DETERMINATION OF WATER RESOURCE CLASSES AND RESOURCE QUALITY OBJECTIVES FOR THE WATER RESOURCES IN THE MZIMVUBU CATCHMENT

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

BACKGROUND INFORMATION DOCUMENT (JUNE 2018)

PURPOSE OF THIS DOCUMENT

The purpose of this document is to:

- Assist members of the public who will be attending the broader stakeholder meetings on 05 or 06 June 2018 to have sufficient **background of the study** to **participate meaningfully**.
- Provide an overview of the steps followed to determine the **Water Resource Classes** and **Resource Quality Objectives** for the Mzimvubu catchment.
- To present the **preliminary results** of the process that will soon be **gazetted** for further public review.

All stakeholders are encouraged to participate in the process by contributing information at meetings or by corresponding with the public participation office, the technical team or the DWS Project Manager at the addresses provided below.

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1. BACKGROUND

The National Water Act (NWA), Act No. 36 of 1998, is founded on the principle that the South African Government has overall responsibility and authority over water resource management for the benefit of the public. In order to achieve this objective, Chapter 3 of the NWA provides for the **protection of water resources** through the implementation of Resource Directed Measures which includes the **Classification of water resources, setting the Reserve and determination of Resource Quality Objectives (RQOs)**.

The DWS is responsible for the classification of water resources in terms of the published Water Resource Classification System (WRCS), Regulation 810 published in September 2010. Classification is required to facilitate an appropriate balance between use of the water resources and the protection thereof.

The DWS has identified the need to classify significant water resources (rivers, wetlands, groundwater and the Mzimvubu Estuary) in the Mzimvubu catchment and determine RQOs. To this end, the DWS appointed a team of Professional Service Providers in August 2016 to assist with the process. The team is led by Dr Patsy Scherman of Scherman Colloty & Associates, based in Grahamstown.

2. AIMS OF THE STUDY

The main aims of the study were to:

- Coordinate the implementation of the WRCS as required in Regulation 810, by classifying all significant water resources in the Mzimvubu catchment.
- Determine RQOs using the DWS's procedures to determine and implement RQOs for the defined classes.
- Consolidate and undertake additional work as required to improve the work previously done on Ecological Water Requirements (EWRs) and Basic Human Needs (BHN) for the purposes of Classification.

3. WHAT ARE WATER RESOURCE CLASSES AND RQOs?

The WRCS is a set of guidelines and procedures for determining the desired characteristics of a water resource and is represented by a Water Resource Class (see **Table 1** for descriptions per Class and defining rules for the Mzimvubu catchment (**Figure 1**)). The Class outlines the attributes required of different water resources and reflects the importance given to protection and/or development. The actual process of applying the WRCS guidelines and procedures in order to establish the classes is called the Classification Process. The outcome of the Classification Process is the approved Water Resource Classes and Resource Quality Objectives (along with the accompanying Reserve) by the Minister or his delegated authority. These will then be binding on all authorities or institutions when exercising any power or performing any duty under the NWA.

Table 1: Water Resource Class descriptions and defining rules for the Mzimvubu T3 catchment

Classes	Description of use		% Ecological Category* representation (or *catchment configuration*) for biophysical nodes in an IUA to define a Class				
			≥ A/B	≥ B	≥C	≥ D	< D
Class I	**Minimally used -** water resource is minimally used and the overall ecological condition of that water resource is minimally altered from its pre-development condition		0	60	80	95	5
Class II	**Moderately used -** water resource is one which is moderately used and the overall ecological condition of that water resource is moderately altered from its pre-development condition			0	70	90	10
Class III	**Heavily used -** water resource is one which is heavily used and the overall ecological condition of that water resource is significantly altered from its pre-development condition	Either			0	80	20
		Or				100	

**The Ecological Category (EC) means the assigned ecological condition to a water resource in terms of the deviation of its biophysical components from a pre-development condition. The scale is A (near natural) to F (critically modified).*

RQOs are numerical and/or narrative descriptive statements of conditions which should be met in the receiving water resource, in terms of the overall quality of the resource, in order to ensure that the water resource is protected. The purpose of the RQOs is to establish clear and measurable goals relating to the required state of the relevant water resource. The National Water Act stipulates that in determining the RQOs a balance must be sought between the need to protect and sustain the water resources, and the need to develop and use them. The RQOs are intended to give effect to Water Resource Classes determined in each water resource.

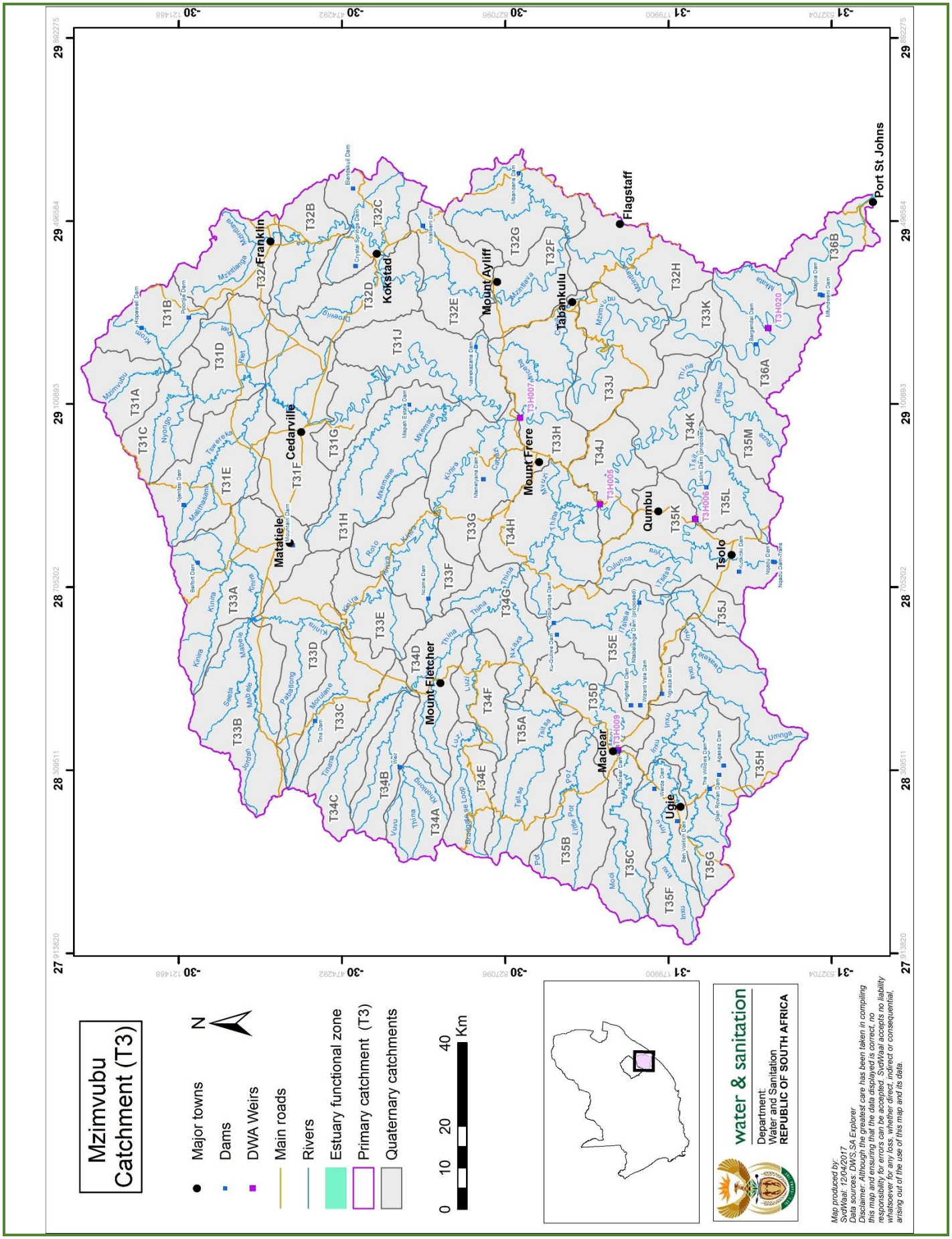


Figure 1: Mzimvubu River Catchment

4. DESCRIPTION OF STUDY AREA

The Mzimvubu catchment forms a major part of the Mzimvubu to Tsitsikamma Water Management Area (WMA); secondary catchment T3. The Mzimvubu River catchment is one of the poorest and least developed parts of South Africa. The catchment comprises the following tertiary drainage regions and associated main river systems as depicted in **Table 2** below:

Table 2: Tertiary drainage regions and associated main river systems in T3

T31	Upper Mzimvubu
T32	Mzintlava
T33	Kinira
T34	Thina
T35	Tsitsa, Inxu (Wildebees)
T36	Lower Mzimvubu

The Mzimvubu River and its tributaries all have their headwaters in the Drakensberg Mountains, flow through deep river valleys into the coastal belt and discharge into the Indian Ocean at Port St Johns. The catchment includes various towns of which the most important are Ugie, Tsolo, Qumbu, Maclear, Mount Fletcher, Mount Ayliff, Mount Frere, Matatiele, Tabankulu, Kokstad, Flagstaff and Port St Johns.

As one descends from the escarpment, extensive and utilised floodplain wetlands occur around Matatiele, Cedarville and Franklin. The area around Ugie and Maclear also has extensive, and often in good condition, channelled valley-bottom wetlands. No major in-stream dams occur along the main rivers.

5. PROJECT PLAN AND PROGRESS

The study was undertaken according to the Project Plan shown in **Figure 2**. The outputs and activities associated with each step are shown in **Table 3**.

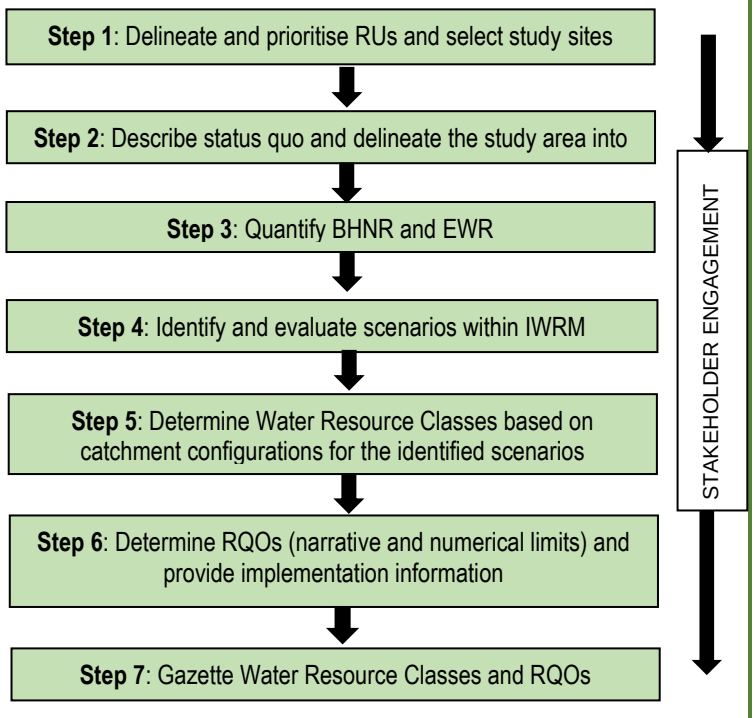
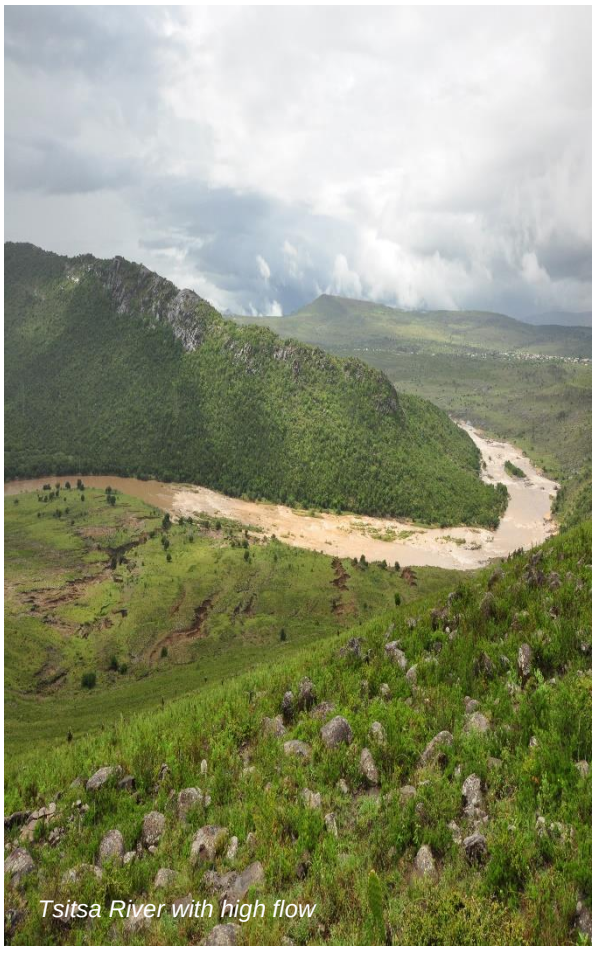


Figure 2: Project Plan for Mzimvubu Study



Tsitsa River with high flow

Table 3: Outputs per step of the Mzimvubu Project Plan

STEP	OBJECTIVE OF STEP	OUTPUTS AND ACTIVITIES
1	Identify high priority areas where more detailed work would be focussed. These areas are selected based on ecological, socio-cultural and water resource use importance and are often areas of high ecological importance where water resources are stressed or may be stressed in future. This is a key step as the gazetted information is Resource Units (RUs) with measured information and potentially higher confidence output. Study sites (or EWR sites), where more detailed field work is undertaken, are selected within High priority RUs, i.e. sites can only be selected once the RU prioritisation process has been completed. RUs are therefore the delineation units for the EWR step.	• Delineation of RUs • Prioritization of RUs
2	Define Integrated Units of Analysis (IUAs) and provide a status quo description for each IUA. An IUA is a homogenous catchment or linear section of river based on the similarity of ecological state, system operation, land use, etc. The status quo description therefore provides the information at a broad scale to inform the delineation of the IUAs. This step therefore includes the identification of the water resource operation in the study area, the identification of users and socio-economics issues, describing the status quo which represents the current condition of the various components, and then, through a process of comparing similar areas, delineate IUAs. IUAs are therefore the delineation units of the Classification process.	• Data-gathering, including a Technical Task Group (East London, January 2017) and Information meeting (Matatiele, March 2017) regarding user water quality. • Delineation of IUAs • Output of Steps 1 and 2: Status Quo and Delineation Report
3	The objective of this step is to quantify the EWRs for different ecological states and set the Basic Human Needs (BHN). These EWRs (Ecological Categories and associated flow regime) are essential input into all the next steps and especially for the scenario evaluation. **Once a recommendation is made regarding the Target Ecological Category (TEC), the EWR determined during this step, and which supports the TEC and the Class, will become the flow or hydrology RQO.** *(**Note**: The Ecological Categories associated with the Water Resource Classes are referred to as Target Ecological Categories)* EWRs are set at desktop level for the desktop biophysical nodes and at detailed level for the study sites (EWR sites) that were selected during Step 1. EWRs can be set for a range of ECs. Note that the terminology *Reserve* is only used once decision on TECs are made later in the process. This step involves the hydrological modelling needed for all subsequent work, as well as the EcoClassification of all water resource components, i.e. rivers, estuary, groundwater and wetlands.	• River field survey (undertaken in September 2016 as flow dependent). • River and estuary specialist workshops (February 2017 and May 2017 respectively). • Basic Human Needs Report (Surface and Groundwater). • River Desktop EWR and Modelling Report: Volume 1 – Systems Modelling Volume 2 – Desktop EWR Assessment • River EWR Report • Estuary EWR Report • Groundwater Report • Wetland EcoClassification Report
4	Step 4 consists of the identification and description of operational scenarios within Integrated Water Resource Management. The objective of this step is to identify operational scenarios which are then modelled (using yield and system models) to provide the outputs in the formats required to evaluate the	• Scenario Description Report • River consequences specialist workshop (end May 2017). • Scenario Non-Ecological Consequences Report (user water quality, ecosystem services, economics). • Ecological Consequences Report (Phase 1 of modelling results).

STEP	OBJECTIVE OF STEP	OUTPUTS AND ACTIVITIES
	scenarios. Outputs are evaluated to determine a range of consequences which are then compared in order to rank the scenarios in terms of impact and meeting ecological objectives.	• Ecological Consequences Report: Appendix (Phase 2 of modelling results).
5	• Integrate the consequences to provide the resulting Classes under each scenario, as well as Classes for the Present Ecological State (PES), Recommended Ecological Category (REC) and TEC for stakeholder evaluation. • With stakeholder input, arrive at Classes and the catchment configuration that will be used for the preparation of the legal notice. The most important part of Step 5 is the determination of the Classes for each IUA under different operational scenarios and ecological states at various biophysical nodes. An analysis is undertaken to determine the best-balanced option between protection and use for each IUA and the biophysical nodes in the IUA (referred to as the Catchment Configuration). The implications of not meeting the ecological objectives represented by the REC are identified and the TECs are selected with appropriate motivations.	Classes and Catchment Configuration Report
6	ROQs are specified for the Classes and catchment configuration per RU. Different RQO levels, according to the RU priority (as determined during Step 1), are determined. The output provides appropriate level of RQOs for all RUs, with RQOs of High Priority RUs available for gazetting. The RQO reports serves as the numerical limits document used for monitoring. This information informs the monitoring phase as well as the implementation of the Classes configuration and the Reserve. According to the priorities of the RUs (determined during Step 1), different levels of detail are provided. High priority RUs will require detailed RQOs for a variety of components which will be gazetted, while low and moderate priority RUs will require broad and mostly narrative RQOs.	• Wetlands and Groundwater RQO Report • River and Estuary RQO Report • Monitoring and Implementation Report (*in preparation*)
7	The legislated process involves the publishing of a notice that provides access to the information to be gazetted and a 60-day public commenting period. Comments are considered and the final product (Water Resource Classes and RQOs) is gazetted for public information Comments received are captured in the Comment and Responses Register.	• Classes and RQOs gazette • Final deliverables of the study, e.g. Main Report

6. WATER RESOURCE CLASSES

During the course of the study, potential development or operational scenarios were identified, consequences evaluated, compared and ranked as a means to determine the appropriate balance between water use and protection for deriving the Classes. Operational scenarios, Water Resource Classes and RQOs are inherently linked as operational scenarios (Sc) inform the Water Resource Class and RQOs define and/or describe the Class (**Figure 3)**. The main development considered in the catchment are the dams of the Mzimvubu Water Project, i.e. Ntabelanga and Lalini dams in T35, referred to as Scenario 69.

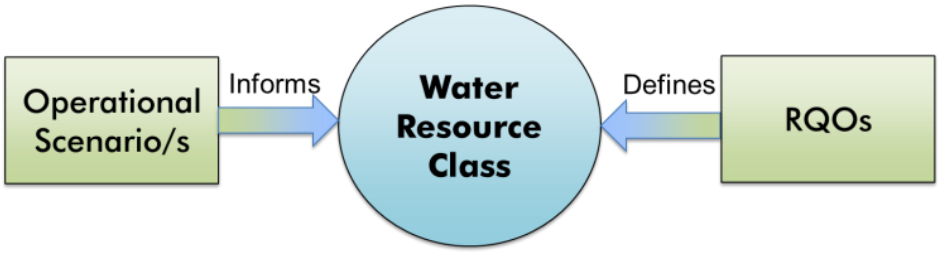


Figure 3: The relationship between scenarios, Classes and RQOs

From the scenario assessment process, draft Classes, defined by the catchment configuration of Ecological Categories for the biophysical nodes, were produced for each IUA. The Ecological Categories associated with the Water Resource Classes are referred to as Target Ecological Categories (TECs). The draft Classes for the IUAs of the Mzimvubu study area are shown graphically in **Figure 4**. It must be noted that as Scenario 69 meets the REC, a final decision on whether the dams will be constructed will not impact on the Classes. Nodes requiring improvement are shown in **Table 4**.

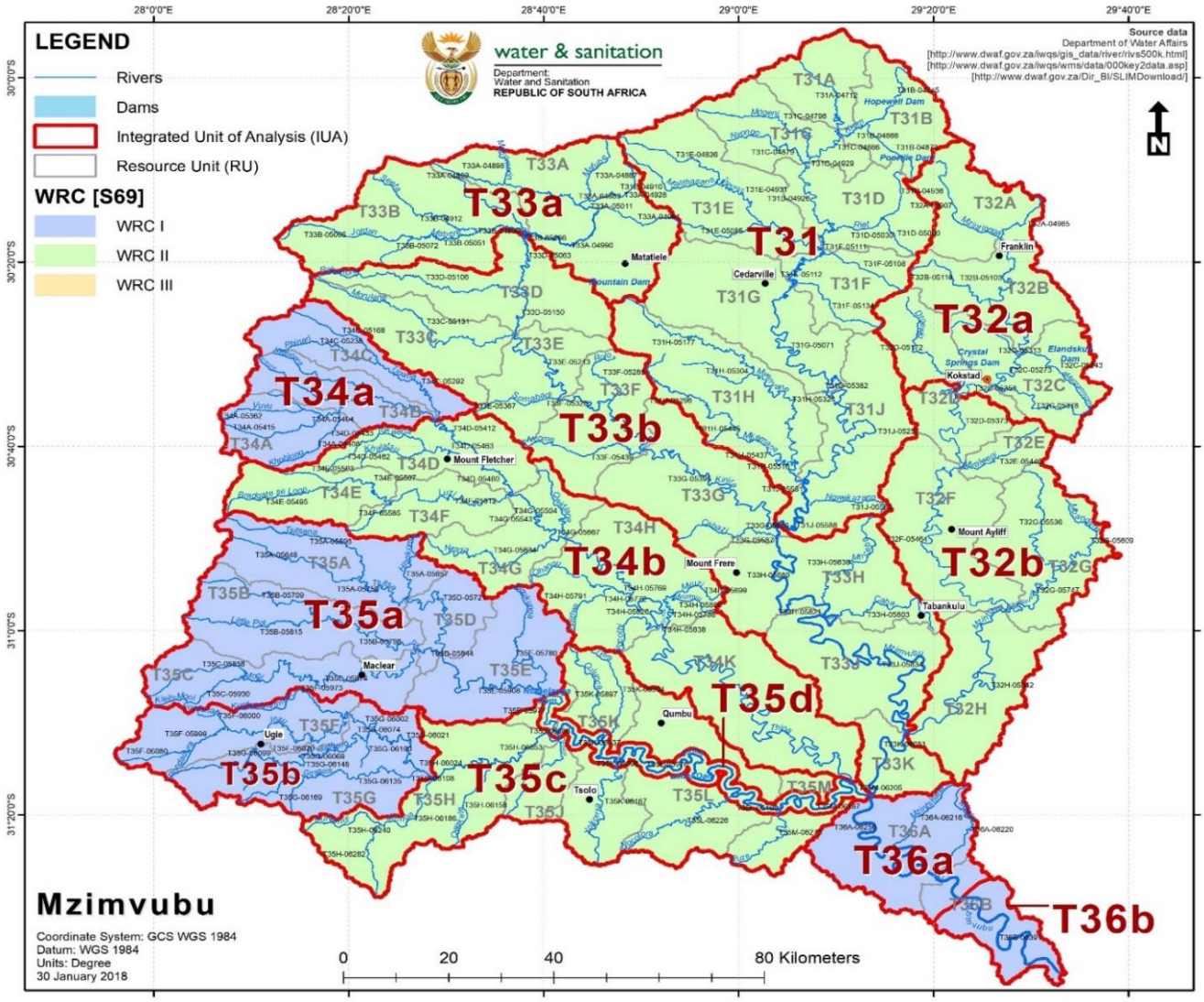


Figure 4: Draft Water Resource Classes for the Mzimvubu Catchment

Table 4: Mzimvubu catchment nodes requiring improvement

RU	RIVER	PES	REC COMMENT	REC
T31-17	unnamed	C	Possible sewage treatment required. Erosion control and improved agricultural practices. Alien vegetation removal.	B/C
T31-18	Mkemane	C/D	Water quality improvement required in terms of sedimentation, i.e. erosion control.	B/C
T32-1	Mzintlava	C	Flow only needs to improve as it relates to sensitivity. Control and management of dams.	B/C
T32-3	Mzintlava	C	Flow only needs to improve as it relates to sensitivity. Control of, amongst others, pivot irrigation, to supply EWR.	B/C
T32-4	Mill Stream	C	Combination of flow and non-flows impacts.	B/C
T32-11	Mzintlava	C/D	Erosion control and improved agricultural practices. Alien vegetation removal.	C
T32-12	Mzintlavana	B/C	Erosion control. Alien vegetation removal.	B
T32-13	Mzintlava	C	Improve riparian continuity by improving riparian buffer zone (floodplain agriculture).	B
T33-13	Caba	C	Improvement of Waste Water Treatment Works (WWTW) discharge quality, erosion prevention, riparian buffer protection.	B
T34-5	Thina	C	Supply the EWR from the dam. Improve the WWTW discharge quality.	B/C
MRU Gat IFR1	Gatberg	B/C	Flow modification can only improve if dams are managed to ensure EWR.	B
T35-10	Qwakele	C	Improve the riparian zone condition (erosion control and limit cultivation in zone) to improve water quality.	B/C
T35-11	Ncolosi	C/D	Improve the riparian zone condition (erosion control and limit cultivation in zone) to improve water quality.	C
T35-12	Culunca	C	Improve the riparian zone condition (erosion control and limit cultivation in zone) to improve water quality.	B/C

7. RESOURCE QUALITY OBJECTIVES

RQOs capture the Water Resource Class of the Classification System and the ecological needs determined in the Reserve into measurable management goals that give direction to resource managers as to how the resource needs to be managed. RQOs provide numerical and/or descriptive statements about the biological, chemical and physical attributes that characterise a resource for the level of protection defined by its Class.

River RQOs may be set for the following components, with the set of RQOs dependent on the priority level of the RU and the driving indicators:

- Quantity, pattern and timing of instream flow (hydrology)
- Water quality
- Geomorphology (EWR sites only)
- Characteristics and condition of riparian habitat and biota
- Characteristics and condition of instream habitat and biota

A full set of RQOs were set for all river EWR sites.

RQOs for the Mzimvubu Estuary were set for the following components:

- Hydrology

- Hydrodynamics
- Physical habitat (sediments)
- Water quality parameters
- Microalgae
- Macrophytes
- Invertebrates
- Fish
- Birds

8. STAKEHOLDER ENGAGEMENT

These broader stakeholder meetings mark the end of the comprehensive stakeholder consultation process which was initiated in August 2016 to provide an opportunity for stakeholders to participate in the process towards the development of proposed Water Resource Classes and RQOs as per the requirements of the National Water Act (Act No 36 of 1998).

Upon conclusion of these stakeholder meetings, the Department will initiate the gazetting process whereby a 60-day comment period will be provided for stakeholders. More information on the project is available on **http://www.dws.gov.za/rdm/WRCS/default.aspx**

The Department of Water & Sanitation and the study team wishes to express its appreciation to all stakeholders and Project Steering Committees for their participation and contributions in this study to date.

9. LIST OF ACRONYMS

BHN	Basic Human Needs		REC	Recommended Ecological Category
EC	Ecological Category		RQO	Resource Quality Objectives
EIS	Ecological Importance and Sensitivity		RU	Resource Units
EWR	Ecological Water Requirements		TEC	Target Ecological Category
IWRM	Integrated Water Resource Management		TTG	Technical Task Group
IUA	Integrated Unit of Analysis		WMA	Water Management Area
NWA	National Water Act		WRCS	Water Resource Classification System
PES	Present Ecological State		WWTW	Waste Water Treatment Works


Mzimvubu River

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COMMENT SHEET

Title:			
First Name:			
Surname:			
Organisation:			
Position:			
Email:			
Cell:			
Tel:		**Fax:**	
Postal Address:			

I would like to make the following comments in response to the Mzimvubu Study:

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We thank you for your participation. Please use separate or additional sheets if you wish.

Please complete and return to: Bongi Shinga,
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MY NOTES

THE DEPARTMENT OF WATER AND SANITATION

AND THE STUDY TEAM

WISHES TO THANK YOU FOR YOUR PARTICIPATION