

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

Project Steering Committee Meeting- Background Information Document
September 2016



PURPOSE OF THIS DOCUMENT

This Background Information Document (BID) serves to update stakeholders on the progress of the study being undertaken 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:

- A brief overview of the study progress;
- A brief description of the RQO development process;
- Information of the resource unit and sub-component prioritisation steps.

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.

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INTRODUCTION

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. The aim

of protection water resources is to ensure that water is available for current and future human use and sustaining our ecosystems. This is achieved by ensuring enough water of the desired quality is in the resource to maintain the overall ecological functioning of the rivers, wetlands, groundwater and estuaries. Protection of the water resource is therefore about the quantity and quality (overall health) of the nation's water resources.

It is within this framework that the Chief Directorate: Water Ecosystems (CD: WE) of the Department of Water and Sanitation (DWS) has commissioned the study "Determination of Resource Quality Objectives (RQOs) in Mokolo, Matlabas, Crocodile (West) and Marico catchments in the Limpopo Water Management Area (WMA)". Proposed water resource classes have been completed in these catchment areas and the determination of the RQOs follows on from this process. Establishment of RQOs is a mechanism through which the balance between sustainable and optimal water use and protection of the water resource can be achieved.

RQOs are defined by the National Water Act as clear goals relating to the quality of the relevant water resources. RQOs translate the management class 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



Protect

Use

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.**

RESOURCE QUALITY OBJECTIVES

In terms of the National Water Act, the RQOs are based on the water resource class and may relate to the following:

- the Reserve;
- the in-stream flow;
- the water level;
- presence and concentration of particular substances in the water;
- the characteristics and quality of the water resource;
- the in-stream and riparian habitat quality;
- characteristics and distribution of aquatic biota; and
- the regulation or prohibition of in-stream or land-based which may affect the quantity of water in or quality of the water resource, and
- any other characteristic.

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.

STUDY AREA

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

The catchment areas lie predominately within the North West Province and include the northern part of Gauteng as well as the south-western portion of the Limpopo Province. Towards the north west it borders on Botswana. The main river systems within the catchment (Crocodile, Marico, Mokolo and Matlabas rivers) flow northwards to join the Limpopo River. Major tributary systems include the Pienaars, Apies, Moretele, Hennops, Jukskei, Magalies, Elands, Klein Marico, Molopo, and Ngotwane rivers.

The Pilanesburg Nature Reserve, the Cradle of Humankind Heritage Site, the Marakele Nature Reserve, the Bafokeng Tribal area, the dolomitic wetland or eye systems and large dams such as the Hartbeespoort, Vaalkop, Roodekopjes, Klipvoor, Roodeplaat, Molatedi and Mokolo Dams are all very important features in the catchment area. The Pilanesburg

Nature Reserve, the Cradle of Humankind Heritage Site and Hartbeespoort Dam are key tourists in South Africa.

The area is altered by catchment development, with economic activity dominated by urban areas and industrial complexes of northern Johannesburg and Tshwane, with platinum mining north-east of Rustenburg, and power generation and mining. In the Lephalale area. Economic activity is mainly centred around commercial agriculture, together with increasing mining operations, game and livestock farming and eco-tourism. The major land-use is irrigation farming, with private and provincial nature reserves as well as extensive coal mining and platinum mining. Parts of the catchment area are also largely rural in nature.

The water resources of the catchment area support major economic activities and a population of approximately 5.0 million people. The surface water potential of the area has largely been developed. Large dolomitic groundwater aquifers occur along the southern part of the area. The aquifers are utilised extensively for urban and irrigation purposes. 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 power generation and expected growth in mining in the Lephalale area.

RQO STUDY PROCESS

The departmental Procedure to Determine and Implement Resource Quality Objectives is being employed to determine the RQOs for the water resources in the Mokolo, Matlabas, Crocodile (West) and Marico catchments. The guideline seven step process as depicted in Figure 2 is being implemented.

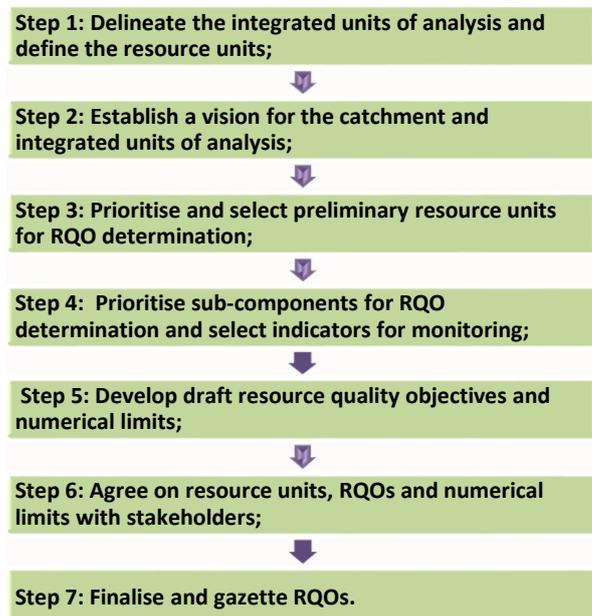


Figure 2: Steps to determine RQOs

WHERE ARE WE IN THE RQO PROCESS?

The RQO determination study for the water resources in the Mokolo, Matlabas, Crocodile (West) and Marico catchments has progressed steadily over the past seven months since project initiation in March 2016.

In terms of the seven step procedure outlined above the progress and outputs of the study thus far are briefly described in Table 1.

Table 1: Outputs of the study to date in terms of the RQO Determination Process

RQO PROCESS	Output
Determination of the Integrated Units of Analysis (IUAs)	Each integrated unit of analysis (IUAs) represents a homogenous catchment area of similar impacts which must be considered in the determination of RQOs. A total of 20 IUAs have been delineated for the Mokolo, Matlabas, Crocodile (West) and Marico catchment area as an output of the Water Resource Classification Study.
Delineation and Prioritisation of Resource Units (RUs) (May to July 2016)	A resource unit (RU) is a section of a water resource within an IUA that is sufficiently ecologically distinct to warrant its own specification of RQOs. In the Mokolo, Matlabas, Crocodile (West) and Marico catchments eighty one RUs were delineated. Subsequently, fifty six of these RUs (including groundwater and wetland priority areas) and eighteen dam RUs, have been prioritised. The prioritised resource units are listed in Table 2 and shown in Figure 3.
Prioritisation of sub-components and selection of indicators (August to September 2016)	The components of the water resource per resource unit viz. habitat, biota, quantity and quality were evaluated at a desktop level and preliminary sub-components have been prioritised for development of RQOs (e.g. flow, salts, fish, in-stream habitat). This was done in consultation with specialists. Key indicators for monitoring the sub-components were then selected for each RU.

As part of the RQO development process thus far, key components included the prioritisation of resource units and the identification of proposed sub-components and indicators for which RQOs should be set. There are number of resource units and a wide range of sub-components for which RQOs can be set, however it is not practical to set RQOs for everything.

A rationalisation process was thus applied to evaluate and prioritise the resource units and sub-components.

The study is at stage were the outputs of Step 3 and 4, the resource unit prioritisation results and the sub-components and indicators selected can be presented for consultation.

STAKEHOLDER ENGAGEMENT

The RQO study process is supported by a focused stakeholder engagement that is aligned to the technical steps of the study. Stakeholders representing various and all relevant interests and sectors of society, technical specialists and the various relevant organs of state in the catchment areas form part of the process and have been invited to participate.

To date the study has been announced and a background information document has been distributed for information. Stakeholder registrations are underway on an ongoing basis and anyone interested in participating is welcome to register.

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.

As part of the RQO development process, a key component is stakeholder consultation on the confirmation of the prioritised RUs and the sub-components and indicators selected. At this point it is appropriate that stakeholders are formally engaged on these process outcomes. It provides an opportunity for stakeholders to engage in the process and provide guidance and direction on where and what RQOs should be set.

Therefore as part of the process, Project Steering Committee meetings are being held to present the information of the resource unit and sub-component prioritisation steps. The Project Steering Committee meetings to be held are as follows:

Rustenburg	
Date:	Tuesday, 27 September 2016
Time:	10h00 to 13h30
Venue:	Sparkling Waters Hotel
Lephalale	
Date:	Wednesday, 28 September 2016
Time:	10h00 to 13h30
Venue:	Palm Park Hotel

Project Steering Committee Members are invited to attend any one of the two meetings to be held. Registration can be done through the study stakeholder engagement office (refer to contact details on page 1).

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Table 2: Prioritised Resource Units

IUA1	Upper Crocodile/Hennops/Hartebeespoort	
RU	Delineation	Catchment Area
1_1	Upper Hennops and Rietvlei Rivers to inflow to Rietvlei Dam	A21A
1_2	Rietvlei Dam	A21A
1_3	Hennops River from outflow Rietvlei Dam to the A21H catchment Sesmyspruit	A21H
1_4	Upper Pienaars River, Edendalespruit and Moretlele Rivers to Roodeplaat Dam	A23A
1_5	Roodeplaat Dam	A23A
1_6	Upper and middle reaches of Apies River, Skinnerspruit, Pienaars River from outflow Roodeplaat Dam to Boekenhoutpruit confluence, Roodeplaatspruit, Boekenhoutspruit	A23B, A23D, A23E
1_7	Jukskei, Klein Jukskei, Modderfonteinspruit	A21C
1_8	Upper reaches of Crocodile River and Bloubank Spruit	A21D, A21E
1_9	Crocodile River from Jukskei confluence to inflow Hartebeespoort Dam, Swartspruit	A21H
1_10	Hartebeespoort Dam	A21H
IUA2	Magalies	
RU	Delineation	Catchment
2_1	Maloneys Eye	South eastern portion of A21F
2_2	Magalies River, Klein Magalies, Bloubank, Skeerpoort Rivers	A21F, A21G
2_3	Surface water area linked to Maloney's eye	A21F
IUA3	Crocodile/Roodekopjes	
RU	Delineation	Catchment
3_1	Crocodile River from outflow Hartebeespoort Dam to inflow Roodekopjes Dam, Rosespruit, Ramogatla and Kareespruit	A21J
3_2	Roodekopjes Dam	A21J
IUA4	Hex/Waterkloofspruit/Vaalkop	
RU	Delineation	Catchment
4_1	Sterkstroom from outflow Buffelspoort Dam to inflow Roodekopjes Dam, Maretwane, Tshukutswe	A21K middle and lower catchment below dam
4_3	Buffelspoort Dam	A21K
4_2	Upper reaches of Sterkstroom to inflow Buffelspoort Dam , Kleinwater	A21K upper catchment to dam
4_4	Upper Hex River to Olifantsnek Dam, Rooikloofspruit	A22G
4_5	Olifantsnek Dam	A22G
4_6	Hex River outflow Olifantsnek Dam to inflow Bospoort Dam, Sandspruit	A22H
4_7	Bospoort Dam	A22H
4_8	Water Kloofspruit tributary catchment	A22H
4_9	Hex River outflow Bospoort Dam to inflow Vaalkop Dam	A22J
4_10	Vaalkop Dam	A22J
IUA5	Elands/Vaalkop	
RU	Delineation	Catchment
5_1	Upper reaches of Elands to Swartruggens Dam	A22A south eastern portion
5_2	Elands river downstream Swartruggens Dam to Lindleyspoort Dam	A22A
5_3	Lindleyspoort Dam	A22A
5_4	Upper Koster River to Koster Dam	A22B
5_6	Selons River, Kodoespruit, Dwarsspruit, lower Koster River	A22C, A22D
5_7	Elands River outflow Lindleyspoort Dam to inflow Vaalkop Dam, Brakkloofspruit, Roospruit, Sandspruit Mankwe, Leragane, Molapongwamongana	A22E, A22F
5.8/51.1	Swartruggens Dam	A22A
IUA6a	Klein Marico	
RU	Delineation	Catchment
6_1	Upper Klein Marico to inflow Klein Maricopoort dam, Rhenosterfonteinspruit, Malmanieloop, Kareespruit	A31D
6_2	Klein Maricopoort dam	A31D
6_3	Klein Marico downstream Klein Maricopoort Dam to Kromellenboog Dam, Wilgeboomspruit	A31E
6_4	Kromellenboog Dam	A31E
IUA6b	Groot Marico	
RU	Delineation	Catchment
6_5	Groot Marico, Polkadraaispruit	A31B
6_6	Marico Bosveld Dam	A31B
IUA7	Kaaloo-se-loop	
RU	Delineation	Catchment
7_1	Marico Eye, Kaaloo-se-Loop, Bokkraal-se-Loop, Ribbokfontein-se-Loop	A31A
IUA8	Malmaniesloop	
RU	Delineation	Catchment

8_1	Malmanie Eye, Dolomites	A31C
IUA9	Molopo	
RU	Delineation	Catchment
9_1	Bodibe Eye	D41A (Polfonteinspruit and Lotlhakane tributary catchment area)
9_2	Molopo Eye, Grootfontein Eye, Molopo headwaters to inflow Modimola dam	D41A
9_3	Molopo River mainstem only from Modimola Dam to Disaneng Dam	D41A (mainstem)
9_4	Modimola Dam	D41A
9_5	Disaneng Dam	D41A
IUA10	Dinokana Eye/Ngotwane Dam	
RU	Delineation	Catchment
10_1	Upper Ngotwane, Dinokane Eye	A10A
10_2	Ngotwane Dam	A10A
IUA11a	Groot Marico/Molatedi Dam	
RU	Delineation	Catchment
11a_1	Groot Marico from outflow Marico Bosveld Dam to Molatedi Dam, all tributaries	A31G, A31H, A31F, A31J, A32A, A32B, A32C
11a_2	Molatedi dam	A32A, A32B, A32C
IUA11b	Groot Marico/Molatedi Dam	
RU	Delineation	Catchment
11b_1	Rasweu, Maselaje rivers	A32D
11b_2	Elandslaagtespruit, Lengope la Kgamanyane, Lenkwane	A32E
IUA12	Bierspruit	
RU	Delineation	Catchment
12_1	Wilgespruit, Bofule, Kolobeng, Magoditshane, Motlhabe,	A24D
12_2	Bierspruit outflow Bierspruit Dam to confluence with the Crocodile River, Brakspruit, Phufane, Sefatlhane, Lesobeng	A24E, A24F
IUA13	Lower Crocodile	
RU	Delineation	Catchment
13_1	Crocodile River outflow Roodekopjes Dam to upstream Sand River confluence, Sleepfonteinspruit, Klipspruit tributaries	A21L, A24A, A24B, A24C
13_2	Sand River to confluence with the Crocodile River to Bierspruit confluence, Sondags, Vaalwaterspruit and Monyagole tributaries	A24G, A24H
13_3	Lower Crocodile from Bierspruit confluence to the Botswana border (Limpopo River)	A24J
IUA14	Tolwane/Kulwane/Moretele/Klipvoor	
RU	Delineation	Catchment
14_1	Apies River, Tshwane tributary	A23F
14_2	Pienaars River from Boekenshout confluence to Apies River confluence	A23C
14_3	Plat River	A23G
14_4	Moretele (Pienaars) River from Plat River confluence to Klipvoor Dam, Kutswane to Klipvoor Dam	A23J
14_7	Pienaars River from Klipvoor Dam to Crocodile Riverconfluence, Tolwane tributary	A23K, A23L
IUA15	Upper Mokolo	
RU	Delineation	Catchment
15_1	Mokolo River in A42C, E, Sand River and Klein Sand, Brakspruit, Sondagsloop, Heuningspruit, Dwars, Jim se loop tributaries	A42C, A42E
15_2	Sterkstroom, Frikiesloon,	A42D
15_3	Mokolo River in A42F to inflow Mokolo Dam, Taaibospruit, Malmanies and Bulspruit tributaries	A42F
15_4	Mokolo Dam and upper portion of A42G	A42F, part A42G
15_5	Grootspruit and Sandspruit tributaries (Mokolo headwater catchment) (upper Mokolo)	A42A, A42B
15_6	Mokolo River mainstem (A42E)	A42E
IUA16	Lower Mokolo	
RU	Delineation	Catchment
16_1	Tambotie river catchment	A42H (major portion -eastern)
16_2	Poer se Loop catchment	A42G
16_4	Sandloop	A42J and remaing portion of A42H
16_5	Mokolo mainstem	A42 G, A42H, A42J (along mainstem river)
IUA17a	Mothlabatsi/Mamba	
RU	Delineation	Catchment
17a_1	Mothlabatsi, Mamba Rivers	A41A, A41B
17a_2	Headwaters Mothlabatsi (peatlands)	A41A (south eastern)
IUA17b	Matlabas	
RU	Delineation	Catchment
17b_1	Matlabas	A41D, A41C

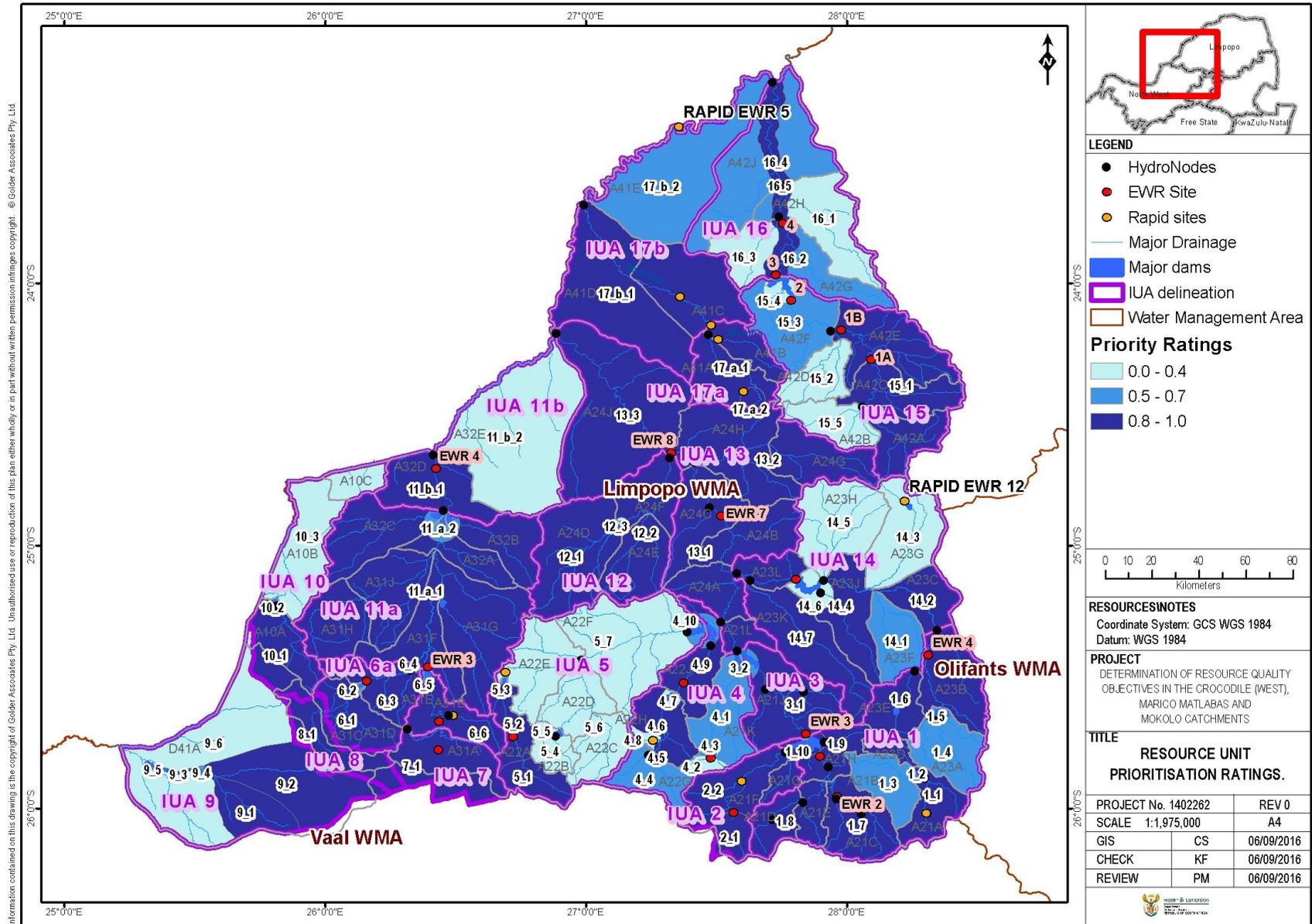


Figure 3: Map of prioritised resource units