# Resource Management Plan LAKE MATSAMO (DRIEKOPPIES DAM)



WATER IS LIFE - SANITATION IS DIGNITY





# water & sanitation

Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA



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- Department of Water and Sanitation;
- Ehlanzeni District Municipality;
- Komati Basin Water Authority;
- Mpumalanga Department of Agriculture Rural Development, Land and Environmental Affairs;
- Nkomazi Local Municipality; and
- The community members of Buffelspruit, Driekoppies, Schulzendal, Schoemansdal, Jeppes Reef and Middelplaas.

Acknowledgement is also extended to all other stakeholders who attended and participated in the various engagements during the development of this plan.

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Review Period	Month	Year				
Annual Review of Business Plan (BP)	December	2020 <sup>1</sup>	2021	2022	2023	2024
Five (5) yearly Review of Resource Management Plan (RMP)	December			2024		

 $<sup>^{1}\</sup>mbox{The}$  implementation of the RMP and BP requires one financial year planning ahead.

Revision No	Description	Date
1	Draft RMP DWS Review	22/11/2016
2	Draft RMP DWS review	25/11/2016
3	Draft RMP for DWS Review	12/04/2017
4	Draft RMP for DWS Review	18/04/2017
5	Draft RMP for KOBWA Review	19/04/2017
6	Draft RMP for DWS Review	12/ 06/2017
7	Draft RMP for DWS Review	11/ 07/2017
8	Final RMP for DWS Review	05/12/2019

## **EXECUTIVE SUMMARY**

**Purpose of the Resource Management Plan:** A Resource Management Plan (RMP) provides the principles and guidance within which the dams must be used for recreational purposes. The principles and guidelines seek to promote community participation and beneficiation, environmental conservation and unlocking socio-economic opportunities associated with the recreational use of the Dam. This RMP is for Lake Matsamo, herein after referred to as the Dam, which is part of the Infrastructure Build, Operate and Maintenance (IBOM): Northern Operations.

This RMP was developed in accordance with the Guidelines for the Compilation of Resource Management Plans (DWAF, 2006), to attain the objectives underlying sustainability in Section 2 of the National Water Act, 1998 (Act No. 36 of 1998) [NWA], with particular relevance to Section 26 and 113 relating to the use of water and access and use of government waterworks for recreational purposes.

There is a Sustainable Utilisation Plan (SUP) which was approved in 2004 for Lake Matsamo. However, it was never implemented nor gazetted. On this note, Department of Water and Sanitation (DWS) has identified the need to update the SUP by replacing it by a RMP for Dam as well as to develop its supporting BP.

Mandate of Department of Water and Sanitation: The Department of Water and Sanitation (DWS), through the National Water Act (NWA), 1998 (Act No. 36 of 1998), mandates the minister as the custodian of the nation's water resources to ensure that the government waterworks (GWWs), including Lake Matsamo, are protected, used, developed, managed and controlled in a sustainable manner, to the benefit of all, as contemplated in Section 2 of the NWA.

A number of factors have prompted the need to compile a Resource Management Plan (RMP) for

GWWs which amongst others, include the following:

## Resource Management:

- The water resource located within or outside a protected area whether is subject to protection by legislation;
- Invasive Alien species.
- Water quality issues.

## Recreational Industry Involvement:

- Conflict between users due to no management tool in place.
- Public safety with regards to the use of inland vessels.
- Uncontrolled developments within the Dam basin.

## Community Participation and Beneficiation:

- Challenges of communities regarding physical access and access to the waterbased economy of the resource.
- Participation and beneficiation of surrounding communities remains a challenge.
- Unlocking the economic potential of the Dam through the establishment of effective Public Private Partnerships (PPPs).
- Equitable and sustainable benefit flow into the community through the creation of appropriate institutional arrangements.

## Public Policy:

 The water resource should be identified as a local development objective in terms of an Integrated Development Plan (IDP) or Strategic Development Framework (SDF) for the relevant local and/or district municipalities. The zoning plan for the water resource must either be developed or updated.

To assist the Minister in fulfilling this mandate, the DWS initiated and commissioned the development of the RMP for the Dam. **Description and Location of the Dam:** The Dam is an earth fill Dam that impounds the White Lomati River.

The surface area of the Dam is 1870 hectares with a capacity of 25.1 million cubic meters. It falls under Ward 28 and 31 of Nkomazi Local Municipality (NLM) within the Ehlanzeni District Municipality (EDM) in Mpumalanga Province of South Africa. However, its impoundment impacts on the Republic of Swaziland Its GPS coordinates are 25°43'0"S 31°32'25"E.

**Purpose of the Dam:** The primary purpose of the Dam is to provide water for irrigation. The secondary use of the Dam offers recreational activities such as fishing (fishing competitions). There are also recreation facilities around the Dam such as picnic site with braai stands, camping and open spaces used for hosting events such as music festivals.

**Dam Ownership and Management:** DWS owns the Dam and surrounding state land. KOBWA as delegated authority, will on behalf of the Government of South Africa and the Kingdom of Swaziland, manage, control and supervise the utilisation of Lake Matsamo with the support of DWS. To assist KOBWA as it endeavours to ensure sustainability through its management actions, there is a proposed institutional structure which includes relevant stakeholders who will assist in effective management of the Dam.

Through the development of the RMP process, an appropriate Implementing Agency (IA), such as KOBWA, shall be appointed by DWS to facilitate the implementation of the objectives and identified action projects in line with the requirements of the Lake Matsamo RMP on behalf of DWS. The IA will sign a Memorandum of Agreement (MOA) with DWS, which shall be a legal binding document outlining the roles, responsibilities and conditions that must be followed by both parties for the management of the water resource for recreational use. **Stakeholder Engagement:** The success of the development and implementation of the RMP depends on the cooperation of all stakeholders [Authorities and Interested and Affected Parties (I&APs)]. Authority and public meetings were conducted to obtain inputs (challenges and objectives) regarding the Dam. These meetings were conducted in accordance with the DWAF Guidelines for Public Participation (2001) that outlines three broad phases for public participation namely the Planning, Participation and Exit phase.

**Identified Objectives and Vision:** During the authority and public meetings, issues and concerns were raised from which the following objectives were identified:

- To keep the Dam and surrounding state land clean;
- Improve water quality by monitoring and assessing the main pollution sources;
- Improve safety of navigation;
- To promote sustainable harvesting of fish at the Dam;
- Introduce aquaculture at the Dam;
- To enable broad public enjoyment of the water resource and provide adequate controlled authorized access and associated infrastructure since there is only one access area for public;
- Introduction of more recreational activities such as boating clubs, swimming and fishing club;
- To uplift the local economy and increase benefit flows to the surrounding communities through community empowerment;
- To make the Dam a tourist attraction centre; and
- To ensure that a suitable institutional structure with the appropriate powers and delegations is in place to effectively manage the recreational use of the

water resource in accordance with this RMP.

A 20-year vision for the Dam, formulated from the objectives identified by stakeholders, is as follows:

"To see general developments that would unlock socio-economic potential of the area."

**Tourism Potential:** The potential recreational developments identified to enhance tourist attraction includes:

- Bird watching and
- Construction of swimming pools.

## The key challenges identified comprise:

- It is inconclusive if the water is fit for recreational use owing to the absence of test samples for all water quality constituents (not only pH), DWAF (1996);
- Lack of solid waste management around the Dam (i.e. disposable nappies dumped into the upstream and e around the Dam);
- There is a small stream flowing from a sewage to the Dam, this poses a threat to the water quality in the Dam;
- There is a lack of environmental and tourism awareness for the community;
- The local community is not involved in the management and utilization of the Dam for recreational purpose, hence they are not benefiting from the Dam;
- Fixed and floating Aids to Navigation (AtoN) and demarcation markers are not in place;
- There is currently no specific incident management system in place to ensure that incidents are recorded and responded to in a co-ordinated manner;
- There are unlawful activities taking place at the Dam which include net fishing and sand mining;
- The Dam is not entirely fenced (i.e. at the inlets of the Dam). As a result, some of the community members have direct access to the Dam in an uncontrolled manner which leads to theft;

- As the Buffelspruit community is reportedly getting water of poor quality;
- It is alleged that KOBWA offices have been built on top of graves, and the remaining cemeteries have been fenced off in such a way that the communities can no longer access them; and
- There are some historical issues.

## **Recommendations:**

This RMP recommends the following immediate actions:

- Appoint KOBWA as an IA to manage recreational use of the Dam on behalf of DWS;
- Monitor the area to avoid people from dumping domestic waste on the environment surrounding the Dam;
- The boats must be inspected before launching to get rid of possible pollutants such as hydrocarbons;
- The NLM should identify the dam as a local development objective in terms of IDP, SDF or Tourism Master Plan;
- Removal of silt from the Dam in order to increase the water quantity;
- Develop waste management plan for the Dam and surrounding areas to prevent pollution;
- The entry fees need to be reasonable to ensure that the Dam remains accessible and affordable to the local community.
- Water quality reporting and monitoring;
- Local communities must be given first priority should any opportunity arise from the Dam e.g. tenders and job opportunities.
- Introduce business initiatives through lease agreements and PPP,
- Strengthening community participation and beneficiation (e.g. via Skill Development programmes);
- Put in place adequate access control measures, such as fencing, in order to ensure the safety of people and livestock; and
- Promotion of small-scale fishery at the Dam that contributes to transformation and

equitable socio-economic benefit from inland fish resources.

# **TABLE OF CONTENTS**

ACKNOW	LEDGEMENTSII		
	LE AND APPROVAL PAGEIII		
AMENDM	ENTS PAGEIV		
EXECUTIV	E SUMMARYV		
LIST OF FI	GURESXII		
LIST OF T	ABLESXII		
LIST OF A	CRONYMSXIII		
CHAPTER	1: INTRODUCTION1		
1.1	BACKGROUND1		
1.2	PURPOSE OF THIS RMP1		
1.3	DESCRIPTION AND LOCATION OF THE DAM2		
1.4	PURPOSE OF THE DAM2		
1.5	DAM OWNERSHIP AND MANAGEMENT		
1.6	LEGISLATIVE FRAMEWORK		
CHAPTER	2: ENVIRONMENTAL ANALYSIS9		
2.1	BIOPHYSICAL ENVIRONMENT9		
2.1.1	Climate9		
2.1.2	2 Topography9		
2.1.3	Geology and Soil9		
2.1.4	Hydrology10		
2.1.5	5 Flora		
2.1.6	5 Fauna		
2.2	BUILT ENVIRONMENT		
2.2.1	Roads and Land-Based Transportation11		
2.2.2	2 Bulk Services		
2.2.3	Other on-site Facilities11		
2.2.4	Fencing		
2.2.5	6 Management and Operation11		
2.2.6	5 Safety		
2.3	SOCIO-ECONOMIC ENVIRONMENT		
2.3.1	Community Beneficiation		
CHAPTER	3: RESOURCE MANAGEMENT PLAN PROCESS 14		
3.1	DEFINITION OF RMP		

3.2	2	PROCESS	TRIGGERS	.4
3.3	3	RMP DEV	/ELOPMENT PROCESS 1	.5
3.4	1	RMP PLA	NNING STAGES	.6
	3.4.1	Des	ktop Study1	.6
	3.4.2	Site	Inspection1	.6
	3.4.3	Pub	lic Participation1	.6
	3.4.4	Plar	nning Partners1	.7
3.5	5	RMP DAT	TA ANALYSIS2	2 <b>1</b>
	3.5.1	Enc	umbrance Survey (Phase 2)	2 <b>1</b>
	3.5.2	SW	OT Analysis and Objective Identification2	1
	3.5.3	Res	earch/ Information Generation (Phase 4)2	24
СНАР	PTER 4	4: INTEGR	ATED RESOURCE MANAGEMENT PLANNING2	25
4.1	1	INSTITUT	FIONAL PLAN	27
	4.1.1	Imp	Dementing Agency (IA)	27
	4.1.2	Dan	n Management Committee (DMC)2	27
	4.1.4	Оре	erations Management Committee (OMC)	0
	4.1.5	Join	nt Water Commission (JWC)	0
	4.1.6	Nat	ional Project Steering Committee (NPSC)	1
4.2	2	ZONING	PLAN	3
	4.2.1	Wa	ter Surface Zoning3	3
	4.2.2	Sho	oreline Zoning	6
	4.2.3	Car	rying Capacity4	1
4.3	3	STRATEG	iiC PLAN	2
4.4	1	FINANCI	AL PLAN	7
	4.4.1	Pot	ential Sources of Revenue4	7
	4.4.2	Tar	get Market4	7
	4.4.3	Co-	Funding4	7
CONC	CLUSI	ON AND	WAYFORWARD4	9
REFEI	RENC	ES		1
APPE	NDIC	ES	5	2
AP	PEND	DIX A	: STAKEHOLDER DATABASE REGISTER5	2
AP	PEND	DIX B	: NEWSPAPER ADVERT5	2
AP	PEND	DIX C	: FLYERS	2
AP	PEND	D XIC	: EMAILS	2
AP	PEND	DIX E	: BACKGROUND INFORMATION DOCUMENT (BID)5	62

APPENDIX F	: EXAMPLES OF SUCCESSFULLY CO-FUNDED PROJECTS	52
APPENDIX G	: POTENTIAL CO-FUNDERS	52
APPENDIX H	: BUSINESS PLAN	52

# **LIST OF FIGURES**

Figure 1: Locality Map for Lake Matsamo Dam	3
Figure 2: Average Temperature and Rainfall of the Vryheid area	9
Figure 3: Fluctuations of Lake Matsamo water level over a year	10
Figure 4: Population size of Ward 28 and 31 Of NLM	12
Figure 5: Employment Status of Ward 28	13
Figure 6: Employment Status for Ward 31	13
Figure 7: RMP Procedure	15
Figure 8: Integrated Resource Management Planning	26
Figure 9: Proposed DMC	28
Figure 10: Existing CD: IO MANCO	
Figure 11: Joint Water Commission	31
Figure 12: Proposed NPSC	32
Figure 13: Proposed Water Surface Zoning	35
Figure 14: Proposed Shoreline Zoning Map	
Figure 15: Proposed Overall Zoning Map	40
Figure 16: RMP and BP Review Framework	50

# **LIST OF TABLES**

Table 1: Lake Matsamo Profile	2
Table 2: Key Data Sources Used to Develop the RMP:	4
Table 3: Legislative Framework Applicable to the Management and Use of the Dam for Recreational Purposes	5
Table 4: Mammal Species of Special Concern Identified within2531DA QDS	11
Table 5: Employment Status	12
Table 6: Summary of triggers and potential challenges for Lake Matsamo	14
Table 7: Planning Partners	18
Table 8: Summary of Biophysical and Social-Cultural Encumbrances	21
Table 9: SWOT Analysis for Lake Matsamo	22
Table 10: Proposed Water Surface Zoning Description	34
Table 11: Proposed Shoreline Zoning Description	37
Table 12: Area required per user	41
Table 13: Strategic Plan for KPA 1: Resource Management	43
Table 14: Strategic Plan for KPA 2: Resource Utilisation	43
Table 15: Strategic Plan for KPA 3: Benefit Flow Management	45

# **LIST OF ACRONYMS**

AtoN	Aid (s) to Navigation
BID	Background Information Document
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sports Sector, Education and training
	Authorities
CD: IO MANCO	Chief Director: Infrastructure Operations Management Committee
CIWSP	Co-operative Inland Waterways Safety Programme
СМА	Catchment Management Area
COGTA	Department of Cooperative Governance and Traditional Affairs
CPSI	Centre for Public Service Innovation
DAC	Department of Arts and Culture
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DHS	Department of Human Settlement
DMC	Dam Management Committee
DO	Dissolved oxygen
DoT	Department of Transport
DoT	Department of transport
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DSR	Department of Sport and Recreation
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorization
ECC	Effective Carrying Capacity
EDM	Ehlanzeni District Municipality
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
FSL	Full Supply Level
GIAMA	Government Immovable Asset Management Act, 2007 (Act No.19 of 2007
GWWs	Government Waterworks
I&APs	Interested and Affected Parties
IA	Implementing Agency
IBOM	Infrastructure Build, Operate and Maintenance
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IRMP	Integrated Resource Management Plan
JWC	Joint Water Commission
KOBWA	Komati Basin Water Authority
КРА	Key Performance Areas
LED	Local Economic Development
MDARDLEA	Mpumalanga Department of Agriculture Rural Development, Land and Environmental Affairs
MFMA	Municipal Finance Management Act

MOA	Memorandum of Agreement
MSA	Municipal Systems Act (2003)
NEMA	National Environmental Management Act (1998)
NLM	Nkomazi Local Municipality
NPSC	National Project Steering Committee
NDT	National Department of Tourism
NT	National Treasury
NWA	National Water Act (Act No. 36 of 1998)
ОМС	Operational Management Committee
ОМС	Operations Management Committee
PB	Purchased Boundary
PCC	Physical Carrying Capacity
PFMA	Public Finance Management Act (1999)
PP	Public Participation
PPP	Public Private Partnerships
PSP	Professional Service Provider
RCC	Real Carrying Capacity
RF	Rotation Factor
RMP	Resource Management Plan
RWU	Recreational Water Use
SAMSA	South African Maritime Safety Authority
SAPS	South African Police Services
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SRSA	Sports and Recreation of South Africa
SWOT	Strengths, Weaknesses, Opportunities, Threats
UPN	Unique Positioning Number
WfW	Working for Water
WMA	Water Management Area
WWTWs	Wastewater Treatment Works

## **CHAPTER 1: INTRODUCTION**

## 1.1 BACKGROUND

The Department of Water and Sanitation (DWS), through the National Water Act (NWA), 1998 (Act No. 36 of 1998), mandates the Minister as the custodian of the nation's water resources to ensure that the government waterworks (GWWs), including the Lake Matsamo, are protected, used, developed, managed and controlled in a sustainable manner and to the benefit of all as contemplated in Section 2 of the NWA.

A number of factors have prompted the need to compile Resource Management Plans (RMP) for GWWs, which *inter alia* include the following:

#### Resource Management:

- The water resource located within or outside a protected area whether is subject to protection by legislation;
- Invasive Alien species; and
- Water quality issues.

## Recreational Industry Involvement:

- Conflict between users due to no management tool in place;
- Public safety with regards to the use of inland vessels; and
- Uncontrolled developments within Dam basin.

## Community Participation and Beneficiation:

- Challenges of communities regarding physical access and access to the waterbased economy of the resource;
- Participation and beneficiation of surrounding communities remains a challenge;
- Unlocking the economic potential of the Dam through the establishment of effective Public Private Partnerships (PPPs); and
- Equitable and sustainable benefit flow into the community through the creation of appropriate institutional arrangements.

#### Public Policy:

 The water resource should be identified as a local development objective in terms of an Integrated Development Plan (IDP) or Strategic Development Framework (SDF) for the relevant local and/or district municipalities. The zoning plan for the water resource must either be developed or updated.

To assist the Minister in fulfilling this mandate, the DWS initiated and commissioned the development of the RMP and its Business Plan (BP) for Lake Matsamo, hereafter referred to as the Dam.

## 1.2 PURPOSE OF THIS RMP

A Resource Management Plan (RMP) provides the principles and guidance within which the dams must be used for recreational purposes. The principles and guidelines seek to promote community participation and beneficiation, environmental conservation and unlocking socio-economic opportunities associated with the recreational use of the Dam. This RMP is for Lake Matsamo, herein after referred to as the Dam, which is part of the Infrastructure Build, Operate and Maintenance (IBOM): Northern Operations.

This RMP is developed in accordance with the Guidelines for the Compilation of Resource Management Plans (DWAF, 2006) for Lake Matsamo, and to attain the objectives underlying sustainability in Section 2 of the NWA, with particular relevance to Section 26 and 113 relating to the use of water and access and use of government waterworks for recreational purposes.

## 1.3 DESCRIPTION AND LOCATION OF THE DAM

The Lake Matsamo is an earthfill dam which impounds the Lomati River. The surface area of the Dam is 1870 hectares with a capacity of 25.1 million cubic meters. **Table 1** shows the Dam profile. The Dam falls under Ward 28 and 31 of Nkomazi Local Municipality (NLM) within the Ehlanzeni District Municipality (EDM) in the in Mpumalanga Province. However, its impoundment impacts on the Republic of Swaziland, as shown in **Figure 1**. Its GPS coordinates are °25°43′0″S 31°32′25″E.

## 1.4 PURPOSE OF THE DAM

The primary purpose of the Dam is to provide water for irrigation. The Dam offers recreational activities such as includes fishing competitions. There are also recreation facilities around the Dam such as picnic site with braai stands, open spaces used for hosting events such as weddings and music festivals

## 1.5 DAM OWNERSHIP AND MANAGEMENT

DWS owns the Dam and surrounding state land. KOBWA as delegated authority, will on behalf of the Government of South Africa and the Kingdom of Swaziland, manage, control and supervise the utilisation of Lake Matsamo with the support of DWS. To assist KOBWA as it endeavours to ensure sustainability through its management actions, there is a proposed institutional structure which includes relevant stakeholders who will assist in effective management of the Dam.

The proposed institutional structure and arrangements for the management of the Dam for recreational use is presented in Section 4 of the RMP.

Lake Matsamo Profile		
Location	South Africa	
Province	Mpumalanga	
District Municipality	Ehlanzeni	
Local Municipality	Nkomazi local Municipality	
Nearest Town	Malelane	
Completion Year	1988	
Coordinates	25º43'0"S 31º32'25"E.	
Primary Purpose	Irrigation	
Owner	DWS	
Quaternary Catchment	X14G	
Water Management Area	Inkomati Water Management Area	
River	Lomati	
Capacity (Mm <sup>3</sup> )	25.1	
Surface Area (ha)	1870	
Wall Type	Gravity and Earth	
Wall Height (m)	50	
Crest Length (m)	2340	

 Table 1: Lake Matsamo Profile

*Source:* Adapted from Department of Water and Sanitation (2016)



Figure 1: Locality Map for Lake Matsamo Dam

## 1.6 LEGISLATIVE FRAMEWORK

The table below list the key data sources used to develop the RMP.

**Table 2:** Key Data Sources Used to Develop the RMP:

Policy and Guidelines	Description
Consideration on Institutional Arrangement for Managing Use of Water for Recreational Purposes (DWAF, 2003)	It outlines some of the institutional issues at a local level and makes recommendations about the conditions under which different Institution Management arrangements may be considered.
1st Draft National Inland Fisheries Policy Framework for South Africa. Department of Agriculture, Forestry and Fisheries, 2018	The Policy seeks to create an efficient regulatory regime for the inland fisheries sector in order to create an enabling environment to promote sustainable growth and transformation of the sector.
General Public Participation Guidelines (DWAF, 2001)	Public Participation refers to the ongoing interaction between Role Players and all stakeholders that is aimed at improving decision making during planning, design, implementation and evaluation of all projects within the state, this includes the proposed development of the RMP.
Government Notice R654 dated 1 May 1964, in terms of the Water Act, 1956 (Act No. 54 of 1956)	Regulates access and use of government waterworks for recreational purposes.
Guidelines for Compilation of Resource Management Plans (DWAF, 2006)	Directs and guides the development of RMPs by providing insight into the purpose and objectives of these plans, the procedure for its compilation and structure of such documents.
Guidelines for Compilation of Zoning Plans for Government Waterworks (DWAF, 1999)	It provides direction on the compilation of zoning plans for government waterworks (within DWS purchased boundary).
Methodology for Carrying Capacity Assessment for the Use of Water for Recreational Purposes (DWAF, 2003)	The carrying capacity of a water resource represents the maximum level of visitor/recreational use and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction or adverse impacts upon the local or host community, the economy and culture of the area.
National Treasury Public Private Partnership (PPP) Toolkit for Tourism, 2005,	This toolkit assists the process of development of tourism-based businesses on State-owned Land. The Toolkit make it easier for Institutions and the Private Sector to enter into tourism related partnerships on State Property managed by National and Provincial Government Institutions.
Operational Policy: Using Water for Recreational Purposes (DWAF, 2004)	This policy is the main guideline in support of the RMP process with regards to the basic principles, policies, strategies and actions for regulating the use of water for recreational purposes.

The legislative framework applicable to the management and use of the Dam for recreational purposes is summarised in the table below.

 Table 3: Legislative Framework Applicable to the Management and Use of the Dam for Recreational Purposes

Legislation: Acts, ordinances, bylaws	Relevance: Description
Constitution	Relevance:
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), Environmental Rights (Section 24)	<ol> <li>Section 24 - Everyone has the right:</li> <li>to an environment that is not harmful to their health or wellbeing,</li> <li>to have an environment protected for the benefit of present and future generations, through reasonable legislative and other measures that-</li> <li>a. prevent pollution and ecological degradation</li> <li>b. promote conservation and secure ecologically sustainable development and use natural resources while promoting justifiable economic and social development.</li> </ol>
National Legislation	Significance to the RMP:
Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003)	It aims to address inequities resulting from the systematic exclusion of black people from meaningful participation in the economy.
Communal Land Rights Act, 2004 (Act No. 11 of 2004)	To provide legal security by transferring communal land to communities or by granting comparable compensation. Based on South Africa's complex history most communities who used to reside in the vicinity of the dams have been forcefully removed. During the implementation of the RMP it is essential to comply with the act where necessary.
Conservation of Agricultural Resource Act, 1983 (Act No. 43 of 1983) [CARA]	Provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith. Regulation 7 and 8 within the same Act deals with the protection of wetlands and water courses, while regulations 15 and 16 deals with Alien Invasive Plant Species and bush encroachment.
1st Draft National Inland Fisheries Policy Framework for South Africa. Department of Agriculture, Forestry and Fisheries, 2018	In terms of the National Water Act (Act 36 of 1998), the Department of Water Affairs and Sanitation (DWS) is the custodian of South Africa's water resources and is responsible for access to and the control of activities on public water works (dams) under its jurisdiction. As such, access to DWS public water works land and water for fishing activities is subject to DWS control. A system of RMPs is being implemented by the DWS to manage the activities of multiple user groups on public water works.
Government Immovable Asset Management Act, 2007 (Act No. 19 of 2007) (GIAMA)	To provide for a uniform framework for the management of an immovable asset that is held or used by a national or provincial department; to ensure the coordination of the use of an immovable asset with the service delivery objectives of a national or provincial department; to provide for issuing of guidelines and

Legislation: Acts, ordinances, bylaws	Relevance: Description
	minimum standards in respect of immovable asset management by a national or provincial department; and to provide for matters incidental thereto.
Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000)	To provide for the manner in which municipal powers and functions are exercised and performed; to provide for community participation; to establish a simple and enabling framework for the core processes of planning, performance management, resource mobilisation and organisational change which underpin the notion of developmental local government.
Merchant Shipping (National Small Vessel Safety) Regulations (2007)	These Regulations provide <i>inter alia</i> for requirements for vessel safety; crewing requirements and responsibilities; controlled events such as competitions and regattas; and responsibilities of authorised agencies (governing boards/clubs/organisations and regulating authorities). These Regulations apply to the Department of Water and Sanitation as they are applicable to all inland and sheltered waters and as the Department and its agencies are allowing access to government waterworks for recreational boating vessels.
National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]	NEMA serves as South Africa's Environmental Framework Legislation. It was designed to provide for co- operative and Integrated Environmental Governance by establishing a general framework for decision- making on matters affecting the environment.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	This Act aims to provide the framework, norms and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources.
[NEMBA]	The Alien and Invasive Species Regulations for this Act came into effect 01 October 2014. NEMBA together with these Regulations aim to prevent the introduction and spread of alien and invasive species across South Africa.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) [NEMPAA]	The aim of this Act is to provide for the protection and conservation of ecologically viable areas, which are representative of South Africa's Biodiversity, as well as natural landscapes and seascapes.
National Environmental Management: Waste Act, 2014 (Act No. 59 of 2008) [NEWA]	Provides for the national domestic waste collection standards and national norms and standards for the storage of waste.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) [NHRA]	To nurture and conserve their heritage resources so that they may be hand down to future generation. To introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa. All heritage sites and cultural artefact must be protected and should be demarcated in the RMP zoning map.

Legislation: Acts, ordinances, bylaws	Relevance: Description
National Water Act, 1998 (Act No. 36 of 1998) [NWA]	The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and appropriate manner, for the benefit of all. Furthermore Section 113 of the Act states that the water of a government waterworks and surrounding state owned land may be made available for recreational purposes, subject to controls determined by the Minister and regulations made by the Minister.
	Using water for recreational purposes is a water use under Section 21K and can be exercised as permissible use of water under Schedule 1 of the Act. However, this provision does not cater for commercial use hence the RMP should be implemented in line with General Strategic Plan for commercialisation of Tourism Public Private Partnerships at Government Waterworks, 2009 and PFMA Treasury Regulation 16. Once the RMP has been approved, the RMP will regulate access and use of the dam. It is important to note that users will need to comply with other relevant legislation.
Occupational Health and Safety Amendment ActAct181 of 1993G.15369GoN 2471	It requires the employer to bring about and maintain, as far as reasonably practicable, a work environment that is safe and without risk to the health of the workers. The workers and the employer must share the responsibility for health and safety in the workplace.
Public Finance Management Act, 1999 (Act No. 29 of 1999) [PFMA]	Section 76 of the Act secures transparency, accountability and sound management of the revenue, expenditure, assets and liabilities of government departments. The Act promotes the objective of good financial management in order to maximise service delivery. The Act allows DWS to enter into PPP agreements with the private sector for the commercial use of state assets.
Safety at Sport and Recreational Events Act, 2010 (Act No. 2 of 2010)	Events management is addressed by Safety at Sport and Recreational Events Act (Act No. 2 of 2010). This act deals with ensuring responsibility for safety and security at events. The act deals with <i>inter alia</i> responsibility for safety and security at the events, risk categorization of events and safety certificates.
South African Maritime Safety Authority Act, 1998 (Act No. 5 of 1998) [SAMSA],	One of SAMSA's three legislative mandates is "to ensure safety of life and property at sea". The Act enables SAMSA to administer and execute the relevant maritime legislation.
Water Services Act, 1997 (Act No. 108 of 1997.	The Act outlines the roles and responsibilities for the supply of water and sanitation to citizens. It also recognises the rights of all humans to basic water supply and sanitation services.
Provincial Legislation	Significance to the RMP:
Mpumalanga Tourism and Parks Agency (MTPA) Act [2005]	The functions of the Board are <i>inter alia</i> area and from time to time to make recommendations to the Minister in relation to policy formation for the coordination of ecotourism projects involving both government and private initiatives, including community-linked projects associated with protected areas.
Technical Report for the Mpumalanga Biodiversity Sector Plan (2015)	Besides protecting a representative sample of all species (biodiversity pattern), there is also a need to conserve ecological processes that allow these biodiversity patterns to persist over time.

Legislation: Acts, ordinances, bylaws	Relevance: Description
Department of Tourism Strategic Plan 2015/16 - 2019/20	To coordinate and undertake capacity building programmes (knowledge, insights and tools) to equip South African missions abroad and the tourism sector to position South Africa as a competitive tourism destination.
Municipal Policy, By-Laws, Reports & Guidelines	Significance to the RMP:
Nkomazi Local Municipality: Spatial Development Framework	Strategy is based on identified development needs, opportunities and comparative advantages of the area, providing the Municipality with guidelines to create and facilitate economic development, realize the underlying economic development potential, and encourage private sector investment and job creation
Nkomazi Local Municipality Integrated Development Plan 2017-2022	The Local Economic Development provides the basic guidelines that promote the application of development principles for spatial development and planning that encourages sustainability, integration, equality, efficiency and fair and good governance.
Nkomazi Local Municipality: Waste Management By-Law, 2014.	The use of the Dam for recreational use shall be subject to the provisions of these By-laws to control waste and littering and dumping amongst other.
Nkomazi Local Municipality: Water Services By- Law, 2014	Water services rendered to a consumer are subject to the provisions of these By-laws and the conditions should be contained in the relevant agreement.

# **CHAPTER 2: ENVIRONMENTAL ANALYSIS**

## 2.1 **BIOPHYSICAL ENVIRONMENT**

## 2.1.1 Climate

The Dam is located in an area characterised by local steppe climate. The climate here is classified as Cwa by the Köppen-Geiger system. (Climate Data.Org).The area's climate is classified as warm and temperate. When compared with winter, the summers have much more rainfall. The average precipitation is 716 mm. The least amount of rainfall occurs in July. And its average is 9 mm. In January, the precipitation reaches its peak, with an average of 135 mm. The variation in the precipitation between the driest and wettest months is 126 mm.

The average annual temperature is 21.7 °C in Malelane. The temperatures are highest in February, at around 25.6 °C and June is the coldest month of the year, at 16.5 °C. The variation in annual temperature is around 9.1 °C. (Climate Data.Org). Refer to **Figure 2** for the average temperatures and rainfall patterns for the area in 2016).



Figure 2: Average Temperature and Rainfall of the Vryheid area Source: Adapted from Climate Data. ORG, 2016

## 2.1.2 Topography

The Dam is situated within an area characterised by undulating topography with gentle slopes surrounding it, therefore it is suitable to erect some major recreational structures such as chalets and overnight accommodation.

## 2.1.3 Geology and Soil

The geology of the area where the Dam is located is characterized by gneiss and migmatite. The underlying soils have a moderate to high erosion potential, stabilized relatively easy by maintaining the natural vegetation cover, especially grass cover (SUP 2004).

## 2.1.4 Hydrology

## Water Surface

The Dam is situated in the Lomati River under the Inkomati Water Management Area. KOBWA as a delegated authority, will on behalf of the Government of South Africa and the Kingdom of Swaziland, manage, control and supervise the utilisation of Lake Matsamo with the support of DWS. During the site inspection in June 2015, the water level in the Dam was very low due to drought. **See Figure: 3** showing the current water level.



Figure 3: Fluctuations of Lake Matsamo water level over a year Source: DWS, 2016

## Water Quality

According DWAF (1996), the following constituents are the indicators of the water quality to determine its suitability for recreational use; pH, algae, odour, turbidity, floating matter and indicator organisms (*E.coli*, faecal coliforms, total coliforms).

At the time of developing this report, the only indicator results for pH was available, and it was found to be within the acceptable Target Water Quality Range (TWQR), between 6.5-8.5, indicating that minimal eye irritation might occur once in contact with water.

Test results for other indicator samples in the Water Management System (WMS) should be recorded and documented (i.e. algae, odour, turbidity, floating matter, *E.coli*, faecal coliforms,

and total coliforms) to determine if the water is fit for recreational use. Hence, precautionary measures should be exercised for contact sports within or around the Dam.

## 2.1.5 Flora

The Dam is situated in the Savannah biome, the area is characterised by grass and open woodland, with transitional vegetation ranging from Lowveld to Lowveld Sour Bushveld (Mucina & Rutherford 2006). The original vegetation has been substantially modified by human use with a few patches of riverine fringe vegetation remaining, yet severely impacted by large fluctuations in the water level of the Dam (SUP 2004).

## 2.1.6 Fauna

The Dam is situated close to communities where domestic livestock such as goats, cattle and sheep graze and drink water from the Dam. During seasons of draught there is a risk of livestock getting stuck into the mud while trying to reach for water in deeper parts of the Dam.

There are mammal species recorded in locus 2531DA as endangered, critical endangered and near threatened see **Table 4.** (http://vmus.adu.org.za/vm projects.php).

 Table 4: Mammal Species of Special Concern Identified

 within2531DA QDS

Species Common Name	Red list category
African wild dog	Endangered
Angolan Free-tailed Bat	Critical Endangered
Geoffroy's Horseshoe Bat	
Darling's Horseshoe Bat	Near Threatened
Lesser Long-fingered Bat	
Temminck's Myotis	

## 2.2 BUILT ENVIRONMENT

The aspects that have been investigated consist of and are presented under the following subheadings:

- Roads and land-based transportation;
- Bulk services;
- Other on-site facilities;
- Fencing;
- Management and operation; and
- Safety.

## 2.2.1 Roads and Land-Based Transportation

The Dam is located on the Lomati River between the villages of Schoemansdal and Middelplaas, approximately 25km due south of Malelane in Mpumalanga and about 45km by road from Malelane. From Malelane take the N4 East for 4 km, then turn right (South) onto the R570 towards Jeppe's Reef. Access to the Dam is possible from the main tarred road between Malelane and Jeppe's Reef (at the border to Swaziland). The junction of the left flank permanent access road with the tarred road is at the Schoemansdal village.

**Internal Road and Circulation:** There are several internal gravel roads that leads to the DWS offices.

**Parking:** There is no demarcated area for parking, however, there is sufficient undeveloped space to provide parking.

## 2.2.2 Bulk Services

**Solid Waste:** There is lack of solid waste management and infrastructure around the Dam. Typical waste observed around the Dam includes solid waste such as disposable nappies, dumped into the river upstream of the Dam. This poses a threat to the quality of the water in the Dam.

## 2.2.3 Other on-site Facilities

The existing facilities at the Dam includes:

- DWS offices;
- Ablution facility;
- Picnicking; and
- Camping facilities

## 2.2.4 Fencing

There is only one authorized access point located at the KOBWA offices. The fence around the Dam has been removed. People access the Dam in any part of the Dam as a result access control is very difficult.

## 2.2.5 Management and Operation

KOBWA as delegated authority, will on behalf of the Government of South Africa and the Kingdom of Swaziland, manage, control and supervise the utilisation of Lake Matsamo with the support of DWS. Through the development of this RMP, KOBWA is proposed as an IA for the management of recreational use for this Dam. There are currently no fixed and floating Aids to Navigation (AtoN) and demarcation markers in place. Local Accountable AtoN Parties (LAAP) and other bodies providing access to government waterways and watercourse have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from the DWS and thereafter the permission by South African Maritime Safety Authority (SAMSA).

## 2.2.6 Safety

There is currently no specific incident management system in place to ensure that incidents are recorded and responded to in a coordinated manner. However, as part of the RMP, the Incident Management Plan will be implemented to ensure that incidents are recorded and responded to.

## 2.3 SOCIO-ECONOMIC ENVIRONMENT

The purpose of assessing the socio-economic conditions is to determine matters that need to be addressed through the implementation of the RMP process to uplift the standard of living of the communities. The study area falls within NLM under Ward 28 and 31.

A social audit was conducted for Ward 28 and 31 of NLM with the data from Stats SA Community Survey (2016) that focus on the socio-economic conditions of the area.

The socio-economic conditions within 28 and 31 of NLM is summarised in the sub-sections as follows:

- Population size;
- Employment status;
- Tourism potential; and
- Community beneficiation.

## **Population Size**

The population of NLM is 393 030 whereas Ward 28 has a population of 6163 and Ward 31 has a population of 7740. **Figure: 4** illustrates the population dynamics of NLM and the two (2) wards. Job opportunities can be generated easily

as the two wards contain less percentage of the population in the whole municipality.



Figure 4: Population size of Ward 28 and 31 Of NLM

Source: Stats SA Community Survey (2016)

#### Employment status

In terms of employment levels within Ward 28 and 31, **Table: 5** and **Figure: 5 and 6** indicate the employment status. According to Census (2011), in both wards the percentage of people who are not earning is very high compared to the people who are employed. There is a need to create jobs to improve the living standards of the communities around the Dam. Community members around the Dam are willing to participate in any recreational activities that can be introduced.

 Table 5: Employment Status

Description	Ward 28	Ward 31
Employed	970	1459
Unemployed	647	911
Discouraged	450	194
Other uneconomically Active	1727	1940
Not applicable	2370	3235



Figure 5: Employment Status of Ward 28 Source: Stats SA Community Survey (2016)



Figure 6: Employment Status for Ward 31

## 2.3.1 Community Beneficiation

It is the DWS's policy that local communities should equally share the benefits emanating from the utilisation of the Dam for recreational use.

According to DWAF (2006), it is important to ensure that communities have physical access to the resource, as well as access to the waterbased recreation economy. This will ensure that water resource remain protected for future generations.

In terms of recreational angling, this sector has a substantial participation rate and a significant

economic impact through the tourism sector and angling supply value chains. It is therefore important that recreational anglers are recognised as important stakeholders in South African inland fisheries and that their interests are recognised in future fisheries development initiatives.

The value chain associated with the recreational fishing sector has the potential to support rural food security through decent jobs, entrepreneurship and participation in the fishing linked tourism service sector.

In addition to the above, subsistence fishing is widely practiced by rural community members to sustain their livelihoods. Appropriate policies to promote greater participation by rural community members in the recreational angling value chain have the potential to create opportunities such as decent jobs and food security in rural areas. In terms of the 1<sup>ST</sup> Draft of the National Inland Fisheries Policy Framework for South Africa. Department of Agriculture, Forestry and Fisheries (2018), more can be done to ensure that this economic sector contributes to transformation and equitable socio-economic benefit from inland fish resources

Involving the communities in the utilisation and management of the Dam will ensure that communities benefit through:

- Equitable access to the Dam;
- Safety while accessing and using the Dam;
- Being given first preference when there are employment opportunities and skills development through the Public Private Partnership (PPP); and
- Participating in decision-making with respect to major developments planned or proposed for the Dam [through the Dam Management Committee (DMC)].

## **CHAPTER 3: RESOURCE MANAGEMENT PLAN PROCESS**

## 3.1 DEFINITION OF RMP

A Resource Management Plan (RMP) is a tool which regulates access to and the recreational utilisation (secondary use) of a water resource and the surrounding state land, in ways that promote community participation and beneficiation, environmental conservation and the unlocking of socio-economic potential of the water resource.

Secondary use includes leisure, culture and religious activities. Although recreational use does not involve consumption of water, it is still a major water use and needs to be managed effectively with minimal detrimental environmental impacts. Process triggers are used to initiate the planning and public participation process in which stakeholder and potential Interested and Affected Parties (I&AP) are given an opportunity to comment or raise issues of concern that are relevant and in line with the process triggers and potential challenges presented in **Table 6.** 

The resource management planning process aims to achieve a common goal, identify site specific challenges and establish a set of objectives and action projects to attain community participation and beneficiation, environmental conservation and the unlocking of socio-economic potential of the water resource.

## 3.2 PROCESS TRIGGERS

Process triggers are factors based on the principles underlying the integrated resource planning procedure for recreational waters.

Triggers (s)	Potential Challenges
Resource Management:	<ul> <li>The Dam is situated closer to the communities, hence people dispose domestic waste near the Dam threating the water quality of the Dam.</li> <li>There are some development initiatives from the local communities.</li> <li>The fence that marked the purchased boundary was stolen.</li> <li>There are allegations of unlawfull net fishing at the Dam.</li> <li>Allegations of unlawfull sand mining</li> </ul>
Recreational Industry Involvement:	• The local communities are not benefiting from the Dam.
Community Participation and Beneficiation	• Local Communities should be involved in managing and utilising the Dam for recreational purpose. This will assist in ensuring that the Dam is utilised in a sustainable manner and in a way that fulfills the interests of the community.
Public Policy	• To ensure that the RMP incorporates the planning documents from Local or District Municipality in cases where the Dam is identified as local development objective in terms of the Integrated Development Plan (IDP), Spatial Development Framework (SDF) or Tourism Master Plans for the relevant Local or District municipality.

 Table 6: Summary of triggers and potential challenges for Lake Matsamo

## **3.3 RMP DEVELOPMENT PROCESS**

The RMP is developed in accordance with the RMP guideline procedure (DWAF, 2006) which

stipulates the stages that needs to be adhered to as shown in **Figure 7.** 

Phase 1: Process Initiation	<ul> <li>Establish motive for undertaking RMP process.</li> <li>Ensuring roles and responsibilities are understood.</li> </ul>
Phase 2: Project Outline and Encumbrance Survey	•Ascertain whether any encumbrance exist and the most appropriate approach to the project.
Phase 3: Objective Identification	•Consult with stakeholders to ascertain common goals and formulate into one document.
Phase 4: Research/ Information Generation	•Prepare a Research Report containing information on sustainable utilisation of the Dam.
	•Undertaking planning through a consultative process and
Phase 5: Integrated Management, Zoning and Institutional Planning	by evaluating information to ascertain what can take place based on specific constrains and parameters. •Outcome: Draft RMP
Phase 6: Evaluation	<ul> <li>Obtain comments from stakeholders on the draft RMP and amend accordingly.</li> <li>Outcome: Approved RMP</li> </ul>
Phase 7: Decision making and Operationalisation	<ul> <li>Obtain approvals and support from relevant Authorities.</li> <li>Undertake implementation and institutionalisation of the RMP.</li> <li>Outcome: Implementation</li> </ul>

Figure 7: RMP Procedure Source: Adapted from DWAF (2006)

## 3.4 RMP PLANNING STAGES

## 3.4.1 Desktop Study

A desktop study was conducted with the aim of acquiring background information about the Dam, such as the review of legislative and regulatory framework, decision-support tools, specialist reports, policies and guidelines, local and district municipal plans, biodiversity sector plans and integrated water information systems.

## 3.4.2 Site Inspection

A site inspection was conducted with the DWS officials (DWS IEE and Dam Control Officer) on **19** November **2015**.

During the site inspection the following were observed: solid waste dumped on the surrounding state land and lack of access control on the other sides of the Dam. Additional background information was collated from consultation with different stakeholders. Potential Interested and Affected Parties (I&APs) were identified during the site inspection through liaison with the Dam Control Officer.

## 3.4.3 Public Participation

The Public Participation (PP) process is a process in which potential Interested and Affected Parties (I&AP) are given an opportunity to comment or raise issues of concern on specific matters. The three (3) fundamental and theoretical objectives of the PP process, as stipulated in the DWAF's Guideline for Public Participation (2001) are:

- To improve decision-making;
- To bring about sustainable development; and
- To normalise the attitudes of stakeholders, authorities and I&AP.

The PP process was conducted in order to obtain information for Phase 2 (Encumbrance Survey), Phase 3 (Objective Identification) and Phase 4 (Research/ Information Generation) from stakeholders, authorities and I&AP, that was used to complete Phase 5 (Integrated

# Management, Zoning and Institutional Planning).

## Stakeholder Database Register

Various stakeholders were identified and invited to participate in an open and consultative process. The stakeholder database was updated on a continuous basis throughout the RMP process (refer to **Appendix A**).

## Advertising Process

The purpose of advertising is to notify the public about the proposed RMP project and to give the public an opportunity to register as I&APs.

The following advertising methods were used:

- Newspaper Advert: Initial public meetings were advertised on Lowveld Newspaper in English on 28 June 2016 (refer to Appendix B).
- Flyers and Onsite Notices: The Flyers and Onsite Notices were compiled in English and IsiSwati and were distributed on 24 June 2016. (Refer to Appendix C).

## **Consultation and Engagement**

Consultation with stakeholders shall continue until the approval of the RMP.

The following consultation and engagement methods were used:

- E-mails: Initial meeting invitations were sent to stakeholders on 04 August 2017, notifying them about the scheduled consultative meetings. The draft RMP presentation was sent on 23 June 2016 (refer to Appendix D).
- Background Information Document (BID): The BID was sent to stakeholders *via* email with background information about the proposed RMP project (refer to Appendix E).

Authority Meeting: The initial authority meeting was held on 08 July 2016 at KOBWA Offices. The draft RMP was presented on 23 June 2017 at KOBWA Offices. The purpose of the meeting was:

- To present the RMP, its goal and the objectives of the project to the authorities; and
- To allow the authorities an opportunity to participate in the project by sharing information on their respective mandates.
- Public Meeting: 08 to 10 July 2016 in five (5) villages. The Draft RMP was presented to the SUP Committee on 23 June 2017 at KOBWA offices, with the agreement that the SUP committee members will present the Draft RMP to the local communities.

## 3.4.4 Planning Partners

As an integrated planning procedure, the RMP Process addresses both the institutional structure required to effectively manage the water resource, as well as the site planning parameters (environment, community and visitor) resulting in a management plan specific to the Dam. Both the proposal regarding the institutional structure and the management plan are consolidated into a RMP, which will serve as guide for the development and management of the water resource for recreational use.

In order to successfully complete the RMP, it is essential that the information obtained in the previous phases is utilised as planning input.

The RMP provides for coordination between different government departments and agencies as shown in **Table 7.** This is to ensure that not only the objectives of DWS are achieved but also that the functions/ objectives of the planning partners (relating to the recreational use of the Dam) are taken into consideration when developing the RMP

## Table 7: Planning Partners

Department	Functions / objections
KOBWA	KOBWA, as a delegated authority, will on behalf of the Government of South Africa and the Kingdom of Swaziland, control and supervise the utilisation of Lake Matsamo based on the principles underlying sustainability.
Ehlanzeni District Municipality/Nkomazi Local Municipality (EDM/NLM).	The Dam is within the jurisdiction of the municipality and is mandated to provide bulk water services.
Mpumalanga Department of Agriculture Rural Development, Land and Environmental Affairs (MDARDLEA)	In relation to the RMP, the Department will assist in issuing fishing permits.
Department of Agriculture, Forestry and Fisheries (DAFF)	The purpose of the DAFF includes sustainable development and management of resources to maximise the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems.
	Operation Phakisa's expansion to inland dams is one of the DAFF's initiatives aimed at unlocking the economic potential of the fisheries sector of inland water. The latter programme will be used as a benchmark for the implementation of conservation policies, while implementing job creation in the fishery and fish processing market.
Department of Environmental Affairs (DEA)	The DEA is mandated to give effect to the right of citizens to an environment that is not harmful to their health or wellbeing, and to have the environment protected for the benefit of present and future generations.
	In relation to the RMP, the DEA is responsible for biodiversity management within the GWWs, including invasive alien species. In addition, the Department should ensure that Environmental Impact Assessments (EIAs) is undertaken for all activities that triggers EIA Regulations. The DEA through the WfW programme, can assist in eradicating alien invasive plants species (blue gums and parrot furthers) and alien invasive fish species.
Department of Public Works (DPW)	DPW is tasked with the function to regulate and control the use of state land outside the GWWs.
Department of Rural Development and Land Reform (DRDLR)	The Department will assist in terms of land claims/ ownership issues (i.e. land under traditional authorities). The Department are also involved in rural development by improving both economic infrastructure (such as roads) and social infrastructure (e.g. communal sanitation and non-farming activities).
Department of Transport (DoT)	Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water, and inland waterways. For the purpose of Inland Waterways, DoT has established an agency called the South African Maritime Safety Authority (SAMSA). SAMSA has been charged with the responsibility of executing the administration of the Merchant Shipping (National Small Vessel Safety) Regulation, 2007 (as amended). The Regulations extends SAMSA's core mandate to include inland waterways accessible to the public within the Republic, to ensure boating safety on our waters.

Department	Functions / objections
National Treasury (NT)	The use of state assets is governed by National Treasury Regulations, requiring the DWS to plan concessions in compliance or association with the National Treasury, guided by the Tourism Public Private Partnership (PPP) Toolkit of 2005.
Centre for Public Service Innovation (CPSI)	The CPSI is supporting a multi-departmental working group that is developing an innovative approach to inland water and safety integrity. The project, was initiated out of the need to find an innovative, practical and cost-effective way to implement SAMSA' vessel safety regulations on inland waterways and to implement responsible water use within the broader socio-economic context of the country.
	The CPSI is supporting a multi-departmental working group that is developing an innovative approach to inland water and safety integrity. The project, was initiated out of the need to find an innovative, practical and cost-effective way to implement SAMSA' vessel safety regulations on inland waterways and to implement responsible water use within the broader socio-economic context of the country.
	The CIWSP is a project piloted by the CPSI that is a partnership between multiple government entities and between the Government and communities. The main aim of the project is to enhance the development of a best practice model to ensure safe and structured inland maritime environment and culture, whilst protecting the country's precious water resource.
Culture, Arts, Tourism, Hospitality, Sport Sector, Education and Training Authority (CATHSSETA)	CATHSSETA deals with the approval and financing of training relating to the culture, hospitality, tourism and sport sectors.
Department of Corporative Governance and Traditional Affairs (CoGTA):	Its function is to develop national policies and legislation with regard to provinces and local government, and to monitor their implementation. Another function of the Department is to support provinces and local government in fulfilling their constitutional and legal obligations
Department of Basic Education (DBE):	The function of the DBE is to develop, maintain and support a South African school education system. In this regard, the DBE can collaborate with nature reserves that encompasses GWWs, in order to provide an opportunity for school environmental tours, as this can also have influence on career options.
Department of Sports and Recreation (DSR)	The Department is mandated to promote and develop sport and recreation activities and also to co-ordinate the relationships between the sports commission, national and recreational federations and other agencies.
Department of Tourism (NDT)	The Department is mandated to create conditions for the sustainable growth and development of tourism in South Africa. The Tourism Act makes provision for the promotion of tourism to and in the Republic and for regulation and rationalisation of the tourism sector, including measures aimed at the enhancement and maintenance of the standards of facilities and services utilised by tourists; and the co-ordination and rationalisation of the activities of those who are active in the tourism sector.

Department	Functions / objections
South African Police Service (SAPS)	The South African Police Service has been entrusted with the responsibility of creating a safe and secure environment for all people in South Africa, as well as preventing anything that may threaten the safety or security of any community.
South African Sports Confederation and Olympic Committee (SASCOC)	SASCOC is mandated to promote and develop high performance in sports, as well as to act as a controlling body for sports in South Africa. It can also assist in coordinating organised events at the Dam.

## 3.5 RMP DATA ANALYSIS

## 3.5.1 Encumbrance Survey (Phase 2)

The purpose of the encumbrance survey is to investigate/ ascertain whether any encumbrances exist around the Dam and other factors that may influence the development and implementation of the RMP.

The survey also identifies the information that is required for effective decision-making regarding the RMP (DWAF, 2006).

The identified encumbrances are categorized into **Biophysical** and **Socio-Cultural and legal**.

 Table 8: Summary of Biophysical and Social-Cultural Encumbrances

Item	Description
Biodiversity	• Some of the contact activities such as swimming will not be feasible in the Dam due to the presence of crocodiles in the Dam.
	• The communities are much concerned about the water provision. As the Buffelspruit community is reportedly getting water of poor quality.
Social Audit	• The land around the Dam is limited and the community members are willing to introduce development structures, thus conflicts may arise within the communities living near the Dam.
	• It is alleged that KOBWA offices have been built on top of graves, and the remaining cemeteries have been fenced off in such a way that the communities can no longer access them.
Tourism	The Dam is under developed.
Information	There is no overnight accommodation for visitors.
Employment	• It is perceived that the residents of Swaziland benefit more from the Lake Matsamo compared to the local people since most people working at KOBWA are from Swaziland.
Land Ownership	• Most of the land outside the purchased boundary is owned by traditional authorities.
Agreements	People who were relocated during the construction of the Dam, alleged they were built houses of poor quality.
	• There were promises made by KOBWA before the construction of the Dam, however they were never fulfilled.

## 3.5.2 SWOT Analysis and Objective Identification

Engineerex Pty Ltd as the process facilitator conducted the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis to determine the **Strengths** and **Opportunities** that define the potential of the Dam whereas the challenges regarding the Dam where identified through **Weaknesses** and **Threats**. Refer to **Table 9** for the SWOT analysis.

**Tables 8** summarises the identified biophysical and social-cultural encumbrances/ limitations, respectively that might affect the development or implementation of the RMP for the Dam.

Strengths	Weaknesses
<ul> <li>Strengths</li> <li>The Dam has a tourism potential for both local and national tourists.</li> <li>The Dam supplies water to downstream farmers.</li> <li>The Dam is an international asset since it falls under two countries.</li> <li>There is enough land for developments.</li> <li>It is the biggest Dam within its area of location.</li> </ul>	<ul> <li>Weaknesses</li> <li>The fence surrounding the Dam has been stolen.</li> <li>Jeppes Reef Community is often told to report matters relating to the Dam to the KOBWA Head office which is in Swaziland, far from the local communities.</li> <li>Tariffs paid for water used for irrigation are unreasonable. There are tariffs from DWS and from the irrigation board. This causes confusion as to which tariffs should be taken into account.</li> <li>The mandate of the management structure is not clear in terms of allocation of roles and responsibilities.</li> <li>The water moving underground from the Dam to community fields (Farms) affects crop production.</li> <li>The name of the Dam is confusing the local communities.</li> <li>It is perceived that the residents of Swaziland benefit more from the Dam as compared to South African residents.</li> <li>Shongwe High School was relocated during the construction of the Dam. The exercise had a negative impact on the image and the dignity of the school.</li> <li>The Sustainable Utilisation Plan (SUP) committee appointed 12 years ago (approval of the SUP) does not provide feedback to the communities about the progress regarding the Dam.</li> <li>There are no developments in Jeppes Reef offering economic opportunities to the locals.</li> <li>The local artists are not recognised or invited to perform at events hosted at the Dam.</li> </ul>
	<ul> <li>People who were relocated during the construction of the Dam, were built houses of poor quality.</li> </ul>
	There is no signage in Malelane showing the direction where the Dam is located.
Opportunities	Threats
<ul> <li>KOBWA can appoint the local people to clean the disposable nappies and other domestic waste that has been dumped on the land near the Dam.</li> <li>The Jeep's Reef community has business interest in the Dam.</li> </ul>	<ul> <li>There are crocodiles in the Dam therefore water contact activities such as swimming cannot take place.</li> <li>It is alleged that people who were relocated prior to the construction were located into the</li> </ul>
<ul> <li>Introduce fishing for business e.g. aquaculture.</li> <li>Job creation opportunities.</li> <li>There is availability of venue for different events.</li> </ul>	<ul> <li>farms which have land claims.</li> <li>It is alleged that KOBWA offices were built on top of graves. The remaining graves have been</li> </ul>

 Table 9: SWOT Analysis for Lake Matsamo

•	The Dam can become a destination of choice.		fenced off and the communities can no longer
•	It is currently under developed in comparison to other		access them.
	state dams	•	Unlawful fishing using nets and sand mining.
		•	Dumping of domestic waste closer to the Dam
			which can be washed into the Dam during
			rainy seasons, leading to water pollution.
		•	Houses were affected by the "blasting"
			process during the construction phase of the
			Dam.
		•	The communities request royalties from the
			name of the dam since it was named after the
			"Driekoppies" community and some
			surrounding communities need clarity on the
			dam name, whether it is 'Driekoppies'' or 'Lake
			Matsamo".
		•	Encroachment of development structures into
			DWS land.
		•	Water quality is also threatened by sewage
			leaking into the river feeding into the Dam.
		•	The local communities believe that there is a
			water snake (mermaid) in the Dam.

Key objectives were formulated from the identified **Strengths** and **Opportunities** of the Dam.

The vision and key performance areas (KPA) for the Dam for a period of 20-years was formulated from the key objectives, discussed in the paragraphs to follow.

## **Objective Identification (Phase 3)**

The set of key objectives acknowledged were categorised into three (3) Key Performance Areas (KPAs) as follows:

## **KPA 1: Resource Management**

- To keep the Dam and surrounding state land clean;
- Improve water quality by monitoring and assessing the main pollution sources; and
- Improve safety of navigation.

## **KPA 2: Resource Utilisation**

- To promote sustainable harvesting of fish at the Dam;
- Introduce aquaculture at the Dam; and

 To enable broad public enjoyment of the water resource and provide adequate controlled authorized access and associated infrastructure since there is only one access area for public.

## **KPA 3: Benefit Flow Management**

- Introduction of more recreational activities such as boating clubs, swimming and fishing club
- To uplift the local economy and increase benefit flows to the surrounding communities through community empowerment;
- To make the Dam a tourist attraction centre;
- To ensure that a suitable institutional structure with the appropriate powers and delegations is in place to effectively manage the recreational use of the water resource in accordance with this RMP.

To ensure that a suitable institutional structure with the appropriate powers and delegations is

in place to effectively Action projects required to achieve these objectives are provided in detail in Section 4.3 (The Strategic Plan).

A 20 year vision for the Dam formulated from the objective identified by the stakeholder is as follow:

"To see general developments that would unlock socio-economic potential of the area."

## 3.5.3 Research/ Information Generation (Phase 4)

The main aim of the research was to identify the Dam tourism development potential and to evaluate the practicality/ feasibility of the identified objectives.

## **Tourism Potential:**

The development of a tourism and marketing strategy will enable the NLM to see direction in moving tourism forward in the region. Specific frameworks that will be developed will focus on providing guidelines for the NLM in terms of marketing and research, product development, investment, infrastructure and institutional arrangements. Prior to developing the framework however it is important to outline a vision for tourism in the NLM. The vision provides an ambitious focus for where the NLM wants to go as a destination in the long term and provides for the development of realistic and implementable tourism Framework (KOBWA 2006).

## <u>Practicability/ Feasibility of Potential</u> Objectives:

According to the DWAF (2006), the feasibility of the proposed objectives needs to be determined prior to the RMP implementation. Based on the desktop study done for the Dam, all identified objectives are considered to be practical/ feasible during the implementation stage, others will be subjected to a feasibility study, refer to the Strategic Plan in **Section 4.3** of this RMP.

## **CHAPTER 4: INTEGRATED RESOURCE MANAGEMENT PLANNING**

The purpose of the Integrated Resource Management Planning (IRMP) is to evaluate the information obtained from preceding phases (Process Triggers, Encumbrance Survey, Objective Identification and Research/ Information Generation) to ascertain what could be achieved based on specific constraints and parameters of the water resource and surrounding State land.

The IRMP consists of four (4) plans namely the **Institutional Plan**, **Zoning Plan**, **Strategic Plan** and **Financial Plan**. **Figure 8** shows the plans and their components.



## 4.1 INSTITUTIONAL PLAN

The Institutional Plan provides a framework for the institutional arrangements at the Dam. The proposed management systems include four (4) committees namely; Dam Management Committee (DMC), Operations Management Committee (OMC); Joint Water Commission (JWC) and National Project Steering Committee (NPSC).

The management authorities appointed by the Department at the Dam, also form part of the institutional structure.

## 4.1.1 Implementing Agency (IA)

The Implementing Agency (IA) is an institution that implements a programme or project on behalf of DWS.

According to DWS, the minimum requirements of an IA include the following:

- An IA can be a government entity or a public-sector body, identified by the DWS;
- IA must have the best interest of water resource and the community at large; and
- IA must be willing to work with the DWS and other users of the water resource.

The IA shall facilitate the implementation of programmes or action projects identified in the RMP for Lake Matsamo. The IA and DWS will sign a Memorandum of Agreement (MOA), which is a legal binding document that outlines the roles and responsibilities and conditions to be followed by both parties when entering into agreement(s) and/or when in terms of managing the Dam/ water resource for recreational use.

Some of the functions/ responsibilities of the IA include:

- Management of public access area;
- Management of recreational and tourism related activities;
- Management of agreements entered between DWS and third parties;

- Management of incident management system;
- Management of community skills and training programmes;
- Management of commercial activities (in line with Treasury Requirements); and
- Management of AtoN and demarcation markers.

## 4.1.2 Dam Management Committee (DMC)

The DMC comprises of user groups representatives that are interested or affected by the Dam and will assist in raising and addressing issues relating to the Dam. Any unresolved issues relating to the Dam are escalated to OMC (described in detailed in **4.1.3**). The DMC is required to meet quarterly.

The functions of the DMC include the following (amongst others):

- To give support to Implementing Agency (IA);
- To assess commercial opportunities at the Dam;
- Seeking resolution for general management issues;
- Monitoring the practical implementation of the RMP and BP;
- Reviewing the feedback received from I&APs;
- Operational management of recreational activities, such as ensuring that the floating AtoN and demarcation markers are in place and setting times for use of the Dam;
- Conveying the management objectives and decisions pertaining to the Dam to the relevant stakeholders; and
- Management of the incident management system and wash bays.

**Figure 9** shows the proposed parties to form part of the DMC for Lake Matsamo



Figure 9: Proposed DMC

## Management Tools:

The DMC will have number of management tools which will enable proper management of the Dam in line with legislative requirements. Some of the management tools includes the *Terms of Reference*.

Terms of Reference (ToR) defines the purpose and structure of the DMC and its management aspect for the implementation of the RMP. The management aspects that will be guided by the ToR includes:

- Roles and responsibility of chairperson;
- Roles and responsibilities of an IA;
- Roles and responsibilities of members;
- Minutes and attendance requirements;
- Reporting requirements;
- Management of agreements;
- Management of access objectives;
- Management of development targets;
- Management of water quality monitoring;
- Management of the control of aquatic invasive species;
- Management of development pressure;
- Management of incident management system and wash bays; and
- Management of AtoN and demarcation markers.

## 4.1.3 Agreements and Permits

The purpose of agreements is to ensure proper use of the Dam in line with the RMP requirements and the relevant acts and regulations.

The applicable agreements for the implementation of RMP are as follows:

## Memorandum of Agreement (MOA)<sup>2</sup>:

MOA is a legally binding document that outlines the roles, responsibilities and conditions to be followed for the management of the water resource for recreational use. An MOA will be signed in an event where the DWS is tasking another organization with its function of managing the Dam for recreational purposes.

## Safety of Navigation Agreements:

The purpose of this agreement is to allow access of boating vessel to government waterworks. This agreement to be concluded between SAMSA, the DWS and other relevant parties or bodies to allow them to:

- Exhibit the relevant AtoN; and
- Establish or deploy the relevant fixed and/or floating AtoN.

## Access Agreements:

All access points to the Dam and surrounding State Land must be authorised. Accessing the Dam through unauthorised access points is an illegal activity unless a formal agreement with the DWS is concluded. Therefore, a formal agreement with DWS will be required for all adjacent landowners and recreational clubs that have direct access to the Dam and surrounding State Land.

A formal agreement on building, management and maintenance of the wash bay is necessary between the DWS and DEA. A wash bay must be built on State Property as part of the Cooperative Inland Waterways Safety Programme (CIWSP).

## **Event Applications:**

All events at the Dam and surrounding state land must be managed through an event application process. The events application will be submitted to DWS for approval through the IA. These applications must follow a specific template and will include amongst others the following:

- Number of participants;
- Emergency Response Plan;
- Advertising and branding (will need to be in line with DWS communication requirements); and

<sup>&</sup>lt;sup>2</sup> The Department of the Water and Sanitation reserves the right to appoint the Implementing Agency at their own discretion.

• Access points to be used.

Furthermore, all events must meet the requirements of the Safety at Sports and Recreation Act, 2010 (Act No. 2 of 2010).

## **National Affiliations:**

All recreational clubs (i.e canoeing and fishing) must be affiliated to a South African Sports Confederation and Olympic Committee (SASCOC) affiliated organisation.

# 4.1.4 Operations Management Committee (OMC)

There is an existing Chief Directorate: Infrastructure Operations Management Committee (CD: IO MANCO) within the DWS IBOM which comprises of directors of the NWRI's four (4) operations (Northern, Southern, Eastern and Central) and is chaired by the Chief Director: Infrastructure Operations within the IBOMI as illustrated in **Figure 10**.

The committee should meet quarterly discussing matters relating to GWWs on their meetings, however an RMP should form part of the agenda item. In instances where issues cannot be addressed in this structure depending on the nature of the issues (within or outside the scope of the RMP), it would either be escalated to JWC or NPSC. This is to allow DWS an opportunity to intervene if of the view that such issues can be addressed but if issues are outside DWS mandate then can be escalated accordingly



Figure 10: Existing CD: IO MANCO

## 4.1.5 Joint Water Commission (JWC)

The Joint Water Commission Treaty is essentially a conversion of the Joint Permanent Technical Committee (JPTC) between Swaziland and South Africa to a Joint Water Commission (JWC).

The objective and functions of the Commission is to act as a technical advisor to the Parties on all matters relating to the development and utilisation of water resources and other functions pertaining to the development and responsible for overall water governance in the Komati Basin between Swaziland and South Africa. More so, JWC is responsible for advising on policy related matters

utilisation of such resources. The JWC is also

The Komati Basin Water Authority is a transboundary institution responsible for the management and operation of two dams namely Maguga Dam in the Kingdom of Swaziland and Lake Matsamo in the Republic of South Africa,

which were built under a treaty signed by the two countries in 1992.

Therefore if there are any issues that are outside the scope of operation and management, will be escalated to JWC through KOBWA board, once they feel an issue was thoroughly dealt with at a board level it is referred to the JWC. The JWC will then assess the matter so that it complies with the treaty. Due to different legislation in both countries, there are different ways on how to handle the recreational issues. The roles and responsibilities of these institutions and how they interact with each other in the management of the Komati River Basin are illustrated in **Figure 11**.



Figure 11: Joint Water Commission

# 4.1.6 National Project Steering Committee (NPSC)

The NPSC is formed by the DWS and is made up of representatives from national government departments and their agencies (also referred to as planning partners) that have direct and/or indirect mandate in managing the water resource. The function of the NPSC is to provide guidance and support to DWS on recreational water use in terms of their respective mandates with the aim of achieving sustainable utilisation of the Dam. The NPSC shall meet twice a year. **Figure 12** shows government departments (also referred to as planning partners and/ or authorities) and agencies that will form part of the NPSC:



Figure 12: Proposed NPSC

## 4.2 ZONING PLAN

The purpose of the zoning plan is to demarcate permissible and non-permissible activities on the water surface and the shoreline to avoid conflict amongst users, uncontrolled development and to protect the water resource. In order to determine the extent of possible recreational use on the water surface, the carrying capacity of the water surface was calculated.

The proposed zoning plan integrates conservation, recreation and development, whilst not retarding the primary functions of the Dam. This RMP and/ or zonation does not legitimise nor does it authorise any existing built structures, infrastructure or services within the Government Water Work (in both the water surface and shoreline).

#### 4.2.1 Water Surface Zoning

The water surface zoning provides guidance on permissible and non-permissible recreational activities on the water surface taking into account the biophysical factors of the Dam. This zonation map is a desktop exercise and must not be used as navigational purposes. DWS and SAMSA will update the zonation map to be used for navigational purposes. The water surface is zoned as follows:

#### Safety and Security Zone:

This zone covers a minimum area of 100m from the wall and outlet works indicated by demarcation markers and AtoN. This area is reserved for the DWS management purposes.

Management of this zone is aimed at protecting the Dam wall and outlet works, as well as to ensure the safety of the public. This is a no-go zone to the public unless authorised.

#### Conservation Zone:

The aim of this zone is to conserve and protect sensitive aquatic habitation at the inlet(s) of the

Dam. Access to this area is generally not allowed due to the following:

- The areas intercept sediments and nutrients/pollutants which pose safety risks to the public due to muddy clay, and
- They are used by aquatic birds and fish species as habitat, refuge and breeding areas.

#### Low Impact Activity Zone:

This zone acts as a buffer between high impact activity zones and conservation zones. The low impact activity zone allows for low intensity activities, i.e. activities associated with little or no wake, such as wind surfing, kayaking, swimming, rowing, sailing, paddle boating, float tubes, canoeing, angling, yachting, aquaculture<sup>3</sup> and small-scale fisheries.

## High Impact Activity Zone:

This zone is demarcated where the Dam is at its deepest level. It caters for high impact activities associated with high speed, wake and noise activities such as motorised boating, house-boating, water-skiing, and para-sailing.

**Table 10** and **Figure 13** shows the proposedwater surface zoning for Lake Matsamo

<sup>&</sup>lt;sup>3</sup> The final location of the aquaculture will be dependent on the outcome of a feasibility study.

2	Zone Description	Permissible Activities	Non Permissible Activities	Recommendation
•	Safety and Security Zone.	<ul> <li>Alien invasive species clearing</li> <li>Management of Dam infrastructure</li> <li>Management and maintenance activities by the DWS and authorised personnel</li> </ul>	Public access	<ul> <li>Area should be demarcated by demarcation makers and AtoN.</li> </ul>
•	Conservation Zones.	• None	<ul> <li>Public activities (to prevent aquatic habitats disturbance)</li> </ul>	<ul> <li>Area should be demarcated by demarcation makers and AtoN.</li> <li>Strict management and control of these areas, especially with regards to illegal fishing and dumping.</li> </ul>
•	Low Impact Activity Zone.	<ul> <li>Angling</li> <li>Rowing</li> <li>Canoeing</li> <li>slipway</li> </ul>	<ul> <li>Motorised boating</li> <li>Water skiing</li> <li>House boats</li> <li>Para-sailing</li> <li>Kite-surfing</li> <li>Jet Skis</li> </ul>	<ul> <li>Area should be demarcated by demarcation makers and AtoN.</li> <li>No private slipways/ floating jetties to be built without approval from the DWS.</li> <li>Launching and mooring of vessels should take place at this zone.</li> <li>Motorised boats are allowed to launch at this zone but no water wake should be formed until the designated area for motorised recreational boating is reached.</li> </ul>
•	High Impact Activity Zone	<ul> <li>Motorised boating</li> <li>Water Skiing</li> <li>Aquaculture facilities</li> </ul>	<ul> <li>Swimming</li> <li>Angling</li> <li>Rowing</li> <li>Paddle boating</li> <li>Float tubes</li> <li>Yachting</li> <li>Canoeing</li> </ul>	<ul> <li>Area should be demarcated by demarcation makers and AtoN.</li> <li>All activities within the high impact zone shall take place beyond 70m from the shoreline.</li> <li>Activities within this zone must be evaluated to determine their impact on the water resources and other Dam users before they are allowed into the Dam.</li> </ul>

Table 10: Proposed Water Surface Zoning Description



Figure 13: Proposed Water Surface Zoning

#### 4.2.2 Shoreline Zoning<sup>4</sup>

In addition to the water surface zoning, an integral part of the RMP is also shoreline zoning, which provides guidance on what recreational activities (if any) are permissible or not permissible on the land adjacent to the Dam (DWS purchased boundary). The shoreline zones include:

# <u>Safety and Security Zone (Dam wall and associated DWS infrastructure):</u>

This zone is applicable to the area surrounding the Dam wall and the outlet works. The extent of this zone is determined by the DWS and shall not be less than 100m from the Dam wall and downstream. This area is reserved for DWS management purposes.

Management of this zone is aimed at protecting the Dam wall and outlet works, as well as ensuring the safety of the public and surrounding areas. This is a no-go zone to the public unless authorised.

#### **Conservation / Low Density Activity Zone:**

This zone consists of ecologically sensitive areas and areas with high biodiversity. It also includes the area around the inlets of the Dam. Access to this area is limited to low impact activities such as hiking, and bird watching. This area is demarcated to prevent ecological Damage due to high density development activities.

#### Medium Density Activity Zone:

This zone is demarcated for small-scale activities such as day visiting, picnic areas, shoreline fishing, camping (tent and caravan), braai facilities, swimming pools, ablution facilities and infrastructure for services.

#### High Density Activity Zone:

This zone is demarcated for large-scale activities including chalets, recreational club houses, infrastructure for services, and land based aquaculture.

## Community Resource Zone:

This zone is for the sole beneficiation of the local communities in ensuring that their livelihoods are maintained and improved. Activities include subsistence fishing, livestock watering points, and small-scale community gardens.

**Table 11** and **Figure 14** shows the proposedshoreline zoning for Lake Matsamo.

<sup>&</sup>lt;sup>4</sup> Permanent structures within the purchased boundary are not allowed. All developments should be outside 1:100 year floodline.

Zone Description	Permissible Activities	Non-permissible Activities	Recommendation
<ul> <li>Safety and</li> <li>Security Zone.</li> <li>•</li> </ul>	Fire management Alien invasive species clearing Management of Dam infrastructure Management and maintenance activities by DWS and authorised personnel	Unauthorised public access	<ul> <li>A minimum area of 100m wide downstream of the Dam wall should be demarcated preventing public access and use.</li> </ul>
<ul> <li>Conservation/</li> <li>Low Density</li> <li>Activity Zone</li> <li></li> </ul>	Conservation management activities Bird watching	Development	<ul> <li>Permissible activities may only be permitted provided that they are approved by the relevant Authorities and they are conduct as per the relevant legislations.</li> <li>These zones should control access to ecological sensitive areas.</li> </ul>
Medium Density     Activity Zone	Shoreline fishingDay visitorsPicnic areasBraai facilitiesCamping site (tents and caravans)Swimming poolsAblution facilities and infrastructure for services	<ul> <li>Accommodation facilities such as</li> <li>Chalets</li> <li>Recreational club houses</li> <li>Permanent structures</li> </ul>	<ul> <li>The management of this area should follow PPP process in terms of the National Treasury.</li> <li>Requirements of the NWA and NEMA must be taken into account in all recreational activities.</li> <li>All developments must be approved by the DWS.</li> <li>No private slipways to be built without approval from DWS.</li> </ul>
<ul> <li>High Density</li> <li>Activity Zone.</li> <li>•</li> <li>•</li> <li>•</li> </ul>	Recreational clubs Chalets Swimming pool Ablution facilities Infrastructure for services	Permanent Structures	<ul> <li>The management of this area should follow PPP process in terms of the National Treasury.</li> <li>Requirements of the NWA and NEMA must be taken into account in all recreational activities.</li> <li>Noise level to be kept at a minimum.</li> <li>All developments must be approved by the DWS.</li> <li>No private slipways to be built without approval from the DWS.</li> </ul>
Community     Zone	Subsistence fishing; and	<ul><li>Chalets;</li><li>Recreational club houses;</li></ul>	• No private slipways to be built without approval from the DWS.

## Table 11: Proposed Shoreline Zoning Description

Zone Description	Permissible Activities			Non-permissible Activities		Recommendation	
	<ul> <li>Lives poin</li> </ul>	tock watering ts.	• •	Braai facilities; Camping and picnicking; and Permanent Structures.	•	Requirements of the NWA must be taken into account in all recreational activities.	



Figure 14: Proposed Shoreline Zoning Map



Figure 15: Proposed Overall Zoning Map

## 4.2.3 Carrying Capacity

The carrying capacity provides a guideline for recreation to ensure that the Dam is safe, that users do not feel crowded and that they enjoy the use of the Dam.

The Methodology for Carrying Capacity Assessment for the use of water for Recreational purposes was used as a guideline to determine the maximum level of visitor/recreational use and related infrastructure that the water resource and surrounding area can accommodate (DWAF, 2003).

There are three levels of carrying capacity:

- Physical Carrying Capacity (PCC) this is the maximum number of users that can physically fit onto the water <u>resource</u> <u>over a particular time;</u>
- Real Carrying Capacity (RCC) this is the maximum permissible number of users that can use the resource once corrective factors that are unique to the Dam are taken into account on the PCC; and
- Effective (or permissible) Carrying Capacity (ECC) – this is the number of visitors that can use the resource, given the management capacity available.

Each level constitutes a corrected capacity level of the preceding level. The PCC is always greater than the RCC, and the RCC is greater than the ECC, i.e.: **PCC > RCC and RCC \geq ECC.** 

The process of establishing the carrying capacity is normally determined through the following tasks:

- Analysis of recreation and water resource management policies;
- Analysis of objectives of the water resource;
- Analysis of current recreational water use;
- Definition, strengthening or modification of policies regarding recreational water use management;

- Identification of factors influencing recreational water use; and
- Determination of the recreational water use carrying capacity.

## **Physical Carrying Capacity (PCC)**

## **PCC** = $A \times U/a \times Rf$

## Where:

A = available surface area for public use
U/a = area required per user
Rf = rotation factor (number of visits/day)

**Table 12** shows the type of craft and therequired area for use.

Table 12: Ar	ea required	per user
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Craft	U/A (ha/craft)
Rowing	0.4
Canoeing	0.3
Fishing	3.0
Average	1.2

Based on the **Table 9**, the average hectare per user is 1.2 ha ( $12\ 000\ m^2$ ), the value of 3.0 ha ( $30\ 000\ m^2$ ) can be acceptable area per user. This has been chosen in order to ensure that the Dam is not overcrowded, as such impacting on the sense of the area.

The available surface area for Lake Matsamo is 1870 **ha** whereas U/a is assumed to be the average which was calculated as 1 craft/3 ha. And again the rotation factor (*Rf*) is assumed as 1 visit per day.

Therefore: **PCC** = A  $\div$  U/a x Rf =1870 x 1/3 x 1 = 623 crafts on the Dam

## Real Carrying Capacity (RCC)

**RCC** = PCC x (100 – Cf1)% x (100 – Cf2)% x ... (100 – Cfn)%

## Where:

**Cf** = a corrective factor expressed as a percentage.

The RCC takes into account factors that limit recreation use (craft based) of the Dam. For Lake Matsamo, these factors includes sensitive areas, such as conservation areas (1.7 ha) as well as aspects regarding the safe operation and management of the Dam (0.1432 ha).

These factors accounts for 169 ha, that is 9% of the area that is not available for recreational use.

Therefore: RCC = PCC x (100 - cf1)% x (100 - cf1)% x (100 - cf1)%

= 616 crafts

## Effective Carrying Capacity (ECC)

**ECC** = [Infrastructure Capacity x Management Capacity] x 100/ RCC

Given that there is no adequate recreational infrastructure facilities and no management capacity at the Dam, the ECC is currently 0. Once a proposed recreational Institutional Structure and infrastructure capacity is in place, the ECC can be recalculated to verify if the RCC can be possible.

## 4.3 STRATEGIC PLAN

The strategic plan is informed by the objectives identified by stakeholders and through research on potential opportunities at the Dam. The objectives are broken down into management fields which are listed below in a format offering ease of reference:

- Objective (What is envisaged for the Dam?)
- Priority (How significant is the objective?)
- Motivation (Why is it important to achieve this?)
- Management support (Who will be involved?)
- Guidelines and Policies (How to get there?)
- Action Projects (How to achieve this?).
- Monitoring Guideline (How will the action projects be monitored?)

In **Tables 13** to **15**, the strategic plan on how to achieve the objectives identified for the Dam is outlined.

Objective		Motivation & Strategy		Action Plans	Management Support
(What do we want)		(Why do we want to achieve this)		(How do we achieve this)	(Who will be involved)
<ul> <li>Clean Environment</li> <li>To keep the Dam and surrounding state land clean.</li> </ul>	•	The Environment surrounding the Dam is polluted with domestic solid waste from the nearby communities.	•	Regular clean the environment around the Dam. Establish a dumping site in the vicinity. Monitor the area to avoid people from dumping domestic waste on the environment surrounding the Dam.	<ul> <li>DEA (Working for Water)</li> <li>DPW</li> <li>KOBWA</li> <li>NLM</li> </ul>
			•	Introduce environmental awareness education.	
<ul> <li>Water Quality</li> <li>Improve water quality by monitoring and assessing the main pollution sources.</li> </ul>	•	Water quality is threatened by sewage from homesteads near the river feeding into the Dam.	•	Identify and monitor pollution sources within the catchment area. Enforce relevant environmental legislations (e.g. NWA and NEMA) at the Dam. Inspect the boats before launching to avoid pollution, for example, oil spills.	<ul> <li>IUCMA</li> <li>DWS</li> <li>DEA</li> <li>KOBWA</li> <li>NLM.</li> </ul>
<ul> <li>Safety of Navigation:</li> <li>Improved safety of navigation.</li> </ul>	•	There are no standardised and harmonised AtoN and demarcation markers available at the Dam.	•	Implement standardised and harmonised AtoN and demarcation markers as directed by SAMSA to improve safety of navigation at the Dam.	<ul> <li>DWS to facilitate the process</li> <li>Agreements between SAMSA, DWS, LAAPs and other relevant parties to be concluded</li> <li>IA (KOBWA) with the support of the DMC</li> </ul>

#### Table 13: Strategic Plan for KPA 1: Resource Management

#### Table 14: Strategic Plan for KPA 2: Resource Utilisation

Objective (What do we want)		Motivation (Why do we want to achieve this)		Action Projects (How do we achieve this)	M (V	lanagement Support Vho will be involved)
<ul> <li>Sustainable fishing</li> <li>To promote sustainable harvesting of fish at the Dam.</li> </ul>	•	People are using gill nets to harvest fish, which is a bad method of harvesting fish for subsistence.	•	Introduce fishing licences and prohibit the use of gill nets and educate people on fishing methods that are safe and sustainable.	•	MDARDLEA DWS KOBWA
<ul> <li>Aquaculture</li> <li>Introduce aquaculture at the Dam.</li> </ul>	•	Most of the people living in the communities near the Dam are not working, therefore they practice unlawful fishing method using gill nets, which is a threat to their lives	•	Conduct a feasibility study to determine the viability of aquaculture project, as well as to demarcate suitable areas for such project at the Dam.	•	MDARDLEA DWS KOBWA NLM

Objective	Motivation	Action Projects	Management Support
(What do we want)	(Why do we want to achieve this)	(How do we achieve this)	(Who will be involved)
	through drowning and attack by crocodiles in the Dam.		
<ul> <li>Access Control</li> <li>To enable broad public enjoyment of the water resource and provide adequate controlled authorized access and associated infrastructure since there is only one access area for public.</li> </ul>	<ul> <li>Most people indicated that they don't use the Dam.</li> </ul>	<ul> <li>Public access points to be developed within the purchased boundary.</li> <li>The entry fees need to be reasonable to ensure that the Dam remains accessible and affordable to the local community.</li> </ul>	<ul> <li>DWS</li> <li>KOBWA</li> <li>DMC</li> </ul>

Table 15: Strategic Plan for KPA 3: Benefit Flow Management

Objective	Motivation	Action Projects	Management Support
(What do we want)	(Why do we want to achieve this)	(How do we achieve this)	(Who will be involved)
Enhancing Recreational Activities • To introduce more recreational activities within DWS purchase land such as swimming pool.	• The Dam is under developed hence there is need to add more recreational facilities.	<ul> <li>KOBWA will, depending on the viability and demand, introduce additional recreational and tourism related activities like swimming pool.</li> </ul>	• KOBWA • DWS
Community Participation and Beneficiation • To uplift the local economy and increase benefit flows to the surrounding communities through community empowerment.	<ul> <li>The tourism sector has been identified as a vehicle for skills development and job creation. It is imperative that the local communities derive benefits from recreational activities conducted at the Dam.</li> <li>This will assist in ensuring that the Dam is utilised in a sustainable manner and in a way that fulfills the interests of the community.</li> </ul>	<ul> <li>Implement skills development programmes where opportunities exist.</li> <li>Institute a comprehensive alien invasive plant education programme in pilot schools in the region, subsequent to be extended to all the schools.</li> <li>Implement of environmental awareness programmes for the local communities and ensure that they are always updated with environmental information.</li> <li>Educate the community on how to utilise the Dam for other recreational activities besides fishing. This will assist in terms of uplifting the surrounding local community.</li> <li>First preference to be given to the local community members if any job opportunities arise.</li> </ul>	<ul> <li>DWS</li> <li>KOBWA</li> <li>Sector Education and Training Authority (SETA)</li> <li>NLM</li> </ul>
Tourism • To make the Dam a tourist attraction centre.	• The Dam is situated in two countries, and also close to Mozambique. Therefore it is easily accessible by people from three (3) countries i.e. Swaziland, Mozambique and South Africa.	• The NLM has to incorporate the Dam on its Development Plans because it has a potential in tourism.	• KOBWA • DMC • NLM
Recreational Institutional Structure • To ensure that a suitable institutional structure with the appropriate powers and delegations is in place to effectively	• The existing structure, due to unclear, uncertain roles and responsibilities is not managing the Dam as expected, which led to poor management of the Dam.	<ul> <li>Put in place recreational institutional structure that is representative of all Stakeholders.</li> <li>The roles and responsibilities of the role players must be clearly defined and understood in the MOA, which may be entered into between the Department of Water and Sanitation and the Implementing agency</li> </ul>	• KOBWA • DWS

Objective	Motivation	Action Projects	Management Support
(What do we want)	(Why do we want to achieve this)	(How do we achieve this)	(Who will be involved)
manage the recreational		• As part of the RMP process, KOBWA to be appointed	
use of the water		as an IA.	
resource in accordance			
with this RMP.			

## 4.4 FINANCIAL PLAN

A Financial Plan provides guidance on how revenue can be generated through recreational use of the Dam and how it should be used to ensure community participation and beneficiation, as well as to ensure the sustained and improved management of the Dam.

The proposed IA (KOBWA) for this Dam can explore the various streams of generating revenue as presented below:

## 4.4.1 Potential Sources of Revenue

## **Access Fees:**

Potential revenue can be generated from access fees paid by visitors. A standard access fee can be charged per head, differentiated on age. The determination of access fees should take cognisance of the socio-economic profile of the area so as to cater for the local poor. The access fees cannot be used for rent seeking.

Over and above access fees, additional fees can also be charged which includes:

## • Parking Fees:

Motorists can be charged extra fees for parking.

## **Event and Service Based Fees:**

These are extra fees that can be charged for the following:

- Fishing (sports);
- Private boating;
- Functions (festivals, wedding, conference and cultural activities); and
- Caravan/ outdoor camping.

It is important that the identified events above be established at the Dam for the realisation of the identified fees.

## **Rental Charges:**

Potential source of revenue can also be explored on rental fees but not limited to the following:

## • Boat Clubs:

Boat clubs operating from the Dam should pay the leasing fees. The terms of payment will be stipulated in the lease agreement between DWS through the IA (leaser) and the leasee.

There is potential rental fees that can be generated from hosting music festivals.

## 4.4.2 Target Market

To realise the above mentioned revenue the following will be the target:

- Local communities;
- Farmers;
- Churches;
- Schools;
- Institutions;
- Group tourists; and
- Government Departments.

In light of the above mentioned, there should be sources of capital for initial investment for the upgrading of existing infrastructures as well as setting up of new facilities. The proposed IA can consider the following as a source of capital.

## 4.4.3 Co-Funding

The project can leverage its existence in the local Integrated Development Plan (IDP) to harness funding. Co-funding is also viable where an IA is appointed to manage recreational use of the Dam, and the examples of projects of similar nature which were successfully co-funded are: Roodeplaat Dam Nature Reserve and Nonoti Beach Resort Development (Coastal Marine Tourism [CMT] Project) the details which are attached as **Appendix F.** 

DWS and/or other relevant Government Departments can fund the IA, to supplement operational costs and other scenarios by co-funding identified objectives that are related to their mandate. It is recommended that KOBWA be appointed as an IA to manage recreational use of the Dam on behalf of DWS and examples of the co-funders are:

- The Department of Tourism;
- Industrial Development Corporation (IDC); and
- InvestSA (One Stop Shop).

More information on the co-funders is attached in **Appendix G.** 

A more detailed Financial Plan (FP) is contained in the Business Plan (refer to **Appendix H**), which will facilitate the implementation of the RMP by providing an implementation program and cost estimates for all possible economic recreational activities.

The information acquired from the RMP will be used to produce the Business Plan (BP) based on the action projects for each objective as stipulated under the Strategic Plan. However, many of the identified objectives are not of commercial nature and as such these noneconomic objectives will not feature in the BP. The BP provides a good description of possible economic recreational activities and the methods that can be used or enhanced to achieve the ultimate vision and the key objectives of the Lake Matsamo RMP. It also describes the financial management and operational requirements to implement the objectives of the RMP.

## **CONCLUSION AND WAYFORWARD**

This RMP comprehensively covered *inter alia* the environmental analysis (biophysical, built environment and socio-economic) of the Dam, RMP data analysis (encumbrance survey, objective identification and research/ information generation) and the integrated resource management planning which consists of the institutional plan, zoning plan, strategic plan and the financial plan.

## **Key Challenges:**

The following key challenges were identified for Lake Matsamo:

- Lack of solid waste management around the Dam (i.e. disposable nappies dumped into the upstream and e around the Dam);
- There is a small stream flowing from a sewage to the Dam, this poses a threat to the water quality in the Dam;
- There is a lack of environmental and tourism awareness for the community;
- The local community is not involved in the management and utilization of the Dam for recreational purpose, hence they are not benefiting from the Dam;
- Fixed and floating Aids to Navigation (AtoN) and demarcation markers are not in place;
- There is currently no specific incident management system in place to ensure that incidents are recorded and responded to in a co-ordinated manner;
- There are unlawful activities taking place at the Dam which include net fishing and sand mining;
- The Dam is not entirely fenced (i.e. at the inlets of the Dam). As a result, some of the community members have direct access to the Dam in an uncontrolled manner which leads to theft;
- As the Buffelspruit community is reportedly getting water of poor quality;
- It is alleged that KOBWA offices have been built on top of graves, and the remaining cemeteries have been fenced off in such a

way that the communities can no longer access them; and

• There are some historical issues.

## **Recommendations:**

This RMP recommends the implementation of the following immediate actions:

- Appoint KOBWA as an IA to manage recreational use of the Dam on behalf of DWS;
- Monitor the area to avoid people from dumping domestic waste on the environment surrounding the Dam;
- The boats must be inspected before launching to get rid of possible pollutants such as hydrocarbons;
- The NLM should identify the dam as a local development objective in terms of IDP, SDF or Tourism Master Plan;
- Removal of silt from the Dam in order to increase the water quantity;
- Develop waste management plan for the Dam and surrounding areas to prevent pollution;
- The entry fees need to be reasonable to ensure that the Dam remains accessible and affordable to the local community;
- Water quality reporting and monitoring;
- Local communities must be given first priority should any opportunity arise from the Dam e.g. tenders and job opportunities.
- Introduce business initiatives through lease agreements and PPP;
- Strengthening community participation and beneficiation (e.g. via Skill Development programmes);
- Put in place adequate access control measures, such as fencing, in order to ensure the safety of people and livestock; and
- Promotion of small-scale fishery at the Dam that contributes to transformation and equitable socio-economic benefit from inland fish resources.

#### **Review:**

According to the DWAF (2006), the RMP may be reviewed and updated every five (5) years to ensure that the management objectives are relevant and that management actions are continually improved. The BP needs to be updated annually. **Figure 16** illustrates the RMP and BP review framework.



Figure 16: RMP and BP Review Framework

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# **APPENDICES**

- APPENDIX A : STAKEHOLDER DATABASE REGISTER
- APPENDIX B : NEWSPAPER ADVERT
- APPENDIX C : FLYERS
- APPENDIX D : EMAILS
- APPENDIX E : BACKGROUND INFORMATION DOCUMENT (BID)
- APPENDIX F : EXAMPLES OF SUCCESSFULLY CO-FUNDED PROJECTS
- APPENDIX G : POTENTIAL CO-FUNDERS
- APPENDIX H : BUSINESS PLAN