

Determination of Resource Quality Objectives in the Mokolo, Matlabas, Crocodile West and Marico Catchments in the Limpopo North West Water Management Area

Background Information Document – 1
June 2016



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

PURPOSE OF THIS DOCUMENT

This Background Information Document (BID) provides information about the study initiated by the Department of Water and Sanitation (DWS), to determine Resource Quality Objectives (RQOs) for the water resources in the Mokolo, Matlabas, Crocodile West and Marico Catchments in the Limpopo Water North West Water Management Area (WMA01).

It provides:

- An introduction to the study and;
- A brief description of the RQOs determination process.

RQOs are descriptors of conditions of water resources that need to be met in order to maintain or improve the overall quality of the water resource.

Stakeholders are invited to participate in the process by attending stakeholder meetings or by corresponding with the stakeholder engagement office or the technical team at the addresses provided below.

Technical enquiries:

Trevor Coleman
Golder Associates Africa
P O Box 6001
Halfway House, 1685
Tel: (011) 254 4800
Fax: (011) 315 0317
Email: tcoleman@golder.co.za

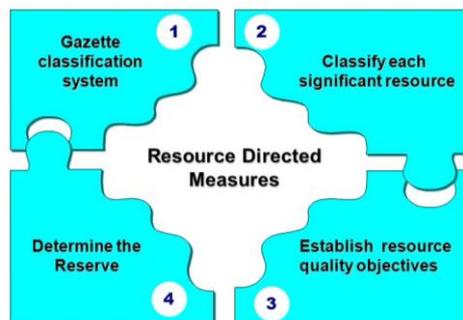
Stakeholder Engagement Office:

Nicolene Venter/Tricia Njapha
Zitholele Consulting (Pty) Ltd
P O Box 6002
Halfway House, 1685
Tel: 083 377 9112
Fax: 086 676 9950
Email: publicprocess@zitholele.co.za

BACKGROUND AND CONTEXT

All of South Africa's water resources are under the custodianship of the Department of Water and Sanitation (DWS). The DWS is mandated to protect, use, develop, conserve, manage and control South Africa's water resources in a manner that is integrated, equitable, efficient and sustainable.

Chapter 3 of the National Water Act, 1998 (NWA, Act 36 of 1998) lays down a series of measures which together are intended to ensure the comprehensive protection of all water resources. These measures includes the classification of water resources, setting the Reserve and establishing resource quality objectives.



Classification of water resources aims to ensure a long term balance between protection of water resources, optimal water use, equity between generations and equitable access. A water resource class, is a measure towards which a water resource must be managed. Once a water resource class is

determined, resource quality objectives (RQOs) are determined. RQOs provide measurable management goals that give direction to resource managers on how the resource needs to be managed. RQOs are either numerical or narrative limits or boundaries set to ensure protection and sustainable use of a water resources.

The Reserve consists of two parts, the basic human needs and the ecological reserve. The basic human needs provides for the essential human needs served by the resource in question whereas the ecological reserve relates to the water required to protect the aquatic ecosystems of the water resource.

In 2013, the Chief Directorate: Water Ecosystems (CD: WE) of the DWS completed the classification of the water resources of the Crocodile (West), Marico, Mokolo and Matlabas catchments in the Limpopo North West Water Management Area (WMA). Leading on from the classification process the DWS has now initiated the study for the determination of RQOs for the water resources in the Crocodile (West), Marico, Mokolo and Matlabas catchments.

DWS Study Managers

Ms Lebogang Matlala	Director: Water Resource Classification	Tel: (012) 336 6707	Matlala@dws.gov.za
Ms Adaora Okonkwo	Project Manager	Tel: (012) 336 7038	OkonkwoA@dws.gov.za

OBJECTIVES

Resource Quality Objectives (RQOs) are defined by the National Water Act as clear goals relating to the quality of the relevant water resources. RQOs translate the water resource class (and ecological Reserve) of the water resource (either Class I, II, or III) into flow, quality, habitat and aquatic ecosystem management goals that need to be achieved to meet the desired class. These objectives are a numerical or descriptive statement of the conditions which should be met in the receiving water resource in order to ensure that the water resource is adequately protected. The RQOs may inform



decision-making relating to the use of water in a specific water resource. RQOs are descriptors of conditions of water resources that need to be met in order to maintain or improve the overall

quality of the resource.

In terms of the NWA, the RQOs are based on the water resource class which may relate to the following:

- Reserve;
- in-stream flow;
- in-stream and riparian habitat quality;
- water level;
- presence and concentration of substances in the water;
- characteristics and quality of water resource;
- characteristics and distribution of aquatic biota; and
- regulation of in-stream or land-based activities affecting water quality.

RQOs encompass four components of the resource:

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

RQOs are important management objectives against which monitoring data will be assessed. This will indicate whether the water resource class is being maintained. In general, RQOs will form important sustainability indicators for water resource management.

STUDY AREA

The study area for the RQO Determination study is the Mokolo, Matlabas, Crocodile (West) and Marico Catchments (see Figure 1) which are part of the Limpopo North West Water Management Area (WMA). Much of the area has low rainfall with significant inter-dependencies for water resources between catchments and with neighbouring WMAs.

Economic activity is mainly centred around game, livestock and irrigation farming, together with increasing mining operations. The surface water potential of the area has largely been developed. Relatively favourable formations for groundwater are found in the area and groundwater is therefore used extensively. However, over exploitation occurs in certain areas. Several inter-water management area transfers exist, all of which bring water into the catchment. A transfer from the Crocodile West catchment into the Mokolo catchment is being planned to support the expected growth in mining and power generation in the Lephalale area. The land-use is agriculture, with private and provincial nature reserves as well as coal mining and platinum mining. The area is largely rural in nature.

Mokolo and Matlabas Catchments

The Mokolo catchment stretches from the Waterberg Mountains through the upper reaches of the Sand River, and includes the Mokolo Dam and a number of small tributaries that join the main Mokolo River up to its confluence with the Limpopo River, including the Tambotie, Poer-se-Loop, Sterk and Rietspruit rivers. The catchment covers an area of 8 387 km² and is largely undeveloped with limited water resources. Land use includes irrigation in parts of the upper catchments, game farming, mining and two power stations. The Mokolo catchment is a dominant coal mining area. There are opportunities for further development of the substantial coal reserves and gas fields and other coal based industries and related development. The Waterberg coalfield is considered to hold more than 40% of South Africa's *in situ* mineable coal reserves. The new thermal Medupi Power Station is currently under construction in the Mokolo Catchment.

The Steenbokpan area, quaternary catchment A41E in the Matlabas catchment, is part of the Lephalale coalfield and numerous mining developments are foreseen for this region. Current and future developments around the available coal reserves in the Steenbokpan area will require adequate planning for future water needs.

Crocodile (West) and Marico

The Crocodile (West) and Marico catchments borders on Botswana in the north-west and includes the two major river systems: Crocodile West and Marico, which give rise to the Limpopo River at their confluence. The catchment also includes the headwaters of the Molopo River, a tributary of the Orange River which drains westwards to the Atlantic Ocean. The catchments cover a total catchment area of 47 565 km². The Crocodile (West) and Marico catchments stretch across three provinces: Gauteng, Northwest and Limpopo.

The water resources of the Crocodile West catchment support major economic activities and a population of approximately 5.0 million people. It is the second most populated catchment area in the country with the largest proportionate (balanced) contribution to the national economy, generating almost a

third of the country's Gross Domestic Product. The area is highly altered by catchment development, with economic activity dominated by urban areas and industrial complexes of northern Johannesburg and Tshwane and with platinum mining north-east of Rustenburg. Extensive irrigation activities occur along the major rivers, with game and livestock farming occurring in other parts of the catchment.

Development and utilisation of surface water occurring naturally in the water management area has reached its full potential. Large dolomitic groundwater aquifers occur along the southern part of the area. The aquifers are utilised extensively for urban and irrigation purposes. A substantial portion of the water used in the catchment is transferred from the Vaal River and further afield. Increasing quantities of effluent return flow from urban and industrial areas offer considerable potential for re-use, but the effluent is at the same time a major cause of pollution in some rivers. Population and economic growth, centred on the Johannesburg - Pretoria metropolitan complex and mining developments, are expected to continue strongly in this area. The Pienaars, Apies, Moretele, Hennops, Jukskei, Magalies and Elands rivers are the major tributaries of the Crocodile River. The Crocodile River contributes to the flow of the Limpopo River, which has an international river basin shared with Botswana, Zimbabwe and Mozambique.

Within the Crocodile West catchment numerous mines occur mainly in a circular belt around the perimeter of the bushveld igneous complex. These mines are mainly focussed on the Platina group of metals. Mining activity is primarily concentrated in the Elands River catchment around Rustenburg. Chromite production takes place in the lower portion of the Bushveld Complex in the Rustenburg area and immediately west of Pilanesberg in the Mankwe area. High-grade hematite is mined from the Penge Formation in the southwest of the province. Acid and metallurgical grade fluorspar is currently produced from two mines hosted in dolomites in the vicinity of Zeerust and Marico, while limestone and dolomite are produced from two quarries in the Zeerust District.

Irrigation occurs mostly in the Crocodile catchment, immediately downstream of the Hartbeespoort Dam and also further downstream towards the south of Thabazimbi. Irrigation is done at Mmabatho with water sourced from the Grootfontein dolomitic compartments. Dry land crops, mostly maize, are grown in the higher rainfall south and south-eastern parts of the Crocodile (West) Marico catchment area. Stock and game farming dominate land-use in the drier northern and western regions.

Several heavy industries occur in the catchment area including Pelindaba and Valindaba (direct abstractions from the Crocodile River upstream of Hartbeespoort Dam), and the Dwaalboom cement factory at Thabazimbi (supplied by

Magalies Water from the Vaalkop Dam). Three relatively small power stations: Rooiwal, Pretoria West and Kelvin, are present in the catchment.

The Marico catchment borders Botswana to the northwest and the Vaal WMA to the south. The catchment is a large, relatively flat basin with low rainfall. Surface water is limited. Groundwater is important with springs and eyes providing river base flows and dolomitic aquifers providing water supply to the neighbouring Mafikeng area. The catchment is predominantly rural, with the main economic activity and water use being irrigated agriculture. Major towns include Zeerust and Marico. Some mining activity is present in the catchment but this is limited. Water supply is limited in the Marico, and sources are over exploited, with resources fully developed. The system is under stress.

Although the Crocodile (West) and Marico catchment area is not as renowned for its tourism activities as other provinces (e.g. Mpumalanga, KwaZulu-Natal, Eastern Cape and Western Cape), tourism nevertheless plays an important role in stimulating accommodation, transport and retail sectors. Of special interest is the Hartbeespoort Dam, a significant hub for various forms of recreation and tourism.

The upper reaches of the Molopo River is fed by a dolomitic eye that is diverted for domestic water supply.

OBJECTIVE OF THE STUDY

The main objective of the study is to determine RQOs for all significant water resources in the Crocodile (West), Marico, Mokolo and Matlabas catchments in the Limpopo North West WMA, that must give effect to the water resources classes that have been determined. This study commenced in March 2016 and will be finalised by September 2017. The RQOs are to be determined in accordance with the Department's Procedures to Determine and Implement Resource Quality Objectives, which follows an adaptive management cycle.

Resource Quality Objectives are set with the intention of maintaining the level of protection associated with an assigned water resource class and should:

- Be set in an integrated way;
- Allow for variability in natural hydrological, chemical and biological conditions; and
- Be implementable, measurable and verifiable.

STUDY PROCESS

The departmental Procedure will be employed to ensure the RQOs are determined consistently. The RQO Determination will have to take account of the potential impacts that the catchments' activities may have on water resources and

possibility of losing the services provided by these water resources in assessing a level of risk. The process will require that impactors and water users have a common and clear understanding of the consequences when deciding on the acceptability of impacts in setting the RQOs.

Determination of Resource Quality Objectives

The 7 guideline step process (Figure 2) of RQO determination will be implemented in order to determine RQOs for all significant water resources in the Mokolo, Matlabas, Crocodile (West) and Marico catchments in the Limpopo North West WMA.

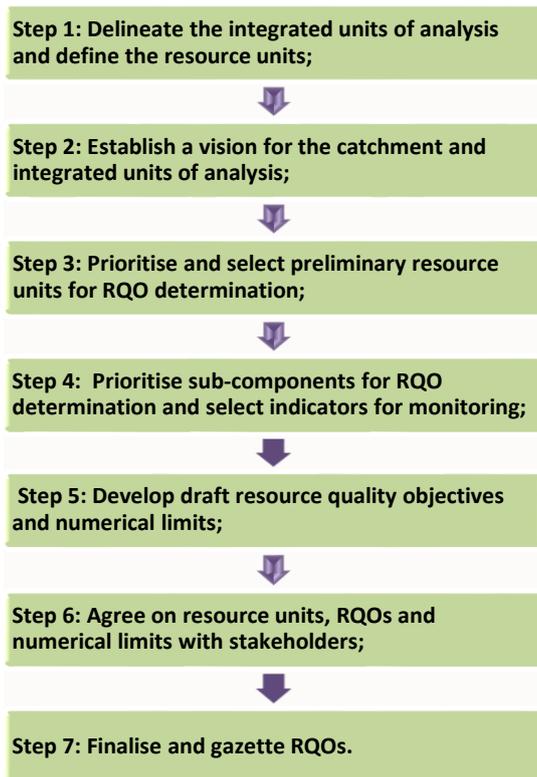


Figure 2: Steps to determine RQOs

STAKEHOLDER INFORMATION

The protection and management of water resources in South Africa is not just the responsibility of the Department but it is the responsibility of every citizen in this country to use water responsibly and to conserve water at all times. It is thus essential for the Department to involve the interested and affected parties (stakeholders) in the study area during this process..

Stakeholders play a vital role in the implementation process and the inputs that stakeholders can provide into a study like

this is necessary to ensure that consensus is reached on the level of protection that is required for the water resources in question.

The RQO study process is supported by a focused stakeholder engagement that is aligned to the technical steps of the study.

It is the intention that stakeholders will be involved at key steps, oversee the RQO process and provide input, comment and guidance as well as communicate the key outcomes of the study back to their constituencies and communities. Stakeholders will specifically be involved in obtaining agreement on the Resource Units, draft RQOs and numerical limits.

Stakeholders that represent all relevant interests and sectors of society, technical specialists and the various relevant organs of state in the catchment areas will form part of the process and will be invited to participate.

Should you wish to be involved in the process and be invited to stakeholder meetings and workshops please complete the registration sheet enclosed with this BID.

ONGOING CONSULTATION WITH STAKEHOLDERS

Stakeholders who which to be kept informed of the project should register to be included on the stakeholder database. Registered stakeholders will continue be informed of the progress electronically over the duration of the project. Stakeholders have an opportunity to engage on the proposed RQOs and numerical limits by attending the stakeholder meetings and workshops. Information regarding study workshops and meetings will be communicated to stakeholders as technical study outputs become available for consultation and review.

Thereafter the proposed Water Resource Classes and RQOs will be published by notice in the Government Gazette, and the public may submit written comments over a 60 days public comment period. The Department envisages that this will take place sometime during September –October 2017.

MORE INFORMATION

Go to the following links on the DWS website for more information on the classification and RQOs processes:

<http://www.dwa.gov.za/rdm/WRCS/default.aspx>

OR

<http://www.dwa.gov.za/rdm/Default.aspx>.

WHO IS CONDUCTING THE STUDIES ON BEHALF OF THE DWS?

The DWS has appointed Golder Associates Africa (Pty) Ltd in association with Wetland Consulting Services, Hydrosol, JMM Stassen and Zitholele Consulting to undertake the study.



Figure 1: Map of the study area