Report Number 14 Edition 2

PLAN

Integrated Water Quality Management Plan for the Olifants River System

Implementation Plan

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

2030 NDP

DEPARTMENT OF WATER AND SANITATION

Water Resource Planning Systems Series

Development of an Integrated Water Quality Management Plan for the Olifants River System

Implementation Plan

Study Report No. 14

P WMA 04/B50/00/8916/15

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FOREWORD

The Minister of the Department of Water and Sanitation in the National Water Resources Strategy 2013 states that this is the decade of equity and redistribution. She further states that the dynamics of water, equity, development and growth are complex where water resource management lies at the heart of our aspiration to achieve growth, sustainable development and poverty reduction. There can be no growth and development without water, so water must be at the heart of all our planning, financing and governance frameworks.

Water, however needs to be of a quality that is fit for use for particular users. The Olifants Water Management Area (WMA) is a highly utilised and regulated catchment and like many other WMAs in South Africa, its water resources are stressed in terms of water quantity and quality. In the Upper Olifants, the source of the Olifants, the number of mining operations has grown significantly in the last 15 to 20 years, resulting in increased excess contaminated mine water that needs to be managed. Downstream users such as irrigators and urban and rural water users are impacted and in turn have their own impacts on the water resources. In many areas of the WMA the fitness for use has been severely compromised. There is therefore an urgency to ensure that water resources in the Olifants WMA are able to sustain their level of uses, improved where necessary and maintained at their desired states. The DWS National and Regional Offices, from a water planning perspective, identified the need to develop an Integrated Water Quality Management Plan for the WMA in order to manage the quality of its' water resources.

This IWQMP developed for the Olifants WMA provides a way forward in terms of ensuring that the water resources in the WMA are managed in a sustainable manner to support growth and development. Where the water quality has deteriorated to such an extent that it can no longer be used for the intended use, or it no longer sustains the ecology at a level for which the area has been classified, then the implementation of the plan should provide measures that will ensure an improvement over time. The plan recognises that water is fundamental to social and economic growth and development, also considering the protection of the ecology. It emphasises the interconnectedness of the various sectors and actions needed to support its' implementation.

The DWS, Provincial Office or mandated Water Management Institution, will be the lead agent for water resource management within the Olifants WMA and as such will take the lead in a number of key water resource management functions, of which water quality management is a key aspect that needs to be integrated into all other functions. However, the management of water quality in the Olifants WMA, can no longer be the sole mandate of DWS, but needs to be a government-wide task (including the Departments of Agriculture, Environment, Minerals, Co-operative Government and Traditional Affairs, Local Government and Health), to be implemented under the leadership of the DWS, with both the private sector and civil society playing a key role. Within this context, the successful implementation of the IWQMP for the Olifants WMA calls for an inclusive approach to managing water quality.

PROVINCIAL HEAD

DOCUMENT INDEX

Reports as part of this study:

Bold type indicates this report.

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3.0	P WMA 04/B50/00/8916/4	Water Quality Planning Limits Report
4.0	P WMA 04/B50/00/8916/5	Scenario Analysis Report
5.0	P WMA 04/B50/00/8916/6	Reconciliation and Foresight Report
6.0	P WMA 04/B50/00/8916/7	Management Options Report
7.0	P WMA 04/B50/00/8916/8	IWQMP for the Upper Olifants sub-catchment
8.0	P WMA 04/B50/00/8916/9	IWQMP for the Middle Olifants sub-catchment
9.0	P WMA 04/B50/00/8916/10	IWQMP for the Lower Olifants sub-catchment
10.0	P WMA 04/B50/00/8916/11	IWQMP for the Steelpoort sub-catchment
11.0	P WMA 04/B50/00/8916/12	IWQMP for the Letaba and Shingwedzi sub-catchments
12.0	P WMA 04/B50/00/8916/13	Monitoring Programme Report
13.0	P WMA 04/B50/00/8916/14	Overarching IWQMP for the Olifants River System
14.0	**P WMA 04/B50/00/8916/15**	**Implementation Plan Report**
15.0	P WMA 04/B50/00/8916/16	Study Close-out Report

APPROVAL

Title: Development of an Integrated Water Quality Management Plan for the Olifants River System: **Implementation Plan Report**

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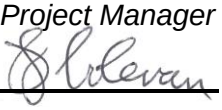

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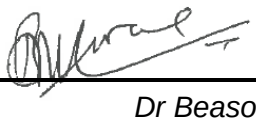

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The following individuals on the PMC are thanked for their contributions to the study:

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EXECUTIVE SUMMARY

The Department of Water and Sanitation (DWS) from a planning perspective identified the need to develop an overarching Integrated Water Quality Management Plan (IWQMP) for the Olifants Water Management Area (WMA) in order to manage the water resources and needed to take cognisance of, and align to a number of studies and initiatives that had been completed to date. The plan needed to establish clear goals relating to the quality of the relevant water resource in order to facilitate a balance between protection and use of water resources.

The main objective of the study is to develop management measures to maintain and improve the water quality in the Olifants WMA in a holistic and sustainable manner to ensure sustainable provision of water to local and international users. The key to the successful management of the water quality in the Olifants River System is the formulation of management measures that will integrate all the relevant aspects that have a bearing on the water resources. In this respect an assessment of the physical, economic, social, institutional, statutory and ecological aspects in the system was undertaken to understand the current situation and therefore be in a position to assess existing management options and proposed new options that will be able to handle the existing as well as anticipated future challenges (DWS Report number: P WMA 04/B50/00/8916/3). The national IWQM Strategy articulates the need to demonstrate success (Report number P RSA 000/00/21715/18). It is, therefore, important to be able to confirm that the efforts that have been put into developing the Olifants IWQMP and sub-catchment plans will have improved the water quality status in the six identified sub-catchments.

The implementation plan deals with the identified key issues of concern in each of the sub-catchments, highlighting the roles and responsibilities of the various government departments and other stakeholders. The various stakeholder engagements that have taken place throughout the project have formed an essential part of identifying and prioritising the critical components of each of the sub-catchment plans.

The determination of management options involved the identification and development of proposed management measures and options that will improve the non-compliance cases and deteriorating trends and utilise the available assimilative capacity to the benefit of the water users and ensure the sustainability of the system. Several existing management options are the right ones to refine, however implementation and enforcement have not been done effectively. The following options are detailed further in Report Number: P WMA 04/B50/00/8916/7, and were taken further in the sub-catchment IWQMPs:

- Structural/ physical options
  - Salinity Management
  - Metals Management
  - Nutrient and Microbiological Management
  - Additional weirs
- Institutional Management Options
  - Establishment of the Catchment Management Agency
  - Collaboration within Management Units: Mines, Industries and Power Stations
  - Collaboration within Government Departments: Defunct Mines

  - Operationalising the IWWMP and associated components
  - Load calculations and implementation of the Waste Discharge Charge System
  - Collaboration with Local Government structures
  - Protection of Source Areas
  - Operating rules
  - Emerging Contaminants Management
- Monitoring and Information
  - Collaborative monitoring
  - Monitoring for metals
  - Microbiological Monitoring
  - Emerging contaminants monitoring
  - Regional Laboratories
- Management Information System
- Groundwater Management Options
  - Water treatment options
  - Aquifer protection zoning
- Stakeholder Engagement

The critical elements that have shaped the construction of the plan can be summarised as follows:

- The strengthening of the water quality management function by assigning roles and responsibilities for implementing the various measures and associated actions that have been identified and for assigning reporting functions;
- Improving the information management systems to enable a more integrated approach to collecting and storing data from all relevant sources to:
  - allow for a better understanding of the status and trends of parameters of concern within the sub-catchments;
  - consolidate monitoring programmes (including levels 1 – 4 monitoring points);
  - prioritise hot spots that require urgent action;
  - report easily and clearly at various levels; and
  - build and sustain capacity in Government, the private sector and civil society.
- Mobilising the various sectors and developing stewardships/ partnerships within the Olifants WMA is critical, and the establishment of a “Community of Practice” is a priority to maintain sector wide engagement. Stakeholders who have been involved in this project, and specifically the sub-catchment workshops, are seen as the initiators of this Community of Practice. The DWS/ WMI needs to ensure that these stakeholders remain committed and are able to assist in sector wide engagement and help to create and deepen awareness at various levels.
- Realising impact and recognising successes are important aspects of ensuring that the process of implementing the plan is maintained.

This Implementation Plan is overarching and needs to be read in conjunction with the overarching IWQMP and sub-catchment plans.

The plan sets out strategic areas, measures and objectives described in the overarching IWQMP for the Olifants WMA. The implementation of the IWQMP will be facilitated through the four strategic areas and specific goals described in the overarching plan:

- **Strategic Area 1: Protecting water resources to maintain the goods and services that are accrued from functioning ecosystems:**

  Goal 1.1: The majority of riverine and wetland systems are maintained with the intent to improve the status of the ecosystems wherever possible

  Goal 1.2: Water in, or from, water resources in the Olifants WMA is fit for use

- **Strategic Area 2: Developing water resources to support social and economic growth:**

  Goal 2.1: Adequate water of appropriate quality is allocated to meet the social objectives of economic development, service delivery and equity/redress;

  Goal 2.2: All waste/ water containing waste generated by households and by economic activities is disposed of/ discharged lawfully and safely.

- **Strategic Area 3: Managing water quality and associated risks to underpin resilience:**

  Goal 3.1: Effective monitoring of source and non-point source pollution demonstrates that adaptive and climate resilient IWQM is being implemented at the WMA and sub-catchment levels.

  Goal 3.2: Compliance with water use authorisations is improved year on year

- **Strategic Area 4: Governing to ensure co-operative water resource management and development.**

  Goal 4.1: Institutional capacity and operational and financial systems are strengthened and supported to enable effective IWQM.

  Goal 4.2: Key partnerships are established, while stakeholder engagements and knowledge management are strengthened and maintained in support of IWQM.

These goals have been translated into the following Strategic Measures for Implementation:

Strategic areas	Strategic measures
Protecting water resources to maintain the goods and services that are accrued from functioning ecosystems;	▪ Strategic Measure 1-A: Meeting Resource Quality Objectives ▪ Strategic Measure 1-B: Groundwater protection ▪ Strategic Measure 1-C: Conserving ecological infrastructure ▪ Strategic Measure 1-D: Catchment and land use planning
Developing water resources to support social and economic growth	▪ Strategic Measure 2-A: Water resources assessment ▪ Strategic Measure 2-B: Water conservation and water demand management ▪ Strategic Measure 2-C: Water Allocation
Managing water quality and associated risks to underpin resilience	▪ Strategic Measure 3-A: Monitoring and information networks ▪ Strategic Measure 3-B: Water use compliance ▪ Strategic Measure 3-C: Adaptive risk management ▪ Strategic Measure 3-D: Climate change resilience
Governing to ensure cooperative water resource management and development	▪ Strategic Measure 4-A: Institutional and financial arrangements ▪ Strategic Measure 4-B: Partnerships ▪ Strategic Measure 4-C: Stakeholder engagement ▪ Strategic Measure 4-D: Knowledge Management

The objective of this report is to clearly define the priority actions that need to be implemented in the water management area (WMA), to allow the water users, stakeholders and regulators to implement the follow-on solutions in a co-ordinated participative manner.

The Implementation Matrix provides the Strategic Area, the associated goals and Objective and the actions require to implement. The table is structured as follows in Figure E-1.

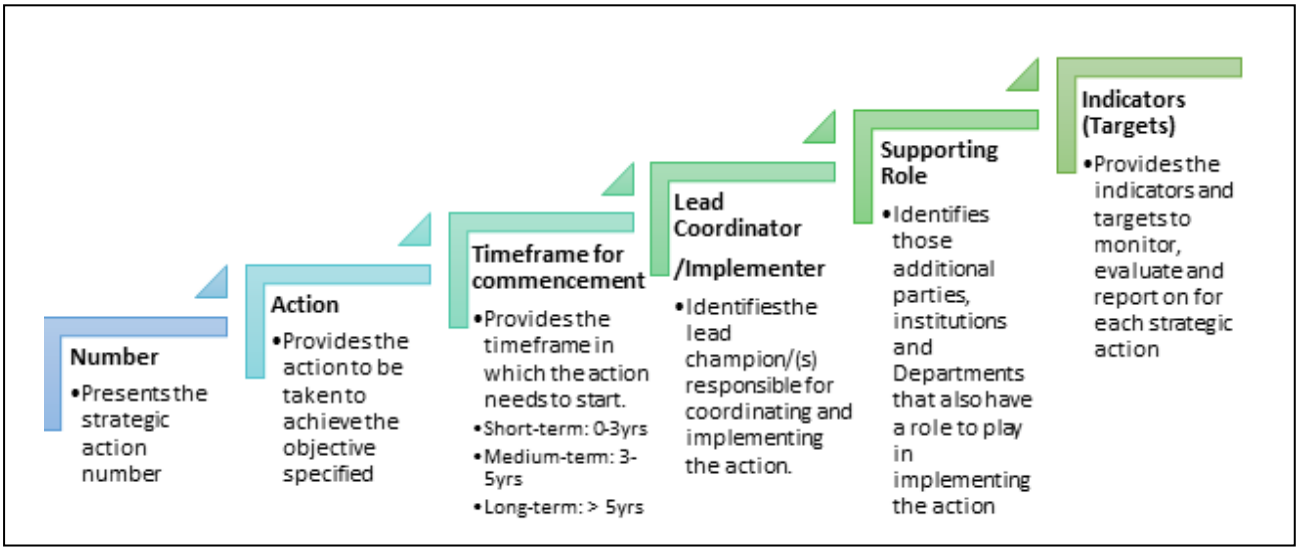

Figure E-1: Structure of the Implementation Matrix

The Implementation Plan is there to guide the way for achieving the strategic measures proposed for each of the strategic areas, setting down the actions that need to be taken in the short-, medium- and longer-term. The implementation plan **is not intended to cover all of the day-to-day functions of the Provincial DWS/ WMI, but highlights the strategic functions, responsibilities, and initiatives for Integrated Water Quality Management in the Olifants WMA in co-operation with other organisations, institutions and stakeholders**. Ultimately, these actions will support the Catchment Management Strategy that must still be developed. The Provincial DWS/ WMI's Annual Performance Plan describes its existing functions and initiatives and will integrate the actions described in this plan.

As described in the overall IWQMP as well as the sub-catchment IWQMPs, critical aspects for implementation success are awareness creation and communication. **It will be important for the Provincial DWS/ WMI to set up a co-ordination meeting to encompass all relevant stakeholders to enable a prioritisation of projects that should be tackled first within the various sectors:** ***rather take on pragmatic and practically sized pieces of work and succeed, as well as allowing for adaptive management as needed.***

It should be noted that this Implementation Plan is supported by an Excel Spreadsheet, which links the actions in the overall Implementation Plan to those in the sub-catchments plans.

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LIST OF ACRONYMS

APP	Annual Performance Plan
CAIA	Chemical Allied Industry Association
CBO	Community-Based Organisations
CD: WE	Chief Directorate: Water Ecosystems
CD: WIMS	Chief Directorate: Water Information Management Systems
CD: WQM	Chief Directorate: Water Quality Management
CMF	Catchment Management Forum
COGTA	Co-operative Governance and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
D: WRPS	Directorate: Water Resource Planning Systems
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DTI	Department of Trade and Industry
DoA	Department of Agriculture
DPME	Department of Planning, Monitoring and Evaluation
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EDC	Endocrine Disrupting Chemicals
EFR	Ecological Flow Requirements
EWR	Ecological Water Requirements
FGM	Focus Group Meeting
GIS	Geographical Information System
GTT	Government Task Team
GWP	Global Water Partnership

IDP	Integrated Development Plan
IGS	Institute for Groundwater Studies
IMC	Inter-Ministerial Committee
IPIC	Interdepartmental Project Implementation Committee
IWQM	Integrated Water Quality Management
IWQMP	Integrated Water Quality Management Plan
IWRM	Integrated Water Resources Management
IWUL	Integrated Water Use Licence
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
KNP	Kruger National Park
LNW	Lepelle Northern Water
LOROC	Lower Olifants River Operations Committee
MU	Management Unit
MUTT	Management Unit Task Team
MWCB	Mine Water Co-ordinating Body
NGO	Non-Governmental Organisation
NWA	National Water Act
NWRS	National Water Resource Strategy
ORS	Olifants River System
OWQMP	Olifants Water Quality Management PlanPAA
PAC	Project Administrative Committee
PGM	Platinum Group Metals
PMC	Project Management Committee
PSC	Project Steering Committee
RBO	River Basin Organisation
RDM	Resource Directed Measures

RQOs	Resource Quality Objectives
RWQOs	Resource Water Quality Objectives
SA	South Africa
SADC GMI	Southern African Development Community Groundwater Management Institute
SALGA	South African Local Government Association
SANBI	South African National Biodiversity Institute
SETA	Skills Education Training Authorities
SIWI	Stockholm International Water Institute
SWPN	Strategic Water Partners Network
TOR	Terms of Reference
WC/ WDM	Water Conservation/ Water Demand Management
WMA	Water Management Area
WMI*	Water Management Institution
WQM	Water Quality Management
WQP	Water Quality Planning
WQPL	Water Quality Planning Limits
WRC	Water Research Commission
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSLG	Water Sector Leadership Group
WUL	Water Use Licence

*__WMI__ – Water Management Institution refers to a catchment management agency, a water user association, a body responsible for international water management or any person who fulfils the functions of a water management institution in terms of the National Water Act (Act 36 of 1998)

1. INTRODUCTION

1.1 Background

The Olifants Water Management Area (WMA) which comprises the Upper, Middle and Lower Olifants River sub-catchments, as well as the Steelpoort, Letaba and Shingwedzi sub-catchments, is a highly utilised and regulated catchment and, like many other water management areas in South Africa, its water resources are critically stressed in respect of both water quantity and quality. This is due to an accelerated rate of socio-economic development and the general scarcity of water resources in the system. There is therefore an urgent need to ensure that water resources in the Olifants River System can sustain their current and anticipated levels of use and be maintained at their desired states.

The Olifants River originates at Trichardt, east of Johannesburg, and flows through to the Kruger National Park. The Letaba River, drained by the Groot Letaba River with its major tributaries being the Klein Letaba, Middle Letaba, Letsitele and Molototsi rivers, joins the Olifants River upstream of the border into Mozambique. Thereafter the Olifants joins the Limpopo River before discharging into the Indian Ocean. The Shingwidzi River flows through the Kruger National Park becoming the Rio Shingwidzi in Mozambique where it confluences with the Rio Elefantes downstream of the Massingir Dam.

Formal economic activity in the system is highly diverse and is characterised by commercial and subsistence agriculture (both irrigated and rain fed), diverse mining activities, manufacturing, commerce and tourism. Large coal deposits are found in the eMalahleni and Middelburg areas (Upper Olifants) and large platinum group metal (PGM) deposits are found in the Steelpoort, with copper and phosphate in the Phalaborwa areas. The catchment is home to several large coal-fired (thermal) power stations, which provide energy to large portions of the country. Extensive agriculture can be found in the Loskop Dam area, the lower catchment near the confluence of the Blyde and Olifants Rivers, as well as in the Steelpoort Valley, the upper Selati catchment and the upper catchments of the Groot Letaba. A large informal economy exists in the Middle Olifants, Middle Letaba and Shingwedzi catchments, with many resource-poor farmers dependent upon ecosystem services. The WMA has many important tourist destinations, including the Blyde River Canyon and the Kruger National Park. Land use in the Olifants River System is diverse and consists of irrigated and dryland cultivation, improved and unimproved grazing, mining, industry, forestry and urban and rural settlements.

1.2 Study overview

The Department of Water and Sanitation (DWS), from a planning perspective, identified the need to develop an overarching Integrated Water Quality Management Plan (IWQMP) for the Olifants WMA to manage the water resources and initiated a study in February 2016. It was important to align the study and its outcomes to other studies and initiatives that had been completed to date for the Olifants WMA

including the reconciliation studies, classification of the water resources, determination of Resource Quality Objectives and Reserve determination studies.

The plan needs to establish clear goals relating to the quality of the relevant water resource portions to facilitate a sustainable balance between the protection and use of water resources.

The main objective of the study was therefore to develop management measures to maintain and improve the water quality in the Olifants WMA for the different user types in a holistic manner to ensure sustainable provision of water to ***both local and international users***. The management measures described in this Implementation Plan are of an overarching nature and will deal with the broader Olifants WMA while taking the strategies and plans developed at the sub-catchment level into account.

The following aspects of the study have been completed:

- Inception Report (Report No: P WMA 04/B50/00/8916/1);
- Water Quality Status Assessment and International Obligations with Respect to Water Quality Report: (Report No: P WMA 04/B50/00/8916/3);
- Water Quality Planning Limits Report: (Report No: P WMA 04/B50/00/8916/4);
- Scenario Analysis Report (P WMA 04/B50/00/8916/5);
- Reconciliation and Foresight Report (P WMA 04/B50/00/8916/6);
- Management Options Report (P WMA 04/B50/00/8916/7);
- Integrated Water Quality Management Plans for each Sub-catchment:
    - IWQMP for the Upper Olifants sub-catchment (P WMA 04/B50/00/8916/8);
    - IWQMP for the Middle Olifants sub-catchment (P WMA 04/B50/00/8916/9);
    - IWQMP for the Lower Olifants sub-catchment (P WMA 04/B50/00/8916/10);
    - IWQMP for the Steelpoort sub-catchment P WMA 04/B50/00/8916/11and
    - IWQMP for the Letaba and Shingwedzi sub-catchments (P WMA 04/B50/00/8916/12).
- Monitoring Programmes Report (P WMA 04/B50/00/8916/13); and
- Overarching IWQMP for the Olifants River WMA (P WMA 04/B50/00/8916/14).

Recognising that water resource management is not just a DWS/ WMI function, an important part of the study has been considerable stakeholder participation to try and ensure that all sectors play relevant roles and are empowered to take accountability for their actions.

1.3 Study Area

The spatial extent of the Olifants River System comprises tertiary drainage regions B11, B12, B20, B31, B32, B41, B42, B52, B52, B60, B71, B72 and B73 in the Olifants River catchment, B81, B82 and B83 in the Letaba catchment and B90 in the Shingwedzi catchment. The study area has been sub-divided into the following sub-catchments (Figure 1):

- Upper Olifants;
- Middle Olifants;
- Steelpoort;
- Lower Olifants; and
- Letaba and Shingwedzi.

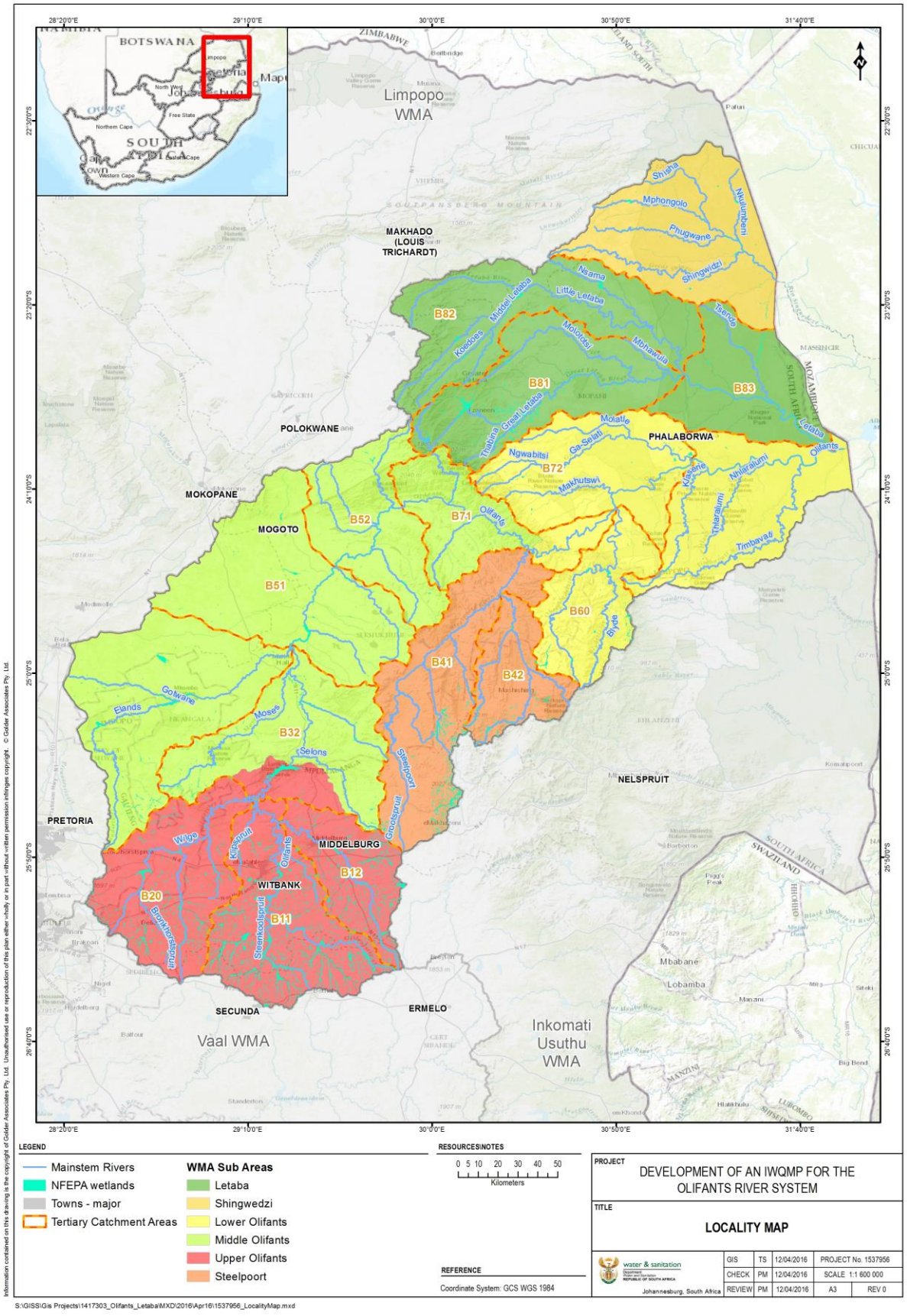

Figure 1: The Olifants River WMA and sub-catchments

The Management Options (P WMA 04/B50/00/8916/7) report involved the identification and development of proposed management measures and options that will:

- improve the level of non-compliance with license conditions and agreed discharge standards;
- trends in water quality deterioration;
- utilise the available assimilative capacity to the benefit of the water users; and
- ensure the sustainability of the system.

Several existing management options remain appropriate, however, implementation and enforcement have not been effective. These have therefore been re-worked into the suite of management options. These management options, detailed in the report (Figure 2), provide an important basis for the development of this implementation plan.

Figure 2: Summary of Management Options for Olifants WMA

1.4 Towards Implementation

This report focuses on providing a context to and guidance on the implementation of the proposed measures and specific actions in the six sub-catchments. It identifies and prioritises the implementation actions that should be undertaken to achieve improvements in water quality in the Olifants WMA.

The measures and actions identified in the Management Options Report, and detailed further in the sub-catchment plans form an integral component of integrated water resource management (IWRM) and will support the implementation and achievement of the RQOs, Management Class and Reserve requirements set for the Olifants WMA, thereby informing the current and future planning, use, development, management and control of the water resources in the sub-catchment areas.

It is important, however, that the i**mplementation actions outlined are not undertaken in isolation**; water quality management measures need to be integrated into the parallel management, strategy and regulatory processes of the Department Water and Sanitation (DWS) and are incorporated into the Annual Performance Plan (APP) of the DWS Provincial Office or WMI, to ensure that implementation is achieved. Some of the activities needed to fulfil the requirements of the implementation relate to functions that are currently performed by different Directorates and offices in DWS or even other government or private institutions. **Co-ordination between these institutions is essential and the allocation of responsibilities** relating to these actions need to be formalised and added to their respective business plans.

Reporting on the compliance of the implementation is critical. This will take place at various levels and a co-ordinated and committed effort is needed for success.

1.5 Purpose of the Report

This report focuses on providing information that can be used towards implementation of the various measures and actions proposed in the overarching and sub-catchment IWQMPs. It provides overarching guidance and information on implementation requirements, activities and actions necessary to implement the plan. **Successful implementation will require close co-ordination** among the responsible role players. The main objectives of this plan are to:

- Identify and prioritise critical concerns at sub-catchment level;
- Focus on identified short- to medium-term actions;
- Provide a framework for actions and roles and responsibilities; and
- Provide a framework to monitor and report on progress for the proposed targets.

2. CORE CONSIDERATIONS FOR IMPLEMENTATION

The national IWQM Strategy articulates the need to demonstrate success (Report number P RSA 000/00/21715/18). It is, therefore, important to be able to confirm that the efforts that have been put into developing the Olifants IWQMP and sub-catchment plans will have improved the water quality status in the six identified sub-catchments. This is guided through a set of considerations for implementation.

2.1 Aligning with broader objectives

There are several studies that have taken place in the Olifants WMA including:

- Reconciliation;
- Classification;
- Resource Quality Objectives setting; and
- Reserve determination.

Each of these projects have monitoring and reporting requirements that will need to be met. The IWQMP needs to ensure that its' monitoring and reporting requirements are aligned and co-ordinated and are not seen as isolated objectives that need to be met separately.

2.2 Scale and sectors

The implementation plan must consider activities across a range of different spatial scales. In the Olifants WMA this includes transboundary, national, catchment and local (sub-catchment and even at management unit level) while also addressing the issues that are specific to certain sectors, as well as between sectors.

While this is very complex because of the different government departments; that should play some role in water quality improvement, as well as the importance of developing stewardships and partnerships within sectors and with other sectors; it remains a critically important aspect. This approach will require a mind-set change in many ways and this is very important if the implementation plan is to succeed.

In this respect the sub-catchment plans and associated Management Unit Task Teams (MUTT) will support this approach.

2.3 Sector co-ordination

The largest challenge for the implementation of the IWQM Strategy, and indeed to the success of IWQM, will be the challenge to mobilise the broader water sector, its users, its impactors and its partner institutions.

This plan builds on the foundation of the IWQM Policy and Strategy that mandates everyone to take responsibility for the management of water quality of our resources. This is further cemented by the Vision statement for the OWQMP:

Government, in partnership with private sector and civil society, secures water in the Olifants water management area that is fit for use, for all, forever.

This plan introduces the concept of Management Unit Task Teams (MUTT) – a task team that is established by a group of water users within a MU with the focus of targeting a specific issue; once the issue is resolved it could move on to the next issue, or dissolve if no longer needed. It does not have to be established by DWS/WMI, rather it is driven by a need to work together to solve a problem that would lead to improved water quality in a water resource.

2.4 Prioritisation

It is essential that the identified measures and actions are prioritised as it is well understood that financial resources and human resource capacity as well as capability are constrained in government institutions at all levels. Even within other sectors such as the mining and industrial sectors, technical and managerial human resource capacity may be inadequate for various reasons.

Measures and specific actions, therefore, need to be prioritised in a manner that will allow successes. Prioritising too many actions will be counterproductive. Prioritisation does not mean that work on the other identified areas should not continue, albeit at a measured scale. Prioritisation, however, will guide the allocation of human and financial resources, with the objective of building for longer-term improvements. Therefore, the prioritisation considers the following:

- A **focus on measure and actions that will require short- to medium-term timeframes**, while building a platform for the longer-term measures and associated actions that will assist in achieving the Strategic Goals (Chapter 3);
- **Prioritising critical concerns**, as identified by stakeholders, while ensuring that any additional concerns that have been identified are also included in the plan and addressed through on-going management or monitoring for future prioritisation and action;
- Considering the relevance at WMA, sub-catchment and even management unit specific scales, whilst **ensuring horizontal alignment across sectors and institutions** at each scale (national, provincial, local government sectors and various stakeholder organisations such as water users associations);
- **Providing a framework** for the specific actions that have been identified via the series of sub-catchment implementation plans; and
- **Enabling adaptive responses** to changing circumstances and achievements based on effective monitoring and evaluation at various levels.

3. STRATEGIC AREAS FOR PRIORITISATION

3.1 Critical Elements

The implementation of the IWQMP for the Olifants will occur within the current integrated water resource management (IWRM) and regulatory environment and therefore integration with existing processes is important. Strategic areas, goals measures and associated actions are linked and dependent on various processes and role players. This plan deals with the overarching identified issues of concern in each of the sub-catchments, highlighting the roles and responsibilities of the various government department and other stakeholders.

The various stakeholder engagements that have taken place throughout the project have formed an essential part of identifying and prioritising the critical components of each of the sub-catchment plans. The **critical elements include**:

- The **strengthening of the water quality management function and coordination** by assigning roles and responsibilities for implementing the various measures and associated actions that have identified and for assigning reporting functions;
- **Improving the information management** system to enable a more integrated approach to collecting and storing data from all relevant sources to:
    - allow for a better understanding of the status and trends of parameters of concern within the sub-catchments;
    - consolidate monitoring programmes (including levels 1 – 4 monitoring points);
    - prioritise hot spots that require urgent action, such as salinity or eutrophication management;
    - report easily and clearly at various levels; and
    - build and sustain capacity in Government, private sector and civil society.
- **Mobilising the various sectors and developing stewardships/ partnerships** within the Olifants WMA is critical, and the establishment of a "Community of Practice" is a priority to maintain sector wide engagement. Stakeholders who have been involved in this project, and specifically the sub-catchment workshops, are seen as the initiators of this Community of Practice. The DWS/ WMI needs to ensure that these stakeholders remain committed and are able to assist in sector wide engagement and help to create and deepen awareness at various levels.
- **Realising impact and recognising successes** are important aspects of ensuring that the process of implementing the plan is maintained.

3.2 Strategic Areas and Goals

Based on the critical elements, and the identified challenges to resolve, four Strategic Areas were identified, each with their associated measures (Table 1). Together, these will provide guidance on which actions should be dealt with first, and which actions will require a longer-term timeframe.

Table 1: Strategic areas and measures for prioritisation

Strategic areas	Strategic measures
Protecting water resources to maintain the goods and services that are accrued from functioning ecosystems;	▪ Strategic Measure 1-A: Meeting Resource Quality Objectives ▪ Strategic Measure 1-B: Groundwater protection ▪ Strategic Measure 1-C: Conserving ecological infrastructure ▪ Strategic Measure 1-D: Catchment and land use planning
Developing water resources to support social and economic growth	▪ Strategic Measure 2-A: Water resources assessment ▪ Strategic Measure 2-B: Water conservation and water demand management ▪ Strategic measure 2-C: Water Allocation
Managing water quality and associated risks to underpin resilience	▪ Strategic Measure 3-A: Monitoring and information networks ▪ Strategic Measure 3-B: Water use compliance ▪ Strategic Measure 3-C: Adaptive risk management ▪ Strategic Measure 3-D: Climate change resilience
Governing to ensure cooperative water resource management and development	▪ Strategic Measure 4-A: Institutional and financial arrangements ▪ Strategic Measure 4-B: Partnerships ▪ Strategic Measure 4-C: Stakeholder engagement ▪ Strategic Measure 4-D: Knowledge Management

The implementation of the IWQMP will be facilitated through the four strategic areas, the strategic measures, each with specific goals described in the overarching plan:

- **Strategic Area 1:** Protecting water resources to maintain the goods and services that are accrued from functioning ecosystems:

  Goal 1.1: The majority of riverine and wetland systems are maintained with the intent to improve the status of the ecosystems wherever possible

  Goal 1.2: Water in, or from, water resources in the Olifants WMA is fit for use

- **Strategic Area 2:** Developing water resources to support social and economic growth:

  Goal 2.1: Adequate water of appropriate quality is allocated to meet the social objectives of economic development, service delivery and

equity/redress;

Goal 2.2: All waste/ water containing waste generated by households and by economic activities is disposed of/ discharged lawfully and safely.

- **Strategic Area 3:** Managing water quality and associated risks to underpin resilience:

  Goal 3.1: Effective monitoring of source and non-point source pollution demonstrates that adaptive and climate resilient IWQM is being implemented at the WMA and sub-catchment levels.

  Goal 3.2: Compliance with water use authorisations is improved year on year

- **Strategic Area 4:** Governing to ensure co-operative water resource management and development.

  Goal 4.1: Institutional capacity and operational and financial systems are strengthened and supported to enable effective IWQM.

  Goal 4.2: Key partnerships are established, while stakeholder engagements and knowledge management are strengthened and maintained in support of IWQM.

As described in the overall IWQMP, the Management Options Report and the sub-catchment IWQMPs, critical aspects for implementation success are awareness creation and communication. It will be important for the Provincial DWS/ WMI to set up a co-ordination meeting to encompass all relevant stakeholders to enable a prioritisation of projects that should be tackled first within the various sectors: *rather take small bites and succeed, as well as allowing for adaptive management as needed.* These co-ordination meetings could form part of the Catchment Forum meetings. Ultimately, these actions will support the Catchment Management Strategy that must still be developed. The Provincial DWS/WMI's Annual Performance Plan describes its existing functions and initiatives and will integrate the actions described in this plan. The actions for implementation are presented in the next section.

4. IMPLEMENTATION ACTIONS

This Implementation Plan is there to **guide the way** for achieving the strategic measures proposed for each of the strategic areas, setting down the actions that need to be taken in the short-, medium- and longer-term. The implementation plan **is not intended to cover all the day-to-day functions of the Provincial DWS/ WMI, but highlights the strategic functions, responsibilities, and initiatives for Integrated Water Quality Management in the Olifants WMA in co-operation with other organisations, institutions and stakeholders**.

The Implementation Matrix, presented in Table 2 provides the Strategic Area, the associated goals and Objective and the actions require to implement. The table is structured as follows (Figure 3).

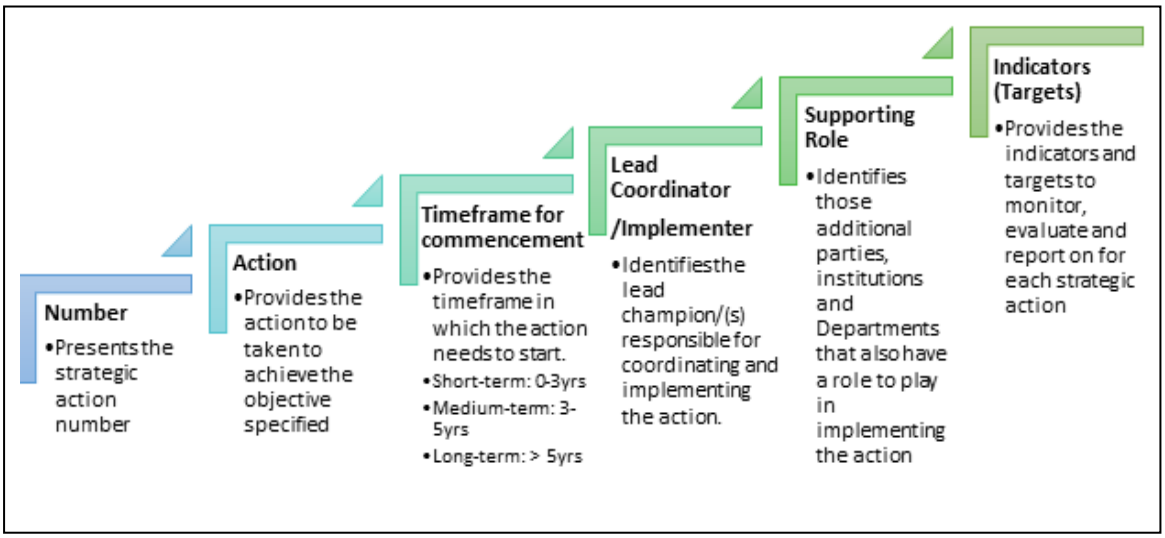

Figure 3: Structure of the Implementation Matrix

Table 2 summarises the indicators and targets to monitor and evaluate the strategic actions presented in the Implementation Matrix. In this implementation matrix there is significant emphasis placed on annual reporting. This should be consolidated in one annual report on the status of water quality in the Olifants WMA, together with a reflection on the progress on activities reflected in this matrix. This is to be submitted to the Chief Directorate: Water Quality Management (CD: WQM), who will in turn engage with key line functions such Chief Directorate: Water Ecosystems (CD: WE) and Directorate: Water Resource Planning Systems (D: WRPS).

It should be noted that this Implementation Plan is supported by an Excel Spreadsheet, which links the actions in this Implementation Plan to those in the sub-catchment plans and Management Options Report.

Table 2: Implementation matrix

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
Strategic Area 1: Protecting water resources to maintain the goods and services that are accrued from functioning ecosystems ▪ **Goal 1.1:** The majority of riverine and wetland systems are maintained with the intent to improve the status of the ecosystems wherever possible ▪ **Goal 1.2:** Water in, or from water resources in the Olifants WMA is fit for use					
Strategic Measure 1-A: Meeting Resource Quality Objectives					
Objective: • *To ensure effective management of the water resources and freshwater ecosystems, so that these resources continue to provide the goods and services upon which society and the economy depend, including provisioning, regulating and cultural services.*					
1-A.1	Implement operational actions as per sub-catchment plans to ensure compliance with RQOs and Reserve requirements	Short	Provincial DWS/ WMI	National DWS, WMI	▪ Progress Report submitted to CD: WQM (annually) ▪ Progress review meeting held with CD:WQM, CD: WE, D: WRPS; etc (annually)
1-A.2	Develop an annual priority action plan towards ensuring impactful improvements in water quality. Including, priority Thematic plans to address, where necessary, the following: • Mine-water management • Metals Management • Nutrient and microbial management • Salinity management; and • Emerging contaminants management	Short to medium	National DWS	Provincial DWS, WMI and other relevant provincial departments and sector leaders including: DMR, DAFF, CoGTA, AgriSA, SALGA, WSA, Chamber of Mines, Mining sector, MWCB	▪ Annual Action Plan developed (submitted annually to CD: WQM)

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
Strategic Measure 1-B: Groundwater protection					
Objective: • *To strengthen our understanding of the groundwater resources of the Olifants water management area in order to develop targeted protection approaches*					
1-B.1	Develop a groundwater protection plan based upon improved understanding of groundwater resources	Medium	National DWS,	Provincial DWS/ WMI, SADC GMI, IGS, Council for Geoscience, Chamber of Mines, MWCB, WRC and other Academic and Research Institutions	▪ Plan developed with implementation timeframes
Strategic Measure 1-C: Conserving ecological infrastructure					
Objectives: ▪ *To promote the co-ordinated development and management of water, land and related resources to ensure that ecological infrastructure sustainably provides the goods and services that ensure ongoing water security*					
1-C.1	Identify priority ecological infrastructure and associated goods and services and develop plans	Short	National DWS *National DEA	Provincial DWS/ WMI,, Provincial DEA, SANBI, WRC, CSIR	▪ Report outlining ecological infrastructure situation assessment
1-C.2	Implement plans for the management of priority ecological infrastructure	Medium	Provincial DWS,WMI *Provincial DEA	National DWS , WMI, WSA, Provincial DEA, SANBI, other sector Departments	▪ Plan for the management of ecological infrastructure ▪ Annual progress report submitted to CD: WE
Strategic Measure 1-D: Catchment and land use planning					

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
Objective:					
• *To ensure that water quality management considerations are integrated into the various land use and catchment management planning processes*					
1-D.1	Undertake analysis to understand the importance of water quantity and water quality management upon the economics of the Olifants WMA	Short	National DWS,	Provincial DWS, WMI, WRC, Academic institutions, Chamber of Mines, AgriSA, SALGA, CSIR, Private Sector, Civil Society	▪ Research study completed
1-D.2	Integrate water and water quality considerations into land use planning processes and to inform future land use, based on water availability, as well as considering impact upon: ▪ Mine water management ▪ Metal management ▪ Nutrients and microbial management ▪ Salinity management; and ▪ Emerging contaminants management	Medium	* *Local Government *Provincial DEA	Provincial DWS, DMR, DAFF, DEA, DTI, WSA, WMI, Human Settlements, DRDLR, CoGTA	▪ Progress reported (annually)
Strategic Area 2: Developing water resources to support social and economic growth ▪ **Goal 2.1:** Adequate water of appropriate quality is allocated to meet the social objectives of economic development, service delivery and equity/redress; ▪ **Goal 2.2:** All waste/ water containing waste generated by households and by economic activities is disposed of/ discharged lawfully and safely.					
Strategic Measure 2-A: Water Resource Assessment					
Objective:					

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
• *To undertake the necessary programmatic actions, on an ongoing basis, that enable water resource managers to understand the quantity and quality dimensions of water availability and water use within the Olifants water management area, to support improved decision making*					
2-A.1	Undertake validation and verification of water use and implement recommendations				
2-A.1.1	Develop protocols/ procedures for validation and verification of water use	Short	National DWS	Provincial DWS/ WMI	▪ protocols and procedures
2-A.1.2	Undertake validation and verification of water use	Medium to long term	Provincial DWS/ WMI	National DWS	▪ Updated analysis completed
2-A.2	Ensure that water quality management aspects are fully integrated into the amended Reconciliation Study for the Olifants WMA	Short	National DWS	Provincial DWS, WMI	▪ Revised Reconciliation Strategy
2-A.3	Update water availability studies as this may impact load allocations, taking into consideration innovative approaches such as conjunctive use, and water re-use to broaden the water mix	Medium	National DWS,	DWS Provincial office, WMI and other sector departments	▪ Updated water availability studies
Strategic Measure 2-B: Water conservation and water demand management					
Objective:					
• *To support and coordinate actions that improve the efficiency of water use within the Olifants water management area.*					
2-B.1	Develop guidelines and conditions to be included in WULs	Short	National DWS	Provincial DWS/WMI WMI	▪ Guidelines, procedures and license conditions available
2-B.2	Implement improved measures for efficient scheme/ system operation to improve: ▪ Mine water management	Medium	Provincial DWS, WMI	National DWS	▪ Revised water use license conditions, linked to 2-B.1

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
	▪ Metals management ▪ Nutrients and microbial management ▪ Salinity management.				
2-B.3	Implement and support priority alien vegetation clearing projects, including nuisance plants in dams, and river maintenance plans	Short	, *Provincial DEA	Provincial DWS, WMI National DWS, WSA, National DEA	▪ Annual plan for removal of alien invasive species (progress reported annually)
2-B.4	Develop and implement WC/ WDM plans for urban areas (using WSDP/ IDPs)	Medium	*Local Government	Provincial DWS, WMI, National DWS, COGTA, SALGA, WSA,	▪ Plans developed
2-B.5	Develop and implement WC/ WDM plans for the agricultural, mining and industrial sectors	Medium	, Mining and industrial sector	Provincial DWS, WMI National DWS, Provincial DAFF, Provincial DMR, DTI	▪ Plans developed
Strategic Measure 2-C: Water Allocation (Reform)					
Objective: • *To support socio-economic development within the Olifants water management area through the authorisation of sustainable and efficient water use*					
2-C.1	Develop protocols/ tools for developing a water quality allocation plan	Short	National DWS	Provincial DWS, WMI	▪ Tools/ protocols developed
2-C.2	Develop a water quality allocation plan for the prioritised water quality constituents	Short	National DWS	Provincial DWS, WMI	▪ Plan developed
2-C.3	Allocate water quality at a sector level.	Short	Provincial DWS, WMI	National DWS	▪ end of pipe standards to Local Government, mines and industries

Strategic Area 3: Managing water quality and associated risks to underpin resilience

- **Goal 3.1:** Effective monitoring of source and non-point source pollution demonstrates that adaptive and climate resilient IWQM is being implemented at the WMA and sub-catchment levels.
- **Goal 3.2:** Compliance with water use authorisations is improved year on year

Strategic Measure 3-A: Monitoring and Information

Objective:

- *To develop and maintain adequate monitoring networks and information management systems to store data and produce management information and knowledge products that enable effective decision making and stakeholder awareness*

3-A.1	Improve the water quality monitoring networks to provide data that enables effective decision making, with specific attention to supporting: ▪ Mine water management ▪ Metal management ▪ Nutrients and microbial management ▪ Salinity management ▪ Emerging contaminants	Ongoing	National DWS and Provincial DWS, WMI	All water users and other Government Departments such as; Provincial DMR, Provincial DEA, Provincial DAFF, Local Government and Provincial COGTA	▪ Review of status and additional requirements (annual)
3-A.2	Ensure water quality monitoring data (source and resource) is collected, stored on appropriate data systems and translated into useful information to support decision-making	Ongoing	National DWS and Provincial DWS, WMI	-	▪ Situation assessment (annual improvement assessment)
3-A.3	Improve existing information management platforms/system to enhance reporting and dissemination	Ongoing	National DWS,	Provincial DWS, WMI, Catchment Management forums	▪ Ongoing improvement (annual assessment of systemic challenges)

Strategic Measure 3-B: Water Use Compliance and Enforcement

Objective:

- *To ensure that water use is compliant with water use authorisations in accordance with licence conditions and to monitor and report upon the status*

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
of compliance monitoring and enforcement within the Olifants water management area					
3-B.1	Maintain a database of registered water users	Short	Provincial DWS, WMI	National DWS,	▪ Database such as WARMS in place and updated annually (ongoing)
3-B.2	Undertake compliance monitoring of all water use authorisations including compliance with international obligations	Short	Provincial DWS, WMI	National DWS	▪ Review progress (annually)
3-B.3	Enforcement measures implemented for unlawful water use (e.g. utilise directives and administrative penalties)	Short	Provincial DWS, WMI	National DWS, Provincial DEA, DMR, DAFF	▪ Strategy for approach to sectoral issues (e.g. mining, local government) developed (March 2019) ▪ Database of actions taken developed
3-B.4	Develop and implement a system to track water use authorisations				
3-B.4.1	Develop a system to track water use authorisations	Short	National DWS	Provincial DWS, WMI	▪ System such as eWULAAS developed and operational (tested)
3-B.4.2	Implement a system to track water use authorisations (information management system)	Short	Provincial DWS, WMI	National DWS,	▪ Database for Olifants WMA on WARMS and eWULAAS
3-B.4.3	Authorise water use in accordance with IWQMP for the Olifants	Short	Provincial DWS, WMI	National DWS, Provincial DEA, DMR, DAFF	▪ Water Use License
Strategic Measure 3-C: Adaptive risk management					
Objective:					

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
• *To ensure that adaptive management responses enable the effective management of priority risks to ensure effective management of water quality in the Olifants water management area*					
3-C.1	Identify opportunities and modalities to enable more adaptive response in managing water quality	Short	National DWS	Provincial DWS, WMI, Sector Departments, DPME, WRC	▪ Discussion with CD:WQM and other Provincial Offices through WQM Forum (ongoing)
3-C.2	Develop Non-Point Source Strategy and plan				
3-C.2.1	Develop national Non-Point Source Strategy	Short	National DWS	Provincial DWS, WMI, DEA, DAFF, DMR, DTI, Human Settlements, COGTA, SALGA, WRC	▪ National NPS Strategy
3-C.2.2	Develop a NPS plan for the Olifants WMA	Short	Provincial DWS, WMI	National DWS, DEA, DAFF, DMR, DTI, Human Settlements, COGTA, SALGA, WRC	▪ Plan for the Olifants
3-C.2.3	Implement the NPS Plan developed for the Olifants WMA	Short	Provincial DWS, WMI	National DWS, DEA, DAFF, DMR, DTI, Human Settlements, COGTA, SALGA, WRC	▪ Implementation initiated
3-C.3	Identify, prioritise and monitor high-risk polluters and other key risk areas to ensure improved water quality	Short	Provincial DWS, WMI	National DWS, Provincial sector departments, WRC, CSIR	▪ Risk Strategy developed

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
3-C.4	Implement an annual priority action plan towards ensuring impactful improvements in water quality	Short	Provincial DWS, WMI	National DWS	▪ Action plan developed, linked to 1-A2 (Annual)
3-C.5	Report annually on the status of water quality in the Olifants WMA, including the meeting of international obligations	Short	Provincial DWS, WMI	DPME, National DWS	▪ Report submitted to CD:WQM (Annually)
3-C.6	Develop and use decision-support protocols/ tools to support water quality management decisions				
3-C.6.1	Develop decision-support protocols/ tools to support water quality management decisions	Short	National DWS	Provincial DWS, WMI	▪ Protocols, processes and models developed ▪ Protocols and processes shared across Provincial Offices through WQM Forum (ongoing)
3-C.6.2	Use (operationalise) decision-support protocols/ tools to support water quality management decisions	Short	Provincial DWS, WMI	National DWS	▪ Tools/ protocols used
Strategic Measure 3-D: Climate change resilience					
Objective: *To undertake measures that ensure increased resilience to the uncertainty introduced by climate change*					
3-D.1	Link water quality management dimensions into the Long-Term Adaptation Strategies and the Provincial Climate Adaptation Strategies	Medium	National DWS *National DEA	Provincial DWS, WMI, Provincial sector Departments	▪ Assessment completed
3-D.2	Undertake research into the impacts of climate change on the water quality of the Olifants WMA	Medium	National DWS, *National DEA,	WRC and other research institutions; Provincial DWS, WMI,	▪ Assessment completed

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
				Local academic institutions	
Strategic Area 4: Governing to ensure cooperative water resource management and development ▪ **Goal 4.1:** Institutional capacity and operational and financial systems are strengthened to enable effective IWQM. ▪ **Goal 4.2:** Key partnerships are established, stakeholder engagements and knowledge management strengthened and maintained in support of IWQM.					
Strategic Measure 4-A: Institutional and financial arrangements					
Objective: ▪ *To ensure adequate institutional and financial capacity to fulfil the mandate given to the various institutions in terms of managing water quality within the Olifants water management area*					
A-A.1	Strengthen and build on existing institutional capacity in the Olifants WMA				
4-A.1.1	Develop capacity building material at various levels and a plan for implementation	Ongoing	National DWS, *SALGA, *CoGTA *Academic Institutions, *SETAs	Provincial DWS, other relevant provincial and national departments WRC, SADC GMI,	▪ Capacity building/ training material developed for various levels ▪ Training course developed
4-A1.2	Courses and training provided at various levels	Ongoing	Provincial and National DWS, WMI, *Water Service Authorities, *SALGA and , CoGTA other	Provincial and National DWS, WMI, Water Service Authorities, SALGA, CoGTA other relevant provincial and national departments,	▪ Capacity development plan implemented in various sectors at various levels, for example, a water quality management module included in Councillor training for local;

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
			relevant provincial and national departments, Academic Institutions, *SETAs	Academic Institutions, SETAs	government initiatives
4-A.2	Develop a pricing/ financing strategy to enable effective water quality management	Short	National DWS, Provincial DWS	WMI, National Treasury	▪ Strategy developed
4-A.3	Implement the Waste Discharge Charge System	Short	National DWS, Provincial DWS/ WMI	National Treasury, Water users	▪ System implemented
Strategic Measure 4-B: Partnerships					
Objective: ▪ *To jointly achieve IWQM in the Olifants, where appropriate, with other sector departments, private sector and civil society*					
4-B.1	Strengthen and build on existing partnerships such as the Mine Water Coordinating Body, Strategic Water Partners Network and the Joint Water Forum.	Ongoing	National DWS/ Provincial DWS, WMI	GTT, DMR, DAFF, DEA, CoGTA, SALGA, WSA, SWPN, SIWI, GWP, AWARD, Academic and Research Institutions	▪ Situation assessment undertaken regularly (annually reported)
4-B.2	Foster inter-sectoral co-operation with government departments	Ongoing	National DWS/ Provincial DWS, WMI	IPIC, IMC, GTT, Departments of Agriculture, Fisheries and Forestry, Mineral Resources,	• Number of engagements (Increase year on year and reported annually)

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
				Environmental Affairs, National Treasury, Trade and Industry, Health, Human Settlement, International Relations, Planning, Monitoring and Evaluation, CoGTA, SALGA	
4-B.3	Establishment of MUTTs and catchment committees where and as required	Ongoing	All sectors; All water users and stakeholders	All water users with support from National DWS, Provincial DWS, WMI	▪ Number of MUTTs established and assessment of support provided in annual reviews (Ongoing) ▪ Reported annually (ongoing)
4-B.4	Maintain networks with trans-boundary and other water management institutions	Medium	National DWS/ Provincial DWS/ WMI	Kingfisher Project, SWPN, SA Water caucus, WSLG, International Relations, RBO's, SADC GMI	▪ Reported annually (ongoing)
Strategic Measure 4-C: Stakeholder Engagement					
Objective: • *To ensure that all stakeholders are well informed and are enabled to contribute to water quality management in the Olifants water management*					

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
area					
4-C.1	Ensure engagement that enables more active participation of civil society at transboundary, national and catchment levels	Ongoing	Provincial DWS/ WMI	National DWS	▪ Reported annually (ongoing) ▪ Newsletter
4-C.2	Strengthen existing platforms for stakeholder engagement regarding the various water quality issues of concern	Ongoing	Provincial DWS/ WMI	Provincial Sector Departments, Catchment forums	▪ Reported annually (ongoing) ▪ Newsletter
Strategic Measure 4-D: Knowledge Management					
Objective: ▪ *To ensure that information is easily available and in an accessible form to all stakeholders, including Government, Private Sector and Civil Society*					
4-D.1	Develop and implement a communication strategy and awareness campaign to improve knowledge and share information	Short	Provincial DWS, WMI	National Departments – specifically communications directorates, Provincial sector Departments, Catchment Forums, WSA, WRC	▪ Communications strategy developed ▪ Monitoring of progress (annual)
4-D.2	Ensure information sharing platforms and systems are current and accessible to improve IWQM capacity for decision making and engagement, including for example: • CMF meetings; • Newsletters; • Relevant information on water	Short	, Provincial DWS, WMI	Provincial DWS, WMI	▪ List of challenges submitted to CD: WIMS ▪ Updating and improvement of systems (ongoing) ▪ CMF meetings are scheduled and take place ▪ Newsletters (bi-annually), for example highlighting

Number	Action	Timeframe for commencement	Lead coordinator/ implementer	Supported by	Indicators (Targets)
	quality at Walk-in Centres;				projects in the Olifants WMA with specific links to water quality; ▪ Relevant information on water quality is available at Walk-in Centres.

5. ROLES AND RESPONSIBILITIES

The IWQM sub-catchment plans and this Implementation Plan have identified several role players. These are described in more detail below.

DWS Provincial Offices/ Water Management Institution

While proposed responsible implementation agents are included in the actions list described, the DWS Mpumalanga and Limpopo Provincial Offices (in the absence of the WMI) or the WMI when established, will need be seen to take the lead and support many of the actions, specifically:

- Maintaining ongoing participation and establishing catchment forums to support co-ordination;
- Improving the level of understanding by various levels of stakeholders of the water resources and water use in the WMA;
- Improvement of monitoring and information management systems in collaboration with other relevant government departments and institutions, specifically in relation to the classification, EFRs and RQOs monitoring
- Leading the implementation of compliance monitoring and enforcement;
- Implementing water use regulation including water use registration;
- Managing pollution incidents; and
- Championing water issues in the various sectors of the WMA and associated planning instruments to support integration.

The following Directorates within the DWS will need to be involved with implementation at some level:

- Limpopo Provincial Office
- Mpumalanga Provincial Office
- Directorate: Water Services and Regulation
- Directorate: Water Resource Classification
- Directorate: Reserve Determination
- Directorate Water Resource Planning Systems, including:
    - Sub-Directorate: Water Quality Planning
    - Sub-Directorate: Systems Operations
    - Sub-Directorate: Integrated Hydrological Planning
    - Sub-Directorate: Systems Analysis
- Directorate: Resource Protection and Waste
- Directorate: Mine Water Management
- Directorate: Surface and Groundwater Information
- Directorate: Resource Quality Information Services
- Directorate: National Water Resources Planning
- Chief Directorate: Water Use Authorisation

- Chief Directorate: Compliance Monitoring and Enforcement
- Chief Directorate: National Resource Infrastructure including:
    - National Resource Infrastructure: Northern Operations (Area Office)

Provincial Government: Provincial Government provides the regional planning and policy that supports sustainable growth and development. In addition, while supporting implementation they also have a clear oversight mandate within the respective provinces. For this strategy there is strong emphasis on the DWS/ WMI collaborating with the Departments of Environmental Affairs (Limpopo and Mpumalanga) and Agriculture (DoA) with regards to various aspects of resource and natural asset conservation. Collaboration with SANParks would also be important here.

There is also a need to develop closer relations with the Department of Local Government and the associated structures including SALGA and COGTA. Their support is critical in terms of supporting Local Municipalities to improve wastewater treatment and water quality management as well as the implementation of water conservation aspects.

Key actions for Provincial Government in this strategy include:

- Taking the lead and guiding the development of land use plans and EMPs with the support of Local Municipalities, the DWS/ WMI and other relevant parties;
- Collaboration between DMR, DEA and other relevant institutions on conservancies and protected areas to develop and implement management plans for priority areas; and
- Support the DWS/ WMI in protecting instream and riparian habitats.

In addition, there needs to be close collaboration with regards to disaster management planning and response. It is therefore important that there is close alignment of business plans and strategies in support of these actions.

Local Government: Local government has a clear mandate to support local economic growth and development and do this through the development of Integrated Development Plans (IDP). This process is currently led by the District Municipalities, while the Local Municipalities provide various services. Within these Local Municipalities there are a variety of water resource impacts that need to be addressed and regulated by DWS/ WMI. It is therefore important that there is a good relationship between the District and Local Municipalities and DWS/ WMI, which currently appears to be lacking.

A few actions for District and Local Municipalities include:

- Collaboration with Provincial Government, as well as the DWS/ WMI, to develop a management plan to support improved compliance in municipal wastewater treatment and associated collection systems. This could already be

linked to the Municipal Management Strategy that COGTA, Mpumalanga is developing;

- Collaboration with the DWS to develop a prioritisation plan for industrial sources of pollution within their areas;
- Support the DWS/ WMI in the development of groundwater management/ protection plans;
- Implementing water conservation/ water demand management plans in respect of domestic and industrial sectors;
- Collaboration with the DWS/ WMI and Provincial Government to develop more integrated processes for land use management.

Research and Academic Institutions: The Water Research Commission (WRC) and tertiary institutions are paramount in undertaking research and building capacity in water resources management aspects, including climate change and resilience and innovative technologies. As the IWQM plans are implemented, specifically at sub-catchment level, these institutions should be engaged.

Private Sector: Corporate business and industry have a real interest in terms of ensuring that sound water resource management supports their ongoing development and investments in the Olifants WMA. They have a role to play in mitigating impacts and, through stewardship/ partnership programmes, highlight the need for responsible water resource management as well as innovation. As these businesses are key components of the social economy it will be crucially important for them and the DWS/ WMI to have constructive engagements to ensure that impacts are mitigated, WC/ WDM is implemented, and water resource requirements, as per each water use authorisation, are complied with.

Non-profit organizations: These include various Non-Governmental Organisations (NGO) and Community-Based Organisations (CBO) that have a significant role in ongoing water resource management. Their roles vary according to circumstance but range from research and development through to action and implementation, and often include an important communication channel and link to the broader society. The organizations are key partners that must play a supporting role in implementing the sub-catchment plans.

Partnerships/Stewardships: These include those organisations that have voluntarily come together to address specific gaps in water resource management, and to support Government through collective action initiatives. Examples of these are the Strategic Water Partners Network, The Mine Water Coordinating Body, the Joint Water Forum, amongst others, that operate in the Olifants WMA. These partnership/stewardships allow for improved constructive engagement with the Department and facilitate the localised actions being implemented. Through these initiatives, there is collective ownership of decisions that are made, building and sharing of knowledge, and increased leadership within localised areas within the Olifants WMA.

Individuals and stakeholders: Water legislation and the associated policy and strategies have included considerable stakeholder engagement allowing citizens to become involved in water resource management in a way that was previously not possible. This has enabled considerable capacity building to take place to allow individuals and stakeholder groups to participate constructively. The DWS Provincial Office/ WMI therefore needs to continue to be fully engaged with individuals and stakeholder groups to allow:

- Continued participation in regional and local decision-making and governance processes through forums and other structures, such as the proposed Management Unit Task Teams (MUTT);
- Engagement with actions and projects as well as to assist in monitoring, protecting and restoring water resources;
- Building and sharing knowledge; and
- Playing a leadership role in the communities and championing local resource protection initiatives.

6. MONITORING AND EVALUATION

The DWS Provincial/ WMI will take the lead in monitoring implementation of the IWQMP and will develop an implementation scorecard that will annually measure the progress of implementation in respect of timeframes and resource allocation. A proposed matrix for this is included in an excel spreadsheet.

While the monitoring of some of the actions, such as quality and quantity measurements, are almost purely technical, there are several actions that are less easily measurable. The DWS Provincial Office/ WMI needs to determine suitable indicators and methods for monitoring progress on each action.

DWS Provincial Office/ WMI will need to work closely with the appropriate government departments, organisations and institutions as part of the collaboration to track these measures. Appropriate Memoranda of Agreement need to be put in place.

Progress on other actions, including the collection of information or the formation of further strategies and partnerships, will be monitored through the completion of the action or evidence of progress against the plan of action. The DWS Provincial Office/ WMI will provide reporting on implementation progress to ensure that responsible parties and stakeholders are kept abreast of progress and developments. Finally, monitoring and refining the implementation plan will feed into the CMS development.

7. REPORTING

It is proposed that reporting is done in both a top down and bottom up approach.

Both the overarching IWQMP and the sub-catchment IWQMPs have an implementation matrix. The Catchment Management Forums (CMFs) could therefore be responsible for ensuring that reporting on the achievement of the implementation of the IWQMP is carried out. This means that the members of the CMF would need to understand who is doing what, when and why, which would mean that it is important to ensure that the composition of the CMF reflects appropriate representatives from all sectors.

A representative from the Management Unit Task teams (MUTTs) would report on progress of *on the ground projects.* The MUTTs can be defined as on the ground task teams established by a group of water users within a MU with a focus on targeting a particular issue from the matrix; once the issue is resolved it could move on to the next issue, or dissolve if it is no longer needed. It does not have to be established by DWS/ WMI; rather it is driven by a need to work together on the ground to solve a problem that would lead to improved water quality in a resource. It may be sector-based, or a simple combination of various water users who need to work together to achieve a certain result.

The Provincial DWS/ WMI will be the lead or have a supporting function in all actions and will submit an annual progress report for the implementation of this IWQMP to CD: WQM.

8. REFERENCES

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APPENDIX A: PROJECT STEERING COMMITTEE MEMBERS

Title	Surname	First Name	Organisation
Mr	Atwaru	Yakeen	Dept. of Water and Sanitation
Mr	Bierman	Bertus	Joint Water Forum/ Lebalelo WUA
Dr	Burgess	Jo	Water Research Commission
Dr	Cogho	Vic	Glencore
Mr	Dabrowski	James	Private Consultant
Mr	De Witt	Pieter	Dept. of Agriculture, Forestry and Fisheries
Mr	Dooge	Nico	Glencore
Dr	Driver	Mandy	SANBI
Ms	Fakude	Barbara	Dept. of Water and Sanitation
Mr	Gouws	Marthinus NJ	Dept. of Agriculture, Rural Development and Land Administration
Mr	Govender	Bashan	Dept. of Water and Sanitation
Mr	Govender	Nandha	Strategic Water Partnership Network
Mr	Grobler	Geert	Dept. of Water and Sanitation
Dr	Gyedu-Ababio	Thomas	IUCMA
Mr	Harris	James	Olifants River Forum
Mr	Jezewski	Witek	Dept. of Water and Sanitation
Mr	Keet	Marius	Dept. of Water and Sanitation
Mr	Khumalo	Frans	COGTA
Mrs	Kobe	Lucy	Dept. of Water and Sanitation
Mr	Kruger	Dirko	Agri-SA
Ms	Kubashni	Mari	Shanduka Coal
Mr	Le Roux	Roelf	Magalies Water
Mr	Leballo	Labane	Lepelle Water
Mr	Lee	Clinton	South 32
Mr	Linström	Charles	Exxaro
Mr	Liphadzi	Stanley	Water Research Commission
Mr	Llanley	Simpson	Department of Science and Technology
Mr	Mabada	Hangwani	Dept. of Water and Sanitation: Limpopo
Mr	Mabalane	Reginald	Chamber of Mines
Mr	Mabogo	Rudzani	Dept. of Mineral Resources
Mrs	Mabuda	Mpho	Dept. of Water and Sanitation
Mr	Mabuda	Livhuwani	Dept. of Water and Sanitation
Mr	Macevele	Stanford	Dept. of Water and Sanitation: Mpumalanga
Mr	Machete	Norman	Limpopo Provincial Administration
Mr	Madubane	Max	Dept. of Mineral Resources
Mr	Maduka	Mashudu	Dept. of Mineral Resources
Mr	Malinga	Neo	Dept. of Water and Sanitation
Mr	Mannya	KCM	Dept. of Agriculture, Forestry and Fisheries
Mr	Masenya	Reuben	Dept. of Mineral Resources
Ms	Maswuma	Z	Dept. of Water and Sanitation
Mr	Mathebe	Rodney	Dept. of Water and Sanitation
Ms	Mathekga	Jacqueline	Dept. of Mineral Resources
Ms	Mathey	Shirley	Dept. of Mineral Resources
Ms	Matlala	Lebogang	Dept. of Water and Sanitation
Mr	Matodzi	Bethuel	Dept. of Mineral Resources
Mr	Mboweni	Manias Bukuta	Dept.of Agriculture, Rural Development and Land Administration
Mr	Meintjies	Louis	National Water Forum TAU SA
Mr	Mntambo	Fanyana	Dept. of Water and Sanitation: Mpumalanga
Mr	Modipane	B J	House of Traditional Leadership
Ms	Modjadji	N	Lepelle Water
Dr	Molwantwa	Jennifer	IUCMA

Title	Surname	First Name	Organisation
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Mr	Moraka	William	SALGA – National
Mr	Morokane	Molefe	Dept. of Mineral Resources
Mr	Mortimer	M	Dept. of Agriculture, Fisheries and Forestry
Mr	Mosefowa	Kganetsi W	Dept. of Water and Sanitation
Ms	Mosoa	Moleboheng	Dept. of Water and Sanitation
Mr	Mphaka	Matlhodi	SANBI
Mr	Mthembu	Dumisani	Dept. of Environmental Affairs
Ms	Mudau	Stephinah	Chamber of Mines
Mr	Mudau	Stephinah	Chamber of Mines
Ms	Muhlbauer	Ritva	Anglo
Ms	Muir	Anet	Dept. of Water and Sanitation
Mr	Mulaudzi	Masala	Dept. of Water and Sanitation
Mr	Musekene	Lucky	Dept. of Water and Sanitation
Dr	Mwaka	Beason	Dept. of Water and Sanitation
Mr	Nditwani	Tendani	Dept. of Water and Sanitation
Ms	Nefale	Avhashoni	Dept. of Water and Sanitation
Mr	Nethononda	B	Dept. of Environmental Affairs
Mr	Nethwadzi	Phumudzo	Dept. Mineral Resources
Mr	Nokeri	Norman	Lepelle Water
Mr	Oberholzer	Michael	Dept. of Mineral Resources
Ms	Olivier	Dorothy	Dept. of Mineral Resources
Mr	Opperman	Nic	Agri-SA
Mr	Parrott	Brenton	Delmas WUA: Representing irrigators in the Upper Olifants Area
Mr	Phalandwa	Musa	Eskom
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Mr	Potgieter	Jan	National Dept. of Agriculture
Ms	Ralekoa	Wendy	Dept. of Water and Sanitation
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Ms	Rammalo	Albertina	MDW
Mr	Ramovha	Matshilele	Dept. Mineral Resources
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Mr	Raphalalani	Israel	Dept. of Water and Sanitation
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Mr	Van Den Berg	Ockie	Dept. of Water and Sanitation
Mr	Van der Merwe	Alwyn	Eskom
Mr	Van Niekerk	Peter	Dept. of Water and Sanitation
Mr	Van Rooyen	Marius	Mpumalanga Provincial Dept. of Agriculture
Mr	Van Stryp	Johan	Loskop Irrigation Board: representing irrigators in the Middle Olifants Area
Mr	Van Vuuren	Jurie	Lower Blyde WUA: representing irrigators in the Lower Olifants Area
Mr	Venter	Jacques	SANParks – KNP
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APPENDIX B: BROADER STAKEHOLDERS WHO CONTRIBUTED TO THE PLAN

Name	**Organisation**
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Ansia de Jager	JWF
Avhafuni Ratombo	DWS, Bronkhorstspruit
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Cecilia Mkhatshwa	City of Tshwane
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Charlotte Khoza	Lepelle Northern Water
Christo Louw	DWS
Craig Zinn	Mpumamanzi Group
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Derrick Netshitungulu	Nkwe Platinum
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Eddie Ridell	KNP
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Jakes Louw	Joint Water Forum
James Ndou	Modikwa Platinum Mine
Jan de Klerk	Sasol
Jaques Venter	SANparks
Jerry Penyene	AFASA
Johan van Stryp	Loskop Water Forum
Johanes Mathungene	LEPELLE/ farmer
Johannes Senyane	Two Rivers Platinum Mine
John Gearg	Wescoal/JKC
Joseph Phasha	DWS, Compliance
Kamo Meso	DWS
Karabo Motene	Glencore Mototolo Platinum Mine
Kerry Beamish	Rand Carbide
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Lebohang Sebola	Lepelle Northern Water
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Reginah Kganyago	DWS
Resenga Shibambo	DWS, Enforcement
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