

# Determining the Water Resource Classes and Resource Quality Objectives in the Thukela River Catchment

## Background Information Document

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### PURPOSE OF THIS DOCUMENT

The purpose of this background information document (BID) is to inform stakeholders about this study that will determine water resource classes and Resource Quality Objectives (RQOs) for all significant water resources in the Thukela River catchment within the Pongola to Mtamvuna Water Management Area in KwaZulu-Natal.

Through this process water resources within the catchment will be classified in accordance with the Water Resource Classification System and RQOs will be determined.

Stakeholders are invited to participate in the process by contributing information at meetings and workshops, or by corresponding with the stakeholder engagement office or the technical team at the addresses provided below.

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### BACKGROUND

The National Water Act, Act No. 36 of 1998 (NWA) is founded on the principle that National Government has overall responsibility for and authority over water resource management for the benefit of the public. It also requires that the nation's water resources be protected, used, developed, conserved, managed and controlled in an equitable, efficient and sustainable manner. 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 (RDM)

The Chief Directorate: Water Ecosystems of the Department of Water and Sanitation (DWS) is responsible for the implementation of RDM which includes the classification of water resources in terms of the Water Resource Classification System (WRCS), determining the Resource Quality Objectives (RQOs) and determination of the Reserve. These protection measures aim to ensure that a balance is sought between the need to protect and sustain water resources on one hand and the need to develop and use them on the other.

In September 2010, the Minister established a WRCS that was formally prescribed as Regulations 810 in terms of Section 12(1) of the NWA. The WRCS is a step-wise process whereby water resources are categorized according to specific classes that represent a management vision of a particular catchment by taking into account the current state of the water resource and defining the ecological, social and economic aspects that are dependent on the resource.

The DWS is underway with the process to set water resources classes for all river systems in South Africa to ensure their protection and sustainable use with the Thukela River catchment in KwaZulu-Natal being the current river system to be classified.

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## WHAT IS THE WATER RESOURCE CLASSIFICATION SYSTEM?

The Water Resource Classification System (WRCS) is a set of procedures for determining the desired characteristics of a water resource and is represented by a water resource class. The class outlines the attributes society requires of different water resources and reflects the importance given to protection and/or development. The implementation of the WRCS, therefore requires taking into account the social, economic and environmental landscape in a catchment in order to assess the costs and benefits associated with utilization versus protection of a water resource.

The actual process of applying the WRCS procedures in order to establish the class is called the classification process. The classification process is a consultative process that allows stakeholders to participate in the setting of the class. The outcome of the classification process will be the approval of the water resource classes by the Minister which will be binding on all authorities or institutions.

### *Why do we need to classify water resources?*

The determination of a class for a water resource represents the first stage in the protection process.

### *What is a water resource class?*

A water resource class, which will range from minimally used to heavily used, essentially describes the desired condition of the resource, along with the degree to which it can be utilised.

### *What are the outcomes of the classification process?*

- Water resource classes: Class I, II, or III.
- Resource quality objectives (RQOs).
- Reserve.

### **Water resources must be classified into the following:**

**Class I** water resource is one which is minimally used, and the overall ecological condition of that water resource is minimally altered from its predevelopment condition.

**Class II** water resource is one which is moderately used, and the overall ecological condition of that water resource is moderately altered from its predevelopment condition.

**Class III** water resource is one which is heavily used, and the overall ecological condition of that water resource is significantly altered from its predevelopment condition.

To determine the water resource class, the set of WRCS procedures grouped together into seven steps will be used, that when applied to a specific catchment, will ultimately assist in the process of maintaining a balance between protecting our water resources and using them to meet economic and social goals. The outcome of this process is a set of desired characteristics for each of the water resources in a given catchment.

## PROCEDURE FOR DETERMINING THE WATER RESOURCE CLASS

<b>Step 1</b>	<b>Delineate the units of analysis (IUA) and describe the status quo of the water resources.</b>
<b>Step 2</b>	<b>Link the socio-economic and ecological value and condition of the water resources.</b>
<b>Step 3</b>	<b>Quantify the ecological water requirements.</b>
<b>Step 4</b>	<b>Determine an ecologically sustainable base configuration (ESBC) scenarios.</b>
<b>Step 5</b>	<b>Evaluate scenarios within the integrated water resources management (IWRM) process.</b>
<b>Step 6</b>	<b>Evaluate the scenarios with stakeholders.</b>
<b>Step 7</b>	<b>Gazette the class configuration.</b>

## WHAT ARE RESOURCE QUALITY OBJECTIVES?

Resource quality objectives (RQOs) are a set of narrative and/or numerical management objectives defined for any particular resource, once the class is determined. RQOs encompass four components of the resource:

- Water quantity;
- Water quality;
- Habitat integrity; and
- Biotic characteristics.

RQOs are important management objectives against which resource monitoring will be assessed. Compliance monitoring will provide an indication as to whether the water resource class is being maintained.

In general, RQOs will form important sustainability indicators for water resource management.

## PURPOSE OF THIS STUDY

The purpose of this study is to determine water resource classes and Resource Quality Objectives (RQOs) for all significant water resources in the Thukela River catchment that will facilitate sustainable use of the water resources while maintaining ecological integrity.

The determination of the water resource classes of the identified water resources in the study area will essentially describe the desired condition of the resource, and conversely, the degree to which it can be utilised by incorporating the economic, social and ecological goals of the users and stakeholders in the catchment.

The class of a water resource sets the boundaries for the volume, distribution and quality of the Reserve and RQOs and, therefore, informs the determination of the allocable portion of a water resource for use.

## AN OVERVIEW OF THE STUDY AREA

The Thukela River catchment drains an area of 29 039 km<sup>2</sup>, rising on the escarpment of the Drakensberg and flowing approximately 512 km through the eastern slopes, the midlands and discharges in the Indian Ocean. The Thukela catchment has two main drainage systems, the Upper Thukela and the Buffalo Rivers. This is attributed to the Great Thukela Fault which runs in an east-west direction through the catchment as far as Colenso. The topography of the Thukela River catchment varies dramatically, ranging from steep areas to gentle slopes. The Thukela catchment lies predominantly in the KwaZulu-Natal Province, except for a narrow strip in the extreme north which falls in Mpumalanga.

The main topographic feature in the water management area is the Drakensberg Mountain Range in the west, which also demarcates the continental divide between the rivers flowing eastward to the Indian Ocean, notably the Thukela River, and the Orange/Vaal River basin with its outflow to the Atlantic Ocean. The climate is strongly influenced by the topography and ranges from cool in the mountains to subtropical at the coast. Mean annual rainfall is in the range from 600 mm to approximately 1 500 mm. As a result of the rainfall distribution and topography, most of the runoff originates in the vicinity of the escarpment and in the upper reaches of tributary streams, where waterfalls are a significant feature.

The Thukela River catchment is the largest river system within the Pongola to Mtamvuna Water Management Area (WMA 4). The system includes small to large catchment areas with the Thukela River flowing directly into the Indian Ocean via the Thukela estuary, situated some 95 km north of Durban.

The main river rises above Bergville. Major tributaries flowing into the Thukela River from the north include:

- The Klip River, which passes through Ladysmith,
- The Sundays River, and
- The Buffalo River, which rises above Newcastle.

Major tributaries into the Thukela River from the south include:

- The Little Thukela River,
- The Bloukrans River,
- The Bushmans River, which passes through Estcourt, and
- The Mooi River.

The resources of the Thukela River are predominantly used to support requirements for water in other parts of the country, with large transfers of water to neighbouring catchments - approximately 70 % of yield. The river is relied upon for transfers into the Vaal River System, to the Mhlathuze catchment to its north and the Mooi-Mgeni system to its south. The catchment includes eight major dams, however, for the most part, the Thukela River remains largely unregulated.

Relatively large potential for further development of surface resources exists in the catchment area, and several options have been investigated in this respect. The largest and most notable of these is the Thukela Water Project which is to consist of the proposed Jana Dam on the main stem of the Thukela River, Mielietuin Dam on the Bushman's River and an extensive aqueduct system for the transfer of water to the Vaal River System.

The total population of the catchment is about 1.56 million and the major towns are Newcastle, Dundee, Ladysmith and Estcourt. The catchment also includes the districts of Msinga, Nkandla and Nquthu which, despite being predominantly rural, are nevertheless heavily settled. Most people in the catchment are dependent on agriculture for their livelihood. Subsistence farming is practised on communal land, which covers much of the catchment area. Agriculture includes large areas of beef and dairy pastures, some sugar cane near the coast and around Weenen (both dry land and irrigated), vegetables, nuts and some citrus farming on the coast near Mandini. There is a limited forestry in the southern and eastern areas. The catchment also includes a paper mill at Mandini. Irrigation is extensive in the catchment.

Coal mining is also predominant in the Thukela catchment. The main mining area is the Buffalo River catchment. A number of other commodities such as sand and dolerite are also mined. Although many of the collieries in the catchment are inactive, they impact on the quality of the water resources in the area. The economy of the Newcastle area is heavily dependent on mining activity. The natural drainage from geological formations, and especially from coal mine workings, also contains appreciable amounts of nitrates and phosphate.

## STUDY APPROACH

This study focuses on the classification of significant water resources (rivers, wetlands, groundwater and the estuary) and determining associated RQOs in the Thukela River catchment.

The process begins by using the WRCS to define the current state of the water resource (or part thereof) in terms of the ecological and biophysical elements.

A detailed status quo assessment of the catchment (water resource quality, water resource issues, existing monitoring programmes, infrastructure, institutional environment, socio-economics, sectoral water uses and users) is undertaken to understand the current conditions.

The catchment is then delineated into integrated units of analysis (IUAs), where the catchment area is divided into basic units of assessment for the classification of water resources, and into resource units (smaller units) for determining RQOs.

A process of modelling, taking into account the protection requirements and development demands, is undertaken to understand consequences of different scenarios for the future of an IUA.

A consultative process will then be undertaken, whereby the outcomes of the scenario analysis are discussed, taking into account all the ecological, social and economic aspects, to define a future desired state of a water resource; namely the water resource class.

RQOs are then determined to ensure that the water resource classes set, can be met.

Once the consultation on the proposed classes and RQOs are complete, they are gazetted for public comment.

## **STAKEHOLDER ENGAGEMENT PROCESS**

The classification and RQOs study process is supported by focused stakeholder engagement aligned to the technical steps of the study. Stakeholders representing various relevant interests and sectors of society as well as organs of state in the catchment, form part of the process and are invited to participate.

It is the intention of the Department that stakeholders oversee the classification of water resources and determination of RQOs, provide input, comment and guidance, as well as communicate the key outcomes of the study to their constituencies and communities.

At this stage of the process, it is necessary that the study is announced, and stakeholders are introduced to the study and understand the process to be followed. The following means of communication and consultation will be undertaken over the course of the study. Stakeholders, interested and affected parties and the public are encouraged to participate in the process.

### ***Identification of stakeholders***

The identification of stakeholders in the study area will be an ongoing process. Stakeholders that have currently been identified include relevant government departments on national, provincial and local level; agriculture (irrigation boards/water user associations, national and local agricultural unions); mining and industry; conservation

organisations; parastatals, community representatives and civil society. As a stakeholder, you are encouraged to inform the stakeholder engagement office of other stakeholders that should be included in this engagement.

### ***Study Announcement***

The study will be announced to the public with a letter of invitation addressed to all Interested and Affected Parties (I&APs) currently on the database, accompanied by this BID and a reply sheet for I&APs to register for participation.

### ***Stakeholder Meetings***

Meetings will be held at key steps in the process to comply with Step 6 of the WRCS which states that stakeholders must evaluate scenarios before the process can be taken further.

### ***Project Steering Committee***

Stakeholders will be asked to serve on a Project Steering Committee (PSC) for the duration of this project. The PSC members will be key stakeholder representatives that will oversee the classification process and provide strategic advice and guidance.

### ***Ongoing Consultation with Stakeholders***

Stakeholders will continue to be informed of progress with the study through further BIDs and will be asked for their inputs on an ongoing basis. The DWS website will also be used to publish information regarding this study.

## **TIME FRAME**

The duration of the study is 30 months - September 2019 to February 2022.

## **THE WAY FORWARD**

This BID serves as a starting point for engagements with all stakeholders and aims to introduce the process and create understanding of the process of balancing the protection of water resources with its utilisation and development in the Thukela River catchment.

The information contained in this BID does not represent the full volume of information available for the study and which will be constantly updated and expanded during the classification process.

## DEFINITIONS

**Ecological Water Requirements (EWR):** The flow patterns (magnitude, timing and duration) and water quality needed to maintain a riverine ecosystem in a particular condition. This term is used to refer to both the quantity and quality components. The EWRs as determined during preliminary Reserve studies will be applied in this study.

**Ecological Water Requirement Sites:** EWR sites are set at specific points on the river. These sites provide sufficient indicators for the specialists to assess environmental flows and information about the variety of conditions in a river reach. An EWR site consists of a length of river which may consist of various cross-sections for both hydraulic and ecological purposes.

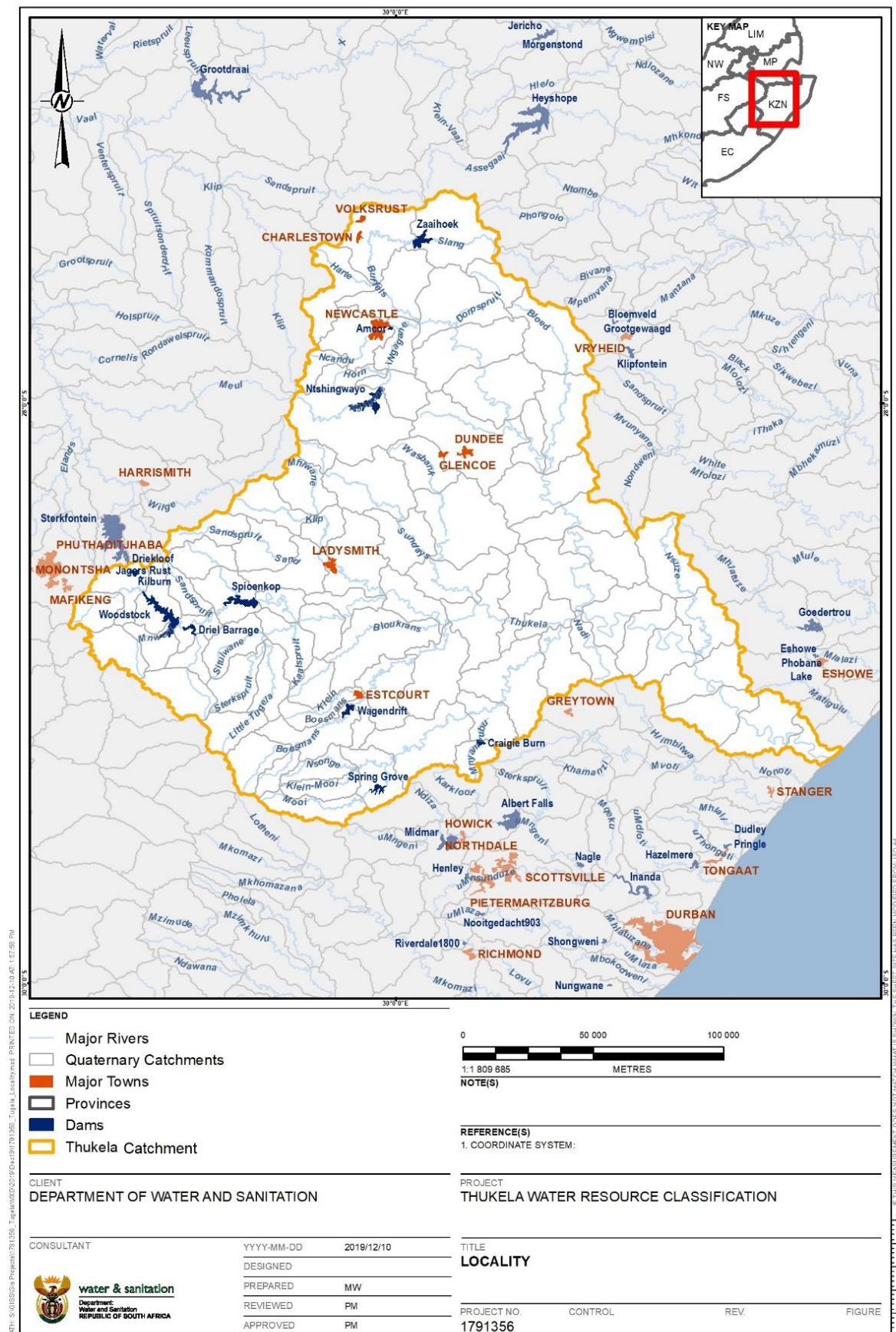
**Integrated Units of Analysis (IUAs):** The basic unit of assessment for the classification of water resources. The IUAs incorporate socio-economic zones and is defined by catchment area boundaries.

**Significant Water Resources:** Water resources that are deemed to be significant from a water resource use perspective, and/or for which sufficient data exist to enable an evaluation of changes in their ecological condition in response to changes in their quality and quantity of water. Water resources are deemed to be significant based on factors such as, but not limited to, aquatic importance, aquatic ecosystems to protect and socio-economic value.

**Resource Quality Objectives:** RQOs provide numerical and narrative descriptors of quality, quantity, habitat and biotic conditions as a basis from which management actions can be implemented for the sustainable use of all water resources.

**The Reserve:** According to the NWA, the Reserve is the quantity and quality of water required to satisfy basic human needs and to protect aquatic ecosystems, in order to secure ecological sustainable management of significant water resources. The Reserve, therefore, consists of two distinct components: (1) basic human needs and (2) the EWRs. The basic human needs provide for the essential needs of people that are dependent on the water resource for their livelihood and who are not supplied with water through formal reticulation systems. The ecological component of the Reserve (EWR) relates to the quantity, quality and variable flow of water required to protect the aquatic ecosystem of the water resource.





### Study Area Locality Map