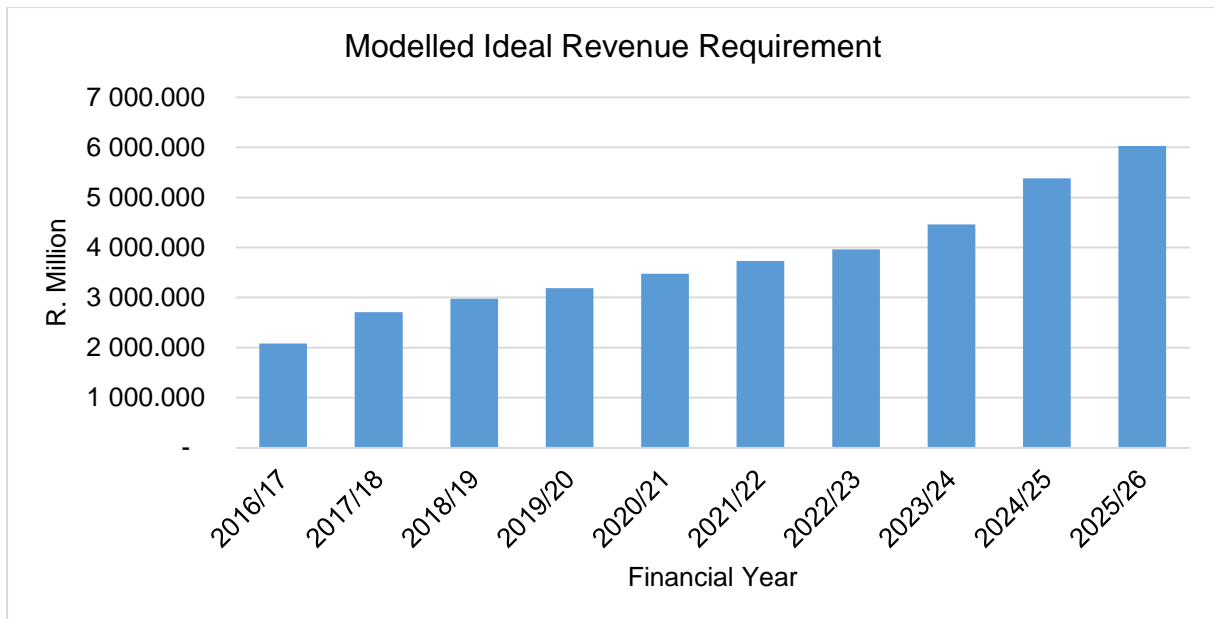


Figure 4.25: Modelled optimal revenue requirement

5.8 Infrastructure Assets Movement

Tables and Figures 5.7 to 5.9 present the Cluster's projected annual infrastructure asset movement, but excluding land. The asset carrying value for land at this Cluster is about R12.123 billion. The asset movement position per facility category (shown in Tables 5.7 to 5.9) are separated between scheme and non-scheme specific, and are also given per scheme, refer to Appendix M, Tables M.1 to M.3.

Table 4.30: Accumulated acquisition cost per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	1 022.382	1 393.051	1 393.051	1 393.290	1 702.805	1 720.006	1 737.308	1 737.308	1 737.308	1 737.308
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	6 995.805	8 237.869	8 598.267	9 020.519	9 633.412	9 723.027	9 866.554	10 675.920	10 779.673	11 161.582
WR: Dams	11 413.368	12 007.392	12 016.446	12 039.353	12 198.357	12 200.376	12 588.804	12 588.804	12 588.804	12 722.938
WR: Power Supply	34.424	36.953	36.953	38.885	39.405	39.467	39.467	39.467	45.036	45.923
WR: Pump stations	1 663.493	1 804.853	1 804.853	1 916.090	1 960.428	2 126.748	2 293.800	2 321.071	2 397.813	2 437.809
WR: Reservoirs	288.010	288.569	288.569	288.569	288.573	288.578	288.585	288.585	395.017	395.023
WR: Roads and bridge	29.251	30.971	30.971	30.971	30.971	30.971	36.931	36.931	36.931	36.931
WR: Steel Pipelines	6 364.893	7 333.726	7 333.726	7 439.235	7 490.446	7 540.762	7 544.268	8 641.286	8 865.125	8 865.690
WR: Telemetry	25.430	25.794	25.794	25.794	25.794	25.794	25.987	25.987	25.987	25.987
WR: Tunnels	5 259.628	5 263.599	5 263.599	5 266.734	5 267.268	5 268.557	5 270.395	5 272.928	6 633.734	6 633.734
WR: Water Treatment	28.129	38.935	38.935	38.935	38.935	45.010	47.801	47.801	47.801	47.801
WS: borehole	1.040	1.040	1.040	1.040	1.040	1.040	1.620	1.620	1.620	1.620
WS: Measuring facility	1 058.267	1 200.664	1 207.368	1 208.092	1 208.092	1 227.674	1 665.296	1 668.428	1 677.534	1 695.938
Total	33 161.74	36 270.37	36 646.52	37 314.22	38 182.72	38 518.00	39 669.51	41 608.83	43 495.08	44 070.98

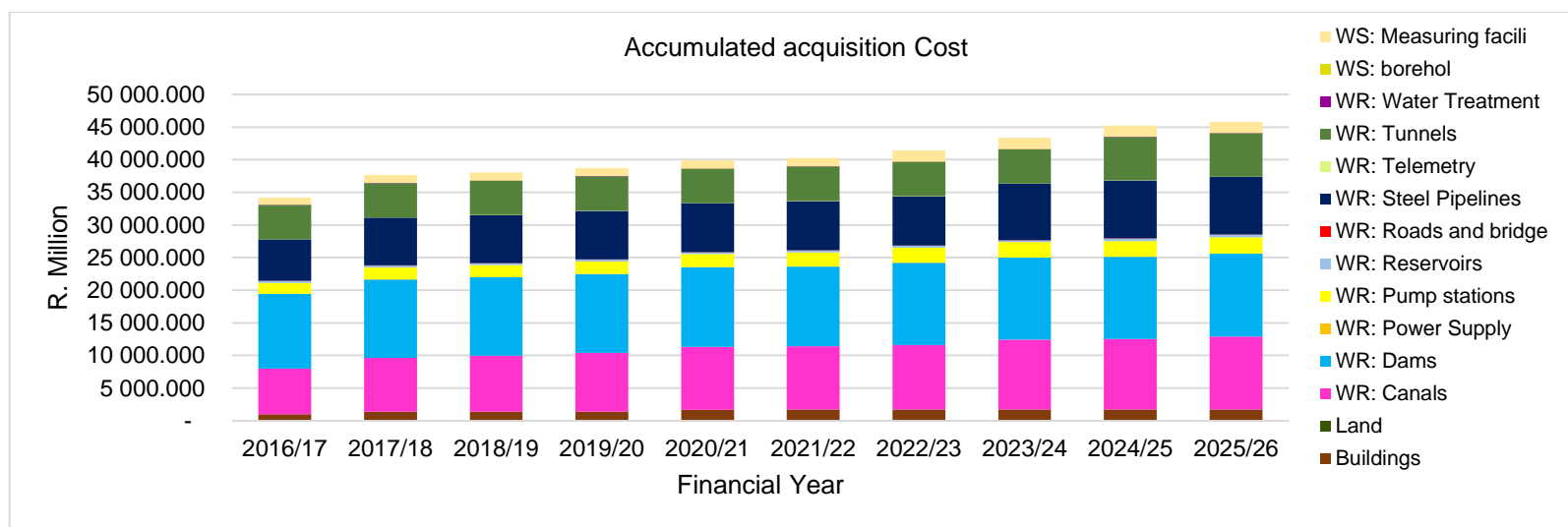


Figure 4.26: Accumulated acquisition cost per asset facility category

Table 4.31: Accumulated depreciation cost per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	541.898	591.589	634.124	676.638	729.307	783.470	837.305	891.139	944.973	998.808
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	2 446.442	2 596.335	2 718.955	2 852.889	3 011.157	3 199.283	3 391.872	3 575.590	3 759.154	3 959.813
WR: Dams	2 188.414	2 352.024	2 459.831	2 568.799	2 684.314	2 855.523	3 026.155	3 196.786	3 367.417	3 542.764
WR: Power Supply	14.182	15.372	16.611	17.934	19.244	20.461	21.678	22.896	24.370	25.864
WR: Pump stations	605.101	657.811	711.874	769.410	831.602	893.502	964.995	1 037.642	1 111.919	1 188.162
WR: Reservoirs	74.871	80.670	84.460	88.249	92.039	98.075	104.113	110.150	115.463	120.777
WR: Roads and bridge	7.885	8.682	9.298	9.913	10.529	11.363	12.140	12.917	13.694	14.471
WR: Steel Pipelines	1 589.688	1 790.489	1 946.722	2 108.266	2 271.565	2 484.206	2 696.985	2 878.129	3 070.752	3 263.407
WR: Telemetry	8.059	8.560	9.155	9.730	10.301	10.794	11.288	11.782	12.277	12.771
WR: Tunnels	1 516.238	1 614.891	1 663.665	1 712.578	1 761.571	1 866.785	1 972.004	2 077.204	2 154.938	2 232.671
WR: Water Treatment	12.358	13.421	14.262	15.103	15.944	17.055	18.149	19.243	20.337	21.430
WS: borehole	0.347	0.377	0.398	0.419	0.440	0.472	0.502	0.533	0.564	0.594
WS: Measuring facility	459.859	493.938	516.882	541.079	565.318	604.829	641.248	677.398	715.406	751.564
Total	9 465.343	10 224.159	10 786.237	11 371.008	12 003.330	12 845.820	13 698.434	14 511.410	15 311.263	16 133.096

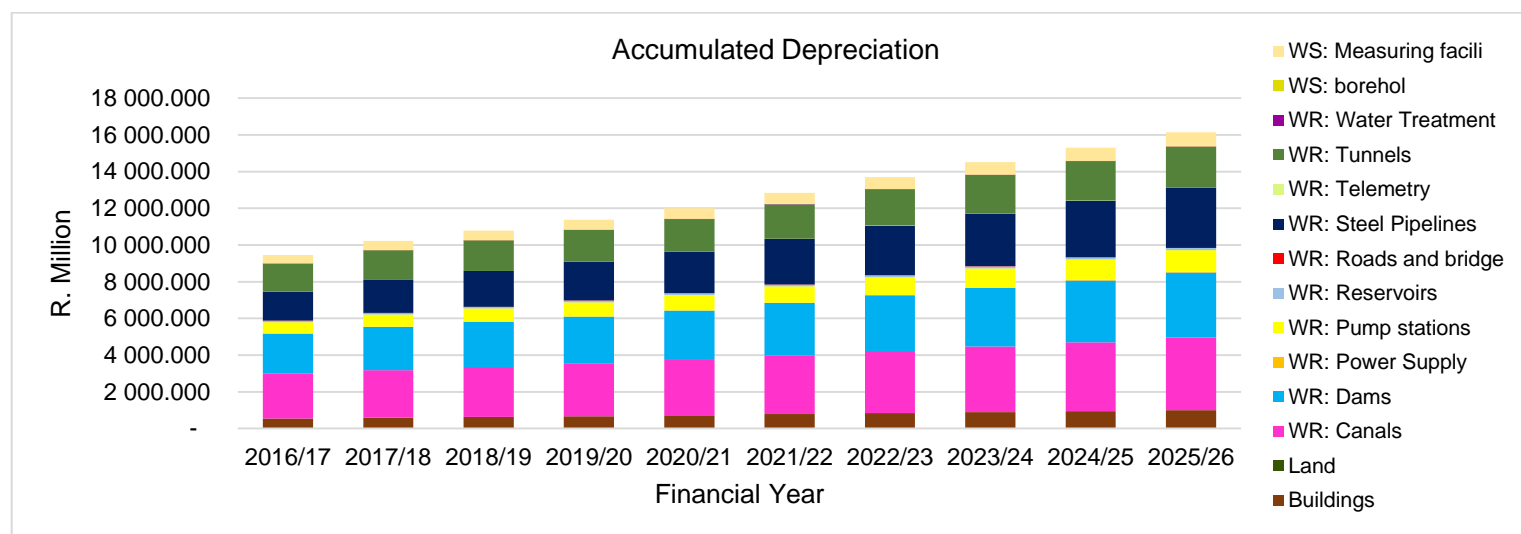


Figure 4.27: Accumulated depreciation cost per asset facility category

Table 4.32: Asset carrying value per asset facility category

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	480.484	801.455	758.927	716.653	973.498	936.536	900.003	846.169	792.334	738.500
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	4 549.428	5 641.534	5 879.313	6 167.629	6 622.254	6 523.744	6 474.682	7 100.330	7 020.519	7 201.769
WR: Dams	9 224.954	9 655.368	9 556.615	9 470.553	9 514.043	9 344.853	9 562.649	9 392.018	9 221.387	9 180.174
WR: Power Supply	20.242	21.581	20.342	20.951	20.161	19.006	17.788	16.571	20.665	20.059
WR: Pump stations	1 059.130	1 147.042	1 092.979	1 146.680	1 128.826	1 233.246	1 328.805	1 283.429	1 285.894	1 249.647
WR: Reservoirs	213.139	207.898	204.109	200.319	196.535	190.503	184.472	178.435	279.554	274.246
WR: Roads and bridge	21.366	22.289	21.673	21.058	20.442	19.608	24.791	24.014	23.237	22.460
WR: Steel Pipelines	4 775.205	5 543.237	5 387.004	5 330.969	5 218.881	5 056.556	4 847.283	5 763.156	5 794.373	5 602.283
WR: Telemetry	17.371	17.233	16.638	16.064	15.492	14.999	14.699	14.205	13.710	13.216
WR: Tunnels	3 743.389	3 648.708	3 599.934	3 554.156	3 505.697	3 401.772	3 298.391	3 195.724	4 478.797	4 401.063
WR: Water Treatment	15.771	25.514	24.673	23.832	22.991	27.955	29.652	28.559	27.465	26.371
WS: borehole	0.693	0.663	0.642	0.621	0.600	0.568	1.118	1.087	1.056	1.026
WS: Measuring facility	598.408	706.788	690.486	667.013	642.774	622.845	1 024.259	991.030	962.544	944.484
Total	24 719.580	27 439.311	27 253.335	27 336.498	27 882.194	27 392.192	27 708.592	28 834.726	29 921.536	29 675.298

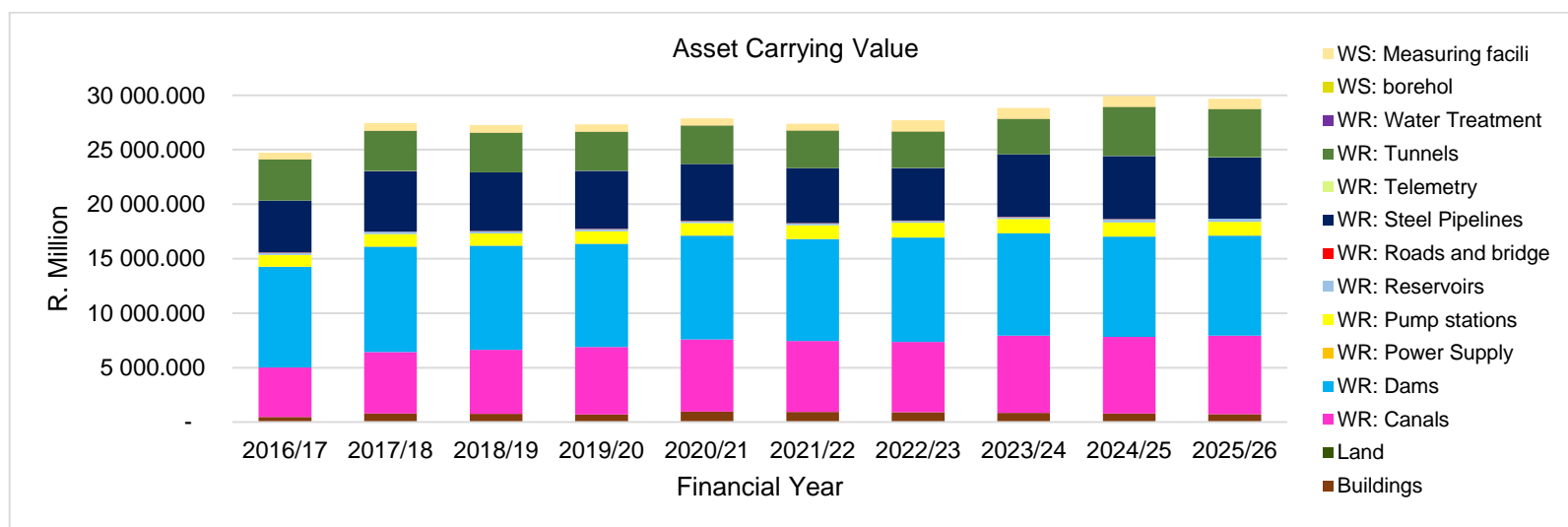


Figure 4.28: Asset carrying value per asset facility category

5.9 Summary

Modelled ten-year optimal cost requirements, per cost component (that is, O&M (inclusive of direct and indirect labour costs); renewal works; upgrades and new capital; and asset disposal) and per asset facility category, necessary to fund the asset life cycle works identified in Section 4 were presented in this section for the Cluster.

The Cluster's projected modelled optimal total cost requirements for the first three years (2016/17, 2017/18 and 2018/19) are about: R2.237 billion; R5.852 billion; and R2.894 billion, respectively. The relatively high cost in 2017/18 is attributed to high renewal, and upgrade and/or new capital cost requirements (R2.253 billion and R1.127 billion, respectively). Such spike, compounded by the current economic and financial constraints facing the country, present some implementation challenges. As such, for implementation purposes, the identified optimal cost requirements for the Cluster are adjusted as indicated below.

The Cluster's projected modelled adjusted optimal total cost requirements for the first three years (2016/17, 2017/18 and 2018/19) are about: R2.237 billion; R2.895 billion; and R3.174 billion, respectively. The projected total cost breakdown for the Cluster is as follows:

- The Cluster's projected optimal annual O&M cost requirement for the first three years (2016/17, 2017/18 and 2018/19) are: R2.237 billion; R2.373 billion; and R2.519 billion, respectively. Pump stations, Canals and Dams related asset components are among the major cost drivers in this Cluster.
- Optimal adjusted annual renewal cost requirement for the Cluster for the first three years (2016/17, 2017/18 and 2018/19) amounts about: R0, R352.883 million and R406.821 million, respectively. The projected renewals cost for 2017/18 is attributed to condition backlog from the past years.
- Optimal annual upgrades and new capital cost requirement for the Cluster for the first three years (2016/17, 2017/18 and 2018/19) are projected to be about: R0, R169.011 million and R249.781 million, respectively. Pipelines, canals and dams related asset components are the main cost drivers of upgrades.

The Cluster's projected optimal annual revenue requirements for the first three years (2016/17, 2017/18 and 2018/19) amount to about: R2.237 billion; R2.895 billion; and R3.174 billion, respectively. Over the projected 10-year period, the revenue which needs to be generated by the Cluster to fund the required immovable asset life cycle works varies between about R2.237 billion and about R6.390 billion. In the event that such revenue cannot be generated through user charges (an indication that the Cluster is not financially self-sustainable), external funding would need to be considered. Such funding can be in the form of fiscal support, cross subsidisation or debt raised through such institutions as TCTA.

6. RECOMMENDATIONS

6.1 Overview

This section provides recommendations for improvement on challenges identified throughout the preceding sections of this AMP, with a particular focus on best practices and AMP monitoring and control.

6.2 Practices Improvement

Key areas of concern, and recommended improvement actions thereof, identified in the preceding sections of this AMP are summarized in Table 6.1.

Table 6.1: Recommended areas for improvement

No.	Area for Improvement	Issue Description	Recommended Action
1	Asset Information Management		
1.1	Asset Register as the indispensable key data source for AMP development	<p>The quality and usefulness of an AMP is highly dependent on the completeness and accuracy of the asset register used in the development of the AMP.</p> <p>Accordingly, the asset life cycle management activities and works (such as maintenance, renewals, upgrades and new capital, and disposals) recommended for the Cluster in this AMP are highly dependent on the asset component condition, criticality and utilisation gradings captured in the asset register used in the development of this AMP.</p> <p>However, during the AMPs review workshops conducted during the development of this AMP, the Cluster and scheme personnel did not fully concur with some of the asset component counts, condition as well as utilisation gradings; indicating the possibility of misalignment between the asset register and the prevailing situation on the ground.</p>	<p>The NWRI needs to urgently conduct physical asset verification and assessments (extent, condition, criticality, utilisation, etc.) for all its immovable assets and develop a comprehensive asset register, inclusive of all crucial asset component details, such as asset component sizes, material of construction, condition, criticality, utilisation, etc. Thereafter, the NWRI needs to conduct similar assessments at least every five years as contemplated in Section 13 of the GIAMA.</p> <p>The abovementioned asset assessments need to be conducted by adequately experienced professionals.</p>

No.	Area for Improvement	Issue Description	Recommended Action
1.2	Current Replacement Cost (CRC)	<p>Each and every asset component in the asset register needs to have a corresponding CRC. The CRCs are useful in the determination and projection of optimal asset life cycle management works, such as O&M, renewals, upgrades and new capital, etc., in line with international best practices.</p> <p>Ideally, the CRC of an asset component needs to be determined by multiplying the unit cost rate (cost per unit size, ideally obtained from suppliers) by the size of the asset component. Thus, the asset register needs to adequately capture such details as asset component sizes, material of construction, etc.</p> <p>However, such asset component details are not fully captured in the asset register used in the development of this AMP. As a result, the CRCs presented in this AMP were determined by adjusting the provided acquisition costs with PPI and an uncertainty factor; hence the projected optimal asset life cycle management costs may be on the conservative side.</p>	<p>The above-recommended assessments for the NWRI immovable assets need to adequately capture such asset component details as sizes and material of construction. This will enable the determination of more accurate CRCs, and consequently projection of more accurate optimal asset life cycle management costs.</p>
2	Financial Management		
2.1	O&M Costs reporting	The DWS is unaware of O&M costs currently being incurred by some of the schemes being operated and maintained by other institutions, such as irrigation boards, water boards and water user associations, and no financial reports are being sent to DWS.	The DWS needs to liaise with the respective institutions and agree on frequent O&M reports, preferably on a quarterly basis.
2.2	O&M Costs splitting	O&M costs in the individual schemes are currently not being budgeted for and recorded separately per asset facility category.	<p>Budget for and record O&M costs: separately (separate operations from maintenance).</p> <p>Budget for and record O&M costs per asset facility category.</p>
3	Human Resources		
3.1	O&M Human Resources Requirements	The DWS is unaware of the optimum number of personnel required for effective operation and maintenance of some of the schemes being operated and maintained by other institutions, such as irrigation boards, water boards and water user associations, and no related reports are being sent to DWS.	The DWS needs to liaise with the respective institutions and agree on frequent O&M reports (including human resources), preferably on a quarterly basis.

No.	Area for Improvement	Issue Description	Recommended Action
4	Risk Management		
4.1	Risk Management	<p>Risk (expected loss) is calculated by determining the product of the likelihood of the risk and the total amount of loss (impact) when the risk occurs: <i>Expected Loss (Risk) = Risk Likelihood x Total Loss (Impact)</i></p> <p>For this Scheme, however, risk likelihood per asset component was not captured in the Asset Register used in the development of this AMP. Hence, an in-depth risk analysis could not be conducted.</p>	Capture risk likelihood per asset component in the infrastructure asset register, so that the next update of this AMP can incorporate an in-depth risk analysis.
5	Contracts Management		
5.1	Immovable Asset Maintenance Contract	<p>The Cluster does not have an immovable asset maintenance contract in place. The one that was there was terminated in October 2016.</p> <p>This poses a high risk of service delivery failure as a result of deteriorating asset condition.</p>	Appoint an immovable asset maintenance contractor, and work towards clearing the maintenance backlog.

6.3 Asset Management Planning, Monitoring and Evaluation

The AMP development, monitoring and evaluation recommendations are consistent with the GIAMA and DWS Asset Management Policy:

- The Director for the Cluster is the *controller* for the Cluster's infrastructure assets and is required to: "safeguard and maintain" the assets; "maintain a system of internal control" over the assets; "maintain an asset register" for the assets; and appoint an Asset Manager at the Cluster level, as contemplated in Section 5 of the DWS Asset Management Policy. It is recommended that:
 - o The Asset Manager (instead of working alone) sets up a dedicated Asset Management team (Asset Management Specialists) at the Cluster level to effectively plan, and effectively monitor the implementation of the AMPs for all the schemes in the cluster.
 - o The NWRI appoints a dedicated in charge AMPs planning, monitoring and evaluation team (at Head Office).
- The AMPs need to be updated annually to inform the budget and after budget allocations have been finalised by the National Treasury, and incorporated into the DWS Strategic Plan, as contemplated in Section 12 of the GIAMA.

6.4 Summary

In order to effectively and efficiently deliver its service (supply of raw water) to its irrigation, and domestic and industrial water users (Section 1), meeting the required levels of service (Section 2), and meeting the projected future raw water demand (Section 3), the Cluster needs to execute the recommended asset life cycle management activities (Section 4) in line with the planned budgets and timeframes (Section 5). Furthermore, a number of recommendations made for process improvement, particularly with regards to the DWS immovable asset register, Asset Management Information System, financial management (in particular the recording of O&M costs), human resources, contract management, as well as risk management, need to be implemented. Pro-activeness and forward-looking, taking care of any changes in the assumptions made in this AMP are also of vital importance.

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APPENDICES

APPENDIX A – Asset Register for the Central Operations Cluster

<Refer to soft-copy file>

APPENDIX B – Strategic Context

1. DWS's Vision, Mission, and Organisational Goals & Objectives

Figure B.1 shows the link between this AMP and the DWS's Vision.



Figure B.1: AMP Alignment with DWS's Vision, Mission, and Organisational Goals & Objectives

Vision

Equitable and sustainable water and sanitation that support socio-economic growth and development of the well-being of current and future generations.

Mission

To ensure the universal access of all South Africans to equitable water resources and sustainable water and sanitation services, by:

- Protecting, developing, conserving, managing and regulating water resources;
- Managing, regulating and providing efficient and effective water and sanitation

services;

- Providing strategic leadership and evidence based policy direction to a coordinated water and sanitation sector for improved sector performance and service delivery;
- Building the skills and capabilities of the sector and enhancing information management to inform decision making; and
- Enhancing communication and stakeholder partnerships with communities and sector constituencies to advance the national development agenda.

Values

- Promoting and maintaining high standards of professional ethics.
- Utilising resources efficiently and effectively.
- Providing services impartially, fairly, equitably and without bias.
- Responding to people's needs; citizens are encouraged to participate in policy-making.
- Rendering an accountable, transparent, and development-oriented public administration.

Organisational Goals and Objectives

- Enhanced and protected water as a resource across the value chain.
- Equitable access to reliable, sustainable and acceptable water resources and water and sanitation services.
- An enhanced contribution to socio-economic development and transformation by the sector.
- An efficient, effective and development oriented water and sanitation sector.
- Sound cooperative governance and an active and engaged citizenry.

APPENDIX C – Stakeholders

1. Key Stakeholders

The key stakeholders are listed in Table C.1.

Table C.1: Key Stakeholders

Stakeholder
The Catchment Management Agencies (CMAs)
Water Service Authorities (WSAs)
Water Service Providers (WSPs)
The customers served by assets in the Cluster: <ul style="list-style-type: none">▪ 93 water users (irrigation, and D&I water users).
Internal Stakeholders <ul style="list-style-type: none">▪ DWS Head Office;▪ The Central Cluster Office;▪ Central Cluster Area Offices;▪ Central Cluster Schemes.

APPENDIX D – Raw Water Volumes and Future Demand

Table D.1: Registered Raw Water Volumes Specific to Each Customer

No.	Question	Answer			
1	Why does this Cluster exist?	To supply domestic and industrial water and water for irrigation.			
2	How much water was registered to the customers for the past 3 financial years?	Water User Category	Cubic Metres (Million)		
			2013/14	2014/15	2015/16
		Domestic & Industrial			3 386.934
		Irrigation			2 049.158
		Total			5 436.092

Table D.2 – The Likely Future Demand for Raw Water

Water Use Category	10 year Projections (Mm ³)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
D&I	3 386.934	3 386.934	3 386.934	3 386.934	3 386.934	3 386.934	3 386.934	3 386.934	3 386.934	3 386.934
IRR	2 049.158	2 049.158	2 049.158	2 049.158	2 049.158	2 049.158	2 049.158	2 049.158	2 049.158	2 049.158
Total	5 436.092	5 436.092	5 436.092	5 436.092	5 436.092	5 436.092	5 436.092	5 436.092	5 436.092	5 436.092

Table. D.3: Sensitivity Analysis

What if Scenario demand changes by		10 year Projections (Mm ³)									
		2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
	5%	5707.897	5993.291	6292.956	6607.604	6937.984	7284.883	7649.127	8031.584	8433.163	8854.821
	3%	5599.175	5767.150	5940.165	6118.369	6301.921	6490.978	6685.707	6886.279	7092.867	7305.653
	2%	5544.814	5655.710	5768.824	5884.201	6001.885	6121.923	6244.361	6369.248	6496.633	6626.566
	Base = 0%	5436.092	5436.092	5436.092	5436.092	5436.092	5436.092	5436.092	5436.092	5436.092	5436.092
	-2%	5327.370	5220.823	5116.406	5014.078	4913.797	4815.521	4719.210	4624.826	4532.330	4441.683
	-3%	5273.009	5114.819	4961.374	4812.533	4668.157	4528.112	4392.269	4260.501	4132.686	4008.705
	-5%	5164.287	4906.073	4660.769	4427.731	4206.344	3996.027	3796.226	3606.414	3426.094	3254.789

APPENDIX E – Asset Details

Table E.1 Asset Condition - Asset component condition grading proportions per asset facility category (Cluster Level)

Asset Facility Category	Condition Grading										Total No. of Assets	Total Row N %
	1-Very Poor		2-Poor		3-Fair		4-Good		5-Very Good			
	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %		
Borehole		0.00%		0.00%	1	50.00%		0.00%	1	50.00%	2	100.00%
Buildings	233	9.07%	852	33.16%	764	29.74%	635	24.72%	85	3.31%	2569	100.00%
Canals	58	0.90%	1818	28.22%	3266	50.69%	1279	19.85%	22	0.34%	6443	100.00%
Dams	57	3.18%	426	23.75%	690	38.46%	582	32.44%	39	2.17%	1794	100.00%
Measuring facilities	16	1.13%	942	66.67%	313	22.15%	129	9.13%	13	0.92%	1413	100.00%
Pipelines	3	0.43%	88	12.64%	358	51.44%	118	16.95%	129	18.53%	696	100.00%
Power supply	12	11.88%	6	5.94%	21	20.79%	44	43.56%	18	17.82%	101	100.00%
Pump stations	256	11.34%	300	13.29%	828	36.67%	462	20.46%	412	18.25%	2258	100.00%
Reservoirs	2	2.60%	3	3.90%	26	33.77%	37	48.05%	9	11.69%	77	100.00%
Roads	1	2.44%	8	19.51%	17	41.46%	8	19.51%	7	17.07%	41	100.00%
Telemetry		0.00%	3	18.75%	2	12.50%		0.00%	11	68.75%	16	100.00%
Tunnels		0.00%		0.00%	66	65.35%	33	32.67%	2	1.98%	101	100.00%
Water Treatment	1	2.04%	11	22.45%	22	44.90%	13	26.53%	2	4.08%	49	100.00%
All Cluster asset components	639	4.11%	4457	28.64%	6374	40.96%	3340	21.47%	750	4.82%	15560	100.00%

Table E.2 Asset RUL/EUL Ratio - Proportion of RUL/EUL Ratio grading for assets per facility category (Cluster Level)

Asset Facility Category	RUL/EUL Ratio										Totals	
	0-10%		11-25%		26-45%		46-70%		71-100%		Total No. of Assets	Total Row N %
	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %		
Buildings	28	7.57%	25	6.76%	233	62.97%	81	21.89%	3	0.81%	370	100.00%
Canals	4	0.70%	17	2.97%	185	32.34%	366	63.99%		-	572	100.00%
Dams	10	1.14%	96	10.93%	294	33.49%	327	37.24%	151	17.20%	878	100.00%
Measuring facilities	3	1.39%	18	8.33%	108	50.00%	69	31.94%	18	8.33%	216	100.00%
Pipelines		-		-	15	25.00%	22	36.67%	23	38.33%	60	100.00%
Power supply		-		-	2	100.00%		-		-	2	100.00%
Pump stations	39	12.54%	41	13.18%	97	31.19%	61	19.61%	73	23.47%	311	100.00%
Reservoirs		-		-	6	85.71%		-	1	14.29%	7	100.00%
Roads		-		-	4	44.44%	1	11.11%	4	44.44%	9	100.00%
Telemetry		-		-	2	40.00%		-	3	60.00%	5	100.00%
Water Treatment		-		-	2	66.67%		-	1	33.33%	3	100.00%
All Cluster asset components	84	3.45%	197	8.10%	948	38.96%	926	38.10%	277	11.39%	2433	100.00%

Table E.3: Asset Criticality - Proportion of Asset Criticality grading for assets per facility category (Cluster Level)

Asset Facility Category	Criticality Grading										Total No. of Assets	Total Row N %
	1-Very Low		2-Low		3-Moderate		4-High		5-Very High			
	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %		
Borehole		0.00%		0.00%	2	100.00%		0.00%		0.00%	2	100.00%
Buildings	384	14.95%	478	18.61%	1316	51.23%	389	15.14%	2	0.08%	2569	100.00%
Canals	56	0.87%	93	1.44%	6256	97.10%	33	0.51%	5	0.08%	6443	100.00%
Dams		0.00%	385	21.46%	211	11.76%	888	49.50%	310	17.28%	1794	100.00%
Measuring facilities	411	29.09%	87	6.16%	712	50.39%	203	14.37%		0.00%	1413	100.00%
Pipelines	1	0.14%	6	0.86%	305	43.82%	72	10.34%	312	44.83%	696	100.00%
Power supply	1	0.99%	22	21.78%	13	12.87%	48	47.52%	17	16.83%	101	100.00%
Pump stations		0.00%	746	33.04%	330	14.61%	584	25.86%	598	26.48%	2258	100.00%
Reservoirs		0.00%	21	27.27%	44	57.14%		0.00%	12	15.58%	77	100.00%
Roads	33	80.49%	4	9.76%	2	4.88%	1	2.44%	1	2.44%	41	100.00%

Asset Facility Category	Criticality Grading										Total No. of Assets	Total Row N %
	1-Very Low		2-Low		3-Moderate		4-High		5-Very High			
	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %		
Telemetry		0.00%	3	18.75%	7	43.75%	6	37.50%		0.00%	16	100.00%
Tunnels	5	4.95%	12	11.88%	61	60.40%	6	5.94%	17	16.83%	101	100.00%
Water Treatment		0.00%	48	97.96%		0.00%	1	2.04%		0.00%	49	100.00%
All Cluster asset components	891	5.73%	1905	12.24%	9259	59.51%	2231	14.34%	1274	8.19%	15560	100.00%

Table E.4: Asset Utilisation - Proportion of Asset Utilisation grading for assets per asset facility category (Cluster Level)

Asset Facility Category	Utilisation Grading										Total No. of Assets	Total Row N %
	1-Strategic redundancy		2-Under-utilised		3-Moderate use		4-Approaching design capacity		5-Exceeding capacity/stressed			
	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %	No. of Assets	Row N %		
Borehole		0.00%		0.00%	2	100.00%		0.00%		0.00%	2	100.00%
Buildings	16	0.62%	122	4.75%	775	30.17%	1655	64.42%	1	0.04%	2569	100.00%
Canals	30	0.47%	608	9.44%	1263	19.60%	4424	68.66%	118	1.83%	6443	100.00%
Dams	3	0.17%	86	4.79%	272	15.16%	1343	74.86%	90	5.02%	1794	100.00%
Measuring facilities		0.00%	7	0.50%	107	7.57%	1299	91.93%		0.00%	1413	100.00%
Pipelines		0.00%	80	11.49%	303	43.53%	308	44.25%	5	0.72%	696	100.00%
Power supply		0.00%		0.00%	37	36.63%	64	63.37%		0.00%	101	100.00%
Pump stations	111	4.92%	19	0.84%	1292	57.22%	750	33.22%	86	3.81%	2258	100.00%
Reservoirs		0.00%	16	20.78%	9	11.69%	52	67.53%		0.00%	77	100.00%
Roads		0.00%	24	58.54%	12	29.27%	5	12.20%		0.00%	41	100.00%
Telemetry		0.00%	2	12.50%		0.00%	14	87.50%		0.00%	16	100.00%
Tunnels		0.00%		0.00%	60	59.41%	39	38.61%	2	1.98%	101	100.00%
Water Treatment		0.00%	8	16.33%	15	30.61%	22	44.90%	4	8.16%	49	100.00%
All Cluster asset components	160	1.03%	972	6.25%	4147	26.65%	9975	64.11%	306	1.97%	15560	100.00%

Table E.5A: Asset component proportions per Criticality - Condition grading and per asset facility category (Maintenance)

Asset Facility Category	Criticality-Condition Grading (Proportion, %)															Total
	H - F	H - G	H - VG	L - F	L - G	L - VG	M - F	M - G	M - VG	VH - F	VH - G	VH - VG	VL - F	VL - G	VL - VG	
Borehole	-	-	-	-	-	-	50.00%	-	50.00%	-	-	-	-	-	-	100.00%
Buildings	9.37%	5.05%	2.70%	11.93%	9.43%	0.27%	24.19%	20.28%	2.49%	-	0.07%	0.07%	6.00%	7.95%	0.20%	100.00%
Canals	0.44%	0.02%	0.22%	0.92%	0.61%	0.11%	69.41%	27.15%	0.02%	0.02%	-	0.09%	0.72%	0.22%	0.04%	100.00%
Dams	23.04%	19.76%	0.69%	9.99%	10.60%	0.53%	5.64%	7.70%	0.38%	13.96%	6.33%	1.37%	-	-	-	100.00%
Measuring facilities	38.68%	5.05%	0.44%	8.57%	7.47%	0.66%	4.18%	1.10%	-	-	-	-	17.36%	14.73%	1.76%	100.00%
Pipelines	2.98%	8.60%	0.33%	0.50%	0.50%	-	25.62%	2.64%	20.99%	29.92%	7.77%	-	0.17%	-	-	100.00%
Power supply	1.20%	38.55%	6.02%	13.25%	4.82%	-	-	-	15.66%	9.64%	9.64%	-	1.20%	-	-	100.00%
Pump stations	7.93%	9.22%	13.63%	17.39%	8.34%	0.29%	3.82%	2.64%	10.28%	19.51%	6.93%	-	-	-	-	100.00%
Reservoirs	-	-	-	9.72%	12.50%	-	19.44%	29.17%	12.50%	6.94%	9.72%	-	-	-	-	100.00%
Roads	-	-	3.13%	-	-	12.50%	3.13%	3.13%	-	3.13%	-	-	46.88%	21.88%	6.25%	100.00%
Telemetry	-	-	46.15%	-	-	-	15.38%	0.00%	38.46%	-	-	-	-	-	-	100.00%
Tunnels	5.94%	-	-	-	9.90%	1.98%	38.61%	21.78%	-	15.84%	0.99%	-	4.95%	-	-	100.00%
Water Treatment	-	-	-	59.46%	35.14%	5.41%	-	-	-	-	-	-	-	-	-	100.00%
<i>All Scheme asset components</i>	7.62%	5.72%	2.93%	6.96%	4.99%	0.31%	37.26%	16.74%	3.56%	6.95%	2.53%	0.22%	2.13%	1.93%	0.14%	100.00%

Table E.5B: CRC per asset Criticality - Condition grading and per asset facility category (Maintenance)

Asset Facility Category	Criticality-Condition Grading (CRC, R Million)															Total	% of Total CRC
	H - F	H - G	H - VG	L - F	L - G	L - VG	M - F	M - G	M - VG	VH - F	VH - G	VH - VG	VL - F	VL - G	VL - VG		
Borehole							1.75		1.13							2.88	0.00
Buildings	283.68	111.16	76.64	254.11	193.17	1.17	352.46	300.93	67.64		4.89	6.84	47.95	93.75	2.42	1,796.80	2.17
Canals	503.83	3.46	113.55	419.91	205.74	75.87	7,169.21	7,462.24	0.34	1.50		15.91	37.49	1.56	0.10	16,010.71	19.38
Dams	3,872.00	8,257.80	44.13	5,303.29	6,351.48	0.84	308.12	553.97	28.19	1,051.26	4,486.83	36.33				30,294.24	36.66
Measuring facilities	989.88	183.08	18.67	179.51	90.33	4.42	155.52	82.59					289.47	330.15	43.80	2,367.42	2.87
Pipelines	44.35	275.51	0.46	0.23	15.12		1,549.70	57.23	5,538.76	2,400.33	3,214.68		6.88			13,103.28	15.86
Power supply	0.36	16.96	3.16	3.10	1.99				35.09	3.11	9.81		0.38			73.97	0.09
Pump stations	131.96	252.21	924.70	365.56	363.33	3.12	18.64	148.42	542.15	397.20	373.52					3,520.81	4.26

Asset Facility Category	Criticality-Condition Grading (CRC, R Million)															Total	% of Total CRC
	H - F	H - G	H - VG	L - F	L - G	L - VG	M - F	M - G	M - VG	VH - F	VH - G	VH - VG	VL - F	VL - G	VL - VG		
Reservoirs				6.20	58.64		114.74	88.09	185.73	260.90	20.72					735.02	0.89
Roads			0.91			23.95	6.13	15.28		0.41			12.84	6.80	1.07	67.40	0.08
Telemetry			8.07				1.66		43.33							53.06	0.06
Tunnels	186.91				40.00	25.24	3,961.59	1,716.23		8,599.90	2.68		15.08			14,547.64	17.61
Water Treatment				27.27	21.39	7.66										56.33	0.07
Total	6,012.96	9,100.19	1,190.29	6,559.19	7,341.20	142.27	13,639.52	10,424.98	6,442.36	12,714.61	8,113.14	59.08	410.10	432.26	47.38	82,629.53	100.00
% of Total CRC	7.28	11.01	1.44	7.94	8.88	0.17	16.51	12.62	7.80	15.39	9.82	0.07	0.50	0.52	0.06	100.00	

Table E.6A: Asset component proportions per Criticality - Condition grading and per asset facility category (Renewals)

Asset Facility Category	Criticality-Condition Grading (Proportion, %)										Total
	H - P	H - VP	L - P	L - VP	M - P	M - VP	VH - P	VH - VP	VL - P	VL - VP	
Buildings	11.71%	0.74%	12.63%	1.84%	51.89%	5.16%	-	-	2.30%	13.73%	100.00%
Canals	0.11%	-	0.96%	-	95.26%	3.09%	-	-	0.59%	-	100.00%
Dams	58.80%	7.04%	19.88%	2.48%	4.35%	2.07%	5.18%	0.21%	-	-	100.00%
Measuring facilities	0.21%	-	0.31%	0.84%	71.09%	0.73%	-	-	26.72%	0.10%	100.00%
Pipelines	-	-	-	-	7.69%	-	89.01%	3.30%	-	-	100.00%
Power supply	11.11%	44.44%	16.67%	22.22%	-	-	5.56%	-	-	-	100.00%
Pump stations	5.58%	5.22%	32.01%	22.48%	3.60%	4.50%	12.77%	13.85%	-	-	100.00%
Reservoirs	-	-	60.00%	40.00%	-	-	-	-	-	-	100.00%
Roads	-	-	-	-	-	-	-	-	88.89%	11.11%	100.00%
Telemetry	-	-	100.00%	-	-	-	-	-	-	-	100.00%
Water Treatment	8.33%	-	83.33%	8.33%	-	-	-	-	-	-	100.00%
<i>All Scheme asset components</i>	<i>8.81%</i>	<i>1.55%</i>	<i>8.85%</i>	<i>3.38%</i>	<i>60.42%</i>	<i>3.06%</i>	<i>3.49%</i>	<i>1.59%</i>	<i>5.89%</i>	<i>2.96%</i>	<i>100.00%</i>

Table E.6B: CRC per asset Criticality - Condition grading and per asset facility category (Renewals)

Asset Facility Category	Criticality-Condition Grading (CRC, R Million)										Total	% of Total CRC
	H - P	H - VP	L - P	L - VP	M - P	M - VP	VH - P	VH - VP	VL - P	VL - VP		
Buildings	207.96	10.45	118.37	12.72	440.44	42.82			8.12	72.25	913.13	13.15%
Canals	12.74		282.45		2,538.56	66.22			9.59		2,909.56	41.89%
Dams	678.33	92.80	309.69	13.02	14.09	9.23	49.04	59.51			1,225.71	17.65%
Measuring facilities	11.16		10.76	32.68	307.66	1.65			128.39	0.33	492.64	7.09%
Pipelines					140.94		824.23	75.02			1,040.19	14.98%
Power supply	0.71	2.38	0.68	1.43			0.77				5.98	0.09%
Pump stations	23.37	17.30	114.68	47.30	14.69	17.97	51.69	42.04			329.03	4.74%
Reservoirs			0.68	0.46							1.14	0.02%
Roads									5.76	0.01	5.76	0.08%
Telemetry			0.68								0.68	0.01%
Water Treatment	7.61		13.59	0.28							21.48	0.31%
Total	941.88	122.93	851.58	107.89	3,456.37	137.89	925.73	176.58	151.87	72.58	6,945.30	100.00%
<i>% of Total CRC</i>	13.56%	1.77%	12.26%	1.55%	49.77%	1.99%	13.33%	2.54%	2.19%	1.05%	100.00%	

APPENDIX F – Risk Management

Table F.1 shows generic risks typically associated with the different asset facility categories.

Table F.1: Generic risks per asset facility category

Asset Facility Category	Generic Risks
Water Sources (i.e. Dams, Ground Water, etc.)	<ul style="list-style-type: none">▪ Structural failure of embankment, valve tower and cut-off wall▪ Failure of control valves, pipework and power supply▪ Contamination of ground water sources▪ Land instability▪ Electrical systems within the dam (control system)
Raw Water Conveyance (Canals, tunnels, pipelines)	<ul style="list-style-type: none">▪ Structural failure of aqueducts, canals, tunnels, portals and raw water mains▪ Land instability
Water Pump Stations	<ul style="list-style-type: none">▪ Structural failure and land instability▪ Failure of pumps, valves, pipework, power supply, motors, drives and controls
Water Reservoirs	<ul style="list-style-type: none">▪ Structural failure and land instability▪ Failure of pumps, valves, pipework, power supply, motors, drives and controls▪ Structural failure of walls due to design and construction deficiencies.▪ Leaks and excessive overflow.
Telemetry and SCADA	<ul style="list-style-type: none">▪ Signals from all types valves, computer systems programming▪ Ventilation on control room

APPENDIX G – (Blank)

APPENDIX H – Optimal total cost requirement

Table H.1A: Identified optimal total cost requirement per cost component (scheme-specific)

Cost Component	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	2 081.01	2 207.40	2 342.00	2 476.80	2 632.76	2 792.20	2 961.17	3 140.03	3 331.91	3 533.98
Renewal	-	2 214.72	5.107	379.07	955.976	247.408	816.277	1 924.03	1 838.87	575.901
Upgrade & New	-	1 126.74	369.453	288.864	222.044	104.221	25.391	14.771	43.554	-
Disposal	-	-	-	-	-	-	-	-	-	-
Total	2 081.01	5 548.86	2 716.56	3 144.74	3 810.78	3 143.83	3 802.84	5 078.83	5 214.33	4 109.88

Table H.1B: Adjusted optimal total cost requirement per cost component (scheme-specific)

Cost Component	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	2 081.011	2 207.397	2 342.003	2 476.802	2 632.760	2 792.198	2 961.170	3 140.025	3 331.914	3 533.982
Renewal	-	332.209	382.806	416.565	530.120	613.659	714.104	1 102.514	1 838.101	2 313.774
Upgrade & New	-	169.011	249.781	292.363	311.337	326.734	288.191	214.974	210.281	179.115
Disposal	-	-	-	-	-	-	-	-	-	-
Total	2 081.011	2 708.617	2 974.590	3 185.730	3 474.218	3 732.591	3 963.465	4 457.512	5 380.296	6 026.871

Table H.2A: Identified optimal total cost requirement per cost component (non-scheme-specific)

Asset Components	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	56.220	59.634	63.270	66.912	71.125	75.433	79.998	84.829	90.013	95.472
Renewal	-	137.829	1.598	-	-	0.858	327.136	0.518	3.827	-
Upgrade & New	-	-	-	-	-	-	-	-	-	-
Disposal	-	-	-	-	-	-	-	-	-	-
Total	56.220	197.463	64.869	66.912	71.125	76.291	407.133	85.348	93.840	95.472

Table H.2B: Adjusted optimal total cost requirement per cost component (non-scheme-specific)

Cost Component	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
O&M	56.220	59.634	63.270	66.912	71.125	75.433	79.998	84.829	90.013	95.472
Renewal	-	20.674	24.015	22.616	19.865	17.576	79.565	94.777	105.192	98.110
Upgrade & New	-	-	-	-	-	-	-	-	-	-
Disposal	-	-	-	-	-	-	-	-	-	-
Total	56.220	80.308	87.286	89.528	90.990	93.008	159.563	179.606	195.205	193.582

Table H.3 A: Identified optimal total cost requirement per asset facility category (scheme-specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	151.756	531.642	170.789	180.858	501.506	220.820	233.242	228.984	242.977	257.713
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	312.853	1 573.918	712.489	794.607	1 008.695	509.387	588.701	1 281.429	604.664	913.199
WR: Dams	218.233	825.511	254.657	282.646	435.099	294.834	698.963	329.291	349.414	504.739
WR: Power Supply	5.360	8.215	6.033	8.311	7.301	7.254	7.627	8.088	14.151	9.990
WR: Pump stations	937.900	1 136.222	1 055.528	1 227.518	1 230.908	1 424.749	1 501.635	1 442.463	1 578.417	1 632.742
WR: Reservoirs	5.889	6.806	6.628	7.009	7.455	7.907	8.387	8.886	115.862	10.007
WR: Roads and bridge	2.181	4.033	2.454	2.596	2.759	2.926	9.063	3.291	3.492	3.703
WR: Steel Pipelines	155.578	1 133.860	175.090	290.677	248.038	259.064	224.885	1 331.769	472.936	264.769
WR: Telemetry	2.945	3.488	3.315	3.506	3.726	3.952	4.385	4.444	4.716	5.002
WR: Tunnels	256.223	275.755	288.357	308.089	324.691	345.076	366.429	389.146	1 771.046	435.119
WR: Water Treatment	2.666	13.634	3.001	3.173	3.373	9.653	6.585	4.023	4.269	4.528
WS: borehole	0.201	0.214	0.227	0.240	0.255	0.270	0.866	0.304	0.322	0.342
WS: Measuring facility	29.224	35.566	37.995	35.505	36.972	57.935	152.070	46.709	52.069	68.032
Total	2 081.011	5 548.864	2 716.562	3 144.735	3 810.779	3 143.827	3 802.838	5 078.827	5 214.334	4 109.883

Table H.3 B: Adjusted optimal total cost requirement per asset facility category (scheme-specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	151.756	216.573	234.729	240.703	291.145	322.092	326.865	313.948	321.995	322.230
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	312.853	518.164	620.406	701.779	805.605	869.876	870.575	1 002.372	1 121.326	1 281.816
WR: Dams	218.233	320.591	349.431	361.037	390.228	408.491	487.085	500.968	526.204	580.885
WR: Power Supply	5.360	6.065	6.469	7.079	7.581	8.018	8.338	8.599	10.713	12.383
WR: Pump stations	937.900	1 016.066	1 079.912	1 155.867	1 234.169	1 341.184	1 450.641	1 531.507	1 645.758	1 752.128
WR: Reservoirs	5.889	6.331	6.724	7.100	7.531	7.973	8.439	8.927	41.395	58.991
WR: Roads and bridge	2.181	2.571	2.751	2.874	3.003	3.140	4.466	4.956	5.332	5.415
WR: Steel Pipelines	155.578	310.352	342.214	357.945	361.987	371.650	359.758	607.446	788.205	842.600
WR: Telemetry	2.945	3.179	3.378	3.565	3.778	3.997	4.266	4.519	4.794	5.071
WR: Tunnels	256.223	272.380	289.042	306.068	325.389	345.279	366.318	388.745	820.844	1 063.292
WR: Water Treatment	2.666	4.449	4.865	4.924	4.909	6.137	6.886	6.763	6.992	6.876
WS: borehole	0.201	0.214	0.227	0.240	0.255	0.270	0.403	0.455	0.492	0.501
WS: Measuring facility	29.224	31.684	34.443	36.549	38.638	44.484	69.425	78.306	86.246	94.682
Total	2 081.011	2 708.617	2 974.590	3 185.730	3 474.218	3 732.591	3 963.465	4 457.512	5 380.296	6 026.871

Table H.4 A: Identified optimal total cost requirement per asset facility category (non-scheme-specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WR: Dams	0.191	0.202	0.214	0.227	0.241	0.256	0.271	0.287	0.305	0.324
WS: Measuring facility	56.029	197.261	64.654	66.685	70.884	76.035	406.862	85.060	93.535	95.149
Total	56.220	197.463	64.869	66.912	71.125	76.291	407.133	85.348	93.840	95.472

Table H.4 B: Adjusted optimal total cost requirement per asset facility category (non-scheme-specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WR: Dams	0.191	0.202	0.214	0.227	0.241	0.256	0.271	0.287	0.305	0.324
WS: Measuring facilities	56.029	80.106	87.071	89.301	90.749	92.753	159.292	179.319	194.900	193.259
Total	56.220	80.308	87.286	89.528	90.990	93.008	159.563	179.606	195.205	193.582

Table H: Adjusted optimal total cost requirement per scheme

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Caledon Modder GWS	8.202	33.949	38.320	38.000	35.790	34.177	30.893	25.779	25.235	27.162
Harts River (Spitskop) GWS	10.121	10.736	11.408	12.068	12.825	13.599	14.417	15.282	16.302	18.078
Harts River (Wentzel Dam) GWS	1.234	1.397	1.489	1.563	1.644	1.728	1.836	2.010	2.154	2.270
Komati River GWS	36.827	40.786	43.463	45.825	49.472	52.621	58.425	61.792	65.683	73.357
Leeu River (Armenia Dam) GWS	2.678	3.823	5.286	6.768	7.837	9.023	10.407	9.902	10.118	10.642
Lesotho Highlands Water GWS	189.674	201.790	214.147	226.753	241.747	258.823	276.263	292.943	514.848	641.388
Loopspruit (Klipdrift dam) GWS	1.609	2.233	2.427	2.497	2.575	2.648	2.688	2.701	2.870	3.000
Middle Vaal GWS	13.693	31.638	35.102	34.793	34.273	33.650	32.972	30.557	30.975	31.480
Modder River GWS	4.115	4.365	4.632	4.898	5.490	5.981	6.308	6.568	6.973	9.208
Mooi River GWS	23.164	39.815	44.951	47.747	53.187	56.819	63.398	66.599	70.614	71.542
Moutloatsi Setlogelo Groothoek dam GWS	0.532	0.629	0.672	0.890	0.991	1.049	1.380	1.445	1.527	1.511
Namahadi (Fika Patso & Metsi Matso) GWS	1.497	1.826	1.959	2.039	2.178	2.291	2.525	2.631	2.775	2.874
Orange Riet Canal GWS	17.441	24.861	54.283	88.935	123.434	140.199	132.730	108.205	105.630	94.400
Orange River - Boegoeberg GWS	23.463	65.680	76.287	79.190	83.172	86.687	83.885	77.667	83.076	86.878
Orange River GWS	234.555	252.610	268.353	284.303	311.709	334.212	380.639	405.159	627.581	766.561
Orange River Kakamas GWS	19.387	28.350	32.758	36.601	40.601	43.891	45.591	50.059	54.252	107.847
Orange River- Upington Islands GWS	10.178	20.422	26.983	32.444	35.673	44.920	44.187	40.447	49.427	56.581
Orange Vaal-Douglas GWS	19.338	22.919	28.360	34.350	37.976	45.430	48.934	52.698	57.434	61.405
Rhenoster River (Koppies, Roodepoort and Weltevrede Dams) GWS	8.814	12.064	13.053	13.459	16.273	17.841	18.014	17.649	18.285	18.845

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Riet River (Kalkfontein Dam) GWS	14.201	29.378	38.246	40.503	46.860	49.326	47.434	52.740	57.904	58.288
Sand-Vet (Erferis and Allemanskraal Dams) GWS	111.923	132.724	145.084	160.528	190.748	211.907	229.355	296.252	346.119	394.415
Schoonspruit GWS	10.462	17.852	21.041	21.938	23.030	23.585	23.537	23.301	24.181	28.125
Slang River (Zaaihoek Dam) GWS	90.206	98.486	104.759	110.703	118.539	126.127	134.661	142.171	162.466	179.020
Sterkspruit River (Jazanashoek Dam) GWS	3.532	9.058	10.084	9.941	9.613	9.311	8.712	21.278	26.657	27.568
Taung (Taung Dam)	0.802	0.977	1.048	1.173	1.280	1.353	1.381	1.383	1.440	1.486
ThabaN'chu (Sediba, Feloana, Woodbridge, Rooifontein and Serowalo) Dams	1.704	2.517	2.735	2.834	3.173	3.364	3.455	3.509	3.690	4.058
Tugela-Vaal GWS	377.279	417.523	444.650	475.007	524.478	576.347	622.743	648.697	717.090	767.806
Usutu River GWS	95.570	244.535	272.209	272.792	269.995	270.059	261.894	277.711	359.840	404.161
Usutu Vaal Phase 2 GWS	127.581	136.608	145.052	153.684	164.032	175.211	188.843	200.184	222.018	239.745
Usutu-Vaal GWS	283.522	373.243	402.813	435.830	471.454	512.161	538.425	619.283	678.682	718.002
Vaal Dam GWS	41.317	48.391	51.749	54.334	67.468	75.266	105.791	113.528	120.892	119.987
Vaalharts GWS	64.335	117.855	129.478	136.311	149.618	159.102	158.377	166.679	179.606	228.868
Van Der Kloof GWS	51.224	85.622	95.740	98.769	101.895	103.662	102.927	179.477	216.436	224.977
VRESAP GWS	249.913	266.467	282.838	299.066	319.123	340.647	376.494	403.154	429.697	453.270
Wittespruit (Egmont Dam) GWS	0.126	0.356	0.397	0.389	0.378	0.366	0.364	0.332	0.334	0.322
KWSAP (Komati Water Scheme Augmentation Project) GWS	30.792	33.211	35.286	37.836	42.212	48.386	51.711	193.714	252.613	265.867
Subtotal	2181.011	2814.695	3087.140	3304.761	3600.741	3871.772	4111.766	4613.706	5545.672	6201.227
Non-scheme Specific	56.219	80.309	87.285	89.525	90.989	93.010	159.563	179.607	195.203	193.581
Total	2237.230	2894.999	3174.417	3394.277	3691.722	3959.775	4265.323	4788.009	5735.612	6390.274

APPENDIX I – Maintenance Strategy, Works and Cost Forecast

1. INTRODUCTION

‘Maintenance’ is *“The actions required to enable an asset to achieve its expected life – recurrent work necessary to preserve or maintain an asset so it can be used for its designated purpose. In other words, recurrent work necessary to prevent deterioration. Maintenance work can be planned or unplanned. Planned maintenance is work to prevent known failure modes and can be time or condition-based. Maintenance includes all of the actions necessary for retaining an asset as near as practicable to its original condition, but excludes renewals.*

2. MAINTENANCE STRATEGY

Refer to the DWS Infrastructure Maintenance Strategy. Table I.1 summarises the Maintenance Strategy applied per Asset Condition Grading in this AMP.

Table I.1: Maintenance Strategy per Asset Condition Grading

Condition Grade	Description	Maintenance Strategy
3	Fair	Significant/improved maintenance required.
4	Good	Target condition maintenance. Preventive maintenance.
5	Very Good	Preventative and Normal Maintenance

3. MAINTENANCE WORKS

Table I.2: Maintenance Works (scheme specific)

Asset Facility Category	Maintenance Strategy (No. of Asset Components)			Total per facility category
	Improved	Preventive	Normal	
Borehole	1		1	2
Buildings	764	635	85	1484
Canals	3266	1279	22	4567
Dams	690	582	30	1302
Measuring facilities	88	86	6	180
Pipelines	358	118	129	605
Power supply	21	44	18	83
Pump stations	828	462	412	1702
Reservoirs	26	37	9	72
Roads	17	8	7	32
Telemetry	2		11	13
Tunnels	66	33	2	101
Water Treatment	22	13	2	37
Total	6149	3297	734	10180

Table I.3: Maintenance Works (Non Scheme specific)

Asset Facility Category	Maintenance Strategy (No. of Asset Components)			Total
	Improved	Preventive	Normal	
Dams			9	9
Measuring facilities	225	43	7	275
Total	225	43	16	284

4. FINANCIAL FORECAST – OPERATIONS AND MAINTENANCE

The forecasted maintenance financial requirements for the next 10 years are in Table I.4.

Table I.4: Operations and Maintenance Costs per Asset Facility Category Forecast (scheme specific)

Asset Facility Category	Expenditure Type		Financial Year (Amounts in Million Rands)									
			2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	O&M	O	13.550	14.373	15.249	16.127	17.142	18.180	19.280	20.445	21.694	23.010
		M	138.206	146.600	155.540	164.492	174.850	185.438	196.660	208.539	221.283	234.703
Land	O&M	O	-	-	-	-	-	-	-	-	-	-
		M	-	-	-	-	-	-	-	-	-	-
WR: Canals	O&M	O	73.149	77.592	82.323	87.062	92.544	98.148	104.087	110.374	117.119	124.222
		M	239.704	254.262	269.767	285.294	303.258	321.623	341.087	361.688	383.791	407.067
WR: Dams	O&M	O	71.808	76.169	80.814	85.465	90.846	96.348	102.179	108.350	114.972	121.944
		M	146.426	155.319	164.790	174.275	185.248	196.467	208.356	220.941	234.443	248.661
WR: Power Supply	O&M	O	1.763	1.870	1.984	2.098	2.230	2.365	2.508	2.660	2.822	2.994
		M	3.597	3.816	4.049	4.282	4.551	4.827	5.119	5.428	5.760	6.109
WR: Pump stations	O&M	O	861.735	914.071	969.811	1 025.630	1 090.212	1 156.234	1 226.205	1 300.267	1 379.727	1 463.403
		M	76.165	80.790	85.717	90.651	96.359	102.194	108.378	114.925	121.948	129.343
WR: Reservoirs	O&M	O	0.736	0.781	0.828	0.876	0.931	0.988	1.048	1.111	1.179	1.250
		M	5.153	5.466	5.799	6.133	6.519	6.914	7.333	7.775	8.251	8.751
WR: Roads and bridge	O&M	O	-	-	-	-	-	-	-	-	-	-
		M	2.181	2.313	2.454	2.596	2.759	2.926	3.103	3.291	3.492	3.703
WR: Steel Pipelines	O&M	O	14.143	15.002	15.917	16.833	17.893	18.977	20.125	21.341	22.645	24.019
		M	141.435	150.025	159.173	168.334	178.934	189.770	201.254	213.410	226.452	240.185
WR: Telemetry	O&M	O	0.527	0.559	0.593	0.627	0.667	0.707	0.750	0.795	0.844	0.895
		M	2.418	2.565	2.722	2.878	3.060	3.245	3.441	3.649	3.872	4.107
WR: Tunnels	O&M	O	54.841	58.172	61.719	65.271	69.381	73.583	78.036	82.749	87.806	93.131
		M	201.382	213.612	226.638	239.683	254.775	270.204	286.556	303.864	322.433	341.988
WR: Water Treatment	O&M	O	0.877	0.930	0.987	1.044	1.109	1.176	1.248	1.323	1.404	1.489
		M	1.789	1.898	2.014	2.130	2.264	2.401	2.546	2.700	2.865	3.039
WS: borehole	O&M	O	0.086	0.092	0.097	0.103	0.109	0.116	0.123	0.130	0.138	0.147
		M	0.115	0.122	0.130	0.137	0.146	0.154	0.164	0.174	0.184	0.195
WS: Measuring facility	O&M	O	9.616	10.200	10.822	11.445	12.165	12.902	13.683	14.509	15.396	16.329
		M	19.608	20.799	22.067	23.337	24.807	26.309	27.901	29.586	31.394	33.298
Total	O&M	O	1 102.831	1 169.810	1 241.144	1 312.581	1 395.230	1 479.725	1 569.271	1 664.055	1 765.747	1 872.833
		M	978.180	1 037.588	1 100.859	1 164.221	1 237.529	1 312.473	1 391.899	1 475.969	1 566.167	1 661.149

Table I.5: Operations and Maintenance Costs per Asset Facility Category Forecast (non-scheme specific)

Asset Facility Category		Expenditure Type	Financial Year (Amounts in Million Rands)									
			2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WR: Dams	O&M	O	0.063	0.066	0.071	0.075	0.079	0.084	0.089	0.095	0.100	0.106
		M	0.128	0.136	0.144	0.152	0.162	0.172	0.182	0.193	0.205	0.217
WS: Measuring facility	O&M	O	18.436	19.556	20.748	21.942	23.324	24.736	26.233	27.818	29.518	31.308
		M	37.593	39.876	42.308	44.743	47.561	50.441	53.493	56.724	60.191	63.841
Total	O&M	O	18.499	19.622	20.819	22.017	23.403	24.820	26.322	27.912	29.618	31.414
		M	37.721	40.012	42.452	44.895	47.722	50.612	53.675	56.917	60.395	64.058

Table I.6: Operation and Maintenance Cost Requirements Forecasts (scheme and non-scheme specific)

SCHEME_NAME	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Caledon Modder GWS	8.202	8.7	9.23	9.762	10.376	11.005	11.671	12.376	13.132	13.928
Harts River (Spitskop) GWS	10.121	10.736	11.39	12.046	12.804	13.58	14.401	15.271	16.205	17.187
Harts River (Wentzel Dam) GWS	1.234	1.309	1.388	1.468	1.561	1.655	1.755	1.861	1.975	2.095
Komati River GWS	36.827	39.063	41.445	43.831	46.591	49.412	52.402	55.567	58.963	62.539
Leeu River (Armenia Dam) GWS	2.678	2.841	3.014	3.187	3.388	3.593	3.81	4.041	4.288	4.548
Lesotho Highlands Water GWS	189.674	201.194	213.462	225.749	239.963	254.496	269.897	286.198	303.688	322.106
Loopspruit (Klipdrift dam) GWS	1.609	1.706	1.81	1.915	2.035	2.158	2.289	2.427	2.576	2.732
Middle Vaal GWS	13.693	14.525	15.411	16.298	17.324	18.373	19.485	20.662	21.924	23.254
Modder River GWS	4.115	4.365	4.632	4.898	5.207	5.522	5.856	6.21	6.589	6.989
Mooi River GWS	23.164	24.571	26.07	27.57	29.306	31.081	32.962	34.953	37.089	39.338
Moutloatsi Setlogelo Groothoek dam GWS	0.532	0.565	0.599	0.634	0.673	0.714	0.757	0.803	0.852	0.904
Namahadi (Fika Patso & Metsi Matso) GWS	1.497	1.588	1.685	1.782	1.894	2.008	2.13	2.259	2.397	2.542
Orange Riet Canal GWS	17.441	18.501	19.629	20.759	22.066	23.402	24.818	26.317	27.925	29.619
Orange River - Boegoeberg GWS	23.463	24.888	26.406	27.925	29.684	31.481	33.387	35.403	37.567	39.845
Orange River GWS	234.555	248.801	263.972	279.166	296.744	314.715	333.760	353.919	375.547	398.323
Orange River Kakamas GWS	19.387	20.564	21.818	23.074	24.527	26.012	27.587	29.253	31.04	32.923
Orange River- Upington Islands GWS	10.178	10.796	11.454	12.114	12.877	13.656	14.483	15.357	16.296	17.284

SCHEME_NAME	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Orange Vaal-Douglas GWS	19.338	20.513	21.764	23.016	24.466	25.947	27.518	29.18	30.963	32.841
Rhenoster River (Koppies, Roodepoort and Weltevrede Dams) GWS	8.814	9.349	9.919	10.49	11.151	11.826	12.542	13.299	14.112	14.968
Riet River (Kalkfontein Dam) GWS	14.201	15.063	15.982	16.902	17.966	19.054	20.207	21.428	22.737	24.116
Sand-Vet (Erfenis and Allemanskraal Dams) GWS	111.923	118.721	125.96	133.21	141.598	150.173	159.261	168.88	179.201	190.068
Schoonspruit GWS	10.462	11.097	11.774	12.452	13.236	14.037	14.887	15.786	16.751	17.767
Slang River (Zaaihoek Dam) GWS	90.206	95.685	101.520	107.363	114.123	121.034	128.359	136.112	144.429	153.189
Sterkspruit River (Jazanashoek Dam) GWS	3.532	3.746	3.975	4.204	4.468	4.739	5.026	5.329	5.655	5.998
Taung (Taung Dam)	0.802	0.851	0.903	0.955	1.015	1.076	1.141	1.21	1.284	1.362
ThabaN'chu (Sediba, Feloana, Woodbridge, Rooifontein and Serowalo) Dams	1.704	1.807	1.918	2.028	2.156	2.286	2.424	2.571	2.728	2.893
Tugela-Vaal GWS	377.279	400.192	424.595	449.034	477.309	506.214	536.848	569.274	604.062	640.696
Usutu River GWS	95.570	101.374	107.556	113.746	120.908	128.231	135.991	144.204	153.017	162.297
Usutu Vaal Phase 2 GWS	127.581	135.329	143.581	151.845	161.407	171.182	181.541	192.506	204.270	216.658
Usutu-Vaal GWS	283.522	300.741	319.080	337.445	358.693	380.416	403.437	427.804	453.948	481.478
Vaal Dam GWS	41.317	43.826	46.499	49.175	52.272	55.437	58.792	62.343	66.153	70.165
Vaalharts GWS	64.335	68.242	72.404	76.571	81.392	86.322	91.545	97.075	103.007	109.254
Van Der Kloof GWS	51.224	54.335	57.648	60.966	64.805	68.729	72.888	77.291	82.014	86.988
VRESAP GWS	249.913	265.092	281.257	297.445	316.174	335.322	355.614	377.093	400.137	424.404
Wittespruit (Egmont Dam) GWS	0.126	0.134	0.142	0.15	0.159	0.169	0.179	0.19	0.202	0.214
KWSAP (Komati Water Scheme Augmentation Project) GWS	30.792	32.662	34.654	36.649	38.956	41.316	43.816	46.462	49.302	52.292
Subtotal	2 181.01	2 313.47	2 454.55	2 595.82	2 759.27	2 926.37	3 103.46	3 290.91	3 492.03	3 703.80
Non-scheme Specific	56.22	59.63	63.27	66.91	71.12	75.43	80.00	84.83	90.01	95.47
Total	2 237.23	2 373.11	2 517.82	2 662.73	2 830.40	3 001.81	3 183.46	3 375.74	3 582.04	3 799.28

APPENDIX J – Renewals Strategy, Works and Expenditure Forecast

1 INTRODUCTION

‘Renewals Expenditure’ is: *“Expenditure on the replacement or rehabilitation of an asset.” It is expenditure on an existing asset which returns the service potential or the life of the asset to that which it had originally. It is periodically required expenditure, and relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. Renewals may reduce operating and maintenance expenditure if completed at the optimum time.”*

It is very important that the NWRIB always clearly distinguishes between New Capital/Upgrade Capital expenditure and Renewals Capital expenditure. The rate at which renewal work is being carried out over *time* compared with the annual provision for depreciation (the cost of consumption – the rate at which the assets are being used) is a good indicator of the extent to which the assets are being maintained, are improving, or are deteriorating.

2. RENEWALS STRATEGY

Table J.1 summarises the Renewal Strategy applied per Asset Condition Grading in this AMP.

Table J.1 Renewal Strategy per Asset Condition Grading

Condition Grade	Description	Renewal Strategy
0	Not Working	Complete replacement of the asset before operations can be revived
1	Very Poor	Stop operating immediately and renew the asset. Replacement needed (>50%)
2	Poor	Significant renewal required.

3. RENEWAL WORKS

Table J.2: Renewals works (asset components per renewals strategy and per asset facility category) for the first projected year (scheme specific)

Asset Facility Category	Renewal Strategy (No. of Asset Components)		Total
	Stop operating immediately and renew the asset	Significantly renew	
Borehole			0
Buildings	233	852	1085
Canals	58	1818	1876
Dams	57	426	483
Measuring facilities	1	4	5
Pipelines	3	88	91
Power supply	12	6	18
Pump stations	256	300	556
Reservoirs	2	3	5
Roads	1	8	9
Telemetry		3	3
Water Treatment	1	11	12
Total	624	3519	4143

Table J.3: Renewals works (asset components per renewals strategy and per asset facility category) for the first projected year (non-scheme specific)

Asset Facility Category	Renewal Strategy (No. of Asset Components)		Total per facility category
	Stop operating immediately and renew the asset	Significantly renew	
Dams	-	-	-
Measuring facilities	15	938	953
Total	15	938	

Table J.4: Renewal Works (asset components per facility category requiring renewal works)

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4. FINANCIAL FORECAST

The forecasted renewals requirements for the next 10 years are in Table J.5.

Table J.5A: Identified Renewals Expenditure Forecasts (scheme specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings		370.656	-	0.239	309.515	17.201	17.301	-	-	-
Land		-	-	-	-	-	-	-	-	-
WR: Canals		814.663	-	133.388	394.108	-	128.756	794.595	60.199	381.909
WR: Dams		446.944	-	22.906	159.004	2.019	388.428	-	-	134.134
WR: Power Supply		2.529	-	1.932	0.520	0.062	-	-	5.569	0.887
WR: Pump stations		130.112	-	111.237	41.079	166.321	156.432	27.271	76.742	39.996
WR: Reservoirs		0.559	-	-	0.004	0.005	0.007	-	106.432	0.006
WR: Roads and bridge		1.720	-	-	-	-	5.960	-	-	-
WR: Steel Pipelines		435.350	-	105.509	51.211	35.711	3.505	1 097.018	223.839	0.565
WR: Telemetry		0.364	-	-	-	-	0.193	-	-	-
WR: Tunnels		-	-	3.135	0.534	1.289	1.837	2.533	1 360.807	-
WR: Water Treatment		7.261	-	-	-	6.075	2.791	-	-	-
WS: borehole		-	-	-	-	-	0.580	-	-	-
WS: Measuring facility		4.568	5.107	0.724	-	18.724	110.486	2.614	5.279	18.404
Total		2 214.723	5.107	379.070	955.976	247.408	816.277	1 924.031	1 838.866	575.901

Table J.5B: Adjusted Renewals Expenditure Forecasts (scheme specific)

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	-	55.598	63.938	60.082	99.151	118.471	110.923	84.964	79.017	64.517
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	-	122.199	140.529	151.984	199.910	215.476	214.354	369.571	458.291	609.096
WR: Dams	-	67.042	77.098	75.841	91.668	95.929	160.717	160.967	167.496	203.169
WR: Power Supply	-	0.379	0.436	0.699	0.800	0.825	0.711	0.511	2.130	3.281

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WR: Pump stations	-	19.517	22.444	37.764	45.511	80.631	112.115	112.252	139.814	155.545
WR: Reservoirs	-	0.084	0.096	0.091	0.080	0.071	0.059	0.041	31.966	48.989
WR: Roads and bridge	-	0.258	0.297	0.279	0.244	0.214	1.363	1.665	1.841	1.712
WR: Steel Pipelines	-	65.303	75.098	86.353	89.339	93.606	81.760	333.739	504.953	551.995
WR: Telemetry	-	0.055	0.063	0.059	0.052	0.045	0.075	0.075	0.078	0.069
WR: Tunnels	-	-	-	0.470	0.668	0.998	1.331	1.865	410.373	627.996
WR: Water Treatment	-	1.089	1.252	1.176	1.032	2.118	2.739	2.502	2.516	2.191
WS: borehole	-	-	-	-	-	-	0.116	0.151	0.169	0.159
WS: Measuring facility	-	0.685	1.554	1.768	1.666	5.273	27.842	34.211	39.456	45.054
Total	-	332.209	382.806	416.565	530.120	613.659	714.104	1 102.514	1 838.101	2 313.774

Table J.6A: Identified Renewals Expenditure Forecasts (non-scheme specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WS: Measuring facility		137.829	1.598	-	-	0.858	327.136	0.518	3.827	-
Total		137.829	1.598	-	-	0.858	327.136	0.518	3.827	-

Table J.6B: Adjusted Renewals Expenditure Forecasts (non-scheme specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WS: Measuring facility	-	20.674	24.015	22.616	19.865	17.576	79.565	94.777	105.192	98.110
Total	-	20.674	24.015	22.616	19.865	17.576	79.565	94.777	105.192	98.110

Table J.7: Adjusted (Smoothened) Renewal Cost Requirements (scheme and non-scheme specific)

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Caledon Modder GWS	-	11.877	13.712	13.796	12.744	12.081	10.347	7.411	6.909	9.265
Harts River (Spitskop) GWS	-	-	0.018	0.022	0.021	0.019	0.016	0.011	0.097	0.891
Harts River (Wentzel Dam) GWS	-	0.088	0.101	0.095	0.083	0.073	0.081	0.149	0.179	0.175

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Komati River GWS	-	1.189	1.404	1.418	2.375	2.767	5.668	5.985	6.513	10.660
Leeu River (Armenia Dam) GWS	-	0.982	1.129	1.067	1.706	2.001	3.441	3.473	3.624	4.303
Lesotho Highlands Water GWS	-	-	-	0.360	1.220	3.833	5.970	6.478	210.929	319.105
Loopspruit (Klipdrift dam) GWS	-	0.527	0.617	0.582	0.540	0.490	0.399	0.274	0.294	0.268
Middle Vaal GWS	-	17.113	19.691	18.495	16.949	15.277	13.487	9.895	9.051	8.226
Modder River GWS	-	-	-	-	0.283	0.459	0.452	0.358	0.384	2.219
Mooi River GWS	-	12.551	14.451	14.428	17.571	18.369	23.802	26.706	28.997	28.555
Moutloatsi Setlogelo Grootboek dam GWS	-	0.064	0.073	0.256	0.318	0.335	0.623	0.642	0.675	0.607
Namahadi (Fika Patso & Metsi Matso) GWS	-	0.238	0.274	0.257	0.284	0.283	0.395	0.372	0.378	0.332
Orange Riet Canal GWS	-	3.784	4.352	5.246	5.971	6.059	6.292	5.150	6.856	7.304
Orange River 0 Boegoeberg GWS	-	15.780	18.165	17.942	20.096	20.240	17.272	12.860	11.874	15.062
Orange River GWS	-	3.788	4.356	5.115	14.945	19.480	46.866	51.230	252.026	368.232
Orange River Kakamas GWS	-	5.697	6.552	6.901	8.553	9.007	9.989	14.823	17.721	70.493
Orange River0 Upington Islands GWS	-	9.626	11.070	11.145	12.876	13.155	11.446	10.409	10.515	14.407
Orange Vaal0Douglas GWS	-	0.728	0.853	1.002	1.532	2.100	4.748	10.542	14.304	18.559
Rhenoster River (Koppies, Roodepoort and Weltevrede Dams) GWS	-	2.715	3.134	2.969	5.122	6.015	5.472	4.350	4.173	3.877
Riet River (Kalkfontein Dam) GWS	-	14.315	16.462	15.871	21.261	23.073	21.260	27.154	31.494	31.312
Sand0Vet (Erfenis and Allemanskraal Dams) GWS	-	14.003	16.139	23.736	45.718	55.155	63.400	121.960	161.751	200.032
Schoonspruit GWS	-	6.755	7.769	7.386	7.086	6.651	6.122	5.677	5.767	9.033
Slang River (Zaaihoek Dam) GWS	-	2.801	3.240	3.340	4.416	5.092	6.302	6.059	18.037	25.831
Sterkspruit River (Jazanashoek Dam) GWS	-	5.312	6.109	5.737	5.145	4.572	3.686	15.949	21.002	21.570
Taung (Taung Dam)	-	0.126	0.145	0.218	0.265	0.277	0.240	0.173	0.156	0.124
ThabaN'chu (Sediba, Feloana, Woodbridge, Rooifontein and Serowalo) Dams	-	0.710	0.817	0.806	1.017	1.078	1.031	0.938	0.962	1.165
Tugela0Vaal GWS	-	17.331	20.055	25.973	47.169	70.133	85.894	79.424	113.028	127.109
Usutu River GWS	-	63.301	72.814	72.796	73.418	75.588	72.898	97.720	175.804	218.159
Usutu Vaal Phase 2 GWS	-	1.279	1.471	1.838	2.625	4.030	7.302	7.679	17.748	23.087
Usutu0Vaal GWS	-	66.392	76.707	91.786	106.972	126.678	130.933	188.741	222.362	234.710

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Vaal Dam GWS	-	4.565	5.250	5.159	15.196	19.829	46.999	51.185	54.739	49.822
Vaalharts GWS	-	46.659	53.676	56.549	65.426	70.329	64.871	68.280	75.452	118.737
Van Der Kloof GWS	-	1.247	1.434	2.826	6.198	7.766	8.249	87.444	121.627	128.199
VRESAP GWS	-	-	-	0.136	1.645	4.184	19.967	25.445	29.025	28.457
Wittespruit (Egmont Dam) GWS	-	0.222	0.255	0.239	0.219	0.197	0.185	0.142	0.132	0.108
KWSAP (Komati Water Scheme Augmentation Project) GWS	-	0.445	0.512	1.074	3.157	6.984	7.826	147.205	203.270	213.544
Subtotal	-	332.208	382.806	416.565	530.120	613.659	714.104	1 102.514	1 838.101	2 313.773
Non-scheme specific	-	20.675	24.015	22.616	19.865	17.576	79.565	94.777	105.192	98.110
Total	-	352.883	406.821	439.181	549.985	631.235	793.669	1 197.290	1 943.294	2 411.883

APPENDIX K – Upgrades and New Capital Strategy and Cost Forecast

1. INTRODUCTION

‘New and Upgrade Capital’ is:

‘Expenditure that is used to create new assets, or to increase the capacity of existing assets beyond their original design capacity or service potential’.

2. NEW & UPGRADE CAPITAL STRATEGY

Table K.1 summarises the Renewal Strategy applied per Asset Condition Grading in this AMP.

Table K.1: New and Upgrade Capital Strategy per Asset Utilisation Grading

Utilisation Grade	Description	New and Upgrade Capital Strategy
5	Exceeding Capacity/Stressed	Consider upgrading the asset component

3. UPGRADE AND NEW CAPITAL WORKS

Table K.2 shows the numbers of asset components per asset facility category that are exceeding their design capacities (stressed), and require upgrading, further split into scheme-specific and non-scheme-specific.

Table K.2 Asset Components Requiring Upgrades Based on Utilisation

Asset Facility Category	Asset Components Exceeding Capacity / Stressed (Require Upgrading)					
	Cluster Total		Scheme Specific		Non Scheme Specific	
	No.	CRC (R million)	No.	CRC (R million)	No.	CRC (R million)
Buildings	1	0.03	1	0.03	-	-
WS: borehole	0	-	0	-	-	-
WR: Canals	118	1 283.71	118	1 283.71	-	-
WR: Dams	90	490.27	90	490.27	-	-
WR: Power Supply	0	-	0	-	-	-
WR: Pump stations	86	22.50	86	22.50	-	-
WR: Reservoirs	0	-	0	-	-	-
WR: Roads and bridge	0	-	0	-	-	-
WR: Steel Pipelines	5	533.48	5	533.48	-	-
WR: Telemetry	0	0	0	-	-	-
WR: Tunnels	2	0	2	3.31	-	-
WR: Water Treatment	4	3.55	4	3.55	-	-
WS: Measuring facility	0	-	0	-	-	-
Total	306	2 333.53	306	2 336.84	0	0.00

Table K.3: Utilisation-based upgrade works (asset components exceeding capacity in utilisation)

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Casing	Welbedacht Dam Crest Gate 1 - casing	500009102_29	4	1	5	9.556
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Mechanism	Welbedacht Dam Crest Gate 1 - mechanism	500009102_30	4	1	5	3.756
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Casing	Welbedacht Dam Crest Gate 2 - casing	500009102_31	4	1	5	9.556
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Mechanism	Welbedacht Dam Crest Gate 2 - mechanism	500009102_32	4	1	5	3.756
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Casing	Welbedacht Dam Crest Gate 3 - casing	500009102_33	4	1	5	9.556
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Mechanism	Welbedacht Dam Crest Gate 3 - mechanism	500009102_34	4	1	5	3.756
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Casing	Welbedacht Dam Crest Gate 4 - casing	500009102_35	4	1	5	9.556

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Mechanism	Welbedacht Dam Crest Gate 4 - mechanism	500009102_36	4	1	5	4.243
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Casing	Welbedacht Dam Crest Gate 5 - casing	500009102_37	4	1	5	9.556
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Crest Gates - Mechanism	Welbedacht Dam Crest Gate 5 - mechanism	500009102_38	4	1	5	3.756
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Casing	WELBEDACHTDAM - intake gate 2 - casing	500009102_2	4	2	5	1.512
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Mechanism	WELBEDACHTDAM - intake gate 2 - mechanism	500009102_3	4	2	5	1.351
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Casing	WELBEDACHTDAM - intake gate 3 - casing	500009102_4	4	2	5	1.512
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Mechanism	WELBEDACHTDAM - intake gate 3 - mechanism	500009102_5	4	2	5	1.351
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Casing	WELBEDACHTDAM - intake gate 4 - casing	500009102_6	4	2	5	1.512
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Mechanism	WELBEDACHTDAM - intake gate 4 - mechanism	500009102_7	4	2	5	1.351
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Casing	WELBEDACHTDAM - intake gate 5 - casing	500009102_8	4	2	5	1.512
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Mechanism	WELBEDACHTDAM - intake gate 5 - mechanism	500009102_9	4	2	5	1.351
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Casing	WELBEDACHTDAM - intake gate 6 - casing	500009102_10	4	2	5	1.512
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Mechanism	WELBEDACHTDAM - intake gate 6 - mechanism	500009102_11	4	2	5	1.351
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Casing	WELBEDACHTDAM - outlet valve 1 - casing	500009102_12	4	2	5	1.606
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Mechanism	WELBEDACHTDAM - outlet valve 1 - mechanism	500009102_13	4	2	5	1.390
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Casing	WELBEDACHTDAM - outlet valve 2 - casing	500009102_14	4	2	5	1.606
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Mechanism	WELBEDACHTDAM - outlet valve 2 - mechanism	500009102_15	4	2	5	1.390
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Casing	WELBEDACHTDAM - outlet valve 3 - casing	500009102_16	4	2	5	1.606
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Mechanism	WELBEDACHTDAM - outlet valve 3 - mechanism	500009102_17	4	2	5	1.390
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Casing	WELBEDACHTDAM - outlet valve 4 - casing	500009102_18	4	2	5	1.606

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Mechanism	WELBEDACHTDAM - outlet valve 4 - mechanism	500009102_19	4	2	5	1.390
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Casing	WELBEDACHTDAM - outlet valve 5 - casing	500009102_20	4	2	5	1.606
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Mechanism	WELBEDACHTDAM - outlet valve 5 - mechanism	500009102_21	4	2	5	1.390
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Casing	WELBEDACHTDAM - outlet valve 6 - casing	500009102_23	4	2	5	1.606
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet Valves - Mechanism	WELBEDACHTDAM - outlet valve 6 - mechanism	500009102_24	4	2	5	1.390
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Cranes	Welbedacht Service gate crane	500009102_25	4	2	5	6.223
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Auxilliary Equip. Main Damwall	Welbedacht Stand by generator	500009102_27	4	2	5	1.660
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Outlet - Pipework- Steel	WELBEDACHTDAM outlet pipes	500009102_28	4	2	5	0.144
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Casing	WELBEDACHTDAM - intake gate 1 - casing	500009102_39	4	2	5	1.512
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Intake Gates - Mechanism	WELBEDACHTDAM - intake gate 1 - mechanism	500009102_40	4	2	5	1.351
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Casing	RFO outlet valve 1 (Knife gate valve) - casing	500009102_41	4	2	5	0.071
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Casing	RFO outlet valve 2 (Knife gate valve) - casing	500009102_42	4	2	5	0.071
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Casing	RFO outlet valve 3 (Knife gate valve) - casing	500009102_43	4	2	5	0.071
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Casing	RFO outlet valve 4 (Knife gate valve) - casing	500009102_44	4	2	5	0.071
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Mechanism	RFO outlet valve 1 (Knife gate valve) - mechanism	500009102_45	4	2	5	0.024
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Mechanism	RFO outlet valve 2 (Knife gate valve) - mechanism	500009102_46	4	2	5	0.024
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Mechanism	RFO outlet valve 3 (Knife gate valve) - mechanism	500009102_47	4	2	5	0.024
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Mechanism	RFO outlet valve 4 (Knife gate valve) - mechanism	500009102_48	4	2	5	0.024
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Auxilliary Equip. Main Damwall	RFO hydraulic power pack for all 6 valves	500009102_49	4	2	5	1.726

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Casing	Welbedacht RFO butterfly valve 1 - casing	500009102_50	4	2	5	0.160
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Casing	Welbedacht RFO butterfly valve 2 - casing	500009102_51	4	2	5	0.160
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Mechanism	Welbedacht RFO butterfly valve 1 - mechanism	500009102_52	4	2	5	0.085
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Valves - Mechanism	Welbedacht RFO butterfly valve 2 - mechanism	500009102_53	4	2	5	0.085
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Cranes	Welbedacht crane 2	500009102_54	4	2	5	6.719
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Meter & Instrumentation	Welbedacht dam meter and instrumentation	500009102_55	4	2	5	0.239
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet - Pipework- Steel	Welbedacht RFO outlet pipe 2	500009102_56	4	2	5	0.833
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet - Pipework- Steel	Welbedacht RFO outlet pipe 3	500009102_57	4	2	5	0.833
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet - Pipework- Steel	Welbedacht RFO outlet pipe 4	500009102_58	4	2	5	0.833
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet - Pipework- Steel	Welbedacht RFO outlet pipe 5	500009102_59	4	2	5	0.833
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet - Pipework- Steel	Welbedacht RFO outlet pipe 6	500009102_60	4	2	5	0.812
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet - Pipework- Steel	Welbedacht RFO pipe 1	500009102_61	4	2	5	0.812
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Auxilliary Equip. Main Damwall	Welbedacht dam handrails	500009102_62	4	2	5	0.531
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Auxilliary Equip. Main Damwall	Welbedacht dam lighting	500009102_63	4	2	5	0.767
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Auxilliary Equip. Main Damwall	Welbedacht dam staircase	500009102_64	4	2	5	1.438
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Outlet Structure	Welbedacht outlet structure	500009102_26	4	3	5	4.149
CALEDON-MODDER GWS	WR: Dams	Main Damwall	WELBEDACHTDAM	Dam Wall - 12m<Height<30m	Welbedacht Concrete	500009102_1	4	4	5	164.505
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Intake Gates	Welbedacht dam stoplog 1 (Radial gate)	500009102_65	4	4	5	0.516
CALEDON-MODDER GWS	WR: Dams	Main Damwall	Welbedacht Dam	Dam Intake Gates	Welbedacht dam stoplog 2 (RFO)	500009102_66	4	4	5	0.516
HYDOMETRY GAUTENG	Land	Hydrological Station	Varkenslaagtespruit @ Doornfontein	Land of specialised buildings	specialized building servitude	500013012_0	5	LAND	5	0.013
HYDOMETRY GAUTENG	Land	Hydrological Station	Wonderfonteinspruit @ O/Flow From Dam @ Luipaardsvle	Land of specialised buildings	specialized building servitude	500013014_0	5	LAND	5	0.013
KOMATI RIVER GWS	Buildings	Stores	Vygeboom Office	Outbuildings	Water Purificaton	500005363_2	2	2	5	0.028

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
KOMATI RIVER GWS	WR: Water Treatment	Wastewater Treatment - Convent	Nooitgedacht Waste Water Treatment Works	Wastewater Treatment - Convent	not componentised	500006762_0	2	2	5	1.177
KOMATI RIVER GWS	WR: Water Treatment	Wastewater Treatment - Convent	Vygeboom Waste Water Treatment Works	Wastewater Treatment - Convent	not componentised	500006764_0	2	2	5	1.299
KOMATI RIVER GWS	WR: Water Treatment	Water Treatment -Conventional	Vygeboom Water Treatment Works	Water Treatment - Conventional	not componentised	500006763_0	2	3	5	0.748
KOMATI RIVER GWS	WR: Water Treatment	Water Treatment -Conventional	Nooitgedacht Water Treatment Works	Water Treatment - Conventional	not componentised	500007503_0	2	4	5	0.321
KWSAP GWS	WR: Pump stations	Pump Station	KWSAP pump station	Valves - Casing	KWSAP Duvha delivery butterfly valve 1 - casing	500010664_99	3	5	5	0.026
KWSAP GWS	WR: Pump stations	Pump Station	KWSAP pump station	Variable Speed Drives	KWSAP Duvha variable speed drive-1	500010664_131	3	5	5	0.380
KWSAP GWS	WR: Pump stations	Pump Station	KWSAP pump station	Variable Speed Drives	KWSAP Duvha variable speed drive-2	500010664_132	3	5	5	0.380
KWSAP GWS	WR: Pump stations	Pump Station	KWSAP pump station	Variable Speed Drives	KWSAP Duvha variable speed drive-3	500010664_133	3	5	5	0.380
KWSAP GWS	WR: Pump stations	Pump Station	KWSAP pump station	Auxilliary Equipment Pump Stat	KWSAP LV room ventilation	500010664_134	3	5	5	0.228
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.7	Canal Lining - TA3	Canal Lining	500005770_3	3	1	5	2.806
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.1	Canal Excavation	Canal excavation	500006461_0	3	2	5	0.627
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.1	Canal Lining - TA3	Canal Lining	500006461_1	3	2	5	1.243
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.1	Canal Service Road	Canal service road	500006461_2	3	2	5	0.382
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.1	Canal Berm	Canal berm	500006461_3	3	2	5	0.067
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.1	Canal Fencing	Canal Fence	500006461_4	3	2	5	0.197
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.7	Canal Excavation	Canal excavation	500005770_0	3	3	5	33.495
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.7	Canal Service Road	Canal service road	500005770_4	3	3	5	0.721
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.7	Canal Berm	Canal berm	500005770_5	3	3	5	0.183
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.2	Canal Excavation	Canal excavation	500006462_0	3	3	5	2.967
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.2	Canal Lining - TA3	Canal Lining	500006462_1	3	3	5	9.157
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.2	Canal Berm	Canal berm	500006462_3	3	3	5	0.242
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.2	Canal Service Road	Canal service road	500006462_5	3	3	5	2.357
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.4	Canal Lining - TA3	Canal Lining	500006473_1	3	3	5	4.682

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.4	Canal Berm	Canal berm	500006473_2	3	3	5	0.105
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.4	Canal Fencing	Canal Fence Righth	500006473_9	3	3	5	0.497
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.7	Canal Fencing	Canal Fence Left	500005770_1	3	4	5	0.048
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.7	Canal Fencing	Canal Fence Righth	500005770_2	3	4	5	0.048
MOOI RIVER GWS	WR: Canals	Canal Section	Boskop RB Prim Canal 1.2	Canal Fencing	Canal Fence	500006462_4	3	4	5	0.041
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 3	Canal Excavation	Canal excavation	500006333_0	3	2	5	47.329
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 3	Canal Lining - TA3	Canal Lining	500006333_1	3	2	5	20.389
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 3	Canal Meters	Measuring Facility	500006333_2	3	2	5	0.172
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 3	Canal Service Road	Canal service road	500006333_3	3	2	5	34.466
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 3	Canal Fencing	Canal Fence	500006333_4	3	2	5	0.547
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 3	Canal Berm	Canal berm	500006333_5	3	2	5	0.920
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 6	Canal Excavation	Canal excavation	500006380_0	3	2	5	4.156
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 6	Canal Fencing	Canal Fence Left	500006380_1	3	2	5	0.029
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 6	Canal Fencing	Canal Fence Righth	500006380_2	3	2	5	0.037
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 6	Canal Lining - TA3	Canal Lining	500006380_3	3	2	5	2.900

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 6	Canal Service Road	Canal service road	500006380_4	3	2	5	9.599
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 6	Canal Berm	Canal berm	500006380_5	3	2	5	0.018
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Excavation	Canal excavation	500006383_0	3	2	5	8.470
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Meters	Measuring Facility	500006383_1	3	2	5	0.172
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Bridges	Canal bridge	500006383_2	3	2	5	0.039
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Controls	Canal Controls - LW	500006383_3	3	2	5	0.156
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Fencing	Canal Fence Left	500006383_4	3	2	5	0.343
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Fencing	Canal Fence Righth	500006383_5	3	2	5	0.343
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Lining - TA3	Canal Lining	500006383_6	3	2	5	5.948
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Service Road	Canal service road	500006383_7	3	2	5	2.533
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 5	Canal Berm	Canal berm	500006383_8	3	2	5	0.023
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Excavation	Canal excavation	500007242_0	3	2	5	9.232
ORANGE RIVER	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Syphons	Canal syphon	500007242_1	3	2	5	0.029

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
(BOEGOEBERG DAM)										
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Controls	Canal Controls - LW	500007242_2	3	2	5	0.275
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Bridges	Canal bridge	500007242_3	3	2	5	0.301
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Outlets	Canal Outlet - Gate	500007242_4	3	2	5	0.035
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Berm	Canal berm	500007242_5	3	2	5	2.132
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Fencing	Canal Fence Left	500007242_6	3	2	5	0.108
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Fencing	Canal Fence Righth	500007242_7	3	2	5	0.108
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Lining - TA3	Canal Lining	500007242_8	3	2	5	6.360
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 4	Canal Service Road	Canal service road	500007242_9	3	2	5	0.801
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 8	Canal Excavation	Canal excavation	500007272_0	3	2	5	2.267
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 8	Canal Fencing	Canal Fence Left	500007272_1	3	2	5	0.052
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 8	Canal Fencing	Canal Fence Righth	500007272_2	3	2	5	0.052
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 8	Canal Lining - TA3	Canal Lining	500007272_3	3	2	5	2.005

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 8	Canal Service Road	Canal service road	500007272_4	3	2	5	0.182
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 8	Canal Berm	Canal berm	500007272_5	3	2	5	0.024
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Excavation	Canal excavation	500006385_0	3	3	5	63.300
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Controls	Canal Controls - Long weir1	500006385_1	3	3	5	0.095
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Berm	Canal berm	500006385_2	3	3	5	0.665
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Syphons	Canal Syphon - concrete pipe	500006385_3	3	3	5	0.096
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Bridges	Canal single vehicular bridge	500006385_4	3	3	5	0.117
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Bridges	Canal human bridge	500006385_5	3	3	5	0.123
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Fencing	Canal Fence Left	500006385_6	3	3	5	3.329
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Fencing	Canal Fence Right	500006385_7	3	3	5	2.953
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Lining - TA3	Canal Lining	500006385_8	3	3	5	19.791
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Bridges	Canal Bridge1	500006385_9	3	3	5	0.123
ORANGE RIVER	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Meters	Rapid gate	500006385_10	3	3	5	0.137

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
(BOEGOEBERG DAM)										
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Controls	Long Weir 2	500006385_11	3	3	5	1.375
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Syphons	Syphon1	500006385_12	3	3	5	0.198
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Controls	Long Weir3	500006385_13	3	3	5	0.095
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Syphons	Syphon 3	500006385_14	3	3	5	0.198
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Controls	longweir	500006385_15	3	3	5	0.054
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 1	Canal Service Road	Canal service road	500006385_16	3	3	5	53.494
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Gariep	Canal Excavation	Canal excavation	500006393_0	3	3	5	59.378
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Gariep	Canal Lining - TA3	Concrete lining of canal	500006393_1	3	3	5	51.742
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Gariep	Canal Meters	Canal Meter - partial	500006393_2	3	3	5	0.137
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Gariep	Canal Fencing	Canal Fence	500006393_3	3	3	5	1.793
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Gariep	Canal Berm	Canal berm	500006393_4	3	3	5	0.459
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Gariep	Canal Service Road	Canal service road	500006393_5	3	3	5	6.535

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Excavation	Canal excavation	500006396_0	3	3	5	0.352
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Lining - TA3	Canal Lining	500006396_1	3	3	5	12.302
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Meters	Measuring facility	500006396_2	3	3	5	0.137
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Controls	Canal Controls - sluice	500006396_3	3	3	5	0.095
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Syphons	Canal Syphon - syphon	500006396_4	3	3	5	0.108
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Service Road	Canal service road	500006396_5	3	3	5	3.579
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Fencing	Canal Fence Left	500006396_6	3	3	5	5.927
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Fencing	Canal Fence Righth	500006396_7	3	3	5	5.927
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 9	Canal Berm	Canal berm	500006396_8	3	3	5	0.084
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Noord_Oranje	Canal Excavation	Canal excavation	500006389_0	3	4	5	11.595
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Noord_Oranje	Canal Fencing	Canal Fence Left	500006389_1	3	4	5	0.015
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Noord_Oranje	Canal Fencing	Canal Fence Righth	500006389_2	3	4	5	0.015
ORANGE RIVER	WR: Canals	Canal Section	prim_Noord_Oranje	Canal Lining - TA3	Canal Lining	500006389_3	3	4	5	20.326

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
(BOEGOEBERG DAM)										
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Noord_Oranje	Canal Service Road	Canal service road	500006389_4	3	4	5	0.110
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	prim_Noord_Oranje	Canal Berm	Canal berm	500006389_5	3	4	5	0.035
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Excavation	Canal excavation	500007270_0	3	4	5	19.883
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Lining - TA3	Canal Lining	500007270_1	3	4	5	37.192
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Meters	Measuring facility	500007270_2	3	4	5	0.137
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Controls	Canal controls	500007270_3	3	4	5	0.054
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Berm	Canal berm	500007270_4	3	4	5	1.483
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Fencing	Canal Fence Left	500007270_5	3	4	5	2.316
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Fencing	Canal Fence Righ	500007270_6	3	4	5	2.316
ORANGE RIVER (BOEGOEBERG DAM)	WR: Canals	Canal Section	Prim Boegoeberg Canal 7	Canal Service Road	Canal service road	500007270_7	3	4	5	3.098
ORANGE RIVER GWS	WR: Canals	Canal Section	Teebus Canal	Canal Fencing	Canal Fence Left	500004749_1	4	3	5	0.166
ORANGE RIVER GWS	WR: Canals	Canal Section	Teebus Canal	Canal Berm	Canal berm	500004749_5	4	3	5	0.148
ORANGE RIVER GWS	WR: Canals	Canal Section	Teebus Canal	Canal Fencing	Canal Fence Righ	500004749_2	3	3	5	0.166

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
ORANGE VAAL (DOUGLAS CANALS)	Land	Canal Section	Louis Bosman 1	Land of pipelines, canals	"canal, pipe & tunnel servitudes"	500018148_0	5	LAND	5	0.850
TUGELA-VAAL GWS	Land	Workshops	Jagersrust Workshop Kilburn II PS	Land of Buildings	building servitudes	500018335_0	5	LAND	5	0.435
USUTU RIVER GWS	Land	Water Treatment -Conventional	Khutala Water Treatment Plant	Land of specialised buildings	specialized building servitude	500018648_0	5	LAND	5	0.043
USUTU RIVER GWS	WR: Pump stations	Pump Station	Kliphoek Booster Pump Station	Valves - Mechanism	Kliphoek Booster PS delivery valve 4 (gate)	500009054_70	3	3	5	1.019
USUTU RIVER GWS	WR: Steel Pipelines	Pipeline Section	Westoe to Jerico Pipeline A	Pipeline- Steel	Pipeline	500008206_0	5	3	5	16.571
USUTU RIVER GWS	WR: Steel Pipelines	Pipeline Section	Jericho - Onverwacht Pipeline A	Pipeline- Steel	Pipeline	500008226_0	5	4	5	257.938
USUTU RIVER GWS	WR: Steel Pipelines	Pipeline Section	Jericho - Onverwacht Pipeline B	Pipeline- Steel	Pipeline	500008788_0	5	4	5	257.386
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Outlet - Pipework- Steel	BOSSIESPRUIT outlet pipes	500009087_6	4	2	5	0.289
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Outlet - Pipework- Steel	BOSSIESPRUIT outlet pipes	500009087_9	4	2	5	0.293
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Auxilliary Equip. Main Damwall	Bossiespruit dam lighting	500009087_22	4	2	5	0.140
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Wall- 15m<Height<30m	Bossiespruit earth Embankment	500009087_1	4	3	5	99.157
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Wall- 15m<Height<30m	Bossiespruit Concrete	500009087_2	4	3	5	19.301
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Intake Gates - Casing	BOSSIESPRUIT - intake gate 2 - casing	500009087_7	4	3	5	0.220
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Intake Gates - Mechanism	BOSSIESPRUIT - intake gate 2 - mechanism	500009087_8	4	3	5	0.080
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Outlet Valves - Casing	BOSSIESPRUIT - outlet valve - casing	500009087_10	4	3	5	0.293
USUTU-VAAL GWS	WR: Dams	Main Damwall	BOSSIESPRUIT	Dam Outlet Valves - Mechanism	BOSSIESPRUIT - outlet valve - mechanism	500009087_11	4	3	5	0.107
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Outlet Valves - Casing	outlet butterfly valve 2 (1200mm)-casing	500009087_12	4	3	5	0.270
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Outlet Valves - Mechanism	Outlet butterfly valve 2 (1200mm) - mechanism	500009087_13	4	3	5	0.090
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Auxilliary Equip. Main Damwall	Bossiespruit dam crawl beam	500009087_14	4	3	5	0.140
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Wall- Height>60m	Bossiespruit dam right earth embankment	500009087_15	4	3	5	3.886
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	damwall drainage	Bossiespruit dam damwall drainage	500009087_16	4	3	5	0.539
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Electric Network	Bossiespruit dam electric network	500009087_17	4	3	5	1.313
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Meter & Instrumentation	Bossiespruit dam flow meter	500009087_18	4	3	5	0.182

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Auxilliary Equip. Main Damwall	Bossiespruit dam handrails	500009087_19	4	3	5	0.140
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Auxilliary Equip. Main Damwall	Bossiespruit dam hydraulic power pack 1	500009087_20	4	3	5	0.280
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Auxilliary Equip. Main Damwall	Bossiespruit dam hydraulic power pack 2	500009087_21	4	3	5	0.280
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Outlet Valves - Casing	Bossiespruit dam sleeve valve 1 - casing	500009087_23	4	3	5	0.104
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Outlet Valves - Casing	Bossiespruit dam sleeve valve 2 - casing	500009087_24	4	3	5	0.104
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Outlet Valves - Mechanism	Bossiespruit dam sleeve valve 1 - mechanism	500009087_25	4	3	5	0.035
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Dam Outlet Valves - Mechanism	Bossiespruit dam sleeve valve 2 - mechanism	500009087_26	4	3	5	0.035
USUTU-VAAL GWS	WR: Dams	Main Damwall	Bossiespruit Dam	Auxilliary Equip. Main Damwall	Bossiespruit dam staircases	500009087_27	4	3	5	0.175
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Rietfontein Pump Station	Control Valves - Casing	Rietfontein PS Control Valves - casing	500002402_4	4	2	5	1.591
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Rietfontein Pump Station	Valves - Mechanism	Rietfontein PS Control Valves - mechanism	500002402_5	4	2	5	0.745
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Rietfontein Pump Station	Control Valves - Mechanism	Rietfontein Pump Station control valve 1	500002402_99	3	2	5	0.228
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Flow Meter	Naauwpoort Booster Pump Station (PS) flow meters	500002131_41	3	3	5	0.076
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Control Valves - Mechanism	Naauwpoort Pump Station control valve 1	500002131_48	3	3	5	0.228
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Valves - Mechanism	Naauwpoort Pump Station suction valve 1	500002131_49	3	3	5	0.228
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Valves - Mechanism	Naauwpoort Pump Station discharge valve 1	500002131_50	3	3	5	0.228
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Rietfontein Pump Station	Valves - Mechanism	Rietfontein Pump Station suction valve 1	500002402_98	3	3	5	0.228
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Grootfontein Pump Station	Cooling & Lubricating Systems	Cooling Water Unit	500009182_103	3	3	5	0.304
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Rietfontein Pump Station	Cranes	Morris Crane 15t	500002402_93	3	4	5	1.058
VAALHARTS CANALS	Land	Workshops	Workshop 2	Land of Buildings	building servitudes	500015095_0	5	LAND	5	0.435
VAALHARTS CANALS	WR: Dams	Main Damwall	Vaalharts Dam	Dam Wall-Height>60m	Vaalharts damwall & spillway	500008737_27	5	4	5	65.655
VAN DER KLOOF	WR: Canals	Canal Balancing Dam (Large)	Ramah Dam 2	Canal Balancing Dam (Large)	Canal Balancing Dam (Large) - not componentised	500006488_0	4	3	5	45.627
VAN DER KLOOF	WR: Canals	Canal Balancing Dam (Large)	Ramah Dam 1	Canal Balancing Dam (Large)	Canal Balancing Dam (Large) - not componentised	500007316_0	4	3	5	54.253

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAN DER KLOOF	WR: Canals	Canal Section	Drain R2-D2	Canal Excavation	Canal excavation	500006163_0	3	2	5	5.980
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Excavation	Canal excavation	500006602_0	3	4	5	431.471
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Berm	Canal berm	500006602_1	3	4	5	0.744
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Bridges	Canal bridge	500006602_2	3	4	5	0.350
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Fencing	Canal Fence	500006602_3	3	4	5	1.565
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Lining - TA3	Canal Lining	500006602_4	3	4	5	108.947
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Service Road	Canal service road	500006602_5	3	4	5	1.210
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Syphons	Canal Syphon	500006602_6	3	4	5	0.615
VAN DER KLOOF	WR: Canals	Canal Section	van der Kloof	Canal Meters	Canal Meter	500006602_7	3	4	5	0.413
VAN DER KLOOF	WR: Canals	Canal Syphon (Large)	Ramah 2 S2	Canal Syphon (large)	Canal Syphon (large) - not componentised	500005892_0	2	3	5	8.481
VAN DER KLOOF	WR: Canals	Canal Syphon (Large)	Ramah 2 S1	Canal Syphon (large)	Canal Syphon (large) - not componentised	500006698_0	2	3	5	7.890
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS outlet isolating valve-2 - casing	500010409_146	3	5	5	0.650
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS outlet isolating valve-2 - mechanism	500010409_154	3	5	5	0.217
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop AW delivery non-return valve - casing	500010409_155	3	5	5	0.375
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Casing	Boschkop PS motor-2 - casing	500010409_162	3	5	5	0.136
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Casing	Boschkop PS motor-3 - casing	500010409_163	3	5	5	0.136
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Casing	Boschkop PS motor-4 (RH) - casing	500010409_164	3	5	5	0.136
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Casing	Boschkop PS motor-5 (RH) - casing	500010409_165	3	5	5	0.136
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Casing	Boschkop PS motor-6 (RH) - casing	500010409_166	3	5	5	0.136
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Rotor	Boschkop PS motor-2 - rotor	500010409_167	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Rotor	Boschkop PS motor-3 - rotor	500010409_168	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Rotor	Boschkop PS motor-4 (RH) - rotor	500010409_169	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Rotor	Boschkop PS motor-5 (RH) - rotor	500010409_170	3	5	5	0.045

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Rotor	Boschkop PS motor-6 (RH) - rotor	500010409_171	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Switchgear	Boschkop PS motor-1 - switchgear	500010409_172	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Switchgear	Boschkop PS motor-2 - switchgear	500010409_173	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Switchgear	Boschkop PS motor-3 - switchgear	500010409_174	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Switchgear	Boschkop PS motor-4 (RH) - switchgear	500010409_175	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Switchgear	Boschkop PS motor-5 (RH) - switchgear	500010409_176	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Electric Motor - Switchgear	Boschkop PS motor-6 (RH) - switchgear	500010409_177	3	5	5	0.045
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop AW delivery scour valve - casing	500010409_178	3	5	5	0.010
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS delivery valve-1 (LH) - casing	500010409_179	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS delivery valve-2 - casing	500010409_180	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS delivery valve-3 (LH) - casing	500010409_181	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS delivery valve-4 (RH) - casing	500010409_182	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS delivery valve-5 (RH) - casing	500010409_183	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS delivery valve-6 (RH) - casing	500010409_184	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS suction valve-2 (LH) - casing	500010409_186	3	5	5	0.334
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS suction valve-3 (LH) - casing	500010409_187	3	5	5	0.334
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS suction valve-4 (RH) - casing	500010409_188	3	5	5	0.334
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS suction valve-5 (RH) - casing	500010409_189	3	5	5	0.334
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Casing	Boschkop PS suction valve-6 (RH) - casing	500010409_190	3	5	5	0.334
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS delivery valve-1 (LH) - mechanism	500010409_191	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS delivery valve-2 - mechanism	500010409_192	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS delivery valve-3 (LH) - mechanism	500010409_193	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS delivery valve-4 (RH) - mechanism	500010409_194	3	5	5	0.069

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS delivery valve-5 (RH) - mechanism	500010409_195	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS delivery valve-6 (RH) - mechanism	500010409_196	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS suction valve-2 (LH) - mechanism	500010409_198	3	5	5	0.111
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS suction valve-3 (LH) - mechanism	500010409_199	3	5	5	0.111
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS suction valve-4 (RH) - mechanism	500010409_200	3	5	5	0.111
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS suction valve-5 (RH) - mechanism	500010409_201	3	5	5	0.111
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Valves - Mechanism	Boschkop PS suction valve-6 (RH) - mechanism	500010409_202	3	5	5	0.111
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Casing	Boschkop PS pump-1 - pump - casing	500010409_203	3	5	5	0.356
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Casing	Boschkop PS pump-2 - pump - casing	500010409_204	3	5	5	0.356
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Casing	Boschkop PS pump-3 - pump - casing	500010409_205	3	5	5	0.356
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Casing	Boschkop PS pump-4 (RH) - pump - casing	500010409_206	3	5	5	0.356
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Casing	Boschkop PS pump-5 (RH) - pump - casing	500010409_207	3	5	5	0.356
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Casing	Boschkop PS pump-6 (RH) - pump - casing	500010409_208	3	5	5	0.356
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Rotor	Boschkop PS pump-1 - pump - rotor	500010409_209	3	5	5	0.119
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Rotor	Boschkop PS pump-2 - pump - rotor	500010409_210	3	5	5	0.119
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Rotor	Boschkop PS pump-3 - pump - rotor	500010409_211	3	5	5	0.119
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Rotor	Boschkop PS pump-4 (RH) - pump - rotor	500010409_212	3	5	5	0.119
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Rotor	Boschkop PS pump-5 (RH) - pump - rotor	500010409_213	3	5	5	0.119
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop Abstraction Works	Pumpstation Pump - Rotor	Boschkop PS pump-6 (RH) - pump - rotor	500010409_214	3	5	5	0.119
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Valves - Casing	Boschkop PS intake isolating valve-4 - casing	500010464_122	3	5	5	0.254

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Valves - Mechanism	Boschkop PS intake isolating valve-4 - mechanism	500010464_128	3	5	5	0.085
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Control Valves - Casing	Boschkop PS Pump control valve-1 - casing	500010464_130	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Control Valves - Casing	Boschkop PS Pump control valve-2 - casing	500010464_131	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Control Valves - Mechanism	Boschkop PS Pump control valve-1 - mechanism	500010464_134	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Control Valves - Mechanism	Boschkop PS Pump control valve-2 - mechanism	500010464_135	3	5	5	0.069
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Pumpstation Pump - Casing	Boschkop PS booster pump-1 - pump - casing	500010464_138	3	5	5	0.855
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Pumpstation Pump - Casing	Boschkop PS booster pump-2 - pump - casing	500010464_139	3	5	5	0.855
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Pumpstation Pump - Casing	Boschkop PS booster pump-3 - pump - casing	500010464_140	3	5	5	0.855
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Pumpstation Pump - Casing	Boschkop PS booster pump-4 - pump - casing	500010464_141	3	5	5	0.855
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Cooling & Lubricating Systems	Boschkop high-lift PS primary cooling system-1	500010464_142	3	5	5	0.759
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Valves - Casing	Boschkop high-lift PS delivery valve-1 - casing	500010464_149	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Valves - Casing	Boschkop high-lift PS delivery valve-2 - casing	500010464_150	3	5	5	0.207
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Auxilliary Equipment Pump Stat	Boschkop High-Lift handrails	500010464_153	3	5	5	0.228
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Auxilliary Equipment Pump Stat	Boschkop High-Lift lighting	500010464_154	3	5	5	0.228
VRESAP GWS	WR: Pump stations	Pump Station	Boschkop High-lift Pump Station	Stores	Boschkop High-Lift PS store room	500010464_155	3	5	5	0.076
VRESAP GWS	WR: Steel Pipelines	Pipeline Section	River Bridge	Pipeline Section	River Bridge cathodic protection	500010458_2	3	3	5	0.080
VRESAP GWS	WR: Steel Pipelines	Pipeline Section	River Bridge	Pipeline bridge	River Bridge structure	500010458_3	3	3	5	1.507

3. FINANCIAL FORECAST

Table K.4A: Identified Scheme specific upgrades and new capital expenditure forecast

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	-	0.014	-	-	-	-	-	-	-	-
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	-	427.401	360.399	288.864	218.785	89.615	14.771	14.771	43.554	-
WR: Dams	-	147.080	9.054	-	-	-	-	-	-	-
WR: Power Supply	-	-	-	-	-	-	-	-	-	-
WR: Pump stations	-	11.248	-	-	3.259	-	10.620	-	-	-
WR: Reservoirs	-	-	-	-	-	-	-	-	-	-
WR: Roads and bridge	-	-	-	-	-	-	-	-	-	-
WR: Steel Pipelines	-	533.483	-	-	-	14.606	-	-	-	-
WR: Telemetry	-	-	-	-	-	-	-	-	-	-
WR: Tunnels	-	3.971	-	-	-	-	-	-	-	-
WR: Water Treatment	-	3.545	-	-	-	-	-	-	-	-
WS: borehole	-	-	-	-	-	-	-	-	-	-
WS: Measuring facility	-	-	-	-	-	-	-	-	-	-
Total	-	1 126.743	369.453	288.864	222.044	104.221	25.391	14.771	43.554	-

Table K.4B: Adjusted Scheme specific upgrades and new capital expenditure forecast

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	-	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	-	64.110	127.787	177.440	209.893	234.629	211.047	160.739	162.124	141.431
WR: Dams	-	22.062	26.729	25.457	22.466	19.747	15.833	10.710	9.294	7.111
WR: Power Supply	-	-	-	-	-	-	-	-	-	-
WR: Pump stations	-	1.687	1.940	1.822	2.088	2.125	3.943	4.063	4.269	3.837
WR: Reservoirs	-	-	-	-	-	-	-	-	-	-
WR: Roads and bridge	-	-	-	-	-	-	-	-	-	-
WR: Steel Pipelines	-	80.022	92.026	86.424	75.821	69.297	56.618	38.956	34.155	26.401
WR: Telemetry	-	-	-	-	-	-	-	-	-	-

Cost Component	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WR: Tunnels	-	0.596	0.685	0.643	0.564	0.494	0.395	0.267	0.231	0.177
WR: Water Treatment	-	0.532	0.612	0.574	0.504	0.441	0.353	0.238	0.207	0.158
WS: borehole	-	-	-	-	-	-	-	-	-	-
WS: Measuring facility	-	-	-	-	-	-	-	-	-	-
Total	-	169.011	249.781	292.363	311.337	326.734	288.191	214.974	210.281	179.115

Table K.5: Non-scheme specific upgrades and new capital expenditure forecast

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2017/18	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-	-	-

Table K.6: New and Upgrade Capital Projects per scheme

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Caledon Modder GWS	-	13.372	15.378	14.442	12.670	11.092	8.875	5.992	5.194	3.969
Harts River (Spitskop) GWS	-	-	-	-	-	-	-	-	-	-
Harts River (Wentzel Dam) GWS	-	-	-	-	-	-	-	-	-	-
Komati River GWS	-	0.534	0.614	0.577	0.506	0.443	0.354	0.239	0.207	0.158
Leeu River (Armenia Dam) GWS	-	-	1.143	2.515	2.743	3.430	3.155	2.387	2.206	1.791
Lesotho Highlands Water GWS	-	0.596	0.685	0.643	0.564	0.494	0.395	0.267	0.231	0.177
Loopspruit (Klipdrift dam) GWS	-	-	-	-	-	-	-	-	-	-
Middle Vaal GWS	-	-	-	-	-	-	-	-	-	-
Modder River GWS	-	-	-	-	-	-	-	-	-	-
Mooi River GWS	-	2.694	4.430	5.749	6.310	7.369	6.634	4.940	4.528	3.649
Moutloatsi Setlogelo Groothoek dam GWS	-	-	-	-	-	-	-	-	-	-
Namahadi (Fika Patso & Metsi Matso) GWS	-	-	-	-	-	-	-	-	-	-
Orange Riet Canal GWS	-	2.576	30.303	62.930	95.397	110.738	101.620	76.737	70.849	57.477

SCHEME NAME	Financial Year (Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Orange River - Boegoeberg GWS	-	25.012	31.716	33.324	33.392	34.966	33.226	29.404	33.635	31.971
Orange River GWS	-	0.021	0.024	0.023	0.020	0.017	0.014	0.009	0.008	0.006
Orange River Kakamas GWS	-	2.088	4.388	6.626	7.521	8.873	8.015	5.983	5.491	4.430
Orange River- Upington Islands GWS	-	-	4.459	9.185	9.920	18.109	18.258	14.681	22.616	24.890
Orange Vaal-Douglas GWS	-	1.679	5.742	10.332	11.978	17.383	16.668	12.976	12.166	10.004
Rhenoster River (Koppies, Roodepoort and Weltevrede Dams) GWS	-	-	-	-	-	-	-	-	-	-
Riet River (Kalkfontein Dam) GWS	-	-	5.801	7.730	7.633	7.199	5.967	4.158	3.673	2.860
Sand-Vet (Erfenis and Allemanskraal Dams) GWS	-	-	2.985	3.582	3.433	6.579	6.693	5.412	5.167	4.315
Schoonspruit GWS	-	-	1.499	2.100	2.708	2.897	2.528	1.838	1.664	1.325
Slang River (Zaaihoek Dam) GWS	-	-	-	-	-	-	-	-	-	-
Sterkspruit River (Jazanashoek Dam) GWS	-	-	-	-	-	-	-	-	-	-
Taung (Taung Dam)	-	-	-	-	-	-	-	-	-	-
ThabaN'chu (Sediba, Feloana, Woodbridge, Rooifontein and Serowalo) Dams	-	-	-	-	-	-	-	-	-	-
Tugela-Vaal GWS	-	-	-	-	-	-	-	-	-	-
Usutu River GWS	-	79.861	91.840	86.250	75.668	66.241	53.006	35.787	31.019	23.705
Usutu Vaal Phase 2 GWS	-	-	-	-	-	-	-	-	-	-
Usutu-Vaal GWS	-	6.110	7.026	6.598	5.789	5.068	4.055	2.738	2.373	1.814
Vaal Dam GWS	-	-	-	-	-	-	-	-	-	-
Vaalharts GWS	-	2.955	3.398	3.191	2.799	2.451	1.961	1.324	1.148	0.877
Van Der Kloof GWS	-	30.040	36.658	34.977	30.891	27.168	21.789	14.742	12.795	9.791
VRESAP GWS	-	1.376	1.582	1.486	1.303	1.141	0.913	0.616	0.534	0.408
Wittespruit (Egmont Dam) GWS	-	-	-	-	-	-	-	-	-	-
KWSAP (Komati Water Scheme Augmentation Project) GWS	-	0.104	0.120	0.113	0.099	0.087	0.069	0.047	0.041	0.031
Subtotal	-	169.016	249.789	292.372	311.345	331.742	294.197	220.278	215.545	183.650
Non-scheme Specific	-	-	-	-	-	-	-	-	-	-
Total	-	169.011	249.781	292.363	311.337	326.734	288.191	214.974	210.281	179.115

APPENDIX L – Asset Impairment, Disposal, Disposal Strategy and Cost Forecast

1 INTRODUCTION

This Appendix covers the: asset disposal strategy; impaired assets; under-utilised or not-in-use assets; as well as assets to be disposed of.

2 DISPOSAL STRATEGY

Refer to the DWS Disposal Strategy for Immovable Assets.

3 IMPAIRED ASSETS

Table L.1: Impaired asset components

Asset facility Category	Impaired Asset Components					
	Cluster Total		Scheme Specific		Non-Scheme Specific	
	No.	CRC (R million)	No.	CRC (R million)	No.	CRC (R million)
Buildings	81	85.04	81	85.04	-	-
WS: borehole	-	-	-	-	-	-
WR: Canals	108	69.13	108	69.13	-	-
WR: Dams	22	81.67	22	81.67	-	-
WR: Power Supply	11	4.59	11	4.59	-	-
WR: Pump stations	59	49.78	59	49.78	-	-
WR: Reservoirs	8	26.16	8	26.16	-	-
WR: Roads and bridge	-	-	-	-	-	-
WR: Steel Pipelines	3	28.12	3	28.12	-	-
WR: Telemetry	-	-	-	-	-	-
WR: Tunnels	20	23.47	20	23.47	-	-
WR: Water Treatment	3	1.36	3	1.36	-	-
WS: Measuring facilities	44	217.04	8	31.94	36	185.10
Total	359	586.36	323	401.26	36	185.10

Table L.2: Impaired asset components (based on zero asset carrying values) per scheme and per facility category

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
CALEDON-MODDER GWS	WR: Steel Pipelines	Pipeline Section	Tienfontein Rising Main	Pipeline- Steel	Pipeline	500009508_0	5	3	10.49
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Leeudoring Spruit @ Klipspruit	Hydrological Station	not componentised	500001293_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Skoon Spruit @ Goedgenoeg	Hydrological Station	not componentised	500001294_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Blesbok Spruit @ Heidelberg	Hydrological Station	not componentised	500001298_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Blesbok Spruit @ Vlakfontein	Hydrological Station	not componentised	500001304_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Blesbok Spruit @ Welgedacht	Hydrological Station	not componentised	500001315_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Klip River@At Concrete Bridge @ Sterkfontein	Hydrological Station	not componentised	500001749_0	4	3	6.49
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Wonderfontein-@Spruit 7 @ Gembokfontein	Hydrological Station	not componentised	500001757_0	4	3	5.92
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Makwassie Spruit @ Vliegekraal	Hydrological Station	not componentised	500001759_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Klip River @ Witkop	Hydrological Station	not componentised	500001767_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Blesbok Spruit @ Grootvlei Mine	Hydrological Station	not componentised	500001768_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Blesbok Spruit @ Nigel East	Hydrological Station	not componentised	500001771_0	4	3	5.82
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	A2H051 Krokodil River @ Van Wyks Restant	Hydrological Station	not componentised	500001179_0	2	1	1.43
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	A3H015 Doornfontein-Eye @ Doornfontein	Hydrological Station	not componentised	500001193_0	2	1	6.49
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Buffelshoek-Eye @ Buffelshoek	Hydrological Station	not componentised	500001685_0	2	1	6.49
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	Stinkhoutboom-Eye @ Stinkhoutboom	Hydrological Station	not componentised	500001686_0	2	1	6.49
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	A3H022 Malmanielloop@Lower-Eye @ Paardenvallei	Hydrological Station	not componentised	500001687_0	2	1	8.39
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	A2H116 Crocodile River @ Haakdongdrift	Hydrological Station	not componentised	500006686_0	2	1	1.20
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	A2H014 Hennops River @ Skurweberg	Hydrological Station	not componentised	500001667_0	2	3	3.35
HYDOMETRY GAUTENG	WS: Measuring facility	Hydrological Station	A2H057 Skinner Spruit @ Daspoort Pretoria	Hydrological Station	not componentised	500001677_0	2	4	1.60
HYDOMETRY GAUTENG	WS: Measuring facility	Meteorological Station	Rodepoort @ Warmbad Dam	Meteorological Station	not componentised	500001062_0	1	3	0.22
HYDOMETRY GAUTENG	WS: Measuring facility	Meteorological Station	Kroondal @ Rustenburg	Meteorological Station	not componentised	500001583_0	1	3	0.22

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
HYDROMETRY NORTHERN CAPE	WS: Measuring facility	Hydrological Station	D4H006 Kuruman-Eye B @ Kuruman	Hydrological Station	not componentised	500001434_0	3	2	3.05
HYDROMETRY NORTHERN CAPE	WS: Measuring facility	Hydrological Station	Aslaagte-Eye @ Lichtenburg	Hydrological Station	not componentised	500001357_0	3	3	5.82
HYDROMETRY NORTHERN CAPE	WS: Measuring facility	Hydrological Station	C9H023 Vaal River @ Schmidtsdrif	Hydrological Station	not componentised	500001415_0	3	3	5.82
HYDROMETRY NORTHERN CAPE	WS: Measuring facility	Hydrological Station	C9H014 Danielskuil 1 @ Danielskuil	Hydrological Station	not componentised	500007525_0	2	2	3.05
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Vals River @ Mooifontein	Hydrological Station	not componentised	500001396_0	4	3	7.06
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Wilge River @ Harrismith	Hydrological Station	not componentised	500001404_0	4	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Meul River @ Claremont	Hydrological Station	not componentised	500001405_0	4	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Liebenbergsvlei @ River @ Vogelfontein 69	Hydrological Station	not componentised	500001409_0	4	3	7.25
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Vaalbank Spruit-West @ Vaalbank 327	Hydrological Station	not componentised	500001834_0	4	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Matjiesfontein River @ Menin	Hydrological Station	not componentised	500001839_0	4	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Caledon River @ Pleasant View	Hydrological Station	not componentised	500001425_0	1	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Caledon River @ Wilgedraai	Hydrological Station	not componentised	500001429_0	1	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Modder River @ Mazelspoort	Hydrological Station	not componentised	500001814_0	1	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Kgabanyane River @ Dankbaar	Hydrological Station	not componentised	500001817_0	1	3	5.82
HYDROMETRY FREE STATE	WS: Measuring facility	Hydrological Station	Little Modder River @ Kromdraai	Hydrological Station	not componentised	500001819_0	1	3	5.82
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Caledon North Dewatering Shaft	Tunnel Shaft	Caledon Dewatering Ventilation	500000196_1	3	3	2.81
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Caledon North Dewatering Shaft	Tunnel Shaft	Caledon 3x 250mm Dewatering pipe valves	500000196_3	3	3	1.69
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Caledon North Dewatering Shaft	Tunnel Shaft	Caledon Butterfly Valve - mechanism	500000196_7	3	3	0.55
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Little Caledon De- watering Shaft	Tunnel Shaft	Little Caledon Dewatering Ventilation	500000199_1	3	3	2.81

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Little Caledon De- watering Shaft	Tunnel Shaft	Little Caledon Dewatering - Fencing	500000199_4	3	3	1.00
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Little Caledon De- watering Shaft	Tunnel Shaft	Little Caledon 3x 250mm Dewatering pipe valves	500000199_6	3	3	1.69
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Little Caledon De- watering Shaft	Tunnel Shaft	Little Caledon Butterfly Valve -1 - mechanism	500000199_10	3	3	0.82
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Shaft	Little Caledon De- watering Shaft	Tunnel Shaft	Little Caledon Butterfly Valve -2 - mechanism	500000199_12	3	3	0.82
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Access (Addit)	Caledon North Adit	Tunnel Access (addit)	Caledon North Adit	500000220_0	3	3	1.54
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Access (Addit)	Little Caledon Adit North	Tunnel Access (addit)	Little Caledon North Adit	500000221_0	3	3	1.54
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Access (Addit)	Little Caledon Adit North	Tunnel Access (addit)	Little Calidon North Adit - fence	500000221_2	3	3	1.13
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Section	Little Caledon Bypass	Tunnel valves	Caledon Bypass - butterfly valve -1 - mechanism	500000222_4	3	3	1.65
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Section	Little Caledon Bypass	Tunnel valves	Caledon Bypass - butterfly valve -2 - mechanism	500000222_6	3	3	1.65
LESOTHO HIGHLANDS WATER GWS	WR: Tunnels	Tunnel Section	Little Caledon Bypass	Building Fencing	Little Caledon Bypass - fence	500000222_2	3	4	1.13
LESOTHO HIGHLANDS WATER GWS	WS: Measuring Facili	Hydrological Station	Ash River Outfall - Measuring Station	Measuring Facility - Instrumen	Ash River Outfall - Measuring Instrumentation	500000217_2	4	5	1.70
MODDER RIVER	Buildings	Residential Housing	Krugersdrift Residential 10	Main Building	Main building	500008171_0	3	1	1.37
MODDER RIVER	Buildings	Residential Housing	Krugersdrift Residential 11	Main Building	Main building	500008172_0	3	1	1.37
MODDER RIVER	Buildings	Residential Housing	Krugersdrift Residential 12	Main Building	Main building	500008173_0	3	1	1.37
MODDER RIVER	Buildings	Residential Housing	Krugersdrift Residential 13	Main Building	Main building	500008174_0	3	1	1.37
MODDER RIVER	Buildings	Hostels / Flats / Compounds	Krugersdrift Dam Single quarters	Main Building	Main building	500008705_0	3	1	1.82
MODDER RIVER	Buildings	Residential Housing	Krugersdrift Residential 9	Main Building	Main building	500008706_0	3	1	1.37
MODDER RIVER	Buildings	Residential Housing	Krugersdrift Residential 14	Main Building	Main building	500008721_0	3	1	1.37

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit P26B	Main Building	Main building	500006967_0	2	3	0.64
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit P26D	Main Building	Main building	500006968_0	2	3	0.64
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit 26C	Main Building	Main building	500007667_0	2	3	0.64
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 7	Main Building	Main building	500008361_0	3	1	0.88
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 7	Outbuildings	Water Stand	500008361_1	3	1	0.11
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 9	Main Building	Main building	500008363_0	3	1	0.88
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 9	Outbuildings	Water Stand	500008363_1	3	1	0.11
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 10	Main Building	Main building	500008364_0	3	1	0.88
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 10	Outbuildings	Water Stand	500008364_1	3	1	0.11
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 New Canal House 5	Main Building	Main building	500008909_0	3	1	0.88
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 11	Main Building	Main building	500008914_0	3	1	0.88
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 5	Main Building	Main building	500008913_0	3	2	0.88
ORANGE RIET CANAL	WR: Pump stations	Pump Station	Scheiding Pump Station	Valves - Casing	Control Valves - casing	500009513_14	2	4	0.00
ORANGE RIVER (UPINGTON ISLANDS)	Buildings	Hostels / Flats / Compounds	Upington Single Quarters	Main Building	Main building	500008817_0	1	3	1.05
ORANGE RIVER GWS	WR: Dams	Dam Hydropower	Teebus Hydropower	Garage & Carports	Carport for 5 cars	500009859_1	4	4	0.84
ORANGE RIVER GWS	WR: Power Supply	Tunnel Controls	Teebus Hydropower	Power Supply Switchgear	Electric Control Switch Gear 1	500009859_2	4	1	0.18
ORANGE RIVER GWS	WR: Power Supply	Tunnel Controls	Teebus Hydropower	Power Supply Switchgear	Electric Control Switch Gear 2	500009859_3	4	1	0.18
ORANGE RIVER GWS	WR: Power Supply	Tunnel Controls	Teebus Hydropower	Power Supply Switchgear	Electric Control Switch Gear 3	500009859_4	4	1	0.18
ORANGE RIVER GWS	WR: Power Supply	Dam Hydropower	Teebus Hydropower	Dam Intake Gates - Casing	Turbine	500009859_5	4	1	0.68
ORANGE RIVER GWS	WR: Power Supply	Dam Hydropower	Teebus Hydropower	Dam Intake Gates - Mechanism	Intake Gate 2	500009859_10	4	4	0.45
ORANGE RIVER GWS	WR: Power Supply	Dam Hydropower	Teebus Hydropower	Building Fencing	Fence wired	500009859_12	4	4	1.09

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
ORANGE RIVER GWS	WR: Power Supply	Dam Hydropower	Teebus Hydropower	Cranes	Crane 8 ton Turbine Room	500009859_23	4	4	0.24
ORANGE RIVER GWS	WR: Power Supply	Dam Hydropower	Teebus Hydropower	Cranes	Crane 1.8 ton Pepperpot 16	500009859_32	4	4	0.63
ORANGE RIVER GWS	WR: Power Supply	Dam Hydropower	Teebus Hydropower	Cranes	Crane 1.5 ton Pepperpot Access Tunnel	500009859_33	4	4	0.26
ORANGE RIVER GWS	WR: Pump stations	Pump Station	Vanderkloof Raw Water Pump Station	Valves - Casing	Suction Valves - casing	500009189_1	2	4	0.00
ORANGE RIVER GWS	WR: Tunnels	Tunnel Section	Teebus Tunnel Outlet	Tunnel valves	De Watering Gate with Operating Mechanism 3	500009791_5	2	4	0.28
ORANGE RIVER GWS	WR: Tunnels	Tunnel Section	Teebus Tunnel Outlet	Tunnel valves	De Watering Gate with Operating Mechanism 4	500009791_6	2	4	0.28
ORANGE RIVER GWS	WR: Tunnels	Tunnel Section	Teebus Tunnel Outlet	Tunnel valves	De Watering Gate with Operating Mechanism 5	500009791_7	2	4	0.28
ORANGE RIVER GWS	WR: Tunnels	Tunnel Section	Teebus Tunnel Outlet	Tunnel valves	De Watering Gate with Operating Mechanism 6	500009791_8	2	4	0.28
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Casing	Nottingham PS discharge gate valve 2 - casing	500009512_55	3	3	0.11
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Casing	Nottingham PS discharge gate valve 3 - casing	500009512_56	3	3	0.11
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Casing	Nottingham PS discharge gate valve 4 - casing	500009512_57	3	3	0.11
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Casing	Nottingham PS discharge gate valve 5 - casing	500009512_58	3	3	0.11
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Casing	Nottingham PS discharge gate valve 6 - casing	500009512_59	3	3	0.11
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Mechanism	Nottingham PS discharge gate valve 2 - mechanism	500009512_60	3	3	0.04
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Mechanism	Nottingham PS discharge gate valve 3 - mechanism	500009512_61	3	3	0.04
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Mechanism	Nottingham PS discharge gate valve 4 - mechanism	500009512_62	3	3	0.04
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Mechanism	Nottingham PS discharge gate valve 5 - mechanism	500009512_63	3	3	0.04

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
ORANGE VAAL (DOUGLAS CANALS)	WR: Pump stations	Pump Station	Nottingham Pump Station	Gate Valves - Mechanism	Nottingham PS discharge gate valve 6 - mechanism	500009512_64	3	3	0.04
RHENOSTER RIVER	Buildings	Garage & Carports	Sand-Vet GWS Double Garage	Outbuildings	Garage & Carports	500010053_0	4	2	0.95
RHENOSTER RIVER	Buildings	Residential Housing	Koppies Dam Residential 3	Main Building	Main building	500021628_0	3	1	1.81
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 1	Main Building	Main building	500007955_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 2	Main Building	Main building	500007956_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 3	Main Building	Main building	500007957_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 4	Main Building	Main building	500007959_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 5	Main Building	Main building	500007960_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 6	Main Building	Main building	500007961_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 7	Main Building	Main building	500007962_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 8	Main Building	Main building	500008490_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 9	Main Building	Main building	500008491_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 10	Main Building	Main building	500008492_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 11	Main Building	Main building	500008493_0	1	1	0.49
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 15	500009794_0	1	1	0.35
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 16	500009795_0	1	1	0.35
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 17	500009796_0	1	1	0.35
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 18	500009797_0	1	1	0.35
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 19	500009875_0	1	1	0.35
RHENOSTER RIVER	Buildings	Hostels / Flats / Compounds	Koppies Dam Hostel 1	Hostels / Flats / Compounds	Main building	500021624_0	1	1	1.40
RHENOSTER RIVER	Buildings	Hostels / Flats / Compounds	Koppies Dam Hostel 2	Hostels / Flats / Compounds	Main building	500021625_0	1	1	1.76
RHENOSTER RIVER	Buildings	Hostels / Flats / Compounds	Koppies Dam Hostel 3	Hostels / Flats / Compounds	Main building	500021627_0	1	1	1.76
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Lining - TA3	Canal Lining	500005000_3	3	1	2.06

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 1	Canal Service Road	Canal service road	500005005_3	3	2	0.46
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 2	Canal Service Road	Canal service road	500005007_2	3	2	0.69
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 4	Canal Service Road	Canal service road	500005009_2	3	2	0.21
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Service Road	Canal service road	500005013_2	3	2	0.32
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Service Road	Canal service road	500005014_3	3	2	0.61
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 7	Canal Service Road	Canal service road	500005016_2	3	2	0.45
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Service Road	Canal service road	500005025_4	3	2	0.00
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Service Road	Canal service road	500006214_5	3	2	0.08
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Service Road	Canal service road	500006244_4	3	2	0.63
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Lining - TA3	Canal Lining	500001544_3	3	3	0.02
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Lining - TA3	Canal Lining	500001545_3	3	3	0.72
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 1	Canal Outlets	Canal Outlets - sluice	500005005_2	3	3	0.04
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 4	Canal Bridges	Canal bridge	500005009_4	3	3	0.14
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Lining - TA3	Canal Lining	500005030_1	3	3	0.47
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Meters	Measuring Facility	500006214_2	3	3	0.17
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Outlets	Canal Outlets - sluice	500006214_3	3	3	0.04
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Controls	Canal Controls - LW	500006214_4	3	3	0.27
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 5	Canal Syphons	Canal syphon	500006217_2	3	3	0.47
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Lining - TA3	Canal Lining	500000964_3	3	4	0.42
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Lining - TA3	Canal Lining	500000966_3	3	4	0.16
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Lining - TA3	Canal Lining	500000967_3	3	4	0.15
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Lining - TA3	Canal Lining	500000968_3	3	4	0.47
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Berm	Canal berm	500000968_5	3	4	0.26
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Lining - TA3	Canal Lining	500000970_3	3	4	0.84

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Berm	Canal berm	500000970_5	3	4	0.07
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Lining - TA3	Canal Lining	500001539_3	3	4	0.11
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Lining - TA3	Canal Lining	500001540_3	3	4	0.57
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Lining - TA3	Canal Lining	500001541_3	3	4	0.28
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Lining - TA3	Canal Lining	500001542_3	3	4	0.50
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Berm	Canal berm	500001542_5	3	4	0.13
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Lining - TA3	Canal Lining	500001543_3	3	4	0.28
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Berm	Canal berm	500001545_5	3	4	0.14
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Berm	Canal berm	500005000_5	3	4	0.37
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 1	Canal Lining - TA3	Canal Lining	500005005_1	3	4	0.73
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 1	Canal Berm	Canal berm	500005005_4	3	4	0.04
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 1	Canal Fencing	Canal Fence Left	500005005_5	3	4	0.37
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 1	Canal Fencing	Canal Fence Righth	500005005_6	3	4	0.37
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 2	Canal Lining - TA3	Canal Lining	500005007_1	3	4	1.73
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 2	Canal Fencing	Canal Fence Left	500005007_3	3	4	0.36
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 2	Canal Berm	Canal berm	500005007_4	3	4	0.21
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 4	Canal Lining - TA3	Canal Lining	500005009_1	3	4	1.23
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 4	Canal Berm	Canal berm	500005009_5	3	4	0.03
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Excavation	Canal excavation	500005013_0	3	4	1.16
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Lining - TA3	Canal Lining	500005013_1	3	4	0.55
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Fencing	Canal Fence Left	500005013_3	3	4	0.10
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Fencing	Canal Fence Righth	500005013_4	3	4	0.10
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Berm	Canal berm	500005013_5	3	4	0.12
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Excavation	Canal excavation	500005014_0	3	4	1.30

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Lining - TA3	Canal Lining	500005014_1	3	4	0.61
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Fencing	Canal Fence Left	500005014_2	3	4	0.06
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Berm	Canal berm	500005014_4	3	4	0.17
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 7	Canal Lining - TA3	Canal Lining	500005016_1	3	4	0.53
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 7	Canal Fencing	Canal Fence Left	500005016_3	3	4	0.24
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 7	Canal Fencing	Canal Fence Righth	500005016_4	3	4	0.24
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 7	Canal Berm	Canal berm	500005016_5	3	4	0.09
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 8	Canal Lining - TA3	Canal Lining	500005018_1	3	4	0.37
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 8	Canal Berm	Canal berm	500005018_4	3	4	0.42
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 2	Canal Lining - TA3	Canal Lining	500005022_1	3	4	1.36
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Excavation	Canal excavation	500005025_0	3	4	0.12
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Berm	Canal berm	500005025_2	3	4	0.02
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Fencing	Canal Fence Left	500005025_3	3	4	0.00
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Fencing	Canal Fence Left	500005030_2	3	4	0.13
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Fencing	Canal Fence Righth	500005030_3	3	4	0.13
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Berm	Canal berm	500005030_5	3	4	0.17
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Lining - TA3	Canal Lining	500005031_1	3	4	0.52
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Fencing	Canal Fence Left	500005031_2	3	4	0.12
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Fencing	Canal Fence Righth	500005031_3	3	4	0.12
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Berm	Canal berm	500005031_5	3	4	0.10
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Lining - TA3	Canal Lining	500006208_3	3	4	0.48
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Lining - TA3	Canal Lining	500006209_3	3	4	0.12
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Lining - TA3	Canal Lining	500006210_3	3	4	0.30
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Berm	Canal berm	500006210_5	3	4	0.12

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Lining - TA3	Canal Lining	500006214_1	3	4	3.48
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Fencing	Canal Fence Left	500006214_6	3	4	0.04
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Fencing	Canal Fence Righth	500006214_7	3	4	0.04
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Berm	Canal berm	500006214_8	3	4	0.12
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 5	Canal Lining - TA3	Canal Lining	500006217_1	3	4	0.52
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 5	Canal Fencing	Canal Fence Left	500006217_3	3	4	0.16
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 5	Canal Fencing	Canal Fence Righth	500006217_4	3	4	0.16
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 5	Canal Berm	Canal berm	500006217_6	3	4	0.16
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 6	Canal Lining - TA3	Canal Lining	500006229_1	3	4	1.36
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 6	Canal Fencing	Canal Fence Left	500006229_2	3	4	0.23
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 6	Canal Fencing	Canal Fence Righth	500006229_3	3	4	0.23
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 6	Canal Berm	Canal berm	500006229_5	3	4	0.06
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Lining - TA3	Canal Lining	500006240_1	3	4	0.42
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Berm	Canal berm	500006240_4	3	4	0.08
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 3	Canal Lining - TA3	Canal Lining	500006242_1	3	4	0.04
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Excavation	Canal excavation	500006244_0	3	4	1.99
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Lining - TA3	Canal Lining	500006244_1	3	4	1.71
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Fencing	Canal Fence Left	500006244_2	3	4	0.03
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Fencing	Canal Fence Righth	500006244_3	3	4	0.03
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Berm	Canal berm	500006244_5	3	4	0.08
RHENOSTER RIVER	WR: Dams	Main Damwall	Roodepoortdam	Dam Wall- 15m<Height<30m	Roodepoort Earth Embankment	500008922_1	2	2	11.33
RHENOSTER RIVER	WR: Dams	Main Damwall	Roodepoortdam	Dam Spillway	Roodepoort- spillway	500008922_2	2	3	23.21
RHENOSTER RIVER	WR: Dams	Main Damwall	Roodepoortdam	Dam Outlet - Pipework- Steel	Roodepoortdam outlet pipes	500008922_3	2	4	0.04
RHENOSTER RIVER	WR: Dams	Main Damwall	Roodepoortdam	Dam Outlet Valves - Casing	Roodepoortdam - outlet valve - casing	500008922_4	2	4	0.04

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
RHENOSTER RIVER	WR: Dams	Main Damwall	Roodepoortdam	Dam Outlet Valves - Mechanism	Roodepoortdam - outlet valve - mechanism	500008922_5	2	4	0.02
RHENOSTER RIVER	WR: Water Treatment	Water Treatment -Conventional	Koppies Dam	Water Treatment - Conventional	not componentised	500009195_0	2	1	0.28
RHENOSTER RIVER	WR: Water Treatment	Wastewater Treatment - Convent	Koppies Dam	Wastewater Treatment - Convent	not componentised	500009517_0	2	2	0.48
RIET RIVER	WS: Measuring facility	Hydrological Station	Riet River @ Kalkfontein	Hydrological Station	not componentised	500001820_0	1	3	5.82
RIET RIVER	WS: Measuring facility	Hydrological Station	Riet River @ Kalkfontein	Hydrological Station	not componentised	500001821_0	1	3	5.82
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement house 10	Main Building	Main Building	500010162_0	4	3	4.48
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement House 15	Main Building	Main Building	500010166_0	4	3	4.42
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement house 14	Main Building	Main Building	500010168_0	4	3	4.85
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement house 4	Main Building	Main Building	500010246_0	4	3	4.53
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 1	Main Building	Main building	500008181_0	3	1	0.88
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 2	Main Building	Main building	500008182_0	3	1	0.88
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 3	Main Building	Main building	500008183_0	3	1	0.88
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 5	Main Building	Main building	500008184_0	3	1	0.88
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 4	Main Building	Main building	500008726_0	3	1	0.88
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 7	Main Building	Main building	500008727_0	3	1	0.88
SAND-VET GWS	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 11	Outbuildings	Water Stand	500008914_1	3	1	0.11
SAND-VET GWS	Buildings	Residential Housing	Allemanskraal Dam Residential 4	Main Building	Main building	500008729_0	3	2	0.88
SAND-VET GWS	Buildings	Residential Housing	Allemanskraal Residential 5	Main Building	Main building	500008730_0	3	2	0.88
SAND-VET GWS	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 5	Outbuildings	Water Stand	500008913_1	3	2	0.11
SAND-VET GWS	WR: Dams	Main Damwall	ERFENISDAM	Dam Outlet - Pipework- Steel	ERFENISDAM outlet pipes	500008923_5	4	1	0.96
SLANG RIVER GWS	Buildings	Hostels / Flats / Compounds	Zaaihoek Single Quarters	Main Building	Zaaihoek Single Quarters	500000155_0	2	3	1.88

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Spillway	Rooifontein Dam: Spillway	500009094_3	3	1	6.75
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Wall- 15m<Height<30m	Rooifontein Dam: Earth Embankment	500009094_4	3	1	0.79
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Outlet - Pipework- Steel	ROOIFONTEIN DAM outlet pipes	500009094_5	3	3	0.06
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Outlet Valves - Casing	ROOIFONTEIN DAM - outlet valve - casing	500009094_6	3	3	0.06
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Outlet Valves - Mechanism	ROOIFONTEIN DAM - outlet valve - mechanism	500009094_7	3	3	0.02
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Outlet - Pipework- Steel	SEROWALO outlet pipes	500009108_5	2	1	0.02
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Outlet Valves - Casing	SEROWALO - outlet valve - casing	500009108_6	2	1	0.02
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Spillway	Seroalo Dam: Spillway	500009108_3	2	2	16.40
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Wall- 15m<Height<30m	Seroalo Dam: Earth Embankment	500009108_4	2	2	12.86
TUGELA-VAAL GWS	Buildings	Residential Housing	Jagersrust Guard House	Main Building	Main Building	500010062_0	4	2	0.13
TUGELA-VAAL GWS	Buildings	Residential Housing	Woodstock Guard House	Main Building	Main Building	500010063_0	4	3	0.41
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Excavation	Canal excavation	500008455_0	3	3	3.35
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Berm	Canal berm	500008455_1	3	3	17.70
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Bridges	Canal bridge	500008455_2	3	3	1.08
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Fencing	Canal Fence	500008455_3	3	3	0.57
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Lining - TA2	Canal Lining	500008455_4	3	3	4.11
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Meters	Measuring facilities	500008455_5	3	3	0.17
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Wall- 15m<Height<30m	Putterill Weir: Concrete	500009008_1	4	1	7.52
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Intake Gates - Casing	Putterill weir - intake gate - casing	500009008_2	3	1	0.16
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Intake Gates - Mechanism	Putterill weir - intake gate - mechanism	500009008_3	3	1	0.06
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Outlet - Pipework- Steel	Putterill weir outlet pipes	500009008_4	3	1	0.22
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Outlet Valves - Casing	Putterill weir - outlet valve - casing	500009008_5	3	1	0.22

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Outlet Valves - Mechanism	Putterill weir - outlet valve - mechanism	500009008_6	3	1	0.08
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Mechanism	Qwaqwa PS inlet valve 2mechanism	500019834_8	4	1	0.24
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Mechanism	Qwaqwa PS inlet valve 3mechanism	500019834_10	4	1	0.24
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Mechanism	Qwaqwa PS discharge valve 1mechanism	500019834_12	4	1	0.40
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Mechanism	Qwaqwa PS discharge valve 2mechanism	500019834_14	4	1	0.40
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Cranes	Qwaqwa PS cranes	500019834_35	4	1	0.87
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Network	Qwaqwa PS electric network	500019834_1	3	1	0.89
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Auxilliary Equipment Pump Stat	Qwaqwa PS auxilliary equipment	500019834_3	3	1	0.94
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Rotor	Qwaqwa Pump Motor 1 rotor	500019834_4	3	1	0.16
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Casing	Qwaqwa PS inlet valve 1 casing	500019834_5	3	1	0.68
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Mechanism	Qwaqwa PS inlet valve 1mechanism	500019834_6	3	1	0.24
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Switchgear	Qwaqwa Pump Motor 1 switchgear	500019834_18	3	1	0.21
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Switchgear	Qwaqwa Pump Motor 2 switchgear	500019834_19	3	1	0.18
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Casing	Qwaqwa Pump Motor 2 casing	500019834_20	3	1	0.34
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Switchgear	Qwaqwa Pump Motor 3 switchgear	500019834_21	3	1	0.18
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Rotor	Qwaqwa Pump Motor 2 rotor	500019834_24	3	1	0.14
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Casing	Qwaqwa Pump Motor 3 casing	500019834_25	3	1	0.34
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Rotor	Qwaqwa Pump Motor 3 rotor	500019834_26	3	1	0.14
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Pumpstation Pump - Rotor	Qwaqwa Pump 1 rotor	500019834_28	3	1	0.45
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Pumpstation Pump - Rotor	Qwaqwa Pump 2 rotor	500019834_30	3	1	0.45
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Pumpstation Pump - Rotor	Qwaqwa Pump 3 rotor	500019834_32	3	1	0.45
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Pumpstation Building & Pit	Qwaqwa PS Building	500019834_33	3	1	0.91
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Pumpstation Pipework	Qwaqwa PS pipework	500019834_34	3	1	3.99

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Switchgear	Qwaqwa Pump Motor 2 - switchgear	500019834_37	3	1	0.01
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Electric Motor - Switchgear	Qwaqwa Pump Motor 3 - switchgear	500019834_38	3	1	0.05
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Casing	Qwaqwa PS inlet valve 2 casing	500019834_7	3	2	0.68
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Casing	Qwaqwa PS inlet valve 3 casing	500019834_9	3	2	0.68
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Casing	Qwaqwa PS discharge valve 1 casing	500019834_11	3	2	1.14
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Casing	Qwaqwa PS discharge valve 2 casing	500019834_13	3	2	1.14
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Valves - Casing	Qwaqwa PS discharge valve 3 casing	500019834_15	3	2	1.14
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Flow Meter	Qwaqwa PS flow meters	500019834_17	3	2	0.97
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Qwaqwa Pump Station	Pumpstation Valves	Qwaqwa PS inlet valve 1	500019834_39	3	2	0.23
TUGELA-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Killburn IB Pipeline	Pipeline- Steel	Pipeline	500008820_0	1	3	6.88
TUGELA-VAAL GWS	WR: Tunnels	Tunnel Section	GRENSHOEK TUNNEL	Tunnel Excavation	Tunnel excavation	500008447_0	1	3	0.56
TUGELA-VAAL GWS	WR: Tunnels	Tunnel Section	GRENSHOEK TUNNEL	Tunnel lining	Tunnel Lining	500008447_1	1	3	0.94
USUTU RIVER GWS	Buildings	Stores	Morgenstond Boat house	Outbuildings	Boat House	500006287_2	3	1	0.82
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 3	Main Building	Main building	500006807_0	3	3	0.88
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 6	Main Building	Main building	500006809_0	3	3	0.88
USUTU RIVER GWS	Buildings	Hostels / Flats / Compounds	Jerico Dam Nature Coservation Complex Single Quart	Main Building	Main building	500006810_0	3	3	1.37
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 1	Main Building	Main building	500007531_0	3	3	1.37
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 2	Main Building	Main building	500007532_0	3	3	1.37
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature conservation Complex House 4	Main Building	Main building	500007533_0	3	3	1.37

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 5	Main Building	Main building	500007534_0	3	3	1.37
USUTU RIVER GWS	Buildings	Hostels / Flats / Compounds	Jerico Dam Nature Conservation Complex Single Qua	Main Building	Main building	500007535_0	3	3	1.37
USUTU RIVER GWS	Buildings	Stores	Davel Store Room	Main Building	Main building	500006434_0	2	3	0.31
USUTU RIVER GWS	Buildings	Stores	Davel Store Room	Outbuildings	Transformer Room	500006434_2	2	3	0.11
USUTU RIVER GWS	WR: Canals	Canal Section	prim_canal1	Canal Fencing	Canal Fence Righth	500000911_3	3	3	0.34
USUTU RIVER GWS	WR: Canals	Canal Section	prim_canal1	Canal Service Road	Canal service road	500000911_5	3	3	1.32
USUTU RIVER GWS	WR: Canals	Canal Section	prim_canal1	Canal Fencing	Canal Fence Left	500000911_2	3	5	0.34
USUTU RIVER GWS	WR: Pump stations	Pump Station	Jericho Pump Station	Valves - Casing	Discharge Valves (pumps 5-6) - casing	500008531_21	4	2	1.72
USUTU RIVER GWS	WR: Pump stations	Pump Station	Jericho Pump Station	Pumpstation Pump - Casing	Jerico Pump 3 casing	500008531_87	2	1	1.81
USUTU RIVER GWS	WR: Pump stations	Pump Station	Jericho Pump Station	Pumpstation Pump - Rotor	Jerico Pump 3 rotor	500008531_88	2	1	2.18
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir	not componentised	500004120_0	5	4	12.12
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir Structure	Camden reservoir Structure No 1	500004120_1	5	4	0.03
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir Lining	Camden reservoir lining No 1	500004120_2	5	4	0.01
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir Pipe	Camden reservoir pipe No 1	500004120_3	5	4	0.01
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir	not componentised	500004119_0	2	4	13.96
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir Structure	Camden Reservoirstructure No 2	500004119_1	2	4	0.03
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir Lining	Camden reservoir lining No 2	500004119_2	2	4	0.01
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir Pipe	Camden reservoir pipe No 2	500004119_3	2	4	0.01
USUTU RIVER GWS	WR: Steel Pipelines	Pipeline Section	Onverwacht - Camden Pipeline A	Pipeline Valves	Onverwacht Camden Gravity Pipeline 1 Section 2 Valve	500008212_2	5	1	10.74
USUTU RIVER GWS	WS: Measuring facility	Meteorological Station	Driehoek @ Ermelo	Meteorological Station	not componentised	500001602_0	1	1	0.33
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Pumpstation Pump - Casing	Geelhoutboom Pump 3 casing	500008611_7	5	1	4.01
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Pumpstation Pump - Rotor	Geelhoutboom Pump 3 rotor	500008611_8	5	1	1.51

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Pumpstation Pump - Casing	Geelhoutboom Booster Pump 3 casing	500008611_16	5	1	4.01
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Pumpstation Pump - Rotor	Geelhoutboom Booster Pump 3 rotor	500008611_17	5	1	1.51
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Electric Motor - Casing	Geelhoutboom Booster Motor 3 casing	500008611_42	5	1	1.51
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Electric Motor - Rotor	Geelhoutboom Booster Motor 3 rotor	500008611_43	5	1	0.60
USUTU VAAL PHASE 2 GWS	WR: Pump stations	Pump Station	Geelhoutboom Pump Station	Electric Motor - Rotor	Geelhoutboom Pump Motor 3 rotor	500008611_31	5	4	3.61
USUTU VAAL PHASE 2 GWS	WR: Water Treatment	Water Treatment -Conventional	Heyshop Water Treatment Works	Water Treatment - Conventional	not componentised	500006775_0	2	4	0.61
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam South House 12	Main Building	Main building	500007931_0	3	3	2.27
USUTU-VAAL GWS	Buildings	Office Building	Grootdraai Dam Vresap Control Room	Office Building	Outbuilding	500010653_0	3	4	2.14
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai South Swimming Pool	Outbuildings	Recreational facility	500021451_0	2	4	0.10
USUTU-VAAL GWS	WR: Power Supply	Power Supply Sub-Station	Naawpoort Transformer 1	Power Supply Sub- station	not componentised	500000059_0	4	4	0.36
USUTU-VAAL GWS	WR: Power Supply	Power Supply Sub-Station	Naawpoort Transformer 1	Power Supply Transformer	Junction Weir	500000076_0	4	4	0.36
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Booster Pump Station	Pumpstation Pump - Casing	Naauwpoort booster pump 5 casing	500002131_12	5	1	0.30
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Pumpstation Pump - Casing	Naauwpoort Pump 6 casing	500002342_14	5	1	1.85
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Pumpstation Pump - Casing	Naauwpoort Pump 7 casing	500002342_16	5	1	1.85
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Pumpstation Pump - Casing	Naauwpoort Pump 8 casing	500002342_18	5	1	1.85
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauwpoort Pump Station	Pumpstation Pump - Casing	Naauwpoort Pump 1 casing	500002342_51	5	1	1.63
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Grootdraai to Vlakfontein Canal Pump Station	Pumpstation Pump - Rotor	Grootdraai Pump 3 rotor	500009511_32	2	3	0.22
USUTU-VAAL GWS	WS: Measuring facility	Hydrological Station	B1H021 Steenkoolspruit at middledrift	Hydrological Station	not componentised	500008062_0	3	4	2.04
USUTU-VAAL GWS	WS: Measuring facility	Hydrological Station	B1H019 Noupootspruit at Naawpoort	Hydrological Station	not componentised	500008597_0	3	4	1.16
VAAL DAM	WS: Measuring facility	Hydrological Station	Waternval River @ Elandslaagte	Hydrological Station	not componentised	500001280_0	4	3	5.82
VAAL DAM	WS: Measuring facility	Hydrological Station	Wilge River @ Frankfort	Hydrological Station	not componentised	500001400_0	4	4	9.25

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	CRC 2016 (R million)
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servant Quarters 1	Main Building	Main building	500008433_0	3	1	0.88
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servant Quarters 3	Main Building	Main building	500008434_0	3	1	0.88
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servants Quarters 5	Main Building	Main building	500008435_0	3	1	0.88
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servants Quarters 6	Main Building	Main building	500008436_0	3	1	0.88
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servants Quarters 8	Main Building	Main building	500008437_0	3	1	0.88
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servant Quarters 2	Main Building	Main building	500008972_0	3	1	0.88
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servants Quarters 4	Main Building	Main building	500008973_0	3	1	0.88
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servants Quarters 7	Main Building	Main building	500008974_0	3	1	0.88
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servants Quarters 10	Main Building	Main building	500008976_0	3	1	0.88
VAALHARTS CANALS	WR: Canals	Canal Section	F Sec 12A	Canal Lining - TA3	Canal Lining	500000839_3	3	1	0.89
VAALHARTS CANALS	WR: Canals	Canal Section	F Sec 11R1	Canal Fencing	Canal Fence Left	500000838_1	3	2	0.09
VAALHARTS CANALS	WR: Canals	Canal Section	F Sec 11R1	Canal Fencing	Canal Fence Righ	500000838_2	3	2	0.09
VAALHARTS CANALS	WR: Canals	Canal Section	F Sec 11R1	Canal Service Road	Canal service road	500000838_4	3	2	0.17
VAALHARTS CANALS	WR: Canals	Canal Section	F Sec 11R1	Canal Berm	Canal berm	500000838_5	3	2	0.36
VAALHARTS CANALS	WR: Canals	Canal Section	F Prim F1	Canal Berm	Canal berm	500000927_5	3	2	0.03

4 UNDER-UTILISED OR NOT-IN-USE ASSETS

Table L.3: Under-utilised asset components

Asset facility Category	Under Utilised Asset Components					
	Cluster Total		Scheme Specific		Non Scheme Specific	
	No.	CRC (R million)	No.	CRC (R million)	No.	CRC (R million)
Buildings	122	144.21	122	144.21	-	-
WS: borehole	0	-	0	-	-	-
WR: Canals	608	462.68	608	462.68	-	-
WR: Dams	86	3 008.94	86	3 008.94	-	-
WR: Power Supply	0	-	0	-	-	-
WR: Pump stations	19	25.50	19	25.50	-	-
WR: Reservoirs	16	147.06	16	147.06	-	-
WR: Roads and bridge	24	6.48	24	6.48	-	-
WR: Steel Pipelines	80	256.73	80	256.73	-	-
WR: Telemetry	2	0	2	1.66	-	-
WR: Tunnels	0	0	0	-	-	-
WR: Water Treatment	8	10.68	8	10.68	-	-
WS: Measuring facilities	7	51.50	4	39.06	3	12.44
Total	972	4 113.79	969	4 103.01	3	12.44

Table L.4: Under-utilised asset components per scheme and per facility category

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
HARTS RIVER (SPITSKOP DAM) GWS	Buildings	Residential Housing	Harts RiverGWS SpitskopDam Residential BuildingsX4	Main Building	Main building	500008703_0	3	4	2	1.366
HARTS RIVER (SPITSKOP DAM) GWS	Buildings	Residential Housing	Spitskop Dam WCO	Main Building	Main building	500009169_0	3	4	2	1.366
HARTS RIVER (WENTZEL DAM) GWS	WR: Roads and bridge	Road Section	WENTZELDAM	Road Section	WENTZELDAM Access Road	500021852_0	1	3	2	0.335
HYDOMETRY NORTHERN CAPE	WS: Measuring facility	Hydrological Station	C9H023 Vaal River @ Schmidtsdrif	Hydrological Station	not componentised	500001415_0	3	3	2	5.820

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
HYDOMETRY NORTHERN CAPE	WS: Measuring facility	Hydrological Station	D4H005 Kuruman-Eye A @ Kuruman	Hydrological Station	not componentised	500001433_0	3	3	2	6.488
HYDOMETRY NORTHERN CAPE	WS: Measuring facility	Meteorological Station	Closed D7E003 P V Ryneveld Airport @ Upington	Meteorological Station	not componentised	500001109_0	1	3	2	0.135
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Nooitgedacht access road1	Road Section	Nooitgedacht access road1	500021780_0	1	2	2	0.247
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Road at Housing	Road Section	Road at Housing	500021801_0	1	2	2	0.120
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Road to valve room	Road Section	Road to valve room	500021808_0	1	2	2	0.113
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Vygeboom Housing road1	Road Section	Vygeboom Housing road1	500021833_0	1	2	2	0.084
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Vygeboom road1	Road Section	Vygeboom road1	500021835_0	1	2	2	0.107
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Nooitgedacht access road2	Road Section	Nooitgedacht access road2	500021781_0	1	3	2	0.525
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Nooitgedacht access road3	Road Section	Nooitgedacht access road3	500021782_0	1	3	2	0.010
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Nooitgedacht access road4	Road Section	Nooitgedacht access road4	500021783_0	1	3	2	0.126
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Nooitgedacht access road5	Road Section	Nooitgedacht access road5	500021784_0	1	3	2	0.205
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Vygeboom Housing road2	Road Section	Vygeboom Housing road2	500021834_0	1	3	2	0.050
KOMATI RIVER GWS	WR: Roads and bridge	Road Section	Vygeboom road2	Road Section	Vygeboom road2	500021836_0	1	3	2	0.125
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal2	Canal Excavation	Canal excavation	500000949_0	3	4	2	0.284
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal8	Canal Excavation	Canal excavation	500000953_0	3	4	2	0.299
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal11	Canal Excavation	Canal excavation	500000954_0	3	4	2	0.108
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter_canal4	Canal Excavation	Canal excavation	500000956_0	3	4	2	0.027
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal1	Canal Excavation	Canal excavation	500000957_0	3	4	2	0.167
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal4	Canal Excavation	Canal excavation	500000960_0	3	4	2	0.313
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter_canal3	Canal Excavation	Canal excavation	500000961_0	3	4	2	0.171
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal10	Canal Excavation	Canal excavation	500000963_0	3	4	2	0.233
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal9	Canal Excavation	Canal excavation	500001530_0	3	4	2	0.067
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal12	Canal Excavation	Canal excavation	500001532_0	3	4	2	0.084
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter_canal2	Canal Excavation	Canal excavation	500001533_0	3	4	2	0.063
LEEU RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal3	Canal Excavation	Canal excavation	500001534_0	3	4	2	0.263

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	sec_canal7	Canal Excavation	Canal excavation	500001535_0	3	4	2	0.280
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter_canal6	Canal Excavation	Canal excavation	500001536_0	3	4	2	0.542
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	Armenia End	Canal Excavation	Canal excavation	500008259_0	3	4	2	1.703
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	Armenia End	Canal Fencing	Canal Fence Left	500008259_1	3	4	2	0.212
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	Armenia End	Canal Fencing	Canal Fence Righth	500008259_2	3	4	2	0.212
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	Armenia End	Canal Lining - TA3	Canal Lining	500008259_3	3	4	2	0.629
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	Armenia End	Canal Service Road	Canal service road	500008259_4	3	4	2	0.389
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	Armenia End	Canal Berm	Canal berm	500008259_5	3	4	2	0.423
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter-canal1	Canal Excavation	Canal excavation	500008747_0	3	4	2	0.173
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter-canal1	Canal Fencing	Canal Fence Left	500008747_1	3	4	2	1.736
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter-canal1	Canal Fencing	Canal Fence Righth	500008747_2	3	4	2	0.179
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter-canal1	Canal Lining - TA3	Canal Lining	500008747_3	3	4	2	0.551
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter-canal1	Canal Service Road	Canal service road	500008747_4	3	4	2	3.183
LEEUE RIVER GWS (ARMENIA DAM)	WR: Canals	Canal Section	ter-canal1	Canal Berm	Canal berm	500008747_5	3	4	2	0.055
MIDDLE VAAL GWS	Buildings	Hostels / Flats / Compounds	Bloemhof Dam Single Quaters 4 rooms	Main Building	Main building	500008162_0	3	1	2	1.175
MODDER RIVER	Buildings	Workshops	Krugerdrisft dam workshop 2 (hydro)	Main Building	Main building	500021500_0	3	3	2	1.633
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit P26	Main Building	Main building	500006965_0	2	3	2	0.642
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit P26	Outbuildings	GARAGES	500006965_1	2	3	2	0.106
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit 26A	Main Building	Main building	500006966_0	2	3	2	0.642
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit 26A	Outbuildings	Garages	500006966_1	2	3	2	0.106
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit P26B	Main Building	Main building	500006967_0	2	3	2	0.642
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit P26D	Main Building	Main building	500006968_0	2	3	2	0.642
MOOI RIVER GWS	Buildings	Residential Housing	Aqua-Park Potch Schoonspruit 26C	Main Building	Main building	500007667_0	2	3	2	0.642
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 7	Main Building	Main building	500008361_0	3	1	2	0.880

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 7	Outbuildings	Water Stand	500008361_1	3	1	2	0.106
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 9	Main Building	Main building	500008363_0	3	1	2	0.880
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 9	Outbuildings	Water Stand	500008363_1	3	1	2	0.106
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 10	Main Building	Main building	500008364_0	3	1	2	0.880
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 10	Outbuildings	Water Stand	500008364_1	3	1	2	0.106
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 New Canal House 5	Main Building	Main building	500008909_0	3	1	2	0.880
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 11	Main Building	Main building	500008914_0	3	1	2	0.880
ORANGE RIET CANAL	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 5	Main Building	Main building	500008913_0	3	2	2	0.880
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates - Mechanism	weir Atherton canal intake gate - mechanism	500008927_2	4	2	2	0.089
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates - Mechanism	weir Bucklands canal intake gate 1 - mechanism	500008927_3	4	2	2	0.089
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates - Mechanism	weir Bucklands canal intake gate 2 - mechanism	500008927_4	4	2	2	0.089
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Cranes	Douglas weir Atherton crane (only rails)	500008927_5	4	2	2	0.527
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates	Douglas weir Atherton canal intake gate - gate	500008927_7	4	2	2	0.266
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates	Douglas weir Bucklands canal intake gate 1 - gate	500008927_8	4	2	2	0.266
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates	Douglas weir Bucklands canal intake gate 2 - gate	500008927_9	4	2	2	0.266
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Meter & Instrumentation	Douglas weir dam meter and instrumentation	500008927_10	4	2	2	0.127
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Wall- 15m<Height<30m	Douglas Weir Concrete Wall	500008927_1	4	3	2	57.924
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Cranes	Douglas weir Bucklands crane (only rails)	500008927_6	4	3	2	0.527
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Auxilliary Equip. Main Damwall	Douglas weir Bucklands hanrails 1	500008927_13	4	3	2	0.127
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Auxilliary Equip. Main Damwall	Douglas weir Bucklands hanrails 2	500008927_14	4	3	2	0.127
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Outlet Structure	Douglas weir Atherton outlet	500008927_11	4	4	2	0.317
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Outlet Structure	Douglas weir Bucklands canal outlet structure	500008927_12	4	4	2	0.317

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates	Douglas weir Atherton canal stoplog	500008927_15	4	4	2	0.341
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates	Douglas weir Bucklands canal stoplog 1	500008927_16	4	4	2	0.341
ORANGE VAAL (DOUGLAS CANALS)	WR: Dams	Main Damwall	Douglas-Atherton Weir	Dam Intake Gates	Douglas weir Bucklands canal stoplog 2	500008927_17	4	4	2	0.341
ORANGE VAAL (DOUGLAS CANALS)	WR: Steel Pipelines	Pipeline Section	Nottingham steel pipeline	Pipeline- Steel	Pipeline	500009509_0	3	4	2	4.880
ORANGE VAAL (DOUGLAS CANALS)	WS: Measuring facility	Meteorological Station	C9E005 Artherton @ St.Claire	Meteorological Station	not componentised	500001102_0	1	3	2	0.202
ORANGE VAAL (DOUGLAS CANALS)	WS: Measuring facility	Hydrological Station	Closed C9H011 Vaal River @ Douglas	Hydrological Station	not componentised	500001844_0	1	3	2	5.916
ORANGE VAAL (DOUGLAS CANALS)	WS: Measuring facility	Hydrological Station	D3H008 Orange River @ Marksdrift	Hydrological Station	not componentised	500001878_0	1	3	2	27.118
ORANGE VAAL (DOUGLAS CANALS)	WS: Measuring facility	Hydrological Station	Orange River @ De Hoek	Hydrological Station	not componentised	500001881_0	1	3	2	5.820
RHENOSTER RIVER	Buildings	Garage & Carports	Sand-Vet GWS Double Garage	Outbuildings	Garage & Carports	500010053_0	4	2	2	0.949
RHENOSTER RIVER	Buildings	Office Building	Sand Canal Office at house 12	Main Building	Main building	500021520_0	4	3	2	0.660
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 13	Main Building	Main building	500007964_0	3	1	2	2.072
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 1	Main Building	Main building	500007955_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 2	Main Building	Main building	500007956_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 3	Main Building	Main building	500007957_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 4	Main Building	Main building	500007959_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 5	Main Building	Main building	500007960_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 6	Main Building	Main building	500007961_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 7	Main Building	Main building	500007962_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 12	Main Building	Main building	500007963_0	1	1	2	2.378
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 12	Outbuildings	Garage and servant's quarter	500007963_1	1	1	2	0.106
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 8	Main Building	Main building	500008490_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 9	Main Building	Main building	500008491_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 10	Main Building	Main building	500008492_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 11	Main Building	Main building	500008493_0	1	1	2	0.493
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 14	Main Building	Main building	500008584_0	1	1	2	1.776

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RHENOSTER RIVER	Buildings	Residential Housing	Koppies House 14	Outbuildings	garage	500008584_1	1	1	2	0.106
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 15	500009794_0	1	1	2	0.354
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 16	500009795_0	1	1	2	0.354
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 17	500009796_0	1	1	2	0.354
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 18	500009797_0	1	1	2	0.354
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 14	500009874_0	1	1	2	0.354
RHENOSTER RIVER	Buildings	Residential Housing	Koppies House	Main Building	House 19	500009875_0	1	1	2	0.354
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Fencing	Canal Fence Left	500005000_1	3	1	2	0.380
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Fencing	Canal Fence Righth	500005000_2	3	1	2	0.380
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Lining - TA3	Canal Lining	500005000_3	3	1	2	2.065
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Service Road	Canal service road	500000964_4	3	2	2	0.153
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Service Road	Canal service road	500000966_4	3	2	2	0.199
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Service Road	Canal service road	500000968_4	3	2	2	0.404
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Service Road	Canal service road	500000970_4	3	2	2	0.125
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Service Road	Canal service road	500001539_4	3	2	2	0.038
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Service Road	Canal service road	500001540_4	3	2	2	0.186
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Service Road	Canal service road	500001541_4	3	2	2	1.073
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Service Road	Canal service road	500001542_4	3	2	2	0.145
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Service Road	Canal service road	500001543_4	3	2	2	0.111
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Service Road	Canal service road	500001544_4	3	2	2	0.008
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Service Road	Canal service road	500001545_4	3	2	2	0.241
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Service Road	Canal service road	500005000_4	3	2	2	0.023
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Service Road	Canal service road	500005013_2	3	2	2	0.322
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Service Road	Canal service road	500005014_3	3	2	2	0.606
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 2	Canal Service Road	Canal service road	500005022_4	3	2	2	0.027
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Service Road	Canal service road	500005025_4	3	2	2	0.002
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Service Road	Canal service road	500005030_4	3	2	2	0.350

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RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Service Road	Canal service road	500005031_4	3	2	2	0.122
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Service Road	Canal service road	500006208_4	3	2	2	0.444
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Service Road	Canal service road	500006214_5	3	2	2	0.081
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Service Road	Canal service road	500006240_2	3	2	2	0.278
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 3	Canal Service Road	Canal service road	500006242_4	3	2	2	0.305
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Service Road	Canal service road	500006244_4	3	2	2	0.633
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Fencing	Canal Fence Left	500001544_1	3	3	2	0.006
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Fencing	Canal Fence Righth	500001544_2	3	3	2	0.006
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Lining - TA3	Canal Lining	500001544_3	3	3	2	0.015
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Fencing	Canal Fence Left	500001545_1	3	3	2	0.118
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Fencing	Canal Fence Righth	500001545_2	3	3	2	0.118
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Lining - TA3	Canal Lining	500001545_3	3	3	2	0.716
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Lining - TA3	Canal Lining	500005030_1	3	3	2	0.472
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Meters	Measuring Facility	500006214_2	3	3	2	0.172
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Outlets	Canal Outlets - sluice	500006214_3	3	3	2	0.035
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Controls	Canal Controls - LW	500006214_4	3	3	2	0.275
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Excavation	Canal excavation	500000964_0	3	4	2	0.320
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Fencing	Canal Fence Left	500000964_1	3	4	2	0.078
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Fencing	Canal Fence Righth	500000964_2	3	4	2	0.078
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Lining - TA3	Canal Lining	500000964_3	3	4	2	0.424
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal1	Canal Berm	Canal berm	500000964_5	3	4	2	0.144
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Excavation	Canal excavation	500000966_0	3	4	2	0.110
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Fencing	Canal Fence Left	500000966_1	3	4	2	0.034
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Fencing	Canal Fence Righth	500000966_2	3	4	2	0.034
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Lining - TA3	Canal Lining	500000966_3	3	4	2	0.164
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal3	Canal Berm	Canal berm	500000966_5	3	4	2	0.065
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Excavation	Canal excavation	500000967_0	3	4	2	0.074

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Fencing	Canal Fence Left	500000967_1	3	4	2	0.040
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Fencing	Canal Fence Righth	500000967_2	3	4	2	0.040
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Lining - TA3	Canal Lining	500000967_3	3	4	2	0.147
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Service Road	Canal service road	500000967_4	3	4	2	0.048
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Drain 1	Canal Berm	Canal berm	500000967_5	3	4	2	0.078
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Excavation	Canal excavation	500000968_0	3	4	2	0.390
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Fencing	Canal Fence Left	500000968_1	3	4	2	0.085
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Fencing	Canal Fence Righth	500000968_2	3	4	2	0.085
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Lining - TA3	Canal Lining	500000968_3	3	4	2	0.472
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal5	Canal Berm	Canal berm	500000968_5	3	4	2	0.259
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Excavation	Canal excavation	500000970_0	3	4	2	0.777
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Fencing	Canal Fence Left	500000970_1	3	4	2	0.105
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Fencing	Canal Fence Righth	500000970_2	3	4	2	0.105
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Lining - TA3	Canal Lining	500000970_3	3	4	2	0.844
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal7	Canal Berm	Canal berm	500000970_5	3	4	2	0.066
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Excavation	Canal excavation	500001539_0	3	4	2	0.049
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Fencing	Canal Fence Left	500001539_1	3	4	2	0.032
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Fencing	Canal Fence Righth	500001539_2	3	4	2	0.032
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Lining - TA3	Canal Lining	500001539_3	3	4	2	0.107
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal2	Canal Berm	Canal berm	500001539_5	3	4	2	0.061
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Excavation	Canal excavation	500001540_0	3	4	2	0.287
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Fencing	Canal Fence Left	500001540_1	3	4	2	0.157
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Fencing	Canal Fence Righth	500001540_2	3	4	2	0.157
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Lining - TA3	Canal Lining	500001540_3	3	4	2	0.571
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal2	Canal Berm	Canal berm	500001540_5	3	4	2	0.294
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Excavation	Canal excavation	500001541_0	3	4	2	0.163
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Fencing	Canal Fence Left	500001541_1	3	4	2	0.066

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RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Fencing	Canal Fence Righth	500001541_2	3	4	2	0.066
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Lining - TA3	Canal Lining	500001541_3	3	4	2	0.279
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal4	Canal Berm	Canal berm	500001541_5	3	4	2	0.120
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Excavation	Canal excavation	500001542_0	3	4	2	0.415
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Fencing	Canal Fence Left	500001542_1	3	4	2	0.082
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Fencing	Canal Fence Righth	500001542_2	3	4	2	0.082
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Lining - TA3	Canal Lining	500001542_3	3	4	2	0.496
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal4	Canal Berm	Canal berm	500001542_5	3	4	2	0.131
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Excavation	Canal excavation	500001543_0	3	4	2	0.118
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Fencing	Canal Fence Left	500001543_1	3	4	2	0.093
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Fencing	Canal Fence Righth	500001543_2	3	4	2	0.093
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Lining - TA3	Canal Lining	500001543_3	3	4	2	0.282
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal6	Canal Berm	Canal berm	500001543_5	3	4	2	0.180
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Excavation	Canal excavation	500001544_0	3	4	2	0.075
RHENOSTER RIVER	WR: Canals	Canal Section	ter_canal7	Canal Berm	Canal berm	500001544_5	3	4	2	0.011
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Excavation	Canal excavation	500001545_0	3	4	2	0.593
RHENOSTER RIVER	WR: Canals	Canal Section	sec_canal6	Canal Berm	Canal berm	500001545_5	3	4	2	0.144
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Excavation	Canal excavation	500005000_0	3	4	2	1.557
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Canal 3	Canal Berm	Canal berm	500005000_5	3	4	2	0.373
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Excavation	Canal excavation	500005013_0	3	4	2	1.159
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Lining - TA3	Canal Lining	500005013_1	3	4	2	0.545
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Fencing	Canal Fence Left	500005013_3	3	4	2	0.097
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Fencing	Canal Fence Righth	500005013_4	3	4	2	0.097
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 5	Canal Berm	Canal berm	500005013_5	3	4	2	0.124
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Excavation	Canal excavation	500005014_0	3	4	2	1.300
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Lining - TA3	Canal Lining	500005014_1	3	4	2	0.611
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Fencing	Canal Fence Left	500005014_2	3	4	2	0.063

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RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 6	Canal Berm	Canal berm	500005014_4	3	4	2	0.166
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 2	Canal Excavation	Canal excavation	500005022_0	3	4	2	2.885
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 2	Canal Lining - TA3	Canal Lining	500005022_1	3	4	2	1.357
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 2	Canal Fencing	Canal Fence Left	500005022_2	3	4	2	0.180
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 2	Canal Berm	Canal berm	500005022_3	3	4	2	0.228
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Excavation	Canal excavation	500005025_0	3	4	2	0.121
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Lining - TA3	Canal Lining	500005025_1	3	4	2	0.198
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Berm	Canal berm	500005025_2	3	4	2	0.017
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 4	Canal Fencing	Canal Fence Left	500005025_3	3	4	2	0.002
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Excavation	Canal excavation	500005030_0	3	4	2	1.004
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Fencing	Canal Fence Left	500005030_2	3	4	2	0.128
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Fencing	Canal Fence Righth	500005030_3	3	4	2	0.128
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 1	Canal Berm	Canal berm	500005030_5	3	4	2	0.166
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Excavation	Canal excavation	500005031_0	3	4	2	1.096
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Lining - TA3	Canal Lining	500005031_1	3	4	2	0.515
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Fencing	Canal Fence Left	500005031_2	3	4	2	0.118
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Fencing	Canal Fence Righth	500005031_3	3	4	2	0.118
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 2	Canal Berm	Canal berm	500005031_5	3	4	2	0.097
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Excavation	Canal excavation	500006208_0	3	4	2	0.280
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Fencing	Canal Fence Left	500006208_1	3	4	2	0.113
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Fencing	Canal Fence Righth	500006208_2	3	4	2	0.113
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Lining - TA3	Canal Lining	500006208_3	3	4	2	0.478
RHENOSTER RIVER	WR: Canals	Canal Section	Ter Canal 1	Canal Berm	Canal berm	500006208_5	3	4	2	0.219
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Excavation	Canal excavation	500006209_0	3	4	2	0.094
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Fencing	Canal Fence Left	500006209_1	3	4	2	0.023
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Fencing	Canal Fence Righth	500006209_2	3	4	2	0.023
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Lining - TA3	Canal Lining	500006209_3	3	4	2	0.125

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Service Road	Canal service road	500006209_4	3	4	2	0.527
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 1	Canal Berm	Canal berm	500006209_5	3	4	2	0.041
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Excavation	Canal excavation	500006210_0	3	4	2	0.226
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Fencing	Canal Fence Left	500006210_1	3	4	2	0.055
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Fencing	Canal Fence Righth	500006210_2	3	4	2	0.055
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Lining - TA3	Canal Lining	500006210_3	3	4	2	0.300
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Service Road	Canal service road	500006210_4	3	4	2	1.465
RHENOSTER RIVER	WR: Canals	Canal Section	Sec Drain 2	Canal Berm	Canal berm	500006210_5	3	4	2	0.124
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Excavation	Canal excavation	500006214_0	3	4	2	2.463
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Lining - TA3	Canal Lining	500006214_1	3	4	2	3.484
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Fencing	Canal Fence Left	500006214_6	3	4	2	0.045
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Fencing	Canal Fence Righth	500006214_7	3	4	2	0.045
RHENOSTER RIVER	WR: Canals	Canal Section	Prim South Canal 3	Canal Berm	Canal berm	500006214_8	3	4	2	0.117
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Excavation	Canal excavation	500006240_0	3	4	2	0.892
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Lining - TA3	Canal Lining	500006240_1	3	4	2	0.420
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Fencing	Canal Fence	500006240_3	3	4	2	0.141
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 1	Canal Berm	Canal berm	500006240_4	3	4	2	0.079
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 3	Canal Excavation	Canal excavation	500006242_0	3	4	2	0.089
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 3	Canal Lining - TA3	Canal Lining	500006242_1	3	4	2	0.042
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 3	Canal Fencing	Canal Fence	500006242_2	3	4	2	0.142
RHENOSTER RIVER	WR: Canals	Canal Section	Prim Stads Canal 3	Canal Berm	Canal berm	500006242_3	3	4	2	0.008
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Excavation	Canal excavation	500006244_0	3	4	2	1.986
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Lining - TA3	Canal Lining	500006244_1	3	4	2	1.713
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Fencing	Canal Fence Left	500006244_2	3	4	2	0.031
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Fencing	Canal Fence Righth	500006244_3	3	4	2	0.031
RHENOSTER RIVER	WR: Canals	Canal Section	Prim North Canal 3	Canal Berm	Canal berm	500006244_5	3	4	2	0.081
RHENOSTER RIVER	WR: Water Treatment	Water Treatment - Conventional	Koppies Dam	Water Treatment - Conventional	not componentised	500009195_0	2	1	2	0.278

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
RHENOSTER RIVER	WR: Water Treatment	Wastewater Treatment - Convent	Koppies Dam	Wastewater Treatment - Convent	not componentised	500009517_0	2	2	2	0.477
RIET RIVER	WR: Canals	Canal Section	sec_canal12 S155	Canal Excavation	Canal excavation	500008738_0	3	3	2	0.929
RIET RIVER	WR: Canals	Canal Section	sec_canal12 S155	Canal Lining - TA3	Canal Lining	500008738_1	3	3	2	3.054
RIET RIVER	WR: Canals	Canal Section	sec_canal12 S155	Canal Berm	Canal berm	500008738_2	3	3	2	0.038
RIET RIVER	WR: Canals	Canal Section	sec_canal12 S155	Canal Fencing	Canal Fence Left	500008738_3	3	3	2	0.026
RIET RIVER	WR: Canals	Canal Section	sec_canal12 S155	Canal Fencing	Canal Fence Righth	500008738_4	3	3	2	0.026
RIET RIVER	WR: Canals	Canal Section	sec_canal12 S155	Canal Service Road	Canal service road	500008738_5	3	3	2	1.779
SAND-VET GWS	Buildings	Hostels / Flats / Compounds	Allemanskraal Dam Ablution	Outbuildings	Ablution building	500009986_0	4	1	2	0.444
SAND-VET GWS	Buildings	Residential Housing	Sand-Vet GWS Canal C3	Main Building	Main Building	500010125_0	4	1	2	2.338
SAND-VET GWS	Buildings	Residential Housing	Sand-Vet GWS Canal 1	Main Building	Main Building	500010101_0	4	2	2	1.717
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 33	Main Building	Main Building	500010129_0	4	2	2	1.524
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 29	Main Building	Main Building	500010130_0	4	2	2	1.953
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 25	Main Building	Main Building	500010131_0	4	2	2	1.672
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 18	Main Building	Main Building	500010137_0	4	2	2	1.939
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 13	Main Building	Main Building	500010140_0	4	2	2	1.731
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 9	Main Building	Main Building	500010141_0	4	2	2	1.317
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 19	Main Building	Main Building	500010150_0	4	2	2	1.939
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 27	Main Building	Main Building	500010152_0	4	2	2	1.968
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 31	Main Building	Main Building	500010153_0	4	2	2	1.879
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 45	Main Building	Main Building	500010160_0	4	2	2	1.746
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 37	Main Building	Main Building	500010170_0	4	2	2	1.628
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 16	Main Building	Main Building	500010230_0	4	2	2	1.820
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 12	Main Building	Main Building	500010231_0	4	2	2	1.761
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 10	Main Building	Main Building	500010232_0	4	2	2	1.569
SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 20	Main Building	Main Building	500010234_0	4	2	2	1.776

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SAND-VET GWS	Buildings	Residential Housing	Schoon Plaats 39	Main Building	Main Building	500010241_0	4	2	2	1.953
SAND-VET GWS	Buildings	Residential Housing	Sand Mechanical Garages	Outbuildings	Garage & Carports	500009948_0	4	3	2	3.953
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement house 10	Main Building	Main Building	500010162_0	4	3	2	4.484
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement House 15	Main Building	Main Building	500010166_0	4	3	2	4.425
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement house 14	Main Building	Main Building	500010168_0	4	3	2	4.854
SAND-VET GWS	Buildings	Residential Housing	Sandvet Settlement house 4	Main Building	Main Building	500010246_0	4	3	2	4.528
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 1	Main Building	Main building	500008181_0	3	1	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 2	Main Building	Main building	500008182_0	3	1	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 3	Main Building	Main building	500008183_0	3	1	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 5	Main Building	Main building	500008184_0	3	1	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 4	Main Building	Main building	500008726_0	3	1	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Erferis Dam Residential 7	Main Building	Main building	500008727_0	3	1	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 11	Outbuildings	Water Stand	500008914_1	3	1	2	0.106
SAND-VET GWS	Buildings	Residential Housing	Allemanskraal Dam Residential 4	Main Building	Main building	500008729_0	3	2	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Allemanskraal Residential 5	Main Building	Main building	500008730_0	3	2	2	0.880
SAND-VET GWS	Buildings	Residential Housing	Orange Riet Canal S2 Old Canal House 5	Outbuildings	Water Stand	500008913_1	3	2	2	0.106
SAND-VET GWS	WR: Canals	Canal Section	Vetriver Canal 3 Sec	Canal Fencing	Canal Fence Righth	500000718_2	3	2	2	0.200
SAND-VET GWS	WR: Canals	Canal Section	Vetriver Canal 3 Sec	Canal Berm	Canal berm	500000718_5	3	2	2	0.382
SAND-VET GWS	WR: Canals	Canal Section	Vetriver Canal 2 Sec	Canal Excavation	Canal Excavation	500000536_0	3	3	2	0.523
SAND-VET GWS	WR: Canals	Canal Section	Vetriver Canal 2 Sec	Canal Fencing	Canal Fence Righth	500000536_2	3	3	2	0.273
SAND-VET GWS	WR: Canals	Canal Section	Vetriver Canal 2 Sec	Canal Berm	Canal Berm	500000536_5	3	3	2	0.283
SAND-VET GWS	WR: Canals	Canal Section	Vetriver Canal 3 Sec	Canal Excavation	Canal excavation	500000718_0	3	3	2	0.702
SAND-VET GWS	WR: Canals	Canal Section	Sandriver Canal 39 Sec	Canal Excavation	Canal excavation	500005907_0	3	3	2	1.869
SAND-VET GWS	WR: Canals	Canal Section	Sandriver Canal 39 Sec	Canal Fencing	Canal Fence Left	500005907_1	3	3	2	0.533
SAND-VET GWS	WR: Canals	Canal Section	Sandriver Canal 39 Sec	Canal Fencing	Canal Fence Righth	500005907_2	3	3	2	0.533
SAND-VET GWS	WR: Canals	Canal Section	Sandriver Canal 39 Sec	Canal Lining - TA3	Canal Lining	500005907_3	3	3	2	3.001
SAND-VET GWS	WR: Canals	Canal Section	Sandriver Canal 39 Sec	Canal Service Road	Canal service road	500005907_4	3	3	2	0.680

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
SAND-VET GWS	WR: Canals	Canal Section	Sandrivier Canal 39 Sec	Canal Berm	Canal berm	500005907_5	3	3	2	0.610
SAND-VET GWS	WR: Reservoirs	Reservoir	Orange Riet CanalWater reservoir	Reservoir	Orange Riet Canal - Drinking Water Reservoir	500000363_0	3	4	2	0.691
SAND-VET GWS	WR: Telemetry	Telemetry Station	VSAT - Sandvet	Telemetry Instrument VSAT Dish	Sandvet 2.4m Satellite dish	500010302_0	3	3	2	1.212
SAND-VET GWS	WR: Telemetry	Telemetry Station	VSAT - Sandvet	Telemetry Instrument VSAT Equi	Sandvet Ancillary equipment	500010302_1	3	3	2	0.449
SCHOONSPRUIT GWS	Buildings	Stores	Schoonspruit Store Room	Main Building	Main building	500008970_0	2	2	2	0.587
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 12	Canal Excavation	Canal excavation	500005168_0	3	2	2	0.371
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 12	Canal Fencing	Canal Fence Left	500005168_1	3	2	2	0.386
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 12	Canal Fencing	Canal Fence Righth	500005168_2	3	2	2	0.386
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 12	Canal Lining - TA3	Canal Lining	500005168_3	3	2	2	1.354
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 12	Canal Service Road	Canal service road	500005168_4	3	2	2	0.274
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 12	Canal Berm	Canal berm	500005168_5	3	2	2	0.719
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 9	Canal Excavation	Canal excavation	500005180_0	3	2	2	1.458
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 9	Canal Lining - TA3	Canal Lining	500005180_1	3	2	2	1.223
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 9	Canal Fencing	Canal Fence Left	500005180_2	3	2	2	0.610
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 9	Canal Fencing	Canal Fence Righth	500005180_3	3	2	2	0.610
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 9	Canal Service Road	Canal service road	500005180_4	3	2	2	0.128
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 9	Canal Berm	Canal berm	500005180_5	3	2	2	1.218
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 11	Canal Excavation	Canal excavation	500006292_0	3	2	2	0.059
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 11	Canal Lining - TA3	Canal Lining	500006292_1	3	2	2	0.068
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 11	Canal Fencing	Canal Fence Left	500006292_2	3	2	2	0.056
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 11	Canal Fencing	Canal Fence Righth	500006292_3	3	2	2	0.056
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 11	Canal Service Road	Canal service road	500006292_4	3	2	2	0.075
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 11	Canal Berm	Canal berm	500006292_5	3	2	2	0.124
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 13	Canal Excavation	Canal excavation	500006293_0	3	2	2	0.113
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 13	Canal Fencing	Canal Fence Left	500006293_1	3	2	2	0.125

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SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 13	Canal Fencing	Canal Fence Righth	500006293_2	3	2	2	0.125
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 13	Canal Lining - TA3	Canal Lining	500006293_3	3	2	2	0.438
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 13	Canal Service Road	Canal service road	500006293_4	3	2	2	0.167
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 13	Canal Berm	Canal berm	500006293_5	3	2	2	0.283
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 10	Canal Excavation	Canal excavation	500006296_0	3	2	2	1.159
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 10	Canal Lining - TA3	Canal Lining	Canal Lining	3	2	2	0.971
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 10	Canal Fencing	Canal Fence Left	500006296_2	3	2	2	0.484
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 10	Canal Fencing	Canal Fence Righth	500006296_3	3	2	2	0.484
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 10	Canal Service Road	Canal service road	500006296_4	3	2	2	1.397
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 10	Canal Berm	Canal berm	500006296_5	3	2	2	0.981
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Excavation	Canal excavation	500005176_0	3	3	2	3.230
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Lining - TA3	Canal Lining	500005176_1	3	3	2	1.591
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Outlets	Canal Outlet - sluice	500005176_2	3	3	2	0.035
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Controls	Canal Controls - LW	500005176_3	3	3	2	0.275
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Service Road	Canal service road	500005176_4	3	3	2	1.606
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Fencing	Canal Fence	500005176_5	3	3	2	0.038
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 6	Canal Berm	Canal berm	500005176_6	3	3	2	0.983
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 8	Canal Excavation	Canal excavation	500005178_0	3	3	2	1.573
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 8	Canal Lining - TA3	Canal Lining	500005178_1	3	3	2	3.294
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 8	Canal Fencing	Canal Fence Left	500005178_2	3	3	2	0.034
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 8	Canal Fencing	Canal Fence Righth	500005178_3	3	3	2	0.165
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 8	Canal Service Road	Canal service road	500005178_4	3	3	2	0.964
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 8	Canal Berm	Canal berm	500005178_5	3	3	2	0.032
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 5	Canal Excavation	Canal excavation	500006294_0	3	3	2	1.350
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 5	Canal Lining - TA3	Canal Lining	500006294_1	3	3	2	1.929
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 5	Canal Fencing	Canal Fence Left	500006294_2	3	3	2	0.012
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 5	Canal Fencing	Canal Fence Righth	500006294_3	3	3	2	0.012

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SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 5	Canal Service Road	Canal service road	500006294_4	3	3	2	0.100
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 5	Canal Berm	Canal berm	500006294_5	3	3	2	0.064
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 7	Canal Excavation	Canal excavation	500006295_0	3	3	2	1.324
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 7	Canal Lining - TA3	Canal Lining	500006295_1	3	3	2	1.010
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 7	Canal Service Road	Canal service road	500006295_2	3	3	2	0.394
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 7	Canal Fencing	Canal Fence	500006295_3	3	3	2	0.280
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 7	Canal Berm	Canal berm	500006295_4	3	3	2	0.176
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Prim Canal 7	Canal Bridges	Canal bridge	500006295_5	3	3	2	0.133
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Sec Canal 1	Canal Excavation	Canal excavation	500006303_0	3	3	2	1.382
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Sec Canal 1	Canal Fencing	Canal Fence Left	500006303_1	3	3	2	0.014
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Sec Canal 1	Canal Fencing	Canal Fence Righth	500006303_2	3	3	2	0.014
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Sec Canal 1	Canal Lining - TA3	Canal Lining	500006303_3	3	3	2	1.324
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Sec Canal 1	Canal Service Road	Canal service road	500006303_4	3	3	2	1.195
SCHOONSPRUIT GWS	WR: Canals	Canal Section	Rietspruit Sec Canal 1	Canal Berm	Canal berm	500006303_5	3	3	2	0.048
SLANG RIVER GWS	WR: Roads and bridge	Road Section	Zaaihoek Road 1	Road Section	Zaaihoek Road 1	500021850_0	1	5	2	0.536
SLANG RIVER GWS	WR: Water Treatment	Wastewater Treatment - Convent	Zaaihoek	Wastewater Treatment - Convent	not componentised	500009192_0	2	2	2	2.583
SLANG RIVER GWS	WR: Water Treatment	Water Treatment - Conventional	Zaaihoek	Water Treatment - Conventional	not componentised	500009518_0	2	2	2	0.575
TAUNG DAM	Buildings	Residential Housing	Taung Dam Residential 1	Main Building	Main building	500008155_0	3	4	2	1.631
TAUNG DAM	Buildings	Residential Housing	Taung Dam Residential 2	Main Building	Main building	500008156_0	3	4	2	1.631
TAUNG DAM	Buildings	Office Building	Taung Dam Office Building	Main Building	Main building	500008154_0	2	4	2	2.900
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal1	Canal Excavation	Canal excavation	500001016_0	3	1	2	0.060
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal1	Canal Fencing	Canal Fence Righth	500001016_2	3	1	2	0.156
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal1	Canal Lining - TA3	Canal Lining	500001016_3	3	1	2	0.065
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Lining - TA3	Canal Lining	500001567_1	3	1	2	0.151

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Fencing	Canal Fence Righth	500001015_5	3	2	2	0.088
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal1	Canal Fencing	Canal Fence Left	500001016_1	3	2	2	0.112
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal1	Canal Service Road	Canal service road	500001016_4	3	2	2	0.552
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Fencing	Canal Fence Righth	500001567_5	3	2	2	0.261
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Excavation	Canal excavation	500001015_0	3	3	2	0.388
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Lining - TA3	Canal lining	500001015_1	3	3	2	0.692
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Bridges	Canal Bridge	500001015_2	3	3	2	0.082
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Service Road	Canal service road	500001015_3	3	3	2	2.292
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Fencing	Canal Fence Left	500001015_4	3	3	2	0.058
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal3	Canal Berm	Canal berm	500001015_6	3	3	2	0.023
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal1	Canal Berm	Canal berm	500001016_5	3	3	2	0.175
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal1	Canal Excavation	Canal excavation	500001017_0	3	3	2	0.117
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal1	Canal Fencing	Canal Fence Left	500001017_1	3	3	2	0.049
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal1	Canal Fencing	Canal Fence Righth	500001017_2	3	3	2	0.049
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal1	Canal Lining - TA3	Canal Lining	500001017_3	3	3	2	0.431
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal1	Canal Service Road	Canal service road	500001017_4	3	3	2	0.288
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal1	Canal Berm	Canal berm	500001017_5	3	3	2	0.048
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal4	Canal Service Road	Canal service road	500001018_4	3	3	2	0.114
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal4	Canal Berm	Canal berm	500001018_5	3	3	2	0.176
THABAN'CHU DAMS	WR: Canals	Canal Section	ter_canal1	Canal Excavation	Canal excavation	500001019_0	3	3	2	0.405
THABAN'CHU DAMS	WR: Canals	Canal Section	ter_canal1	Canal Fencing	Canal Fence Left	500001019_1	3	3	2	0.031
THABAN'CHU DAMS	WR: Canals	Canal Section	ter_canal1	Canal Fencing	Canal Fence Righth	500001019_2	3	3	2	0.031
THABAN'CHU DAMS	WR: Canals	Canal Section	ter_canal1	Canal Lining - TA3	Canal Lining	500001019_3	3	3	2	0.056
THABAN'CHU DAMS	WR: Canals	Canal Section	ter_canal1	Canal Service Road	Canal service road	500001019_4	3	3	2	0.046
THABAN'CHU DAMS	WR: Canals	Canal Section	ter_canal1	Canal Berm	Canal berm	500001019_5	3	3	2	0.070
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Excavation	Canal excavation	500001567_0	3	3	2	0.145
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Bridges	Canal bridge	500001567_2	3	3	2	0.082

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Service Road	Service road	500001567_3	3	3	2	0.213
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Fencing	Canal Fence Left	500001567_4	3	3	2	0.261
THABAN'CHU DAMS	WR: Canals	Canal Section	prim_canal2	Canal Berm	Canal berm	500001567_6	3	3	2	0.141
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal5	Canal Service Road	Canal service road	500001568_4	3	3	2	0.098
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal5	Canal Berm	Canal berm	500001568_5	3	3	2	0.152
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal3	Canal Service Road	Canal service road	500001569_4	3	3	2	0.136
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal3	Canal Berm	Canal berm	500001569_5	3	3	2	0.203
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal2	Canal Excavation	Canal excavation	500001570_0	3	3	2	0.448
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal2	Canal Fencing	Canal Fence Left	500001570_1	3	3	2	0.004
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal2	Canal Fencing	Canal Fence Righth	500001570_2	3	3	2	0.004
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal2	Canal Lining - TA3	Canal Lining	500001570_3	3	3	2	0.058
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal2	Canal Service Road	Canal service road	500001570_4	3	3	2	0.053
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal2	Canal Berm	Canal berm	500001570_5	3	3	2	0.080
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal4	Canal Excavation	Canal excavation	500001018_0	3	4	2	0.026
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal4	Canal Fencing	Canal Fence Left	500001018_1	3	4	2	0.073
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal4	Canal Fencing	Canal Fence Righth	500001018_2	3	4	2	0.006
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal4	Canal Lining - TA3	Canal Lining	500001018_3	3	4	2	0.155
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal5	Canal Excavation	Canal excavation	500001568_0	3	4	2	0.864
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal5	Canal Fencing	Canal Fence Left	500001568_1	3	4	2	0.290
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal5	Canal Fencing	Canal Fence Righth	500001568_2	3	4	2	0.290
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal5	Canal Lining - TA3	Canal Lining	500001568_3	3	4	2	0.134
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal3	Canal Excavation	Canal excavation	500001569_0	3	4	2	0.031
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal3	Canal Fencing	Canal Fence Left	500001569_1	3	4	2	0.044
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal3	Canal Fencing	Canal Fence Righth	500001569_2	3	4	2	0.134
THABAN'CHU DAMS	WR: Canals	Canal Section	sec_canal3	Canal Lining - TA3	Canal Lining	500001569_3	3	4	2	0.186
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Spillway	Rooifontein Dam: Spillway	500009094_3	3	1	2	6.748
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Wall- 15m<Height<30m	Rooifontein Dam: Earth Embankment	500009094_4	3	1	2	0.793

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEDIBA DAM	Dam Outlet Valves - Casing	SEDIBA DAM - outlet valve - casing	500008751_6	3	2	2	0.014
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEDIBA DAM	Dam Spillway	Sediba Dam: Spillway	500008751_3	3	3	2	1.598
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEDIBA DAM	Dam Wall- 15m<Height<30m	Sediba Dam: Earth Embankment	500008751_4	3	3	2	3.480
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEDIBA DAM	Dam Outlet - Pipework- Steel	SEDIBA DAM outlet pipes	500008751_5	3	3	2	0.014
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEDIBA DAM	Dam Outlet Valves - Mechanism	SEDIBA DAM - outlet valve - mechanism	500008751_7	3	3	2	0.005
THABAN'CHU DAMS	WR: Dams	Main Damwall	FELOANA DAM	Dam Spillway	Feloana Dam: Spillway	500008752_3	3	3	2	17.077
THABAN'CHU DAMS	WR: Dams	Main Damwall	FELOANA DAM	Dam Wall- 15m<Height<30m	Feloana Dam: Earth Embankment	500008752_4	3	3	2	3.306
THABAN'CHU DAMS	WR: Dams	Main Damwall	FELOANA DAM	Dam Outlet - Pipework- Steel	FELOANA DAM outlet pipes	500008752_5	3	3	2	0.019
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Outlet - Pipework- Steel	ROOIFONTEIN DAM outlet pipes	500009094_5	3	3	2	0.059
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Outlet Valves - Casing	ROOIFONTEIN DAM - outlet valve - casing	500009094_6	3	3	2	0.059
THABAN'CHU DAMS	WR: Dams	Main Damwall	ROOIFONTEIN DAM	Dam Outlet Valves - Mechanism	ROOIFONTEIN DAM - outlet valve - mechanism	500009094_7	3	3	2	0.022
THABAN'CHU DAMS	WR: Dams	Main Damwall	FELOANA DAM	Dam Intake Gates - Casing	FELOANA DAM - intake gate - casing	500008752_1	3	4	2	0.015
THABAN'CHU DAMS	WR: Dams	Main Damwall	FELOANA DAM	Dam Outlet Valves - Casing	FELOANA DAM - outlet valve - casing	500008752_6	3	4	2	0.019
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Outlet - Pipework- Steel	SEROWALO outlet pipes	500009108_5	2	1	2	0.016
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Outlet Valves - Casing	SEROWALO - outlet valve - casing	500009108_6	2	1	2	0.016
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Outlet Valves - Mechanism	SEROWALO - outlet valve - mechanism	500009108_7	2	1	2	0.008
THABAN'CHU DAMS	WR: Dams	Main Damwall	WOODBIDGE	Dam Wall- 15m<Height<30m	Woodbridge Dam: Earth Embankment	500008830_3	2	2	2	13.216
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Spillway	Seroalo Dam: Spillway	500009108_3	2	2	2	16.404
THABAN'CHU DAMS	WR: Dams	Main Damwall	SEROWALO	Dam Wall- 15m<Height<30m	Seroalo Dam: Earth Embankment	500009108_4	2	2	2	12.858
THABAN'CHU DAMS	WR: Dams	Main Damwall	WOODBIDGE	Dam Spillway	Woodbridge Dam: Spillway	500008830_2	2	3	2	2.132
THABAN'CHU DAMS	WR: Dams	Main Damwall	WOODBIDGE	Dam Outlet - Pipework- Steel	WOODBIDGE outlet pipes	500008830_1	2	4	2	1.154
THABAN'CHU DAMS	WR: Dams	Main Damwall	WOODBIDGE	Dam Outlet Valves - Casing	WOODBIDGE - outlet valve - casing	500008830_4	2	4	2	1.154
THABAN'CHU DAMS	WR: Dams	Main Damwall	WOODBIDGE	Dam Outlet Valves - Mechanism	WOODBIDGE - outlet valve - mechanism	500008830_5	2	4	2	0.410
TUGELA-VAAL GWS	Buildings	Residential Housing	Schoon Plaats 26	Main Building	Main Building	500010134_0	4	2	2	1.761
TUGELA-VAAL GWS	Buildings	Office Building	Sand-Vet Office at Canal house 7	Main Building	Main Building	500010035_0	4	3	2	1.846

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TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Excavation	Canal excavation	500001023_0	3	3	2	10.812
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Berm	Canal berm	500001023_1	3	3	2	6.019
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Bridges	Canal bridge	500001023_2	3	3	2	2.337
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Controls	Canal Controls - Gate	500001023_3	3	3	2	0.182
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Fencing	Canal Fence Left	500001023_4	3	3	2	0.417
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Lining - TA2	Canal lining (General)	500001023_5	3	3	2	6.633
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Lining - TA2	Canal lining (km 4-km 5.5)	500001023_6	3	3	2	6.633
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Meters	Canal Meter	500001023_7	3	3	2	0.258
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Service Road	Canal service road	500001023_8	3	3	2	0.611
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 2	Canal Syphons	Khombela Siphon	500001023_9	3	3	2	1.133
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Excavation	Canal excavation	500008455_0	3	3	2	3.353
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Berm	Canal berm	500008455_1	3	3	2	17.699
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Bridges	Canal bridge	500008455_2	3	3	2	1.076
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Fencing	Canal Fence	500008455_3	3	3	2	0.567
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Lining - TA2	Canal Lining	500008455_4	3	3	2	4.112
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Meters	Measuring facilities	500008455_5	3	3	2	0.172
TUGELA-VAAL GWS	WR: Canals	Canal Section	Putterhill	Canal Service Road	Canal service road	500008455_6	3	3	2	0.165
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Excavation	Canal excavation	500009003_0	3	3	2	8.375
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Berm	Canal berm	500009003_1	3	3	2	26.043
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Fencing	Canal Fence	500009003_2	3	3	2	0.371
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Lining - TA2	Canal Lining	500009003_3	3	3	2	7.353
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Controls	Canal controls	500009003_4	3	3	2	0.026
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Controls	Canal Controls - Gates	500009003_5	3	3	2	0.344
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Service Road	Canal service road	500009003_6	3	3	2	0.093
TUGELA-VAAL GWS	WR: Canals	Canal Section	Clifford Chambers 1	Canal Syphons	Tugela Siphon	500009003_7	3	3	2	1.133
TUGELA-VAAL GWS	WR: Canals	Canal Syphon (Large)	TUGELA SIPHON	Canal Syphon (large)	not componentised	500008454_0	2	3	2	24.817
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Wall- 15m<Height<30m	Putterill Weir: Concrete	500009008_1	4	1	2	7.516

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Casing	Sterkfontein Dam - outlet valve - casing	500009007_10	4	3	2	2.167
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Mechanism	Sterkfontein Dam - outlet valve - mechanism	500009007_11	4	3	2	0.962
TUGELA-VAAL GWS	WR: Dams	Secondary Damwall	Sterkfontein Secondary Dam wall	Dam Wall- 15m<Height<30m	Sterkfontein: Earth Embankment	500009046_1	4	3	2	32.085
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Intake Gates - Casing	Putterill weir - intake gate - casing	500009008_2	3	1	2	0.164
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Intake Gates - Mechanism	Putterill weir - intake gate - mechanism	500009008_3	3	1	2	0.060
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Outlet - Pipework- Steel	Putterill weir outlet pipes	500009008_4	3	1	2	0.218
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Outlet Valves - Casing	Putterill weir - outlet valve - casing	500009008_5	3	1	2	0.218
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Putterill weir	Dam Outlet Valves - Mechanism	Putterill weir - outlet valve - mechanism	500009008_6	3	1	2	0.081
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Nuwejaarspruit Weir	Dam Wall- 15m<Height<30m	Nuwejaarspruit: Concrete	500009045_1	3	3	2	0.810
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Nuwejaarspruit Weir	Dam Meter & Instrumentation	Nuwejaarspruit weir meter and instrumentation	500009045_2	3	3	2	0.040
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein Tower staircase	500009007_12	2	2	2	2.074
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein dam handrails	500009007_30	2	2	2	0.425
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein Dam - lift	500009007_33	2	2	2	2.186
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein Dam - lighting	500009007_34	2	2	2	1.167
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein standby generator	500009007_39	2	2	2	2.625
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein Dam - ventilation	500009007_40	2	2	2	0.243
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Structure	Sterkfontein Dam Outlet	500009007_1	2	3	2	72.796
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Meter & Instrumentation	Sterkfontein Dam: Instrumentation	500009007_3	2	3	2	2.677
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates - Casing	Sterkfontein Dam - intake gate - casing	500009007_4	2	3	2	1.625
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates - Mechanism	Sterkfontein Dam - intake gate - mechanism	500009007_5	2	3	2	0.580
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet - Intake Tower	Sterkfontein Dam: Intake Tower	500009007_6	2	3	2	63.950
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Wall- Height>60m	Sterkfontein Dam: Earth Embankment	500009007_7	2	3	2	2,651.501
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Cranes	Condra crane	500009007_8	2	3	2	3.120
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet - Pipework- Steel	Sterkfontein Dam outlet pipes	500009007_9	2	3	2	2.167
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Casing	outlet isolating valve 1 (LH) casing	500009007_13	2	3	2	0.150
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Mechanism	outlet isolating valve 1 (LH) mechanism	500009007_15	2	3	2	0.050

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates	isolating slab gate 1 (left) gate	500009007_17	2	3	2	0.725
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates	isolating slab gate 2 (right) gate	500009007_18	2	3	2	0.725
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates	outlet control slab gate 1 (left) gate	500009007_19	2	3	2	0.725
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates	outlet control slab gate 2 (right) gate	500009007_20	2	3	2	0.725
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates - Mechanism	isolating slab gate 1 (left) mechanism	500009007_21	2	3	2	0.242
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates - Mechanism	isolating slab gate 2 (right) mechanism	500009007_22	2	3	2	0.242
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates - Mechanism	outlet control slab gate 1 (left) mechanism	500009007_23	2	3	2	0.242
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Intake Gates - Mechanism	outlet control slab gate 2 (right) mechanism	500009007_24	2	3	2	0.242
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Tunnel	Sterkfontein outlet tunnel	500009007_28	2	3	2	6.738
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Electric Network	Sterkfontein Dam - electric network	500009007_29	2	3	2	1.093
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein Dam - HPP	500009007_31	2	3	2	1.093
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein dam HPP 2	500009007_32	2	3	2	1.093
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Casing	Sterkfontein dam needle valve 1 (LH) - casing	500009007_35	2	3	2	0.135
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Casing	Sterkfontein dam needle valve 2 (RH) - casing	500009007_36	2	3	2	0.135
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Mechanism	Sterkfontein dam needle valve 1 (LH) - mechanism	500009007_37	2	3	2	0.045
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Dam Outlet Valves - Mechanism	Sterkfontein dam needle valve 2 (RH) - mechanism	500009007_38	2	3	2	0.045
TUGELA-VAAL GWS	WR: Dams	Main Damwall	Sterkfontein Dam	Auxilliary Equip. Main Damwall	Sterkfontein dam boat slipway	500009007_27	2	4	2	0.364
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Driel III Pump Station	Cranes	Driel 3 pumpstation crane	500008466_5	4	3	2	3.299
TUGELA-VAAL GWS	WR: Pump stations	Pump Station	Kilburn I Pump Station	Cranes	Kuli crane	500008476_13	4	3	2	5.669
TUGELA-VAAL GWS	WR: Roads and bridge	Road Section	Driekloof Concrete Path to Dam wall	Road Section	Driekloof Concrete Path to Dam wall	500021725_0	1	1	2	0.005
TUGELA-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Killburn IB Pipeline	Pipeline- Steel	Pipeline	500008820_0	1	3	2	6.885
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 3	Main Building	Main building	500006807_0	3	3	2	0.880

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USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 6	Main Building	Main building	500006809_0	3	3	2	0.880
USUTU RIVER GWS	Buildings	Hostels / Flats / Compounds	Jerico Dam Nature Coservation Complex Single Quart	Main Building	Main building	500006810_0	3	3	2	1.366
USUTU RIVER GWS	Buildings	Hostels / Flats / Compounds	Jerico Dam Nature Conservatoion complex toilets	Main Building	Main building	500006813_0	3	3	2	1.366
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 1	Main Building	Main building	500007531_0	3	3	2	1.366
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 2	Main Building	Main building	500007532_0	3	3	2	1.366
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature conservation Complex House 4	Main Building	Main building	500007533_0	3	3	2	1.366
USUTU RIVER GWS	Buildings	Residential Housing	Jerico Dam Nature Conservation Complex House 5	Main Building	Main building	500007534_0	3	3	2	1.366
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir	not componentised	500004120_0	5	4	2	12.117
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir Structure	Camden reservoir Structure No 1	500004120_1	5	4	2	0.026
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir Lining	Camden reservoir lining No 1	500004120_2	5	4	2	0.006
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 1	Reservoir Pipe	Camden reservoir pipe No 1	500004120_3	5	4	2	0.005
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir	not componentised	500004119_0	2	4	2	13.963
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir Structure	Camden Reservoirstructure No 2	500004119_1	2	4	2	0.026
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir Lining	Camden reservoir lining No 2	500004119_2	2	4	2	0.006
USUTU RIVER GWS	WR: Reservoirs	Reservoir	Camden Reservoir No 2	Reservoir Pipe	Camden reservoir pipe No 2	500004119_3	2	4	2	0.005
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Road around dam	Road Section	Road around dam	500021800_0	1	2	2	1.639
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Westoe road to inlet	Road Section	Westoe road to inlet	500021846_0	1	2	2	0.037
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Fire break roads	Road Section	Fire break roads	500021739_0	1	3	2	0.360
USUTU RIVER GWS	WR: Roads and bridge	Road Bridge	Bonnie brook bridges	Road Bridge	Bonnie brook bridges	500021704_0	1	4	2	0.531
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Jericho Dam Main 1	Road Section	Jericho Dam Main 1	500021757_0	1	4	2	0.248
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Jericho Dam Main 2	Road Section	Jericho Dam Main 2	500021758_0	1	4	2	0.253
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Main road 1	Road Section	Main road 1	500021772_0	1	4	2	0.180
USUTU RIVER GWS	WR: Roads and bridge	Road Section	Main road 2	Road Section	Main road 2	500021773_0	1	4	2	0.064
USUTU RIVER GWS	WR: Roads and bridge	Road Bridge	Bridge at Usutu river inlet	Road Bridge	Bridge at Usutu river inlet	500021706_0	1	5	2	0.531

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
USUTU RIVER GWS	WR: Water Treatment	Water Treatment - Conventional	Morgenstond Water Treatment Works	Water Treatment - Conventional	not componentised	500007509_0	2	4	2	1.460
USUTU-VAAL GWS	Buildings	Residential Housing	Naauppoort House 6	Main Building	Main building	500008261_0	3	1	2	0.277
USUTU-VAAL GWS	Buildings	Residential Housing	Naauppoort House 7	Main Building	Main building	500008262_0	3	1	2	0.277
USUTU-VAAL GWS	Buildings	Residential Housing	Naauppoort House 8	Main Building	Main building	500008276_0	3	1	2	0.277
USUTU-VAAL GWS	Buildings	Residential Housing	Naauppoort House 9	Main Building	Main building	500008277_0	3	1	2	0.277
USUTU-VAAL GWS	Buildings	Residential Housing	Naauppoort House 3	Main Building	Main building	500008822_0	3	1	2	0.277
USUTU-VAAL GWS	Buildings	Residential Housing	Naauppoort House 10	Main Building	Main building	500008825_0	3	1	2	0.277
USUTU-VAAL GWS	Buildings	Hostels / Flats / Compounds	Naawpoort Single Quarters	Hostels / Flats / Compounds	Naawpoort Single Quarters - not componentised	500000043_0	3	2	2	10.634
USUTU-VAAL GWS	Buildings	Residential Housing	Rietfontein Snr Housing 2	Main Building	Main building	500008283_0	3	2	2	1.031
USUTU-VAAL GWS	Buildings	Hostels / Flats / Compounds	Naawpoort Dam Single Quaters (10)	Main Building	Main building	500008521_0	3	2	2	1.823
USUTU-VAAL GWS	Buildings	Residential Housing	Rietfontein Snr Housing 1	Outbuildings	garage and servant quarters	500008283_1	3	3	2	0.106
USUTU-VAAL GWS	Buildings	Residential Housing	Rietfontein Snr Housing 1	Main Building	Main building	500008516_0	3	3	2	2.511
USUTU-VAAL GWS	Buildings	Residential Housing	Trichardsfontein Guards House	Main Building	Main building	500005806_0	2	2	2	0.089
USUTU-VAAL GWS	Buildings	Schools & Training Centres	Standerton Primary School	Main Building	Standerton Primary School	500000042_0	1	3	2	2.057
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 5	Main Building	Main building	500007383_0	1	3	2	0.833
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 5	Outbuildings	single garage	500007383_1	1	3	2	0.106
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 17	Main Building	Main building	500007394_0	1	3	2	0.833
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 17	Outbuildings	single garage	500007394_1	1	3	2	0.106
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 15	Main Building	Main building	500008038_0	1	3	2	0.833
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 15	Outbuildings	single garage	500008038_1	1	3	2	0.106
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 16	Main Building	Main building	500008039_0	1	3	2	0.833
USUTU-VAAL GWS	Buildings	Residential Housing	Grootdraai Dam North House 16	Outbuildings	single garage	500008039_1	1	3	2	0.106
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauppoort Booster Pump Station	Pumpstation Pump - Casing	Naauppoort booster pump 1 casing	500002131_1	5	3	2	0.297
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauppoort Booster Pump Station	Pumpstation Pump - Rotor	Naauppoort booster pump 1 rotor	500002131_2	5	3	2	0.099
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauppoort Booster Pump Station	Pumpstation Pump - Casing	Naauppoort booster pump 2 casing	500002131_4	5	3	2	0.297
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naauppoort Booster Pump Station	Pumpstation Pump - Rotor	Naauppoort booster pump 2 rotor	500002131_5	5	3	2	0.099

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USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Booster Pump Station	Pumpstation Pump - Casing	Naaupoort booster pump 3 casing	500002131_7	5	3	2	0.297
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Booster Pump Station	Pumpstation Pump - Rotor	Naaupoort booster pump 3 rotor	500002131_8	5	3	2	0.099
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Booster Pump Station	Pumpstation Pump - Casing	Naaupoort booster pump 4 casing	500002131_10	5	3	2	0.297
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Booster Pump Station	Pumpstation Pump - Rotor	Naaupoort booster pump 4 rotor	500002131_11	5	3	2	0.099
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Booster Pump Station	Valves - Mechanism	Naaupoort Booster Pump Station PS discharge valve	500002131_18	5	3	2	5.918
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Casing	Naaupoort Pump 2 casing	500002342_1	5	3	2	1.632
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Rotor	Naaupoort Pump 2 rotor	500002342_2	5	3	2	0.627
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Casing	Naaupoort Pump 3 casing	500002342_4	5	3	2	1.632
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Rotor	Naaupoort Pump 3 rotor	500002342_5	5	3	2	0.627
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Casing	Naaupoort Pump 4 casing	500002342_7	5	3	2	1.632
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Rotor	Naaupoort Pump 4 rotor	500002342_8	5	3	2	0.627
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Casing	Naaupoort Pump 5 casing	500002342_10	5	3	2	1.632
USUTU-VAAL GWS	WR: Pump stations	Pump Station	Naaupoort Pump Station	Pumpstation Pump - Rotor	Naaupoort Pump 5 rotor	500002342_11	5	3	2	0.627
USUTU-VAAL GWS	WR: Roads and bridge	Road Section	Grootfontein Pump Station - Access Road	Road Section	Grootfontein Pump Station - Access Road	500021745_0	1	3	2	0.052
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI2N - PI1 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI2N - PI1 Duvha-Hendrina pipeline	500008069_0	5	2	2	3.904
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI2N - PI1 Duvha-Hendrina	Pipeline Lining- Bitchumen	Gravity Pipe : PI2N - PI1 Duvha-Hendrina pipeline	500008069_1	5	2	2	0.732
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI2N - PI1 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI2N - PI1 Duvha-Hendrina pipeline	500008069_2	5	2	2	0.244
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI1 - PI2 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI1 - PI2 Duvha-Hendrina pipeline	500008070_0	5	2	2	12.932
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI1 - PI2 Duvha-Hendrina	Pipeline Lining- Bitchumen	Gravity Pipe : PI1 - PI2 Duvha-Hendrina pipeline	500008070_1	5	2	2	2.425
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI1 - PI2 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI1 - PI2 Duvha-Hendrina pipeline	500008070_2	5	2	2	0.808
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI4N - PI5 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI4N - PI5 Duvha-Hendrina pipeline	500008071_0	5	2	2	16.903
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI4N - PI5 Duvha-Hendrina	Pipeline Lining- Bitchumen	Gravity Pipe : PI4N - PI5 Duvha-Hendrina pipeline	500008071_1	5	2	2	3.169

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USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI4N - PI5 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI4N - PI5 Duvha-Hendrina pipeline	500008071_2	5	2	2	1.056
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI6 - PI7 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI6 - PI7 Duvha-Hendrina pipeline	500008072_0	5	2	2	5.735
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI6 - PI7 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI6 - PI7 Duvha-Hendrina pipeline	500008072_1	5	2	2	1.075
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI6 - PI7 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI6 - PI7 Duvha-Hendrina pipeline	500008072_2	5	2	2	0.358
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI8 - PI9 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI8 - PI9 Duvha-Hendrina pipeline	500008073_0	5	2	2	0.545
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI8 - PI9 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI8 - PI9 Duvha-Hendrina pipeline	500008073_1	5	2	2	0.102
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI8 - PI9 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI8 - PI9 Duvha-Hendrina pipeline	500008073_2	5	2	2	0.034
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI9 - PI10N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI9 - PI10N Duvha-Hendrina pipelin	500008074_0	5	2	2	2.028
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI9 - PI10N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI9 - PI10N Duvha-Hendrina pipelin	500008074_1	5	2	2	0.380
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI9 - PI10N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI9 - PI10N Duvha-Hendrina pipelin	500008074_2	5	2	2	0.127
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI11N - PI12N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI11N - PI12N Duvha-Hendrina pipel	500008075_0	5	2	2	6.769
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI11N - PI12N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI11N - PI12N Duvha-Hendrina pipel	500008075_1	5	2	2	1.269
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI11N - PI12N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI11N - PI12N Duvha-Hendrina pipel	500008075_2	5	2	2	0.423
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI14 - PI15N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI14 - PI15N Duvha-Hendrina pipeli	500008076_0	5	2	2	2.102
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI14 - PI15N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI14 - PI15N Duvha-Hendrina pipeli	500008076_1	5	2	2	0.394
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI14 - PI15N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI14 - PI15N Duvha-Hendrina pipeli	500008076_2	5	2	2	0.131
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI16 - PI17N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI16 - PI17N Duvha-Hendrina pipeli	500008077_0	5	2	2	9.143
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI16 - PI17N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI16 - PI17N Duvha-Hendrina pipeli	500008077_1	5	2	2	1.714

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USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI16 - PI17N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI16 - PI17N Duvha-Hendrina pipeli	500008077_2	5	2	2	0.571
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI18N - PI19 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI18N - PI19 Duvha-Hendrina pipeli	500008078_0	5	2	2	3.209
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI18N - PI19 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI18N - PI19 Duvha-Hendrina pipeli	500008078_1	5	2	2	0.602
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI18N - PI19 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI18N - PI19 Duvha-Hendrina pipeli	500008078_2	5	2	2	0.201
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI19 - PI20 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI19 - PI20 Duvha-Hendrina pipelin	500008079_0	5	2	2	30.137
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI19 - PI20 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI19 - PI20 Duvha-Hendrina pipelin	500008079_1	5	2	2	5.651
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI19 - PI20 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI19 - PI20 Duvha-Hendrina pipelin	500008079_2	5	2	2	1.884
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	H-D section1	Pipeline- Steel	H-D section1 pipeline	500008120_0	5	2	2	0.152
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	H-D section1	Pipeline Lining-Bitchumen	H-D section1 pipeline lining	500008120_1	5	2	2	0.028
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	H-D section1	Pipeline Valves	H-D section1 pipeline valves	500008120_2	5	2	2	0.009
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI2 - PI3 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI2 - PI3 Duvha-Hendrina pipeline	500008616_0	5	2	2	8.430
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI2 - PI3 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI2 - PI3 Duvha-Hendrina pipeline	500008616_1	5	2	2	1.581
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI2 - PI3 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI2 - PI3 Duvha-Hendrina pipeline	500008616_2	5	2	2	0.527
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI3 - PI4N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI3 - PI4N Duvha-Hendrina pipeline	500008617_0	5	2	2	4.213
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI3 - PI4N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI3 - PI4N Duvha-Hendrina pipeline	500008617_1	5	2	2	0.790
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI3 - PI4N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI3 - PI4N Duvha-Hendrina pipeline	500008617_2	5	2	2	0.263
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI5 - PI6 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI5 - PI6 Duvha-Hendrina pipeline	500008618_0	5	2	2	2.379
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI5 - PI6 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI5 - PI6 Duvha-Hendrina pipeline	500008618_1	5	2	2	0.446
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI5 - PI6 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI5 - PI6 Duvha-Hendrina pipeline	500008618_2	5	2	2	0.149

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI7 - PI8 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI7 - PI8 Duvha-Hendrina pipeline	500008619_0	5	2	2	1.540
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI7 - PI8 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI7 - PI8 Duvha-Hendrina pipeline	500008619_1	5	2	2	0.289
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI7 - PI8 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI7 - PI8 Duvha-Hendrina pipeline	500008619_2	5	2	2	0.096
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI10N - PI11N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI10N - PI11N Duvha-Hendrina pipel	500008620_0	5	2	2	1.496
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI10N - PI11N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI10N - PI11N Duvha-Hendrina pipel	500008620_1	5	2	2	0.281
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI10N - PI11N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI10N - PI11N Duvha-Hendrina pipel	500008620_2	5	2	2	0.094
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI12N - PI13 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI12N - PI13 Duvha-Hendrina pipeli	500008621_0	5	2	2	9.429
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI12N - PI13 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI12N - PI13 Duvha-Hendrina pipeli	500008621_1	5	2	2	1.768
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI12N - PI13 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI12N - PI13 Duvha-Hendrina pipeli	500008621_2	5	2	2	0.589
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI13 - PI14 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI13 - PI14 Duvha-Hendrina pipelin	500008622_0	5	2	2	0.350
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI13 - PI14 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI13 - PI14 Duvha-Hendrina pipelin	500008622_1	5	2	2	0.066
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI13 - PI14 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI13 - PI14 Duvha-Hendrina pipelin	500008622_2	5	2	2	0.022
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI15N - PI16 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI15N - PI16 Duvha-Hendrina pipeli	500008623_0	5	2	2	33.120
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI15N - PI16 Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI15N - PI16 Duvha-Hendrina pipeli	500008623_1	5	2	2	6.210
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI15N - PI16 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI15N - PI16 Duvha-Hendrina pipeli	500008623_2	5	2	2	2.070
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI17N - PI18N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI17N - PI18N Duvha-Hendrina pipel	500008624_0	5	2	2	4.342
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI17N - PI18N Duvha-Hendrina	Pipeline Lining-Bitchumen	Gravity Pipe : PI17N - PI18N Duvha-Hendrina pipel	500008624_1	5	2	2	0.814
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI17N - PI18N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI17N - PI18N Duvha-Hendrina pipel	500008624_2	5	2	2	0.271

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI20 - PI21 Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI20 - PI21 Duvha-Hendrina pipelin	500008625_0	5	2	2	4.386
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI20 - PI21 Duvha-Hendrina	Pipeline Lining- Bitchumen	Gravity Pipe : PI20 - PI21 Duvha-Hendrina pipelin	500008625_1	5	2	2	0.822
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI20 - PI21 Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI20 - PI21 Duvha-Hendrina pipelin	500008625_2	5	2	2	0.274
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI21 - PI22N Duvha-Hendrina	Pipeline- Steel	Gravity Pipe : PI21 - PI22N Duvha-Hendrina pipeli	500008626_0	5	2	2	2.318
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI21 - PI22N Duvha-Hendrina	Pipeline Lining- Bitchumen	Gravity Pipe : PI21 - PI22N Duvha-Hendrina pipeli	500008626_1	5	2	2	0.435
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Gravity Pipe : PI21 - PI22N Duvha-Hendrina	Pipeline Valves	Gravity Pipe : PI21 - PI22N Duvha-Hendrina pipeli	500008626_2	5	2	2	0.145
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	N-D section 2.1	Pipeline- Steel	N-D section 2.1 pipeline	500008657_0	5	2	2	12.084
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	N-D section 2.1	Pipeline Lining- Bitchumen	N-D section 2.1 pipeline lining	500008657_1	5	2	2	2.266
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	N-D section 2.1	Pipeline Valves	N-D section 2.1 pipeline valves	500008657_2	5	2	2	0.755
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	N-D section 2.2	Pipeline- Steel	N-D section 2.2 pipeline	500008658_0	5	2	2	17.506
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	N-D section 2.2	Pipeline Lining- Bitchumen	N-D section 2.2 pipeline lining	500008658_1	5	2	2	3.282
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	N-D section 2.2	Pipeline Valves	N-D section 2.2 pipeline valves	500008658_2	5	2	2	1.094
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Naaupoort - Duvha section 1	Pipeline- Steel	Naaupoort - Duvha section 1 pipeline	500008656_0	5	3	2	0.817
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Naaupoort - Duvha section 1	Pipeline Lining- Bitchumen	Naaupoort - Duvha section 1 pipeline lining	500008656_1	5	3	2	0.153
USUTU-VAAL GWS	WR: Steel Pipelines	Pipeline Section	Naaupoort - Duvha section 1	Pipeline Valves	Naaupoort - Duvha section 1 pipeline valves	500008656_2	5	3	2	0.051
USUTU-VAAL GWS	WR: Water Treatment	Water Treatment - Conventional	Rietfontein Water Treatment Plant	Water Treatment - Conventional	not componentised	500004808_0	2	3	2	0.691
USUTU-VAAL GWS	WR: Water Treatment	Water Treatment - Conventional	Grootdraai Water Treatment PLant	Water Treatment - Conventional	not componentised	500009194_0	2	3	2	0.608
VAAL DAM	WR: Water Treatment	Wastewater Treatment - Convent	Vaaldam STW	Wastewater Treatment - Convent	not componentised	500008006_0	2	4	2	4.013
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servant Quarters 1	Main Building	Main building	500008433_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servant Quarters 3	Main Building	Main building	500008434_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servants Quarters 5	Main Building	Main building	500008435_0	3	1	2	0.880

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VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servants Quarters 6	Main Building	Main building	500008436_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Hostels / Flats / Compounds	Warrenton Servants Quarters 8	Main Building	Main building	500008437_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servant Quarters 2	Main Building	Main building	500008972_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servants Quarters 4	Main Building	Main building	500008973_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servants Quarters 7	Main Building	Main building	500008974_0	3	1	2	0.880
VAALHARTS CANALS	Buildings	Residential Housing	Warrenton Servants Quarters 10	Main Building	Main building	500008976_0	3	1	2	0.880
VAALHARTS CANALS	WR: Canals	Canal Section	Vaalharts Canal	Canal Balancing Dams (Small)	Vaalharts - Borrelskop Canal Balancing Dam	500000281_0	3	2	2	6.718
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Berm	Canal berm	500000694_5	3	2	2	0.105
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Berm	Canal berm	500000695_5	3	2	2	0.058
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 12	Canal Berm	Canal berm	500000696_5	3	2	2	0.081
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB10	Canal Excavation	Canal excavation	500000697_0	3	2	2	1.648
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB10	Canal Meters	Canal Meter	500000697_2	3	2	2	0.172
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB10	Canal Bridges	Canal bridge	500000697_3	3	2	2	0.117
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB10	Canal Berm	Canal berm	500000697_7	3	2	2	0.058
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500000698_0	3	2	2	0.013
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Left	500000698_1	3	2	2	0.081
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000698_2	3	2	2	0.081
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Lining - TA3	Canal Lining	500000698_3	3	2	2	0.053
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000698_5	3	2	2	0.106
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500000699_0	3	2	2	0.046
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Left	500000699_1	3	2	2	0.194
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000699_2	3	2	2	0.194
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Lining - TA3	Canal Lining	500000699_3	3	2	2	0.010
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000699_5	3	2	2	0.011
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500000700_0	3	2	2	0.025
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Left	500000700_1	3	2	2	0.127
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000700_2	3	2	2	0.127

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VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Lining - TA3	Canal Lining	500000700_3	3	2	2	0.075
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000700_5	3	2	2	0.057
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000701_2	3	2	2	0.133
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000701_5	3	2	2	0.058
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500000702_0	3	2	2	0.085
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Left	500000702_1	3	2	2	0.183
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000702_2	3	2	2	0.133
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Lining - TA3	Canal Lining	500000702_3	3	2	2	0.201
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000702_5	3	2	2	0.199
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000712_2	3	2	2	0.133
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000712_5	3	2	2	0.023
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Berm	Canal berm	500000713_5	3	2	2	0.055
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Excavation	Canal excavation	500000714_0	3	2	2	0.030
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Fencing	Canal Fence Righth	500000714_2	3	2	2	0.123
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Berm	Canal berm	500000714_5	3	2	2	0.052
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 16	Canal Berm	Canal berm	500000716_5	3	2	2	0.061
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 15	Canal Berm	Canal berm	500000717_5	3	2	2	0.005
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500000719_0	3	2	2	0.036
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Left	500000719_1	3	2	2	0.129
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500000719_2	3	2	2	0.057
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Lining - TA3	Canal Lining	500000719_3	3	2	2	0.105
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500000719_5	3	2	2	0.059
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 1	Canal Excavation	Canal excavation	500000720_0	3	2	2	0.013
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 1	Canal Fencing	Canal Fence Righth	500000720_2	3	2	2	0.141
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 1	Canal Berm	Canal berm	500000720_5	3	2	2	0.106
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU11	Canal Berm	Canal berm	500000721_5	3	2	2	0.154
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Excavation	Canal excavation	500000722_0	3	2	2	0.672

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Berm	Canal berm	500000722_5	3	2	2	0.054
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-1	Canal Excavation	Canal excavation	500000723_0	3	2	2	1.498
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-1	Canal Meters	Canal Meter	500000723_2	3	2	2	0.172
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-1	Canal Berm	Canal berm	500000723_3	3	2	2	2.364
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 6	Canal Excavation	Canal excavation	500000724_0	3	2	2	0.112
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 6	Canal Fencing	Canal Fence Righth	500000724_2	3	2	2	0.504
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 6	Canal Berm	Canal berm	500000724_5	3	2	2	0.077
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Excavation	Canal excavation	500000726_0	3	2	2	0.073
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Berm	Canal berm	500000726_5	3	2	2	0.058
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-2	Canal Excavation	Canal excavation	500000727_0	3	2	2	0.258
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-2	Canal Meters	Canal Meter	500000727_2	3	2	2	0.172
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-2	Canal Berm	Canal berm	500000727_3	3	2	2	0.429
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-3	Canal Berm	Canal berm	500000728_5	3	2	2	0.058
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB16	Canal Berm	Canal berm	500000934_5	3	2	2	0.051
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU14	Canal Berm	Canal berm	500000935_5	3	2	2	0.060
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Berm	Canal berm	500000940_5	3	2	2	0.056
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Berm	Canal berm	500001037_5	3	2	2	0.025
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Berm	Canal berm	500001038_5	3	2	2	0.077
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500001039_2	3	2	2	0.311
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500001039_5	3	2	2	0.028
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Berm	Canal berm	500001040_5	3	2	2	0.051
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500001041_0	3	2	2	0.164
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500001041_2	3	2	2	0.136
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500001041_5	3	2	2	0.053
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Excavation	Canal excavation	500001042_0	3	2	2	0.122
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Left	500001042_1	3	2	2	0.845
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500001042_2	3	2	2	0.845

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Lining - TA3	Canal Lining	500001042_3	3	2	2	0.364
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500001042_5	3	2	2	0.138
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Fencing	Canal Fence Righth	500001043_2	3	2	2	0.272
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Berm	Canal berm	500001043_5	3	2	2	0.054
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB8	Canal Excavation	Canal excavation	500001044_0	3	2	2	0.373
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB8	Canal Berm	Canal berm	500001044_5	3	2	2	0.013
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Berm	Canal berm	500001045_5	3	2	2	0.095
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Berm	Canal berm	500001046_5	3	2	2	0.049
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 17	Canal Berm	Canal berm	500001047_5	3	2	2	0.173
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2	Canal Excavation	Canal excavation	500001048_0	3	2	2	2.474
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2	Canal Berm	Canal berm	500001048_5	3	2	2	0.018
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU8	Canal Berm	Canal berm	500001049_5	3	2	2	0.031
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU10	Canal Berm	Canal berm	500001050_5	3	2	2	0.521
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 5	Canal Excavation	Canal excavation	500001051_0	3	2	2	0.015
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 5	Canal Fencing	Canal Fence Righth	500001051_2	3	2	2	0.141
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 5	Canal Berm	Canal berm	500001051_5	3	2	2	0.178
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Excavation	Canal excavation	500001052_0	3	2	2	0.067
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Fencing	Canal Fence Left	500001052_1	3	2	2	0.133
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Fencing	Canal Fence Righth	500001052_2	3	2	2	0.133
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Lining - TA3	Canal Lining	500001052_3	3	2	2	0.011
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Berm	Canal berm	500001052_5	3	2	2	0.070
VAALHARTS CANALS	WR: Canals	Canal Section	KB Prim Canal	Canal Berm	Canal berm	500001522_2	3	2	2	0.505
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal x	Canal Berm	Canal berm	500001524_5	3	2	2	0.052
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU2	Canal Berm	Canal berm	500001525_5	3	2	2	0.145
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal DC	Canal Excavation	Canal excavation	500004273_0	3	2	2	0.738
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal DC	Canal Berm	Canal berm	500004273_1	3	2	2	0.672
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal DC	Canal Lining - TA3	Canal Lining	500004273_2	3	2	2	0.889

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal DC	Canal Fencing	Canal Fence Left	500004273_3	3	2	2	0.327
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal DC	Canal Fencing	Canal Fence Righth	500004273_4	3	2	2	0.327
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal DC	Canal Service Road	Canal service road	500004273_5	3	2	2	1.559
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2 Start	Canal Excavation	Canal excavation	500004274_0	3	2	2	0.124
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2 Start	Canal Lining - TA3	Canal Lining	500004274_1	3	2	2	0.698
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2 Start	Canal Fencing	Canal Fence Left	500004274_2	3	2	2	0.131
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2 Start	Canal Fencing	Canal Fence Righth	500004274_3	3	2	2	0.131
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2 Start	Canal Service Road	Canal service road	500004274_4	3	2	2	0.521
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2 Start	Canal Berm	Canal berm	500004274_5	3	2	2	0.012
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Excavation	Canal excavation	500004275_0	3	2	2	0.995
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Lining - TA3	Canal Lining	500004275_1	3	2	2	4.763
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Bridges	Canal bridge	500004275_2	3	2	2	0.117
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Berm	Canal berm	500004275_3	3	2	2	1.013
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Fencing	Canal Fence Left	500004275_4	3	2	2	0.041
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Fencing	Canal Fence Righth	500004275_5	3	2	2	0.041
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD	Canal Service Road	Canal service road	500004275_6	3	2	2	0.800
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Excavation	Canal excavation	500004276_0	3	2	2	3.778
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Lining - TA3	Canal Lining	500004276_1	3	2	2	14.122
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Meters	Measuring Facility	500004276_2	3	2	2	0.172
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Berm	Canal berm	500004276_3	3	2	2	1.891
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Bridges	Canal bridge	500004276_4	3	2	2	0.093
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Fencing	Canal Fence Left	500004276_5	3	2	2	0.134
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Fencing	Canal Fence Righth	500004276_6	3	2	2	0.134
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD3	Canal Service Road	Canal service road	500004276_7	3	2	2	1.015
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Excavation	Canal excavation	500004278_0	3	2	2	4.297
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Lining - TA3	Canal Lining	500004278_1	3	2	2	9.602
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Meters	Canal Meter	500004278_2	3	2	2	0.172

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Berm	Canal berm	500004278_3	3	2	2	0.270
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Fencing	Canal Fence Left	500004278_4	3	2	2	0.197
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Fencing	Canal Fence Righth	500004278_5	3	2	2	0.197
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB1	Canal Service Road	Canal service road	500004278_6	3	2	2	0.899
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB2	Canal Excavation	Canal excavation	500004279_0	3	2	2	5.653
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB2	Canal Lining - TA3	Canal Lining	500004279_1	3	2	2	11.993
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB2	Canal Berm	Canal berm	500004279_2	3	2	2	0.519
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB2	Canal Fencing	Canal Fence Left	500004279_3	3	2	2	0.150
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB2	Canal Fencing	Canal Fence Righth	500004279_4	3	2	2	0.150
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal RB2	Canal Service Road	Canal service road	500004279_5	3	2	2	0.657
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Fencing	Canal Fence Righth	500000694_2	3	3	2	0.754
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Fencing	Canal Fence Righth	500000695_2	3	3	2	0.143
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 12	Canal Excavation	Canal excavation	500000696_0	3	3	2	0.072
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 12	Canal Fencing	Canal Fence Righth	500000696_2	3	3	2	0.036
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB10	Canal Service Road	Canal service road	500000697_6	3	3	2	0.607
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Service Road	Canal service road	500000698_4	3	3	2	0.465
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Service Road	Canal service road	500000699_4	3	3	2	0.926
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Service Road	Canal service road	500000700_4	3	3	2	0.607
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Service Road	Canal service road	500000702_4	3	3	2	0.684
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Fencing	Canal Fence Righth	500000713_2	3	3	2	0.123
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 16	Canal Excavation	Canal excavation	500000716_0	3	3	2	0.206
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 16	Canal Fencing	Canal Fence Righth	500000716_2	3	3	2	0.267
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 15	Canal Excavation	Canal excavation	500000717_0	3	3	2	0.167
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 15	Canal Fencing	Canal Fence Righth	500000717_2	3	3	2	0.047
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Service Road	Canal service road	500000719_4	3	3	2	0.283
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU11	Canal Excavation	Canal excavation	500000721_0	3	3	2	0.093
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU11	Canal Fencing	Canal Fence Righth	500000721_2	3	3	2	0.095

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Fencing	Canal Fence Righth	500000722_2	3	3	2	1.099
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-1	Canal Service Road	Canal service road	500000723_6	3	3	2	0.772
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Excavation	Canal excavation	500000725_0	3	3	2	0.071
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Fencing	Canal Fence Left	500000725_1	3	3	2	0.121
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Fencing	Canal Fence Righth	500000725_2	3	3	2	0.121
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Lining - TA3	Canal Lining	500000725_3	3	3	2	0.155
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Service Road	Canal service road	500000725_4	3	3	2	0.476
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Berm	Canal berm	500000725_5	3	3	2	0.031
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Fencing	Canal Fence Righth	500000726_2	3	3	2	0.067
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-2	Canal Service Road	Canal service road	500000727_6	3	3	2	3.972
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-3	Canal Excavation	Canal excavation	500000728_0	3	3	2	1.482
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-3	Canal Fencing	Canal Fence Righth	500000728_2	3	3	2	0.768
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Excavation	Canal excavation	500000729_0	3	3	2	0.151
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Fencing	Canal Fence Left	500000729_1	3	3	2	0.134
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Fencing	Canal Fence Righth	500000729_2	3	3	2	0.134
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Lining - TA3	Canal Lining	500000729_3	3	3	2	0.363
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Service Road	Canal service road	500000729_4	3	3	2	0.636
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Berm	Canal berm	500000729_5	3	3	2	0.070
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Excavation	Canal excavation	500000730_0	3	3	2	0.097
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Fencing	Canal Fence Left	500000730_1	3	3	2	0.138
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Fencing	Canal Fence Righth	500000730_2	3	3	2	0.138
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Lining - TA3	Canal Lining	500000730_3	3	3	2	0.192
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Service Road	Canal service road	500000730_4	3	3	2	2.264
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 11	Canal Berm	Canal berm	500000730_5	3	3	2	0.047
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB16	Canal Excavation	Canal excavation	500000934_0	3	3	2	1.410
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB16	Canal Fencing	Canal Fence Righth	500000934_2	3	3	2	0.114
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU14	Canal Excavation	Canal excavation	500000935_0	3	3	2	0.600

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU14	Canal Fencing	Canal Fence Righ	500000935_2	3	3	2	0.138
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Excavation	Canal excavation	500000938_0	3	3	2	0.038
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Fencing	Canal Fence Left	500000938_1	3	3	2	0.354
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Fencing	Canal Fence Righ	500000938_2	3	3	2	0.354
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Lining - TA3	Canal Lining	500000938_3	3	3	2	0.121
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Service Road	Canal service road	500000938_4	3	3	2	1.687
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 4	Canal Berm	Canal berm	500000938_5	3	3	2	0.076
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Excavation	Canal excavation	500000939_0	3	3	2	0.033
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Fencing	Canal Fence Left	500000939_1	3	3	2	0.595
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Fencing	Canal Fence Righ	500000939_2	3	3	2	0.595
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Lining - TA3	Canal Lining	500000939_3	3	3	2	0.108
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Service Road	Canal service road	500000939_4	3	3	2	0.639
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Berm	Canal berm	500000939_5	3	3	2	0.035
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Excavation	Canal excavation	500000940_0	3	3	2	0.413
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Fencing	Canal Fence Left	500000940_1	3	3	2	0.102
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Fencing	Canal Fence Righ	500000940_2	3	3	2	0.102
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Lining - TA3	Canal Lining	500000940_3	3	3	2	1.217
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Service Road	Canal service road	500000940_4	3	3	2	1.078
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Fencing	Canal Fence Righ	500001037_2	3	3	2	0.082
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 9	Canal Fencing	Canal Fence Righ	500001038_2	3	3	2	0.100
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 7	Canal Fencing	Canal Fence Righ	500001040_2	3	3	2	0.462
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal	Canal Service Road	Canal service road	500001042_4	3	3	2	0.292
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB8	Canal Lining - TA3	Canal Lining	500001044_1	3	3	2	5.194
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal RB8	Canal Fencing	Canal Fence Righ	500001044_3	3	3	2	0.834
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Fencing	Canal Fence Righ	500001045_2	3	3	2	0.174
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 2	Canal Fencing	Canal Fence Righ	500001046_2	3	3	2	0.259
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 17	Canal Excavation	Canal excavation	500001047_0	3	3	2	0.287

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 17	Canal Fencing	Canal Fence Righth	500001047_2	3	3	2	0.052
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2	Canal Lining - TA3	Canal Lining	500001048_1	3	3	2	15.411
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HD2	Canal Fencing	Canal Fence Righth	500001048_3	3	3	2	0.174
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU8	Canal Excavation	Canal excavation	500001049_0	3	3	2	0.254
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU8	Canal Fencing	Canal Fence Righth	500001049_2	3	3	2	0.103
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU10	Canal Excavation	Canal excavation	500001050_0	3	3	2	0.095
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU10	Canal Fencing	Canal Fence Righth	500001050_2	3	3	2	1.114
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal	Canal Service Road	Canal service road	500001052_4	3	3	2	0.634
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Excavation	Canal excavation	500001053_0	3	3	2	0.250
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Fencing	Canal Fence Left	500001053_1	3	3	2	0.029
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Fencing	Canal Fence Righth	500001053_2	3	3	2	0.029
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Lining - TA3	Canal Lining	500001053_3	3	3	2	0.597
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Service Road	Canal service road	500001053_4	3	3	2	0.136
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 8	Canal Berm	Canal berm	500001053_5	3	3	2	0.059
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Excavation	Canal excavation	500001058_0	3	3	2	0.183
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Fencing	Canal Fence Left	500001058_1	3	3	2	0.416
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Fencing	Canal Fence Righth	500001058_2	3	3	2	0.416
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Lining - TA3	Canal Lining	500001058_3	3	3	2	0.401
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Service Road	Canal service road	500001058_4	3	3	2	4.949
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 10	Canal Berm	Canal berm	500001058_5	3	3	2	0.070
VAALHARTS CANALS	WR: Canals	Canal Section	KB Prim Canal	Canal Excavation	Canal excavation	500001522_0	3	3	2	1.086
VAALHARTS CANALS	WR: Canals	Canal Section	KB Prim Canal	Canal Fencing	Canal Fence Righth	500001522_4	3	3	2	0.385
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Excavation	Canal excavation	500001523_0	3	3	2	0.024
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Fencing	Canal Fence Left	500001523_1	3	3	2	0.067
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Fencing	Canal Fence Righth	500001523_2	3	3	2	0.067
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Lining - TA3	Canal Lining	500001523_3	3	3	2	0.079
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Service Road	Canal service road	500001523_4	3	3	2	1.653

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal 3	Canal Berm	Canal berm	500001523_5	3	3	2	0.015
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal x	Canal Excavation	Canal excavation	500001524_0	3	3	2	0.165
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal x	Canal Fencing	Canal Fence Righth	500001524_2	3	3	2	0.330
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU2	Canal Excavation	Canal excavation	500001525_0	3	3	2	0.818
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU2	Canal Fencing	Canal Fence Righth	500001525_2	3	3	2	0.218
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Excavation	Canal excavation	500003394_0	3	3	2	8.140
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Lining - TA3	Canal Lining	500003394_1	3	3	2	16.246
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Berm	Canal berm	500003394_2	3	3	2	1.284
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Meters	Canal Meter	500003394_3	3	3	2	0.172
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Fencing	Canal Fence Left	500003394_4	3	3	2	0.156
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Fencing	Canal Fence Righth	500003394_5	3	3	2	0.184
VAALHARTS CANALS	WR: Canals	Canal Section	KB Sec Canal HU	Canal Service Road	Canal service road	500003394_6	3	3	2	0.441
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12	Canal Excavation	Canal excavation	500003469_0	3	3	2	0.496
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12	Canal Fencing	Canal Fence Left	500003469_1	3	3	2	0.116
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12	Canal Fencing	Canal Fence Righth	500003469_2	3	3	2	0.116
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12	Canal Lining - TA3	Canal Lining	500003469_3	3	3	2	1.495
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12	Canal Service Road	Canal service road	500003469_4	3	3	2	0.554
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12	Canal Berm	Canal berm	500003469_5	3	3	2	0.063
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-4	Canal Excavation	Canal excavation	500004280_0	3	3	2	1.075
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-4	Canal Fencing	Canal Fence Left	500004280_1	3	3	2	0.138
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-4	Canal Fencing	Canal Fence Righth	500004280_2	3	3	2	0.138
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-4	Canal Lining - TA3	Canal Lining	500004280_3	3	3	2	3.241
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-4	Canal Service Road	Canal service road	500004280_4	3	3	2	0.657
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-4	Canal Berm	Canal berm	500004280_5	3	3	2	0.122
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Excavation	Canal excavation	500004281_0	3	3	2	0.215
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Fencing	Canal Fence Left	500004281_1	3	3	2	0.087
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Fencing	Canal Fence Righth	500004281_2	3	3	2	0.087

Scheme	Facility Category	Facility Type	Facility Name	Component Type	Component Name	Component UID	Criticality	Condition	Utilisation	CRC 2016 (R million)
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Lining - TA3	Canal Lining	500004281_3	3	3	2	0.543
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Service Road	Canal service road	500004281_4	3	3	2	0.415
VAALHARTS CANALS	WR: Canals	Canal Section	KB Ter Canal HU12-5	Canal Berm	Canal berm	500004281_5	3	3	2	0.046
VAALHARTS CANALS	WR: Reservoirs	Reservoir	VaalhartsWater reservoir	Reservoir	Vaalharts - Water Tanks @3 at Mixer Station	500000401_0	3	4	2	0.138
VRESAP GWS	WR: Reservoirs	Reservoir	Boschkop balancing dam and desilting works	Reservoir Structure	Boschkop balancing - structure 1	500010465_0	3	5	2	32.683
VRESAP GWS	WR: Reservoirs	Reservoir	Boschkop balancing dam and desilting works	Reservoir Structure	Boschkop balancing - structure 3	500010465_1	3	5	2	32.683
VRESAP GWS	WR: Reservoirs	Reservoir	Boschkop balancing dam and desilting works	Balancing Dam - Lining	Boschkop balancing - lining 1	500010465_2	3	5	2	7.342
VRESAP GWS	WR: Reservoirs	Reservoir	Boschkop balancing dam and desilting works	Balancing Dam - Lining	Boschkop balancing - lining 2	500010465_3	3	5	2	7.342
VRESAP GWS	WR: Reservoirs	Reservoir	Boschkop balancing dam and desilting works	Balancing Dam - Lining	Boschkop balancing - lining 3	500010465_4	3	5	2	7.342
VRESAP GWS	WR: Reservoirs	Reservoir	Boschkop balancing dam and desilting works	Reservoir Structure	Boschkop balancing - structure 2	500010465_5	3	5	2	32.683

5 ASSETS TO BE DISPOSED OF

Table L.5: Assets to be disposed of

Facility Category (Asset Class)	Facility Type	Facility Name (Asset Description)	Component Type	Component Name (Additional Description)	Component No.	Comment
-	-	-	-	-	-	-
-	-	-	-	-	-	-

APPENDIX M – Infrastructure Assets Movement

Table M.1:1 Accumulated acquisition cost per asset facility category for scheme assets (scheme specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	117.597	135.066	135.066	135.066	198.300	198.300	213.143	213.143	213.143	213.143
WR: Canals	308.109	310.420	348.747	349.779	388.364	409.524	446.870	452.498	504.620	524.618
WR: Dams	5 426.177	5 485.330	5 485.330	5 563.159	5 589.245	5 590.232	5 656.781	5 656.781	5 657.985	5 669.787
WR: Power Supply	0.165	0.165	0.165	0.392	0.392	0.392	0.392	0.392	0.392	0.392
WR: Pump stations	113.240	132.184	132.184	152.727	154.157	172.453	185.563	185.868	198.634	208.049
WR: Reservoirs	2.784	2.784	2.784	2.784	2.784	2.784	2.784	2.784	3.636	3.636
WR: Roads and bridge	85.829	85.829	85.829	85.829	85.829	85.829	85.942	85.942	85.942	85.942
WR: Steel Pipelines	308.758	606.341	606.341	606.712	606.712	606.712	606.712	607.296	639.979	639.979
WR: Telemetry	6.987	6.987	6.987	6.987	6.987	6.987	7.180	7.180	7.180	7.180
WR: Water Treatment	0.577	0.577	0.577	0.577	0.577	0.577	1.089	1.089	1.089	1.089
WS: Measuring facility	102.002	104.067	105.450	111.962	113.836	116.470	131.394	152.039	159.275	163.392
Total	6 472.225	6 869.749	6 909.459	7 015.974	7 147.184	7 190.259	7 337.850	7 365.012	7 471.876	7 517.209

Table M.1. 2: Accumulated acquisition cost per asset facility category for non-Scheme specific assets (Non-Scheme Specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WS: Measuring facility	177.594	181.067	182.155	182.155	182.155	182.456	306.114	306.114	308.717	308.717
Total	177.594	181.067	182.155	182.155	182.155	182.456	306.114	306.114	308.717	308.717

Table M.2:1 Accumulated depreciation cost per asset facility category for scheme specific assets (Scheme Specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	62.128	67.625	71.869	76.113	82.441	88.723	95.098	101.473	107.848	114.223
Land	-	-	-	-	-	-	-	-	-	-
WR: Canals	122.162	131.030	137.974	145.753	154.740	164.822	175.897	186.972	198.128	210.924
WR: Dams	664.928	733.405	784.823	837.372	891.399	962.723	1 033.921	1 105.120	1 176.322	1 247.912
WR: Power Supply	0.119	0.127	0.135	0.155	0.174	0.191	0.207	0.224	0.241	0.257
WR: Pump stations	55.417	59.883	64.246	69.313	74.934	80.877	87.500	94.134	100.919	108.227
WR: Reservoirs	0.500	0.542	0.576	0.611	0.646	0.689	0.731	0.774	0.821	0.868
WR: Roads and bridge	6.140	8.099	9.857	11.614	13.371	15.348	17.325	19.302	21.279	23.256
WR: Steel Pipelines	86.473	98.320	110.484	122.661	134.800	146.617	158.434	170.251	183.622	196.993
WR: Telemetry	0.875	0.977	1.080	1.168	1.256	1.357	1.460	1.562	1.665	1.768
WR: Water Treatment	0.292	0.304	0.316	0.327	0.339	0.352	0.371	0.391	0.410	0.430
WS: Measuring facility	25.715	29.136	31.833	34.216	38.585	45.700	52.918	56.969	70.375	85.691
Total	1 024.750	1 129.450	1 213.193	1 299.305	1 392.685	1 507.398	1 623.864	1 737.173	1 861.630	1 990.548

Table M.2:2 Accumulated depreciation cost per asset facility category for Non-Scheme specific assets (Non-Scheme Specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WS: Measuring facility	67.055	73.266	76.866	80.584	84.301	91.302	97.362	103.423	109.701	115.979
Total	67.055	73.266	76.866	80.584	84.301	91.302	97.362	103.423	109.701	115.979

Table M.3:1 Asset carrying value per asset facility category for scheme assets (Scheme Specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Buildings	55.469	67.441	63.197	58.953	115.860	109.577	118.045	111.670	105.295	98.921
WR: Canals	185.947	179.388	210.772	204.026	233.623	244.702	270.972	265.525	306.492	313.694
WR: Dams	4 761.248	4 751.925	4 700.508	4 725.787	4 697.846	4 627.509	4 622.860	4 551.661	4 481.663	4 421.876
WR: Power Supply	0.045	0.038	0.030	0.237	0.217	0.201	0.184	0.168	0.151	0.134
WR: Pump stations	57.831	72.301	67.938	83.414	79.224	91.576	98.062	91.734	97.715	99.822
WR: Reservoirs	2.284	2.242	2.208	2.173	2.138	2.095	2.053	2.010	2.815	2.768
WR: Roads and bridge	79.689	77.729	75.972	74.215	72.457	70.481	68.618	66.641	64.663	62.686
WR: Steel Pipelines	222.285	508.020	495.857	484.051	471.912	460.095	448.278	437.045	456.358	442.986
WR: Telemetry	6.112	6.010	5.907	5.819	5.731	5.630	5.721	5.618	5.515	5.413
WR: Water Treatment	0.285	0.273	0.261	0.250	0.238	0.225	0.718	0.698	0.678	0.659
WS: Measuring facility	76.287	74.961	73.616	77.745	75.252	70.770	80.376	95.222	88.981	78.688
Total	5 447.483	5 740.329	5 696.266	5 716.669	5 754.499	5 682.862	5 715.887	5 627.992	5 610.328	5 527.647

Table M.3:2 Asset carrying value per asset facility category for Non-Scheme specific assets (Non-Scheme Specific)

Asset Facility Category	Financial Year (Amounts in Million Rands)									
	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
WS: Measuring facility	110.563	107.801	105.290	101.572	97.854	91.154	208.752	202.691	199.016	192.738
Total	110.563	107.801	105.290	101.572	97.854	91.154	208.752	202.691	199.016	192.738