DEPARTMENT OF WATER AND SANITATION

NO. 998 **19 JULY 2019**

NATIONAL WATER ACT, 1998
(ACT NO. 36 OF 1998)

RESERVE DETERMINATION OF WATER RESOURCES FOR THE INKOMATI CATCHMENT

I, Gugile Ernest Nkwinti, in my capacity as Minister of Water and Sanitation of the Department of Water and Sanitation, having complied with section 13 of the National Water Act, (Act No. 36 of 1998) ("the Act") and Regulation 3 of the Regulations for the establishment of Water Resource Classification System (No. R. 810 Government Gazette No. 33541, 17 September 2010), and duly authorised in terms of sections 16(1) and 63(1)(a) of the Act, after having complied with section 16(2) and (3) of the Act, hereby publish the Reserve determination of water resources for the Inkomati catchment.

Director: Reserve Determination
Attention: Mr Yakeen Atwaru
Department of Water and Sanitation
Ndinaye Building 5084
178 Francis Baard Street
Private Bag X313
Pretoria
0001

Email: AtwaruY@dws.gov.za

NKWINTI GE (MP)
MINISTER OF WATER AND SANITATION
DATE: 24/05/2019

SCHEDULE

1. DESCRIPTION OF WATER RESOURCE

1.1 The Reserve is determined for all or part of every significant water resource within the Inkomati catchment as set out below:

Water Management Area:	Inkomati-Usutu
Drainage Regions:	X Primary Drainage Region
Rivers:	Komati, Crocodile and Sabie-Sand River Systems

1.2 The Minister has in terms of section 16 of the National Water Act, 1998 (Act No.36 of 1998) ("the Act'), prescribed a system for classifying water resources by issuing Government Notice No. R. 810, published in Government Gazette No. 33541 dated 17 September 2010. In terms of section 16(1) of the Act, the Minister must, as soon as reasonably practicable after the class of all or part of a water resource has been determined, by Notice in the Gazette, determine the Reserve for all or part of that water resource.

1.3 The Minister, in terms of section 16(1) and (2) of the Act, declares, the following Reserve for the Inkomati catchment.

2. ACRONYMS AND DEFINITIONS

2.1 Acronyms

BHN	Basic Human Needs
BHNR	Basic Human Needs Reserve
EcoSpecs	Ecological Specifications
EIS	Ecological Importance and Sensitivity
EWR	Ecological Water Requirement
EWR_MLF	Ecological Water Requirement_Maintenance Low Flows
WARMS	Water Allocation Registration Management System
GRAII	Groundwater Resource Assessment Phase II
GRDM	Groundwater Resource Directed Measures
MAR	Mean Annual Runoff
MCM	Million Cubic Metres
PES	Present Ecological Status
REC	Recommended Ecological Category
TEC	Targeted Ecological Category
DWS	Department of Water and Sanitation
DWAF	Department of Water Affairs and Forestry
EC	Electrical Conductivity
TIN	Total Inorganic Nitrogen
SRP	Soluble Reactive Phosphorus
RC	Reference Condition
WQU	Water Quality Unit

2.2 Definitions

In this Determination, unless the context otherwise indicates -

"Baseflow" means a sustained low flow in rivers during dry or fair weather conditions, but not necessarily all contributed by groundwater and includes contribution from delayed interflow and groundwater discharge;

"EWR" (Ecological Water Requirements) means the flow patterns (magnitude, timing and duration) and water quality needed to maintain a riverine ecosystem in a particular condition;

"Recharge" means the addition of water to the zone of saturation, either by downward percolation of precipitation or surface water and/ or the lateral migration of groundwater from adjacent aquifers.

3. RESERVE DETERMINATION

A summary of the quantity component for the Rivers which include the EWR (**Figure 1 & 2**) and the BHN for the Inkomati catchment is set out in Section 4. **Table 4.1** includes the results of the EWR Sites and the biophysical nodes and **Table 4.2** includes the results of BHN per quaternary catchment.

A summary of the quality component for the Rivers at the EWR sites for the Inkomati catchment is set out in **Tables 5.1.1 – 5.3.6**.

A summary of the groundwater contribution to the Reserve for Water Quantity for the Inkomati catchment is set out in **Table 6.1**.

A summary of the groundwater contribution to the Reserve for Water Quality for the Inkomati catchment is set out in **Tables 7.1**, **7.2** and **7.3**.

A summary of the Water Quantity & Quality Reserve for selected Wetlands for the Inkomati catchment is set out in **Tables 8.1 and 8.2**.

4. SURFACE-WATER - QUANTITY COMPONENT FOR RIVERS

The results for the Reserve determination and ecological categorisation for the Inkomati Catchment, where the Reserve is expressed as a percentage of the NMAR for the respective catchments (cumulative) are tabulated below.

Table 4.1: Summary of the quantity component for the Rivers which includes the results of the EWR Sites and the biophysical nodes.

Biophysical nodes	Water Resource	PES	EIS	TEC	Ecological Reserve (%NMAR)	NMAR (MCM)
Komati River Catchment						
X11A-01248	Vaalwaterspruit	C	Moderate	C	23.50	26.30
X11A-01295	Vaalwaterspruit	C	Moderate	C	27.20	15.40
X11A-01300	Vaalwaterspruit	B	Moderate	B	28.10	1.70
X11A-01354	Vaalwaterspruit	C	Moderate	C	24.50	3.90
X11A-01358	Vaalwaterspruit	C	Moderate	C	26.80	6.60
X11B-01272	Boesmanspruit	C	High	B/C	24.20	51.20
X11B-01361	Boesmanspruit	B/C	Moderate	B/C	27.00	4.20
X11B-01370	Boesmanspruit	B	High	B	28.80	4.80
X11C-01147	Witkloofspruit	C	Very High	C	22.10	11.40
X11D-01129	Klein-Komati	C	High	C	27.40	21.00
X11D-01137	Waarkraalloop	C	Moderate	C	27.30	11.70
X11D-01196	Komati	C	Moderate	C	20.10	95.40
X11D-01219	Komati	C/D	Moderate	C/D	12.30	73.60
X11E-01237	Swartspruit	C	Very High	B	27.90	14.80
X11E-01157	Komati	B/C	High	B/C	25.60	118.30
X11F-01133	Bankspruit	B	High	B	30.80	6.50
EWR K1	**Komati**	**B/C**	**Moderate**	**C**	**27.50**	**158.62**
X11G-01143	Gemakstroom	C	Moderate	C	26.10	10.40
X11G-01188	Ndubazi	B/C	High	B	34.90	17.40
EWRG1	**Gladdespruit**	**D**	**Moderate**	**D**	**26.90**	**29.52**
X11K-01165	Poponyane	C	Moderate	C	22.70	13.70
X11K-01179	Gladdespruit	C	Moderate	C	20.20	64.40
X11K-01194	Gladdespruit	C	Moderate	C	19.10	71.20

Biophysical nodes	Water Resource	PES	EIS	TEC	Ecological Reserve (%NMAR)	NMAR (MCM)
X11K-01199	Gladdespruit	D	Moderate	D	22.30	2.40
X12A-01305	Buffelspruit	C	Very High	B	30.30	32.00
X12B-01246	Hlatjiwe	C	Moderate	C	30.50	22.10
X12C-01242	Phophenyane	B	High	B	37.50	6.30
X12C-01271	Buffelspruit	B	High	B	40.50	71.10
X12D-01235	Seekoeispruit	C	High	C	30.50	97.00
EWRT1	**Teespruit**	**C**	**Moderate**	**C**	**35.30**	**56.36**
EWRK2	**Komati**	**C**	**High**	**C**	**18.30**	**545.56**
X12H-01318	Sandspruit	C	Moderate	C	31.70	13.90
X12H-01338	Sandspruit	B	High	B	36.70	4.40
X12H-01340	Sandspruit	B	High	B	39.50	4.80
X12J-01202	Mtsoli	B	Very High	B	33.50	66.50
X12K-01316	Komati	D	Moderate	D	21.20	577.00
X12K-01332	Mhlangampepa	B	High	B	40.00	3.40
X12K-01333	Mlondozi	C	High	B/C	28.20	22.40
EWR K3A	**Komati**	**D**	**Moderate**	**D**	**17.20**	**1021.67**
X13J-01141	Mzinti	D	Moderate	D	19.10	6.30
X13J-01205	Mbiteni	D	Moderate	D	17.60	5.90
X13J-01221	Komati	D	Moderate	D	19.70	1000.30
X13K-01068	Nkwakwa	C/D	Moderate	C/D	22.70	5.40
X13K-01114	Komati	D	Moderate	D	18.10	1341.40
X13K-01136	Mambane	D	Moderate	D	22.40	1.80
X13L-00995	Komati	D	Moderate	D	11.10	1356.60
X13L-01000	Ngweti	D	Moderate	D	14.50	4.60
X14A-01173	Lomati	C	High	B/C	36.30	84.40
X14B-01166	Ugutugulo	C	High	C	31.70	20.90
EWR L1	**Lomati**	**C**	**Moderate**	**C**	**17.30**	**294.31**
Crocodile River Catchment						
EWR C1	**Crocodile**	**A/B**	**Moderate**	**A/B**	**30.3**	**15.6**

Biophysical nodes	Water Resource	PES	EIS	TEC	Ecological Reserve (%NMAR)	NMAR (MCM)
X21B-00898	Lunsklip	C/D	High	C/D	25.80	8.40
X21B-00925	Lunsklip	C	High	C	31.30	25.80
X21B-00929	Gemsbokspruit	C/D	High	C/D	26.30	3.80
EWR C2	**Crocodile**	**B**	**High**	**B**	**35.63**	**76.1**
X21C-00859	Alexanderspruit	C	High	C	31.50	28.80
X21D-00938	Crocodile	C	High	C	24.00	124.80
X21D-00957	Buffelskloofspruit	C	High	B/C	32.60	16.90
X21E-00897	Buffelskloofspruit	B	High	B	35.30	8.40
EWR C3	**Crocodile**	**B/C**	**High**	**B/C**	**48.8**	**194**
X21E-00947	Crocodile	B	High	B	28.90	125.10
X21F-01046	Elands	C	Moderate	C	35.20	35.10
X21F-01081	Elands	C	High	C	35.50	50.80
X21F-01091	Rietvleispruit	C	Moderate	C	35.40	3.30
X21F-01092	Leeuspruit	C/D	Moderate	C/D	31.20	11.90
X21F-01100	Leeuspruit	C	Moderate	C	35.10	11.90
X21G-01016	Swartkoppiespruit	C	High	C	32.50	11.40
EWR E1	**Elands**	**B**	**Moderate**	**B**	**48.82**	**50.10**
X21G-01090	Weltevredespruit	C	Moderate	C	32.00	5.50
X21H-01060	Ngodwana	C	Very High	B	22.10	59.60
X21J-01013	Elands	C	High	B/C	30.50	151.50
X21K-01007	Lupelule	B	High	B	32.10	29.40
EWR E2	**Elands**	**B**	**High**	**B**	**45.02**	**50.10**
X22A-00824	Blystaanspruit	B/C	High	B	35.30	21.00
X22A-00875	Houtbosloop	B/C	High	B	34.20	6.90
X22A-00887	Beestekraalspruit	B/C	High	B/C	33.90	3.70
X22A-00913	Houtbosloop	C	Very High	B	41.30	75.30
X22A-00917	Houtbosloop	C	Moderate	C	29.70	14.80
X22A-00919	Houtbosloop	B/C	Moderate	B/C	34.70	10.60
X22A-00920	Houtbosloop	B	Moderate	B	39.40	1.70

Biophysical nodes	Water Resource	PES	EIS	TEC	Ecological Reserve (%NMAR)	NMAR (MCM)
X22C-00990	Visspruit	B/C	Moderate	B/C	31.10	3.40
X22C-01004	Gladdespruit	C	High	B/C	20.90	16.30
X22D-00843	Nels	C	Moderate	C	29.60	20.60
X22D-00846	Nels	C	Moderate	C	31.90	13.80
X22E-00833	Kruisfonteinspruit	C	Moderate	C	26.60	11.10
X22E-00849	Sand	C	Moderate	C	27.70	8.70
X22F-00842	Nels	C	High	C	19.00	74.90
X22F-00886	Sand	C	High	C	27.40	48.90
X22F-00977	Nels	C/D	High	C/D	24.10	125.40
X22H-00836	Wit	D/E	High	D	14.90	43.00
EWR C4	**Crocodile**	**C**	**High**	**C**	**31.74**	**824.8**
X22K-01029	Blinkwater	C	Moderate	C	27.20	7.60
X22K-01042	Mbuzulwane	B	Moderate	B	38.50	1.20
X22K-01043	Blinkwater	B	High	B	34.90	5.90
X23B-01052	Noordkaap	D	Very High	C	23.50	50.90
X23C-01098	Suidkaap	C	High	B/C	39.50	61.80
X23E-01154	Queens	C	High	B/C	27.10	39.50
X23F-01120	Suidkaap	C	Moderate	C	31.00	109.80
EWR K7	**Kaap**	**C**	**High**	**C**	**21.84**	**179.5**
X24A-00826	Nsikazi	C	Moderate	C	34.00	2.00
X24A-00881	Nsikazi	B	High	B	40.60	11.70
X24B-00903	Gutshwa	D	Moderate	D	24.40	25.40
X24B-00928	Nsikazi	A/B	High	A/B	44.00	42.40
X24C-00978	Nsikazi	B	High	B	40.50	52.30
EWR C5	**Crocodile**	**C**	**Very High**	**C**	**22.2**	**1117.4**
EWR C6	**Crocodile**	**C**	**Very High**	**C**	**12.53**	**1165.6**
Sabie River Catchment						
X31A-00741	Klein Sabie	C	High	B/C	23.00	14.60
X31A-00783	Klein Sabie	C	Moderate	C	33.80	12.10

Biophysical nodes	Water Resource	PES	EIS	TEC	Ecological Reserve (%NMAR)	NMAR (MCM)
X31A-00786	Klein Sabie	B	High	B	47.80	4.70
EWR S1	**Sabie**	**B/C**	**High**	**B**	**40.31**	**132**
X31B-00792	Goudstroom	B/C	Moderate	B/C	38.90	12.20
EWR S4	**Mac Mac**	**B**	**High**	**B**	**45.31**	**65.78**
X31E-00647	Marite	B/C	High	B	34.70	79.90
X31F-00695	Motitsi	C	High	B	26.50	43.90
EWR S2	**Sabie**	**C**	**High**	**B**	**28.2**	**261.7**
X31D-00773	Sabani	C/D	Moderate	C/D	19.50	19.20
EWR S5	**Marite**	**B/C**	**High**	**B/C**	**28.57**	**156.4**
X31H-00819	White Waters	C	High	B/C	31.40	28.90
X31J-00774	Noord-Sand	D	Moderate	D	16.00	45.10
X31J-00835	Noord-Sand	D	Moderate	D	31.30	12.00
X31K-00713	Bejani	D	Moderate	D	25.70	2.40
EWR S3	**Sabie**	**A/B**	**Very High**	**A/B**	**37.94**	**493.69**
X31K-00771	Phabeni	B	High	B	39.00	2.50
X31L-00657	Matsavana	C	Moderate	C	16.80	3.80
X31L-00664	Saringwa	C	Moderate	C	24.50	10.90
X31L-00678	Saringwa	B/C	High	B/C	30.80	3.20
X31M-00673	Musutlu	B/C	Moderate	B/C	19.00	1.80
EWR S7	**Thulandziteka (Sand)**	**C**	**Moderate**	**C**	**32.67**	**28.9**
X32B-00551	Motlamogatsana	C	High	C	25.70	15.40
X32C-00558	Nwandlamuhari	C	Moderate	C	20.20	49.70
X32C-00564	Mphyanyana	C	Moderate	C	10.50	3.10
X32C-00606	Nwandlamuhari	C	Moderate	C	23.60	53.20
X32E-00629	Nwarhele	C/D	High	C	26.10	10.60
EWR S6	**Mutlumuvi**	**C**	**High**	**C**	**28.46**	**44.99**
X32F-00628	Nwarhele	C/D	Moderate	C/D	31.30	14.80
X32G-00549	Khokhovela	C	Moderate	C	17.00	3.90
X32H-00560	Phungwe	A	High	A	26.10	7.60

Biophysical nodes	Water Resource	PES	EIS	TEC	Ecological Reserve (%NMAR)	NMAR (MCM)
EWR S8	Sand	B	High	B	25.46	133.61

The bolded quaternary catchments are the EWR Sites

1) NMAR is the Natural Mean Annual Runoff.

2) This amount represents the long term mean based on the NMAR. If the NMAR changes, this volume will also change.

BASIC HUMAN NEEDS RESERVE

The BHNR provides for the essential needs of individuals served directly by the water resource in question and includes water for drinking, food preparation and for personal hygiene. A lifeline amount of 25 litres per person per day was used.

Communities likely to be reliant on run of river were identified per quaternary catchment and using these population sizes, the BHNR is calculated.

Table 4.2: Reserve information on quaternary catchment level

Quaternary catchment	Water Resource	BHN Reserve (%NMAR)
X11A	Vaalwaterspruit	0.09
X11B	Boesmanspruit	0.16
X11C	Witkloofspruit	0.00
X11D	Komati	0.00
X11E	Komati	0.00
X11F	Bankspruit	0.00
X11G	Upper Komati	0.00
X11J	Gladdespruit	0.00
X11K	Gladdespruit	0.00
X12A	Buffelspruit	0.00
X12B	Hlatjiwe	0.00
X12C	Buffelspruit	0.00
X12D	Seekoeispruit	0.03
X12E	Teespruit	0.00
X12H	Upper Komati	0.01
X12J	Mtsoli	0.01
X12K	Komati	0.02
X13J	Lower Komati	0.14
X13K	Komati	0.04
X13L	Komati	0.01
X14A	Lomati	0.00
X14B	Ugutugulo	0.02
X14H	Lomati	0.12
X21A	Crocodile	0.02

Quaternary catchment	Water Resource	BHN Reserve (%NMAR)
X21B	Lunsklip	0.12
X21B	Crocodile	0.01
X21C	Alexanderspruit	0.11
X21D	Crocodile	0.02
X21E	Crocodile	0.09
X21F	Elands	0.17
X21G	Elands River	0.26
X21H	Ngodwana	0.01
X21J	Elands	0.01
X21K	Elands River	0.01
X22A	Houtbosloop	0.01
X22C	Gladdespruit	0.07
X22D	Nels	0.02
X22E	Kruisfonteinspruit	0.00
X22F	Nels	0.01
X22H	Wit	0.00
X22K	Crocodile	0.01
X23B	Noordkaap	0.01
X23C	Suidkaap	0.01
X23E	Queens	0.01
X23F	Suidkaap	0.45
X23G	Kaap River	0.02
X24A	Nsikazi	4.25
X24B	Nsikazi	3.70
X24C	Nsikazi	3.21
X24D	Crocodile	0.01
X24H	Crocodile	0.01
X31A	Klein	0.73
X31B	Sabie	0.00
X31C	Mac Mac	0.03

Quaternary catchment	Water Resource	BHN Reserve (%NMAR)
X31E	Marite	0.36
X31F	Motitsi	0.05
X31D	Sabie	0.08
X31G	Marite	0.07
X31H	White Waters	0.00
X31J	Noord-Sand	0.63
X31K	Sabie	0.07
X31L	Saringwa	3.45
X31M	Musutlu	10.94
X32B	Motlamogatsana	0.69
X32C	Tlulandziteka	0.57
X32E	Nwarhele	2.87
X32F	Mutlumuvi	0.42
X32G	Khokhovela	8.57
X32H	Phungwe	2.33
X32J	Sand	0.30

5. SURFACE-WATER - QUALITY COMPONENT FOR RIVERS

5.1 Croc-East Catchment

Table 5.1.1: EWR 1– Crocodile River: EcoSpecs relating to physico-chemical data (PES and REC)

River: Crocodile		EWR 1	Monitoring site: X2H074Q01
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.5 mg/L.	
	Turbidity	Vary (small amount) from natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.015 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be <10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	The 95th percentile of the data must be within the TWQR as stated in DWAF (1996).	

Table 5.1.2: EWR 2 –Crocodile River: EcoSpecs relating to physico-chemical data (PES and REC)

River: Crocodile		EWR Site 2	Monitoring site: X2H074Q01
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 20 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 27 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 22 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 39 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 118 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 43 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.5 mg/L.	
	Turbidity	Vary (small amount) from natural turbidity range; minor silting of habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.015 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be <10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	The 95th percentile of the data must be within the TWQR as stated in DWAF (1996).	

Table 5.1.3: EWR 3– Crocodile River: EcoSpecs relating to physico-chemical data (PES)

River: Crocodile		**EWR 3**	**Monitoring site: X2H013Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	Small to moderate deviation from the natural temperature range. Some highly temperature sensitive species in lower abundances and frequency of occurrence than expected for reference.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 6 mg/L.	
	Turbidity	Moderate changes to the catchment landuse resulting in temporary unnaturally high sediment loads and high turbidity.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.025 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 52.5 mg/m².	
	Toxics	The 95th percentile of the data must be within the TWQR as stated in DWAF (1996).	

Table 5.1.4: EWR 4 Crocodile River - EcoSpecs relating to physico-chemical data (PES)

River: Crocodile		**EWR 4**	**Monitoring site: X2H032Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 38 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 191 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 55 mS/m	
	pH	The 5th percentile of the data must be 5.9 – 6.5, and the 95th percentile 8.0 – 8.8.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.5 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 1.0 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	The 95th percentile of the data must be within the CEV as stated in DWAF (1996).	

Table 5.1.5: EWR 5 Crocodile River: EcoSpecs relating to physico-chemical data (PES)

River: Crocodile		**EWR 5**	**Monitoring site: X2H017Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 45 mg/L.**	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 70 mS/m.***	
	pH	The 5th percentile of the data must be 5.9 – 6.5, and the 95th percentile 8.0 – 8.8.	
	Temperature	Moderate deviation from the natural temperature range. Most highly temperature sensitive species in lower abundances and frequency of occurrence than expected for reference.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	The 95th percentile of the data must be within the TWQR as stated in DWAF (1996).	

Table 5.1.6: EWR 6 Crocodile River: EcoSpecs relating to physico-chemical data (PES)

River: Crocodile		**EWR 6**	**Monitoring site: X2H016Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 45 mg/L	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 30 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 57 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 85 mS/m.	
	pH	The 5th percentile of the data must be 5.9 – 6.5, and the 95th percentile 8.0 – 8.8.	
	Temperature	Small to moderate deviation from the natural temperature range. Some highly temperature sensitive species in lower abundances and frequency of occurrence than expected for reference.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	The 95th percentile of the data must be within the CEV as stated in DWAF (1996)	

Table 5.1.7: EWR 7 Crocodile River: EcoSpecs relating to physico-chemical data (PES and REC)

River: Kaap		**EWR 7**	**Monitoring site: X2H022Q01**
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	ALL	-	
Physical variables	EC	The 95th percentile of the data must be ≤ 100 mS/m.	
	pH	The 5th percentile of the data must range from 6.5 to 8.0, and the 95th percentile from 8.0 to 8.8.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 8 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 1.0 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 52.5 mg/m^2.	
	Toxics	The 95th percentile of the data must be within the TWQR as stated in DWAF (1996).	

5.2 Sabie-Sand Catchment

Table 5.2.1: EWR 1 (Upper Sabie): EcoSpecs relating to physico-chemical data (PES and REC)

River: Sabie		EWR 1	Monitoring site: X3H001Q01
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	No deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 8.0 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.025 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be <10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.2: EWR 2 (Aan de Vliet): EcoSpecs relating to physico-chemical data (PES and REC)

River: Sabie		**EWR Site: 2**	**Monitoring site: X3H006Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 118 mg/L (A/B category).	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.5 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.025 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 84 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.3: EWR 3 (Kidney): EcoSpecs relating to physico-chemical data (PES and REC)

River: Sabie		EWR 3	Monitoring site: X3H013Q01
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th percentile of the data must range from 6.5 to 8.0, and the 95th percentile from 6.5 to 8.8.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.5 mg/L.	
	Turbidity	Small to moderate changes to the catchment landuse resulting in minor effects of silting of habitats, largely of a temporary nature, with very intermittent temporary unnaturally high sediment loads and high turbidity.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.25 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.015 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be <10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.4: EWR 4 (Mac Mac) - EcoSpecs relating to physico-chemical data (PES)

River: Mac Mac		**EWR 4**	**Monitoring site: X3H003Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 8.0 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.015 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 84 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.5: EWR 5 (Marite): EcoSpecs relating to physico-chemical data (PES and REC)

River: Marite		**EWR 5**	**Monitoring site: X3H011Q01**
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 30 mS/m.	
	pH	The 5th and 95th percentiles of the data must range from 6.5 to 8.0.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.0 mg/L.	
	Turbidity	Vary by a small amount from the natural turbidity range; minor silting of instream habitats acceptable.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.015 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be <10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 84 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.6: EWR 6 (Mutlumuvi): EcoSpecs relating to physico-chemical data (PES)

River: Mutlumuvi		**EWR 6**	**Monitoring site: X3H008Q01**
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 42 mS/m (A/B category).	
	pH	The 5th percentile of the data must range from 6.5 to 8.0, and the 95th percentile from 6.5 to 8.8.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.0 mg/L.	
	Turbidity	Small to moderate changes to the catchment landuse resulting in minor effects of silting of habitats, largely of a temporary nature, with very intermittent temporary unnaturally high sediment loads and high turbidity.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 84 mg/m²	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.7: EWR 7 (Tlulandziteka): EcoSpecs relating to physico-chemical data (PES and REC)

River: Tlulandziteka		EWR 7	Monitoring site: X3H008Q01
Water quality metrics		**ECOSPEC: PES**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 42 mS/m (A/B category).	
	pH	The 5th percentile of the data must range from 6.5 to 8.0, and the 95th percentile from 6.5 to 8.8.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.0 mg/L.	
	Turbidity	Moderate changes to the catchment landuse resulting in temporary unnaturally high sediment loads and high turbidity.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be < 10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 84 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

Table 5.2.8: EWR 8 (Lower Sand): EcoSpecs relating to physico-chemical data (PES and REC)

River: Sand		**EWR 8**	**Monitoring site: X3H008Q01**
Water quality metrics		**ECOSPEC: PES and REC**	
Inorganic salts	$MgSO_4$	The 95th percentile of the data must be ≤ 16 mg/L.	
	Na_2SO_4	The 95th percentile of the data must be ≤ 20 mg/L.	
	$MgCl_2$	The 95th percentile of the data must be ≤ 15 mg/L.	
	$CaCl_2$	The 95th percentile of the data must be ≤ 21 mg/L.	
	NaCl	The 95th percentile of the data must be ≤ 45 mg/L.	
	$CaSO_4$	The 95th percentile of the data must be ≤ 351 mg/L.	
Physical variables	EC	The 95th percentile of the data must be ≤ 42 mS/m (A/B category).	
	pH	The 5th percentile of the data must range from 6.5 to 8.0, and the 95th percentile from 6.5 to 8.8.	
	Temperature	Small deviation from the natural temperature range.	
	Dissolved Oxygen	The 5th percentile of the data must be ≥ 7.5 mg/L.	
	Turbidity	Small to moderate changes to the catchment landuse resulting in minor effects of silting of habitats, largely of a temporary nature, with very intermittent temporary unnaturally high sediment loads and high turbidity.	
Nutrients	TIN	The 50th percentile of the data must be ≤ 0.7 mg/L.	
	PO_4-P	The 50th percentile of the data must be ≤ 0.125 mg/L.	
Response variables	Chl-a phytoplankton	The 50th percentile of the data must be <10 µg/L.	
	Chl-a periphyton	The 50th percentile of the data must be ≤ 21 mg/m².	
	Toxics	An impact is expected if the 95th percentile of the data exceeds the TWQR as stated in DWAF (1996).	

5.3 **Komati Catchment**

Table 5.3.1: EWR K1 – Upper Komati

River	**Upper Komati**	**DWS Water Quality Monitoring Points**		
WQU	**2**	**RC**		**X1H033Q01**
EWR Site	**K1**	**PES**		**X1H033Q01**
Water Quality Constituents		**Present State**		**Quality EcoSpecs (Benchmark Classification)**
Inorganic Salts	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	A		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	A		45 mg/L.
	$CaSO_4$	A		351 mg/L.
Nutrients	SRP	B/C (0.025)		0.017 mg/L.
	TIN	A (0.09)		0.129 mg/L.
Physical Variable	pH	B (6.3 – 8.58)		5th Percentile: 6.00-6.25 95th Percentile: 8.37-8.69
	Temperature	Expected to increase due to dams and surface runoff	Potential impacts associated with the operational procedure and releases from the Nooitgedacht Dam as there are only surface warm water spills.	Vary not more than 2°C when compared to natural mean monthly
	Dissolved Oxygen	No data		7-8 mg/L.
	Turbidity (NTU)	No data- The river banks are eroded due to steep slopes as well as animal trampling. The Dam will reduce turbidity.		Small change allowed – largely natural and related to natural catchment processes such as rainfall runoff.
Response variables	Chl-a periphyton	Chlorophyll-a values low (2.9 µg/L) and phaeton phyte (2.5 µg/L) in Nooitgedacht Dam. Diatoms on rocks in river.		< 1.7 mg/m²
	Chl-a phytoplankton			5 µg/L
	Biotic community composition - macroinvertebrate	Fish: B/C ASPT: 5.4 – 5.8 SASS5: 134-163		ASPT 6
	Instream toxicity	Not sampled		
Toxics	Fluoride	200 (A)		1500 µg/L (A category)
	Al			20 µg/L (A category)
	Ammonia			15 µg/L (A category)
	As			20 µg/L (A category)
	Atrazine			19 µg/L (A category)
	Cd soft			0.2 µg/L (A category)
	Cd mod			0.2 µg/L (A category)
	Cd hard			0.3 µg/L (A category)
	Chlorine			0.4 µg/L (A category)
	Cr(III)			24 µg/L (A category)
	Cr(VI)			14 µg/L (A category)
	Cu soft			0.5 µg/L (A category)
	Cu mod			1.5 µg/L (A category)
	Cu hard			2.4 µg/L (A category)
	Cyanide			4 µg/L (A category)

Table 5.3.2: EWR K2 – Upper Komati

River	**Upper Komati**	**DWS Water Quality Monitoring Points**		
WQU	**3**	**RC**		**X1H001Q01**
EWR Site	**K2**	**PES**		**X1H001Q01**
Water Quality Constituents		**Resent State**		**Quality EcoSpecs (Benchmark Classification)**
Inorganic Salts	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	B		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	A		45 mg/L.
	$CaSO_4$	A		351 mg/L.
Nutrients	SRP	B (0.018)		0.017 mg/L.
	TIN	B (0.146)		0.129 mg/L.
Physical Variable	pH	B/C (6.2 – 9.19)		5^{th} Percentile: 6.24-6.46 95^{th} Percentile: 8.69-9.00
	Temperature	No data	Impacts expected as a result of warming in the Vygeboom and operational procedures.	Vary not more than 2°C when compared to natural mean monthly.
	Dissolved Oxygen	No data		7-8 mg/L.
	Turbidity (NTU)	High sediment inputs especially from Seeikoespruit.		Small change allowed – largely natural and related to natural catchment processes such as rainfall runoff.
Response variables	Chl-a periphyton	Chlorophyll-a values in Vygeboom Dam low (1.0-1.25 µg/L).		21 mg/m²
	Chl-a phytoplankton			< 5 µg/L
	Biotic community composition - macroinvertebrate	ASPT: 6-8 SASS5 ca.200		ASPT 6
	Instream toxicity	Not sampled		
Toxics	Fluoride	A (252)		1500 µg/L (A category)
	Al			20 µg/L (A category)
	Ammonia			15 µg/L (A category)
	As			20 µg/L (A category)
	Atrazine			19 µg/L (A category)
	Cd soft			0.2 µg/L (A category)
	Cd mod			0.2 µg/L (A category)
	Cd hard			0.3 µg/L (A category)
	Chlorine			0.4 µg/L (A category)
	Cr(III)			24 µg/L (A category)
	Cr(VI)			14 µg/L (A category)
	Cu soft			0.5 µg/L (A category)
	Cu mod			1.5 µg/L (A category)
	Cu hard			2.4 µg/L (A category)
	Cyanide			4 µg/L (A category)

Table 5.3.3: EWR K3 – Lower Komati

River	Upper Komati	DWS Water Quality Monitoring Points	
WQU	**7**	**RC**	**X1H003Q01**
EWR Site	**K3**	**PES**	**X1H003Q01**
Water Quality Constituents		**Resent State**	**Quality EcoSpecs (Benchmark Classification)**
Inorganic Salts	$MgSO_4$	B	16 mg/L.
	Na_2SO_4	B	20 mg/L.
	$MgCl_2$	B	15 mg/L.
	$CaCl_2$	A	21 mg/L.
	NaCl	B	45 mg/L.
	$CaSO_4$	A	351 mg/L.
Nutrients	SRP	C (0.025)	0.017 mg/L.
	TIN	C (0.32)	0.129 mg/L.
Physical Variable	pH	B (6.01-8.77)	5th Percentile: 6.5-6.8 95th Percentile: 8.0-8.5
	Temperature	No data	Vary not more than 2°C when compared to natural mean monthly.
	Dissolved Oxygen	No data	7-8 mg/L.
	Turbidity (NTU)	Expected high turbidity after rains due to removal of riparian vegetation and the natural steep topography.	
Response variables	Chl-a periphyton	Not sampled/ rocks clogged with filamentous algae.	
	Chl-a phytoplankton		< 5 µg/L
	Biotic community composition - macroinvertebrate	ASPT: 5 SASS5: < 50	ASPT 6
	Instream toxicity	Not sampled	
Toxics	Fluoride	225 (A)	1500 µg/L (A category)
	Al		20 µg/L (A category)
	Ammonia		15 µg/L (A category)
	As		20 µg/L (A category)
	Atrazine		19 µg/L (A category)
	Cd soft		0.2 µg/L (A category)
	Cd mod		0.2 µg/L (A category)
	Cd hard		0.3 µg/L (A category)
	Chlorine		0.4 µg/L (A category)
	Cr(III)		24 µg/L (A category)
	Cr(VI)		14 µg/L (A category)
	Cu soft		0.5 µg/L (A category)
	Cu mod		1.5 µg/L (A category)
	Cu hard		2.4 µg/L (A category)
	Cyanide		4 µg/L (A category)

Table 5.3.4: EWR G1 – Upper Komati

River	Upper Komati	DWS Water Quality Monitoring Points	
WQU	**4**	**RC**	**X1H019Q01**
EWR Site	**G1**	**PES**	**X1H019Q01**
Water Quality Constituents		**Resent State**	**Quality EcoSpecs (Benchmark Classification)**
Inorganic Salts	$MgSO_4$	B	16 mg/L.
	Na_2SO_4	A	20 mg/L.
	$MgCl_2$	A	15 mg/L.
	$CaCl_2$	A	21 mg/L.
	NaCl	A	45 mg/L.
	$CaSO_4$	A	351 mg/L.
Nutrients	SRP	B/C (0.014)	> 0.125 mg/L.
	TIN	B/C (0.235)	0.75 mg/L.
Physical Variable	pH	B/C (7.25-8.44)	5th Percentile: 6.00-6.25 95th Percentile: 8.37-8.69
	Temperature	No data	
	Dissolved Oxygen	No data	
	Turbidity (NTU)	High TDS values recorded (range 7 to 155).	
Response variables	Chl-a periphyton	None recorded	
	Chl-a phytoplankton	None recorded	
	Biotic community composition - macroinvertebrate	ASPT: 4.21-6.3 SASS5:30-160	ASPT 5
	Instream toxicity	Not sampled	
Toxics	Fluoride	167 (A)	1500 µg/L (A category)
	Al		20 µg/L (A category)
	Ammonia		15 µg/L (A category)
	As		20 µg/L (A category)
	Atrazine		19 µg/L (A category)
	Cd soft		0.2 µg/L (A category)
	Cd mod		0.2 µg/L (A category)
	Cd hard		0.3 µg/L (A category)
	Chlorine		0.4 µg/L (A category)
	Cr(III)		24 µg/L (A category)
	Cr(VI)		14 µg/L (A category)
	Cu soft		0.5 µg/L (A category)
	Cu mod		1.5 µg/L (A category)
	Cu hard		2.4 µg/L (A category)
	Cyanide		4 µg/L (A category)

Table 5.3.5: EWR T1 – Upper Komati

River	Upper Komati	DWS Water Quality Monitoring Points		
WQU	6	RC		
EWR Site	T1	PES		
Water Quality Constituents		Resent State		Quality EcoSpecs (Benchmark Classification)
Inorganic Salts	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	A		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	B		45 mg/L.
	$CaSO_4$	B		351 mg/L.
Nutrients	SRP	C/D (0.04)		> 0.125 mg/L.
	TIN	A (0.186)		0.75 mg/L.
Physical Variable	pH	A (7.78-7.74)		5th Percentile: 6.00-6.25 95th Percentile: 8.37-8.69
	Temperature	No data	No impacts expected	
	Dissolved Oxygen	No data		
	Turbidity (NTU)	Expected high turbidity after rains due to removal of riparian vegetation and the natural steep topography.		
Response variables	Chl-a periphyton	Not sampled		
	Chl-a phytoplankton			
	Biotic community composition - macroinvertebrate	ASPT:5.7 7.2 SASS: 163-239		ASPT > 6
	Instream toxicity	Not sampled		
Toxics	Fluoride	363 (A)		1500 µg/L (A category)
	Al			20 µg/L (A category)
	Ammonia			15 µg/L (A category)
	As			20 µg/L (A category)
	Atrazine			19 µg/L (A category)
	Cd soft			0.2 µg/L (A category)
	Cd mod			0.2 µg/L (A category)
	Cd hard			0.3 µg/L (A category)
	Chlorine			0.4 µg/L (A category)
	Cr(III)			24 µg/L (A category)
	Cr(VI)			14 µg/L (A category)
	Cu soft			0.5 µg/L (A category)
	Cu mod			1.5 µg/L (A category)
	Cu hard			2.4 µg/L (A category)
	Cyanide			4 µg/L (A category)

Table 5.3.6: EWR L1 – Lomati

River	**Upper Komati**	**DWS Water Quality Monitoring Points**		
WQU	**10**	**RC**		**X1HO49Q1**
EWR Site	**L1**	**PES**		**X1HO49Q1**
Water Quality Constituents		**Resent State**		**Quality EcoSpecs (Benchmark Classification)**
Inorganic Salts	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	A		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	B		45 mg/L.
	$CaSO_4$	A		351 mg/L.
Nutrients	SRP	C (0.022)		0.058 mg/L.
	TIN	B/C (0.277)		<0.25 mg/L.
Physical Variable	pH	B (6.9-8.6)		5^{th} Percentile: 5.75-6.00 95^{th} Percentile: 8.05-8.37
	Temperature	No data	Driekoppies Dam operational procedures will impact on temperatures due to releases from deeper colder water.	
	Dissolved Oxygen	No data		
	Turbidity (NTU)	Sediments settled out in dams.		
Response variables	Chl-a periphyton	Not sampled		21 mg/m²
	Chl-a phytoplankton			5 µg/L in Driekoppies Dam
	Biotic community composition - macroinvertebrate	ASPT: 5.5-7.0 SASS5:60-250		ASPT > 6
	Instream toxicity	Not sampled		
Toxics	Fluoride	154 (A)		1500 µg/L (A category)
	Al			20 µg/L (A category)
	Ammonia			15 µg/L (A category)
	As			20 µg/L (A category)
	Atrazine			19 µg/L (A category)
	Cd soft			0.2 µg/L (A category)
	Cd mod			0.2 µg/L (A category)
	Cd hard			0.3 µg/L (A category)
	Chlorine			0.4 µg/L (A category)
	Cr(III)			24 µg/L (A category)
	Cr(VI)			14 µg/L (A category)
	Cu soft			0.5 µg/L (A category)
	Cu mod			1.5 µg/L (A category)
	Cu hard			2.4 µg/L (A category)
	Cyanide			4 µg/L (A category)

6. GROUNDWATER - QUANTITY COMPONENT

The groundwater quantity component was determined using values (recharge, baseflow, groundwater use and stress index) obtained during the determination of water resource classes and associated resource quality objectives in the Inkomati catchment, (DWS 2015), shown in Table 6.1. The average annual groundwater recharge for the entire catchment based on the Groundwater Resource Assessment project Phase II (GRA II) dataset is estimated to be more than 1 500 Mm^3/a. The Ecological Water Requirements_Maintenance Low Flow (EWR_MLF) values were obtained from the Rapid groundwater Reserve determination study for the Inkomati catchment (AGES, 2010).

Population values were obtained from the Water Services dataset of 2011. The Basic Human Needs Reserve provides for the essential needs of individuals served by the water resource in question and includes water for drinking, food preparation and for personal hygiene. A life-line amount of 25 litres per person per day was used. The current study approach also took cognisance of the GRA II and WARMS 2013 datasets to achieve a more balanced estimate of groundwater use. The total groundwater use for the Inkomati catchment was subsequently estimated at 52.3 Mm^3/a. The groundwater stress index reflects groundwater used versus recharge.

Table 6.1 Summary of the Reserve

Quaternary	Area(km²)	Recharge (Mm³/a)	Population	Baseflow (Mm³/a) (DWS, 2015)	EWR_MLF (Mm³/a)	BHN Reserve (Mm³/a)	Reserve (Mm³/a)	Groundwater Use (Mm³/a)	Stress Index
X11A	672	24.36	2561	7.21	11.47	0.023	11.49	0.33	1%
X11B	597	22.93	8946	6.96	10.72	0.082	10.80	0.83	4%
X11C	319	13.12	30051*	3.68	5.99	0	5.99	1.56	12%
X11D	590	25.97	30051*	23.59	12.24	0	12.24	0.51	2%
X11E	242	11.38	30051*	9.97	4.77	0	4.77	0.02	0%
X11F	183	9.49	30051*	7.54	4.24	0	4.24	0.15	2%
X11G	264	20.58	30051*	17.25	9.65	0	9.65	0.2	1%
X11H	265	21.55	30051*	17.17	10.09	0	10.09	0.44	2%
X11J	186	15.75	30051*	11.98	7.24	0	7.24	0.26	2%
X11K	211	16.73	30051*	10	7.38	0	7.38	0.82	5%
X12A	244	15.45	30051*	13.94	7.27	0	7.27	0.08	0%
X12B	155	10.3	30051*	12.05	4.84	0	4.84	0.04	0%
X12C	186	13.28	30051*	8.03	6.52	0	6.52	0.08	1%
X12D	223	14.19	2735	7.54	6.23	0.025	6.25	0.29	2%
X12E	333	20.72	1020	11.5	9.63	0.009	9.64	0.09	0%
X12F	313	21.69	59707	10.85	10.63	0.545	11.17	0.13	1%
X12G	239	16.9	13058	3.42	8.11	0.119	8.23	0.05	0%
X12H	286	26.31	6177	9.41	12.6	0.056	12.66	0.05	0%
X12J	296	29.62	246	5.77	14.3	0.002	14.30	0.16	1%
X12K	286	27.93	10338	9.37	13.57	0.094	13.66	0.08	0%
X13J	828	20.68	157637	0	8.63	1.438	10.07	0.7	3%
X13K	621	10.25	56636	6.86	0.13	0.517	0.65	2.56	25%
X13L	286	5.17	3387	2.83	0.36	0.031	0.39	0.98	19%
X14A	141	8.89	30051*	0	4.2	0	4.20	0.09	1%
X14B	185	11.39	457	0	5.41	0.004	5.41	0.09	1%

Quaternary	Area(km²)	Recharge (Mm³/a)	Population	Baseflow (Mm³/a) (DWS, 2015)	EWR_MLF (Mm³/a)	BHN Reserve (Mm³/a)	Reserve (Mm³/a)	Groundwater Use (Mm³/a)	Stress Index
X14F	117	6.89	30051*	4.62	3.36	0	3.36	0.07	1%
X14G	204	6	89074	6.15	2.29	0.813	3.10	0.62	10%
X14H	360	8.67	38790	3.19	3.62	0.354	3.97	6.68	77%
X21A	265	13.85	446	2.69	0.93	0.004	0.93	0.67	5%
X21B	378	18.81	28783*	4.01	3.27	0	3.27	0.45	2%
X21C	311	16.25	869	3.21	7.67	0.008	7.68	0.75	5%
X21D	219	10.95	28783*	2.04	4.84	0	4.84	0.14	1%
X21E	345	29.69	28783*	3.59	16.58	0	16.58	0.2	1%
X21F	397	18.3	9513	3.17	8.83	0.087	8.92	0.83	5%
X21G	347	17.51	14487	4.24	8	0.132	8.13	0.16	1%
X21H	229	21.19	28783*	5.7	10.23	0	10.23	0.08	0%
X21J	355	29.26	120	6.45	14.08	0.001	14.08	0.15	1%
X21K	245	22.78	625	4.16	11.13	0.006	11.14	0.11	0%
X22A	252	23.67	28783*	4.28	11.3	0	11.30	0.07	0%
X22B	227	21.24	28783*	4.36	9.75	0	9.75	0.46	2%
X22C	366	20.69	28783*	7.51	8.43	0	8.43	1.03	5%
X22D	274	25.58	12182	3.84	12.02	0.111	12.13	0.15	1%
X22E	153	13.92	28783*	3.9	6.75	0	6.75	0.04	0%
X22F	212	11.41	947	2.05	3.02	0.009	3.03	1.19	10%
X22G	107	9.39	28783*	3.02	4.72	0	4.72	0.11	1%
X22H	200	10.22	5440	2.09	2.95	0.050	3.00	0.92	9%
X22J	240	12.75	23373	2.56	5.48	0.213	5.69	0.81	6%
X22K	335	14.57	33140	3.55	42.45	0.302	42.75	2.89	20%
X23A	127	10.69	28783*	1.71	4.79	0	4.79	0.07	1%
X23B	229	12.38	28783*	3.18	5.13	0	5.13	0.65	5%
X23C	81	6.98	28783*	3.34	2.93	0	2.93	0.12	2%
X23D	182	12.89	28783*	2.43	6.11	0	6.11	0.17	1%

Quaternary	Area(km²)	Recharge (Mm³/a)	Population	Baseflow (Mm³/a) (DWS, 2015)	EWR_MLF (Mm³/a)	BHN Reserve (Mm³/a)	Reserve (Mm³/a)	Groundwater Use (Mm³/a)	Stress Index
X23E	180	12.02	28783*	3.18	5.32	0	5.32	0.16	1%
X23F	310	20.29	53913	1.63	8.5	0.492	8.99	2.41	12%
X23G	225	11.2	596	2.24	4.97	0.005	4.98	0.26	2%
X23H	306	14.59	3837	1.92	10.78	0.035	10.82	0.66	4%
X24A	249	7.57	54450	2.52	3.42	0.497	3.92	0.4	5%
X24B	335	11.06	171771	2.46	5.13	1.567	6.70	0.82	7%
X24C	286	10.49	184218	1.35	4.87	1.681	6.55	0.09	1%
X24D	302	10.58	340	2.08	52.22	0.003	52.22	0.38	4%
X24E	526	12.28	5073	0	5.56	0.046	5.61	0.22	2%
X24F	262	5.76	323	0	1.89	0.003	1.89	0.72	12%
X24G	620	11.69	28783*	0	4.84	0	4.84	0.12	1%
X24H	769	12.78	28783*	0	90	0	90.00	0.98	8%
X31A	230	39.15	11707	2.14	19.1	0.107	19.21	2.33	6%
X31B	195	32.54	1722	1.81	7.43	0.016	7.45	0.11	0%
X31C	154	25.8	355	1.44	5.21	0.003	5.21	0.11	0%
X31D	192	17.49	2099	0.77	11.35	0.019	11.37	1.16	7%
X31E	214	26.11	31805	1.92	12.42	0.290	12.71	0.37	1%
X31F	94	11.66	2255	1.88	5.41	0.021	5.43	0.08	1%
X31G	169	12.43	22348	1.65	10.04	0.204	10.24	1.4	11%
X31H	60	6.69	26567*	0.6	2.98	0	2.98	0.12	2%
X31J	154	13.54	30984	1.57	5.55	0.283	5.83	0.53	4%
X31K	488	12.58	97372	0	29.39	0.889	30.28	0.58	5%
X31L	304	13.71	41155	0	6.09	0.376	6.47	0.51	4%
X31M	709	12.79	21584	0	4.44	0.197	4.64	0.95	7%
X32A	112	7.4	18850	0	3.24	0.172	3.41	0.5	7%
X32B	55	3.38	11671	1.07	1.28	0.106	1.39	0.32	9%
X32C	233	6.52	57961	0.52	3.32	0.529	3.85	0.91	14%

Quaternary	Area(km²)	Recharge (Mm³/a)	Population	Baseflow (Mm³/a) (DWS, 2015)	EWR_MLF (Mm³/a)	BHN Reserve (Mm³/a)	Reserve (Mm³/a)	Groundwater Use (Mm³/a)	Stress Index
X32D	100	6.75	30860	1.47	2.93	0.282	3.21	0.32	5%
X32E	78	4.68	33350	0.95	1.74	0.304	2.04	2.36	50%
X32F	157	4.71	32638	0.76	2.73	0.298	3.03	0.4	8%
X32G	336	5.48	36640	0.99	1.7	0.334	2.03	1.02	19%
X32H	488	7.21	19418	0	2.84	0.177	3.02	0.28	4%
X32J	355	4.96	26567*	0	9.32	0	9.32	0.09	2%
X33A	600	7.85	26567*	0	3.16	0	3.16	0.05	1%
X33B	311	3.24	26567*	0	0.9	0	0.90	0.02	1%
X33C	183	1.27	26567*	0	0.24	0	0.24	0.03	2%
X33D	350	3.92	26567*	0	1.93	0	1.93	0	0%
X40A	924	9.59	0	0	2.77	0	2.77	0.1	1%
X40B	743	7.71	0	0	2.4	0	2.40	0.07	1%
X40C	941	10.89	7552	0	3.87	0.069	3.94	0.15	1%
X40D	589	4.89	0	0	1.59	0	1.59	0.06	1%

*Population estimated based on the average of the secondary catchment X1, X2 and X2

7. GROUNDWATER - QUALITY COMPONENT

The groundwater quality should comply with the water quality guidelines as shown in Table 7.1. The groundwater quality for the Inkomati catchment was assessed per quaternary catchment (Table 7.2). A summary of the water quality class and parameters of concern per quaternary catchment is shown in Table 7.3. The parameter of concern is the parameter that was used to make a decision about the water quality Class of the quaternary.

Table 7.1: Assessment guide for the suitability of groundwater for potable use

Chemical Parameter	Target Water Quality Ranges [1]			
	Class 0	Class I	Class II	Class III
pH (pH units)	6 – 9	5 – 6 & 9 – 9.5	4 – 5 & > 9.5 – 10	<4 & >10
Electrical Conductivity (mS/m)	< 70	70 - 150	150 – 370	>370
Calcium as Ca	< 80	80 - 150	150 – 300	>300
Magnesium as Mg	< 70	70 - 100	100 – 200	>200
Sodium as Na	< 100	100 - 200	200 – 400	>400
Chloride as Cl	< 100	100 - 200	200 – 600	>600
Sulphate as SO_4	< 200	200 - 400	400 – 600	>600
Nitrate as NO_x-N	< 6	6 - 10	10 – 20	>20
Fluoride as F	<0.7	0.7 – 1.0	1.0 – 3.5	>3.5

[1] Ref: *Quality of Domestic Water Supplies, Volume 1: Assessment Guide, 2nd Ed.*1998. Water Research Commission Report No: TT 101/98. Pretoria, South Africa. *Note:* all units of measurement are in *mg/l*, unless otherwise stated.

Quaternary Catchment

Groundwater quality data was obtained from the WMS and used to determine the quality per quaternary catchment, see Table 7.2 and Table 7.3 for a summary of the water quality class and parameters of concern.

Table 7.2 Groundwater quality per Quaternary Catchment

Chemical Parameter	Unit	Quaternary Catchments X11A, X11B, X11C, X11D											
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]		
		X11A*	X11B*	X11C*	X11D*	X11A*	X11B*	X11C*	X11D*		X11A*	X11B*	X11C*	X11D*
pH		44	41	42	42	7.99	8.03	8.02	8.02	5.0 – 9.5	8.79	8.83	8.82	8.82
Electrical Conductivity	mS/m	44	41	42	42	22.75	22.70	22.60	22.60	<150	25.03	24.97	24.86	24.86
Calcium as Ca	mg/l	39	36	37	37	23.07	22.80	22.53	22.53	<150	25.37	25.07	24.78	24.78
Magnesium as Mg	mg/l	39	36	37	37	6.72	6.70	6.68	6.68	<100	7.39	7.37	7.35	7.35
Sodium as Na	mg/l	38	36	37	37	8.78	8.63	8.51	8.51	<200	9.65	9.49	9.36	9.36
Total Alkalinity as $CaCO_3$	mg/l	39	36	37	37	98.80	98.43	98.06	98.06	N/A	108.68	108.27	107.87	107.87
Chloride as Cl	mg/l	40	37	38	38	5.38	5.35	5.17	5.17	<200	5.92	5.88	5.69	5.69
Sulphate as SO_4	mg/l	38	36	37	37	5.89	5.58	5.45	5.45	<400	6.48	6.14	6.00	6.00
Nitrate as NO_x-N	mg/l	40	37	38	38	0.11	0.11	0.11	0.11	<10	0.12	0.12	0.12	0.12
Fluoride as F	mg/l	39	36	37	37	0.17	0.17	0.17	0.17	<1.0	0.18	0.19	0.19	0.19

Chemical Parameter	Unit	Quaternary Catchments X11E, X11F, X11G, X11H												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X11E*	X11F*	X11G*	X11H	X11E*	X11F*	X11G*	X11H		X11E*	X11F*	X11G*	X11H
pH		42	42	4	24	8.02	8.02	7.98	7.54	5.0 – 9.5	8.82	8.82	8.77	8.30
Electrical Conductivity	mS/m	42	42	4	24	22.60	22.60	15.85	17.60	<150	24.86	24.86	17.44	19.36
Calcium as Ca	mg/l	37	37	4	23	22.53	22.53	12.40	12.21	<150	24.78	24.78	13.64	13.43
Magnesium as Mg	mg/l	37	37	4	23	6.68	6.68	11.55	5.70	<100	7.35	7.35	12.71	6.27
Sodium as Na	mg/l	37	37	4	23	8.51	8.51	4.00	10.40	<200	9.36	9.36	4.40	11.44
Total Alkalinity as $CaCO_3$	mg/l	37	37	4	23	98.06	98.06	81.80	70.80	N/A	107.87	107.87	89.98	77.88
Chloride as Cl	mg/l	38	38	4	23	5.17	5.17	1.50	5.00	<200	5.69	5.69	1.65	5.50
Sulphate as SO_4	mg/l	37	37	4	23	5.45	5.45	4.05	4.40	<400	6.00	6.00	4.46	4.84
Nitrate as NO_x-N	mg/l	38	38	4	23	0.11	0.11	0.13	0.77	<10	0.12	0.12	0.14	0.85
Fluoride as F	mg/l	37	37	4	23	0.17	0.17	0.23	0.16	<1.0	0.19	0.19	0.25	0.17

Chemical Parameter	Unit	Quaternary Catchments X11J, X11K, X12A, X12B												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X11J*	X11K	X12A*	X12B*	X11J*	X11K	X12A*	X12B*		X11J*	X11K	X12A*	X12B*
pH		24	3	10	4	7.54	6.71	7.17	7.98	5.0 – 9.5	8.30	7.38	7.88	8.77
Electrical Conductivity	mS/m	24	3	10	4	17.60	16.2	14.05	15.85	<150	19.36	17.82	15.46	17.44
Calcium as Ca	mg/l	23	3	10	4	12.21	10.1	5.85	12.40	<150	13.43	11.11	6.44	13.64
Magnesium as Mg	mg/l	23	3	10	4	5.70	5.3	3.50	11.55	<100	6.27	5.83	3.85	12.71
Sodium as Na	mg/l	23	3	10	4	10.40	13.4	8.35	4.00	<200	11.44	14.74	9.19	4.40
Total Alkalinity as $CaCO_3$	mg/l	23	3	10	4	70.80	75.3	31.50	81.80	N/A	77.88	82.83	34.65	89.98
Chloride as Cl	mg/l	23	3	10	4	5.00	5	3.55	1.50	<200	5.50	5.50	3.91	1.65
Sulphate as SO_4	mg/l	23	3	10	4	4.40	4.5	4.60	4.05	<400	4.84	4.95	5.06	4.46
Nitrate as NO_x-N	mg/l	23	3	10	4	0.77	0.29	0.35	0.13	<10	0.85	0.32	0.38	0.14
Fluoride as F	mg/l	23	3	10	4	0.16	0.11	0.12	0.23	<1.0	0.17	0.12	0.13	0.25

Chemical Parameter	Unit	Quaternary Catchments X12C, X12D, X12E, X12F											
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]		
		X12C*	X12D	X12E*	X12F	X12C*	X12D	X12E*	X12F		X12C*	X12D	X12E*	X12F
pH		51	50	51	11	8.54	8.55	8.54	7.99	5.0 – 9.5	9.39	9.40	9.39	8.79
Electrical Conductivity	mS/m	51	50	51	11	61.00	61.10	61.00	43.80	<150	67.10	67.21	67.10	48.18
Calcium as Ca	mg/l	47	46	47	11	6.10	6.10	6.10	22.80	<150	6.71	6.71	6.71	25.08
Magnesium as Mg	mg/l	46	45	46	11	0.63	0.50	0.63	17.40	<100	0.69	0.55	0.69	19.14
Sodium as Na	mg/l	45	44	45	11	110.40	110.66	110.40	26.80	<200	121.44	121.73	121.44	29.48
Total Alkalinity as $CaCO_3$	mg/l	46	45	46	11	54.50	54.60	54.71	170.00	N/A	59.95	60.06	60.18	187.00
Chloride as Cl	mg/l	47	46	47	11	124.82	124.91	124.82	6.70	<200	137.30	137.40	137.30	7.37
Sulphate as SO_4	mg/l	47	46	47	11	17.38	17.46	17.38	9.70	<400	19.11	19.21	19.11	10.67
Nitrate as NO_x-N	mg/l	47	46	47	11	0.05	0.05	0.05	0.27	<10	0.06	0.06	0.06	0.30
Fluoride as F	mg/l	45	44	45	11	9.91	9.93	9.91	0.66	<1.0	9.91	9.93	9.91	0.73
Chemical Parameter	**Unit**	**Quaternary Catchments X12G, X12H, X12J, X12K**											
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]		
		X12G	X12H*	X12J*	X12K	X12G	X12H*	X12J*	X12K		X12G	X12H*	X12J*	X12K
pH		3	11	3	9	8.37	8.10	8.37	8.10	5.0 – 9.5	9.21	8.91	9.21	8.91
Electrical Conductivity	mS/m	3	11	3	9	64.90	44.70	64.90	66.70	<150	71.39	49.17	71.39	73.37
Calcium as Ca	mg/l	3	11	3	9	23.90	17.10	23.90	31.70	<150	26.29	18.81	26.29	34.87
Magnesium as Mg	mg/l	3	11	3	9	63.60	26.80	63.60	30.40	<100	69.96	29.48	69.96	33.44
Sodium as Na	mg/l	3	11	3	9	23.20	30.20	23.20	21.70	<200	25.52	33.22	25.52	23.87
Total Alkalinity as $CaCO_3$	mg/l	3	11	3	9	349.10	230.90	349.10	293.70	N/A	384.01	253.99	384.01	323.07
Chloride as Cl	mg/l	3	11	3	9	6.50	9.50	6.50	9.50	<200	7.15	10.45	7.15	10.45
Sulphate as SO_4	mg/l	3	11	3	9	7.60	14.50	7.60	14.50	<400	8.36	15.95	8.36	15.95
Nitrate as NO_x-N	mg/l	3	11	3	9	0.32	0.60	0.32	0.50	<10	0.36	0.65	0.36	0.55
Fluoride as F	mg/l	3	11	3	9	0.35	0.39	0.35	0.25	<1.0	0.39	0.43	0.39	0.28

Chemical Parameter	Unit	Quaternary Catchments X13J, X13K, X13L, X14A											
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]		
		X13J	X13K	X13L*	X14A	X13J	X13K	X13L*	X14A		X13J	X13K	X13L*	X14A
pH		60	19	8	31	8.28	8.12	8.54	7.21	5.0 – 9.5	9.11	8.93	9.39	7.93
Electrical Conductivity	mS/m	60	19	8	31	138.00	155.00	76.40	2.80	<150	150	155.00	84.04	3.08
Calcium as Ca	mg/l	60	19	8	27	52.10	58.50	22.20	1.10	<150	57.31	64.35	24.42	1.21
Magnesium as Mg	mg/l	60	19	8	27	45.40	52.70	23.05	0.50	<100	49.94	57.97	25.36	0.55
Sodium as Na	mg/l	60	19	8	27	201.95	200.10	112.30	2.54	<200	201.95	200.10	123.53	2.79
Total Alkalinity as $CaCO_3$	mg/l	60	19	8	27	382.85	395.00	281.95	6.70	N/A	421.14	434.50	310.15	7.37
Chloride as Cl	mg/l	60	19	8	27	189.20	292.47	89.30	5.00	<200	200	292.47	98.23	5.50
Sulphate as SO_4	mg/l	60	19	8	27	14.60	27.86	5.35	2.00	<400	16.06	30.64	5.89	2.20
Nitrate as NO_x-N	mg/l	60	19	8	27	0.72	0.42	0.86	0.06	<10	0.79	0.47	0.94	0.07
Fluoride as F	mg/l	60	19	8	27	0.51	0.65	0.81	0.12	<1.0	0.57	0.72	0.89	0.14
Chemical Parameter	**Unit**	**Quaternary Catchments X14B, X14F, X14G, X14H**											
		No. of Samples				**Ambient GW quality or median[1]**				**BHN Reserve[2]**	**Groundwater Quality Reserve[3]**		
		X14B	**X14F**	**X14G**	**X14H**	**X14B**	**X14F**	**X14G**	**X14H**		**X14B**	**X14F**	**X14G**	**X14H**
pH		4	4	54	8	7.97	7.79	8.54	8.54	5.0 – 9.5	8.76	8.56	9.39	9.39
Electrical Conductivity	mS/m	4	4	54	8	303.00	37.15	71.40	76.40	<150	333.30	40.87	78.54	84.04
Calcium as Ca	mg/l	4	4	54	8	130.40	38.40	33.95	22.20	<150	143.44	42.24	37.35	24.42
Magnesium as Mg	mg/l	4	4	54	8	99.20	17.60	43.60	23.05	<100	109.12	19.36	47.96	25.36
Sodium as Na	mg/l	4	4	54	8	495.75	25.10	84.35	112.30	<200	495.75	27.61	92.79	123.53
Total Alkalinity as $CaCO_3$	mg/l	4	4	54	8	632.95	148.55	276.25	281.95	N/A	696.25	163.41	303.88	310.15
Chloride as Cl	mg/l	4	4	54	8	831.30	9.95	38.70	89.30	<200	831.30	10.95	42.57	98.23
Sulphate as SO_4	mg/l	4	4	54	8	60.45	14.15	2.00	5.35	<400	66.50	15.57	2.20	5.89
Nitrate as NO_x-N	mg/l	4	4	54	8	3.01	0.33	2.19	0.86	<10	3.31	0.36	2.41	0.94
Fluoride as F	mg/l	4	4	54	8	0.64	0.35	0.44	0.81	<1.0	0.70	0.39	0.48	0.89

Chemical Parameter	Unit	Quaternary Catchments X21A, X21B, X21C, X21D												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X21A*	X21B*	X21C*	X21D*	X21A*	X21B*	X21C*	X21D*		X21A*	X21B*	X21C*	X21D*
pH		8	8	7	8	8.02	8.02	8.03	8.02	5.0 – 9.5	8.82	8.82	8.83	8.82
Electrical Conductivity	mS/m	8	8	7	8	76.85	76.85	95.70	76.85	<150	84.54	84.54	105.27	84.54
Calcium as Ca	mg/l	8	8	7	8	41.78	41.78	43.25	41.78	<150	45.96	45.96	47.58	45.96
Magnesium as Mg	mg/l	8	8	7	8	33.55	33.55	43.04	33.55	<100	36.90	36.90	47.35	36.90
Sodium as Na	mg/l	8	8	7	8	44.65	44.65	56.70	44.65	<200	49.11	49.11	62.37	49.11
Total Alkalinity as $CaCO_3$	mg/l	8	8	7	8	114.48	114.48	116.76	141.56	N/A	125.93	125.93	128.44	155.71
Chloride as Cl	mg/l	8	8	7	8	126.78	126.78	161.82	126.78	<200	139.46	139.46	178.00	139.46
Sulphate as SO_4	mg/l	8	8	7	8	56.22	56.22	69.54	56.22	<400	61.85	61.85	76.49	61.85
Nitrate as NO_x-N	mg/l	8	8	7	8	0.65	0.48	0.62	0.48	<10	0.72	0.52	0.68	0.52
Fluoride as F	mg/l	8	8	7	8	0.13	0.13	0.13	0.13	<1.0	0.14	0.14	0.14	0.14

Chemical Parameter	Unit	Quaternary Catchments X21E, X21F, X21G, X21H												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X21E*	X21F	X21G*	X21H*	X21E*	X21F	X21G*	X21H*		X21E*	X21F	X21G*	X21H*
pH		9	55	55	7	8.03	8.12	8.12	8.03	5.0 – 9.5	8.83	8.93	8.93	8.83
Electrical Conductivity	mS/m	9	55	55	7	58.00	39.20	39.20	95.70	<150	63.80	43.12	43.12	105.27
Calcium as Ca	mg/l	9	49	49	7	40.31	9.86	9.86	43.25	<150	44.34	10.85	10.85	47.58
Magnesium as Mg	mg/l	9	47	47	7	24.06	3.30	3.30	43.04	<100	26.46	3.63	3.63	47.35
Sodium as Na	mg/l	9	46	46	7	32.60	63.85	63.85	56.70	<200	35.86	70.24	70.24	62.37
Total Alkalinity as $CaCO_3$	mg/l	9	48	48	7	112.20	103.90	103.90	116.76	N/A	123.42	114.29	114.29	128.44
Chloride as Cl	mg/l	9	47	47	7	91.74	49.02	49.02	161.82	<200	100.92	53.92	53.92	178.00
Sulphate as SO_4	mg/l	9	49	49	7	42.91	5.15	5.15	69.54	<400	47.20	5.66	5.66	76.49
Nitrate as NO_x-N	mg/l	9	49	49	7	0.62	0.05	0.05	0.62	<10	0.68	0.06	0.06	0.68
Fluoride as F	mg/l	9	47	47	7	0.13	3.38	3.38	0.13	<1.0	0.14	3.38	3.72	0.14

Chemical Parameter	Unit	Quaternary Catchments X21J, X21K, X22A, X22B												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X21J	X21K*	X22A*	X22B*	X21J	X21K*	X22A*	X22B*		X21J	X21K*	X22A*	X22B*
pH		7	7	7	4	8.03	8.03	8.03	7.58	5.0 – 9.5	8.83	8.83	8.83	8.34
Electrical Conductivity	mS/m	7	7	7	4	95.70	95.70	95.70	9.00	<150	105.27	105.27	105.27	9.90
Calcium as Ca	mg/l	7	7	7	4	43.25	43.25	43.25	6.30	<150	47.58	47.58	47.58	6.93
Magnesium as Mg	mg/l	7	7	7	4	43.04	43.04	43.04	1.75	<100	47.35	47.35	47.35	1.93
Sodium as Na	mg/l	7	7	7	3	56.70	56.70	56.70	2.10	<200	62.37	62.37	62.37	2.31
Total Alkalinity as $CaCO_3$	mg/l	7	7	7	4	116.76	116.76	116.76	26.40	N/A	128.44	128.44	128.44	29.04
Chloride as Cl	mg/l	7	7	7	4	161.82	161.82	161.82	3.35	<200	178.00	178.00	178.00	3.69
Sulphate as SO_4	mg/l	7	7	7	3	69.54	69.54	69.54	2.00	<400	76.49	76.49	76.49	2.20
Nitrate as NO_x-N	mg/l	7	7	7	4	0.62	0.62	0.62	0.23	<10	0.68	0.68	0.68	0.25
Fluoride as F	mg/l	7	7	7	4	0.13	0.13	0.13	0.11	<1.0	0.14	0.14	0.14	0.12
Chemical Parameter	Unit	Quaternary Catchments X22C, X22D, X22E, X22F												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X22C*	X22D	X22E*	X22F*	X22C*	X22D	X22E*	X22F*		X22C*	X22D	X22E*	X22F*
pH		5	4	4	3	7.42	7.58	7.51	7.31	5.0 – 9.5	8.16	8.34	8.26	8.04
Electrical Conductivity	mS/m	5	4	4	3	45.40	9.00	37.85	45.40	<150	49.94	9.90	41.64	49.94
Calcium as Ca	mg/l	5	4	4	3	18.10	6.30	17.40	16.70	<150	19.91	6.93	19.14	18.37
Magnesium as Mg	mg/l	5	4	4	3	12.00	1.75	11.85	12.00	<100	13.20	1.93	13.04	13.20
Sodium as Na	mg/l	4	3	3	2	49.70	2.10	46.10	49.70	<200	54.67	2.31	50.71	54.67
Total Alkalinity as $CaCO_3$	mg/l	5	4	4	3	177.80	26.40	161.95	177.80	N/A	195.58	29.04	178.15	195.58
Chloride as Cl	mg/l	5	4	4	3	16.70	3.35	13.20	16.70	<200	18.37	3.69	14.52	18.37
Sulphate as SO_4	mg/l	4	3	3	2	15.90	2.00	22.70	24.60	<400	17.49	2.20	24.97	27.06
Nitrate as NO_x-N	mg/l	5	4	4	3	2.69	0.23	1.25	2.48	<10	2.96	0.25	1.38	2.73
Fluoride as F	mg/l	5	4	4	3	0.56	0.11	0.60	0.44	<1.0	0.62	0.12	0.66	0.48

Chemical Parameter	Unit	Quaternary Catchments X22G, X22H, X22J, X22K											
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]		
		X22G*	X22H	X22J*	X22K	X22G*	X22H	X22J*	X22K		X22G*	X22H	X22J*	X22K
pH		3	3	6	6	7.31	7.31	7.81	7.81	5.0 – 9.5	8.04	8.04	8.59	8.59
Electrical Conductivity	mS/m	3	3	6	6	45.40	45.40	43.55	43.55	<150	49.94	49.94	47.91	47.91
Calcium as Ca	mg/l	3	3	6	6	16.70	16.70	34.85	34.85	<150	18.37	18.37	38.34	38.34
Magnesium as Mg	mg/l	3	3	6	6	12.00	12.00	10.95	10.95	<100	13.20	13.20	12.05	12.05
Sodium as Na	mg/l	2	2	6	6	49.70	49.70	53.00	53.00	<200	54.67	54.67	58.30	58.30
Total Alkalinity as $CaCO_3$	mg/l	3	3	6	6	177.80	177.80	191.65	191.65	N/A	195.58	195.58	210.82	210.82
Chloride as Cl	mg/l	3	3	6	6	16.70	16.70	14.30	14.30	<200	18.37	18.37	15.73	15.73
Sulphate as SO_4	mg/l	2	2	6	6	24.60	24.60	9.60	9.60	<400	27.06	27.06	10.56	10.56
Nitrate as NO_x-N	mg/l	3	3	6	6	2.48	2.48	0.92	0.92	<10	2.73	2.73	1.02	1.02
Fluoride as F	mg/l	3	3	6	6	0.44	0.44	1.86	1.86	<1.0	0.48	0.48	1.86	1.86
Chemical Parameter	**Unit**	**Quaternary Catchments X23A, X23B, X23C, X23D**											
		No. of Samples				**Ambient GW quality or median[1]**				**BHN Reserve[2]**	**Groundwater Quality Reserve[3]**		
		X23A*	**X23B**	**X23C***	**X23D**	**X23A***	**X23B**	**X23C***	**X23D**		**X23A***	**X23B**	**X23C***	**X23D**
pH		7	4	6	6	7.40	7.45	7.39	7.39	5.0 – 9.5	8.14	8.19	8.12	8.12
Electrical Conductivity	mS/m	7	4	6	6	24.30	42.80	22.50	22.50	<150	26.73	47.08	24.75	24.75
Calcium as Ca	mg/l	7	4	6	6	18.90	29.90	14.80	14.80	<150	20.79	32.89	16.28	16.28
Magnesium as Mg	mg/l	7	4	6	6	10.60	10.85	10.95	10.95	<100	11.66	11.94	12.05	12.05
Sodium as Na	mg/l	7	4	6	6	16.00	16.50	15.60	15.60	<200	17.60	18.15	17.16	17.16
Total Alkalinity as $CaCO_3$	mg/l	7	4	6	6	91.20	127.85	73.85	73.85	N/A	100.32	140.64	81.24	81.24
Chloride as Cl	mg/l	7	4	6	6	10.30	5.90	10.60	10.60	<200	11.33	6.49	11.66	11.66
Sulphate as SO_4	mg/l	7	4	6	6	6.30	9.10	6.70	6.70	<400	6.93	10.01	7.37	7.37
Nitrate as NO_x-N	mg/l	7	4	6	6	1.33	0.53	2.02	2.02	<10	1.46	0.58	2.22	2.22
Fluoride as F	mg/l	7	4	6	6	0.34	0.55	0.34	0.34	<1.0	0.37	0.60	0.37	0.37

Chemical Parameter	Unit	Quaternary Catchments X23E, X23F, X23G, X23H												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X23E*	X23F*	X23G*	X23H	X23E*	X23F*	X23G*	X23H		X23E*	X23F*	X23G*	X23H
pH		6	6	15	13	7.39	7.39	8.06	8.14	5.0 – 9.5	8.12	8.12	8.87	8.95
Electrical Conductivity	mS/m	6	6	15	13	22.50	22.50	64.80	66.70	<150	24.75	24.75	71.28	73.37
Calcium as Ca	mg/l	6	6	15	13	14.80	14.80	31.30	28.70	<150	16.28	16.28	34.43	31.57
Magnesium as Mg	mg/l	6	6	15	13	10.95	10.95	30.80	29.20	<100	12.05	12.05	33.88	32.12
Sodium as Na	mg/l	6	6	15	13	15.60	15.60	48.50	54.60	<200	17.16	17.16	53.35	60.06
Total Alkalinity as $CaCO_3$	mg/l	6	6	15	13	73.85	73.85	291.80	291.80	N/A	81.24	81.24	320.98	320.98
Chloride as Cl	mg/l	6	6	15	13	10.60	10.60	23.40	24.60	<200	11.66	11.66	25.74	27.06
Sulphate as SO_4	mg/l	6	6	15	13	6.70	6.70	18.70	34.70	<400	7.37	7.37	20.57	38.17
Nitrate as NO_x-N	mg/l	6	6	15	13	2.02	2.02	1.38	0.21	<10	2.22	2.22	1.51	0.24
Fluoride as F	mg/l	6	6	15	13	0.34	0.34	0.38	0.38	<1.0	0.37	0.37	0.42	0.42
Chemical Parameter	**Unit**	**Quaternary Catchments X24A, X24B, X24C, X24D**												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X24A	X24B	X24C	X24D	X24A	X24B	X24C	X24D		X24A	X24B	X24C	X24D
pH		5	51	5	13	8.48	8.18	8.14	8.45	5.0 – 9.5	9.33	9.00	8.95	9.30
Electrical Conductivity	mS/m	5	51	5	13	37.10	42.80	69.50	74.30	<150	40.81	47.08	76.45	81.73
Calcium as Ca	mg/l	5	44	5	13	39.60	20.88	38.00	19.60	<150	43.56	22.97	41.80	21.56
Magnesium as Mg	mg/l	5	44	5	13	5.94	21.64	31.30	41.90	<100	6.54	23.81	34.43	46.09
Sodium as Na	mg/l	5	44	5	13	57.17	28.99	97.77	37.10	<200	62.89	31.89	107.54	40.81
Total Alkalinity as $CaCO_3$	mg/l	5	44	5	13	131.74	145.74	348.30	380.60	N/A	144.92	160.32	383.13	418.66
Chloride as Cl	mg/l	5	45	5	13	23.22	20.80	61.80	28.50	<200	25.54	22.88	67.98	31.35
Sulphate as SO_4	mg/l	5	45	5	13	5.10	23.33	13.90	18.50	<400	5.61	25.66	15.29	20.35
Nitrate as NO_x-N	mg/l	5	43	5	12	0.75	2.54	0.07	2.80	<10	0.82	2.79	0.08	3.08
Fluoride as F	mg/l	4	41	5	11	1.09	0.21	0.91	0.23	<1.0	1.09	0.23	1.00	0.25

Chemical Parameter	Unit	Quaternary Catchments X24E, X24F, X24G, X24H												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X24E	X24F	X24G	X24H	X24E	X24F	X24G	X24H		X24E	X24F	X24G	X24H
pH		12	5	23	55	8.61	8.62	8.48	8.25	5.0 – 9.5	9.47	9.48	9.33	9.08
Electrical Conductivity	mS/m	12	5	23	55	100.35	119.80	88.50	77.90	<150	110.39	131.78	97.35	85.69
Calcium as Ca	mg/l	12	5	21	49	36.20	64.40	27.30	39.17	<150	39.82	70.84	30.03	43.08
Magnesium as Mg	mg/l	12	5	21	48	29.55	46.40	26.80	29.43	<100	32.51	51.04	29.48	32.37
Sodium as Na	mg/l	12	5	21	47	190.95	155.70	117.50	68.50	<200	210.05	171.27	129.25	75.35
Total Alkalinity as $CaCO_3$	mg/l	12	5	21	49	411.60	420.00	369.50	208.14	N/A	452.76	462.00	406.45	228.96
Chloride as Cl	mg/l	12	5	21	49	108.10	171.70	83.70	105.35	<200	118.91	188.87	92.07	115.88
Sulphate as SO_4	mg/l	12	5	21	49	8.35	9.00	8.10	22.15	<400	9.19	9.90	8.91	24.37
Nitrate as NO_x-N	mg/l	12	5	21	49	0.02	0.81	0.05	0.57	<10	0.02	0.89	0.06	0.63
Fluoride as F	mg/l	12	4	21	47	0.97	0.51	0.62	0.38	<1.0	1.06	0.56	0.68	0.42
Chemical Parameter	Unit	Quaternary Catchments X31A, X31B, X31C, X31D												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X31A*	X31B	X31C	X31D*	X31A*	X31B	X31C	X31D*		X31A*	X31B	X31C	X31D*
pH		4	50	50	52	7.58	8.08	7.54	8.06	5.0 – 9.5	8.34	8.89	8.29	8.87
Electrical Conductivity	mS/m	4	48	49	50	9.00	23.05	6.83	23.13	<150	9.90	25.36	7.51	25.44
Calcium as Ca	mg/l	4	45	45	47	6.30	21.45	5.50	21.41	<150	6.93	23.59	6.05	23.55
Magnesium as Mg	mg/l	4	45	44	47	1.75	12.79	2.99	12.79	<100	1.93	14.07	3.29	14.07
Sodium as Na	mg/l	3	44	43	46	2.10	2.64	2.00	2.69	<200	2.31	2.90	2.20	2.96
Total Alkalinity as $CaCO_3$	mg/l	4	43	45	45	26.40	97.70	28.80	97.70	N/A	29.04	107.47	31.68	107.47
Chloride as Cl	mg/l	4	46	46	48	3.35	3.77	3.30	3.80	<200	3.69	4.14	3.63	4.18
Sulphate as SO_4	mg/l	3	45	46	47	2.00	11.02	2.00	11.01	<400	2.20	12.12	2.20	12.11
Nitrate as NO_x-N	mg/l	4	45	46	47	0.23	0.66	0.25	0.66	<10	0.25	0.72	0.28	0.73
Fluoride as F	mg/l	4	50	50	46	0.11	8.08	7.54	0.11	<1.0	0.12	8.89	8.29	0.13

Chemical Parameter	Unit	Quaternary Catchments X31E, X31F, X31G, X31H												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X31E	X31F*	X31G	X31H*	X31E	X31F*	X31G	X31H*		X31E	X31F*	X31G	X31H*
pH		20	46	46	52	7.31	7.51	7.51	8.06	5.0 – 9.5	8.04	8.26	8.26	8.87
Electrical Conductivity	mS/m	20	46	46	50	8.52	21.60	21.60	23.13	<150	9.37	23.76	23.76	25.44
Calcium as Ca	mg/l	20	46	46	47	5.49	12.10	12.10	21.41	<150	6.04	13.31	13.31	23.55
Magnesium as Mg	mg/l	20	46	46	47	1.71	6.02	6.02	12.79	<100	1.88	6.63	6.63	14.07
Sodium as Na	mg/l	20	46	46	46	7.52	16.77	16.77	2.69	<200	8.28	18.45	18.45	2.96
Total Alkalinity as $CaCO_3$	mg/l	20	46	46	45	33.07	68.19	68.19	97.70	N/A	36.38	75.01	75.01	107.47
Chloride as Cl	mg/l	20	46	46	48	5.00	8.85	8.85	3.80	<200	5.50	9.74	9.74	4.18
Sulphate as SO_4	mg/l	20	46	46	47	7.31	2.00	2.00	11.01	<400	8.04	2.20	2.20	12.11
Nitrate as NO_x-N	mg/l	20	46	46	47	0.12	2.19	2.19	0.66	<10	0.13	2.40	2.40	0.73
Fluoride as F	mg/l	20	46	46	46	0.14	0.27	0.27	0.11	<1.0	0.16	0.30	0.30	0.13
Chemical Parameter	**Unit**	**Quaternary Catchments X31J, X31K, X31L, X31M**												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X31J*	X31K	X31L	X31M	X31J*	X31K	X31L	X31M		X31J*	X31K	X31L	X31M
pH		4	91	68	50	7.31	8.11	8.01	8.17	5.0 – 9.5	8.04	8.92	8.81	8.98
Electrical Conductivity	mS/m	4	92	68	50	29.40	49.75	98.55	113.10	<150	32.34	54.73	108.41	124.41
Calcium as Ca	mg/l	4	87	68	50	12.75	23.70	44.09	50.90	<150	14.03	26.07	48.50	55.99
Magnesium as Mg	mg/l	4	86	68	50	11.85	17.49	31.34	71.86	<100	13.04	19.24	34.47	79.05
Sodium as Na	mg/l	3	85	68	50	39.80	47.10	134.61	91.30	<200	43.78	51.81	148.07	100.43
Total Alkalinity as $CaCO_3$	mg/l	4	85	68	50	109.65	204.70	288.47	481.35	N/A	120.62	225.17	317.31	529.49
Chloride as Cl	mg/l	4	87	68	50	13.65	24.91	108.70	82.40	<200	15.02	27.40	119.57	90.64
Sulphate as SO_4	mg/l	3	87	68	50	22.70	8.00	13.22	11.75	<400	24.97	8.80	14.54	12.93
Nitrate as NO_x-N	mg/l	4	85	68	50	1.28	1.65	8.60	4.07	<10	1.40	1.82	9.46	4.47
Fluoride as F	mg/l	4	84	68	50	0.41	0.81	0.79	0.58	<1.0	0.45	0.89	0.87	0.63

Chemical Parameter	Unit	Quaternary Catchments X32A, X32B, X32C, X32D												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X32A	X32B	X32C	X32D	X32A	X32B	X32C	X32D		X32A	X32B	X32C	X32D
pH		22	12	91	25	7.56	7.55	7.96	7.55	5.0 – 9.5	8.31	8.31	8.76	8.31
Electrical Conductivity	mS/m	22	12	91	25	17.35	16.15	47.20	16.60	<150	19.09	17.77	51.92	18.26
Calcium as Ca	mg/l	22	12	91	25	10.22	9.10	23.20	9.80	<150	11.24	10.01	25.51	10.78
Magnesium as Mg	mg/l	22	12	91	25	4.05	2.65	10.53	3.54	<100	4.46	2.92	11.58	3.90
Sodium as Na	mg/l	22	12	90	25	16.53	18.71	54.92	17.10	<200	18.19	20.58	60.41	18.81
Total Alkalinity as $CaCO_3$	mg/l	22	12	91	25	63.90	62.00	159.20	64.20	N/A	70.29	68.20	175.12	70.62
Chloride as Cl	mg/l	22	12	91	25	6.70	5.05	23.90	6.80	<200	7.37	5.56	26.29	7.48
Sulphate as SO_4	mg/l	22	12	90	25	3.00	2.00	7.38	2.00	<400	3.30	2.20	8.12	2.20
Nitrate as NO_x-N	mg/l	22	12	91	25	1.10	1.53	1.80	1.15	<10	1.21	1.68	1.98	1.27
Fluoride as F	mg/l	22	12	91	25	0.25	0.28	0.67	0.26	<1.0	0.27	0.31	0.74	0.29

Chemical Parameter	Unit	Quaternary Catchments X32E, X32F, X32G, X32H												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X32E	X32F	X32G	X32H	X32E	X32F	X32G	X32H		X32E	X32F	X32G	X32H
pH		84	27	96	69	7.72	8.01	8.11	8.12	5.0 – 9.5	8.50	8.81	8.92	8.93
Electrical Conductivity	mS/m	84	27	96	69	37.80	65.90	123.55	162.00	<150	41.58	72.49	135.91	162.00
Calcium as Ca	mg/l	84	27	96	69	20.94	35.25	52.75	55.30	<150	23.03	38.78	58.03	60.83
Magnesium as Mg	mg/l	84	27	96	69	9.42	15.80	39.90	72.70	<100	10.36	17.38	43.89	79.97
Sodium as Na	mg/l	84	27	96	69	31.45	85.60	143.07	226.60	<200	34.60	94.16	157.38	226.60
Total Alkalinity as $CaCO_3$	mg/l	84	27	96	69	142.77	219.90	379.15	591.90	N/A	157.04	241.89	417.07	651.09
Chloride as Cl	mg/l	84	27	96	69	16.95	72.60	125.10	140.70	<200	18.65	79.86	137.61	154.77
Sulphate as SO_4	mg/l	84	27	96	69	5.23	10.00	14.47	15.80	<400	5.75	11.00	15.92	17.38
Nitrate as NO_x-N	mg/l	84	27	96	68	1.17	0.93	84	27	<10	1.29	1.02	84	27
Fluoride as F	mg/l	84	27	96	69	0.42	0.82	84	27	<1.0	0.46	0.90	84	27

Chemical Parameter	Unit	Quaternary Catchments X32J, X33A, X33B, X33C												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X32J	X33A	X33B	X33C	X32J	X33A	X33B	X33C		X32J	X33A	X33B	X33C
pH		5	13	3	7	8.74	8.70	8.67	8.68	5.0 – 9.5	9.5	9.5	9.5	9.5
Electrical Conductivity	mS/m	5	13	3	7	172.00	320.00	416.00	141.00	<150	172.00	320.00	416.00	150
Calcium as Ca	mg/l	5	13	3	7	42.00	51.20	74.00	57.70	<150	46.20	56.32	81.40	63.47
Magnesium as Mg	mg/l	5	13	3	7	34.50	73.80	95.00	41.00	<100	37.95	81.18	100	45.10
Sodium as Na	mg/l	5	13	3	7	309.60	597.90	627.60	220.00	<200	309.60	597.90	627.60	220.00
Total Alkalinity as $CaCO_3$	mg/l	5	13	3	7	569.80	714.70	584.50	542.60	N/A	626.78	786.17	642.95	596.86
Chloride as Cl	mg/l	5	13	3	7	223.40	634.90	1060.90	154.60	<200	223.40	634.90	1060.90	170.06
Sulphate as SO_4	mg/l	5	13	3	7	16.40	35.20	38.90	4.60	<400	18.04	38.72	42.79	5.06
Nitrate as NO_x-N	mg/l	5	13	3	7	0.02	0.02	0.36	0.02	<10	0.02	0.02	0.40	0.02
Fluoride as F	mg/l	5	13	3	7	0.97	1.34	1.60	1.18	<1.0	1.0	1.34	1.60	1.18

Chemical Parameter	Unit	Quaternary Catchments X33D, X40A, X40B, X40C												
		No. of Samples				Ambient GW quality or median[1]				BHN Reserve[2]	Groundwater Quality Reserve[3]			
		X33D*	X40A	X40B	X40C	X33D*	X40A	X40B	X40C		X33D*	X40A	X40B	X40C
pH		4	50	10	43	8.65	8.49	8.67	8.50	5.0 – 9.5	9.5	9.34	9.5	9.35
Electrical Conductivity	mS/m	4	51	10	43	331.00	124.40	152.50	199.00	<150	364.10	136.84	152.50	199.00
Calcium as Ca	mg/l	4	46	10	43	90.65	54.10	69.75	50.54	<150	99.72	59.51	76.73	55.60
Magnesium as Mg	mg/l	4	45	10	43	84.35	78.50	88.25	67.70	<100	92.79	86.35	97.08	74.47
Sodium as Na	mg/l	4	43	10	42	512.65	76.75	178.35	338.95	<200	512.65	84.43	196.19	338.95
Total Alkalinity as $CaCO_3$	mg/l	4	44	10	43	561.65	446.35	565.30	616.90	N/A	617.82	490.99	621.83	678.59
Chloride as Cl	mg/l	4	46	10	43	706.15	159.28	211.10	288.60	<200	706.15	175.21	211.10	288.60
Sulphate as SO_4	mg/l	4	46	10	42	30.45	30.60	7.45	22.50	<400	33.50	33.66	8.20	24.75
Nitrate as NO_x-N	mg/l	4	44	10	37	0.52	1.52	3.73	0.74	<10	0.57	1.67	4.10	0.81
Fluoride as F	mg/l	4	42	10	43	1.42	0.73	1.12	0.74	<1.0	1.42	0.81	1.12	0.81

Chemical Parameter	Unit	Quaternary Catchments X40D			
		No. of Samples	Ambient GW quality or median[1)]	BHN Reserve[2)]	Groundwater Quality Reserve[3)]
		X40D	X40D		X40D
pH		38	8.37	5.0 – 9.5	9.21
Electrical Conductivity	mS/m	39	192.50	<150	192.50
Calcium as Ca	mg/l	34	68.78	<150	75.66
Magnesium as Mg	mg/l	33	102.13	<100	102.13
Sodium as Na	mg/l	32	183.93	<200	202.32
Total Alkalinity as $CaCO_3$	mg/l	33	513.50	N/A	564.85
Chloride as Cl	mg/l	34	312.94	<200	312.94
Sulphate as SO_4	mg/l	34	18.47	<400	20.32
Nitrate as NO_x-N	mg/l	33	4.30	<10	4.72
Fluoride as F	mg/l	32	0.95	<1.0	1.04

*These quaternaries did not have groundwater quality, as a result the data was extrapolated from the neighbouring quaternary with similar geology.

Table 7.3: Water Quality Class and parameters of concern

Quaternary	Class	Water Quality parameters of concern
X11A	0	
X11B	0	
X11C	0	
X11D	0	
X11E	0	
X11F	0	
X11G	0	
X11H	0	
X11J	0	
X11K	0	
X12A	0	
X12B	0	
X12C	3	Fluoride
X12D	3	Fluoride
X12E	I	Chloride
X12F	0	
X12G	I	Magnesium
X12H	0	
X12J	I	Magnesium
X12K	I	Magnesium
X13J	I	Chloride, Electrical Conductivity, Magnesium
X13K	2	Chloride, Electrical Conductivity, Sodium
X13L	I	Electrical Conductivity, Sodium
X14A	0	
X14B	3	Sodium, Chloride
X14F	0	
X14G	I	Electrical Conductivity, Magnesium
X14H	I	Electrical Conductivity, Sodium
X21A	I	Chloride, Electrical Conductivity, Magnesium
X21B	I	Chloride, Electrical Conductivity, Magnesium
X21C	I	Chloride, Electrical Conductivity, Magnesium
X21D	I	Chloride, Electrical Conductivity, Magnesium
X21E	0	
X21F	3	Fluoride
X21G	2	Fluoride
X21H	I	Chloride, Electrical Conductivity
X21J	I	Chloride, Electrical Conductivity
X21K	I	Chloride, Electrical Conductivity
X22A	I	Chloride, Electrical Conductivity, Magnesium
X22B	0	
X22C	0	
X22D	0	
X22E	0	
X22F	0	
X22G	0	
X22H	0	
X22J	2	Fluoride
X22K	3	Fluoride
X23A	0	

Quaternary	Class	Water Quality parameters of concern
X23B	0	
X23C	0	
X23D	0	
X23E	0	
X23F	0	
X23G	I	Magnesium
X23H	0	
X24A	2	Fluoride
X24B	0	
X24C	I	Fluoride
X24D	I	Electrical Conductivity
X24E	I	Chloride, Electrical Conductivity, Sodium, Fluoride
X24F	I	Chloride, Electrical Conductivity, Sodium
X24G	I	Electrical Conductivity, Sodium
X24H	I	Chloride, Electrical Conductivity
X31A	0	
X31B	0	
X31C	0	
X31D	0	
X31E	0	
X31F	0	
X31G	0	
X31H	0	
X31J	0	
X31K	I	Fluoride
X31L	I	Sodium, Electrical Conductivity, Chloride, Magnesium, Nitrate
X31M	I	Electrical Conductivity, Magnesium
X32A	0	
X32B	0	
X32C	0	
X32D	0	
X32E	0	
X32F	I	Fluoride
X32G	2	Nitrate
X32H	2	Electrical Conductivity, Sodium
X32J	2	Chloride, Electrical Conductivity, Sodium
X33A	3	Sodium, Chloride
X33B	3	Chloride, Electrical Conductivity, Sodium, Fluoride
X33C	2	Sodium, Fluoride
X33D	3	Chloride, Sodium
X40A	I	Electrical Conductivity, Chloride, Magnesium, Fluoride
X40B	2	Chloride, Electrical Conductivity, Fluoride
X40C	2	Chloride, Electrical Conductivity, Sodium
X40D	2	Chloride, Electrical Conductivity, Magnesium

8. Desktop Wetland Typing and Ecoclassification

Table 8.1: Summary of Wetland Resource Units, associated wetlands and the PES and EIS results

WRU	Quaternary Catchments	Description	Summarised PES and EIS	Impacts
1 – Highveld Grasslands	Portions of catchments X11 and X12.	High density of large wetlands. Very large pans (rare). The vegetation type is regarded as "Endangered". Assumed that the wetland - dependent species within this vegetation type are similarly threatened.	Moderate - estimates range from a C to C/D EC. High EIS	Widespread agriculture (water quality impacts; trampling/grazing, erosion; encroachment into & channelization). Water quality impacts from mining. Limited impacts from invasive alien plants and the effects of dams drowning some wetlands and reducing water availability.
2 – Escarpment Grasslands	Portions of catchments X11, X12, X21, X23 and X14.	High density of very large wetlands. Vegetation types are "Vulnerable" - assumed that the wetland-dependent species are therefore similarly not critically threatened.	Mostly Moderate EIS scores. X21A, X21B, X21C and X21F: High EIS scores. In these quaternary catchments diversity of wetland types is higher (number of large pans - rare). Density of wetlands is high. X21A adjacent to the RAMSAR-listed Verloren Vallei. PES relatively High - estimates range from a B/C to C EC.	Trout farming - dams drowning wetlands & reducing water availability, water quality impacts and canalisation. Agricultural areas - runoff; trampling/grazing & erosion; encroachment & channelization. Afforestation, invasive alien vegetation, mining.
3 - Bushveld	X22 and portions of catchments X21, X31, X23 & X24.	Moderate (Mountain Bushveld) to low (Sour Bushveld) density. Wetland sites moderate to small. Density & diversity is low, density slightly higher in the Sour Bushveld area. Vegetation type endangered. Vegetation types in the Mountain Bushveld unit - "Least Threatened" - accounts for the slight differences in average EIS scores.	PES of the wetlands is relatively low - Range from a C to D EC. Quaternary catchments within the Sour Bushveld WRU have Moderate EIS scores, whilst those in the Mountain Bushveld WRU tend to have Low EIS scores.	Extensive afforestation - reduced interflow, reducing water availability for wetlands. Forestry has encroached. Edge effects of forestry & roads disturb wetlands which result in degradation. Irrigation farming, peri-urban areas of the former homelands and invasive alien vegetation have also caused some wetland degradation.

WRU	Quaternary Catchments	Description	Summarised PES and EIS	Impacts
4 – Granite Lowveld	Portions of catchments X31, X32, X40, X33, X24, X14 and X13.	Wetlands are small or cryptic. Density & diversity is very low – few wetlands. Those that do occur are not rare or high in diversity. The vegetation types are listed as "Vulnerable". Large areas of this section of the catchment are protected within significant conservation areas.	Low EIS scores. A wide range of PES: D to A ECs - indicative of the diverse conditions. Entire catchments are impacted by urbanisation of former homeland areas, lower quaternary catchments within Kruger National Park and private conservation areas. Little change from reference conditions in these areas; albeit that very few wetlands are found here.	Afforestation, agriculture and peri-urban areas. Forestry and the extensive agricultural areas have reduced the area of wetlands and the water available. Both landuse activities have encroached in places on the wetlands; whilst peri-urban areas have caused erosion (though increased runoff, grazing pressures and confinement of the drainage lines associated with infrastructure development).
5 – Basalt Lowveld	Portions of catchments X40, X33, X24 and X13.	Wetlands confined to valley bottom positions. Density and diversity is very low. A few that do occur are not rare types or occur in high diversity relative to one another. The vegetation types are listed as "Least Threatened".	Low EIS scores. PES very high – in A & B ECs. Notable exceptions are the quaternaries X13J, X13K and X13L which have been heavily impacted by urban and peri-urban areas of the former homelands, as well as by extensive irrigation farming.	Most of the quaternaries are located within the Kruger National Park, and no significant impacts at a regional (catchment) scale are likely to have occurred.
6 - Lebombo	Portions of catchments X40, X33 and X24.	No wetlands of any regional importance are expected due to steep slopes, shallow soils, low rainfall and high evaporation demands. Diversity would be very low, and density/occurrence extremely low.		

Table 8.2: Estimated average PES, EIS and REC for the wetlands within the quaternary catchments of the Crocodile, Sabie and Sand River catchments

Quaternary Catchment	Desktop PES	Desktop EIS	Desktop REC
X21A	C	High	B
X21B	C	High	B
X21C	C	High	B
X21D	B/C	Moderate	B/C
X21E	C	Moderate	C
X21F	B/C	High	B
X21G	C	Moderate	C
X21H	C/D	Moderate	C/D
X21J	D	Moderate	D
X21K	D	Moderate	D
X22A	C/D	Moderate	C/D
X22B	C/D	Low	C/D
X22C	D	Moderate	D
X22D	C/D	Moderate	C/D
X22E	C/D	Moderate	C/D
X22F	C	Moderate	C
X22G	C/D	Moderate	C/D
X22H	C	Moderate	C
X22J	D	Low	D
X22K	C	Low	C
X23A	C	Moderate	C
X23B	C	Moderate	C
X23C	C/D	Moderate	C/D
X23D	C	Moderate	C
X23E	C/D	Moderate	C/D
X23F	C	Moderate	C
X23G	C	Moderate	C
X23H	C	Low	C
X24A	D	Low	D
X24B	D	Low	D
X24C	B/C	Low	B/C
X24D	C	Low	C

Quaternary Catchment	Desktop PES	Desktop EIS	Desktop REC
X24E	B	Low	B
X24F	B	Low	B
X24G	A	Low	A
X31A	D	Low	D
X31B	D	Low	D
X31C	D	Moderate	D
X31D	C	Moderate	C
X31E	D	Moderate	D
X31F	C	Moderate	C
X31G	D	Low	D
X31H	C/D	Moderate	C/D
X31J	D	Low	D
X31K	D	Low	D
X31L	D	Low	D
X31M	A	Low	A
X32A	D	Moderate	D
X32B	D	Moderate	D
X32C	D	Low	D
X32D	D	Moderate	D
X32E	D	Moderate	D
X32F	D	Low	D
X32G	D	Low	D
X32H	C	Low	C
X32J	A	Low	A
X33A	A	Low	A
X33B	A	Low	A
X33C	A	Low	A
X33D	A	Low	A
X40A	A	Low	A
X40B	A	Low	A
X40C	C	Low	C
X40D	A	Low	A

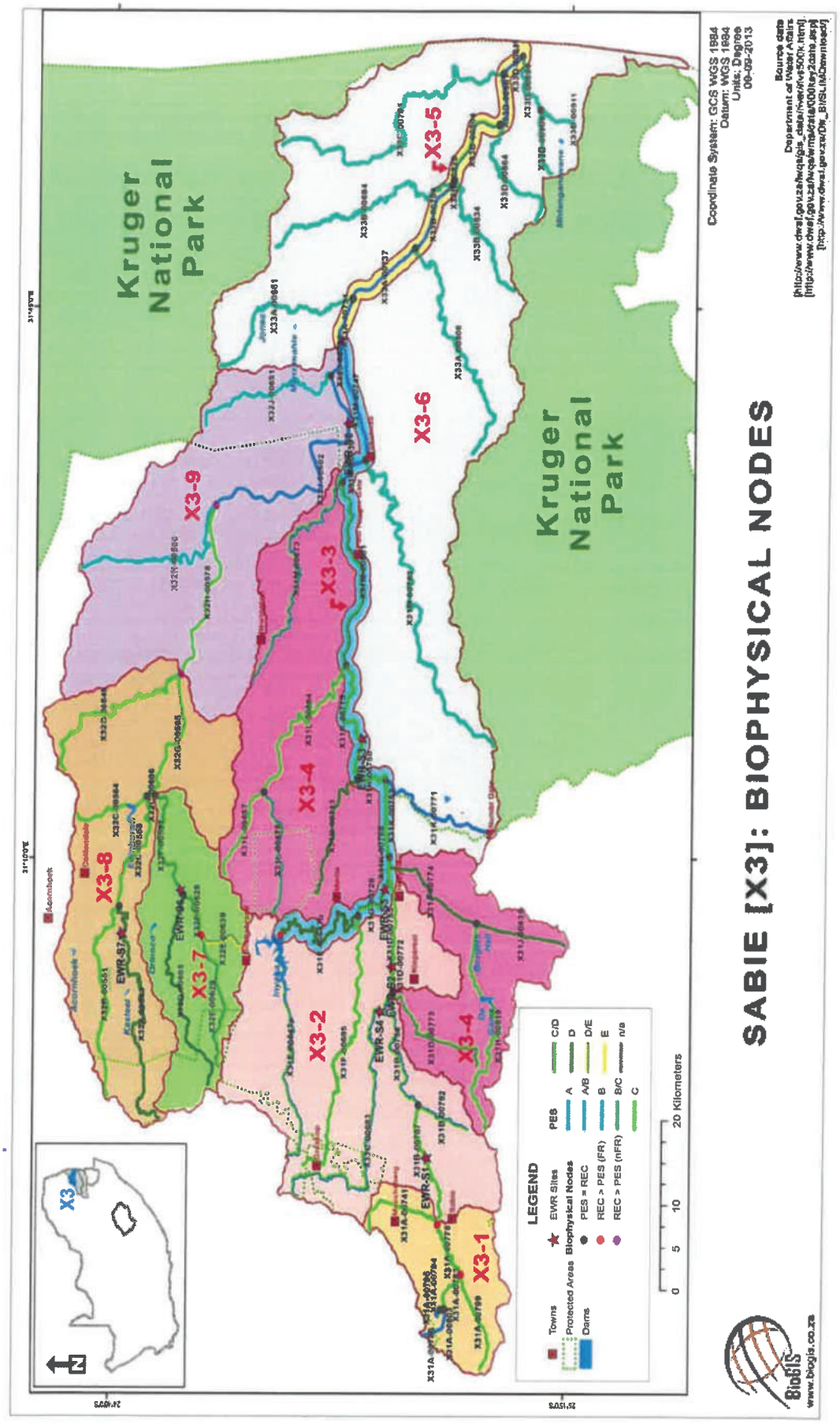


Figure 1: Locality of the selected EWR sites in the Sabie-Sand (X3) catchment

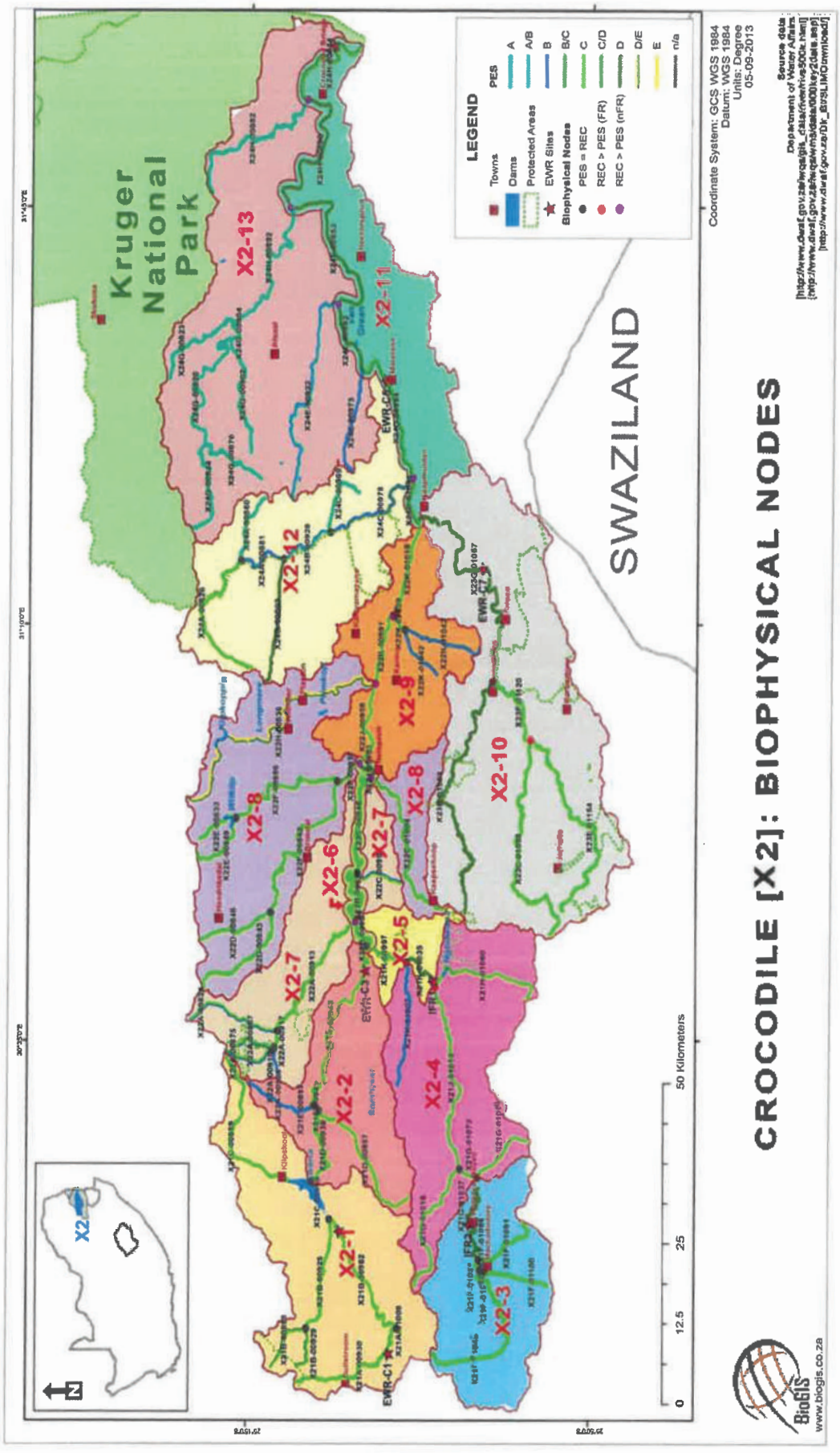


Figure 2: Locality of the selected EWR sites in the Crocodile (X2) catchment

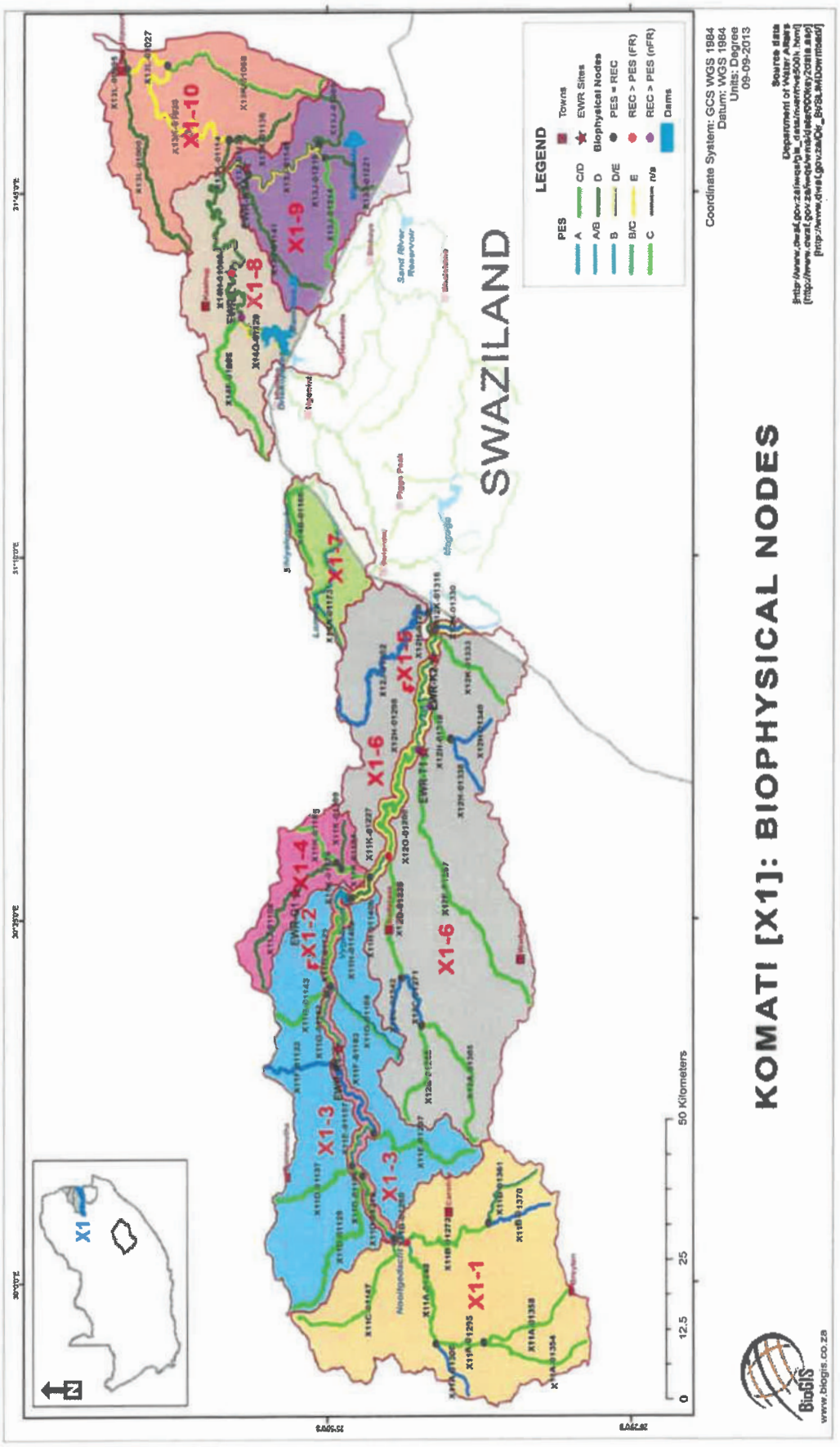


Figure 3: Locality of the selected EWR sites in the Komati (X1) catchment

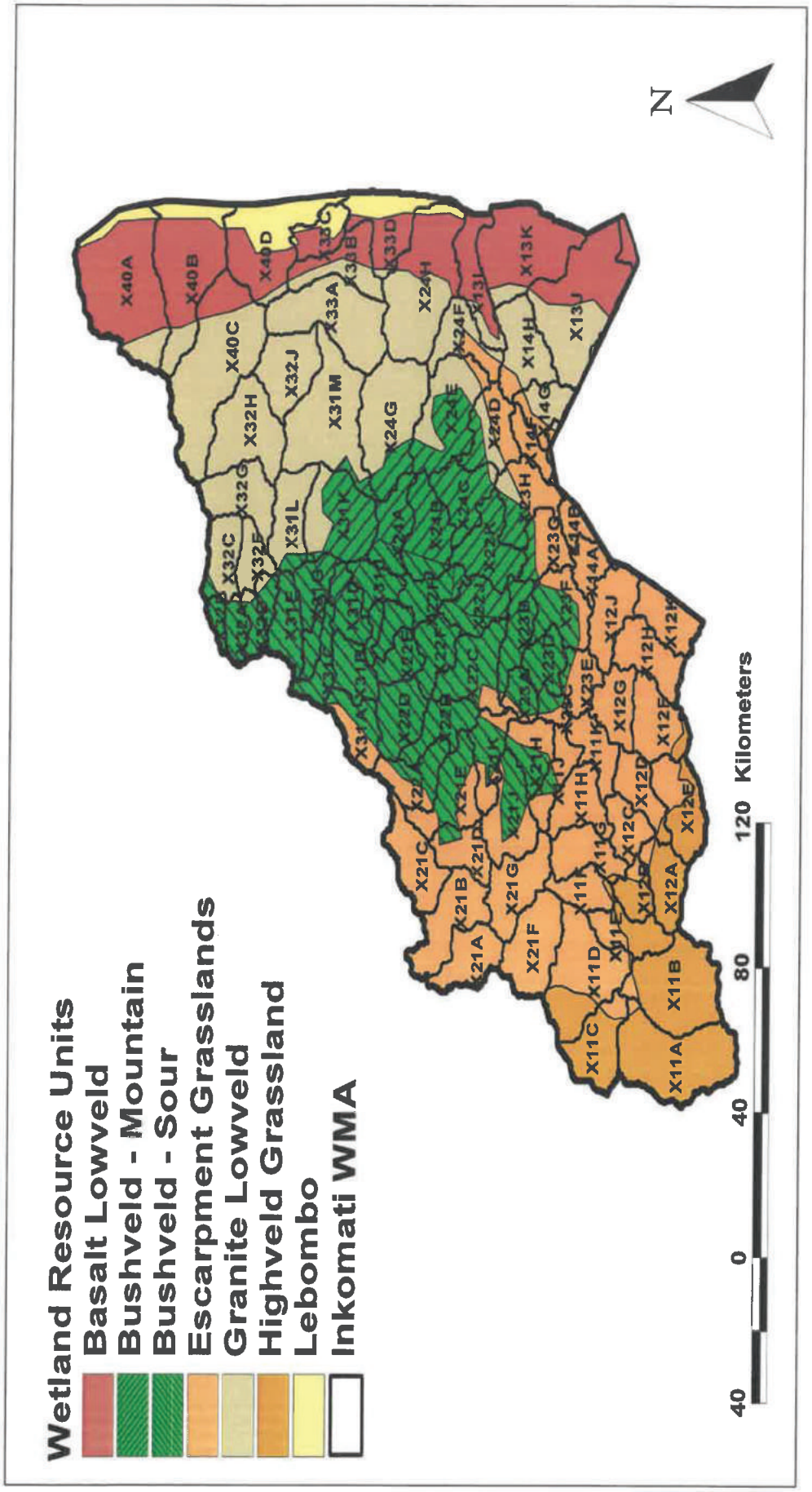


Figure 4: The distribution of quaternary catchments in relation to the Wetland Resource Units

UMTSETFO WEMANTI WAVELONKHE, 1998
(UMTSETFO NOMBOLO 36 WANGA-1998)

KUNCUNYWA KWESABELO SEMITFOMBOLUSITO YETIGODZI TEMANTI ENKOMAZI

Mine, Gugile Ernest Nkwinti, esikhundleni sami njengeLibamba leMcondzisi Jikelele weLitiko Letemanti Nekususwe Kwetinsila, ngemuva kwekulandzela sigaba 13 seMtsetfo Wemanti Wavelonkhe, (Umtsetfo nombolo 36 wanga-1998) ("uMtsetfot") kanye neMitsetfotimiso yekusungulwa kweLuhlelo Lwekwehlukanisa Imitfombolusito Yemanti (nombolo R. 810 lgazethi Yahulumende nombolo 33541, 17 Septemba 2010), futsi ngigunyatwe ngekwemtsetfo ngekulandzela tigaba 16(1) na 63(1)(a) teMtsetfo, ngemuva kwekutfobela sigaba 16(2) na (3) seMtsetfo, ngitsandza kushicelela sincumo seSabelo semitfombolusito yemanti setigodzi temanti eNkomati.

Umcondzisi: Kuncunywa Kwesabelo
Ucondziswe: Mnu Yakeen Atwaru
Litiko Letemanti Nekususwa Kwetinsila
Ndinaye Building 5084
178 Francis Baard Street
Private Bag X313
EPitoli
0001

I-imeyili: AtwaruY@dws.gov.za

NKWINTI GE (MP)
MINISTER OF WATER AND SANITATION
DATE: 24|05|2019

ISHEJULI

1. INCHAZELO YEMITFOMBOLUSITO YEMANTI

1.1 Lesabelo sincunyelwe yonkhe nobe incenye yonkhe imitfombolusito yemanti lesemcoka ngekhatsi kwesigodzi semanti saseNkomati njengbobe kubekiwe ngaphasi:

Indzawo Yekuphatfwa Kwemanti:	Inkomati-Usutu
Tigodzi Lekudvonswa Emanti kuto:	X Sigodzi Lekudvoswa kuso lesikhulu
Imifula:	Imifula iKomati, Umgwenya, neSabie-Sand

1.2 Indvuna ngekulandzela sigaba 16 seMtsetfo Wemanti Wavelonkh, 1998 (Umtsetfo nombolo 36 wanga-1998) ("uMtsetfo'), ubeke luhlelo lwekwehlukanisa imitfombolusito yemanti ngekukhipha Satiso seGazethi nombolo R. 810, lesishicelelwe kuGazethi Yahulumende nombolo 33541 yangamhlaka 17 Septemba 2010. Ngekulandzela sigaba 16(1) seMtsetfo, iNdvuna kumele, masinyane ngendlela lekhonakalako ngemuva kwesigaba sawo wonkhe nobe incenye yemtfombolusito wemanti sewuncunyiwe, ngeSatiso kuGazethi, incume Sabelo sawo wonkhe nobe incenye yemtfombolusito wemanti.

1.3 Indvuna, ngekulandzela sigaba 16(1) na (2) seMtsetfo, imemetela, leSabelo lesilandzelako yesesigodzi semanti iNkomati.

2. EMABINTANA NETINCHAZELO

2.1 Emabintana

BHN	Tidzingo Tebantfu Letisisekelo
BHNR	Siciwu Basic Human Needs Reserve
EcoSpecs	Tinchazelo Letiphatsele Nemvelo
EIS	Kubaluleka Kwemvelo Nekuyinakekela
EWR	Tidzingo Temanti Emvelo
EWR_MLF	Sidzingo Semanti Emvelo_Kulungisa Kugeleta Lokuphasi
WARMS	Luhlelo Lwekuphatsa Kubhalisa Kuniketwa Kwemanti
GRAII	Umgamu Wekuhlola Umtfombolusito Wemanti aphasi II
GRDM	Tindlela Leticondzisiwe Temtfombolusito Wemanti aphasi
MAR	I-Mean Annual Runoff
MCM	Emamithih Layikhiyubhu Lasigidzi
PES	Simo Setemvelo Lesikhona
REC	Sigaba Setemvelo Lesinconotiwe
TEC	Sigaba Setemvelo Lesihlosiwe
DWS	Litiko Letemanti Nekususwa Kwetinsila
DWAF	Litiko Letemanti Netemahlatsi
EMpumalanga Kapa	Kuhanjiswa Kwagezi
TIN	Inayithrojini Yalokungaphili Lephelele
SRP	Ifosforasi Lencibilikako
RC	Simo Lekucondziswe kuso
WQU	Ligumbi Lebunjalo Bemanti

2.2 Tinchazelo

KuleSincumo, ngaphandle nangabe ingcikitsi isho ngalenye indlela -

"Kugeleta lokuphasi" kusho kugeleta kancane lokutintile emifuleni ngetikhatsi tesimo selitulu lesomile nobe lesifanele, kodvwa akusho kutsi konkhe kubangelwa ngemanti aphasi futsi kufaka ekhatsi kwengeta kugeleta lokungenako lokubanjelelwe kanye nekukhishwa kwemanti aphasi;

"EWR" (Sidzingo Semanti Emvelo) kusho emaphethini ekuhamba emanti (bukhulu, kucaphela sikhatsi budze besikhatsi) kanye nelizinga lemanti lelidzingekile kugcina luhlelo lwemvelo lwemfula esimeni lesitsite;

"Kuvuselela" kusho kwengetwa kwemanti endzaweni yekuhwamuka, ngekuchinineka lokuya phasi kwemfomo nobe kwemanti langetulu kanye/nobe kwekuphuma kwemanti lasecadzini eticojeni letisemaceleni.

3. KUNCUNYWA KWESABELO

Sifinyeto sencenye lebuningi Bemifula lefaka ekhatsi i-EWR (Sitfombe 1 na 2) kanye neBHN yetigodzi temanti teNkomati sibekiwe kuSigaba 4. **Lithebula 4.1** lifaka ekhatsi imiphumela Yetindzawo te-EWR kanye nemanodi etindzawo temvelo kantsi **Lithebula 4.2** lifaka ekhatsi imiphumela yeBHN ngesigodzi sekhwathenari.

Sifinyeto sencenye yebunjalo Bemifula etindzaweni ye-EWR yetigodzi temanti teNkomati njengobe sibekiwe **kuThebula 5.1.1 – 5.3.6.**

Sifinyeto seligalelo lemanti aphasi kuSabelo Sebunyenti Bemanti kusigodzi semanti seNkomati sibekiwe **kuLithebula 6.1.**

Sifinyeto seligalelo lemanti aphasi kuSabelo Sebunjalo Bemanti kusigodzi semanti seNkomati sibekiwe **kumaThebula 7.1, 7.2 naku 7.3.**

Sifinyeto seligalelo lemanti aphasi kuSabelo Sebunjalo Nebunyenti Bemanti kumaChibi lakhetsiwe esigdozi semanti seNkomati sibekiwe **kumaThebula 8.1 na 8.2.**

4. INCENYE-YEBUNYENTI-BEMANTI-ANGETULU YEMIFULA

Imiphumela yekuncunywa kwesabelo kanye nekwehlukanisa lokuphatselene nemvelo kweSigodzi Semanti seNkomati, lapho khona Sabelo sikhonjiswa njengeliphesenti leNMAR ngetigodzi ngekwehlukana kwato ikhonjiswe ngelithebula ngaphasi.

Lithebula 4.1: Sifinyeto sencenye yebunyenti Bemifula lesifaka ekhatsi imiphumela Yetindzawo te-EWR kanye nemanodi etindzawo temvelo.

Emanodi etindzawo temvelo	Umtfombo Wemanti	PES	EIS	TEC	Sabelo Semvelo (%NMAR)	NMAR (MCM)
Sigodzi Semfula lKomati						
X11A-01248	Vaalwaterspruit	C	Emkhatsini	C	23.50	26.30
X11A-01295	Vaalwaterspruit	C	Emkhatsini	C	27.20	15.40
X11A-01300	Vaalwaterspruit	B	Emkhatsini	B	28.10	1.70
X11A-01354	Vaalwaterspruit	C	Emkhatsini	C	24.50	3.90
X11A-01358	Vaalwaterspruit	C	Emkhatsini	C	26.80	6.60
X11B-01272	Boesmanspruit	C	Etulu	B/C	24.20	51.20
X11B-01361	Boesmanspruit	B/C	Emkhatsini	B/C	27.00	4.20
X11B-01370	Boesmanspruit	B	Etulu	B	28.80	4.80
X11C-01147	Witkloofspruit	C	Etulu kakhulu	C	22.10	11.40
X11D-01129	Klein-Komati	C	Etulu	C	27.40	21.00
X11D-01137	Waarkraalloop	C	Emkhatsini	C	27.30	11.70
X11D-01196	Komati	C	Emkhatsini	C	20.10	95.40
X11D-01219	Komati	C/D	Emkhatsini	C/D	12.30	73.60
X11E-01237	Swartspruit	C	Etulu kakhulu	B	27.90	14.80
X11E-01157	Komati	B/C	Etulu	B/C	25.60	118.30
X11F-01133	Bankspruit	B	Etulu	B	30.80	6.50
EWR K1	**Komati**	**B/C**	**Emkhatsini**	**C**	**27.50**	**158.62**
X11G-01143	Gemakstroom	C	Emkhatsini	C	26.10	10.40
X11G-01188	Ndubazi	B/C	Etulu	B	34.90	17.40
EWRG1	**Gladdespruit**	**D**	**Emkhatsini**	**D**	**26.90**	**29.52**
X11K-01165	Poponyane	C	Emkhatsini	C	22.70	13.70

Emanodi etindzawo temvelo	Umtfombo Wemanti	PES	EIS	TEC	Sabelo Semvelo (%NMAR)	NMAR (MCM)
X11K-01179	Gladdespruit	C	Emkhatsini	C	20.20	64.40
X11K-01194	Gladdespruit	C	Emkhatsini	C	19.10	71.20
X11K-01199	Gladdespruit	D	Emkhatsini	D	22.30	2.40
X12A-01305	Buffelspruit	C	Etulu kakhulu	B	30.30	32.00
X12B-01246	Hlatjiwe	C	Emkhatsini	C	30.50	22.10
X12C-01242	Phophenyane	B	Etulu	B	37.50	6.30
X12C-01271	Buffelspruit	B	Etulu	B	40.50	71.10
X12D-01235	Seekoeispruit	C	Etulu	C	30.50	97.00
EWRT1	**Teespruit**	**C**	**Emkhatsini**	**C**	**35.30**	**56.36**
EWRK2	**Komati**	**C**	**Etulu**	**C**	**18.30**	**545.56**
X12H-01318	Sandspruit	C	Emkhatsini	C	31.70	13.90
X12H-01338	Sandspruit	B	Etulu	B	36.70	4.40
X12H-01340	Sandspruit	B	Etulu	B	39.50	4.80
X12J-01202	Mtsoli	B	Etulu kakhulu	B	33.50	66.50
X12K-01316	Komati	D	Emkhatsini	D	21.20	577.00
X12K-01332	Mhlangampepa	B	Etulu	B	40.00	3.40
X12K-01333	Mlondozi	C	Etulu	B/C	28.20	22.40
EWR K3A	**Komati**	**D**	**Emkhatsini**	**D**	**17.20**	**1021.67**
X13J-01141	Mzinti	D	Emkhatsini	D	19.10	6.30
X13J-01205	Mbiteni	D	Emkhatsini	D	17.60	5.90
X13J-01221	Komati	D	Emkhatsini	D	19.70	1000.30
X13K-01068	Nkwakwa	C/D	Emkhatsini	C/D	22.70	5.40
X13K-01114	Komati	D	Emkhatsini	D	18.10	1341.40
X13K-01136	Mambane	D	Emkhatsini	D	22.40	1.80
X13L-00995	Komati	D	Emkhatsini	D	11.10	1356.60
X13L-01000	Ngweti	D	Emkhatsini	D	14.50	4.60
X14A-01173	Umlumati	C	Etulu	B/C	36.30	84.40

Emanodi etindzawo temvelo	Umtfombo Wemanti	PES	EIS	TEC	Sabelo Semvelo (%NMAR)	NMAR (MCM)
X14B-01166	Ugutugulo	C	Etulu	C	31.70	20.90
EWR L1	**Umlumati**	**C**	**Emkhatsini**	**C**	**17.30**	**294.31**
Sigodzi Semfula Umgwenya						
EWR C1	**UMgwenya**	**A/B**	**Emkhatsini**	**A/B**	**30.3**	**15.6**
X21B-00898	Lunsklip	C/D	Etulu	C/D	25.80	8.40
X21B-00925	Lunsklip	C	Etulu	C	31.30	25.80
X21B-00929	Gemsbokspruit	C/D	Etulu	C/D	26.30	3.80
EWR C2	**UMgwenya**	**B**	**Etulu**	**B**	**35.63**	**76.1**
X21C-00859	Alexanderspruit	C	Etulu	C	31.50	28.80
X21D-00938	UMgwenya	C	Etulu	C	24.00	124.80
X21D-00957	Buffelskloofspruit	C	Etulu	B/C	32.60	16.90
X21E-00897	Buffelskloofspruit	B	Etulu	B	35.30	8.40
EWR C3	**UMgwenya**	**B/C**	**Etulu**	**B/C**	**48.8**	**194**
X21E-00947	UMgwenya	B	Etulu	B	28.90	125.10
X21F-01046	Elands	C	Emkhatsini	C	35.20	35.10
X21F-01081	Elands	C	Etulu	C	35.50	50.80
X21F-01091	Rietvleispruit	C	Emkhatsini	C	35.40	3.30
X21F-01092	Leeuspruit	C/D	Emkhatsini	C/D	31.20	11.90
X21F-01100	Leeuspruit	C	Emkhatsini	C	35.10	11.90
X21G-01016	Swartkoppiespruit	C	Etulu	C	32.50	11.40
EWR E1	**Elands**	**B**	**Emkhatsini**	**B**	**48.82**	**50.10**
X21G-01090	IWeltevredespruit	C	Emkhatsini	C	32.00	5.50
X21H-01060	Ngodwana	C	Etulu kakhulu	B	22.10	59.60
X21J-01013	Elands	C	Etulu	B/C	30.50	151.50
X21K-01007	Lupelule	B	Etulu	B	32.10	29.40
EWR E2	**Elands**	**B**	**Etulu**	**B**	**45.02**	**50.10**
X22A-00824	Blystaanspruit	B/C	Etulu	B	35.30	21.00

Emanodi etindzawo temvelo	Umtfombo Wemanti	PES	EIS	TEC	Sabelo Semvelo (%NMAR)	NMAR (MCM)
X22A-00875	Houtbosloop	B/C	Etulu	B	34.20	6.90
X22A-00887	Beestekraalspruit	B/C	Etulu	B/C	33.90	3.70
X22A-00913	Houtbosloop	C	Etulu kakhulu	B	41.30	75.30
X22A-00917	Houtbosloop	C	Emkhatsini	C	29.70	14.80
X22A-00919	Houtbosloop	B/C	Emkhatsini	B/C	34.70	10.60
X22A-00920	Houtbosloop	B	Emkhatsini	B	39.40	1.70
X22C-00990	IVisspruit	B/C	Emkhatsini	B/C	31.10	3.40
X22C-01004	Gladdespruit	C	Etulu	B/C	20.90	16.30
X22D-00843	Nels	C	Emkhatsini	C	29.60	20.60
X22D-00846	Nels	C	Emkhatsini	C	31.90	13.80
X22E-00833	Kruisfonteinspruit	C	Emkhatsini	C	26.60	11.10
X22E-00849	Sand	C	Emkhatsini	C	27.70	8.70
X22F-00842	Nels	C	Etulu	C	19.00	74.90
X22F-00886	Sand	C	Etulu	C	27.40	48.90
X22F-00977	Nels	C/D	Etulu	C/D	24.10	125.40
X22H-00836	Wit	D/E	Etulu	D	14.90	43.00
EWR C4	**UMgwenya**	**C**	**Etulu**	**C**	**31.74**	**824.8**
X22K-01029	Blinkwater	C	Emkhatsini	C	27.20	7.60
X22K-01042	Mbuzulwane	B	Emkhatsini	B	38.50	1.20
X22K-01043	Blinkwater	B	Etulu	B	34.90	5.90
X23B-01052	INoordkaap	D	Etulu kakhulu	C	23.50	50.90
X23C-01098	Suidkaap	C	Etulu	B/C	39.50	61.80
X23E-01154	Queens	C	Etulu	B/C	27.10	39.50
X23F-01120	Suidkaap	C	Emkhatsini	C	31.00	109.80
EWR K7	**Kaap**	**C**	**Etulu**	**C**	**21.84**	**179.5**
X24A-00826	Nsikazi	C	Emkhatsini	C	34.00	2.00
X24A-00881	Nsikazi	B	Etulu	B	40.60	11.70

Emanodi etindzawo temvelo	Umtfombo Wemanti	PES	EIS	TEC	Sabelo Semvelo (%NMAR)	NMAR (MCM)
X24B-00903	Gutshwa	D	Emkhatsini	D	24.40	25.40
X24B-00928	Nsikazi	A/B	Etulu	A/B	44.00	42.40
X24C-00978	Nsikazi	B	Etulu	B	40.50	52.30
EWR C5	**UMgwenya**	**C**	**Etulu kakhulu**	**C**	**22.2**	**1117.4**
EWR C6	**UMgwenya**	**C**	**Etulu kakhulu**	**C**	**12.53**	**1165.6**
		Sigodzi Semfula iSabie				
X31A-00741	Klein Sabie	C	Etulu	B/C	23.00	14.60
X31A-00783	Klein Sabie	C	Emkhatsini	C	33.80	12.10
X31A-00786	Klein Sabie	B	Etulu	B	47.80	4.70
EWR S1	**Sabie**	**B/C**	**Etulu**	**B**	**40.31**	**132**
X31B-00792	Goudstroom	B/C	Emkhatsini	B/C	38.90	12.20
EWR S4	**Mac Mac**	**B**	**Etulu**	**B**	**45.31**	**65.78**
X31E-00647	Marite	B/C	Etulu	B	34.70	79.90
X31F-00695	Motitsi	C	Etulu	B	26.50	43.90
EWR S2	**Sabie**	**C**	**Etulu**	**B**	**28.2**	**261.7**
X31D-00773	Sabani	C/D	Emkhatsini	C/D	19.50	19.20
EWR S5	**Marite**	**B/C**	**Etulu**	**B/C**	**28.57**	**156.4**
X31H-00819	White Waters	C	Etulu	B/C	31.40	28.90
X31J-00774	Noord-Sand	D	Emkhatsini	D	16.00	45.10
X31J-00835	Noord-Sand	D	Emkhatsini	D	31.30	12.00
X31K-00713	Bejani	D	Emkhatsini	D	25.70	2.40
EWR S3	**Sabie**	**A/B**	**Etulu kakhulu**	**A/B**	**37.94**	**493.69**
X31K-00771	Phabeni	B	Etulu	B	39.00	2.50
X31L-00657	Matsavana	C	Emkhatsini	C	16.80	3.80
X31L-00664	Saringwa	C	Emkhatsini	C	24.50	10.90
X31L-00678	Saringwa	B/C	Etulu	B/C	30.80	3.20
X31M-00673	Musutlu	B/C	Emkhatsini	B/C	19.00	1.80

Emanodi etindzawo temvelo	Umtfombo Wemanti	PES	EIS	TEC	Sabelo Semvelo (%NMAR)	NMAR (MCM)
EWR S7	**Thulandziteka (Sand)**	**C**	**Emkhatsini**	**C**	**32.67**	**28.9**
X32B-00551	Motlamogatsana	C	Etulu	C	25.70	15.40
X32C-00558	Nwandlamuhari	C	Emkhatsini	C	20.20	49.70
X32C-00564	Mphyanyana	C	Emkhatsini	C	10.50	3.10
X32C-00606	Nwandlamuhari	C	Emkhatsini	C	23.60	53.20
X32E-00629	Nwarhele	C/D	Etulu	C	26.10	10.60
EWR S6	**Mutlumuvi**	**C**	**Etulu**	**C**	**28.46**	**44.99**
X32F-00628	Nwarhele	C/D	Emkhatsini	C/D	31.30	14.80
X32G-00549	Khokhovela	C	Emkhatsini	C	17.00	3.90
X32H-00560	Phungwe	A	Etulu	A	26.10	7.60
EWR S8	**Sand**	**B**	**Etulu**	**B**	**25.46**	**133.61**

Letigodzi tasemandvulo letibhalwe ngalokukhulu nguLetindzawo teEWR

1) I-NMAR yiNatural Mean Annual Runoff.

2) Lelinani limele sibalokhatsi sethemu lendze nge-NMAR. Nangabe i-NMAR igucuka, lemtsamo nawo utawugucuka.

SABELO SETIDZINGO TEBANTFU LETISISEKELO

I-BHNR iniketa tidzingo letisisekelo tebantfu labaphakelwa ngco ngumtfombo wemanti lekukhulunywa ngayo futsi tifaka ekhatsi emanti ekunatsa, ekulungiselela kudla kanye nekutihlobisa. Linani lemphilo yonkhe lemalitha langu-25 ngemuntfu lisetjentisiwe.

Imiphakatsi lengatsembela ekugujimeni kwemfula ikhetfwe ngesigodzi semandvulo futsi ngekusebentisa bukhulu belinanibantfu, kubalwa iBHNR.

Lithebula 4.2: Umniningwane wesibalo selizinga lesigodzi semanti semandvulo

Sigodzi semant semandvulo	Umtfombo Wemanti	Sabelo seBHN (%NMAR)
X11A	Vaalwaterspruit	0.09
X11B	Boesmanspruit	0.16
X11C	Witkloofspruit	0.00
X11D	Komati	0.00
X11E	Komati	0.00
X11F	Bankspruit	0.00
X11G	lKomati Lesetulu	0.00
X11J	Gladdespruit	0.00
X11K	Gladdespruit	0.00
X12A	Buffelspruit	0.00
X12B	Hlatjiwe	0.00
X12C	Buffelspruit	0.00
X12D	Seekoeispruit	0.03
X12E	Teespruit	0.00
X12H	lKomati Lesetulu	0.01
X12J	Mtsoli	0.01
X12K	Komati	0.02
X13J	lKomati Lephasi	0.14
X13K	Komati	0.04
X13L	Komati	0.01
X14A	Umlumati	0.00
X14B	Ugutugulo	0.02
X14H	Umlumati	0.12

Sigodzi semant semandvulo	Umtfombo Wemanti	Sabelo seBHN (%NMAR)
X21A	UMgwenya	0.02
X21B	Lunsklip	0.12
X21B	UMgwenya	0.01
X21C	Alexanderspruit	0.11
X21D	UMgwenya	0.02
X21E	UMgwenya	0.09
X21F	Elands	0.17
X21G	Umfula i-Elands	0.26
X21H	Ngodwana	0.01
X21J	Elands	0.01
X21K	Umfula i-Elands	0.01
X22A	Houtbosloop	0.01
X22C	Gladdespruit	0.07
X22D	Nels	0.02
X22E	Kruisfonteinspruit	0.00
X22F	Nels	0.01
X22H	Wit	0.00
X22K	UMgwenya	0.01
X23B	INoordkaap	0.01
X23C	Suidkaap	0.01
X23E	Queens	0.01
X23F	Suidkaap	0.45
X23G	Kaap River	0.02
X24A	Nsikazi	4.25
X24B	Nsikazi	3.70
X24C	Nsikazi	3.21
X24D	UMgwenya	0.01
X24H	UMgwenya	0.01
X31A	Klein	0.73

Sigodzi semant semandvulo	Umtfombo Wemanti	Sabelo seBHN (%NMAR)
X31B	Sabie	0.00
X31C	Mac Mac	0.03
X31E	Marite	0.36
X31F	Motitsi	0.05
X31D	Sabie	0.08
X31G	Marite	0.07
X31H	White Waters	0.00
X31J	Noord-Sand	0.63
X31K	Sabie	0.07
X31L	Saringwa	3.45
X31M	Musutlu	10.94
X32B	Motlamogatsana	0.69
X32C	ITlulandziteka	0.57
X32E	Nwarhele	2.87
X32F	Mutlumuvi	0.42
X32G	Khokhovela	8.57
X32H	Phungwe	2.33
X32J	Sand	0.30

5. EMANTI-LANGETULU - INCENYE YELIZINGA LEMIFULU

5.1 Sigodzi Lesisempumalanga-seMgwenya

Lithebula 5.1.1: EWR 1– Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: Umgwenya		**EWR 1**	**Indzawo yekucaphela: X2H074Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.5 mg/L.	
	Kudvungeka	Kwehluka (lokuncane kakhulu) kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.25 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.015 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.1.2: EWR 2 – Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: Umgwenya		**I-EWR Site 2**	**Indzawo yekucaphela: X2H074Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	Na_2SO_4	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 27 mg/L.	
	$MgCl_2$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 22 mg/L.	
	$CaCl_2$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 39 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 118 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 43 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.5 mg/L.	
	Kudvungeka	Kwehluka (lokuncane kakhulu) kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.25 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.015 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.1.3: EWR 3– Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES)

Umfula: Umgwenya		**EWR 3**	**Indzawo yekucaphela: X2H013Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kwehluka lokuncane kuya kulokusemkhatsini kusuka eluhlwini lwelizinga lekushisa lemvelo. Letinye tilwane letingavami nelizinga lekushisa lelisetulu temanani lamancane kanye nekwenteka lokuphindzaphindzene kundlula lokulindzelekile.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 6 mg/L.	
	Kudvungeka	Tingucuko letisemkhatsini ngekusetjentiswa kwemhlaba wemfula ekudvungekeni lokusetulu lokungakavami kwesikhashana.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.25 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.025 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 52 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.1.4: EWR 4 Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES)

Umfula: Umgwenya		**EWR 4**	**Indzawo yekucaphela: X2H032Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 38 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 191 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 55 mS/m.	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 5.9 – 6.5, kantsi Sebalo semaphesenti sema-95 kumele sibe ku 8.0 – 8.8.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.5 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 1.0 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweCEV njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.1.5: EWR 5– Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES)

Umfula: Umgwenya		**EWR 5**	**Indzawo yekucaphela: X2H017Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 70 mS/m.	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 5.9 – 6.5, kantsi Sebalo semaphesenti sema-95 kumele sibe ku 8.0 – 8.8.	
	Lizingakushisa	Kwehluka lokusemkhatsini kusuka eluhlwini lwelizinga lekushisa lemvelo. Letinyenti tilwane letingavami nelizinga lekushisa lelisetulu temanani lamancane kanye nekwenteka lokuphindzaphindzene kundlula lokulindzelekile.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.1.6: EWR 6 Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES)

Umfula: Umgwenya		**EWR 6**	**Indzawo yekucaphela: X2H016Q01**
Emamethrikhi ellzinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 30 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 57 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 85 mS/m.	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 5.9 – 6.5, kantsi Sebalo semaphesenti sema-95 kumele sibe ku 8.0 – 8.8.	
	Lizingakushisa	Kwehluka lokuncane kuya kulokusemkhatsini kusuka eluhlwini lwelizinga lekushisa lemvelo. Letinye tilwane letingavami nelizinga lekushisa lelisetulu temanani lamancane kanye nekwenteka lokuphindzaphindzene kundlula lokulindzelekile.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweCEV njengobe siphawuliwe kuDWAF (1996)	

Lithebula 5.1.7: EWR 7– Umfula Umgwenya: I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: iKaap		**EWR 7**	**Indzawo yekucaphela: X2H022Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	KONKHE	-	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 100 mS/m.	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 6.5 – 8.0 kantsi Sebalo semaphesenti sema-95 kumele sibe kusuka ku 8.0 – 8.8.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 8 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 1.0 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 52 mg/m2.	
	Tintfo letiyingoti	Sebalo semaphesenti sema-95 sedatha kumele sibe ngekhatsi kweTWQR njengobe siphawuliwe kuDWAF (1996).	

5.2 Sigodzi semanti iSabie-Sand

Lithebula 5.2.1: EWR 1– (iSabie Lesetulu): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: iSabie		**EWR 1**	**Indzawo yekucaphela: X3H001Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kute kwehluka kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 8.0 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.025 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.2: EWR 2– (Ann de Vliet): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: iSabie		**I-EWR Site: 2**	**Indzawo yekucaphela: X3H006Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 118 mg/L (Sigaba A/B).	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.5 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.25 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.025 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 84 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.3: EWR 3– (Kidney): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: iSabie		**EWR 3**	**Indzawo yekucaphela: X3H013Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 6.5 – 8.0 kantsi Sebalo semaphesenti sema-95 kumele sibe kusuka ku 8.0 kuya ku 8.8.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.5 mg/L.	
	Kudvungeka	Tingucuko letincane kuya kuletisemkhatsini ngekusetjentiswa kwemhlaba wemfula ekudvungekeni lokusetulu lokungakavami kwesikhashana, kakhulu ngencane yemvelo yesikhashana, ngekudvungeka lokwenteka nje ngasikhatsi lokungesiko kwemvelo kwesikhashana.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.25 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.015 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.4: EWR 4 U(Mac Mac) - I-EcoSpecs macondzana nedatha ye-physico-chemical (PES)

Umfula: IMac Mac		**EWR 4**	**Indzawo yekucaphela: X3H003Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 8.0 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.015 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 84 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.5: EWR 5– (Marite): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: Marite		**EWR 5**	**Indzawo yekucaphela: X3H011Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 30 mS/m.	
	pH	Tibalo tesi-5 netesi-95 tedatha kumele tisukele ku 6.5 kuya ku 8.0.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.0 mg/L.	
	Kudvungeka	Kwehluka ngelinani lelincane kusuka kulibanga lekudvungeka; kudvungeka kwelidzaka kwemfula kwemukelekile kubahlali bemfula.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.015 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 84 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.6: EWR 6 (Mutlumuvi): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES)

Umfula: Mutlumuvi		**EWR 6**	**Indzawo yekucaphela: X3H008Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 42 mS/m (Sigaba A/B).	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 6.5 – 8.0 kantsi Sebalo semaphesenti sema-95 kumele sibe kusuka ku 8.0 kuya ku 8.8.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.0 mg/L.	
	Kudvungeka	Tingucuko letincane kuya kuletisemkhatsini ngekusetjentiswa kwemhlaba wemfula ekudvungekeni lokusetulu lokungakavami kwesikhashana, kakhulu ngencane yemvelo yesikhashana, ngekudvungeka lokwenteka nje ngasikhatsi lokungesiko kwemvelo kwesikhashana.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 84 mg/m2	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.7: EWR 7 (Tlulandziteka): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: Tlulandziteka		**EWR 7**	**Indzawo yekucaphela: X3H008Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 42 mS/m (Sigaba A/B).	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 6.5 – 8.0 kantsi Sebalo semaphesenti sema-95 kumele sibe kusuka ku 8.0 kuya ku 8.8.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.0 mg/L.	
	Kudvungeka	Tingucuko letisemkhatsini ngekusetjentiswa kwemhlaba wemfula ekudvungekeni lokusetulu lokungakavami kwesikhashana.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-50 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sema-50 sedatha kumele sibe ku ≤ 84 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

Lithebula 5.2.8: EWR 8– (iSabie Lephasi): I-EcoSpecs macondzana nedatha ye-physico-chemical (PES neREC)

Umfula: ISand		**EWR 8**	**Indzawo yekucaphela: X3H008Q01**
Emamethrikhi elizinga lemanti		**I-ECOSPEC: PES neREC**	
Sawoti wetintfo letingaphili	$MgSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 16 mg/L.	
	Na_2SO_4	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 20 mg/L.	
	$MgCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 15 mg/L.	
	$CaCl_2$	Sebalo semaphesenti sema-95 sedatha kumele sibe ku ≤ 21 mg/L.	
	NaCl	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 45 mg/L.	
	$CaSO_4$	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 351 mg/L.	
Umehluko wesimomvelo	EMpumalanga Kapa	Sibalo lesingu-95 sedatha kumele sibe ku ≤ 42 **mS/m** (Sigaba A/B).	
	pH	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku 6.5 – 8.0 kantsi Sebalo semaphesenti sema-95 kumele sibe kusuka ku 8.0 kuya ku 8.8.	
	Lizingakushisa	Kwehluka lokuncane kusuka eluhlwini lwelizinga lekushisa lemvelo.	
	I-Oksijini lencibilikile	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 7.5 mg/L.	
	Kudvungeka	Tingucuko letincane kuya kuletisemkhatsini ngekusetjentiswa kwemhlaba wemfula ekudvungekeni lokusetulu lokungakavami kwesikhashana, kakhulu ngencane yemvelo yesikhashana, ngekudvungeka lokwenteka nje ngasikhatsi lokungesiko kwemvelo kwesikhashana.	
Takhamtimba	TIN	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.7 mg/L.	
	PO_4-P	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 0.0125 mg/L.	
Kwehlukana kwetimphendvulo	I-Chl-a phytoplankton	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 10 µg/L.	
	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Sebalo semaphesenti sesi-5 sedatha kumele sibe ku ≤ 21 mg/m2.	
	Tintfo letiyingoti	Umtselela ulindzelekile nangabe Sebalo semaphesenti sema-95 sedatha sindlula iTWQR njengobe siphawuliwe kuDWAF (1996).	

5.3 **Sigodzi Semanti lKomati**

Lithebula 5.3.1: EWR K1 – lKomati Lesetulu

Umfula	**lKomati Lesetulu**	**Tindzawo Tekucephela Lizinga Lemanti teDWS**		
WQU	**2**	**RC**		**X1H033Q01**
I-EWR Site	**K1**	**PES**		**X1H033Q01**
Tincenye Telizinga Lemanti		**Simo Sanyalo**		**I-Quality EcoSpecs (Kwehlukanisa iBenchmark)**
Sawoti wetintfo letingaphili	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	A		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	A		45 mg/L.
	$CaSO_4$	A		351 mg/L.
Takhamtimba	SRP	B/C (0.025)		0.017 mg/L.
	TIN	A (0.09)		0.129 mg/L.
Kwehlukahlukana kwesimomvelo	pH	B (6.3 – 8.58)		Linani lesi-5th: 6.00-6.25 Linani lema-95: 8.37-8.69
	Lizingakushisa	Lilindzeleke kutsi likhule ngenca yemadamu kanye nekuhamba kwemanti ngetulu	Imitselela lengaba khona lehlobene nenchubo yekusebenta kanye nekhishwa kwemanti eNooitgedacht Dam njengobe kucitseka kuphela emanti lafudvumele langetulu.	Ehluka ngalokungengci ku20C nangabe acatsaniswa sibalokhatsi semvelo sangenyanga
	I-Oksijini lencibilikile	Kute idatha		7-8 mg/L.
	Kudvungeka (NTU)	Kute idatha - Emasentse emfula agubhekile ngenca yekwehlela lokukhulu kanye nekunyatsela kwetilwane. Lidamu litawunciphisa kudvungeka.		Ingucuko lencane ivumelekile - kakhulu ngetinchubo temvelo futsi letihlobene netinchubo tesigodzi semanti njengekugeleta kwemvula.
Kwehlukana kwetimphendvulo	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	I-Chlorophyll-a values iphasi (2.9 µg/L) kanye ne-phaeton phyte (2.5 µg/L) eNooitgedacht Dam. Ema-Diatoms emadvwaleni emfuleni.		< 1.7 mg/m^2
	I-Chl-a phytoplankton			5 µg/L

	I-Biotic community composition - macroinvertebrate	Timfishi: B/C ASPT: 5.4 – 5.8 SASS5: 134-163	ASPT 6
	Kungena lokungena ngemfudlane	Akukasampulwa	
Tintfo letiyingoti	Iflorayidi	200 (A)	1500 µg/L (Sigaba A)
	Al		20 µg/L (Sigaba A)
	I-amoniya		15 µg/L (Sigaba A)
	As		20 µg/L (Sigaba A)
	I-Atrazine		19 µg/L (Sigaba A)
	Cd soft		0.2 µg/L (Sigaba A)
	Cd mod		0.2 µg/L (Sigaba A)
	Cd hard		0.3 µg/L (Sigaba A)
	Iklorini		0.4 µg/L (Sigaba A)
	Cr(III)		24 µg/L (Sigaba A)
	Cr(VI)		14 µg/L (Sigaba A)
	Cu soft		0.5 µg/L (Sigaba A)
	Cu mod		1.5 µg/L (Sigaba A)
	Cu hard		2.4 µg/L (Sigaba A)
	I-Cyanide		4 µg/L (Sigaba A)

Lithebula 5.3.2: EWR K2 – IKomati Lesetulu

Umfula	**IKomati Lesetulu**	**Tindzawo Tekucephela Lizinga Lemanti teDWS**		
WQU	**3**	**RC**		**X1H001Q01**
I-EWR Site	**K2**	**PES**		**X1H001Q01**
Tincenye Telizinga Lemanti		**Simo Lesingatsandzeki**		**I-Quality EcoSpecs (Kwehlukanisa iBenchmark)**
Sawoti wetintfo letingaphili	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	B		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	A		45 mg/L.
	$CaSO_4$	A		351 mg/L.
Takhamtimba	SRP	B (0.018)		0.017 mg/L.
	TIN	B (0.146)		0.129 mg/L.
Kwehlukahlukana kwesimomvelo	pH	B/C (6.2 – 9.19)		Linani lesi-5: 6.24-6.46 Linani lema-95: 8.69-9.00
	Lizingakushisa	Kute idatha	Imitselela lelindzeleke ngenca yekufudvumala eVygeboom netinchubo tekusebenta.	Ehluka ngalokungengci ku20C nangabe acatsaniswa sibalokhatsi semvelo sangenyanga.
	I-Oksijini lencibilikile	Kute idatha		7-8 mg/L.
	Kudvungeka (NTU)	Emagalelo e-sediment lasetulu ikakhulukati kusuka eSeeikoespruit.		Ingucuko lencane ivumelekile - kakhulu ngetinchubo temvelo futsi letihlobene netinchubo tesigodzi semanti njengekugeleta kwemvula.
Kwehlukana kwetimphendvulo	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	I-Chlorophyll-a values eVygeboom Dam iphasi (1.0-1.25 µg/L).		21 mg/m^2
	I-Chl-a phytoplankton			< 5 µg/L
	I-Biotic community composition - macroinvertebrate	ASPT: 6-8 SASS5 ca.200		ASPT 6
	Kungena lokungena ngemfudlane	Akukasampulwa		
	Iflorayidi	A (252)		1500 µg/L (Sigaba A)

Tintfo letiyingoti	Al		20 µg/L (Sigaba A)
	I-amoniya		15 µg/L (Sigaba A)
	As		20 µg/L (Sigaba A)
	I-Atrazine		19 µg/L (Sigaba A)
	Cd soft		0.2 µg/L (Sigaba A)
	Cd mod		0.2 µg/L (Sigaba A)
	Cd hard		0.3 µg/L (Sigaba A)
	Iklorini		0.4 µg/L (Sigaba A)
	Cr(III)		24 µg/L (Sigaba A)
	Cr(VI)		14 µg/L (Sigaba A)
	Cu soft		0.5 µg/L (Sigaba A)
	Cu mod		1.5 µg/L (Sigaba A)
	Cu hard		2.4 µg/L (Sigaba A)
	I-Cyanide		4 µg/L (Sigaba A)

Lithebula 5.3.3: EWR K3 – IKomati Lesentasi

Umfula	**IKomati Lesetulu**	**Tindzawo Tekucephela Lizinga Lemanti teDWS**	
WQU	7	**RC**	**X1H003Q01**
I-EWR Site	**K3**	**PES**	**X1H003Q01**
Tincenye Telizinga Lemanti		**Simo Lesingatsandzeki**	**I-Quality EcoSpecs (Kwehlukanisa iBenchmark)**
Sawoti wetintfo letingaphili	$MgSO_4$	B	16 mg/L.
	Na_2SO_4	B	20 mg/L.
	$MgCl_2$	B	15 mg/L.
	$CaCl_2$	A	21 mg/L.
	NaCl	B	45 mg/L.
	$CaSO_4$	A	351 mg/L.
Takhamtimba	SRP	C (0.025)	0.017 mg/L.
	TIN	C (0.32)	0.129 mg/L.
Kwehlukahlukana kwesimomvelo	pH	B (6.01-8.77)	Linani lemaphesenti lasi-5: 6.5-6.8 Linani lemaphesenti langema-95: 8.0-8.5
	Lizingakushisa	Kute idatha	Ehluka ngalokungengci ku20C nangabe acatsaniswa sibalokhatsi semvelo sangenyanga.
	I-Oksijini lencibilikile	Kute idatha	7-8 mg/L.
	Kudvungeka (NTU)	Kulindzeleke kudvungeka lokukhulu ngemuva kwetimvula ngenca yekukhishwa kwetilimo temvelo kanye nekwehlela kwemvelo.	
Kwehlukana kwetimphendvulo	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Not sampled/ rocks clogged with filamentous algae.	
	I-Chl-a phytoplankton		< 5 µg/L
	I-Biotic community composition - macroinvertebrate	ASPT: 5 SASS5: < 50	ASPT 6
	Kungena lokungena ngemfudlane	Akukasampulwa	
	Iflorayidi	225 (A)	1500 µg/L (Sigaba A)

Tintfo letiyingoti	Al		20 µg/L (Sigaba A)
	I-amoniya		15 µg/L (Sigaba A)
	As		20 µg/L (Sigaba A)
	I-Atrazine		19 µg/L (Sigaba A)
	Cd soft		0.2 µg/L (Sigaba A)
	Cd mod		0.2 µg/L (Sigaba A)
	Cd hard		0.3 µg/L (Sigaba A)
	Iklorini		0.4 µg/L (Sigaba A)
	Cr(III)		24 µg/L (Sigaba A)
	Cr(VI)		14 µg/L (Sigaba A)
	Cu soft		0.5 µg/L (Sigaba A)
	Cu mod		1.5 µg/L (Sigaba A)
	Cu hard		2.4 µg/L (Sigaba A)
	I-Cyanide		4 µg/L (Sigaba A)

Table 5.3.4: EWR G1 – Upper Komati

Umfula	**IKomati Lesetulu**	**Tindzawo Tekucephela Lizinga Lemanti teDWS**	
WQU	**4**	**RC**	**X1H019Q01**
I-EWR Site	**G1**	**PES**	**X1H019Q01**
Tincenye Telizinga Lemanti		**Simo Lesingatsandzeki**	**I-Quality EcoSpecs (Kwehlukanisa iBenchmark)**
Sawoti wetintfo letingaphili	$MgSO_4$	B	16 mg/L.
	Na_2SO_4	A	20 mg/L.
	$MgCl_2$	A	15 mg/L.
	$CaCl_2$	A	21 mg/L.
	NaCl	A	45 mg/L.
	$CaSO_4$	A	351 mg/L.
Takhamtimba	SRP	B/C (0.014)	> 0.125 mg/L.
	TIN	B/C (0.235)	0.75 mg/L.
Kwehlukahlukana kwesimomvelo	pH	B/C (7.25-8.44)	Linani lesi-5th: 6.00-6.25 Linani lema-95: 8.37-8.69
	Lizingakushisa	Kute idatha	
	I-Oksijini lencibilikile	Kute idatha	
	Kudvungeka (NTU)	Kurekhodwe ema-values eTDS lasetulu (kusuka ku 7 kuya ku 155).	
Kwehlukana kwetimphendvulo	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Kute lerekhodiwe	
	I-Chl-a phytoplankton	Kute lerekhodiwe	
	I-Biotic community composition - macroinvertebrate	ASPT: 4.21-6.3 SASS5:30-160	ASPT 5
	Kungena lokungena ngemfudlane	Akukasampulwa	
	Iflorayidi	167 (A)	1500 µg/L (Sigaba A)
	Al		20 µg/L (Sigaba A)
	I-amoniya		15 µg/L (Sigaba A)
	As		20 µg/L (Sigaba A)
	I-Atrazine		19 µg/L (Sigaba A)

Tintfo letiyingoti	Cd soft		0.2 µg/L (Sigaba A)
	Cd mod		0.2 µg/L (Sigaba A)
	Cd hard		0.3 µg/L (Sigaba A)
	Iklorini		0.4 µg/L (Sigaba A)
	Cr(III)		24 µg/L (Sigaba A)
	Cr(VI)		14 µg/L (Sigaba A)
	Cu soft		0.5 µg/L (Sigaba A)
	Cu mod		1.5 µg/L (Sigaba A)
	Cu hard		2.4 µg/L (Sigaba A)
	I-Cyanide		4 µg/L (Sigaba A)

Table 5.3.5: EWR T1 – Upper Komati

Umfula	**IKomati Lesetulu**	**Tindzawo Tekucephela Lizinga Lemanti teDWS**		
WQU	**6**	**RC**		
I-EWR Site	T1	**PES**		
Tincenye Telizinga Lemanti		**Simo Lesingatsandzeki**		**I-Quality EcoSpecs (Kwehlukanisa iBenchmark)**
Sawoti wetintfo letingaphili	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	A		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	B		45 mg/L.
	$CaSO_4$	B		351 mg/L.
Takhamtimba	SRP	C/D (0.04)		> 0.125 mg/L.
	TIN	A (0.186)		0.75 mg/L.
Kwehlukahlukana kwesimomvelo	pH	A (7.78-7.74)		Linani lesi-5th: 6.00-6.25 Linani lema-95: 8.37-8.69
	Lizingakushisa	Kute idatha	Kute imitselela lelindzelekile	
	I-Oksijini lencibilikile	Kute idatha		
	Kudvungeka (NTU)	Kulindzeleke kudvungeka lokukhulu ngemuva kwetimvula ngenca yekukhishwa kwetilimo temvelo kanye nekwehlela kwemvelo.		
Kwehlukana kwetimphendvulo	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Akukasampulwa		
	I-Chl-a phytoplankton			
	I-Biotic community composition - macroinvertebrate	ASPT:5.7 7.2 SASS: 163-239		ASPT > 6
	Kungena lokungena ngemfudlane	Akukasampulwa		
	Iflorayidi	363 (A)		1500 µg/L (Sigaba A)
	Al			20 µg/L (Sigaba A)
	I-amoniya			15 µg/L (Sigaba A)
	As			20 µg/L (Sigaba A)

Tintfo letiyingoti	I-Atrazine		19 µg/L (Sigaba A)
	Cd soft		0.2 µg/L (Sigaba A)
	Cd mod		0.2 µg/L (Sigaba A)
	Cd hard		0.3 µg/L (Sigaba A)
	Iklorini		0.4 µg/L (Sigaba A)
	Cr(III)		24 µg/L (Sigaba A)
	Cr(VI)		14 µg/L (Sigaba A)
	Cu soft		0.5 µg/L (Sigaba A)
	Cu mod		1.5 µg/L (Sigaba A)
	Cu hard		2.4 µg/L (Sigaba A)
	I-Cyanide		4 µg/L (Sigaba A)

Lithebula 5.3.6: EWR L1 – Lomati

Umfula	**IKomati Lesetulu**	**Tindzawo Tekucephela Lizinga Lemanti teDWS**		
WQU	**10**	**RC**		**X1HO49Q1**
I-EWR Site	**L1**	**PES**		**X1HO49Q1**
Tincenye Telizinga Lemanti		**Simo Lesingatsandzeki**		**I-Quality EcoSpecs (Kwehlukanisa iBenchmark)**
Sawoti wetintfo letingaphili	$MgSO_4$	B		16 mg/L.
	Na_2SO_4	A		20 mg/L.
	$MgCl_2$	A		15 mg/L.
	$CaCl_2$	A		21 mg/L.
	NaCl	B		45 mg/L.
	$CaSO_4$	A		351 mg/L.
Takhamtimba	SRP	C (0.022)		0.058 mg/L.
	TIN	B/C (0.277)		<0.25 mg/L.
Kwehlukahlukana kwesimomvelo	pH	B (6.9-8.6)		Linani lemaphesenti lesi-5: 5.75-6.00 Linani lemaphesenti lema-95: 8.05-8.37
	Lizingakushisa	Kute idatha	Lidami laseDriekoppies tinchubo tekusebenta titawuba nemtselela emazingeni ekushisa ngenca yekuphuma kwemanti labandzabako phakatsi.	
	I-Oksijini lencibilikile	Kute idatha		
	Kudvungeka (NTU)	Ema-sediments atintekile emadamini.		
Kwehlukana kwetimphendvulo	I-Chl-a periphyton (tintfo letingaphili letinamatsela etihlahleni)	Akukasampulwa		21 mg/m²
	I-Chl-a phytoplankton			5 µg/L eDriekoppies Dam
	I-Biotic community composition - macroinvertebrate	ASPT: 5.5-7.0 SASS5:60-250		ASPT > 6
	Kungena lokungena ngemfudlane	Akukasampulwa		
	Iflorayidi	154 (A)		1500 µg/L (Sigaba A)

Tintfo letiyingoti	Al		20 µg/L (Sigaba A)
	I-amoniya		15 µg/L (Sigaba A)
	As		20 µg/L (Sigaba A)
	I-Atrazine		19 µg/L (Sigaba A)
	Cd soft		0.2 µg/L (Sigaba A)
	Cd mod		0.2 µg/L (Sigaba A)
	Cd hard		0.3 µg/L (Sigaba A)
	Iklorini		0.4 µg/L (Sigaba A)
	Cr(III)		24 µg/L (Sigaba A)
	Cr(VI)		14 µg/L (Sigaba A)
	Cu soft		0.5 µg/L (Sigaba A)
	Cu mod		1.5 µg/L (Sigaba A)
	Cu hard		2.4 µg/L (Sigaba A)
	I-Cyanide		4 µg/L (Sigaba A)

6. EMANTI APHASI - INCENYE YEBUNYENTI

Incenye yebunyenti bemanti aphasi incunywe ngekusebentisa ema-values (i-recharge, kuhamba kwemanti phasi, kusetjentiswa kwemanti aphasi kanye ne-stress index) lesitfolwe ngekuncunywa kwetigaba temtfombo wemanti kanye netinjongo temtfombo lohlobene esigodzini semanti iNkomati, (DWS 2015), letikhonjiswe kuLithebula 6.1. Lizinga lelisemkhatsini le-recharge yemanti aphasi emnyaka kuso sonkhe sigodzi semanti ngekuya ngemklamo weGroundwater Resource Assessment Phase II (GRA II) idataset ilinganiselwa kuba ngetulu kwa 1 500 Mm3/a. Emagugu e-Ecological Water Requirements_Maintenance Low Flow (EWR_MLF) atfolwe kusifundvo sesincumo seSabelo semanti aphasi laphangisako esigdozi se-Inkomati (AGES, 2010).

Emagugu elinanibantfu latfolwe kudaset Yetinsita Temanti tanga-2011. Sabelo Setidzingo Tebantfu Letisisekelo siniketa tidzingo letisisekelo tebantfu labaphakelwa ngco ngumtfombo wemanti lekukhulunywa ngayo futsi tifaka ekhatsi emanti ekunatsa, ekulungiselela kudla kanye nekutihlobisa. Linani lekuphila lemalitha langu-25 ngemuntfu lisetjentisiwe. Indlela yesifundvo yamanje nayo itsatse ibuke emadaset eGRA II nema-WARMS anga 2013 kutfola silinganiso lesifanele sekusetjentiswa kwemanti aphasi. Kusetjentiswa kwemanti aphasi lokuphelele kwesigodzi semanti Inkomati kulinganiswe ku 52.3 Mm3/a. Inkhomba yekucineka kwemanti aphasi kukhombisa kusetjentiswa kwemanti aphasi kanye neku-recharge.

Lithebula 6.1 Sifinyeto Sesabelo

Sigodzi semanti semandvulo	Area(km²)	I-Recharge (Mm3/a)	Linanibantfu	Kuhamba kwaphasi (Mm3/a) (DWS, 2015)	EWR_MLF (Mm³/a)	Sabelo seBHN (Mm3/a)	Sabelo (Mm3/a)	Kusetjentiswa kwemanti aphasi (Mm3/a)	Inkhomba Yekucineka
X11A	672	24.36	2561	7.21	11.47	0.023	11.49	0.33	1%
X11B	597	22.93	8946	6.96	10.72	0.082	10.80	0.83	4%
X11C	319	13.12	30051*	3.68	5.99	0	5.99	1.56	12%
X11D	590	25.97	30051*	23.59	12.24	0	12.24	0.51	2%
X11E	242	11.38	30051*	9.97	4.77	0	4.77	0.02	0%
X11F	183	9.49	30051*	7.54	4.24	0	4.24	0.15	2%
X11G	264	20.58	30051*	17.25	9.65	0	9.65	0.2	1%
X11H	265	21.55	30051*	17.17	10.09	0	10.09	0.44	2%
X11J	186	15.75	30051*	11.98	7.24	0	7.24	0.26	2%
X11K	211	16.73	30051*	10	7.38	0	7.38	0.82	5%
X12A	244	15.45	30051*	13.94	7.27	0	7.27	0.08	0%
X12B	155	10.3	30051*	12.05	4.84	0	4.84	0.04	0%
X12C	186	13.28	30051*	8.03	6.52	0	6.52	0.08	1%
X12D	223	14.19	2735	7.54	6.23	0.025	6.25	0.29	2%
X12E	333	20.72	1020	11.5	9.63	0.009	9.64	0.09	0%
X12F	313	21.69	59707	10.85	10.63	0.545	11.17	0.13	1%
X12G	239	16.9	13058	3.42	8.11	0.119	8.23	0.05	0%
X12H	286	26.31	6177	9.41	12.6	0.056	12.66	0.05	0%
X12J	296	29.62	246	5.77	14.3	0.002	14.30	0.16	1%
X12K	286	27.93	10338	9.37	13.57	0.094	13.66	0.08	0%
X13J	828	20.68	157637	0	8.63	1.438	10.07	0.7	3%
X13K	621	10.25	56636	6.86	0.13	0.517	0.65	2.56	25%
X13L	286	5.17	3387	2.83	0.36	0.031	0.39	0.98	19%
X14A	141	8.89	30051*	0	4.2	0	4.20	0.09	1%
X14B	185	11.39	457	0	5.41	0.004	5.41	0.09	1%

Sigodzi semanti semandvulo	Area(km²)	I-Recharge (Mm3/a)	Linanibantfu	Kuhamba kwaphasi (Mm3/a) (DWS, 2015)	EWR_MLF (Mm³/a)	Sabelo seBHN (Mm3/a)	Sabelo (Mm3/a)	Kusetjentiswa kwemanti aphasi (Mm3/a)	Inkhomba Yekucineka
X14F	117	6.89	30051*	4.62	3.36	0	3.36	0.07	1%
X14G	204	6	89074	6.15	2.29	0.813	3.10	0.62	10%
X14H	360	8.67	38790	3.19	3.62	0.354	3.97	6.68	77%
X21A	265	13.85	446	2.69	0.93	0.004	0.93	0.67	5%
X21B	378	18.81	28783*	4.01	3.27	0	3.27	0.45	2%
X21C	311	16.25	869	3.21	7.67	0.008	7.68	0.75	5%
X21D	219	10.95	28783*	2.04	4.84	0	4.84	0.14	1%
X21E	345	29.69	28783*	3.59	16.58	0	16.58	0.2	1%
X21F	397	18.3	9513	3.17	8.83	0.087	8.92	0.83	5%
X21G	347	17.51	14487	4.24	8	0.132	8.13	0.16	1%
X21H	229	21.19	28783*	5.7	10.23	0	10.23	0.08	0%
X21J	355	29.26	120	6.45	14.08	0.001	14.08	0.15	1%
X21K	245	22.78	625	4.16	11.13	0.006	11.14	0.11	0%
X22A	252	23.67	28783*	4.28	11.3	0	11.30	0.07	0%
X22B	227	21.24	28783*	4.36	9.75	0	9.75	0.46	2%
X22C	366	20.69	28783*	7.51	8.43	0	8.43	1.03	5%
X22D	274	25.58	12182	3.84	12.02	0.111	12.13	0.15	1%
X22E	153	13.92	28783*	3.9	6.75	0	6.75	0.04	0%
X22F	212	11.41	947	2.05	3.02	0.009	3.03	1.19	10%
X22G	107	9.39	28783*	3.02	4.72	0	4.72	0.11	1%
X22H	200	10.22	5440	2.09	2.95	0.050	3.00	0.92	9%
X22J	240	12.75	23373	2.56	5.48	0.213	5.69	0.81	6%
X22K	335	14.57	33140	3.55	42.45	0.302	42.75	2.89	20%
X23A	127	10.69	28783*	1.71	4.79	0	4.79	0.07	1%
X23B	229	12.38	28783*	3.18	5.13	0	5.13	0.65	5%
X23C	81	6.98	28783*	3.34	2.93	0	2.93	0.12	2%

Sigodzi semanti semandvulo	Area(km²)	I-Recharge (Mm3/a)	Linanibantfu	Kuhamba kwaphasi (Mm3/a) (DWS, 2015)	EWR_MLF (Mm³/a)	Sabelo seBHN (Mm3/a)	Sabelo (Mm3/a)	Kusetjentiswa kwemanti aphasi (Mm3/a)	Inkhomba Yekucineka
X23D	182	12.89	28783*	2.43	6.11	0	6.11	0.17	1%
X23E	180	12.02	53913	3.18	5.32	0	5.32	0.16	1%
X23F	310	20.29	596	1.63	8.5	0.492	8.99	2.41	12%
X23G	225	11.2	3837	2.24	4.97	0.005	4.98	0.26	2%
X23H	306	14.59	54450	1.92	10.78	0.035	10.82	0.66	4%
X24A	249	7.57	171771	2.52	3.42	0.497	3.92	0.4	5%
X24B	335	11.06	184218	2.46	5.13	1.567	6.70	0.82	7%
X24C	286	10.49	340	1.35	4.87	1.681	6.55	0.09	1%
X24D	302	10.58	5073	2.08	52.22	0.003	52.22	0.38	4%
X24E	526	12.28	323	0	5.56	0.046	5.61	0.22	2%
X24F	262	5.76	28783*	0	1.89	0.003	1.89	0.72	12%
X24G	620	11.69	28783*	0	4.84	0	4.84	0.12	1%
X24H	769	12.78	11707	0	90	0	90.00	0.98	8%
X31A	230	39.15	1722	2.14	19.1	0.107	19.21	2.33	6%
X31B	195	32.54	355	1.81	7.43	0.016	7.45	0.11	0%
X31C	154	25.8	2099	1.44	5.21	0.003	5.21	0.11	0%
X31D	192	17.49	31805	0.77	11.35	0.019	11.37	1.16	7%
X31E	214	26.11	2255	1.92	12.42	0.290	12.71	0.37	1%
X31F	94	11.66	22348	1.88	5.41	0.021	5.43	0.08	1%
X31G	169	12.43	26567*	1.65	10.04	0.204	10.24	1.4	11%
X31H	60	6.69	30984	0.6	2.98	0	2.98	0.12	2%
X31J	154	13.54	97372	1.57	5.55	0.283	5.83	0.53	4%
X31K	488	12.58	41155	0	29.39	0.889	30.28	0.58	5%
X31L	304	13.71	21584	0	6.09	0.376	6.47	0.51	4%
X31M	709	12.79	18850	0	4.44	0.197	4.64	0.95	7%
X32A	112	7.4	11671	0	3.24	0.172	3.41	0.5	7%

Sigodzi semanti semandvulo	Area(km²)	I-Recharge (Mm3/a)	Linanibantfu	Kuhamba kwaphasi (Mm3/a) (DWS, 2015)	EWR_MLF (Mm³/a)	Sabelo seBHN (Mm3/a)	Sabelo (Mm3/a)	Kusetjentiswa kwemanti aphasi (Mm3/a)	Inkhomba Yekucineka
X32B	55	3.38	30860	1.07	1.28	0.106	1.39	0.32	9%
X32C	233	6.52	33350	0.52	3.32	0.529	3.85	0.91	14%
X32D	100	6.75	32638	1.47	2.93	0.282	3.21	0.32	5%
X32E	78	4.68	36640	0.95	1.74	0.304	2.04	2.36	50%
X32F	157	4.71	19418	0.76	2.73	0.298	3.03	0.4	8%
X32G	336	5.48	26567*	0.99	1.7	0.334	2.03	1.02	19%
X32H	488	7.21	26567*	0	2.84	0.177	3.02	0.28	4%
X32J	355	4.96	26567*	0	9.32	0	9.32	0.09	2%
X33A	600	7.85	26567*	0	3.16	0	3.16	0.05	1%
X33B	311	3.24	26567*	0	0.9	0	0.90	0.02	1%
X33C	183	1.27	0	0	0.24	0	0.24	0.03	2%
X33D	350	3.92	0	0	1.93	0	1.93	0	0%
X40A	924	9.59	7552	0	2.77	0	2.77	0.1	1%
X40B	743	7.71	0	0	2.4	0	2.40	0.07	1%
X40C	941	10.89	30860	0	3.87	0.069	3.94	0.15	1%
X40D	589	4.89	33350	0	1.59	0	1.59	0.06	1%

*Population estimated based on the average of the secondary catchment X1, X2 and X2

7. EMANTI APHASI - INCENYE YEBUNJALO

Bunjalo bemanti aphasi kumele butfobele tinkhombandlela tebunjalo bemanti aphasi njengobe bukhonjisiwe kuLithebula 7.1. Bunjalo bemanti aphasi esigodzini semanti Inkomati buhlolwe ngesigodzi semanti sasemandvulo (Lithebula 7.2). Sifinyeto sesigaba sebunjalo bemanti kanye netilinganiso tetinkinga ngekuya ngesigodzi semanti sasemandvulo kuLithebula 7.3. Silinganisi senkinga ngulesilinganiso lesilinganisi lesasetjentiswa kwenta sincumo ngesigaba sebunjalo bemanti bemfulo wasemandvulo.

Lithebula 7.1: Insitabhuku yekuhlola kufaneleka kwemanti aphasi ekusetjentiswa kahle

Silinganisi Yemakhemikhali	I-Target Water Quality Ranges 1)			
	Sigaba 0	Sigaba I	Sigaba II	Sigaba III
pH (emayunithi e-pH)	6 – 9	5 – 6 & 9 – 9.5	4 – 5 & > 9.5 – 10	<4 & >10
Kuhanjiswa Kwagezi (mS/m)	< 70	70 - 150	150 – 370	>370
Ikhalisiyamu njenge Ca	< 80	80 - 150	150 – 300	>300
Imagineziyamu njenge Mg	< 70	70 - 100	100 – 200	>200
Isodiyamu njenge Na	< 100	100 - 200	200 – 400	>400
Ikloriyadi njenge Cl	< 100	100 - 200	200 – 600	>600
Isaliphiyethi njenge SO4	< 200	200 - 400	400 – 600	>600
Inayithrethi njenge NOx-N	< 6	6 - 10	10 – 20	>20
Iflorayidi njenge F	<0.7	0.7 – 1.0	1.0 – 3.5	>3.5

1) Irefurensi: Bunjalo Bekuphakelwa Kwemanti Asemakhaya, Ivolumu 1: Insitabhuku Yekuhlola, 2nd Ed.1998. Umbiko Wekhomishini Yekuphenya Emanti nombolo: TT 101/98. Pitoli, Ningizimu Afrika.

Khumbula: onkhe emayunithi ekulinganise aku mg/l, ngaphandle nangabe kuphawulwe ngalendlela.

Sigodzi semant semandvulo

Idatha yebunjalo bemanti aphasi yatfolwa ku WMS futsi yasetjentiswa kuncuma bunjalo besigodzi semfula wasemandvulo, buka Lithebula 7.2 neLithebula 7.3 kutfola sifinyeto sesigaba sebunjalo bemanti kanye netilinganisi tetinkinga.

Lithebula 7.2 Bunjalo bemanti aphasi ngekuya ngeSigodzi semanti sasemandvulo

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X11A, X11B, X11C, X11D											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X11A*	X11B*	X11C*	X11D*	X11A*	X11B*	X11C*	X11D*		X11A*	X11B*	X11C*	X11D*
pH		44	41	42	42	7.99	8.03	8.02	8.02	5.0 – 9.5	8.79	8.83	8.82	8.82
Kuhanjiswa Kwagezi	mS/m	44	41	42	42	22.75	22.70	22.60	22.60	<150	25.03	24.97	24.86	24.86
Ikhalisiyamu njenge Ca	mg/l	39	36	37	37	23.07	22.80	22.53	22.53	<150	25.37	25.07	24.78	24.78
Imagineziyamu njenge Mg	mg/l	39	36	37	37	6.72	6.70	6.68	6.68	<100	7.39	7.37	7.35	7.35
Isodiyamu njenge Na	mg/l	38	36	37	37	8.78	8.63	8.51	8.51	<200	9.65	9.49	9.36	9.36
I-Alkalinity Lephelele njenge CaCO3	mg/l	39	36	37	37	98.80	98.43	98.06	98.06	Ayidzingeki	108.68	108.27	107.87	107.87
Ikloriyadi njenge Cl	mg/l	40	37	38	38	5.38	5.35	5.17	5.17	<200	5.92	5.88	5.69	5.69
Isaliphiyethi njenge SO4	mg/l	38	36	37	37	5.89	5.58	5.45	5.45	<400	6.48	6.14	6.00	6.00
Inayithrethi njenge NOx-N	mg/l	40	37	38	38	0.11	0.11	0.11	0.11	<10	0.12	0.12	0.12	0.12
Iflorayidi njenge F	mg/l	39	36	37	37	0.17	0.17	0.17	0.17	<1.0	0.18	0.19	0.19	0.19

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X11E, X11F, X11G, X11H											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X11E*	X11F*	X11G*	X11H	X11E*	X11F*	X11G*	X11H		X11E*	X11F*	X11G*	X11H
pH		42	42	4	24	8.02	8.02	7.98	7.54	5.0 – 9.5	8.82	8.82	8.77	8.30
Kuhanjiswa Kwagezi	mS/m	42	42	4	24	22.60	22.60	15.85	17.60	<150	24.86	24.86	17.44	19.36
Ikhalisiyamu njenge Ca	mg/l	37	37	4	23	22.53	22.53	12.40	12.21	<150	24.78	24.78	13.64	13.43
Imagineziyamu njenge Mg	mg/l	37	37	4	23	6.68	6.68	11.55	5.70	<100	7.35	7.35	12.71	6.27
Isodiyamu njenge Na	mg/l	37	37	4	23	8.51	8.51	4.00	10.40	<200	9.36	9.36	4.40	11.44
I-Alkalinity Lephelele njenge CaCO3	mg/l	37	37	4	23	98.06	98.06	81.80	70.80	Ayidzingeki	107.87	107.87	89.98	77.88
Ikloriyadi njenge Cl	mg/l	38	38	4	23	5.17	5.17	1.50	5.00	<200	5.69	5.69	1.65	5.50
Isaliphiyethi njenge SO4	mg/l	37	37	4	23	5.45	5.45	4.05	4.40	<400	6.00	6.00	4.46	4.84
Inayithrethi njenge NOx-N	mg/l	38	38	4	23	0.11	0.11	0.13	0.77	<10	0.12	0.12	0.14	0.85
Iflorayidi njenge F	mg/l	37	37	4	23	0.17	0.17	0.23	0.16	<1.0	0.19	0.19	0.25	0.17

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X11J, X11K, X12A, X12B											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X11J*	X11K	X12A*	X12B*	X11J*	X11K	X12A*	X12B*		X11J*	X11K	X12A*	X12B*
pH		24	3	10	4	7.54	6.71	7.17	7.98	5.0 – 9.5	8.30	7.38	7.88	8.77
Kuhanjiswa Kwagezi	mS/m	24	3	10	4	17.60	16.2	14.05	15.85	<150	19.36	17.82	15.46	17.44
Ikhalisiyamu njenge Ca	mg/l	23	3	10	4	12.21	10.1	5.85	12.40	<150	13.43	11.11	6.44	13.64
Imagineziyamu njenge Mg	mg/l	23	3	10	4	5.70	5.3	3.50	11.55	<100	6.27	5.83	3.85	12.71
Isodiyamu njenge Na	mg/l	23	3	10	4	10.40	13.4	8.35	4.00	<200	11.44	14.74	9.19	4.40
I-Alkalinity Lephelele njenge CaCO3	mg/l	23	3	10	4	70.80	75.3	31.50	81.80	Ayidzingeki	77.88	82.83	34.65	89.98
Ikloriyadi njenge Cl	mg/l	23	3	10	4	5.00	5	3.55	1.50	<200	5.50	5.50	3.91	1.65
Isaliphiyethi njenge SO4	mg/l	23	3	10	4	4.40	4.5	4.60	4.05	<400	4.84	4.95	5.06	4.46
Inayithrethi njenge NOx-N	mg/l	23	3	10	4	0.77	0.29	0.35	0.13	<10	0.85	0.32	0.38	0.14
Ifluorayidi njenge F	mg/l	23	3	10	4	0.16	0.11	0.12	0.23	<1.0	0.17	0.12	0.13	0.25

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X12C, X12D, X12E, X12F											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X12C*	X12D	X12E*	X12F	X12C*	X12D	X12E*	X12F		X12C*	X12D	X12E*	X12F
pH		51	50	51	11	8.54	8.55	8.54	7.99	5.0 – 9.5	9.39	9.40	9.39	8.79
Kuhanjiswa Kwagezi	mS/m	51	50	51	11	61.00	61.10	61.00	43.80	<150	67.10	67.21	67.10	48.18
Ikhalisiyamu njenge Ca	mg/l	47	46	47	11	6.10	6.10	6.10	22.80	<150	6.71	6.71	6.71	25.08
Imagineziyamu njenge Mg	mg/l	46	45	46	11	0.63	0.50	0.63	17.40	<100	0.69	0.55	0.69	19.14
Isodiyamu njenge Na	mg/l	45	44	45	11	110.40	110.66	110.40	26.80	<200	121.44	121.73	121.44	29.48
I-Alkalinity Lephelele njenge CaCO3	mg/l	46	45	46	11	54.50	54.60	54.71	170.00	Ayidzingeki	59.95	60.06	60.18	187.00
Ikloriyadi njenge Cl	mg/l	47	46	47	11	124.82	124.91	124.82	6.70	<200	137.30	137.40	137.30	7.37
Isaliphiyethi njenge SO4	mg/l	47	46	47	11	17.38	17.46	17.38	9.70	<400	19.11	19.21	19.11	10.67
Inayithrethi njenge NOx-N	mg/l	47	46	47	11	0.05	0.05	0.05	0.27	<10	0.06	0.06	0.06	0.30
Iflorayidi njenge F	mg/l	45	44	45	11	9.91	9.93	9.91	0.66	<1.0	9.91	9.93	9.91	0.73

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X12G, X12H, X12J, X12K											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X12G	X12H*	X12J*	X12K	X12G	X12H*	X12J*	X12K		X12G	X12H*	X12J*	X12K
pH		3	11	3	9	8.37	8.10	8.37	8.10	5.0 – 9.5	9.21	8.91	9.21	8.91
Kuhanjiswa Kwagezi	mS/m	3	11	3	9	64.90	44.70	64.90	66.70	<150	71.39	49.17	71.39	73.37
Ikhalisiyamu njenge Ca	mg/l	3	11	3	9	23.90	17.10	23.90	31.70	<150	26.29	18.81	26.29	34.87
Imagineziyamu njenge Mg	mg/l	3	11	3	9	63.60	26.80	63.60	30.40	<100	69.96	29.48	69.96	33.44
Isodiyamu njenge Na	mg/l	3	11	3	9	23.20	30.20	23.20	21.70	<200	25.52	33.22	25.52	23.87
I-Alkalinity Lephelele njenge CaCO3	mg/l	3	11	3	9	349.10	230.90	349.10	293.70	Ayidzingeki	384.01	253.99	384.01	293.7
Ikloriyadi njenge Cl	mg/l	3	11	3	9	6.50	9.50	6.50	9.50	<200	7.15	10.45	7.15	10.45
Isaliphiyethi njenge SO4	mg/l	3	11	3	9	7.60	14.50	7.60	14.50	<400	8.36	15.95	8.36	15.95
Inayithrethi njenge NOx-N	mg/l	3	11	3	9	0.32	0.60	0.32	0.50	<10	0.36	0.65	0.36	0.55
Iflorayidi njenge F	mg/l	3	11	3	9	0.35	0.39	0.35	0.25	<1.0	0.39	0.43	0.39	0.28

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X13J, X13K, X13L, X14A											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X13J	X13K	X13L*	X14A	X13J	X13K	X13L*	X14A		X13J	X13K	X13L*	X14A
pH		60	19	8	31	8.28	8.12	8.54	7.21	5.0 – 9.5	9.11	8.93	9.39	7.93
Kuhanjiswa Kwagezi	mS/m	60	19	8	31	138.00	155.00	76.40	2.80	<150	150	155.00	84.04	3.08
Ikhalisiyamu njenge Ca	mg/l	60	19	8	27	52.10	58.50	22.20	1.10	<150	57.31	64.35	24.42	1.21
Imagineziyamu njenge Mg	mg/l	60	19	8	27	45.40	52.70	23.05	0.50	<100	49.94	57.97	25.36	0.55
Isodiyamu njenge Na	mg/l	60	19	8	27	201.95	200.10	112.30	2.54	<200	201.95	200.10	123.53	2.79
I-Alkalinity Lephelele njenge CaCO3	mg/l	60	19	8	27	382.85	395.00	281.95	6.70	Ayidzingeki	421.14	434.50	310.15	7.37
Ikloriyadi njenge Cl	mg/l	60	19	8	27	189.20	292.47	89.30	5.00	<200	200	292.47	98.23	5.50
Isaliphiyethi njenge SO4	mg/l	60	19	8	27	14.60	27.86	5.35	2.00	<400	16.06	30.64	5.89	2.20
Inayithrethi njenge NOx-N	mg/l	60	19	8	27	0.72	0.42	0.86	0.06	<10	0.79	0.47	0.94	0.07
Ifforayidi njenge F	mg/l	60	19	8	27	0.51	0.65	0.81	0.12	<1.0	0.57	0.72	0.89	0.14

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X14B, X14F, X14G, X14H											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X14B	X14F	X14G	X14H	X14B	X14F	X14G	X14H		X14B	X14F	X14G	X14H
pH		4	4	54	8	7.97	7.79	8.54	8.54	5.0 – 9.5	8.76	8.56	9.39	9.39
Kuhanjiswa Kwagezi	mS/m	4	4	54	8	303.00	37.15	71.40	76.40	<150	333.30	40.87	78.54	84.04
Ikhalisiyamu njenge Ca	mg/l	4	4	54	8	130.40	38.40	33.95	22.20	<150	143.44	42.24	37.35	24.42
Imagineziyamu njenge Mg	mg/l	4	4	54	8	99.20	17.60	43.60	23.05	<100	109.12	19.36	47.96	25.36
Isodiyamu njenge Na	mg/l	4	4	54	8	495.75	25.10	84.35	112.30	<200	495.75	27.61	92.79	123.53
I-Alkalinity Lephelele njenge CaCO3	mg/l	4	4	54	8	632.95	148.55	276.25	281.95	Ayidzingeki	696.25	163.41	303.88	310.15
Iklоriyadi njenge Cl	mg/l	4	4	54	8	831.30	9.95	38.70	89.30	<200	831.30	10.95	42.57	98.23
Isaliphiyethi njenge SO4	mg/l	4	4	54	8	60.45	14.15	2.00	5.35	<400	66.50	15.57	2.20	5.89
Inayithrethi njenge NOx-N	mg/l	4	4	54	8	3.01	0.33	2.19	0.86	<10	3.31	0.36	2.41	0.94
Iflorayidi njenge F	mg/l	4	4	54	8	0.64	0.35	0.44	0.81	<1.0	0.70	0.39	0.48	0.89

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X21A, X21B, X21C, X21D											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X21A*	X21B*	X21C*	X21D*	X21A*	X21B*	X21C*	X21D*		X21A*	X21B*	X21C*	X21D*
pH		8	8	7	8	8.02	8.02	8.03	8.02	5.0 – 9.5	8.82	8.82	8.83	8.82
Kuhanjiswa Kwagezi	mS/m	8	8	7	8	76.85	76.85	95.70	76.85	<150	84.54	84.54	105.27	84.54
Ikhalisiyamu njenge Ca	mg/l	8	8	7	8	41.78	41.78	43.25	41.78	<150	45.96	45.96	47.58	45.96
Imagineziyamu njenge Mg	mg/l	8	8	7	8	33.55	33.55	43.04	33.55	<100	36.90	36.90	47.35	36.90
Isodiyamu njenge Na	mg/l	8	8	7	8	44.65	44.65	56.70	44.65	<200	49.11	49.11	62.37	49.11
I-Alkalinity Lephelele njenge CaCO3	mg/l	8	8	7	8	114.48	114.48	116.76	141.56	Ayidzingeki	125.93	125.93	128.44	155.71
Ikloriyadi njenge Cl	mg/l	8	8	7	8	126.78	126.78	161.82	126.78	<200	139.46	139.46	178.00	139.46
Isaliphiyethi njenge SO4	mg/l	8	8	7	8	56.22	56.22	69.54	56.22	<400	61.85	61.85	76.49	61.85
Inayithrethi njenge NOx-N	mg/l	8	8	7	8	0.65	0.48	0.62	0.48	<10	0.72	0.52	0.68	0.52
Iflorayidi njenge F	mg/l	8	8	7	8	0.13	0.13	0.13	0.13	<1.0	0.14	0.14	0.14	0.14

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X21E, X21F, X21G, X21H												
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X21E*	X21F	X21G*	X21H*	X21E*	X21F	X21G*	X21H*		X21E*	X21F	X21G*	X21H*
pH		9	55	55	7	8.03	8.12	8.12	8.03	5.0 – 9.5	8.83	8.93	8.93	8.83
Kuhanjiswa Kwagezi	mS/m	9	55	55	7	58.00	39.20	39.20	95.70	<150	63.80	43.12	43.12	105.27
Ikhalisiyamu njenge Ca	mg/l	9	49	49	7	40.31	9.86	9.86	43.25	<150	44.34	10.85	10.85	47.58
Imagineziyamu njenge Mg	mg/l	9	47	47	7	24.06	3.30	3.30	43.04	<100	26.46	3.63	3.63	47.35
Isodiyamu njenge Na	mg/l	9	46	46	7	32.60	63.85	63.85	56.70	<200	35.86	70.24	70.24	62.37
I-Alkalinity Lephelele njenge CaCO3	mg/l	9	48	48	7	112.20	103.90	103.90	116.76	Ayidzingeki	123.42	114.29	114.29	128.44
Ikloriyadi njenge Cl	mg/l	9	47	47	7	91.74	49.02	49.02	161.82	<200	100.92	53.92	53.92	178.00
Isaliphiyethi njenge SO4	mg/l	9	49	49	7	42.91	5.15	5.15	69.54	<400	47.20	5.66	5.66	76.49
Inayithrethi njenge NOx-N	mg/l	9	49	49	7	0.62	0.05	0.05	0.62	<10	0.68	0.06	0.06	0.68
Ifiorayidi njenge F	mg/l	9	47	47	7	0.13	3.38	3.38	0.13	<1.0	0.14	3.38	3.72	0.14

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X21J, X21K, X22A, X22B											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X21J	X21K*	X22A*	X22B*	X21J	X21K*	X22A*	X22B*		X21J	X21K*	X22A*	X22B*
pH		7	7	7	4	8.03	8.03	8.03	7.58	5.0 – 9.5	8.83	8.83	8.83	8.34
Kuhanjiswa Kwagezi	mS/m	7	7	7	4	95.70	95.70	95.70	9.00	<150	105.27	105.27	105.27	9.90
Ikhalisiyamu njenge Ca	mg/l	7	7	7	4	43.25	43.25	43.25	6.30	<150	47.58	47.58	47.58	6.93
Imagineziyamu njenge Mg	mg/l	7	7	7	4	43.04	43.04	43.04	1.75	<100	47.35	47.35	47.35	1.93
Isodiyamu njenge Na	mg/l	7	7	7	3	56.70	56.70	56.70	2.10	<200	62.37	62.37	62.37	2.31
I-Alkalinity Lephelele njenge CaCO3	mg/l	7	7	7	4	116.76	116.76	116.76	26.40	Ayidzingeki	128.44	128.44	128.44	29.04
Ikloriyadi njenge Cl	mg/l	7	7	7	4	161.82	161.82	161.82	3.35	<200	178.00	178.00	178.00	3.69
Isaliphiyethi njenge SO4	mg/l	7	7	7	3	69.54	69.54	69.54	2.00	<400	76.49	76.49	76.49	2.20
Inayithrethi njenge NOx-N	mg/l	7	7	7	4	0.62	0.62	0.62	0.23	<10	0.68	0.68	0.68	0.25
Iflorayidi njenge F	mg/l	7	7	7	4	0.13	0.13	0.13	0.11	<1.0	0.14	0.14	0.14	0.12

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X22C, X22D, X22E, X22F											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X22C*	X22D	X22E*	X22F*	X22C*	X22D	X22E*	X22F*		X22C*	X22D	X22E*	X22F*
pH		5	4	4	3	7.42	7.58	7.51	7.31	5.0 – 9.5	8.16	8.34	8.26	8.04
Kuhanjiswa Kwagezi	mS/m	5	4	4	3	45.40	9.00	37.85	45.40	<150	49.94	9.90	41.64	49.94
Ikhalisiyamu njenge Ca	mg/l	5	4	4	3	18.10	6.30	17.40	16.70	<150	19.91	6.93	19.14	18.37
Imagineziyamu njenge Mg	mg/l	5	4	4	3	12.00	1.75	11.85	12.00	<100	13.20	1.93	13.04	13.20
Isodiyamu njenge Na	mg/l	4	3	3	2	49.70	2.10	46.10	49.70	<200	54.67	2.31	50.71	54.67
I-Alkalinity Lephelele njenge CaCO3	mg/l	5	4	4	3	177.80	26.40	161.95	177.80	Ayidzingeki	195.58	29.04	178.15	195.58
Ikloriyadi njenge Cl	mg/l	5	4	4	3	16.70	3.35	13.20	16.70	<200	18.37	3.69	14.52	18.37
Isaliphiyethi njenge SO4	mg/l	4	3	3	2	15.90	2.00	22.70	24.60	<400	17.49	2.20	24.97	27.06
Inayithrethi njenge NOx-N	mg/l	5	4	4	3	2.69	0.23	1.25	2.48	<10	2.96	0.25	1.38	2.73
Ifluorayidi njenge F	mg/l	5	4	4	3	0.56	0.11	0.60	0.44	<1.0	0.62	0.12	0.66	0.48

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X22G, X22H, X22J, X22K											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X22G*	X22H	X22J*	X22K	X22G*	X22H	X22J*	X22K		X22G*	X22H	X22J*	X22K
pH		3	3	6	6	7.31	7.31	7.81	7.81	5.0 – 9.5	8.04	8.04	8.59	8.59
Kuhanjiswa Kwagezi	mS/m	3	3	6	6	45.40	45.40	43.55	43.55	<150	49.94	49.94	47.91	47.91
Ikhalisiyamu njenge Ca	mg/l	3	3	6	6	16.70	16.70	34.85	34.85	<150	18.37	18.37	38.34	38.34
Imagineziyamu njenge Mg	mg/l	3	3	6	6	12.00	12.00	10.95	10.95	<100	13.20	13.20	12.05	12.05
Isodiyamu njenge Na	mg/l	2	2	6	6	49.70	49.70	53.00	53.00	<200	54.67	54.67	58.30	58.30
I-Alkalinity Lephelele njenge CaCO3	mg/l	3	3	6	6	177.80	177.80	191.65	191.65	Ayidzingeki	195.58	195.58	210.82	210.82
Ikloriyadi njenge Cl	mg/l	3	3	6	6	16.70	16.70	14.30	14.30	<200	18.37	18.37	15.73	15.73
Isaliphiyethi njenge SO4	mg/l	2	2	6	6	24.60	24.60	9.60	9.60	<400	27.06	27.06	10.56	10.56
Inayithrethi njenge NOx-N	mg/l	3	3	6	6	2.48	2.48	0.92	0.92	<10	2.73	2.73	1.02	1.02
Iflorayidi njenge F	mg/l	3	3	6	6	0.44	0.44	1.86	1.86	<1.0	0.48	0.48	1.86	1.86

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X23A, X23B, X23C, X23D											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X23A*	X23B	X23C*	X23D	X23A*	X23B	X23C*	X23D		X23A*	X23B	X23C*	X23D
pH		7	4	6	6	7.40	7.45	7.39	7.39	5.0 – 9.5	8.14	8.19	8.12	8.12
Kuhanjiswa Kwagezi	mS/m	7	4	6	6	24.30	42.80	22.50	22.50	<150	26.73	47.08	24.75	24.75
Ikhalisiyamu njenge Ca	mg/l	7	4	6	6	18.90	29.90	14.80	14.80	<150	20.79	32.89	16.28	16.28
Imagineziyamu njenge Mg	mg/l	7	4	6	6	10.60	10.85	10.95	10.95	<100	11.66	11.94	12.05	12.05
Isodiyamu njenge Na	mg/l	7	4	6	6	16.00	16.50	15.60	15.60	<200	17.60	18.15	17.16	17.16
I-Alkalinity Lephelele njenge CaCO3	mg/l	7	4	6	6	91.20	127.85	73.85	73.85	Ayidzingeki	100.32	140.64	81.24	81.24
Ikloriyadi njenge Cl	mg/l	7	4	6	6	10.30	5.90	10.60	10.60	<200	11.33	6.49	11.66	11.66
Isaliphiyethi njenge SO4	mg/l	7	4	6	6	6.30	9.10	6.70	6.70	<400	6.93	10.01	7.37	7.37
Inayithrethi njenge NOx-N	mg/l	7	4	6	6	1.33	0.53	2.02	2.02	<10	1.46	0.58	2.22	2.22
Iflorayidi njenge F	mg/l	7	4	6	6	0.34	0.55	0.34	0.34	<1.0	0.37	0.60	0.37	0.37

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X23E, X23F, X23G, X23H											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X23E*	X23F*	X23G*	X23H	X23E*	X23F*	X23G*	X23H		X23E*	X23F*	X23G*	X23H
pH		6	6	15	13	7.39	7.39	8.06	8.14	5.0 – 9.5	8.12	8.12	8.87	8.95
Kuhanjiswa Kwagezi	mS/m	6	6	15	13	22.50	22.50	64.80	66.70	<150	24.75	24.75	71.28	73.37
Ikhalisiyamu njenge Ca	mg/l	6	6	15	13	14.80	14.80	31.30	28.70	<150	16.28	16.28	34.43	31.57
Imagineziyamu njenge Mg	mg/l	6	6	15	13	10.95	10.95	30.80	29.20	<100	12.05	12.05	33.88	32.12
Isodiyamu njenge Na	mg/l	6	6	15	13	15.60	15.60	48.50	54.60	<200	17.16	17.16	53.35	60.06
I-Alkalinity Lephelele njenge CaCO3	mg/l	6	6	15	13	73.85	73.85	291.80	291.80	Ayidzingeki	81.24	81.24	320.98	320.98
Ikloriyadi njenge Cl	mg/l	6	6	15	13	10.60	10.60	23.40	24.60	<200	11.66	11.66	25.74	27.06
Isaliphiyethi njenge SO4	mg/l	6	6	15	13	6.70	6.70	18.70	34.70	<400	7.37	7.37	20.57	38.17
Inayithrethi njenge NOx-N	mg/l	6	6	15	13	2.02	2.02	1.38	0.21	<10	2.22	2.22	1.51	0.24
Iflorayidi njenge F	mg/l	6	6	15	13	0.34	0.34	0.38	0.38	<1.0	0.37	0.37	0.42	0.42

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X24A, X24B, X24C, X24D											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X24A	X24B	X24C	X24D	X24A	X24B	X24C	X24D		X24A	X24B	X24C	X24D
pH		5	51	5	13	8.48	8.18	8.14	8.45	5.0 – 9.5	9.33	9.00	8.95	9.30
Kuhanjiswa Kwagezi	mS/m	5	51	5	13	37.10	42.80	69.50	74.30	<150	40.81	47.08	76.45	81.73
Ikhalisiyamu njenge Ca	mg/l	5	44	5	13	39.60	20.88	38.00	19.60	<150	43.56	22.97	41.80	21.56
Imagineziyamu njenge Mg	mg/l	5	44	5	13	5.94	21.64	31.30	41.90	<100	6.54	23.81	34.43	46.09
Isodiyamu njenge Na	mg/l	5	44	5	13	57.17	28.99	97.77	37.10	<200	62.89	31.89	107.54	40.81
I-Alkalinity Lephelele njenge CaCO3	mg/l	5	44	5	13	131.74	145.74	348.30	380.60	Ayidzingeki	144.92	160.32	383.13	418.66
Ikloriyadi njenge Cl	mg/l	5	45	5	13	23.22	20.80	61.80	28.50	<200	25.54	22.88	67.98	31.35
Isaliphiyethi njenge SO4	mg/l	5	45	5	13	5.10	23.33	13.90	18.50	<400	5.61	25.66	15.29	20.35
Inayithrethi njenge NOx-N	mg/l	5	43	5	12	0.75	2.54	0.07	2.80	<10	0.82	2.79	0.08	3.08
Ifloraykli njenge F	mg/l	4	41	5	11	1.09	0.21	0.91	0.23	<1.0	1.09	0.23	1.00	0.25

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X24E, X24F, X24G, X24H												
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X24E	X24F	X24G	X24H	X24E	X24F	X24G	X24H		X24E	X24F	X24G	X24H
pH		12	5	23	55	8.61	8.62	8.48	8.25	5.0 – 9.5	9.47	9.48	9.33	9.08
Kuhanjiswa Kwagezi	mS/m	12	5	23	55	100.35	119.80	88.50	77.90	<150	110.39	131.78	97.35	85.69
Ikhalisiyamu njenge Ca	mg/l	12	5	21	49	36.20	64.40	27.30	39.17	<150	39.82	70.84	30.03	43.08
Imagineziyamu njenge Mg	mg/l	12	5	21	48	29.55	46.40	26.80	29.43	<100	32.51	51.04	29.48	32.37
Isodiyamu njenge Na	mg/l	12	5	21	47	190.95	155.70	117.50	68.50	<200	210.05	171.27	129.25	75.35
I-Alkalinity Lephelele njenge CaCO3	mg/l	12	5	21	49	411.60	420.00	369.50	208.14	Ayidzingeki	452.76	462.00	406.45	228.96
Ikloriyadi njenge Cl	mg/l	12	5	21	49	108.10	171.70	83.70	105.35	<200	118.91	188.87	92.07	115.88
Isaliphiyethi njenge SO4	mg/l	12	5	21	49	8.35	9.00	8.10	22.15	<400	9.19	9.90	8.91	24.37
Inayithrethi njenge NOx-N	mg/l	12	5	21	49	0.02	0.81	0.05	0.57	<10	0.02	0.89	0.06	0.63
Iflorayidi njenge F	mg/l	12	4	21	47	0.97	0.51	0.62	0.38	<1.0	1.06	0.56	0.68	0.42

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X31A, X31B, X31C, X31D												
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]			
		X31A*	X31B	X31C	X31D*	X31A*	X31B	X31C	X31D*		X31A*	X31B	X31C	X31D*
pH		4	50	50	52	7.58	8.08	7.54	8.06	5.0 – 9.5	8.34	8.89	8.29	8.87
Kuhanjiswa Kwagezi	mS/m	4	48	49	50	9.00	23.05	6.83	23.13	<150	9.90	25.36	7.51	25.44
Ikhalisiyamu njenge Ca	mg/l	4	45	45	47	6.30	21.45	5.50	21.41	<150	6.93	23.59	6.05	23.55
Imagineziyamu njenge Mg	mg/l	4	45	44	47	1.75	12.79	2.99	12.79	<100	1.93	14.07	3.29	14.07
Isodiyamu njenge Na	mg/l	3	44	43	46	2.10	2.64	2.00	2.69	<200	2.31	2.90	2.20	2.96
I-Alkalinity Lephelele njenge CaCO3	mg/l	4	43	45	45	26.40	97.70	28.80	97.70	Ayidzingeki	29.04	107.47	31.68	107.47
Ikloriyadi njenge Cl	mg/l	4	46	46	48	3.35	3.77	3.30	3.80	<200	3.69	4.14	3.63	4.18
Isaliphiyethi njenge SO4	mg/l	3	45	46	47	2.00	11.02	2.00	11.01	<400	2.20	12.12	2.20	12.11
Inayithrethi njenge NOx-N	mg/l	4	45	46	47	0.23	0.66	0.25	0.66	<10	0.25	0.72	0.28	0.73
Ifluorayidi njenge F	mg/l	4	50	50	46	0.11	8.08	7.54	0.11	<1.0	0.12	8.89	8.29	0.13

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X31E, X31F, X31G, X31H											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X31E	X31F*	X31G	X31H*	X31E	X31F*	X31G	X31H*		X31E	X31F*	X31G	X31H*
pH		20	46	46	52	7.31	7.51	7.51	8.06	5.0 – 9.5	8.04	8.26	8.26	8.87
Kuhanjiswa Kwagezi	mS/m	20	46	46	50	8.52	21.60	21.60	23.13	<150	9.37	23.76	23.76	25.44
Ikhalisiyamu njenge Ca	mg/l	20	46	46	47	5.49	12.10	12.10	21.41	<150	6.04	13.31	13.31	23.55
Imagineziyamu njenge Mg	mg/l	20	46	46	47	1.71	6.02	6.02	12.79	<100	1.88	6.63	6.63	14.07
Isodiyamu njenge Na	mg/l	20	46	46	46	7.52	16.77	16.77	2.69	<200	8.28	18.45	18.45	2.96
I-Alkalinity Lephelele njenge CaCO3	mg/l	20	46	46	45	33.07	68.19	68.19	97.70	Ayidzingeki	36.38	75.01	75.01	107.47
Ikloriyadi njenge Cl	mg/l	20	46	46	48	5.00	8.85	8.85	3.80	<200	5.50	9.74	9.74	4.18
Isaliphiyethi njenge SO4	mg/l	20	46	46	47	7.31	2.00	2.00	11.01	<400	8.04	2.20	2.20	12.11
Inayithrethi njenge NOx-N	mg/l	20	46	46	47	0.12	2.19	2.19	0.66	<10	0.13	2.40	2.40	0.73
Iflorayidi njenge F	mg/l	20	46	46	46	0.14	0.27	0.27	0.11	<1.0	0.16	0.30	0.30	0.13

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X31J, X31K, X31L, X31M											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X31J*	X31K	X31L	X31M	X31J*	X31K	X31L	X31M		X31J*	X31K	X31L	X31M
pH		4	91	68	50	7.31	8.11	8.01	8.17	5.0 – 9.5	8.04	8.92	8.81	8.98
Kuhanjiswa Kwagezi	mS/m	4	92	68	50	29.40	49.75	98.55	113.10	<150	32.34	54.73	108.41	124.41
Ikhalisiyamu njenge Ca	mg/l	4	87	68	50	12.75	23.70	44.09	50.90	<150	14.03	26.07	48.50	55.99
Imagineziyamu njenge Mg	mg/l	4	86	68	50	11.85	17.49	31.34	71.86	<100	13.04	19.24	34.47	79.05
Isodiyamu njenge Na	mg/l	3	85	68	50	39.80	47.10	134.61	91.30	<200	43.78	51.81	148.07	100.43
I-Alkalinity Lephelele njenge CaCO3	mg/l	4	85	68	50	109.65	204.70	288.47	481.35	Ayidzingeki	120.62	225.17	317.31	529.49
Ikloriyadi njenge Cl	mg/l	4	87	68	50	13.65	24.91	108.70	82.40	<200	15.02	27.40	119.57	90.64
Isaliphiyethi njenge SO4	mg/l	3	87	68	50	22.70	8.00	13.22	11.75	<400	24.97	8.80	14.54	12.93
Inayithrethi njenge NOx-N	mg/l	4	85	68	50	1.28	1.65	8.60	4.07	<10	1.40	1.82	9.46	4.47
Iflorayidi njenge F	mg/l	4	84	68	50	0.41	0.81	0.79	0.58	<1.0	0.45	0.89	0.87	0.63

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X32A, X32B, X32C, X32D											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X32A	X32B	X32C	X32D	X32A	X32B	X32C	X32D		X32A	X32B	X32C	X32D
pH		22	12	91	25	7.56	7.55	7.96	7.55	5.0 – 9.5	8.31	8.31	8.76	8.31
Kuhanjiswa Kwagezi	mS/m	22	12	91	25	17.35	16.15	47.20	16.60	<150	19.09	17.77	51.92	18.26
Ikhalisiyamu njenge Ca	mg/l	22	12	91	25	10.22	9.10	23.20	9.80	<150	11.24	10.01	25.51	10.78
Imagineziyamu njenge Mg	mg/l	22	12	91	25	4.05	2.65	10.53	3.54	<100	4.46	2.92	11.58	3.90
Isodiyamu njenge Na	mg/l	22	12	90	25	16.53	18.71	54.92	17.10	<200	18.19	20.58	60.41	18.81
I-Alkalinity Lephelele njenge CaCO3	mg/l	22	12	91	25	63.90	62.00	159.20	64.20	Ayidzingeki	70.29	68.20	175.12	70.62
Ikloriyadi njenge Cl	mg/l	22	12	91	25	6.70	5.05	23.90	6.80	<200	7.37	5.56	26.29	7.48
Isaliphiyethi njenge SO4	mg/l	22	12	90	25	3.00	2.00	7.38	2.00	<400	3.30	2.20	8.12	2.20
Inayithrethi njenge NOx-N	mg/l	22	12	91	25	1.10	1.53	1.80	1.15	<10	1.21	1.68	1.98	1.27
Iflorayidi njenge F	mg/l	22	12	91	25	0.25	0.28	0.67	0.26	<1.0	0.27	0.31	0.74	0.29

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X32E, X32F, X32G, X32H											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X32E	X32F	X32G	X32H	X32E	X32F	X32G	X32H		X32E	X32F	X32G	X32H
pH		84	27	96	69	7.72	8.01	8.11	8.12	5.0 – 9.5	8.50	8.81	8.92	8.93
Kuhanjiswa Kwagezi	mS/m	84	27	96	69	37.80	65.90	123.55	162.00	<150	41.58	72.49	135.91	162.00
Ikhalisiyamu njenge Ca	mg/l	84	27	96	69	20.94	35.25	52.75	55.30	<150	23.03	38.78	58.03	60.83
Imagineziyamu njenge Mg	mg/l	84	27	96	69	9.42	15.80	39.90	72.70	<100	10.36	17.38	43.89	79.97
Isodiyamu njenge Na	mg/l	84	27	96	69	31.45	85.60	143.07	226.60	<200	34.60	94.16	157.38	226.60
I-Alkalinity Lephelele njenge CaCO3	mg/l	84	27	96	69	142.77	219.90	379.15	591.90	Ayidzingeki	157.04	241.89	417.07	651.09
Ikloriyadi njenge Cl	mg/l	84	27	96	69	16.95	72.60	125.10	140.70	<200	18.65	79.86	137.61	154.77
Isaliphiyethi njenge SO4	mg/l	84	27	96	69	5.23	10.00	14.47	15.80	<400	5.75	11.00	15.92	17.38
Inayithrethi njenge NOx-N	mg/l	84	27	96	68	1.17	0.93	84	27	<10	1.29	1.02	84	27
Iflorayidi njenge F	mg/l	84	27	96	69	0.42	0.82	84	27	<1.0	0.46	0.90	84	27

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X32J, X33A, X33B, X33C											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani1)				Sabelo seBHN [2])	Sabelo Sebunjalo Bemanti aphasi3)			
		X32J	X33A	X33B	X33C	X32J	X33A	X33B	X33C		X32J	X33A	X33B	X33C
pH		5	13	3	7	8.74	8.70	8.67	8.68	5.0 – 9.5	9.5	9.5	9.5	9.5
Kuhanjiswa Kwagezi	mS/m	5	13	3	7	172.00	320.00	416.00	141.00	<150	172.00	320.00	416.00	150
Ikhalisiyamu njenge Ca	mg/l	5	13	3	7	42.00	51.20	74.00	57.70	<150	46.20	56.32	81.40	63.47
Imagineziyamu njenge Mg	mg/l	5	13	3	7	34.50	73.80	95.00	41.00	<100	37.95	81.18	100	45.10
Isodiyamu njenge Na	mg/l	5	13	3	7	309.60	597.90	627.60	220.00	<200	309.60	597.90	627.60	220.00
I-Alkalinity Lephelele njenge CaCO3	mg/l	5	13	3	7	569.80	714.70	584.50	542.60	Ayidzingeki	626.78	786.17	642.95	596.86
Ikloriyadi njenge Cl	mg/l	5	13	3	7	223.40	634.90	1060.90	154.60	<200	223.40	634.90	1060.90	170.06
Isaliphiyethi njenge SO4	mg/l	5	13	3	7	16.40	35.20	38.90	4.60	<400	18.04	38.72	42.79	5.06
Inayithrethi njenge NOx-N	mg/l	5	13	3	7	0.02	0.02	0.36	0.02	<10	0.02	0.02	0.40	0.02
Iflorayidi njenge F	mg/l	5	13	3	7	0.97	1.34	1.60	1.18	<1.0	1.0	1.34	1.60	1.18

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X33D, X40A, X40B, X40C											
		Nombolo Yemasampuli				Tigodzi Bunjalo be-Ambient GW nobe imediyani[1]				Sabelo seBHN[2]	Sabelo Sebunjalo Bemanti aphasi[3]		
		X33D*	X40A	X40B	X40C	X33D*	X40A	X40B	X40C		X33D*	X40A	X40B	X40C
pH		4	50	10	43	8.65	8.49	8.67	8.50	5.0 – 9.5	9.5	9.34	9.5	9.35
Kuhanjiswa Kwagezi	mS/m	4	51	10	43	331.00	124.40	152.50	199.00	<150	364.10	136.84	152.50	199.00
Ikhalisiyamu njenge Ca	mg/l	4	46	10	43	90.65	54.10	69.75	50.54	<150	99.72	59.51	76.73	55.60
Imagineziyamu njenge Mg	mg/l	4	45	10	43	84.35	78.50	88.25	67.70	<100	92.79	86.35	97.08	74.47
Isodiyamu njenge Na	mg/l	4	43	10	42	512.65	76.75	178.35	338.95	<200	512.65	84.43	196.19	338.95
I-Alkalinity Lephelele njenge CaCO3	mg/l	4	44	10	43	561.65	446.35	565.30	616.90	Ayidzingeki	617.82	490.99	621.83	678.59
Ikloriyadi njenge Cl	mg/l	4	46	10	43	706.15	159.28	211.10	288.60	<200	706.15	175.21	211.10	288.60
Isaliphiyethi njenge SO4	mg/l	4	46	10	42	30.45	30.60	7.45	22.50	<400	33.50	33.66	8.20	24.75
Inayithrethi njenge NOx-N	mg/l	4	44	10	37	0.52	1.52	3.73	0.74	<10	0.57	1.67	4.10	0.81
Ifluorayidi njenge F	mg/l	4	42	10	43	1.42	0.73	1.12	0.74	<1.0	1.42	0.81	1.12	0.81

Silinganisi Yemakhemikhali	Iyunithi	Tigodzi Temanti Asemandvulo X40D			
		Nombolo Yemasampuli	Tigodzi Bunjalo be-Ambient GW nobe imediyani[1)]	Sabelo seBHN [2)]	Sabelo Sebunjalo Bemanti aphasi[3)]
		X40D	X40D		X40D
pH		38	8.37	5.0 – 9.5	9.21
Kuhanjiswa Kwagezi	mS/m	39	192.50	<150	192.50
Ikhalisiyamu njenge Ca	mg/l	34	68.78	<150	75.66
Imagineziyamu njenge Mg	mg/l	33	102.13	<100	102.13
Isodiyamu njenge Na	mg/l	32	183.93	<200	202.32
I-Alkalinity Lephelele njenge CaCO3	mg/l	33	513.50	Ayidzingeki	564.85
Ikloriyadi njenge Cl	mg/l	34	312.94	<200	312.94
Isaliphiyethi njenge SO4	mg/l	34	18.47	<400	20.32
Inayithrethi njenge NOx-N	mg/l	33	4.30	<10	4.72
Iflorayidi njenge F	mg/l	32	0.95	<1.0	1.04

*These quaternaries did not have groundwater quality, as a result the data was extrapolated from the neighbouring quaternary with similar geology.

Lithebula 7.3: Sigaba Sebunjalo Bemanti kanye netilinganisi letiyinkinga

Sigodzi semanti semandvulo	Sigaba	Tilinganisi Tebunjalo bemanti letiyinkinga
X11A	0	
X11B	0	
X11C	0	
X11D	0	
X11E	0	
X11F	0	
X11G	0	
X11H	0	
X11J	0	
X11K	0	
X12A	0	
X12B	0	
X12C	3	Iflorayidi njenge
X12D	3	Iflorayidi njenge
X12E	I	Ikloriyadi njenge
X12F	0	
X12G	I	Imagineziyamu njenge
X12H	0	
X12J	I	Imagineziyamu njenge
X12K	I	Imagineziyamu njenge
X13J	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge
X13K	2	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Isodiyamu njenge
X13L	I	Kuhanjiswa Kwagezi, Isodiyamu njenge
X14A	0	
X14B	3	Isodiyamu njenge, Ikloriyadi njenge
X14F	0	
X14G	I	Kuhanjiswa Kwagezi, Imagineziyamu njenge
X14H	I	Kuhanjiswa Kwagezi, Isodiyamu njenge
X21A	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge
X21B	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge

Sigodzi semanti semandvulo	Sigaba	Tilinganisi Tebunjalo bemanti letiyinkinga
X21C	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge
X21D	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge
X21E	0	
X21F	3	Iflorayidi njenge
X21G	2	Iflorayidi njenge
X21H	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi
X21J	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi
X21K	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi
X22A	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge
X22B	0	
X22C	0	
X22D	0	
X22E	0	
X22F	0	
X22G	0	
X22H	0	
X22J	2	Iflorayidi njenge
X22K	3	Iflorayidi njenge
X23A	0	
X23B	0	
X23C	0	
X23D	0	
X23E	0	
X23F	0	
X23G	I	Imagineziyamu njenge
X23H	0	
X24A	2	Iflorayidi njenge
X24B	0	
X24C	I	Iflorayidi njenge
X24D	I	Kuhanjiswa Kwagezi
X24E	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Isodiyamu njenge, Imagineziyamu njenge

Sigodzi semanti semandvulo	Sigaba	Tilinganisi Tebunjalo bemanti letiyinkinga
X24F	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Isodiyamu njenge,
X24G	I	Kuhanjiswa Kwagezi, Isodiyamu njenge
X24H	I	Ikloriyadi njenge, Kuhanjiswa Kwagezi
X31A	0	
X31B	0	
X31C	0	
X31D	0	
X31E	0	
X31F	0	
X31G	0	
X31H	0	
X31J	0	
X31K	I	Iflorayidi njenge
X31L	I	Isodiyamu njenge, Kuhanjiswa Kwagezi, Ikloriyadi njenge, Imagineziyamu njenge, Inayithrethi njenge
X31M	I	Kuhanjiswa Kwagezi, Imagineziyamu njenge
X32A	0	
X32B	0	
X32C	0	
X32D	0	
X32E	0	
X32F	I	Iflorayidi njenge
X32G	2	Inayithrethi njenge
X32H	2	Kuhanjiswa Kwagezi, Isodiyamu njenge
X32J	2	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Isodiyamu njenge
X33A	3	Isodiyamu njenge, Ikloriyadi njenge
X33B	3	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Isodiyamu njenge, Iflorayidi njenge
X33C	2	Isodiyamu njenge, Iflorayidi njenge
X33D	3	Ikloriyadi njenge, Isodiyamu njenge
X40A	I	Kuhanjiswa Kwagezi, Ikloriyadi njenge, Imagineziyamu njenge, Iflorayidi njenge
X40B	2	Ikloriyadi njenge, Kuhanjiswa Kwagezi , Iflorayidi njenge

Sigodzi semanti semandvulo	Sigaba	Tilinganisi Tebunjalo bemanti letiyinkinga
X40C	2	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Isodiyamu njenge
X40D	2	Ikloriyadi njenge, Kuhanjiswa Kwagezi, Imagineziyamu njenge

8. I-Desktop Wetland Typing kanye neKwahlukanisa imvelo

Lithebula 8.1: Sifinyeto Semayunithi Emtfombo Wesitete, titete letihlobene kanye nePES nemiphumela ye-EIS

WRU	Tigodzi Temanti Temandvulo	Inchazelo	I-PES ne-EIS lefinyetiwe	Imitselela
1 – I-Highveld Grasslands	Tincenye tetigodzi temanti X11 and X12.	Umtsamo losetulu wetitete letikhulu. Emapani lamakhulu kakhulu (langakavani). Loluhlobo lwetimila lotsantfwa "Njengalolusengcuphelweni yekuphela". Cabana kwekutsi sitete - ngekuya ngetinhlobo ngekhatsi kwaloluhlobo lwetimila tisengcuphelweni ngalokufanako.	Semkhatsini - tilinganiso kusuka ku C kuya ku C/D EC. I-EIS Lesetulu	Kwandza kwetekulima (imitselela yebunjalo bemanti; kunyatselwa/kudliwa tilwane, kuguguleka; kuntjontjwa nekujikiswa). Imitselela yebunjalo bemanti etikwekumayina. Imitselela lejutjelwe yetitjalo tekuchamuka letihlaselako kanye nemitselela yemadamu kuncwilisa letinye titete kanye nekunciphisa kuba khona kwemanti.
2 – Tindzawo Tetjani Emaphetfonkhangala	Tincenye tetigodzi temanti X11, X12, X21, X23 and X14.	Umtsamo losetulu wetitete letikhulu kakhulu. Tinhlobo tetimila "Tinekulimateka" - kutsatfwa kwekutsi letinhlobo letitsembele etiteteni ngako-ke etikho engcuphelweni kakhulu.	Emaphuzu Lasemkhatsini lamanye e-EIS X21A, X21B, X21C kanye X21F: Emaphusu lasetulu e-EIS Kuletigodzi temanti tasemandvulo kwehlukahlukana kwetihlobo tetitete kusetulu (Sebalo semaphesenti semapani lasetulu - asikavami). Umtsamo wetitete usetulu. X21A edvute ne-RAMSAR-listed Verloren Vallei. I-PES isetulu - ilinganiselwa kusuka ku B/C kuya ku C EC.	Kulinywa kwethrawuthi - emadamu ancwilisa titete futsi anciphisa kuba khona kwemanti, imitselela yebunjalo bemanti kanye nekuba nemisele. Tindzawo tetekulima - kuguguleka; kunyatselwa/kudliwa kwetjani nekugedvuleka; kuntjontjwa kwemanti nekujikiswa kwemifula. Kuhlanyelwa kwemahlatsi, timila tekuchamuka letihlaselako, timayini.
3 - Lihlanze	I-X22 netincenye tetigodzi temanti X21, X31, X23 & X24.	Kuminyana (Mountani Bushveld) lokusemkhatsini (Sour Bushveld) kuya kulokuphasi. Tindzawo tetitete letisemkhatsini kuya kuletincane. Kuminyana nekwahlukahlukana kuphasi, kuminyana kungetudlala endzaweni yaseSour Bushveld. Luhlobo lwetimila	I-PES yetitete iphasi kakhulu - Kusuka ku C kuya ku D EC. Tigodzi temanti temandvulo ngekhatsi kweSour Bushveld WRU tinemaphuzu e-EIS	Kuhlanyelwa kwemahlatsi lokukhulu - kunciphisa kungena kwemanti, kunciphisa kuba khona kwemanti kwetitete. Kuhlanyelwa kwemahlatsi kuyahlasela. Imitselela yemaphetselo ekuhlanyelwa kwetihlahla nemigwaco kutsikameta titete bese kuholela

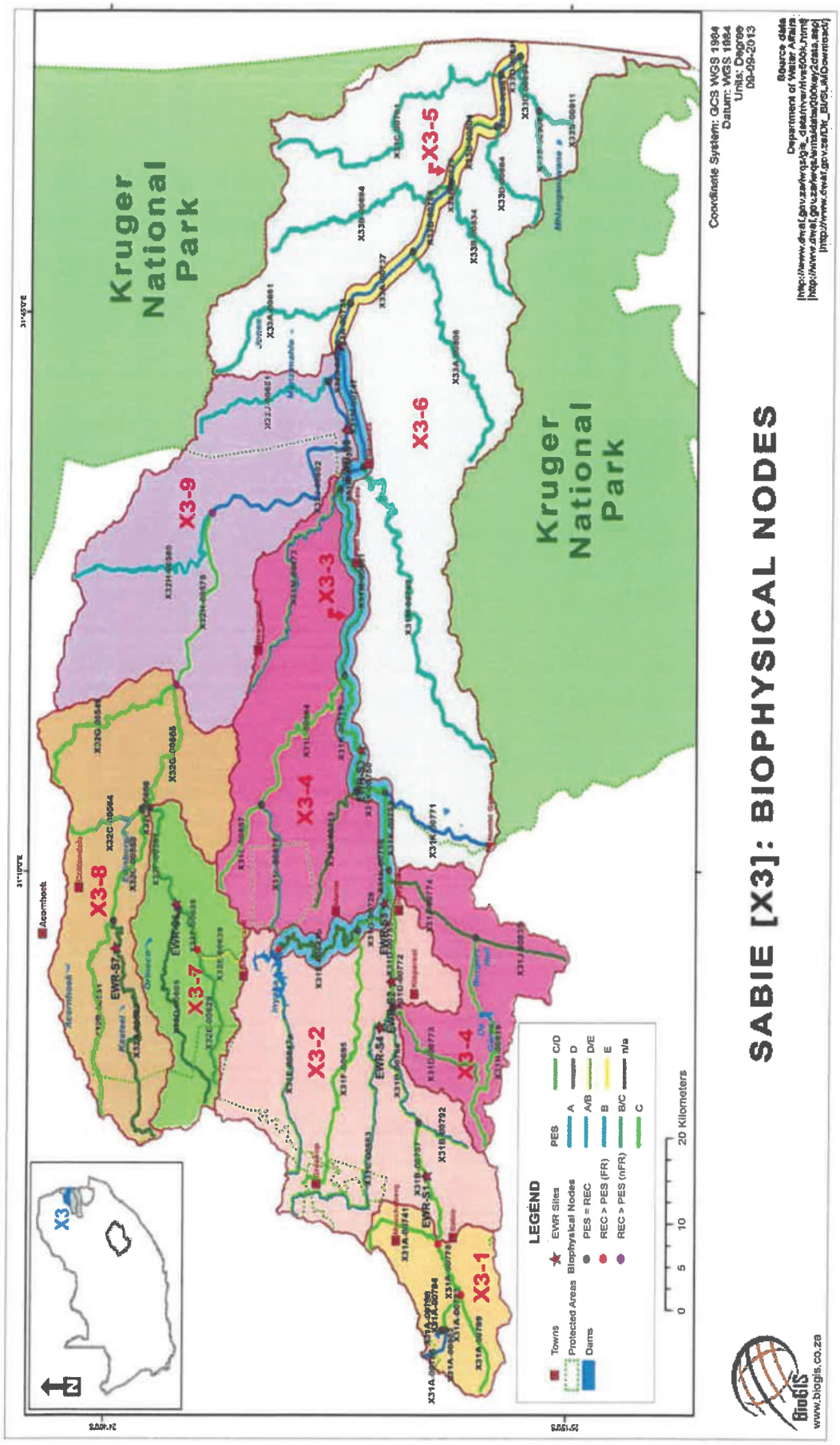
WRU	Tigodzi Temanti Temandvulo	Inchazelo	I-PES ne-EIS lefinyetiwe	Imitselela
		letisengotini yekushabalala. Tinhlobo tetimila egunjini leMountain Bushveld - "Letisengotini Kancane" - tenta umehluko lomncanyana kumaphuzu e-EIS lesemkhatsini.	Lesemkhatsini, bese kutsi leti letikuMountain Bushveld WRU tinemaphuzu e-EIS lephasi.	ekululateni. Kulima kwekunisela, tindzawo temadolobha tetabelo takudzala kanye netimila tekuchamuka letihlaselako nato tibangele lokunye kululateka kwetitete.
4 – IGranite Lowveld	Tincenye tetigodzi temanti X31, X32, X40, X33, X24, X14 na X13.	Titete tincane. Minyana nekwehlukahlukana kwetimila kuncane kakhulu - titete letimbalwa. Loku lokwentekako akukavami nobe kusetulu ngekwehlukahlukana kwetimila. Luhlobo lwetimila lubalwe "Letinekulimateka". Tindzawo letikhulu talesigaba nesigodzi semanti tivikelekile ngekhatsi kwetindzawo tekulondvolotwa kakhulu.	Emaphuzu e-EIS laphasi. Luhla lolubanti lwePES: D kuya kuma A EC - inkhomba yetimo letahlukahlukene. Tonkhe tigodzi temanti titsintfwa ngulokwentiwa kwemadolobha kwetindzawo tetabelo takudzala, tigodzi temanti tasemandvulo letiphasi ngekhatsi kweKruger National Park nasetindzawo tekugcina imvelo tangasese. Ingucuko lencane etimeni taletindzawo; ngesizatfu sekutsi kunetitete letincane kakhulu letitfolakala lapho.	Kuhlanyelwa kwetihlahla, kulima kanye nekwentiwa kwemadolobha. Tindzawo tetihlahla kanye nekulima lokukhulu kunciphisa indzawo yetitete kanye nemanti lakhona. Kokubili imisebenti yekusetjentiswa kwemalanga kungene nasetindzawo tetitete; bese kutsi tindzaw temadolobha tibangele kuguguleka (ngekuguguleka lokukhulu, tingcindzetelo tekudla kwetilwane kanye nekufakwa kwemaphayiphi lokuhlobene nekutfutfukiswa kwetakhiwoncanti).
5 – I-Basalt Lowveld	Tincenye tetigodzi temanti X40, X33, X24 na X13.	Titete letisetindzawo letiphasi kwetihosha. Kuminyana nekwahlukahlukana kwetimila kuphasi kakhulu. Loku lokuncane lokwentekako akukavami nobe kwenteka ngelizinga lelisetulu kulokunye. Loluhlobo lwetimila lubalwe "Njengalolusengcuphelweni Kancane".	Emaphuzu e-EIS laphasi. I-PES isetulu kakhulu – ku A nakuma B EC. Letingakava letibonakalako nguletigodzi temandvulo X13J, X13K na X13L letitsintfwe kakhulu nguletindzawo tasemadolobheni naleti letentiwa emadolobha tasetabelweni takudzala, kanye nekuniselwa kakhulu kwemapulazi.	Tigodzi temandvulo letinyenti titfolakala ngekhatsi kweKruger National Park, futsi kute imitselela lemikhulu kakhulu ezingeni lesigodzi (sigodzi semanti) lekungenteka yentekile.

WRU	Tigodzi Temanti Temandvulo	Inchazelo	I-PES ne-EIS lefinyetiwe	Imitsetsela
6 - ELebombo	Tincenye tetigodzi temanti X40, X33 na X24.	Kute titete tekubaluleka kwanobe ngusiphi sigodzi letilindzelekile ngenca yekwehlela kakhulu, imihlaba lengashoni, kuna lokuncane kwemvula kanye netidzingo tekuhwamuka lokukhulu. Kwehlukahlukana kwetimilo kutawuba phasi kakhulu, futsi kuminyana kutawuba phasi kakhulu.		

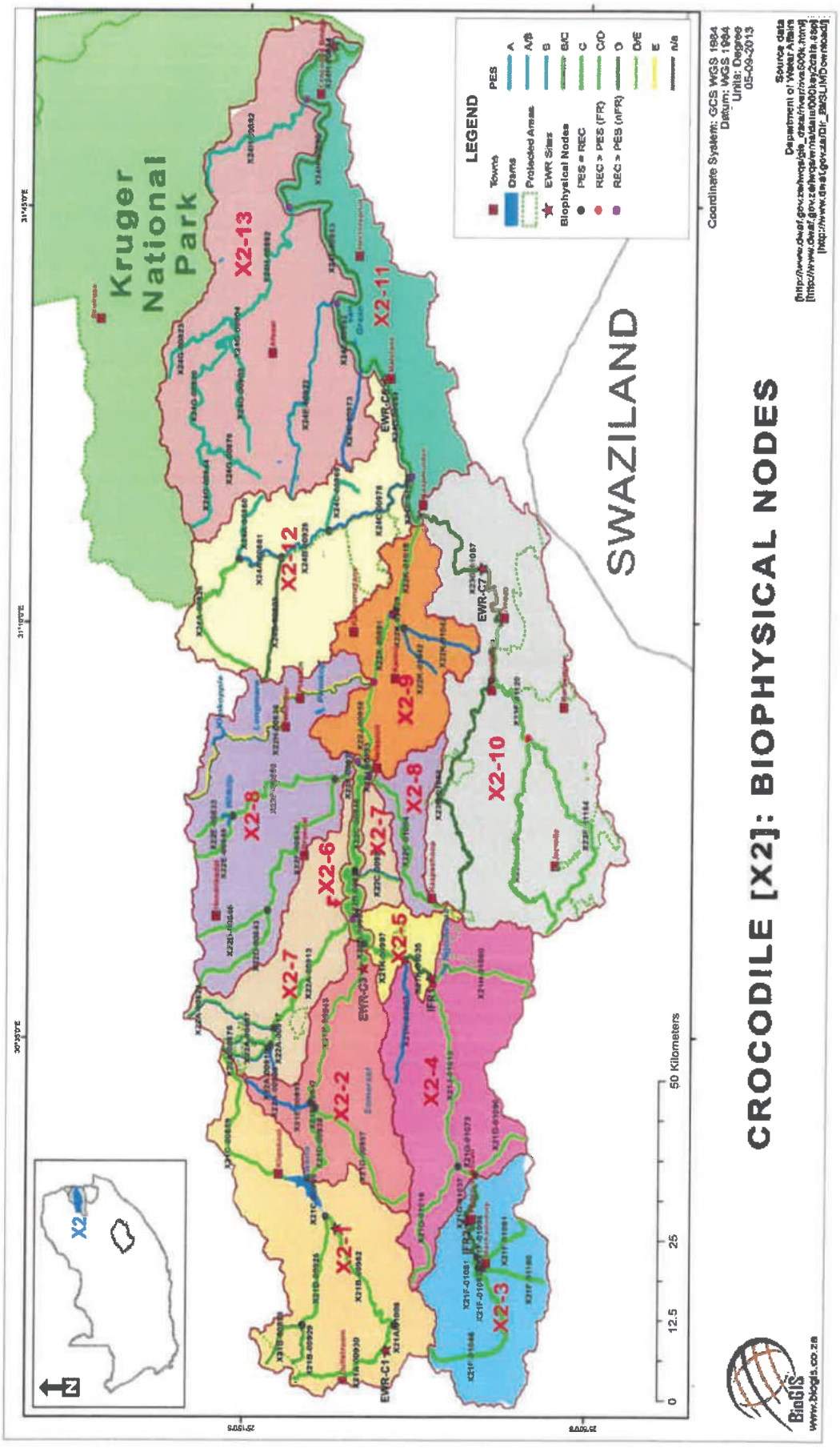
Lithebula 8.2: Sibalokhatsi lesilinganisiwe sePES, EIS neREC setitete ngekhatsi kwetigodzi temandvulo tetigodzi temanti Umgwenya, iSabie neSand River

Sigodzi Semanti Semandvulo	Desktop PES	Desktop EIS	Desktop REC
X21A	C	Etulu	B
X21B	C	Etulu	B
X21C	C	Etulu	B
X21D	B/C	Emkhatsini	B/C
X21E	C	Emkhatsini	C
X21F	B/C	Etulu	B
X21G	C	Emkhatsini	C
X21H	C/D	Emkhatsini	C/D
X21J	D	Emkhatsini	D
X21K	D	Emkhatsini	D
X22A	C/D	Emkhatsini	C/D
X22B	C/D	Phasi	C/D
X22C	D	Emkhatsini	D
X22D	C/D	Emkhatsini	C/D
X22E	C/D	Emkhatsini	C/D
X22F	C	Emkhatsini	C
X22G	C/D	Emkhatsini	C/D
X22H	C	Emkhatsini	C
X22J	D	Phasi	D
X22K	C	Phasi	C
X23A	C	Emkhatsini	C
X23B	C	Emkhatsini	C
X23C	C/D	Emkhatsini	C/D
X23D	C	Emkhatsini	C
X23E	C/D	Emkhatsini	C/D
X23F	C	Emkhatsini	C
X23G	C	Emkhatsini	C
X23H	C	Phasi	C
X24A	D	Phasi	D
X24B	D	Phasi	D
X24C	B/C	Phasi	B/C
X24D	C	Phasi	C

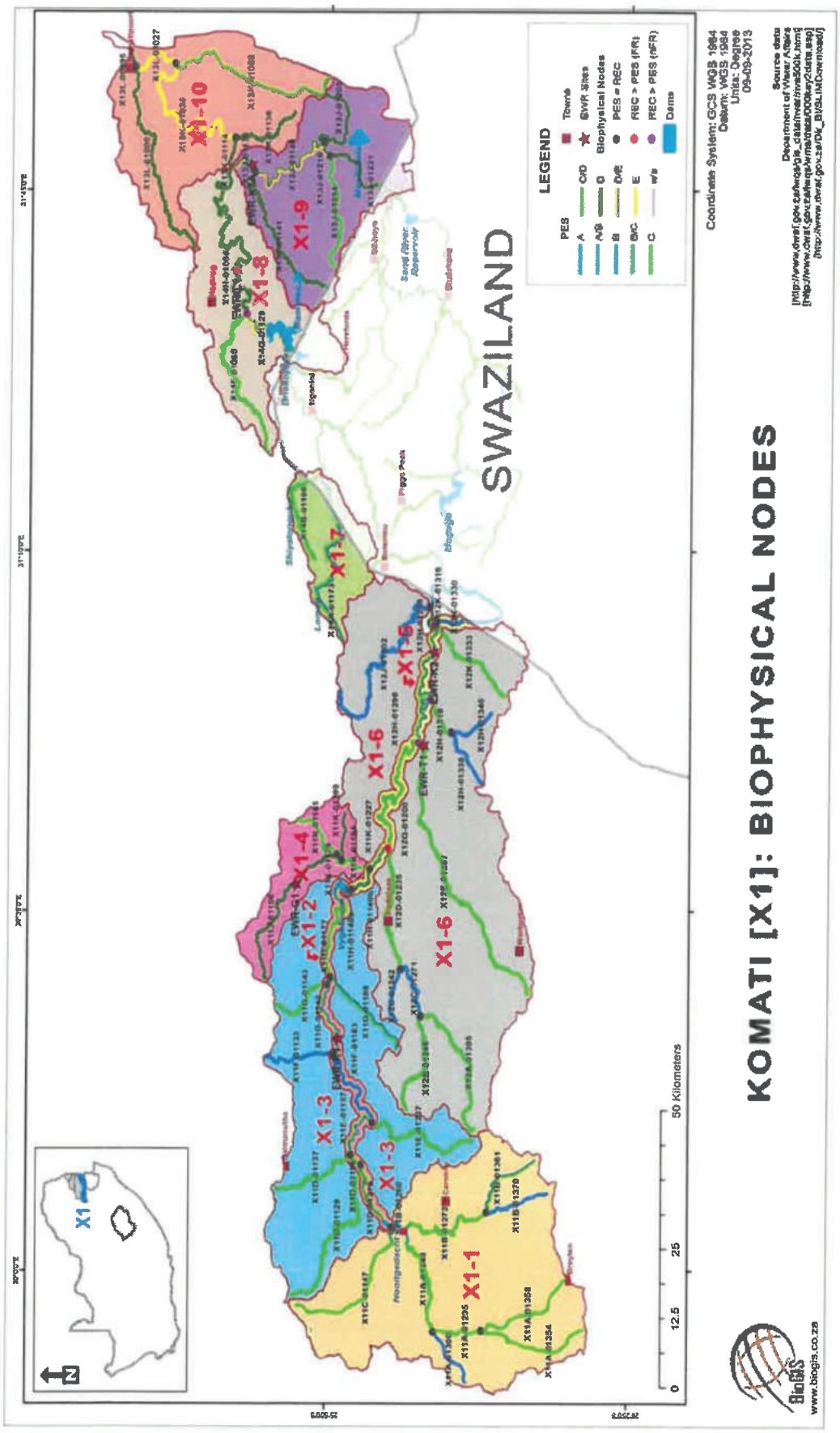
Sigodzi Semanti Semandvulo	Desktop PES	Desktop EIS	Desktop REC
X24E	B	Phasi	B
X24F	B	Phasi	B
X24G	A	Phasi	A
X31A	D	Phasi	D
X31B	D	Phasi	D
X31C	D	Emkhatsini	D
X31D	C	Emkhatsini	C
X31E	D	Emkhatsini	D
X31F	C	Emkhatsini	C
X31G	D	Phasi	D
X31H	C/D	Emkhatsini	C/D
X31J	D	Phasi	D
X31K	D	Phasi	D
X31L	D	Phasi	D
X31M	A	Phasi	A
X32A	D	Emkhatsini	D
X32B	D	Emkhatsini	D
X32C	D	Phasi	D
X32D	D	Emkhatsini	D
X32E	D	Emkhatsini	D
X32F	D	Phasi	D
X32G	D	Phasi	D
X32H	C	Phasi	C
X32J	A	Phasi	A
X33A	A	Phasi	A
X33B	A	Phasi	A
X33C	A	Phasi	A
X33D	A	Phasi	A
X40A	A	Phasi	A
X40B	A	Phasi	A
X40C	C	Phasi	C
X40D	A	Phasi	A



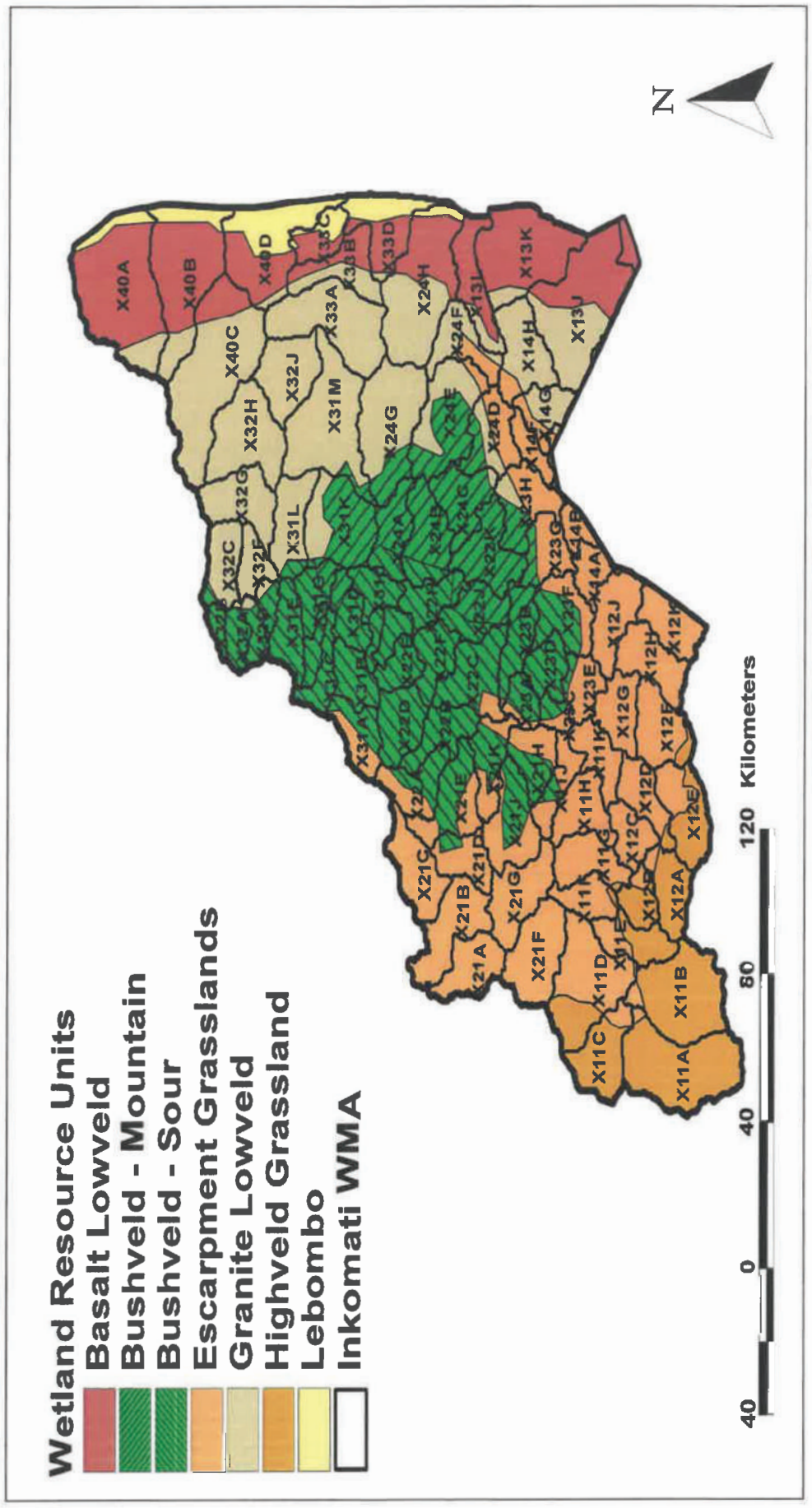
Undwebo 1: Indzawo yemasayithi lakhetshwe e-EWR esigodzini semanti iSabie-Sand (X3)



Undvwebo 2: Indzawo yemasayithi lakhetsiwe e-EWR esigodzini semanti Umgwenya (X3)



Undvwebo 3: Indzawo yemasayithi lakhetsiwe e-EWR esigodzini semanti lKomati (X3)



Umdwebo 4: Kusatjalaliswa kwetigodzi temanti temandvulo macondzana neMagumbi Emtfombo Wetitete