

DEPARTMENT OF WATER AND SANITATION

NO. 724

17 JUNE 2016

**NATIONAL WATER ACT, 1998
(ACT NO. 36 OF 1998)****PROPOSED CLASSES OF WATER RESOURCES AND RESOURCE QUALITY OBJECTIVES
WITH THE ACCOMPANYING RESERVE FOR THE CATCHMENTS OF THE MVOTI TO
UMZIMKULU**

I, Nomvula Paula Mokonyane, in my capacity as Minister of Water and Sanitation, and duly authorised in terms of section 13(4) of the National Water Act, 1998 (Act No.36 of 1998), hereby publish, for public comment, the proposed classes of water resources and the proposed resource quality objectives for the catchments of the Mvoti to Umzimkulu, in the Schedule, to be determined under section 13(1) of the said Act.

Any person who wishes to submit written comments with regards to the proposed classes and resource quality objectives should submit the comments within 60 days from the date of publication of this Notice to:

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**MRS NP MOKONYANE
MINISTER OF WATER AND SANITATION**

DATE: 06. 03/16

PROPOSED CLASSES OF WATER RESOURCES AND RESOURCE QUALITY OBJECTIVES WITH THE ACCOMPANYING RESERVE FOR THE CATCHMENTS OF THE MVOTI TO UMZIMKULU TO BE DETERMINED IN TERMS OF SECTION 13(1) OF THE NATIONAL WATER ACT, 1998 (ACT NO.36 OF 1998)

SCHEDULE

1. DESCRIPTION OF WATER RESOURCE

- 1.1 The proposed classes and resource quality objectives are determined for all or part of every significant water resource within the catchments of the Mvoti to Umzimkulu as set out below:

Water Management Area: Mvoti to Umzimkulu

Catchment: U Primary Catchment

Drainage areas: Secondary drainage areas T40 (Mtamvuna) and T52 (Umzimkulu)

River(s): Major rivers include the Mvoti, uMngeni, uMkhomazi, Umzimkulu and Mtamvuna river systems

- 1.2 The Minister has in terms of section 12 of the National Water Act, Act No.36 of 1998 (the Act), prescribed a system for classifying water resources by issuing Government Notice No. R810, published in *Gazette* No. 33541 dated 17 September 2010. In terms of section 13(1) of the Act, the Minister must, as soon as reasonably practicable after the Minister has prescribed a system for classifying water resources and subject to subsection (4), by notice in the *Gazette*, determine for all or part of every significant water resource, a class in accordance with the prescribed classification system and resource quality objectives based on the class so determined.
- 1.3 The Minister, in terms of section 13(4) of the Act, proposes, for the purposes of section 13(1) of the Act, the following classes of each significant water resource for catchments of the of the Mvoti to Umzimkulu:

A. PROPOSED CLASSES OF WATER RESOURCES AS REQUIRED IN TERMS OF SECTION 13(4)(a)(i)(aa) OF THE NATIONAL WATER ACT, 1998

- i. A summary of the water resource classes for integrated units of analysis (IUA) (Figure 1) and ecological categories per biophysical node is set out in Table 1.
- ii. IUAs are classified in terms of their extent of permissible utilisation and protection as either Class I: indicating high environmental protection and minimal utilisation; Class II indicating moderate protection and moderate utilisation; and Class III indicating sustainable minimal protection and high utilisation.
- iii. Table 1 provides the IUA, its water resource classes and its respective catchment configuration. The catchment configuration consists of a number of biophysical nodes representing river reaches or resource units (RUs). The target ecological category (TEC) for each RU in the IUA is provided.

B. PROPOSED RESOURCE QUALITY OBJECTIVES OF WATER RESOURCES AS REQUIRED IN TERMS OF SECTION 13(4)(a)(i)(bb) to (ee) OF THE NATIONAL WATER ACT, 1998

- i. Table 2 to Table 4 provides the resource quality objectives (RQOs) for each resource unit (RU) which is represented by a biophysical node.
- ii. Table 5 represents the water quality RQOs for each HIGH PRIORITY water quality (WQ) RU.
- iii. RQOs will apply from the date signed off as determined in terms of Section 13(1) of the National Water Act, 1998, unless otherwise specified by the Minister.

1. PROPOSED WATER RESOURCE CLASSES AND CATCHMENT CONFIGURATION

Table 1 Summary of Water Resource Classes and Ecological Categories

IUA	Water Resource Class	Nodes	River	TEC
T4: MTAMVUNA				
T4-1	II	T40A-05450	Mafadobo	B
		T40A-05487	Goxe	B
		T40B-05337	Weza	C
		T40C-05510	Mtamvuna	B
		T40C-05520	Mtamvuna	C
		T40C-05530	Mtamvuna	B
		T40C-05566	Ludeke	B
		T40C-05589	KuNtlamvukazi	B
		T40C-05600	Ludeke	B
		T40D-05537	Mtamvuna	C
		T40D-05584	Mtamvuna	C
		T40D-05615	Tungwana	B
		T40D-05643	Gwala	B
		T40D-05683	Ntelekweni	B/C
		T40D-05707	Mtamvuna	C
		T40D-05719	Londobezi	B
	Mt_R_EWR1	Mtamvuna	C	
	T40E-05767	Hlolweni	B	
T5: UMZIMKULU				
T5-1	I	T51A-04431	Mzimbkhulu	B
		T51A-04522	Mzimude	B
		T51A-04608		B
		T51A-04551	Mzimude	B
		T51B-04421	Mzimbkhulu	B
		T51D-04404	Pholela	B
		T51F-04566	Boesmans	A
		T51F-04674		C
		T51G-04669	Ndawana	B
	T51G-04722	Ndawana	C	
T5-2	II	T51C-04606		C
		MzEWR2i	Mzimbkhulu	B
		T51D-04460	Pholelana	D/E
		T51E-04536		C
		MzEWR9r	Pholela	B/C
		T51F-04611	Ngwangwane	A
		MzEWR8r	Ngwangwane	C
		T51G-04751		B
		T51H-04828	Gungununu	A/B
		T51H-04846	Lubhukwini	A
		T51H-04913	Nonginqa	B/C
		T51H-04923	Malenge	B
		T51H-04808	Gungununu	B
T51H-04884	Gungununu	B/C		
T51H-04908	Gungununu	B/C		

IUA	Water Resource Class	Nodes	River	TEC
		MzEWR3i	Mzimkhulu	B
		T52B-04947	Cabane	B
		T52C-04880		C
		T52C-04960	Mzimkhulu	B
		T52D-05024	Ncalu	B
		T52D-05061	Mgodi	B
		T52D-04948	Mzimkhulu	B
		T52D-05137	Mzimkhulu	B
		T52E-05053	Upper Bisi	B
		T52F-05104	Little Bisi	C
		T52F-05190	Mbumba	B/C
		T52F-05139	Little Bisi	B
		T52G-05226	uMbumbane	B/C
		T52G-05171	Bisi	B
		T52H-05244	Mahobe	B/C
		T52H-05178	Bisi	B
		T52K-05475	Nkondwana	B/C
		MzEWR17i	Mzimkhulwana	B
T5-3	I	T52H-05295	Magogo	B
		MzEWR14r	Bisi	B/C
		T52H-05189	Bisi	B
		MzEWR6i	Mzimkhulu	A/B
U1: uMKHOMAZI				
U1-1	I	U10A-04115	Lotheni	A/B
		U10A-04202	Nhlathimbe	B
		U10A-04301	Lotheni	B
		U10B-04239	uMkhomazi	B
		U10B-04251	uMkhomazi	A
		U10B-04274	Nhlangeni	A
		U10B-04337	uMkhomazi	B
		U10B-04343	Mqatsheni	B
		U10C-04347	Mkhomazana	B
		U10D-04199	Nzinga	A
		U10D-04222	Rooidraai	B
		U10D-04298	Nzinga	B
		U10D-04349	uMkhomazi	B
		U10D-04434	uMkhomazi	B
U1-2	II	U10E-04380	uMkhomazi	C
		U10F-04528	uMkhomazi	C
		Mk_I_EWR1	uMkhomazi	C
		U10G-04388	Elands	B
		U10G-04405		C
		U10G-04473	Elands	B
U1-3	I	U10H-04576	Tholeni	B
		U10H-04666	Ngudwini	B
		U10H-04708	Ngudwini	B
		U10H-04729	Mzalanyoni	C
		Mk_I_EWR2	uMkhomazi	B

IUA	Water Resource Class	Nodes	River	TEC
		U10J-04721	Pateni	B
U1-4	II	U10J-04713	Mkobeni	B
		U10J-04820	Lufafa	B
		U10J-04837		A/B
		U10K-04842	Nhlavini	B
		U10K-04899	Xobho	C/D
		U10K-04946	Nhlavini	B/C
		Mk_I_EWR3	uMkhomazi	C
		U2: uMNGENI		
U2-1	II	Mg_R_EWR1	uMngeni	C/D
		U20B-04074	Ndiza	B
		U20B-04144	Mpofana	C
		U20B-04173	Lions	B
		U20B-04185	Lions	B/C
		U20C-04190	Lions	B
		U20C-04332	Gqishi	B
		U20C-04340	Nguklu	C
U2-2	III	U20D-04029	Yarrow	B
		U20D-04032	Karkloof	C
		U20D-04098	Kusane	D
		U20D-04151	Karkloof	B
		U20E-04136	Nculwane	C
		Mg_R_EWR3	Karkloof	B
		U20E-04221	uMngeni	B/C
		Mg_I_EWR 2	uMngeni	C
		U20E-04271	Doring Spruit	B/C
		U20F-04011	Sterkspruit	C/D
U2-3	III	U20F-04095	Mpolweni	C/D
		U20F-04131	Mhlalane	C/D
		U20F-04204	Sterkspruit	B/C
		U20F-04224	Mpolweni	B/C
		U20G-04194	Mkabela	C/D
		U20G-04215	Cramond Stream	B/C
		U20G-04240	uMngeni	B/C
		U20G-04259	uMngeni	B/C
U20G-04385US	uMngeni	B/C		
U2-4	II	U20H-04410	Nqabeni	C
		U20H-04449	uMnsunduze	C
		Mg_R_EWR4	uMnsunduze	D
		U20J-04391	uMnsunduze	C
		U20J-04401	uMnsunduze	D
		U20J-04452	Mpushini	B
		U20J-04459	uMnsunduze	C
		U20J-04461	Slang Spruit	C/D
		U20J-04488	Mshwati	B
U2-5	III	U20K-04181	Mqeku	C
		U20K-04296	Tholeni	B/C
		U20K-04411	Mqeku	B

IUA	Water Resource Class	Nodes	River	TEC
		Mg_I_EWR 5	uMngeni	D
U2-6	III	U20M-04625		D
		U20M-04639	Palmiet	D
		U20M-04642	Palmiet	D
		U20M-04649	Mbongokazi	C
		U20M-04653	Palmiet	C/D
		U20M-04659	Palmiet	C
		U20M-04682		C/D
U3: uMDLOTI AND uTHONGATHI				
U3-1	III	U30A-04228	uMdloti	B
		U30A-04360	uMdloti	D
		U30A-04363	Mwangala	B
U3-2	II	U30B-04465	Black Mhlashini	B/C
U3-3	II	U30C-04227	uThongathi	B/C
		U30C-04272	Mona	B
U4: MVOTI				
U4-1	II	U40A-03869	Mvoti	B
		U40B-03708	Intinda	C
		U40B-03740	Mvozana	C
		Mv_I_EWR_1	Heinespruit	C
		U40B-03832	Mvozana	C/D
		U40B-03896	Mvoti	C
		U40C-03982	Khamanzi	B
		U40D-03867	Mvoti	B
U4-2	I	U40D-03908	Mtize	B
		U40D-03957	Mvoti	B
		U40E-03967	Mvoti	B/C
		U40E-03985	Mvoti	B
		U40E-04079	Faye	B
		U40E-04082	Sikoto	B
		U40E-04137	Sikoto	B
		U40F-03690	Potspruit	C
		U40F-03694	Hlimbitwa	C
		U40F-03730	Cubhu	C
		U40F-03769	Hlimbitwa	C
		U40F-03790	Nseleni	B/C
		U40F-03806	Hlimbitwa	B
		U40G-03843	Hlimbitwa	B
U4-3	II	Mv_I_EWR_2	Mvoti	C
		U40H-04091	Pambela	B
		U40H-04117	Nsuze	B
		U40H-04133	Nsuze	B
U6: UMLAZI				
U6-1	III	U60A-04533	uMlazi	C
		U60B-04614	Mkuzane	C/D
		U60C-04555	uMlazi	C/D
		U60C-04556	Sterkspruit	D
		U60C-04613	Wekeweke	C

IUA	Water Resource Class	Nodes	River	TEC
U6-2	III	U60D-04661	uMlazi	C/D
U6-3	I	U60E-04714	Mbokodweni	B
		U60E-04792	Mbokodweni	C
		U60E-04795	Bivane	B
U7: LOVU				
U7-1	III	U70A-04599	Serpentine	C
		U70A-04609	Lovu	B/C
		U70A-04618		C
		U70A-04685	Lovu	C
		U70B-04655	Lovu	C/D
		U70C-04710	Mgwahumbe	C
		U70C-04724		C
		U70C-04732		C
		Lo_R_EWR1	Lovu	B/C
U70D-04800	Nungwane	B/C		
U8: MTWALUME AND MZUMBE				
U8-1	I	U80B-05145	Mzumbe_Est	B
		U80B-05161	Mhlabatshane	B
		U80C-05231	Mzumbe	B
		U80C-05329	Kwa-Malukaka	B
U8-2	II	U80E-05028	Mtwalume	C
		U80E-05212	Quha	B
		U80F-05258	Mtwalume	B
		U80F-05301	uMngeni	B
SOUTHERN CLUSTERS 1				
SC.1	I	T40F-05666	Mbizana	B
		T40G-05616	Vungu	B
		Estuary	Mtamvuma	A/B
		Estuary	Zolwane	B
		Estuary	Sandhlunlu	C
		Estuary	Kuboyoyi	B
		Estuary	Tongazi	B/C
		Estuary	Kandanhlovu	B
		Estuary	Mpenjati	B
		Estuary	Umhlangankulu	C
		Estuary	Kaba	C
		Estuary	Mbizana	B
		Estuary	Mvuthsini	B/C
		Estuary	Bilanhlo	C
		Estuary	Umvazana	C
		Estuary	Kongweni	EF
		Estuary	Vungu	B
		Estuary	Mhlangeni	C
		Estuary	Zotsha	B
		Estuary	Boboyi	B/C
Estuary	Mbango	EF		
Estuary	Umzimkulu	B		
SOUTHERN CLUSTERS 2				

IUA	Water Resource Class	Nodes	River	TEC
SC.2	II	U80G-05097	Fafa	B
		U80H-05109	Mzinto	C
		U80H-05120	Mzimayi	C
		U80H-05186	Mkhumbane	C
		U80H-05202	Sezela	C
		U80H-05229	Mdesingane	C
		U80J-04979	Mpambanyoni	B
		U80J-05043	Ndonyane	B/C
		U80K-04952	Mpambanyoni	C
		Estuary	Mtentwini	C
		Estuary	Mhlangamkulo	C
		Estuary	Domba	D
		Estuary	Koshwani	C
		Estuary	Inhshambili	C
		Estuary	Mzumbe	C/D
		Estuary	Mhlabatshane	B
		Estuary	Mhlungwa	C
		Estuary	Mfazazana	C
		Estuary	KwaMakozi	B
		Estuary	Mnamfu	C
		Estuary	Mtwalume	C
		Estuary	Mvuzi	C
		Estuary	Fafa	C
		Estuary	Mdesingane	D
		Estuary	Sezela	C
		Estuary	Mkumbane	C
		Estuary	Mzinto	C/D
		Estuary	Nkomba	C
Estuary	Mzimayi	C/D		
Estuary	Mpambanyoni	C		
CENTRAL CLUSTER				
CC	III	U80L-05020	aMahlongwa	B/C
		U70E-04942	Umsimbazi	C
		U70E-04974	uMgababa	C
		U70F-04845	aManzimtoti	C
		U70F-04893	Little amanzimtoti	C
		Estuary	aMahlongwa	B
		Estuary	Mahlangwana	B
		Estuary	uMkhomazi	B/C
		Estuary	Ngane	C
		Estuary	Umgababa	B/C
		Estuary	Msimbazi	B
		Estuary	Lovu	B/C
		Estuary	Little aMmanzimtoti	EF
		Estuary	aManzimtoti	D
		Estuary	Mmbokotwini	EF
		Estuary	Sipingo	EF
		Estuary	Durban Bay	EF

IUA	Water Resource Class	Nodes	River	TEC
		Estuary	Durban Bay Shallow Zone	D
		Estuary	uMngeni	D
		Estuary	Mhlanga	B
NORTHERN CLUSTER				
NC	III	U30E-04207	Mhlali	C
		U50A-04018	Zinkwazi	B/C
		U50A-04021	Nonoti	B/C
		U50A-04141	Mdlotane	B/C
		Estuary	Mhlali	D
		Estuary	Bobstream	B/C
		Estuary	Seteni	B/C
		Estuary	Mvoti	C/D
		Estuary	Mdlotane	A/B
		Estuary	Nonoti	C
		Estuary	Zinkwazi	B

2. RESOURCE QUALITY OBJECTIVES

Resource Quality Objectives for each RU are presented in Table 2 to 4 below. All RQOs are applicable from the date signed off, unless otherwise stated.

Table 2 provides an indication of the hydrological RQOs for rivers expressed in terms of flow at the ecological water requirement (EWR) sites. These summarised statistics are representative of the required flow regime in the river where the variability is dependent on the seasonal and temporal pattern of natural flow conditions. The mean monthly flows represent low flow requirements of a representative wet (February) and dry (September) month.

Table 2 RIVERS: Summary of key hydrological RQOs

RU	Biophysical node and EWR site	River	TEC	nMAR ¹ (MCM)	Low flows (% nMAR) ²	Total flows (%nMAR) ³	Sep		Feb	
							(m ² /s)		(m ² /s)	
							90%	60%	90%	60%
MTAMVUNA (T4): IUA T4-1										
MRU MT B	T40E-05601 Mt_R_EWR1	Mtamvuna	C	79.22	19.1	32.1	0.332	0.525	1.157	1.606
uMKHOMAZI (U1): IUA U1-2										
MRU uMKHOMAZI B.3	U10E-04380 Mk_I_EWR1	uMkhomazi	C	683.17	18.1	27.2	0.890	1.458	4.130	5.542
uMKHOMAZI (U1): IUA U1-3										
MRU uMKHOMAZI C	U10J-04679 Mk_I_EWR2	uMkhomazi	B	890.91	14.2	35.8	1.551	2.869	5.991	10.488
uMKHOMAZI (U1): IUA U1-4										
MRU uMKHOMAZI D	U10M-04746 Mk_I_EWR3	uMkhomazi	C	1068.6	21.2	31.1	1.532	2.203	5.589	7.668
uMNGENI (U2): IUA U2-1										
MRU uMnA	U20A-04253 Mg_R_EWR1	uMngeni	C/D	79.22	10.1	21.7	0.016	0.098	0.179	0.327
uMNGENI (U2): IUA U2-2										
M KAR C	U20E-04170 Mg_R_EWR3	uMngeni	B	70.11	27.3	43.5	0.032	0.245	0.203	0.758
MRU uMnB	U20E-04243 Mg_I_EWR2	uMngeni	C	228.19	14.7	20	0.460	0.810	0.450	0.990
uMNGENI (U2): IUA U2-5										
MRU uMn D	U20L-04435 Mg_I_EWR5	uMngeni	D	583.66	21.2	24.3	0.856	2.017	1.655	2.477
MVOTI (U4): IUA U4-1 and U4-2										
MRU HEYNS A	U40B-03770 Mv_I_EWR1	Mvoti	C	17.36	18.2	27.9	0.030	0.037	0.067	0.093
MVOTI (U4): IUA U4-3										
MRU MVOTI C	U40H-04064 Mv_I_EWR2	Mvoti	C	273.96	14.4	21.2	0.174	0.402	0.622	1.336
LOVU (U7): IUA U7-1										
MRU LOVU D	U40H-04064 Lo_R_EWR1	Lovu	B/C	87.76	22.8	37.9	0.142	0.189	0.359	0.533

1 nMAR is the natural Mean Annual Runoff in million cubic meters per annum.

2 % nMAR is flow required at the nodes expressed as a percentage of the natural Mean Annual Runoff, Low flows and Total flows.

3 Percentage points on the monthly low flow frequency distribution continuum at the nodes, expressed as the percentage of the months (90% and 60% for EWR sites) that the flow should equal or exceed the indicated minimum values.

Table 3 provides the habitat, biota and water quality RQOs for each IUA of high priority RUs in the respective river systems. RQOs and the TECs are provided for each component and/or indicator. Note that monitoring sites used for water quality monitoring must be those specified in the associated Reserve documentation.

Table 3 RIVERS: RQOs for water quality, geomorphology, riparian vegetation, macro-invertebrates and fish in HIGH priority RUs

Component/ Indicator	TEC	RQO
IUA T4-1: MTAMVUNA		
RU EWR MT_R_EWR1 (T40E-05601, T40C-05520, T40D-05537, 05584, 05707)		
Instream Habitat Integrity	B/C	Maintain the target EC (>78%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	B/C	Maintain the target EC (>78%).
Invertebrates	B	Maintain the target EC (>82%).
Riparian vegetation	C/D	Maintain the target EC (>58%).
Water quality	A/B	Maintain the target EC (>88%). Ensure that turbidity or clarity levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff events (Aquatic ecosystems: driver).
IUA U1-2: MIDDLE uMKHOMAZI		
RU MK_I_EWR 1 DS (U10F-04528 DS)		
Instream Habitat Integrity	B	Maintain the target EC (>82%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	B	Maintain the target EC (>82%).
Invertebrates	B/C	Maintain the target EC (>78%).
Riparian vegetation	C	Maintain the target EC (>62%).
Water quality	A/B	Maintain the target EC (>88%). Ensure that turbidity or clarity levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff events (Aquatic ecosystems: driver).
IUA U1-3: uMKHOMAZI GORGE		
RU MK_I_EWR 2 (U10J-04679, U10JH-04638, 04675)		
Instream Habitat Integrity	B	Maintain the target EC (>82%)
Riparian Habitat Integrity	B/C	Maintain the target EC (>78%)
Fish	B	Maintain the target EC (>82%).
Invertebrates	B	Maintain the target EC (>82%).
Riparian vegetation	B	Maintain the target EC (>82%).
Water quality	A/B	Maintain the target EC (>88%). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.015 mg/L PO ₄ -P (Aquatic ecosystems: driver). Ensure that electrical conductivity (salt) levels are within Ideal limits: 95 th percentile of the data must be less than or equal to 30 mS/m (Aquatic ecosystems: driver).
IUA U1-4: LOWER uMKHOMAZI		
RU MK_I_EWR 3 (U10M-04746, U10J-04807, 04799, 04833, U10K-04838)		
Instream Habitat Integrity	C	Maintain the target EC (>62%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	B	Maintain the target EC (>82%).

Component/ Indicator	TEC	RQO
Invertebrates	B	Maintain the target EC (>82%).
Riparian vegetation	D	Maintain the target EC (>42%).
Water quality	A/B	Maintain the target EC (>88%). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.015 mg/L PO ₄ -P (Aquatic ecosystems: driver).
		Ensure that electrical conductivity (salt) levels are within Acceptable limits: 95 th percentile of the data must be less than or equal to 55 mS/m (Aquatic ecosystems: driver).
IUA U2-1: uMNGENI UPSTREAM MIDMAR DAM RU Mg_R_EWR 1 (U20A-04253, U20C-04275)		
Instream Habitat Integrity	C	Maintain the target EC (>62%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	D (C)	Maintain the target EC (>42%).
Invertebrates	C	Maintain the target EC (>62%).
Riparian vegetation	C/D	Maintain the target EC (>58%). Perennial invasive alien species must be kept in check to maintain the C/D. Maintain the composition and diversity of the woody and non-woody species.
Water quality	B	Maintain the target EC (>82%). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.015 mg/L PO ₄ -P (Aquatic ecosystems: driver).
		Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
IUA U2-2: uMNGENI, MIDMAR TO ALBERT FALLS RU Mg_I_EWR 2 (U20E-04243, U20E-04221)		
Instream Habitat Integrity	D	Maintain the target EC (>42%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	D	Maintain the target EC (>42%).
Invertebrates	C	Maintain the target EC (>62%).
Riparian vegetation	C	Maintain the target EC (>62%).
Water quality	C/D	Maintain the target EC (>58%). Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.075 mg/L PO ₄ -P (Aquatic ecosystems: driver).
		Ensure that nutrient levels (Total Inorganic Nitrogen; TIN) are within Acceptable limits: 50 th percentile of the data must be less than 0.85 mg/L TIN-N (Aquatic ecosystems: driver).
		Ensure that electrical conductivity (salt) levels are within Ideal limits: 95 th percentile of the data must be less than or equal to 30 mS/m (Aquatic ecosystems: driver).
		Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
		Ensure that toxics (ammonia, aluminium, lead) are within Tolerable categories: 95 th percentile of the data must be within the D category according to DWAF (2008). Ensure that other toxics monitored are within Ideal limits or A categories (DWAF, 2008) or the TWQR for toxics in DWAF (1996).
RU Mg_R_EWR 3 (U20E-04170)		
Instream Habitat Integrity	C	Maintain the target EC (>62%)
Riparian Habitat Integrity	B	Maintain the target EC (>82%)
Fish	B/C	Maintain the target EC (>78%)
Invertebrates	B	Maintain the target EC (>82%).

Component/ Indicator	TEC	RQO
Riparian vegetation	B	Maintain the target EC (>82%).
Water quality	B	Maintain the target EC (>82%). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.015 mg/L PO ₄ -P (Aquatic ecosystems: driver).
IUA U2-5: uMNGENI DS uMNSUNDUZE CONFLUENCE TO INANDA DAM RU Mg_I_EWR 5 (U20L-04435, U20M-04396)		
Instream Habitat Integrity	D	Maintain the target EC (>42%)
Riparian Habitat Integrity	D	Maintain the target EC (>42%)
Fish	D	Maintain the target EC (>42%).
Invertebrates	C/D	Maintain the target EC (>58%).
Riparian vegetation	D	Maintain the target EC (>42%).
Water quality	C/D	Maintain the target EC (>58%). Ensure that nutrient levels (phosphate and Total Inorganic Nitrogen; TIN) are within Tolerable limits: 50 th percentile of the data must be less than or equal to 0.075 mg/L PO ₄ -P (Aquatic ecosystems: driver). 50 th percentile of the data must be less than or equal to 4.0 mg/L TIN-N (Aquatic ecosystems: driver).
		Ensure that electrical conductivity (salt) levels are within Acceptable limits: 95 th percentile of the data must be less than or equal to 55 mS/m (Aquatic ecosystems: driver).
		Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
IUA U4-1 AND 4-2: MVOTI RU MV_I_EWR 1 (U40B-03770, HEINSSPRUIT)		
Instream Habitat Integrity	C	Maintain the target EC (>62%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	C	Maintain the target EC (>62%).
Invertebrates	C	Maintain the target EC (>62%).
Riparian vegetation	B/C	Maintain the target EC (>78%).
Water quality	C	Maintain the target EC (>62%). Ensure that nutrient levels (phosphate and Total Inorganic Nitrogen; TIN) are within Tolerable limits: 50 th percentile of the data must be less than 0.125 mg/L PO ₄ -P (Aquatic ecosystems: driver). 50 th percentile of the data must be less than 2.5 mg/L TIN-N (Aquatic ecosystems: driver).
		Ensure that electrical conductivity (salt) levels are within Ideal limits: 95 th percentile of the data must be less than or equal to 30 mS/m (Aquatic ecosystems: driver).
		Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
		Ensure that toxics (ammonia) are within Tolerable categories: 95 th percentile of the data must be within the D category according to DWAF (2008). Ensure that other toxics monitored are within Ideal limits or A categories (DWAF, 2008) or the TWQR for toxics in DWAF (1996).
IUA U4-3: LOWER MVOTI RU MV_I_EWR 2 (U40H-04064)		
Instream Habitat Integrity	C	Maintain the target EC (>62%)
Riparian Habitat Integrity	C	Maintain the target EC (>62%)
Fish	B/C	Maintain the target EC (>78%)
Invertebrates	B/C	Maintain the target EC (>78%).

Component/ Indicator	TEC	RQO
Riparian vegetation	C/D	Maintain the target EC (>58%).
Water quality	C	Maintain the target EC (>62%). Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.125 mg/L PO ₄ -P (Aquatic ecosystems: driver).
IUA U7-1: LOVU RU LO_R_EWR 1 (U70C-04859)		
Instream Habitat Integrity	B/C	Maintain the target EC (>78%)
Riparian Habitat Integrity	B/C	Maintain the target EC (>78%)
Fish	B/C	Maintain the target EC (>78%).
Invertebrates	B/C	Maintain the target EC (>78%).
Riparian vegetation	B/C	Maintain the target EC (>78%).
Water quality	B/C	Maintain the target EC (>78%). Ensure that turbidity or clarity levels stay within Acceptable limits: A small change from present with minor silting of habitats and turbidity loads (Aquatic ecosystems: driver).

* Note that all river faecal coliform and *E. coli* targets for full and partial contact are presented in terms of SA NMMP guidelines and health risks in terms of counts/100 mL, as follows:

Low	Medium	High
< 100	600 - 2 000	> 2 000

Guidelines are provided in the absence of data or knowledge of recreational activities in the area.

Table 4 provides an indication of the ECs and associated RQOs of Estuaries for water quality, geomorphology, vegetation, invertebrates, fish and birds, respectively to achieve the TEC listed in Table 1. The configurations of EC, as well as quantification of RQOs are based on best available information at the time of gazetting.

Table 4 ESTUARIES: RQOs for water quality, geomorphology, riparian vegetation, macro-invertebrates and fish in HIGH priority RUs

Component/ Indicator	TEC	RQO
uMKHOMAZI ESTUARY		
Hydrology	C/D	<ul style="list-style-type: none"> Maintain the target EC (>57%). Monthly river inflow > 1.0 m³/s Monthly river inflow > 2.0 m³/s persists for longer than three months in a row. Monthly river inflow > 5.0 m³/s for more than 30% of the time.
Hydrodynamics	A	<ul style="list-style-type: none"> Maintain the target EC (>93%). Mouth closure occurs less than 2 - 3 weeks in a year. Mouth closure occurs for less than two years out of ten. Mouth closure do not occur between September and April.
Water quality	C	Maintain the target EC (>63%). ROQs for water quality in river inflow to protect estuarine ecosystem quality: <ul style="list-style-type: none"> pH: 7.5 - 8.5. DO > 6 mg/L. Turbidity (low flow < 5m³/s): < 15 NTU. Turbidity (low flow > 5m³/s): Naturally turbid. Dissolved nutrients (low flow < 5m³/s): NO_x-N <150 µg/L; NH₃-N < 20 µg/L; PO₄-P < 10 µg/L. Dissolved nutrients (high flow > 5m³/s): NO_x-N <200 µg/L; NH₃-N < 20 µg/L; PO₄-P < 20 µg/L.

Component/ Indicator	TEC	RQO
		<p>Minimum requirement for recreational use (DEA, 2012):</p> <ul style="list-style-type: none"> • <i>Enterococci</i>: Ninety percentile (90%ile) over a 12 month running period \leq 185 counts per 100 ml. • <i>E. coli</i>: Ninety percentile (90%ile) over a 12 month running period \leq 500 counts per 100 ml. <p>ROQs for water quality in estuary to protect estuarine ecosystem quality::</p> <ul style="list-style-type: none"> • Salinity: 0 in the upper reaches; $>$ 20 middle reaches during the low flow season; freshwater dominated for 70% of the time. • Turbidity (low flow $<$ 5m³/s): Average $<$ 10 NTU in any sampling survey. • pH: Average 7.0 - 8.5 in any sampling survey. • Dissolved oxygen: Average $>$6 mg/L in any sampling survey. • Dissolved nutrients (low flow $<$ 5m³/s): Average NO_x-N $<$ 150 μg/L, NH₃-N $<$ 20 μg/L and PO₄-P $<$ 10 μg/L in any sampling survey. • Dissolved nutrients (high flow $>$ 5m³/s): Average NO_x-N $<$ 300 μg/L, NH₃-N $<$ 20 μg/L and PO₄-P $<$ 20 μg/L in any sampling survey. • Total metal concentrations in water not to exceed target values as per SA Water Quality Guidelines for coastal marine waters (DWAf, 1995). • Total metal concentration in sediment not to exceed target values as per WIO Region guidelines (UNEP/Nairobi Convention Secretariat and CSIR, 2009).
Sediment dynamics	B	Maintain the target EC ($>$ 78)
Microalgae	B	Maintain the target EC ($>$ 78%).
Macrophytes	D	Maintain the target EC ($>$ 43%).
Invertebrates	B	Maintain the target EC ($>$ 78%).
Fish	D	Maintain the target EC ($>$ 43).
Birds	C	Maintain the target EC ($>$ 63%).
MVOTI ESTUARY		
Hydrology	C/D	<p>Maintain the target EC ($>$57%).</p> <ul style="list-style-type: none"> • Monthly river inflow $>$ 1.0 m³/s. • Monthly river inflow $>$ 2.0 m³/s persists for longer than three months in a row. • Monthly river inflow $>$ 2.0 m³/s for more than 50% of the time.
Hydrodynamics	A	<p>Maintain the target EC ($>$93%).</p> <ul style="list-style-type: none"> • Mouth closure occurs less than two - three weeks in a year. • Mouth closure occurs for less than two years out of ten. • Mouth closure do not occurs between November and June.
Water quality	C/D	<p>Maintain the target EC ($>$57%). RQOs for river inflow to protect estuarine ecosystem quality:</p> <ul style="list-style-type: none"> • pH: 7.0 - 8.5. • DO $>$ 4 mg/L. • Turbidity (low flow): $<$15 NTU. • Dissolved nutrients: NO_x-N $<$ 400 μg/L; NH₃-N $<$ 30 μg/L; PO₄-P $<$ 25 μg/L. <p>ROQs for water quality in estuary to protect estuarine ecosystem quality:</p> <ul style="list-style-type: none"> • Salinity: Average salinity in waters upstream of 1 km from mouth $<$20 PSU ; Average salinity throughout estuary $<$1 PSU for at least 50% of time • Turbidity (low flow): Average $<$10 NTU in any sampling survey. • pH: Average 7.0 - 8.5 in any sampling survey. • Dissolved oxygen: Average $>$ 4 mg/L in any sampling survey. • Dissolved nutrients: Average NO_x-N $<$ 400 μg/L, NH₃-N $<$ 30 μg/L and PO₄-P $<$ 25 μg/L in any sampling survey. • Total metal concentrations in water not to exceed target values as per SA Water Quality Guidelines for coastal marine waters (DWAf, 1995). • Total metal concentration in sediment not to exceed target values as per WIO Region guidelines (UNEP/Nairobi Convention Secretariat and CSIR, 2009).
Sediment dynamics	B/C	Maintain the target EC ($>$ 72%).
Microalgae	B	Maintain the target EC ($>$ 78%).
Macrophytes	D	Maintain the target EC ($>$ 43%).

Component/ Indicator	TEC	RQO
Invertebrates	E	Maintain the target EC (>23%).
Fish	D	Maintain the target EC (>43%).
Birds	E	Maintain the target EC (>23%).

Table 5 provides RQOs for rivers where water quality issues are a priority. **Note that only rivers and variables currently included in a monitoring programme have been listed**, as this table refers to RQOs immediately applicable. Recommendations to include additional variables or systems will be made in the relevant reports for the study.

Table 5 RIVERS: Summary of key WATER QUALITY RQOs in HIGH WQ priority RUs of study area

RU	Sub Quaternary	Water quality RQOs
IUA T4-SC: MTAMVUNA		
RU SC1	T40G-05616	Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.125 mg/L PO ₄ -P (Aquatic ecosystems: driver). Ensure that electrical conductivity (salt) levels are within Acceptable limits: 95 th percentile of the data must be less than or equal to 55 mS/m (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
IUA T5-2: UMZIMKULU		
MRU MzA	MzEWR2i T51C-04760	Ensure that electrical conductivity (salt) levels are within Ideal limits: 95 th percentile of the data must be less than or equal to 30 mS/m (Aquatic ecosystems: driver). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.025 mg/L PO ₄ -P (Aquatic ecosystems: driver).
MRU MzB	MzEWR3i T52C-04960 T52D-04948 T52D-05137	Ensure that electrical conductivity (salt) levels are within Ideal limits: 95 th percentile of the data must be less than or equal to 30 mS/m (Aquatic ecosystems: driver). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.025 mg/L PO ₄ -P (Aquatic ecosystems: driver).
IUA U2-3: uMNGENI		
RU uMn7	U20F-04131 U20F-04204 U20F-04224 U20G-04194 U20G-04215	Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.025 mg/L PO ₄ -P (Aquatic ecosystems: driver). Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
MRU uMnC	U20G-04240 U20G-04259 U20G-04385	Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.075 mg/L PO ₄ -P (Aquatic ecosystems: driver). Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Ensure that toxics (ammonia, iron, manganese) are within Ideal limits or A categories: 95 th percentile of the data must be within the TWQR for toxics (DWAf, 1996) or the upper limit of the A category in DWAf (2008). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
IUA 2-4: UMNSUNDUZE		
RU uMn8	U20J-04461 U20J-04488	Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
MRU Duze D	U20J-04459	Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.

IUA U2-6: uMNGENI		
RU uMn10	U20M-04625 U20M-04639 U20M-04642 U20M-04649 U20M-04653 U20M-04659 U20M-04682	Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.075 mg/L PO ₄ -P (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*. Ensure that toxics (ammonia) are within Tolerable categories: 95 th percentile of the data must be within the D category according to DWAF (2008).
IUA U3-1: uMDLOTI		
RU U3.1	U30A-04228 U30A-04363 U30A-04360	Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.025 mg/L PO ₄ -P (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.
IUA U4-1 AND U4-2: MVOTI		
RU Mv1	U40B-03708 U40B-03740 U40B-03832	Ensure that nutrient levels (phosphate) are within Acceptable limits: 50 th percentile of the data must be less than 0.025 mg/L PO ₄ -P (Aquatic ecosystems: driver). Ensure that electrical conductivity (salt) levels are within Ideal limits: 95 th percentile of the data must be less than or equal to 30 mS/m (Aquatic ecosystems: driver).
IUA U6-1: UPPER UMLAZI		
RU U6.1	U60A-04533 U60B-04614 U60C-04555	Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.075 mg/L PO ₄ -P (Aquatic ecosystems: driver). Ensure that electrical conductivity (salt) levels are within Tolerable limits: 95 th percentile of the data must be less than or equal to 85 mS/m (Aquatic ecosystems: driver). Ensure that toxics (ammonia) are within Tolerable categories: 95 th percentile of the data must be within the D category according to DWAF (2008). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*. Ensure that toxics (ammonia) are within Tolerable categories: 95 th percentile of the data must be within the D category according to DWAF (2008).
RU U6.2	U60C-04556	Ensure that turbidity/clarity or TSS levels stay within Acceptable limits: A moderate change from present with temporary high sediment loads and turbidity during runoff event (Aquatic ecosystems: driver). Ensure that nutrient levels (phosphate) are within Tolerable limits: 50 th percentile of the data must be less than 0.075 mg/L PO ₄ -P (Aquatic ecosystems: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*. Ensure that electrical conductivity (salt) levels are within Tolerable limits: 95 th percentile of the data must be less than or equal to 85 mS/m (Aquatic ecosystems: driver). Ensure that toxics (ammonia) are within Tolerable categories: 95 th percentile of the data must be within the D category according to DWAF (2008).
IUA U6-3: MBOKODWENI		
RU U6.6	U60E-04792	Ensure that electrical conductivity (salt) and toxics levels are within appropriate limits for intended use, e.g. industrial use: Numerical limits can be found in DWAF (1996e) (Industrial use: driver). Meet faecal coliform and E. coli targets for recreational / other (full or partial contact) use*.

* Note that all river faecal coliform and *E. coli* targets for full and partial contact are presented in terms of SA NMMP guidelines and health risks in terms of counts/100 ml, as follows:

Low	Medium	High
< 600	600 - 2 000	> 2 000

Guidelines are provided in the absence of data or knowledge of recreational activities in the area.

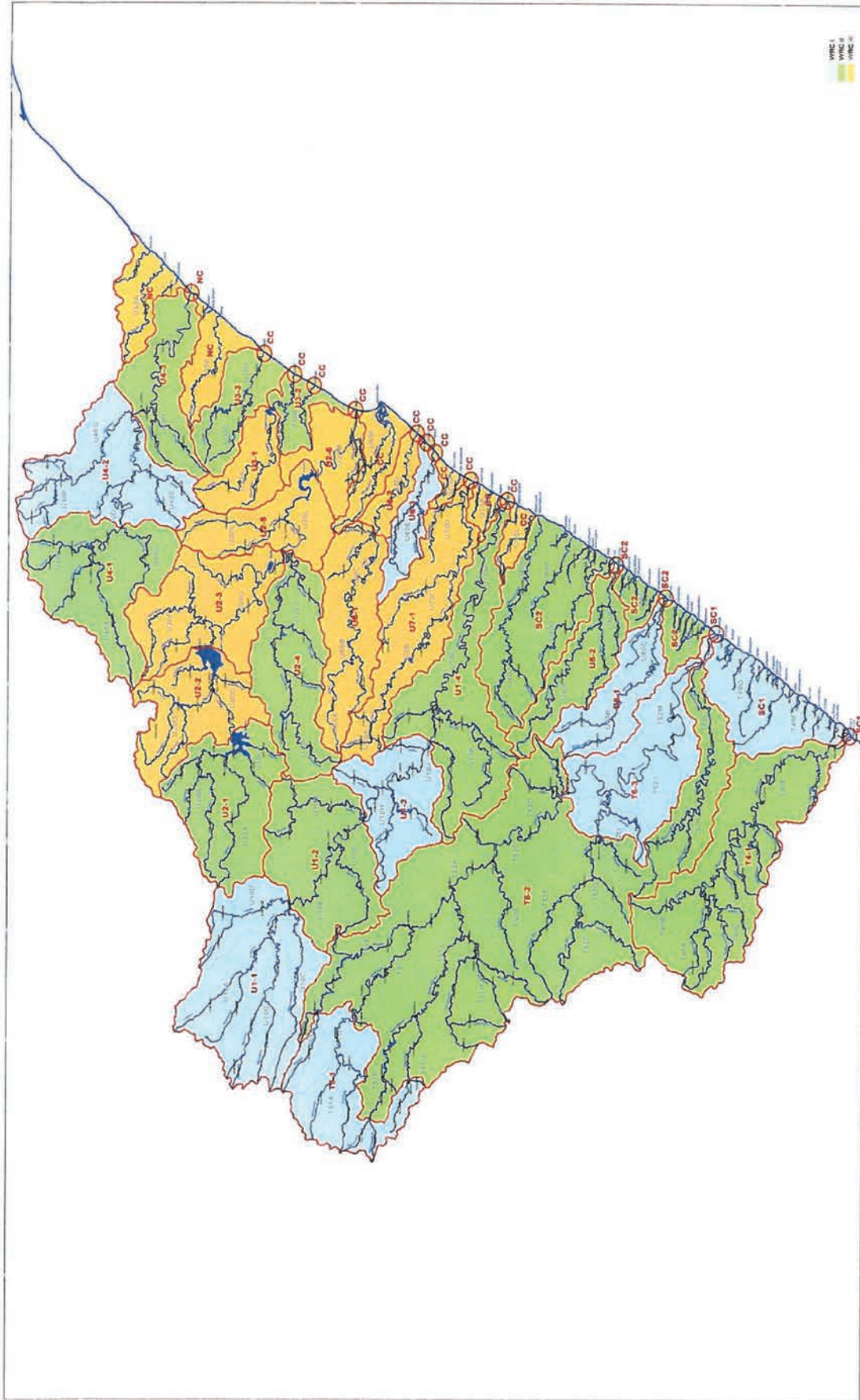


Figure 1 Water Resource Classes for IUAs of the Mvoti to Umzimkulu WMA