water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

CLASSIFICATION OF WATER RESOURCES AND DETERMINATION OF THE COMPREHENSIVE RESERVE AND RESOURCE QUALITY OBJECTIVES IN THE MVOTI TO UMZIMKULU WATER MANAGEMENT AREA

DRAFT SUMMARY OF WATER RESOURCE CLASSES, CATCHMENT CONFIGURATION AND INTERVENTIONS REQUIRED TO MEET THE CLASS – SUPPORTING INFORMATION FOR PSC MEETING 6

This summary is provided as a handout as supporting information to the presentations and to provide more detail than the presentations to refer to. It is an extract of the pertinent information in the relevant report which is currently being finalised and will be available for review. This information also may change based on stakeholder input

Please note: Naming of rivers and estuaries will not be consistent at this stage and this will be addressed for the final report.

TABLE OF CONTENTS

LIST OF TABLES

KEY TERMINOLOGY

What is the Target Ecological Category (TEC)?

- *Each Integrated Unit of Analysis (IUA) is allocated a Water Resource Class and a catchment configuration.*
- *The catchment configuration consist of biophysical nodes (which can be estuaries) and its Ecological Categories (ECs).*
- *These ECs, could be the Present Ecological State (PES), the Recommended Ecological Category (REC) of any other category and is referred to as the Target Ecological Category (TEC).*
- *As a starting point, the TEC will strive to be equal to the REC.*
- *But classification is a balance between protection and use and therefore the TEC may be different than the REC depending on the implications of meeting the REC*

1 CATCHMENT CONFIGURATION: TARGET ECOLOGICAL CATEGORIES AND WATER RESOURCE CLASSES

(The red outline of blocks in the last comment indicate where the target EC requires interventions to be met)

Table 1 River IUAs per secondary catchment

IUA	Water Resource Class	Nodes	River	Length (Km)	Target EC
T4: Mtamvuna					
T4-1	II	T40A-05450	Mafadobo	19.3	B
		T40A-05487	Goxe	36.2	B
		T40B-05337	Weza	43.0	C
		T40C-05510	Mtamvuna	13.6	B
		T40C-05520	Mtamvuna	19.2	C
		T40C-05530	Mtamvuna	5.4	B
		T40C-05566	Ludeke	9.3	B
		T40C-05589	KuNtlamvukazi	20.5	B
		T40C-05600	Ludeke	18.8	B
		T40D-05537	Mtamvuna	8.8	C
		T40D-05584	Mtamvuna	31.5	C
		T40D-05615	Tungwana	10.5	B
		T40D-05643	Gwala	19.1	B
		T40D-05683	Ntelekweni	28.7	B/C
		T40D-05707	Mtamvuna	0.8	C
		T40D-05719	Londobezi	17.5	B
		Mt_R_EWR1	Mtamvuna	49.5	C
		T40E-05767	Hlolweni	25.4	B
T5: Umzimkulu					
T5-1	I	T51A-04431	Mzimkhulu	27.4	B
		T51A-04522	Mzimude	34.2	B
		T51A-04608		3.0	B
		T51A-04551	Mzimude	16.1	B
		T51B-04421	Mzimkhulu	23.1	B
		T51D-04404	Pholela	30.8	B
		T51F-04566	Boesmans	12.6	A
		T51F-04674		6.4	C
		T51G-04669	Ndawana	19.4	B
		T51G-04722	Ndawana	26.2	C
T5-2	II	T51C-04606		6.4	C
		MzEWR2i	Mzimkhulu	76.0	B
		T51D-04460	Pholelana	12.4	D/E
		T51E-04536		14.1	C
		MzEWR9r	Pholela	73.0	B/C
		T51F-04611	Ngwangwane	12.6	A
		MzEWR8r	Ngwangwane	123.0	C
		T51G-04751		5.0	B
		T51H-04828	Gungununu	13.6	A/B
		T51H-04846	Lubhukwini	18.7	A
		T51H-04913	Nonginqa	23.2	B/C
		T51H-04923	Malenge	36.9	B
		T51H-04808	Gungununu	30.7	B
		T51H-04884	Gungununu	10.1	B/C
		T51H-04908	Gungununu	3.1	B/C
		MzEWR3i	Mzimkhulu	21.4	B
		T52B-04947	Cabane	46.4	B

IUA	Water Resource Class	Nodes	River	Length (Km)	Target EC
		T52C-04880		15.9	C
		T52C-04960	Mzimkhulu	4.8	B
		T52D-05024	Ncalu	20.4	B
		T52D-05061	Mgodi	26.3	B
		T52D-04948	Mzimkhulu	50.6	B
		T52D-05137	Mzimkhulu	4.7	B
		T52E-05053	Upper Bisi	49.7	B
		T52F-05104	Little Bisi	39.2	C
		T52F-05190	Mbumba	33.1	B/C
		T52F-05139	Little Bisi	13.8	B
		T52G-05226	uMbumbane	19.8	B/C
		T52G-05171	Bisi	10.3	B
		T52H-05244	Mahobe	22.0	B/C
		T52H-05178	Bisi	16.9	B
		T52K-05475	Nkondwana	20.4	B/C
		MzEWR17i	Mzimkhulwana	87.2	B
T5-3	I	T52H-05295	Magogo	28.6	B
		MzEWR14r	Bisi	20.1	B/C
		T52H-05189	Bisi	12.0	B
		MzEWR6i	Mzimkhulu	133.2	A/B
U2: uMngeni					
U2-1	II	Mg_R_EWR1	uMngeni	62.1	C/D
		U20B-04074	Ndiza	21.1	B
		U20B-04144	Mpofana	20.1	C
		U20B-04173	Lions	50.4	B
		U20B-04185	Lions	9.2	B/C
		U20C-04190	Lions	18.1	B
		U20C-04332	Gqishi	14.8	B
		U20C-04340	Nguklu	14.5	C
U2-2	III	U20D-04029	Yarrow	18.8	B
		U20D-04032	Karkloof	39.4	C
		U20D-04098	Kusane	34.2	D
		U20D-04151	Karkloof	5.5	B
		U20E-04136	Nculwane	23.0	C
		Mg_R_EWR3	Karkloof	17.6	B
		U20E-04221	uMngeni	5.5	B/C
		Mg_I_EWR 2	uMngeni	22.8	C
		U20E-04271	Doring Spruit	12.9	B/C
		U20F-04011	Sterkspruit	43.2	C/D
U2-3	III	U20F-04095	Mpolweni	30.0	C/D
		U20F-04131	Mhlalane	18.8	C/D
		U20F-04204	Sterkspruit	11.5	B/C
		U20F-04224	Mpolweni	7.4	B/C
		U20G-04194	Mkabela	35.5	C/D
		U20G-04215	Cramond Stream	3.8	B/C
		U20G-04240	uMngeni	9.5	B/C
		U20G-04259	uMngeni	38.8	B/C
		U20G-04385US	uMngeni	3.8	B/C
U2-4	II	U20H-04410	Nqabeni	10.1	C
		U20H-04449	uMnsunduze	38.1	C
		Mg_R_EWR4	uMnsunduze	23.9	D
		U20J-04391	uMnsunduze	29.2	C
		U20J-04401	uMnsunduze	20.7	D
		U20J-04452	Mpushini	22.6	B
		U20J-04459	uMnsunduze	19.4	C

IUA	Water Resource Class	Nodes	River	Length (Km)	Target EC
		U20J-04461	Slang Spruit	13.8	C/D
		U20J-04488	Mshwati	23.5	B
U2-5	III	U20K-04181	Mqeku	30.4	C
		U20K-04296	Tholeni	21.2	B/C
		U20K-04411	Mqeku	7.3	B
		Mg_I_EWR 5	uMngeni	30.5	D
U2-6	III	U20M-04625		2.4	D
		U20M-04639	Palmiet	1.1	D
		U20M-04642	Palmiet	7.8	D
		U20M-04649	Mbongokazi	5.7	C
		U20M-04653	Palmiet	0.9	C/D
		U20M-04659	Palmiet	11.3	C
		U20M-04682		1.3	C/D
U3: Mdloti & Tongati					
U3-1	III	U30A-04228	Mdloti	36.0	B
		U30A-04360	Mdloti	37.4	D
		U30A-04363	Mwangala	17.6	B
U3-2	II	U30B-04465	Black Mhlashini	17.3	B/C
U3-3	II	U30C-04227	Tongati	44.4	B/C
		U30C-04272	Mona	39.7	B
U6: uMlazi					
U6-1	III	U60A-04533	uMlazi	43.2	C
		U60B-04614	Mkuzane	26.8	C/D
		U60C-04555	uMlazi	52.9	C/D
		U60C-04556	Sterkspruit	60.9	D
		U60C-04613	Wekeweke	31.8	C
U6-2	III	U60D-04661	uMlazi	42.1	C/D
U6-3	I	U60E-04714	Mbokodweni	54.5	B
		U60E-04792	Mbokodweni	31.4	C
		U60E-04795	Bivane	60.7	B
U7: Lovu					
U7-1	III	U70A-04599	Serpentine	12.0	C
		U70A-04609	Lovu	4.7	B/C
		U70A-04618		7.1	C
		U70A-04685	Lovu	5.4	C
		U70B-04655	Lovu	95.8	C/D
		U70C-04710	Mgwahumbe	46.6	C
		U70C-04724		1.0	C
		U70C-04732		0.9	C
		Lo_R_EWR1	Lovu	28.3	B/C
		U70D-04800	Nungwane	30.4	B/C
U8: Mtwalume & Mzumbe					
U8-1	I	U80B-05145	Mzumbe_Est	23.1	B
		U80B-05161	Mhlabatshane	24.6	B
		U80C-05231	Mzumbe	56.8	B
		U80C-05329	Kwa-Malukaka	27.4	B
U8-2	II	U80E-05028	Mtwalume	74.6	C
		U80E-05212	Quha	35.8	B
		U80F-05258	Mtwalume	9.0	B
		U80F-05301	uMgeni	20.1	B

Table 2 Estuary IUAs per secondary catchment

IUA	Water Resource Class	Nodes/Estuaries	River	Length / hectares (Km/ha)	Target EC
SC.1	I	T40F-05666	Mbizana	6.7	B
		T40G-05616	Vungu	7.5	B
		Mtamvuma		54.15	A/B
		Zolwane		0.44	B
		Sandhlunlu		4.73	C
		Kuboyoyi		0.73	B
		Tongazi		0.73	B/C
		Kandanhlovu		1.29	B
		Mpenjati		14.90	B
		Umhlangankulu		5.61	C
		Kaba		2.42	C
		Mbizana		13.41	B
		Mvuthsini		0.63	B/C
		Bilanhlolo		2.01	C
		Umvazana		0.36	C
		Kongweni		1.52	EF
		Vungu		0.28	B
		Mhlangeni		5.85	C
		Zotsha		8.54	B
		Boboyi		1.83	B/C
		Mbango		0.37	EF
		Umzimkulu		107.03	B
SC.2	II	U80G-05097	Fafa	14.68	B
		U80H-05109	Mzinto	7.66	C
		U80H-05120	Mzimayi	0.23	C
		U80H-05186	Mkhumbane	0.23	C
		U80H-05202	Sezela	0.23	C
		U80H-05229	Mdesingane	0.23	C
		U80J-04979	Mpambanyoni	8.36	B
		U80J-05043	Ndonyane	4.14	B/C
		U80K-04952	Mpambanyoni	15.46	C
		Mtentwini		7.76	C
		Mhlangamkulo		2.78	C
		Domba		3.57	D
		Koshwani		1.01	C
		Inhshambili		0.68	C
		Mzumbe		6.68	C/D
		Mhlabatshane		3.00	B
		Mhlungwa		5.94	C
		Mfazazana		1.08	C
		KwaMakozi		2.46	B
		Mnamfu		1.31	C
		Mtwalume		5.01	C
		Mvuzi		0.92	C

IUA	Water Resource Class	Nodes/Estuaries	River	Length / hectares (Km/ha)	Target EC
		Fafa		14.30	C
		Mdesingane		0.17	D
		Sezela		6.58	C
		Mkumbane		1.08	C
		Mzinto		5.76	C/D
		Nkomba		0.07	C
		Mzimayi		0.50	C/D
		Mpambanyoni		2.92	C
CC	III	U80L-05020	aMahlongwa	7.26	B/C
		U70E-04942	Umsimbazi	2.39	C
		U70E-04974	uMgababa	29.38	C
		U70F-04845	Manzimtoti	30.08	C
		U70F-04893	Little Amanzimtoti	16.51	C
		aMahlongwa		7.64	B
		Mahlangwana		6.53	B
		Mkomazi		70.33	B/C
		Ngane		1.86	C
		Umgababa		17.08	B/C
		Msimbazi		20.42	B
		Lovu		35.62	B/C
		Little Amanzimtoti		2.58	E
		Manzimtoti		5.20	D
		Mmbokotwini		8.75	E
		sipingo		0.00	F
		Durban Bay		0.00	E
		Durban Bay Shallow Zone		--	D
		Mgeni		84.54	D
		Mhlanga		11.21	B
		Mdloti		28.46	D
		Tongati		3.66	D
NC	III	U30E-04207	Mhlali	25.55	
		Mhlali		19.26	D
		Bobstream		0.38	B/C
		Seteni		0.89	B/C
		Mvoti		28.33	C/D
		Mdlotane		8.97	A/B
		Nonoti		12.13	C
		Zinkwazi		32.22	B

2 INTERVENTIONS REQUIRED TO ACHIEVE THE TEC

Table 3 River nodes requiring improvements[1]

IUA	Node	River	PES	REC	REC Comment	TEC
T4-Mtamvuna						
T4-1	*T40A-05487*	*Goxe*	**B/C**	**B**	*Catchment management of informal agriculture and overgrazing will be required. Unlikely to be attainable.*	**B**
	T40C-05510	*Mtamvuna*	**B/C**	**B**	*Catchment management of informal agriculture and overgrazing will be required. Unlikely to be attainable. Alien vegetation can be removed.*	**B**
	T40E-05767	*Hlolweni*	**B/C**	**B**	*Catchment management of informal agriculture and overgrazing will be required. Unlikely to be attainable. Alien vegetation can be removed.*	**B**
T5-Umzimkulu						
T5-1	*T51A-04551*	*Mzimude*	**B/C**	**B**	*Flow modification needs to improve from a 1.5 to a 1*	**B**
T5-2	*T51H-04923*	*Malenge*	**B/C**	**B**	*Riparian buffer reinstatement.*	**B**
	T52D-05024	*Ncalu*	**B/C**	**B**	*Reduce sedimentation and establish buffer zone (forestry area)*	**B**
	T52D-05061	*Mgodi*	**B/C**	**B**	*Reduce sedimentation and establish buffer zone (forestry area)*	**B**
	T52E-05053	*Upper Bisi*	**B/C**	**B**	*Buffer zone reinstatement in forestry and other areas and alien veg removal*	**B**
U2-uMngeni						
U2-1	*U20B-04074*	*Ndiza*	**B/C**	**B**	*Reinstate riparian zone in forestry.*	**B**
	U20B-04173	*Lions*	**C**	**B**	*Reinstate riparian zone in forestry and wetland buffers. Address irrigation return flows (wq) & town runoff*	**B**
	U20C-04190	*Lions*	**B/C**	**B**	*IBT a given - constant flows, no seasonality, but reinstating wetland buffers (off channel) and riparian river zones*	**B**
	U20C-04332	*Gqishi*	**B/C**	**B**	*Riparian zone buffer to be improved.*	**B**
U2-2	*U20D-04029*	*Yarrow*	**B/C**	**B**	*Agricultural area - wetland buffers,*	**B**
	U20D-04151	*Karkloof*	**B/C**	**B**	*Reinstate riparian buffer zone and wetland buffers.*	**B**
U2-4	*Mg_R_EWR 4*	*uMnsunduze*	**D/E**	**D**	*Water quality improvement*	**D**
	U20J-04452	*Mpushini*	**B/C**	**B**	*Water quality from Ashburton and other aspects*	**B**
	U20J-04488	*Mshwati*	**B/C**	**B**	*Lower section in worse state. Reinstate riparian zone, address erosion.*	**B**
U2-5	*U20K-04296*	*Tholeni*	**C**	**B/C**	*Riparian zone buffer to be improved.*	**B/C**
	U20K-04411	*Mqeku*	**B/C**	**B**	*Riparian zone buffer to be improved.*	**B**
U3: Mdloti & Tongati						
U3-1	*U30A-04228*	*Mdloti*	**B/C**	**B**	*Improve riparian buffer zone, erosion control*	**B**
	U30A-04363	*Mwangala*	**B/C**	**B**	*Improve riparian buffer zone, erosion control*	**B**
U3-3	*U30C-04272*	*Mona*	**B/C**	**B**	*Riparian buffer zone improvement*	**B**
U6: uMlali						

[1] *Excludes U1 and U4 which has already been presented, documented and reviewed by PSC*

IUA	Node	River	PES	REC	REC Comment	TEC
U6-1	U30C-04272	Mona	B/C	B	Riparian buffer zone improvement	B
U6-3	U60E-04795	Bivane	B/C	B	Erosion control, riparian buffer, agricultural practices	B
U6: Mtwalume & Mzumbe						
U8-2	U80F-05258	Mtwalume	B/C	B	Improve water quality of return flows	B
	U80F-05301	uMgeni	B/C	B	Improve water quality of return flows. Reinstate buffer zone	B
Southern Clusters						
SC.1	T40G-05616	Vungu	B/C	B	Improve water quality	B
SC.2	U80G-05097	Fafa	B/C	B	Reinstate riparian zone. Improve flow (optimise irrigation methods. Improve water quality (return flows)	B
	U80H-05109	Mzinto	C/D	C		C

Table 4 Detailed SC catchment configuration, interventions and TEC motivations

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
Mtamvuma	A/B	B		B	B	Interventions required to achieve the REC of an A/B: • Restoration of estuarine riparian habitat; • Reduce/control fishing high pressure; • Protect baseflows to estuary to maintain mouth state and salinity profile. A/B TEC is immediately applicable.	A/B
Zolwane	B	B		B	B	TEC set to maintain the PES and REC and is immediately applicable.	B
Sandhlunlu	C	C		C	C	TEC set to maintain the PES and REC and is immediately applicable.	C
Kuboyoyi	B	B		B	B	TEC set to maintain the PES and REC and is immediately applicable.	B
Tongazi	B/C	B/C		B/C	B/C	TEC set to maintain the PES and REC and is immediately applicable. Scenarios that comply to the TEC are acceptable.	B/C
Kandanhlovu	B	B		B	B	TEC set to maintain the PES and REC and is immediately applicable.	B
Mpenjati	B	B/C		B/C	B/C	Interventions required to achieve the REC: • Remove/reduce impact of sand mining; • Improve water quality; • Restore estuarine riparian habitat. The B TEC is immediately applicable if the above non-flow related activities are addressed. Water quality should also be improved and standards for existing situation and future scenarios should be investigated to allow for improvement.	B
Umhlangankulu	C	C		C	C	TEC set to maintain the PES and REC and is immediately applicable.	C
Kaba	C	C		C	C	TEC set to maintain the PES and REC and is immediately applicable.	C
Mbizana	B	B		B	B	TEC set to maintain the PES and REC and is immediately applicable.	B
Mvuthsini	B/C	B/C		B/C	C	TEC set to maintain the PES and REC and is immediately applicable. Any scenario that achieves the TEC (eg Sc C) is acceptable.	B/C
Bilanhlolo	C	C		C	C	TEC set to maintain the PES and REC and is immediately applicable.	C
Umvazana	C	C		C	C	TEC set to maintain the PES and REC and is immediately applicable.	C
Kongweni	D	E		E	E	Interventions required to achieve the REC: • Restoration of estuarine riparian habitat; • Improve water quality. • Reduce baseflows to estuary to maintain mouth state and salinity profile. The D can be achieved under current situation by removing half the waste and flow of current discharges. This has socio-economic implications and will be difficult to do. Therefore, the TEC is set to maintain the PES below a D. The system should not become a health hazard.	E/F
Vungu	B	B		B/C	B/C	TEC set to maintain the PES and REC and is immediately applicable. Implications for future use is that waste will have to be deposited elsewhere.	B
Mhlangeni	C	C		C	C	TEC set to maintain the PES and REC and is immediately applicable.	C

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
Zotsha	*B*	*B/C*		*B/C*	*B/C*	*Interventions required to achieve the REC:* *• Restoration of estuarine riparian habitat;* *• Improve water quality.* *TEC set to achieve the REC and is immediately applicable. No future waste scenarios should be considered for this system.*	**B**
Boboyi	*B/C*	*B/C*		*B/C*	*B/C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**B/C**
Mbango	*D*	*E*		*E*	*E*	*Interventions required to maintain the REC:* *• Restore baseflows to estuary to maintain mouth state and salinity profile* *• Maintain water quality; and* *• Partial restoration of estuarine habitat.* *The D can be achieved under current situation by removing half the waste and flow of current discharges. This has socio-economic implications and will be difficult to do. Therefore, the TEC is set to maintain the PES below a D. The system should not become a health hazard.*	**EF**
Umzimkulu	*B*	*B*		*B*	*B*	*Interventions required to counteract the downward trajectory and to meet the REC/TEC:* *• eradicate invasive alien vegetation* *• remove derelict, redundant and old quays, jetties, wharfs and revetments; and rehabilitate banks;* *• prohibit dredge spoil dumping in inappropriate areas;* *• manage agricultural and industrial practices in the catchment.*	**B**
Mtentwini	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Mhlangamkulo	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Domba	*C*	*D*		*D*	*D*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to maintain mouth state and salinity profile* *• Maintain water quality; and* *• Partial restoration of estuarine habitat.* *The PES is to be maintained as the TEC in the short term as restoration of baseflows have potential socio-economic implications. Further investigations can be undertaken as part of the estuarine management plans to determine whether improvement is possible even to a C/D by addressing non-flow measurements. No further scenarios should be considered as this could compromise potential improvement and as water quality must be maintained in its present state.*	**D**
Koshwani	*B*	*C/D*		*C/D*	*C/D*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to increase mouth state and salinity profile.* *• Improve water quality; and* *• Partial restoration of estuarine habitat.* *There is uncertainty regarding the capacity and discharge of the WWM works. To improve the estuary would either require removal of waste water and/or improvement of the treatment work to the required standard. Due to these uncertainties and the uncertainty around the implications of improvement, the TEC has been set to a C only. Once more information is available, the TEC can be reviewed.*	**C**
Inhshambili	*B*	*C*		*C*	*C*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality; and* *• Partial restoration of estuarine habitat.* *The PES is to be maintained as the TEC in the short term as information is not available on the increased baseflows required. Restoration of base flows are the key parameter which require improvement. Further investigations can be undertaken as part of the estuarine management plans to determine whether improvement is possible even to a B/C by addressing non-flow measurements. No scenarios should be considered.*	**C**
Mzumbe	*C*	*C/D*		*C/D*	*C/D*		**C**
Mhlabatshane	*A/B*	*B/C*		*B/C*	*B/C*	*Interventions required to achieve the REC:* *• Catchment water quality; and* *• Restoration of estuarine habitat (riparian).* *As it is assumed that addressing catchment water quality may be difficult and not possible on the short term, it was evaluated whether only addressing the estuarine habitat will achieve an improvement. Improvement will be to a B which is set as the TEC and immediately applicable. The TEC therefore represents an improvement, but not to*	**B**

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
						the REC.	
Mhlungwa	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Mfazazana	*B*	*C*		*C*	*C*	*Interventions required to achieve the REC:* *• Improve baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality; and* *• Partial restoration of estuarine riparian habitat.* *The PES is to be maintained as the TEC in the short term as restoration of baseflows have potential socio-economic implications. Further investigations can be undertaken as part of the estuarine management plans to determine whether improvement is possible even to a B/C by addressing non-flow measurements.*	**C**
KwaMakozi	*B*	*B/C*		*B/C*	*B/C*	*Interventions required to achieve the REC/TEC:* *• Protect baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality; and* *Partial restoration of estuarine habitat.* *The TEC is set to improve to a B.*	**B**
Mnamfu	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Mtwalume	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Mvuzi	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Fafa	*C*	*C/D*		*C/D*	*C/D*	*Interventions required to achieve the REC:* *• Restore estuarine riparian habitat.* *The C TEC is immediately applicable if the above non-flow related activities are addressed.*	**C**
Mdesingane	*D*	*D*		*D*	*D*	*TEC set to maintain the PES and REC and is immediately applicable.*	**D**
Sezela	*C*	*C*		*C*	*C/D*	*TEC set to maintain the PES and REC and is immediately applicable. Scenarios that comply to the TEC are acceptable.*	**C**
Mkumbane	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Mzinto	*C/D*	*C/D*		*C/D*	*C/D*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C/D**
Nkomba	*B/C*	*B/C*		*B/C*	*B/C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**B/C**
Mzimayi	*C/D*	*C/D*		*C/D*	*C/D*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C/D**
Mpambanyoni	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**

Table 5 Detailed CC catchment configuration, interventions and TEC motivations

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
aMahlongwa	*B*	*C*		*C*	*C*	*Interventions required to achieve the REC:* *• Protect baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality;* *• Partial restoration estuarine riparian habitat* *• Control and reduce fishing pressure.* *B TEC is immediately applicable.*	**B**
Mahlangwana	*B*	*C*		*C*	*C*	*Interventions required to achieve the REC:* *• Protect baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality;* *• Partial restoration estuarine riparian habitat* *B TEC is immediately applicable.*	**B**
Mkomazi	*B*	*C*		*C*	*C*	*Interventions required to achieve the REC:* *• Remove sandmining from the upper reaches below the Sappi Weir;* *• Restoration of vegetation in the upper reaches and along the northern bank in the middle and lower reaches;* *• Curb recreational activities in lower reaches;* *• Reduce/remove cast netting in the mouth area* *• Relocate upstream, or remove, the Sappi Weir.* *• Restore baseflows to estuary to maintain mouth state and salinity profile.* *The TEC of a B/C is immediately applicable and excludes the relocation of the SAPPI weir (as it may have economic consequences) and restoration of baseflows (difficult without a dam). The same anthropogenic measures under medium to long-term option Sc21 (includes the dam) as well as Sc Ci and Di, will also achieve the B/C.*	**B/C**

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
						However, putting any additional waste whatsoever in the Mkomazi should be avoided due to the risk of mouth closure (especially pre-dam) and other options should be sought.	
Ngane	*C*	*C*		*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Umgababa	*B*	*C*		*C*	*C*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality; and* *• Partial restoration of estuarine habitat.* *Without information on the baseflow requirements (and a way to supply it), the REC cannot be achieved in the short term. The TEC therefore represents an improvement, but not to the REC. Water quality and estuarine habitat must be improved to achieve the TEC which is immediately applicable. Once higher confidence information is available on this estuary, the TEC can be improved to a B. No waste water must be put into this system as it will then not make it possible to improve to the REC in the long term.*	**B/C**
Msimbazi	*A*	*B*		*B*	*B*	*Interventions required to achieve the REC:* *• Protect baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality.* *• Partial restoration of estuarine habitat.* *The TEC is set to maintain the PES. Improvement to the A will be difficult as one would have to remove some development in the catchment.*	**B**
Lovu	*B*	*C/D*		*C/D*	*C/D*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to improve mouth state and salinity profile. (Scenario L4)* *• Improve water quality; and* *• Partial restoration of estuarine habitat.* *ScL4 (significant decrease in forestry and irrigation) may meet REC. Socio economic implications of this scenarios are significant and the immediately applicable TEC is set at a B/C by applying non-flow related measures. Further improvement may require measurements that have significant socio-economic consequences.*	**B/C**
Little Amanzimtoti	*D*	*E*		*E*	*E*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to improve mouth state and salinity profile.* *• Significant improvement in water quality; and* *• Partial restoration of estuarine habitat.* *Immediate applicable maintain PES, as it is very difficult (costly) to achieve the D as this would require removing all waste. Further WW scenarios can therefore be considered as long as the estuary does not become a health hazard and there is compliance to other relevant legal requirements.*	**EF**
Manzimtoti	*D*	*D/E*		*D/E*	*D/E*	*Interventions required to achieve the REC:* *Catchment water quality.* *Riparian habitat.* *REC of a D is immediately applicable*	**D**
Mmbokotwini	*D*	*E*		*E*	*E*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to improve mouth state and salinity profile.* *• Significant improvement in water quality; and* *• Partial restoration of estuarine habitat.* *Immediate applicable maintain PES, as it is very difficult (costly) to achieve the D as this would require removing all waste. Further WW scenarios can therefore be considered as long as the estuary does not become a health hazard and there is compliance to other relevant legal requirements.*	**EF**
Sipingo	*D*	*F*		*F*	*F*	*Interventions required to achieve the REC:* *• Restore as much as possible baseflows to estuary to improve mouth state and salinity profile.* *• A significant improvement in water quality (storm water) needed.* *• Partial restoration of estuarine habitat.* *It is not possible to improve the estuary to a D as there is limited restoration potential. It must be noted that the mangrove habitat should not be compromised within the estuary. Stormwater the overriding problem.*	**EF**
Durban Bay	*D*	*E*		*E*	*E*	*It is not possible to improve the estuary to a D as there is limited restoration potential. It must be noted that the white mangrove habitat should not be compromised within the estuary.*	**EF**
Durban Bay	*D*	*E*				*Interventions required to restore functionality to Durban Bay applicable to the specific important areas within the bay:*	**D**

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
Shallow water and interidal zone						*• Protect baseflows to estuary to maintain mouth state and salinity profile.* *• Improve water quality (storm water management);* *• Reduce fishing effort, and* *• Partial restoration of estuarine habitat in upper reaches.* *The restoration of this area requires a TEC of a D and is immediately applicable.*	
Mgeni	*D*	*D/E*		*D*	*D*	*Interventions required to achieve the REC/TEC:* *• Restoration of macrophytes: removal of alien plant species, replanting/ reintroduction with indigenous species (some of which is already occurring)* *• Wetland engineering (creation of new wetland habitats in close proximity to the uMngeni River banks,.* *• Implement flow allocation in an estuary friendly manner* *• Review the current breaching policy that only requires breaching after 2 to 3 weeks, this poses a risk to plant communities and birds.* *• Develop an Estuary Management Plan* *The above interventions can achieve the TEC which is immediately applicable. Any scenarios that result in a D TEC are acceptable.*	**D**
Mhlanga	*B*	*D*		*D*	*D*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to improve mouth state and salinity profile.* *• A significant improvement in water quality needed.* *• Partial restoration of estuarine habitat.* *If the existing pumping scheme comes into operation, it should achieve REC. The TEC is therefore set as the REC and is immediately applicable.*	**B**
Mdloti	*C*	*D*		*D*	*D/E*	*Interventions required to achieve the REC:* *• Restore baseflows to estuary to improve mouth state and salinity profile.* *• A significant improvement in water quality needed; and* *• Partial restoration of estuarine habitat.* *Further investigation need to be conducted to see to what extend the catchment quality can be improved to meet the REC. The importance rating should also be reviewed as it is likely that improvement to a C may not be required. The TEC that is therefore immediately applicable is set to maintain the PES. A scenario that includes more waste water to a specific limit must be investigated as this could achieve the TEC.*	**D**
Tongati	*C*	*D*		*E*	*E/F*	*Improvement is based on low confidence importance which cannot be refined (1 point). Based on this, the immediate applicable TEC is set as a D and all scenarios apart from Aiii will maintain the present state.*	**D**

Table 6 Detailed NC catchment configuration, interventions and TEC motivations

Estuary	REC	PES		Sc C	Sc D	TEC motivation	TEC
Mhlali	*B/C*	*C/D*		*D*	*D*	*Interventions required to achieve the REC:* *• Reduce the nutrient input from the WWTW and catchment to control growth of reeds and aquatic invasive plants;* *• Remove the sugarcane from the Estuary Functional Zone (below 5 m contour);* *• Removal of vegetation from main river channel in upper reaches, including invasive aliens plants;* *• Ensure that the estuary is not artificial breached; and* *• Remove the old saltwater weir from middle reaches of system.* *Intervention without removal of WW will achieve a C, but not REC. However, infrastructure has already been constructed and licenses awared for an increases in waste (from .8 to 6 Ml/D) (Sc D). Any increase of waste from current is likely to result in a decreased (from PES) state as nutrients are the key factor in this estuary.*	**D**
Bobstream	*B/C*	*B/C*		*B/C*	*B/C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**B/C**
Seteni	*B/C*	*B/C*		*B/C*	*B/C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**B/C**
Mvoti	*C*	*D*		*D*	*D*	*Interventions required to achieve the REC:* *• Improvement of oxygen levels in the estuary, through for example, removal of the high organic content from the Sappi Stanger effluent;* *• Reduce the nutrient input from the catchment by 20%.* *• Remove the sugarcane from the Estuary Functional Zone (below 5 m contour).*	**C/D**

					If the Sappi effluent is retained, but other interventions applied TEC = C/D. Sc 21, 22, 41, 42 and 43 (which includes a proposed dam) will also achieve the TEC with the above measures. Limited increase in WW to this system is not likely to degrade it below a D as long as the system remains open. *The TEC is set as a C/D which can be maintained with a new dam, possibly limited increases in waste water, and by addressing the interventions above without the removal or organic content from the SAPPI effluent.*	
Mdlotane	*A/B*	*B*	*B*	*B*	*Interventions required to achieve the REC:* *Improve water quality; and* *Partial restoration of estuarine habitat.* *The TEC is set as an A/B.*	**A/B**
Nonoti	*C*	*C*	*C*	*C*	*TEC set to maintain the PES and REC and is immediately applicable.*	**C**
Zinkwazi	*A/B*	*B/C*	*B/C*	*B/C*	*Interventions required to achieve the REC/TEC:* *• Protect baseflows to estuary to ensure mouth state and salinity regime.* *• Improve water quality; and* *• Partial restoration of estuarine habitat.* *MEasures should be put in place to improve to a B and the TEC of a B is immediately applicable. It is felt that achieving an A/B will required a scale of interventions that is difficult and with negative socio-economic implications.*	**B**