Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

Resource Management Plan
HEYSHOPE (DRIEFONTEIN) DAM

REPORT – Volume 4 of 5 | **August 2017**

WATER IS LIFE - SANITATION IS DIGNITY

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

2030 NDP

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- Department of Water and Sanitation;
- Mkhondo Local Municipality;
- Ogenyaneni Traditional Council
- South African Maritime Safety Authority;
- South African Police Service (Water Wing- Middelburg); and
- The community members of Dirkiesdorp, Driefontein, Etsheni, Heyshope Farms, Kwa-Ngema, Nkosinathi and Saulmkhize.

Acknowledgement is also extended to all other Stakeholders who attended and participated in the Stakeholder engagements.

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Review Period	Month	Year				
Annual Review of Business Plan	December	2019[1]	2020	2021	2022	2023
Five (5) Yearly Review of RMP	December	2023				

[1] The implementation of the RMP and BP requires a year budget planning prior to operationalisation.

AMENDMENTS PAGE

Revision No	Description	Date
1	Draft RMP for DWS to Review	15/12/2016
2	Draft RMP for DWS to Review	28/02/2017
3	Final Draft RMP for DWS to Approve	12/05/2017
4	Final Draft RMP for DWS to Approve	28/06/2017
5	Final Draft RMP for Public Review	05/07/2017
6	Final RMP Report for DWS Sign off	16/08/2017

LIST OF ACRONYMS

AtoN	Aids to Navigation
BID	Background Information Document
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sport Sector, Education and Training Authority
CD: IO MANCO	Chief Director Infrastructure Operations: Management Committee
CIWSP	Co-operative Inland Waterways Safety Programme
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DHS	Department of Human Settlement
DoT	Department of Transport
DMC	Dam Management Committee
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DSR	Department of Sports and Recreation
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
ECC	Effective Carrying Capacity
EMF	Environmental Management Framework
FSL	Full Supply Level
GIAMA	Government Immovable Asset Management Act
GPS	Global Positioning System
GWWs	Government Waterworks
I&APs	Interested and Affected Parties
IA	Implementing Agency
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IRMP	Integrated Resource Management Plan
ISP	Internal Strategic Perspective
IUCMA	Inkomati-Usuthu Catchment Management Agency
KPA	Key Performance Area
LAAP	Local Accountable AtoN Parties
LED	Local Economic Development
MOA	Memorandum of Agreement
NDT	National Department of Tourism
MC	Management Capacity
NEMA	National Environmental Management Act
NEMPAA	National Environmental Management: Protected Areas Act
NPSC	National Project Steering Committee
NSA	National Strategic Asset
NT	National Treasury
NWA	National Water Act
OMC	Operations Management Committee
PCC	Physical Carrying Capacity
PP	Public Participation
PPP	Public Private Partnership
QDS	Quarter Degree Square
RCC	Real Carrying Capacity
RF	Rotation Factor

RMP	Resource Management Plan
SAMSA	South African Maritime Safety Authority
SAPS	South African Police Service
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
TP	Tourism Potential
SWOT	Strengths, Weaknesses, Opportunities, Threats
WfW	Working for Water
WMA	Water Management Area

EXECUTIVE SUMMARY

Mandate: The Department of Water and Sanitation (DWS), through the National Water Act, 1998 (Act No. 36 of 1998), is mandated to protect aquatic and associated ecosystems and their biological diversity. The Minister of Water and Sanitation, as the custodian of the nation's water resources must ensure that the Government Waterworks (GWWs), including Heyshope Dam, are protected, used, developed, managed and controlled in a sustainable manner, for the benefit of all. To assist the Minister in attaining the mandate, and to ensure that access to, and use of, the dam is equitable, the DWS initiated and commissioned the development of the Resource Management Plan (RMP) Heyshope Dam.

Purpose of the RMP: The RMP is a plan which aims to regulate access and the recreational utilisation of a water resource and the surrounding state land in ways which promote community participation and beneficiation, environmental conservation and to unlock socio-economic potential of the water resource.

According to DWAF (2006), the use and management of the GWWs for recreation purpose needs to be based on Integrated Resource Management Plan (IRMP) included within the RMP.

Location of the dam: Heyshope Dam, also known by local communities as Driefontein Dam, is an earth-fill type which impounds the Assegaai River with Ngulane, Anysspruit, Boesmanspruit, and Klein Assegaai Rivers as tributaries. It is located approximately 30 kilometers west of Mkhondo (Piet Retief) Town on the Klipspruit 502 IT farm. It is located in ward 1, 2, 3 and 18 of the Mkhondo Local Municipality (MLM) within Gert Sibande District Municipality (GSDM) in Mpumalanga Province, South Africa. Its GPS coordinates are: **31° 31' 25"S 26° 59' 55''E.**

Purpose of the dam: The primary purpose of Heyshope Dam is to provide raw water for irrigation, industrial and domestic use.

The dam also currently offers recreational activities such as power boating, canoeing and angling. There are also recreational facilities such as caravan parks, boat clubs and there is a residential development adjacent to the dam (Heyshope Lodgers).

Dam ownership and management: Heyshope Dam is owned and operated by DWS. There are five (5) access points to the dam, which are through the following recreational clubs: Ermelo Outdoor Activities, Western Bassmaster, Newcastle Bassmaster, Heyshope Lodgers and Heyshope Dam Boat Club.

There is currently no institutional structure to manage the recreational use of the dam. However, the structure has been proposed in the RMP. The recreational institutional structure is necessary for the effective governance of the Heyshope Dam for recreational purposes.

Stakeholder engagement: The success of the development and implementation of the RMP depends on the role players and their level of participation. It is thus recognized that different roles and responsibilities of the stakeholders [Authorities and Interested and Affected Parties (I&APs)], their relationship towards each other and the steps in the planning procedure are imperative in the successful development of the RMP. As such, proper consultation with the public was done in order to help in producing a credible RMP.

DWAF's Guidelines for Public Participation (2001) outlines three (3) broad phases for public participation namely the **Planning, Participation** and **Exit phase**.

During the **Planning phase** a site inspection was conducted and literature reviewed in order to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant authorities to ensure co-operative interests and support in the RMP project.

The **Participation phase** entailed three (3) important aspects, namely:

- Informing stakeholders about the RMP project;
- Meeting the stakeholders to present the RMP process; and
- Giving Feedback in the form of meeting minutes, follow-up emails, telephonic and direct communication.

During the **Exit phase**, a draft RMP was presented to the stakeholders for comment and inputs. The Exit phase entailed two (2) important aspects, namely:

- Ensuring that all goals, challenges, concerns, objectives and the vision of the dam are identified and documented in the RMP; and
- Officially ending the public participation process.

Identified objectives and vision: During the Authority and Public Meetings issues of concerns were raised from which common objectives were identified and a vision for the dam, for a period of 20 years, were formulated by the stakeholders.

- To improve and maintain the water quality of Heyshope Dam**;**
- To prevent the regeneration and spread of Alien Aquatic weeds in and around the dam to support recreational activities at the dam;
- To ensure that there is adequate public access to the dam, by establishing controlled access points and also develop recreational facilities at the dam to attract tourists;
- To promote public safety for local community and tourists when accessing the dam for recreational purposes;
- To promote sustainable harvesting of fish at the dam;
- To establish and market Heyshope Dam to become a major tourists attraction point in the Mpumalanga Province in order to uplift the local economy;
- To uplift the local economy by empowering the local community;
- To establish capacity building and training for youth within the local communities; and
- To establish an appropriate institutional structure which will effectively manage the recreational use of the water resource and the surrounding environment in accordance with the RMP. The appropriate powers and delegations must be clear.

A vision for the dam for a period of 20 years was formulated by stakeholders to be as follows:

"To ensure that Heyshope Dam becomes a tourist destination of choice by developing world class recreational facilities that will attract tourists, empower the local community, conserve the environment and uplift the socio-economic potential of the area".

The aforementioned objectives and vision are aimed at supporting the attainment of DWS's vision, mission and objectives.

Tourism Potential: The following were identified as some of the potential recreational developments at the Heyshope Dam that could enhance tourist attraction:

- Establishment of accommodation facilities such as guest houses, lodges, chalets,
- Establishment picnic sites with braai facilities, etc.
- Improvement of access roads.
- Introduction of aquaculture projects.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF HEYSHOPE DAM

Heyshope also known by local communities as Driefontein Dam is an earth-fill type which impounds the Assegaai River with Ngulane, Anysspruit, Boesmanspruit, and Klein Assegaai Rivers as tributaries. It is located approximately 30 kilometers west of Mkhondo (Piet Retief) Town on the farm Klipspruit 502 IT. It is located in ward 1, 2, 3 and 18 of the Mkhondo Local Municipality (MLM) within Gert Sibande District Municipality (GSDM) in Mpumalanga Province, South Africa. Its GPS coordinates are: **31° 31' 25"S 26° 59' 55''E.** (See **Figure 1** for Locality Map).

The dam is owned and operated by Department of Water and Sanitation (DWS). There is currently no formal institutional structure to manage the dam for recreational activities. The dam was completed in 1986 and its primary purpose is for domestic and industrial purposes.

Heyshope Dam falls under W51B Quaternary catchment under the Inkomati-Usuthu Water Management Area**.** See **Figure 2** for Hydrology Map and **Table 1** for Heyshope Dam Profile)

Table 1: Heyshope Dam profile

Heyshope Dam Profile	
Location	South Africa
Province	Mpumalanga
District Municipality	Gert Sibande District Municipality
Local Municipality	Mkhondo Local Municipality
Nearest Town	Mkhondo
Completion Date	1986
GPS Coordinates	31° 31' 25"S 26° 59' 55''E
Purpose	Domestic and Industrial Use
Owner	DWS
Water Management Area	Inkomati-Usuthu WMA
Quaternary Catchment	W51B
Catchment Area (km^2)	1120
River	Assegaai River
Capacity (m^3)	453 4400 000
Surface area (ha)	5 023.8
Wall Type	Earth-fill
Wall Height (m)	28.5
Length (m)	1030

Source: Department of Water Affairs (List of registered dams, 2015)

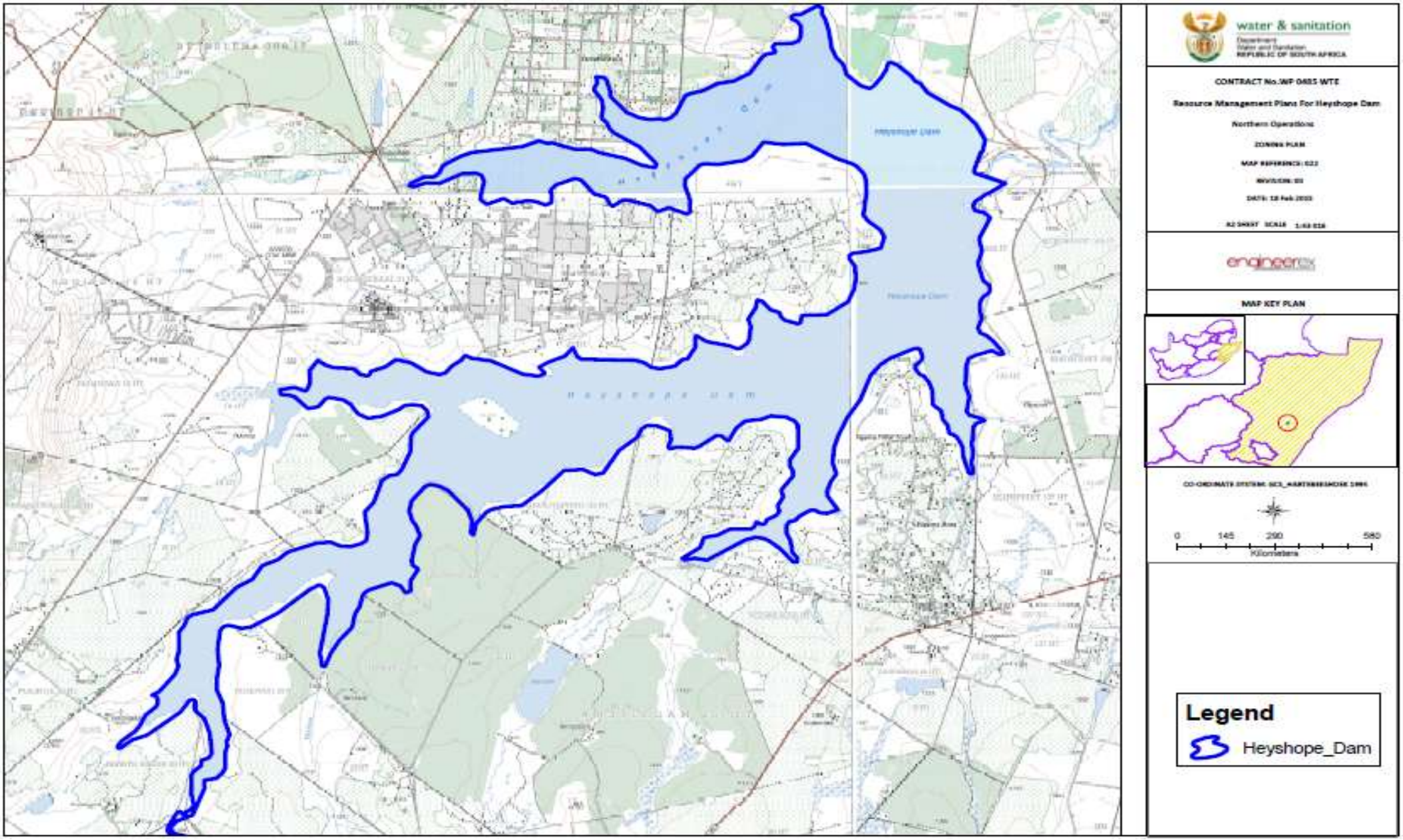

Figure 1: Locality Map for Heyshope Dam

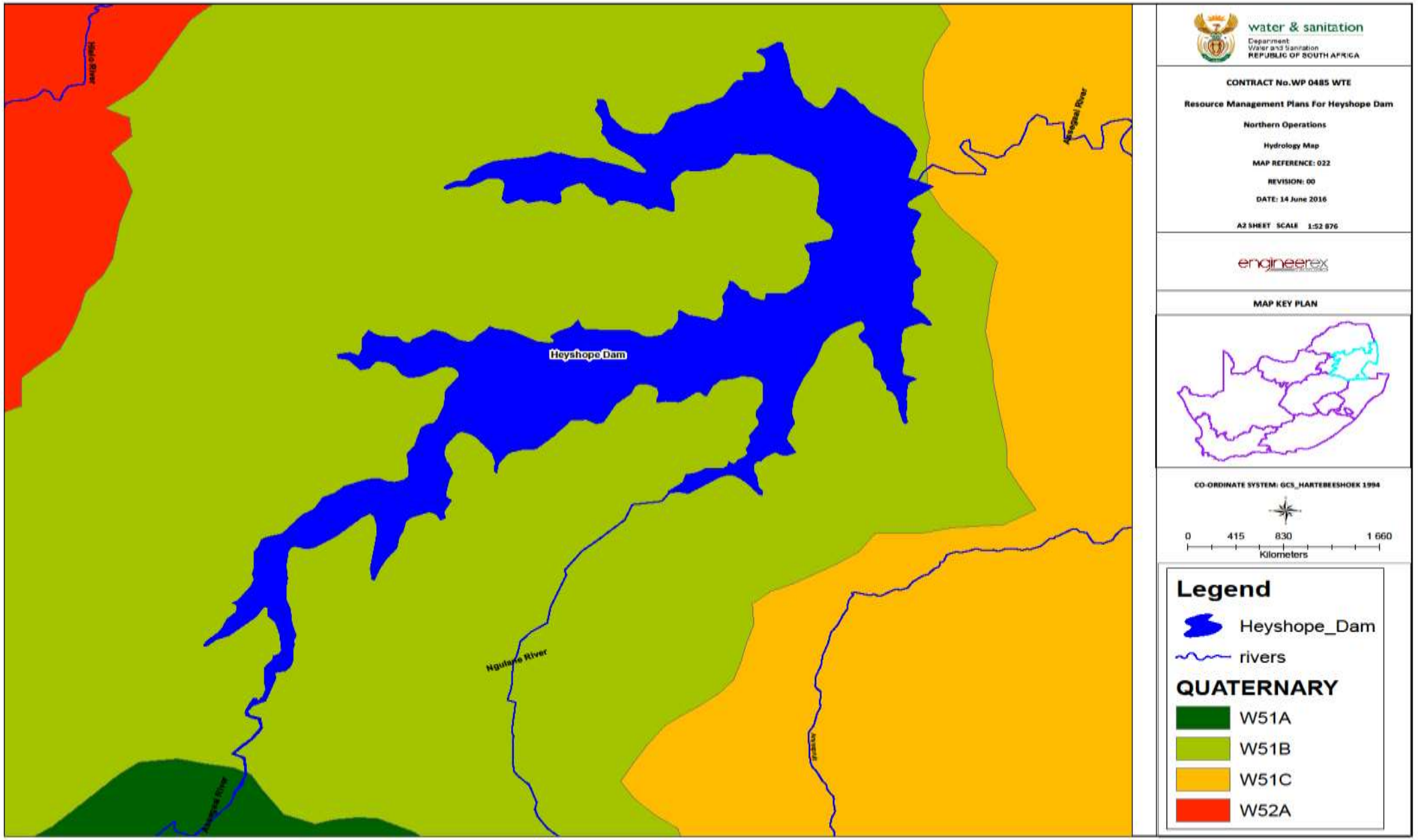

Figure 2: Hydrology Map for Heyshope Dam

1.2 BIO-PHYSICAL ENVIRONMENT

1.2.1 Climate

The climate here is mild, and generally warm and temperate. The summers are much rainier than the winters in Piet Retief. Precipitation is the lowest in June, with an average of 11 mm. The greatest amount of precipitation occurs in December, with an average of 159 mm.

At an average temperature of 20.1 °C, January is the hottest month of the year. The lowest average temperatures in the year occur in July, when it is around 11.4 °C. (Refer to **Figure 3** for the average temperatures and rainfall patterns for the area in 2016).

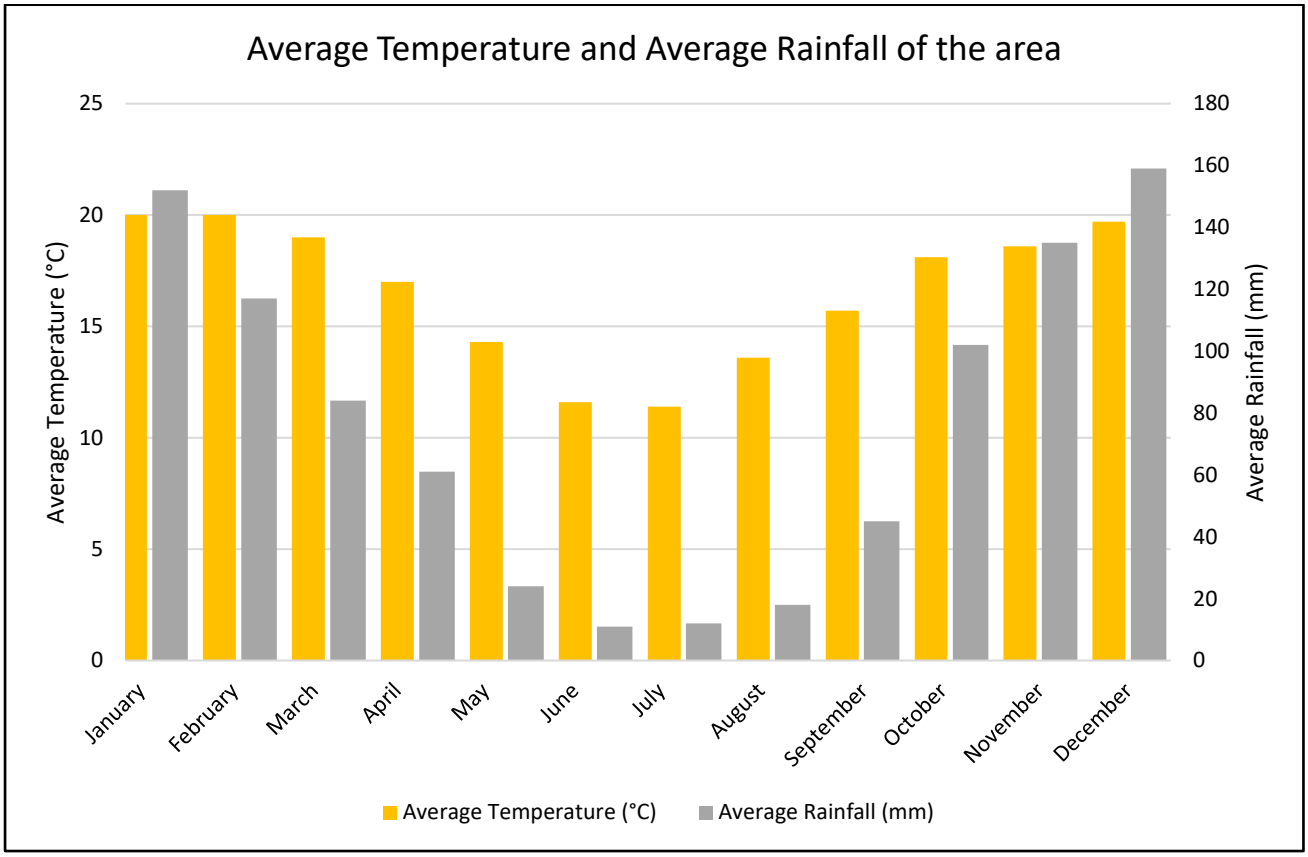

Figure 3: Average Temperature for Piet Retief

1.2.2 Flora

The dam falls within the Eastern Highveld Grassland which consist of short dense grassland dominated by the usual Highveld grass composition (aristida, Digitaria, Eragrostis, Themeda, Tristachya etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (Acacia caffra, Celtis africana, Diospyros lyciodes subsp lycioides, Parinari capensis, Protea caffra, p. welwitschii and Rhus magalismontanum) *(OLEMF, 2009).*

1.2.2.1 **Terrestrial Alien Invasive Vegetation**

Alien invasive plant species are non-indigenous plants introduced from other countries. Once they were introduced, they tend to spread beyond the area where they are desired. Alien plant species also outcompete the indigenous species wherever they germinate.

Alien invasive species have been categorized in the following categories: NEMBA 2004 (Act No. 10 of 2004), Alien and Invasive Species Regulations, 2014:

- **Category 1a:** Invader plants species which must be combatted or eradicated.
- **Category 1b:** Invader plants species which must be controlled.
- **Category 2:** Invader plants species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be.
- **Category 3:** Invader plants species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act.

The most common Terrestrial Alien Plants in South Africa are the Black Wattle (*Acacia Mearnsii)*, Mauritius Thorn (*Caesalpinia Decapetala)*, Guava (*Psidium Guajava)*, Castor Oil plant (*Ricinas Communis)*, Blue Gum (*Eucalyptus globulus)*, Pine Trees, Bug weed (*Solanum Mauritinum)*, Port Jackson willow (*Acacia Saligna*), weeping willow (*Salix Babylonica)*, Tick berry (*Lantana camara*, blackwood (*Dalbergia melanoxylon)* and the silver wattle (*Acacia dealbata*).

1.2.2.2 **Aquatic Weeds**

There are ten known aquatic weeds in South Africa. The known weeds include, among others, the Water Hyacinth (Eichhornia crassipes), Red water fern (Azolla filiculoides), Parrots feather (Myriophyllum aquaticum), Water lettuce (Pistia Stratiotes), etc.

During the research on the RMP process, no aquatic alien species were identified at Heyshope Dam.

There are different methods to control alien aquatic weeds at the dam which include:

- **Mechanical control** is the mowing or mechanical cutting of an invasive plant infestation to limit seed production.
- **Manual invasive plant control** is hand-pulling or digging of the aquatic weeds.
- **Biological control** often works best on large infestations, or infestations that are near the water.

The establishment of wash bays in dams where there are no alien aquatic weeds will prevent the introduction of these weeds into the dam from other dam.

1.2.3 Fauna

There are no crocodiles and hippopotamuses at the dam. However, the local communities believes that there is a water snake (mermaid) in the dam. According to bass fishing, 2016, there are three (3) fish species found at the dam which are largemouth bass, carp and yellow fish.

1.2.4 Geology and Soil

The dam is characterised by red and yellow sandy soil of the Ba and Bb land types (The Ba and Bb land types are characterised by undulating landscapes with a gentle slope. Red and/or yellow apedal soils dominate these land types) found on shales and sandstones of the Madzaringwe formation (karoo super group). Land types Bb (65%) and Ba (30%) (SRK Consulting, 2014). See attached (See **Figure 4** for Geology Map).

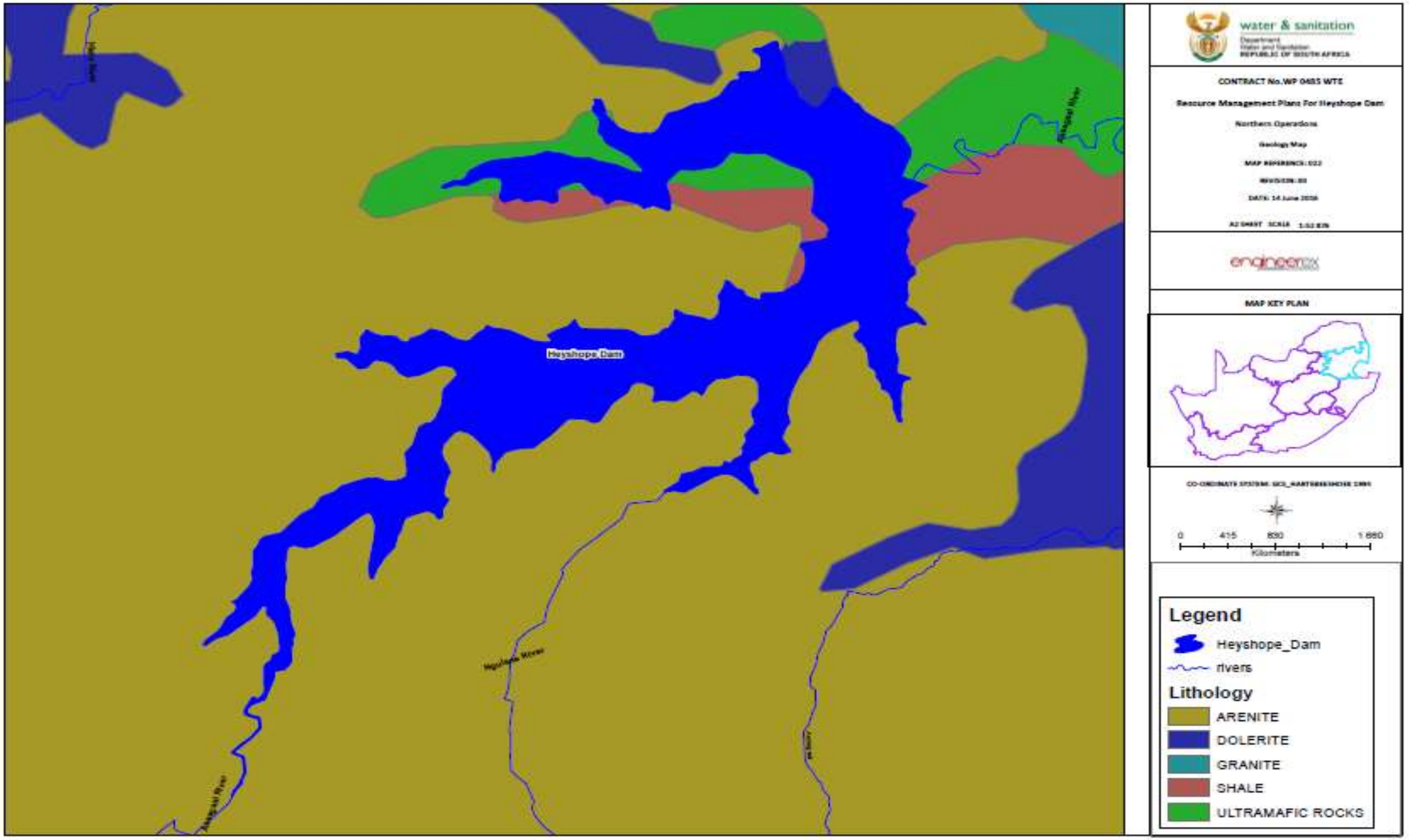

Figure 4: Geology Map for Heyshope Dam

1.2.5 Hydrology

1.2.5.1 Surface Water

The dam falls within the Inkomati-Usuthu Water Management Area (WMA), under W51B Quaternary Catchment. with a storage capacity of 453 4400 000 m^3 with the surface area of 5 023.8 ha and a wall height of 28.5 m. Heyshope Dam impounds Assegaai River with Ngulane, Anysspruit, Boesmanspruit, and Klein Assegaai Rivers as tributaries. According to DWS Hydrology (Data, Dams, Flood and Flows) website the Full Supply Capacity of Heyshope Dam was last updated in July 2016 when the storage capacity was showing a drop or decrease in water level from 90% to 80%. The drop in the water level is caused by the drought that South Africa is facing. The water level on the 27/09/2016 according to the data obtained from DWS, it was at 81.2%.

The dam is the biggest in Mpumalanga Province and number nine (9) in South Africa. Water from Heyshope Dam is transferred to Jericho, Morgenstond and Grootdraai Dams to supplement them during dry seasons. The Geelhoutboom pump station was strategically built solely for this purpose.

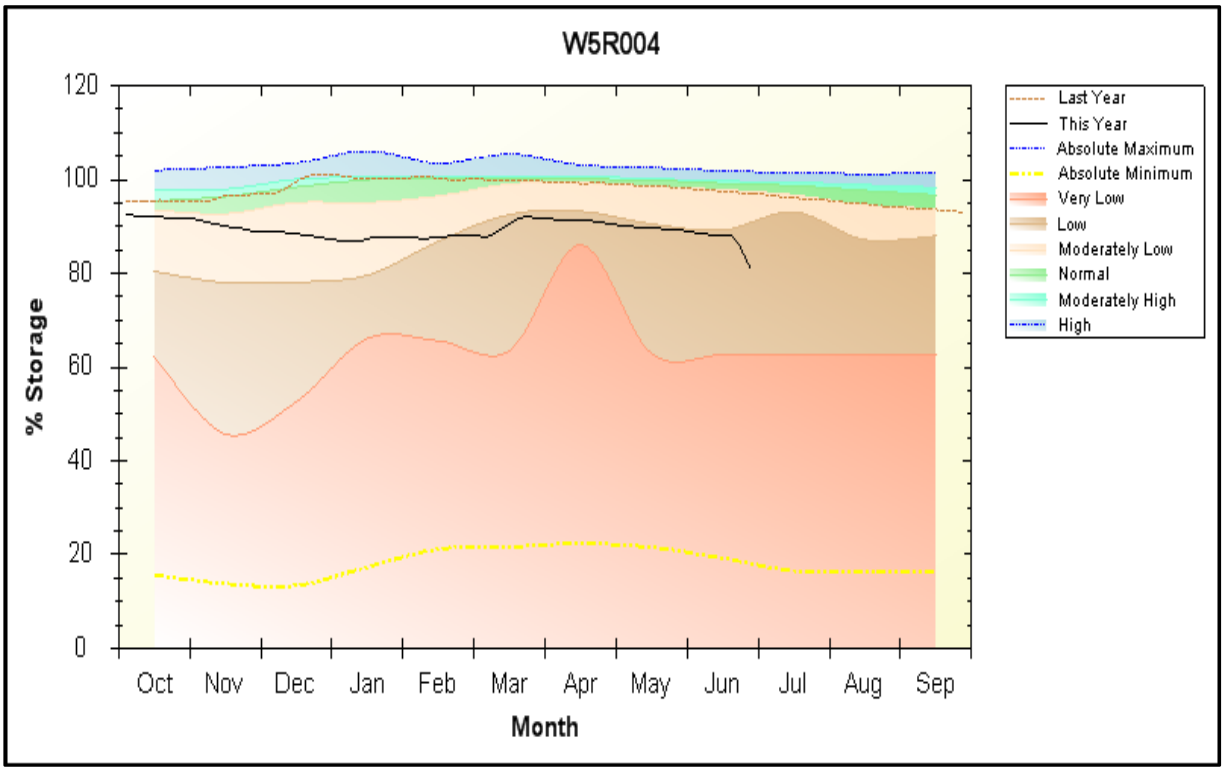

Figure 5: Fluctuations of the dam's water level over a year (DWS, 2016)

1.2.5.2 Water Quality

According to the water quality results which were sampled at the dam wall area and analyzed by Regen Water Laboratory from March 2016 to July 2016, Heyshope Dam has good water quality. The parameters analyzed in 2016, were within the DWS standards for recreational use. However, it is alleged that Kangra Coal Mine is discharging wastewater into the dam threatening the water quality. It was also indicated that there is no proper compliance and monitoring at the dam, hence potential threats to the water quality. The local communities also dump disposable nappies in the river and streams which are flowing into the dam.

According to the Integrated Water Quality Management Plan for the Vaal River System: September (2009), the water quality of the Heyshope Dam is deteriorating due to developments around the dam.

Table 2: Water Quality Variables for Heyshope Dam

Characteristics	Test Results	Water Target Range (Recreational Use)	Description
pH (pH units)	7.83	6.5-8.5	The pH of water is well within Quality Range and the buffering capacity of the lachrymal fluid of the human eye. Skin, ear and mucous membrane irritation is absent.
Electrica; Conductivity in mS/m	15.1	0-70	No health effects associated with electrical conductivity of water are expected < 45 mS/m.
Sulphate (mg/l)	2.9	0-200	No health or aesthetic effects can occur.
Chloride (mg/l)	13.7	0-100	No health or aesthetic effects can occur.
Nitrate (mg/l)	<0.1	0-6	No health or aesthetic effects can occur.
Free and Saline Ammonia (mg/l)	<0.20	0-1.0	No health or aesthetic effects can occur.
E.coli (cfu/100mL)	7	0-130	A low risk of gastrointestinal illness is indicated for contact recreational water use.
Turbidity (NTU)	N/A	3.0	N/A

Source: Inkomati Usuthu Catchment Management Agency (Regen Waters Laboratory, 2016)[2]

1.3 BUILT ENVIRONMENT

1.3.1 Roads

Access roads leading to the dam are gravel and not in good condition and the soil tend to be slippery during raining seasons.

There used to be a bridge separating Kwa-Ngema and Etsheni communities but has since been flooded during heavy rain seasons now the communities have to travel long distance to go to other community.

1.3.2 Canal

There is a canal which is approximately 20 km where water is pumped from Heyshope Dam into the Heyshope Canal and on to the Geelhoutboom Station. Communities adjacent to the canal (Driefontein, Lindelani and Shabalala communities) tend to experience drowning incidents of both people (including young children) and livestock.

The canal is administered by DWS. There have been some several attempts to fence off the canal by DWS, but the local communities steal the fence and the gate as well leaving the canal exposed. High security system fence is recommended to keep the local communities from the canal and it will be difficult to steal it.

1.4 USES AND USERS OF THE DAM

1.4.1 Primary Functions

1.4.1.1 Domestic Use

One of the primary functions of the dam is to provide the Mkhondo Local Municipality with bulk raw water and the municipality purifies the water and supply it to the local communities for domestic use.

1.4.1.2 Industrial Use

Heyshope Dam is also used by industries where it supply water to the Eskom Tutuka Power Station.

1.4.2 Secondary Function

1.4.2.1 Recreation Use

There are five (5) recreational clubs adjacent the dam which are: Ermelo Outdoor Activities, Western Bassmaster, Newcastle Bassmaster, Heyshope Lodgers and Heyshope Dam Boat Club.

[2] **N.B:** During the time when the study was conducted, the analytical results for turbidity were not recorded on the DWS water quality management system.

Most of these clubs are practicing recreational fishing (catch and release), and boating. Some have cavaran parks and picnic sites. Heyshope Lodgers is a residential area with access control which is situated adjacent to the dam. Some structures within this area are permanent structures.

1.4.3 Other Uses

1.4.3.1 Afforestation

There are commercial timber plantations (Blue Gums Trees) which are privately owned adjacent to the dam.

1.5 RECREATIONAL INSTITUTIONAL STRUCTURE

There is no formal institutional structure managing the recreational use of the dam. However, DWS is the owner and operator of the dam.

1.5.1 Management of Water Surface

The management of the surface water in terms of operation of the dam is done by DWS.

In addition to the DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA.

1.5.2 Access

There are five (5) access points to the dam, which are through the following recreational clubs: Ermelo Outdoor Activities, Western Bassmaster, Newcastle Bassmaster, Heyshope Lodgers and Heyshope Dam boat Club.

1.5.3 Event Management

Permits should be issued by DWS prior to any event undertaken at the dam.

1.6 SAFETY

There is safety concern at the dam due to the fact that the dam is huge and is not fenced. This has led some tourists to become victims of crime in the area. It is advised that tourists should park their vehicles in a secured place when they visit the dam, and should not wander around alone as they might become victims of crime. Some of the houses which have been built at Heyshope Lodgers are permanent and pose a safety risk in case there are floods in the area.

The absence of buoys at the safety and security zone (dam wall) has led to some drowning incidents at the dam, as a result of boat angling at the safety and security zone.

1.6.1 Safety of Navigation

There is currently no adequate, standardised and harmonised fixed and floating Aids to Navigation[3] (AtoN) and Demarcation Markers in place at the dam wall.

1.6.2 Incident Management

There is no specific incident management system in place to ensure that incidents are responded to in a co-ordinated manner.

1.7 LAND ONWERSHIP

DWS is the owner of Heyshope Dam and the purchased boundary. The dam is located in the rural areas where the land outside the purchase boundary is under the jurisdiction of traditional authorities.

1.7.1 Land Claims

There is a land claim which has been lodged and validated by Department of Rural Development. It was also indicated that some part of the claimed land is under water. Land which is under water must be validated by the Land Claim Commissioner before DWS can facilitate closure of the matter.

[3] A maritime Aid to Navigation (AtoN) is defined by the international Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) as "A device or system external to vessels that is designed and operated to enhance the safe and efficient navigation of vessels and/or vessel traffic"

1.7.2 Lease Agreements

17.2.1 Recreational Clubs

There are five (5) recreational clubs adjacent the dam which are: Ermelo Outdoor Activities, Western Bassmaster, Newcastle Bassmaster, Heyshope Lodgers and Heyshope Boat Club.

Most of these clubs are practising recreational fishing (catch and release), and boating. Some have cavaran parks and picnic sites.

The lease agreements of all these clubs will be reviewed as part of the RMP process to ensure that their objectives are aligned with the objectives of the RMP and NWA.

1.8 SOCIO-ECONOMIC ENVIRONMENT

1.8.1 Social Audit

The main purpose of social audit is to examine the general status of the study area and to determine issues that need to be addressed when developing the RMP in order to overcome potential difficulties in an area. The study area falls within Ward 1, 2, 3 and 18 of the MLM, within Gert Sibande District Municipality in Mpumalanga Province. An understanding of socio-economic conditions of Ward 1, 2, 3 and 18 can be used at a later stage to determine the impact of a RMP in the area in terms of changed socio-economic conditions.

A social Audit which focused on the population composition of the ward, Education level and employment status was undertaken and is presented in section 1.8.1.1 to 1.8.1.3, respectively.

1.8.1.1 Population Dynamics

The total population size of MLM is 171 982 with ward 1 (Driefontein: Mkhize Village and New Stand), having 10 133, ward 2 (Driefontein: Mabilisa and Masihambisane) 16 446, ward 3 (Dirkiesdorp and Kwa-Ngema South) 13 006 and ward 18 (Driefontein: Esibovini and Masihambisane East) with 3 404 population size. Fifty four percent (54%) of the total population size in Mkhondo resides in the rural areas whereas 46% resides in the urban areas Census, 2011). The major towns are Amsterdam and Mkhondo (Piet Retief).

Table 3: Population group for MLM

Language	Percentage
Afrikaans	3.5%
English	2.4%
IsiNdebele	1%
IsiXhosa	0.1%
IsiZulu	88.2%
Sepedi	0.2%
Sesotho	0.1%
Setswana	0.6 %
Sign Language	0.3%
SiSwati	1.8%
Tshivenda	0.1%
Xitsonga	0.1%
Other	0.6%
Not Applicable	0.9%

1.8.1.2 Education Level

According to census 2011, 11.7% of residence has completed secondary education and only 0.6 % have higher education qualifications. This pose a concern as most of the people in the MLM do not have an education, and without education people are not able to get decent jobs but get jobs that requires hard labour e.g. working in the mines, industries for plantation and agricultural fields.

Table 4: Educational Level for MLM

Group	Percentage
No Schooling	3.9%
Some Primary	45.9%
Completed Primary	7%
Some Secondary	30.1%
Completed Secondary	11.7%
Higher Education	0.6%
Not Applicable	0.8%

1.8.1.3 Employment Status

According to Census 2011, 47% of the total population residing in the MLM is economically active which shows that there is high rate of young children, elderly people and those who do not have schooling to obtain employment and 30% of the population is employed while 17% is unemployed.

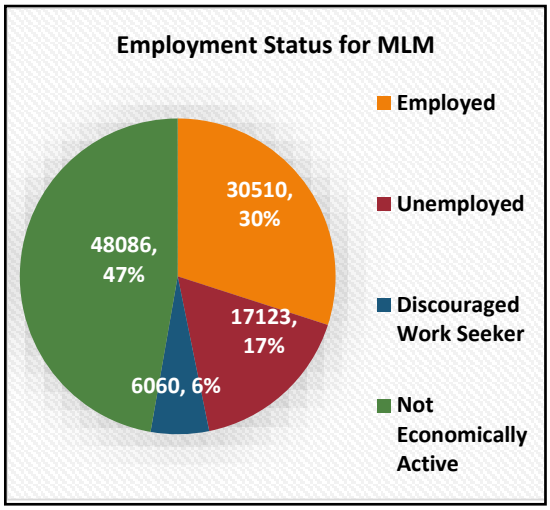

Figure 6: Educational Level for MLM

1.8.4 Community Beneficiation

It is DWS's belief that communities which host water resources should share in the benefits emanating from the utilization of the resource for recreational purposes by ensuring that these communities have both physical access to the resource, as well as access to the water-based recreation economy.

When developing a RMP for Heyshope Dam, community beneficiation is one of the key factors which was considered.

The community will benefit in amongst others the following ways:

- By having equitable access to the dam;
- The community needs will be addressed in an appropriate and equitable manner;
- By being safe while accessing and using the dam;
- By being given first preference when there are employment opportunities and skills development;
- Through the PPP; and
- By participating in decision-making with respect to major developments planned or proposed for the dam (through the Dam Management Committee).

CHAPTER 2: LEGISLATIVE FRAMEWORK

The RMP forms the overarching framework for the management of Heyshope Dam. It is informed by relevant policy, legislation and planning documents administered by other government departments, most of which are herein under discussed. Similarly, these government departments are required to use the RMP to inform the development of future policy, legislation and planning documents.

I. **The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), Section 24:** Provides that, everyone has a right to an environment that is not harmful to their health or well-being.

II. **Conservation of Agricultural Resource Act, 1983 (Act No. 43 of 1983):** 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**.**

III. **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.

IV. **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.

V. **Government Immovable Asset Management Act, 2007 (Act No. 19 of 2007):** 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 minimum standards in respect of immovable asset management by a national or provincial department; and to provide for matters incidental thereto.

VI. **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.

VII. **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.

VIII. **Merchant Shipping (National Small Vessel Safety) Regulations (2007):** These Regulations provide *inter alia* 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.

IX. **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.

X. **National Environmental Management Act, 1998 (Act No. 107 of 1998):** 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.

XI. **National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) and Related Regulations:** 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.

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.

XII. **National Environmental Management: Protected Area Act, 2003 (Act No. 57 of 2003):** 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.

XIII. **National Treasury Public Private Partnership (PPP) Toolkit for Tourism, 2005:** This toolkit assist 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.

XIV. **National Water Act, 1998 (Act No. 36 of 1998):** 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.

XV. **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.

XVI. **Public Finance Management Act (PFMA) (Act No. 29 of 1999**): 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 maximize service delivery. The Act allows DWS to enter into PPP agreements with the private sector for the commercial use of state assets.

XVII. **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 among other things,

- Responsibility for safety and security at the events;
- Risk categorization of events; and
- Safety certificates.

XVIII. **South African Maritime Safety Authority Act, 1998 (Act No. 5 of 1998):** 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.

XIX. **Water Services Act (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.

The RMP process also takes cognizance of the following Legislations, Policies, Programmes and Reports:

- Broad-based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003).
- Communal Land Rights Act, 2004 (Act No.11 of 2004).
- Development Facilitation Act, 1995 (Act No. 67 of 1995).
- Disaster Management Act, 2002 (Act No. 57 of 2002).
- Environmental Conservation Act, 1989 (Act No, 73 of 1989).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).
- Sustainable Development Goals (2015)
- National Development Plan (Vision for 2030).
- National Heritage Resources Act, 1999 (No. 25 of 1999)
- National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)
- Occupation Health and Safety Act, 1993 (Act No. 85 of 1993).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).
- State Land Disposal Act, 1961 (Act No. 48 of 1961).
- Tourism Act, 1993 (Act No. 72 of 1993).
- **Safety of Navigation:**
  In addition to its common-law responsibility, DWS is, in terms of the requirements described in the National Water Act, Act No 36 of 1998, amongst others, responsible for the safety of Government's waterways and watercourses, including its dams.

DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required fixed and/or floating AtoN for general navigation. In addition to the DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA. In order to demarcate specific zones/areas, standardised demarcation markers are to be used in conjunction with the relevant AtoN.

- SAMSA Marine Notices and its Directive on the Standardisation of fixed and floating AtoN and Demarcation Markers on all navigable Inland Waterways in the Republic of South Africa.

The aim is to enhance the development of a best practice model to ensure a safe and structured inland maritime environment and culture, whilst protecting the country's precious water resources. Not only do these Acts, Regulations and Frameworks guide specific decisions and actions, they also provide the framework for monitoring performance and compliance, and provide guidelines regarding contravention, offences and penalties. This list is not complete and other legislations could be applicable.

CHAPTER 3: WHAT IS A RESOURCE MANAGEMENT PLAN

3.1 DEFINITION OF RMP

A Resource Management Plan (RMP) is a plan which aims to regulate access and the recreational utilisation of a water resource and the surrounding state land in ways which promote community participation and beneficiation, environmental conservation and to unlock socio-economic potential of the water resource.

Recreational use includes activities ranging from leisure, sport to culture and religion. Although recreational use does not involve consumption of water, it is still a major water use and needs to be managed effectively with minimal environmental impacts and to ensure communities have access to water based economy.

3.2 PURPOSE OF THE RMP

The main aim of RMPs will be to attain the objectives underlying sustainability and to compile functional, workable sustainable access and utilisation plans for water resources.

Without approved management plans relating to water resources utilized for recreational purposes, it is difficult for informed decisions to be made necessitating a precautionary approach to access, utilisation and development proposals.

One of the components of the RMP process is to implement an Institutional Plan for effective management of GWWs. The focus on the Institutional Plan is accompanied by a Zoning Plan which is influenced by current and potential recreational uses. The RMP also outlines the Strategic Plan for all the identified objectives for the dam. In addition, a Financial Plan is incorporated into the Business Plan (BP) and provides guidance on funding requirements and funding options to implement the potential recreational activities at the dam.

3.3 PROCESS TRIGGERS

Triggers Factors are factors that have encouraged DWS to initiate and commission the development of RMPs.

A number of generic factors have been identified by DWS for the development of RMPs, however, the Process Facilitator identified site specific trigger factors for Heyshope Dam, as illustrated in **Table 5**.

Table 5: Trigger Factors for the Development of Heyshope Dam RMP

Trigger Factors	Description
Resource Management	**Water quality** • It is alleged that Kangra Coal Mine is discharging untreated wastewater into the dam. • Communities around the dam tend to dump disposable nappies in and around the dam, which poses a threat to the water quality of the dam. These actions may increase the Ecoli and faecal Coliforms count in the water. • Sewage effluents from Driefontein Wastewater Treatment Works (WWTWs) causes a threat to the water quality of the dam. • Aesthetically the water on the dam might look clean, but chemically and biologically might be unfit. **Water quantity** • Heyshope is the biggest dam in Mpumalanga province and number nine (9) in the country.
	Vegetation • There used to be aquatic weeds at the dam, but they were removed by the Working for Water (WfW) programme (possible recurrence). • There are medicinal plants at the dam which have been submerged under water.
Recreational Industry Involvement	**Public safety** • There are drowning incidents caused by both recreational activities and the alleged presence of a water snake in the dam. • There are unauthorised access points to the dam which lead to criminal activities such as mugging of people visiting the dam. **Unlawful activities within the dam** • Community members are practising net fishing which depletes the fish species within the water resource. **Unauthorised development at the dam** • There are permanent structures within the DWS purchased boundary and according to DWS, permanent structures are not allowed in and around the dam for safety reasons.
Community Participation and Beneficiation	**Public Private Partnership** • Heyshope Dam has a potential to attract tourists which in turn will unlock the economic potential of the dam.
Public Policy	**Local Planning Initiatives** • Currently the dam is not included in the Mkhondo Local Municipality planning initiatives such as IDP, SDF, EMF, etc. • The dam can be a tourist attraction centre, but it is not developed nor utilised to its full potential.

3.4 RMP DEVELOPMENT PROCESS

The RMP will be developed in accordance with the RMP guideline procedure (DWAF, 2006) as illustrated in **Figure 7.**

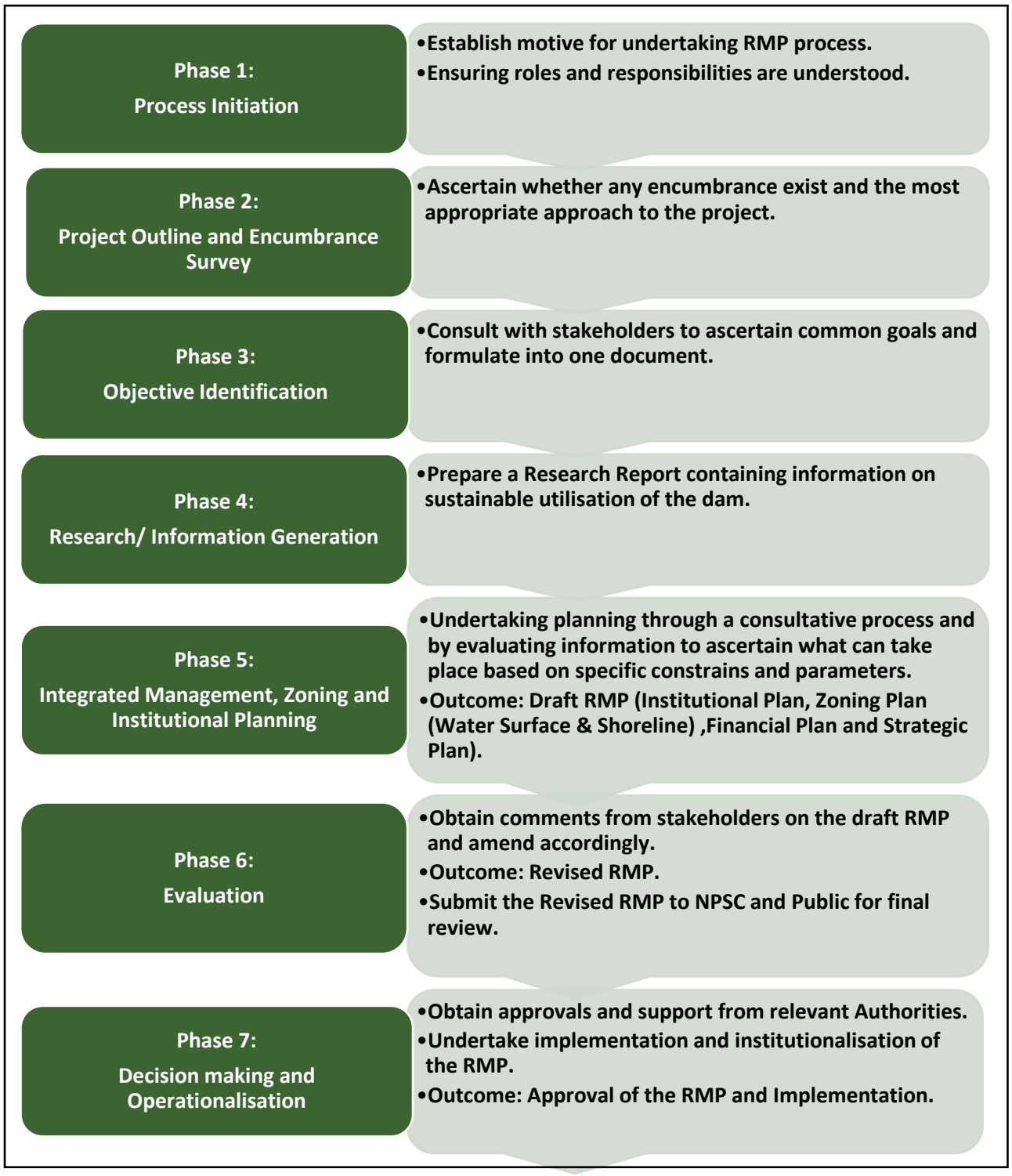

Figure 7: RMP Procedure

3.5 RMP PLANNING STAGES

3.5.1 Desktop Study

The desktop study was conducted with the aim of acquiring background information about the Heyshope Dam. This was done through literature review. This study provided information such as the location of the dam, user groups, current activities, previous studies conducted for the dam.

3.5.2 Site Inspection

A site inspection was conducted at Heyshope Dam on the **27 November 2015** to gather baseline information using a checklist questionnaire**.** The site inspection was undertaken with the DWS delegates (DWS IEE: Central Operations, Water control officer and the dam operator). Photos of the study area were also taken during site inspection.

3.5.3 Public Participation

Public Participation process (PP) is a process in which potential Interested and Affected Parties (I&APs) are given an opportunity to comment on or raise issues relevant to specific matters. The three (3) fundamental and theoretical objectives of 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&APs).

A Public Participation was conducted in order to acquire information for **Phase 2 (Encumbrance Survey)**, **Phase 3 (Objective Identification)** and **Phase 4 (Research/ Information Gathering)** from stakeholders, which was used to complete **Phase 5 (Integrated Management, Zoning and Institutional Planning)**. In order to successfully complete the RMP, it is essential that the information obtained in the previous phases is utilised as planning input.

The public participation process for this project was formulated to include the following objectives:

- The identification of role players;
- The introduction of the RMP project to role players and inform them about their roles and responsibilities;
- The engaging of the Stakeholders (Authorities and I&APs) in the planning process;
- The answering of questions and noting of concerns;
- The identification of important issues, problems, conflicts and alternatives;
- Identification of the overall vision of the dam;
- The elimination of false expectations and preconceptions; and
- The creation of awareness amongst users.

DWAF's Guidelines for Public Participation (2001) outlines three (3) broad phases for public participation namely the **Planning**, **Participation** and **Exit** phase. Summarized below are the aspects of each phase and the approach for this project.

3.5.3.1 **Planning Phase**

Planning phase entails three (3) important aspects namely:

- Decision analysis;
- Participation planning; and
- Implementation planning.

During the **Planning Phase** a site inspection and literature review was conducted to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant Authorities to ensure co-operative interests and support in the RMP project.

3.5.3.1.1 The Role Players

It is recognized that different roles and responsibilities of the stakeholders (Authorities and I&APs), and their relationship towards each other and the steps in the planning procedure are imperative in the successful development of the RMP. It is also important that proper consultation with the public is done in order to produce a credible RMP.

As such, the success of the RMP is dependent on the level of involvement of the various stakeholders. Various stakeholders were identified and invited to participate in an open and consultative process. (See attached **Appendix A)**. The stakeholder list is updated on a continuous basis throughout the RMP process.

3.5.3.2 **Participation Phase**

The **Participation Phase** entails three (3) important aspects:

- Informing Stakeholders – explained briefly under **3.5.3.4 Advertising Process**
- Meeting the Stakeholders – explained briefly under **3.5.3.5 Direct communication**
- Feedback – it is of utmost importance that feedback is directed to and from Stakeholders. In this project feedback thus far has been given in a form of minutes of the meetings and follow up emails.

3.5.3.3 **Exit Phase**

The **Exit Phase** entails two (2) important aspects namely:

- Ensuring that all goals, challenges, concerns, objectives and the vision for the dam have been identified and documented in the RMP.
- Officially ending the public participation process for the development of a RMP.

During this Phase, a draft RMP and a draft BP will be presented to the Stakeholders so that they can comment and give inputs.

3.5.3.4 **The Advertising Process**

3.5.3.4.1 Compilation and Distribution of Background Information Document (BID)

The purpose of this document was to provide Stakeholders (Authorities and I&APs) with the background information about the proposed RMP project and to introduce the processes to be followed in developing the RMP plan. The BID also aimed at informing Authorities and I&APs on how to fully participate in the process and encouraged active attendance in Stakeholder engagement meetings.

In addition the BID also provided Authorities with the opportunity to raise issues of concern and inform any other organizations that might be interested in the project. (See Attached **Appendix B**).

3.5.3.4.2 Newspaper Advert

Newspaper advert regarding the RMP project was placed in the **Excelsior** Newspaper. The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **26 August 2016**. Furthermore, an advert for the draft RMP was advertised on **10 March 2017**. (See attached **Appendix C**).

3.5.3.4.3 Flyers Compilation and Distribution

Flyers were also used as a form of notification, they aimed at informing the I&APs about the public consultative meetings. The flyer detailed a brief description of the RMP, meeting date, time, venue and relevant contact details. The flyers were compiled in English and in isiZulu and were distributed on **26 August 2016**.

The flyers for the draft RMP were distributed on **03 March 2017** (See attached **Appendix D**).

3.5.3.5 **Direct Communication**

3.5.3.5.1 E-mails

Meeting invitations were sent out to authorities and I&APs notifying them about the scheduled consultative meetings. The invitation entailed the BID, meeting venue and time. The email notifications were sent out on **30 June 2016** and the reminder on **11 July 2016.** Moreover, the meeting invites for the draft RMP were sent out on **07 March 2017** (See attached **Appendix E**).

3.5.3.5.2 Authority Meeting

The Authority meeting was held on **13 July 2016** at **Mkhondo Local Municipality – Board Room.**

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.

The draft RMP was presented to the authorities on **17 March 2017**.

3.5.3.5.3 Public Meeting

The initial public meetings were held on **10, 11 and 12 September 2016** in Kwa-Ngema, Dirkiesdorp, Nkosinathi, Saulmkhizeville, Driefontein, Heyshope farms and Piet Retief communities. A platform was also given to I&APs to identify encumbrances/challenges that might hinder the RMP process as well as to identify objectives and vision for the Heyshope Dam.

The draft RMP was presented to the Public on **17, 18, 19** and **20 March 2017.**

3.5.3.6 **Comments and Responses Register**

A copy of a draft RMP report was circulated on **03 March 2017** for commenting. The commenting period was to elapse on **20 March 2017**. (See attached **Appendix F**).

3.5.4 Planning Partners

RMPs are developed through a process of cooperative governance and Stakeholder participation. The distinctly different roles and responsibilities of the stakeholders, and their relationship towards each other and the steps in the planning procedure are imperative in the success compilation of the RMP.

The RMP provides for coordination between different governments and agencies to ensure that not only the objectives of DWS are attained, but also the objectives of other relevant Government Departments are attained. Such Departments includes among others as outlined in **Table 6**.

Table 6: Planning Partners and their Respective mandate

Department/ Agency	Mandate
Gert Sibande District Municipality/ Mkhondo Local Municipality (MLM)	The dam is within the jurisdiction of the municipality and is mandated to provide bulk water services.
Department of Agriculture, Forestry and Fisheries (DAFF)	The purpose of DAFF includes sustainable development and management of resources to maximizing the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems. Operation Phakisa expansion to inland dams is one of DAFF initiative aimed at unlocking economic potential of fisheries sector within the inland water. The latter programme will be used as benchmark for implementation of conservation policies while implementing job creation within fishery and fish processing market.
Department of Rural Development and Land Reform (DRDLR)	The department will assist in terms of Land Claims/Ownership issues.
Department of Environmental Affairs (DEA)	Responsible for Biodiversity Management within the dam including Invasive Alien Species.
Department of Public Works (DPW)	Has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the department as some of the recreational activities will overlap into the state land.

Department/ Agency	Mandate
Department of Transport (DoT)	Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea also inland waterways.
National Treasury (NT)	The use of State assets is governed by National Treasury Regulations, requiring DWS to plan concessions in compliance or association with National Treasury, guided by the Tourism Public Private Partnership (PPP) Toolkit of 2005.
South African Maritime Safety Authority (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.

3.6 RMP DATA ANALYSIS

3.6.1 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 will assist DWS to identify hindrances and other factors that may influence the development and implementation of the RMP. The identified encumbrances are broken down into **Biophysical, Legal and Social.**

Tables 7 and 9 outline the summary of limitations that might affect the development or implementation of the RMP for the dam.

Table 7: Summary of Legal Encumbrances

Item	Description
Lease Agreements	• In the past DWS used to issue out blanket agreements for people who wanted to lease a land adjacent to the dam. The RMP will rectify all the blanket agreements which were issued in the past. • All the lease agreements will be reviewed as part of the RMP process.
DWS Agreements	• The absence of management structure for recreational use of the dam has led to unauthorized developments adjacent to the dam, uncontrolled access and illegal activities such as net fishing and permanent structures at the dam.
Historical Issues	• The community feel they were let down by DWS because when the dam was built they were relocated from their original homes and moved to other places which are smaller than their original places, and they did not receive compensation. • Completely submerged graves prevent relatives of the deceased from visiting the graves and also to perform rituals. • Affected families will need to be engaged.
Land Ownership	• Part of the land that is claimed alleged to be under water must be validated by the Land Claim Commissioner before DWS can facilitate closure of the matter. • It is however important to note that the dam cannot be restored to the claimant as it is a National Strategic Asset (NSA).

Table 8: Summary of Biophysical Encumbrances

Item	Description
Geology and Soil	• The type of soil which is leading to the dam makes it difficult for the local people and tourists to visit the dam during rainy times as the soil is slippery.
Fauna	• Local communities are a bit skeptical to go to the dam as they believe that there is a mermaid in the dam.
Water Quality	• The water quality and aquatic species are being threatened by wastewater which is allegedly being discharged by Kangra Coal Mine into the dam. Disposable nappies which are being dumped in rivers and streams which are flowing into the dam are also a threat to water quality of the dam. • The absence of proper compliance and monitoring at the dam makes it vulnerable to water pollution.

Table 9: Summary of Social Encumbrances

Item	Description
Tourism Information	• There are signage to alert the public and possible tourists about the dam. However, there are limited facilities which are associated with tourism at the dam. • The dam is under developed and underutilized. • There is no institutional structure to manage the dam for recreational use of the dam.
Expectations	• People expect employment opportunities at the dam and this might affect the process in a negative way as the RMP is not a project that provides employment opportunities.
Mobility	• There is no proper access road which leads to the dam.
Safety	• Accessing the dam from any point or at unauthorized access point lead to people engaging in unlawful activities and criminal activities at the dam. • Fishing at no go areas is risky and might even cause loss of life.
Social Audit	• According to census 2011, there is a high rate of unemployment in the MLM. This has resulted to very poor living conditions, teenage pregnancies and criminal activities in and around the area and as such it will makes it very difficult for the young people to actively get involved in the upliftment of local economy in the area as they are not well informed.

Upon identifying the encumbrances, objectives needed to be identified in order to facilitate a planning procedure aimed at the compilation of a RMP. It is essential to clarify objectives to be met by the planning procedure (DWAF 2006).

3.6.2 SWOT Analysis and Objective Identification

The SWOT Analysis was conducted to gather **Strengths** and **Opportunities** that define the potential of the dam whereas the challenges regarding the dam where identified through **Weaknesses** and **Threats**. The common key objectives were formulated and identified from the **Strengths** and **Opportunities** of the dam.

Moreover, the vision for the dam for a period of 20 years was formulated by stakeholders from the identified objectives.

3.6.2.1 **SWOT Analysis Approach**

There were issues of concerns that were raised in the stakeholder engagement meetings prior to conducting the SWOT Analysis. Other challenges or encumbrances that may hinder the progress of the dam's RMP process were identified by the stakeholders following the SWOT analysis approach as illustrated in **Table 10.**

Table 10: Trigger Factors for the Development of Heyshope Dam RMP

Strengths	Weaknesses
• Heyshope is the biggest dam in Mpumalanga province and number nine (9) in the country. • The dam provides water for domestic use to some of the local communities. • There are no dangerous aquatic animals in the dam. • The dam is well known for bass fishing with a good reputation.	• There are reports of drowning incidents at the dam and the canal. • The road which lead to the dam is not in good condition and it is slippery during rainy seasons. • There are no ablution facilities for use by the people visiting the dam • Poor compliance and monitoring of the water quality by DWS • Remoteness of the dam is a weakness, especially during emergencies. • It is alleged that the water quality looks good physically but chemically is bad because of coal mine discharging waste water into the dam.
Opportunities	**Threats**
• Potential for development of guest houses, lodges, chalets, picnic sites, caravan park and braai facilities, etc. • Development of better access roads. • Knowledge about safety in partaking on water sports e.g boating. • Opportunity to establish aquaculture projects.	• Lack of proper sanitation systems leads to sewage being discharged in the rivers feeding into the dam. • Net fishing threatens the ecosystem.

3.6.2.2 **Objective Identification (Phase 3)**

Objectives were identified by all the stakeholders in order to ascertain common goals. These objectives address the following questions:

- What do we want?
- How are we going to achieve this?
- Who will be involved?
- By when would we like to achieve our goals?
- Why would we want to achieve our goals?

The set common key objectives were derived from the SWOT Analysis for the Heyshope Dam and have been categorized into three (3) Key Performance Areas (KPAs) as illustrated below:

KPA 1: Resource Management

- To improve and maintain the water quality of Heyshope Dam; and
- To prevent the regeneration and spread of alien aquatic weeds in the dam to support the proposed recreational activities.

KPA 2: Resource Utilisation

- To ensure that there is adequate public access to the dam by establishing controlled access points and also to develop recreational facilities to attract tourists;
- To promote public safety for local community members and tourists when accessing the dam for recreational purposes;
- To promote sustainable harvesting of fish at the dam; and
- To establish and market Heyshope Dam to become a major tourists attraction point in the Mpumalanga Province in order to uplift the local economy.

KPA 3: Benefit Flow Management

- To uplift the local economy by empowering the local community;
- To establish capacity building and training for youth within the local communities; and

- To establish an appropriate institutional structure which will effectively manage the recreational use of the water resource and the surrounding environment in accordance with the RMP. The appropriate powers and delegations must be clear.

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

A vision for the dam for a period of 20 years was formulated from the key common objectives identified by the stakeholders and stands as follows:

To ensure that Heyshope Dam becomes a tourist destination of choice by developing world class recreational facilities that will attract tourists, empower the local community, conserve the environment and uplift the socio-economic potential".

After setting both the dam's specific objectives, a research was conducted in order to provide relevant information to decision – makers regarding the sustainable utilisation of the water resource and where applicable the State Land.

3.6.3 Information Generation/ Research (Phase 4)

The aim of undertaking the research process was to collect the relevant data about the dam. This will serve as a decision-making guideline tool, guided by the objectives set for the dam and any limitations due to encumbrances. The report documents the following data as illustrated in **Figure 8**.

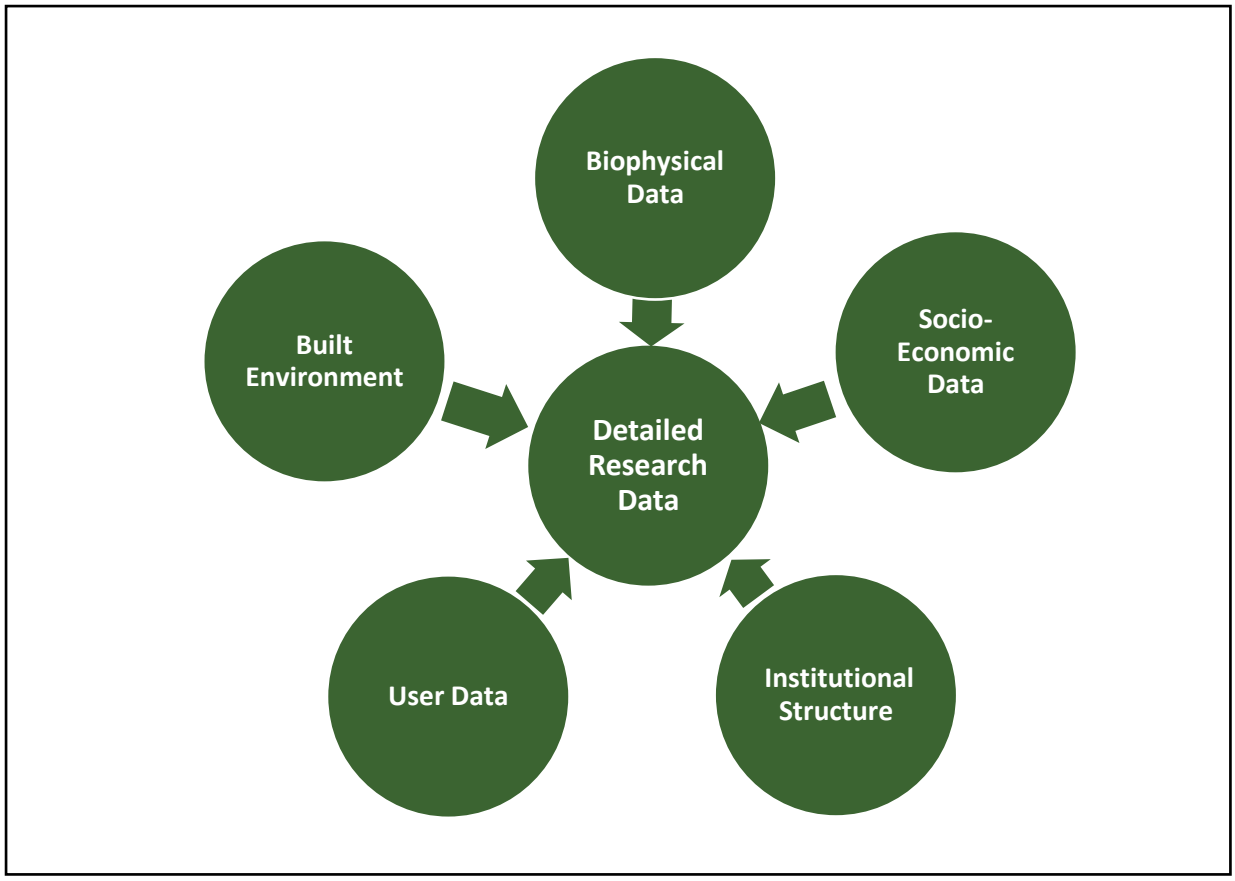

Figure 8: Researched Data

The main aim of the research was to identify the dam tourism development potential and also to evaluate the practicability/feasibility of the potential objectives identified.

3.6.3.1. **Tourism Development Potential**

Tourism is dominated by guesthouse facilities around the town of Mkhondo which cater for weekend and transit travel, while conservancies and private reserve developments are increasing in the Ngwempisi and Assegai River valley and catchments. The N2 linkage through Mkhondo is the major tourism link connecting northern KZN and the Mpumalanga / Limpopo Lowveld areas to one another. The mountains south of Dirkiesdorp and high grassland escarpment to the west in the region hold high bio and scenic diversity. The potential could be realized via appropriate sustainable private sector or corporate investment. Facilities associated with Heyshope dam (compared to the Jerico Dam) appear limited.

The dam is huge and if it can be marketed and advertised in a proper manner, it will be able to attract new tourists into the area.

The dam has potential for a resort which can include day visits, resort guest and caravan park. The day visits facilities can include swimming pools, slides and entertainment area for both kids and adults e.g volley ball court and soccer pitch depending on the needs and desires of the community.

The resorts guest can have access to all the facilities which are being offered to day visitors, which should include unlimited or extended time to the pool and the braai area. They can stay at the chalets to maximize their visit to the resort. People who come with their cavaran will also have the same benefits with the day visitors and they can stay in their own caravans.

This dam can accommodate all these activities and as such it will be able to uplift the local economy of the area.

3.6.3.2. **Feasibility for Potential Objectives**

According to DWAF (2006), the feasibility of the proposed objectives needs to be determined in light of the local environmental conditions. **Table 11** shows the practicability of all the proposed objectives.

Table 11: Feasibility of Potential Recreational Objectives

KPA 1: Resource Management		
Objective	**Status Quo**	**Practicability**
• To improve and maintain the water quality of Heyshope Dam.	• It is alleged that Kangra Coal Mine is discharging untreated wastewater into the dam, which threatens the water quality of the dam. • Community members are dumping disposable nappies in streams and river flowing into the dam.	• Water monitoring points should be established and monitored regularly in order to find out the extent of the pollution. • MLM, DEA and Department of health should educate the local communities including those communities which are adjacent to the dam through awareness campaigns, how to handle general solid waste (waste management) and the consequences (health related) of contaminating the water resource. • There should be proper waste management systems (ablution and waste bins) in the facilities around the dam.
• To prevent the regeneration and spread of alien aquatic weeds in the dam to support the proposed recreational activities.	• There used to be alien aquatic weeds at the dam and they were removed by working for water project. • Aquatic weeds are a problem in most of the dams and they need to be prevented to reoccur at Heyshope Dam.	• Working for Water should constantly monitor to check if aquatic weeds are not growing again. • The construction of wash bays at the dam will eliminate the introduction of alien aquatic weeds from other dams.
KPA 2: Resource Utilisation		
Objectives	**Status Quo**	**Practicability**
• To ensure that there is adequate public access to the dam by establishing controlled access points and also develop recreational facilities to attract tourists.	• The dam is not fenced and can be accessed from any point. • The bridge which connects Kwa-Ngema and Etsheni has been flooded by heavy rains, this has resulted to the local communities to use a long route to go to these places.	• An agreement needs to be entered into by DWS and the entity which will manage and operate public facilities. • Public access should be provided and the entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community.
• To promote public safety for local community and tourists when accessing the dam for recreational purposes.	• The dam is not fenced and it can be accessed from any point and such has resulted in tourists been targeted by criminals in the area. • Public safety is very important when developing and implementing the RMP.	• Implementation of the DWS Incident Management System. • Formal appointment of SAMSA Enforcement Officer at the dam. The officer should be able to utilize the Incident Management System to alert the relevant authorities of any illegal activity.

	• The RMP should eliminate incidents assorted with recreational use of the dam by enforcing dam safety rules.	• Implementation of standardised and harmonised AtoN and Demarcation Markers. • Implement aspects of the CIWSP best practice model to ensure the safe usage of the dam by the public. • It is vital to fence off hot spots for crime and also establish security at the dam to ensure that local community as well as tourists are safe when engaging in recreational activities at the dam.
• To improve safety of Navigation	• There are AtoN demarcation markers only at the dam wall.	• To improve safety of navigation through the implementation of standardised and harmonised AtoN and demarcation markers as directed by SAMSA.
• To promote sustainable harvesting of fish at the dam through aquaculture. • Fisheries have the opportunity to provide nutrition, food security, sustainable livelihoods and poverty alleviation to the local community.	• There is a lot of unauthorized activities which are taking place at the dam including net fishing through unauthorized access points.	• DWS, DAFF, DARDLEA and other relevant conservation NGOs should work together to determine the feasibility of aquaculture and also educate the local community about sustainable fishing methods.
• To establish Heyshope Dam into a tourists attraction point.	• Heyshope Dam is a bass fishing destination with a great reputation. Although slightly remote, Heyshope Dam is a one of the main largemouth bass fishing lakes in South Africa.	• IA and DMC should work together in order to market the dam and also ensure that there is a good marketing strategy for the dam.
KPA 3: Benefit Flow Management		
Objectives	**Status Quo**	**Practicability**
• To uplift the local economy by empowering the local community. • To establish capacity building and training for youth within the local communities. • To support community based projects for the local communities.	• There is a high rate of unemployment in the area and it will be vital if the community benefit from the dam. • It is imperative that the young people benefit from the opportunities emanating from the dam. • There is a two (2) hectare farm planted with various vegetables and it requires water constantly to sustain it.	• DWS, local, district municipality and all the relevant departments which have a role in empowering the community should work together to ensure that the local community benefit from the opportunities emanating from the dam. • IUCMA is currently verifying the existing water uses to establish the lawful and unlawful water use activities. Communities are urged to complete registration forms from the Department to determine the type of water use authorization they require.
• To establish an appropriate institutional structure which will effectively manage	• There is no institutional structure which is managing the dam for recreational use.	• DWS should establish an effective institutional structure which will effectively manage the

the recreational use of the water resource and the surrounding environment in accordance with the RMP. The appropriate powers and delegations must be clear.	• The proposed institutional structure will effectively manage the dam and combat criminal activities at the dam.	recreational use of the water resource and the surrounding environment in accordance with the RMP. • MLM is being considered to be an IA to manage the dam for recreational use.

CHAPTER 4: INTEGRATED MANAGEMENT, ZONING AND INSTITUTIONAL PLANNING (PHASE 5)

The purpose of this phase is to evaluate the information obtained from previous stages to ascertain what could be achieved based on specific constraints and parameters of the various input factors such as biophysical, cultural and socio-economic, current institutional and needs of the dam users. The Integrated Resource Management Plan (IRMP) will take into account the following:

- Biophysical, cultural and socio-economic and User needs constraints;
- Development Potential and requirements;
- Site planning and Zonation;
- Programmes and Plans that will unlock the potential of the water resource; and
- Institution options and legal aspects required to create these programmes and plans.

The IRMP is broken down into four (4) main plans namely the **Institutional Plan**, **Zoning Plan, Strategic Plan** and **Financial Plan** as illustrated by **Figure 9**.

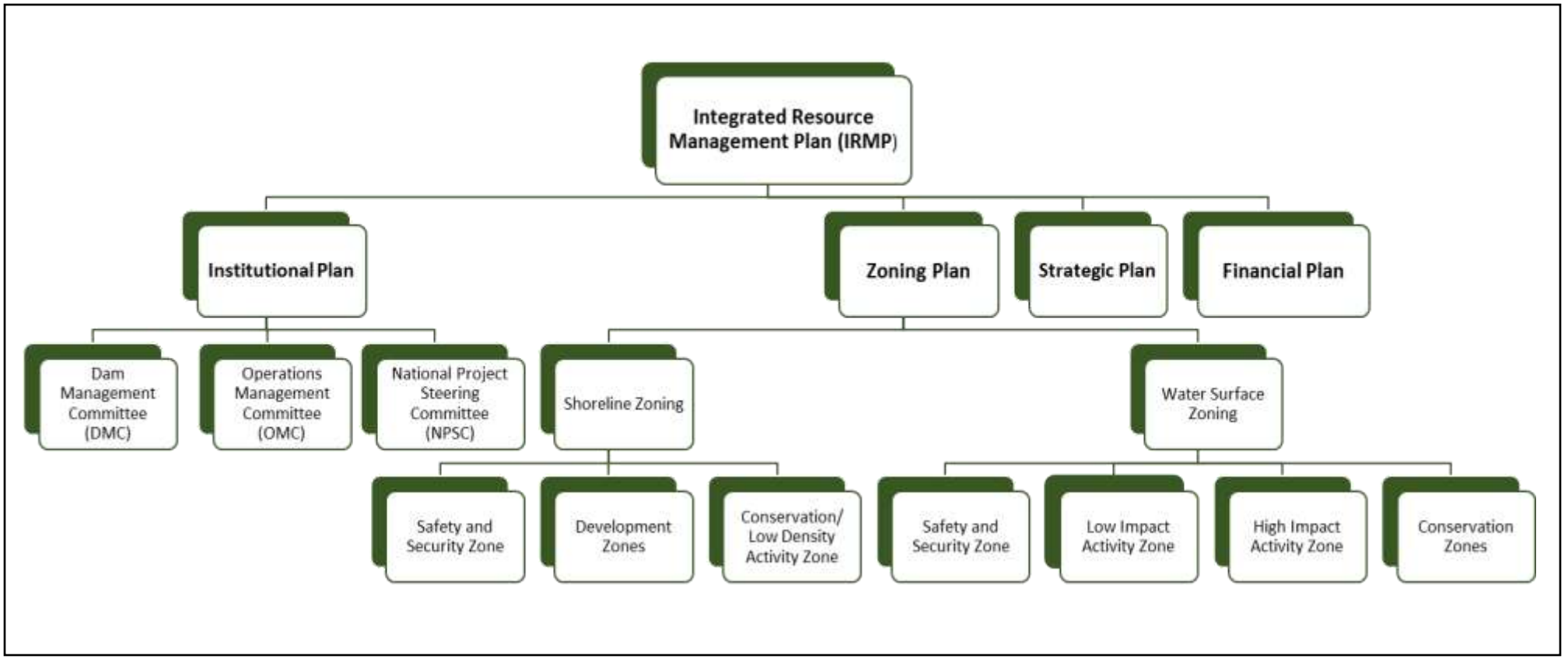

Figure 9: Integrated Resource Management Plan

4.1. INSTITUTIONAL PLAN

The Institutional Plan provides a framework for the institutional arrangements at the dam. The proposed management systems includes three (3) committees namely; The Dam Management Committee (DMC), Operations Management Committee (OMC) and National Project Steering Committee (NPSC). The appointed management authorities by DWS at the dams, also form part of the institutional structure.

4.1.1 Dam Management Committee (DMC)

DMC refers to any party that is interested or affected by the dam and will assist in raising and addressing issues relating to the dam.

One of the main functions of the DMC is to provide support to the Implementing Agent (IA) with the management of the dam for recreational purposes and to assess commercial opportunities at the dam. As such, an agenda item related to the Strategic Plan for commercialization is required. In addition, changes in water quality, developments in the area, status of Aquatic Invasive Species, education and information programmes should be discussed. The DMC must meet quarterly.

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

- 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 the floating AtoN and demarcation markers are in place and setting times for use of the dam (no recreational activities can take place between sunset and sunrise);
- 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 10 illustrates the proposed user groups that will form part of the DMC.

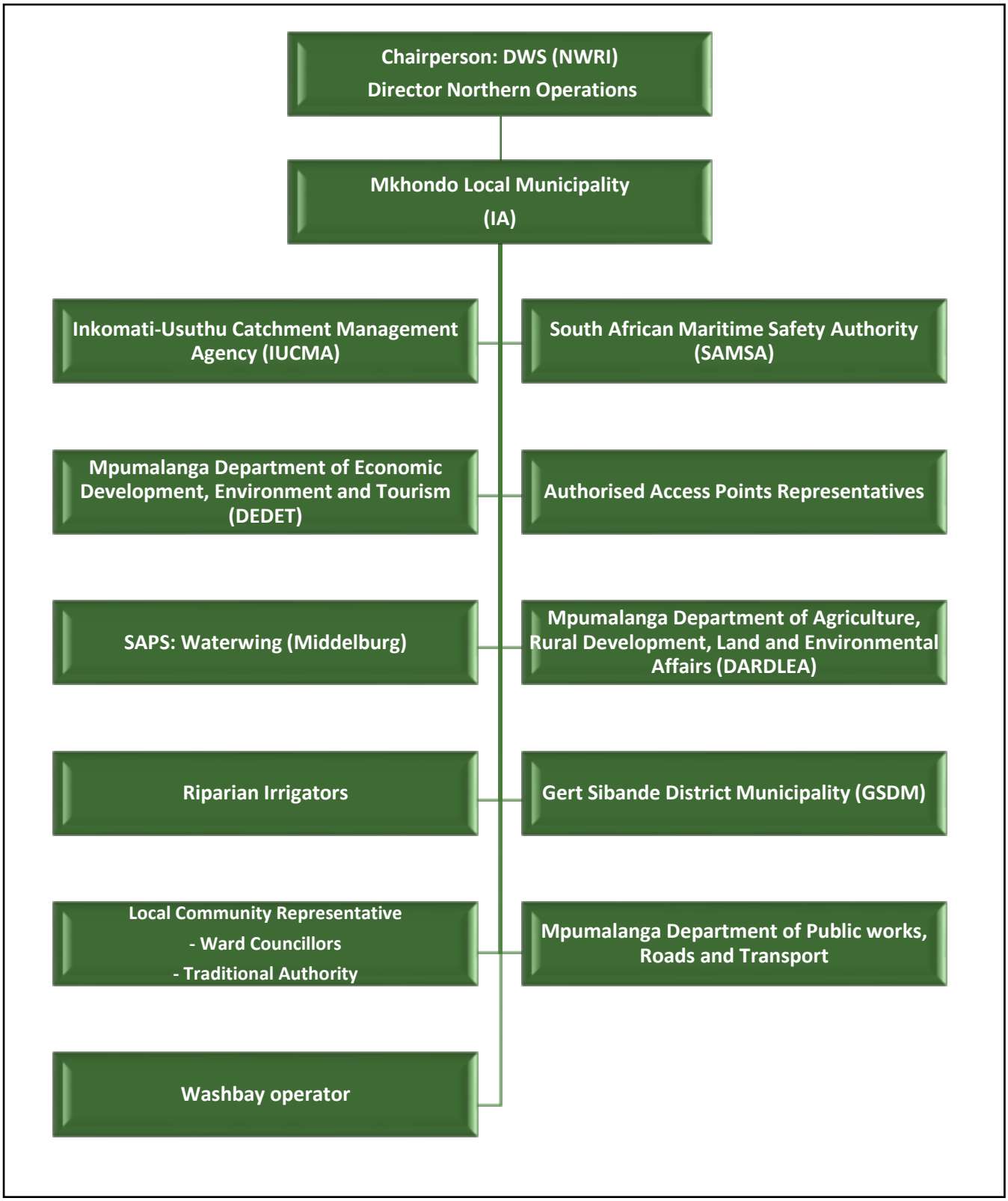

Figure 10: Proposed DMC

The DMC will have a number of management tools which will enable proper management of the dam in line with legislative requirements.

4.1.1.1 Management Tools

Terms of Reference

The DMC and NPSC will be guided by Terms of Reference (ToR) regarding roles and responsibilities. ToR is not required for the **OMC** as this is an existing reporting structures. The ToR provide guidance on the following management aspects:

- 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.

Agreements

One of the main management tool available is the use of agreements to ensure proper use of the dam in line with the RMP vision and objectives. Although agreements with some recreational clubs exist, there is no overarching agreement to manage recreational use at the dam.

All the existing agreements should be reviewed within the 12 months of the RMP being approved. This is to ensure that the agreements are aligned with the objectives of the RMP.

Agreements between DWS and Implementing Agency

MLM will be appointed as an Implementing Agency (IA) for the RMP of Heyshope Dam. MLM and DWS will sign a Memorandum of Agreement (MOA), which is a legal binding document which will outline the roles and responsibilities and conditions to be followed by both parties in terms of managing the water resource for recreational use.

The minimum requirements of an IA include the following:

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

The IA is appointed to manage commercial and recreational use of the dam. This would include the following:

- Management of public access area;
- 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.

Regardless, all agreements should be in line with the RMP requirements and relevant Legislations and Regulations.

Recreational Use Agreements

Recreational Clubs must enter into an agreement with the IA who will be responsible for the surface water and shoreline management of the dam. All recreational use at the dam must be through an appropriate Legal Framework. However, all agreements must be approved in writing by the IA.

Recreational Use Agreements must be developed in line with the conditions stipulated in the agreement between DWS and the IA. All agreements must be finalised within twelve (12) months of the RMP being gazetted.

Safety of Navigation Agreements

In addition to its common law responsibility, DWS is, in terms of the requirements described in the National Water Act, 1998 (Act No. 36 of 1998), amongst others, responsible for the safety of GWWs and watercourses, including its dams. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required fixed and/or floating Aids to Navigation (AtoN)[4] for general navigation.

Agreements between SAMSA and DWS, other relevant Parties or Bodies are to be concluded to allow them to:

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

Access Agreements

All surface water and shoreline access must be formalised. The conditions for such access must be written into the agreement. All illegal practices must be addressed. Appropriate action must be taken to ensure that all parties comply with the requirements of the RMP.

All adjacent landowners and clubs must be made aware that access to the surface water as well as shoreline should only be through authorised access points. Accessing the surface water through unauthorised access points is an illegal activity unless they enter into a formal agreement with IA. Further, a formal agreement with IA will be required for all adjacent landowners and recreational clubs that have direct access to the water surface of the dam through constructed slipways, natural slipways or jetties for angling and/or launching of vessels.

The wash bay must be built on State Property as part of the CIWSP. A formal agreement is necessary between the IA and Department of Environmental Affairs (DEA) on the management and maintenance of the facility.

Event Applications

The dam is used for competitive angling events. All events must be managed through an event application process. The events application will be submitted to the IA for approval and to DWS for commenting. These applications must follow a specific template and will include the following:

- Number of participants;
- Emergency Response Plan;
- Advertising and branding (will need to be in line with DWS communication requirements); and
- 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 should be affiliated to a SASCOC affiliated organisation. The development targets set by the National Organisations must be met.

4.1.2 Operations Management Committee (OMC)

There is an existing Chief Director: Infrastructure Operations Management Committee (CD: IO MANCO) within the NWRI which comprises of all directors of four (4) operations (Northern, Southern, Eastern and Central) and is chaired by the Chief Director of Operational Infrastructure within NWRI as illustrated by **Figure 11.**

The committee should meet quarterly discussing matters relating to operations and maintenance of all GWWs. RMP must be a standard agenda item. Any matters relating to the RMP that are outside the scope of DWS will be escalated to the NPSC.

[4] AtoN refers to any sort of marker which aids the traveler in navigation; the term is most commonly used to refer to nautical or aviation travel, common types of such aids include lighthouses, buoys, fog signals and day beacons.

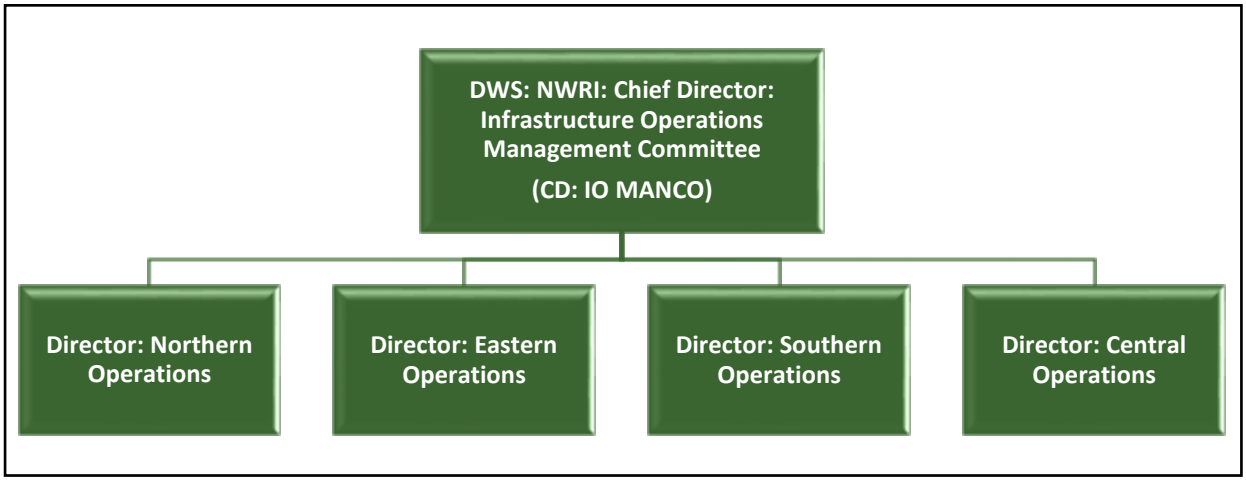

Figure 11: Existing CD: IO MANCO

4.1.3 National Project Steering Committee (NPSC)

NPSC is formed by DWS and is made up of representatives from National Government Departments and Implementing Agencies that are relevant in terms of managing the water resource.

The primary function of the NPSC is to provide guidance on recreational water use in terms of their respective mandates as well as to ensure that continuous support by different Government Sectors is provided to the dam with the aim of achieving sustainable utilisation of the dam for recreational purposes. The NPSC should meet twice a year. **Figure 12** illustrates a typical example of Governmental Departments that will form part of the NPSC:

Figure 12: Proposed NPSC

The role of the relevant departments forming part of the NPSC is listed below:

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 CIWSP is a project piloted by 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 culture, hospitality, tourism and sport sectors.

Department of Agriculture, Forestry and Fisheries (DAFF):
The purpose of DAFF includes sustainable development and management of resources to maximizing the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems.

Operation Phakisa expansion to inland dams is one of DAFF initiative aimed at unlocking economic potential of fisheries sector within the inland water. The latter programme will be used as benchmark for implementation of conservation policies while implementing job creation within fishery and fish processing market.

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. Other function of the Department is to support Provinces and Local Government in fulfilling their constitutional and legal obligations.

Department of Environmental Affairs (DEA):
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 Department should ensure that Environmental Impact Assessments is undertaken for all activities that triggers EIA Regulations at the dam. Furthermore, DEA through WfW programme can assist to eradicate alien invasive plants species (Blue Gums and Parrot Furthers) and alien invasive fish species at the dam.

Department of Public Works (DPW):
DPW has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the Department as some of the recreational activities will overlap into the State Land, e.g. trail running, biking and running.

Department of Rural Development and Land Reform (DRDLR):
The Department is tasked with the facilitation of land claims within the country. They are also involved in rural development by improving both economic infrastructure (such as roads, etc.) and social infrastructure (e.g. communal sanitation and non-farming activities).

Department of Sports and Recreation (DSR):
The Department is mandated to promote and develop sport and recreation activities and also in co-ordination of the relationships between the Sports Commission, national and recreation 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 rationalization 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 rationalization of the activities of those who are active in the tourism sector.

Department of Transport (DoT):
Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea, including small vessels and inland waterways.

Department of Water and Sanitation (DWS):
DWS through the National Water Act, 1998 (Act No. 36 of 1998) is mandated to protect aquatic and associated ecosystems and their biological diversity as well as to reduce degradation of the water resources. As part of its mandate, DWS initiated the development of RMPs together with the supporting BPs with the aim of ensuring sustainable and equitable development, utilisation and management of GWWs.

National Treasury (NT):
The Department is mandated to support the optimal allocation and utilisation of financial resources in all spheres of government. As part of the RMP, The National Treasury Public Private Partnership (PPP) Toolkit for Tourism (2005), will assist the process of tourism-based businesses development 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, Provincial and Local Government Institutions.

South African Maritime Safety Authority (SAMSA):
Administers and executes maritime related legislation and regulations, including the National Small Vessel Safety Regulations and ensures standardisation, harmonisation and compliance of all AtoN in South African waters.

South African Police Service (SAPS):
The South African Police Service have been entrusted with the responsibility of creating a safe and secure environment for all people in South Africa as well as to prevent 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 of sports as well as to act as a controlling body for sports in South Africa. It can also assist to coordinate organise events at the dam.

4.2. ZONING PLAN

According to DWAF (2006), a site-specific master planning and zoning which describes a framework for the allocation of zones needs to be undertaken based on the results of the Encumbrance Survey and basic Research regarding the Bio-physical, Social and Cultural environment as well as the objectives set by the Stakeholders (refer to section **3.6**).

The proposed Zoning Plan will integrate conservation, recreation and development whilst not retarding the primary functions of the dam.

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. The Water Surface is zoned as follows:

Safety and Security Zone:
It covers a minimum of 100m area from the wall and outlet works indicated by demarcation markers and AtoN. 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 to ensure the safety of the public. This is a no-go zone to the public unless authorised.

Conservation Zones:

The aim of this zone is to conserve and protect sensitive aquatic habitation at the inlet(s) of the dam. According to Section 12 and 26 of NWA, the existence of these zones is thus not negotiable as it is imperative to protect the water resource for the purposes relating to basic human needs, environmental sustainability and water quality requirements. Access to these areas 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 act as a buffer between High Impact Activity Zones and Conservation Zones. 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 and small scale fisheries.

High Impact Activity Zone:

This zone has the largest water surface area and is located where the reservoir is at its deepest. It caters for high impact activities associated with high speed, wake and noise activities such as motor boating, house boating, water skiing, para-sailing, and kite-surfing.

The water surface zoning colour coding mean the following:

Color	Zone Description
Red	Safety and Security Zone
Green	Conservation Zone
Sky Blue	Low Impact Activity Zone
Dark Blue	High Impact Activity Zone

Table 12: Proposed Water Surface Zoning Description

Zone Name	Permissible activities	Non Permissible activities	Recommendation
• Safety and Security Zone.	• Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel.	• No public access	• Area should be demarcated by demarcation markers and AtoN.
• Conservation Zone.	• Access is limited to conservation and research personnel.	• No public activities are allowed in order to allow for: o Undisturbed fish and bird breeding habitats • To limit pollution potential.	• These areas should be demarcated by demarcation markers and AtoN. • Strict management and control of these areas are necessary, especially with regards to unlawful net fishing.
• Low Impact Activity Zone.	• Activities associated with no or little wakes, such as: o Swimming o Canoeing o Boat angling o Sailing o Wind surfing o Kayaking o Paddle boating o Float tubes o yachting o Aquaculture project • Development of sport with specific requirement for low wake water surface conditions.	• No high impact activities such as o Motorised boating o Water Skiing o House boats o Para-sailing o Kite-surfing o Jet skis	• Area should be demarcated by demarcation markers and AtoN. • Launching and mooring of vessels should take place at this zone. • Recreational users will be responsible for the buoys system based in delineated zones while complying with DWS/SAMSA specifications.
• High Impact Activity Zone	• Motorised boating • Water Skiing • Para-sailing • Kite-surfing • Jet ski	• No low impact activities such as: o Swimming o canoeing o Sailing	• Area should be demarcated by demarcation makers and AtoN. • All activities within the high impact zone shall take place beyond 70m from the shoreline. • 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.

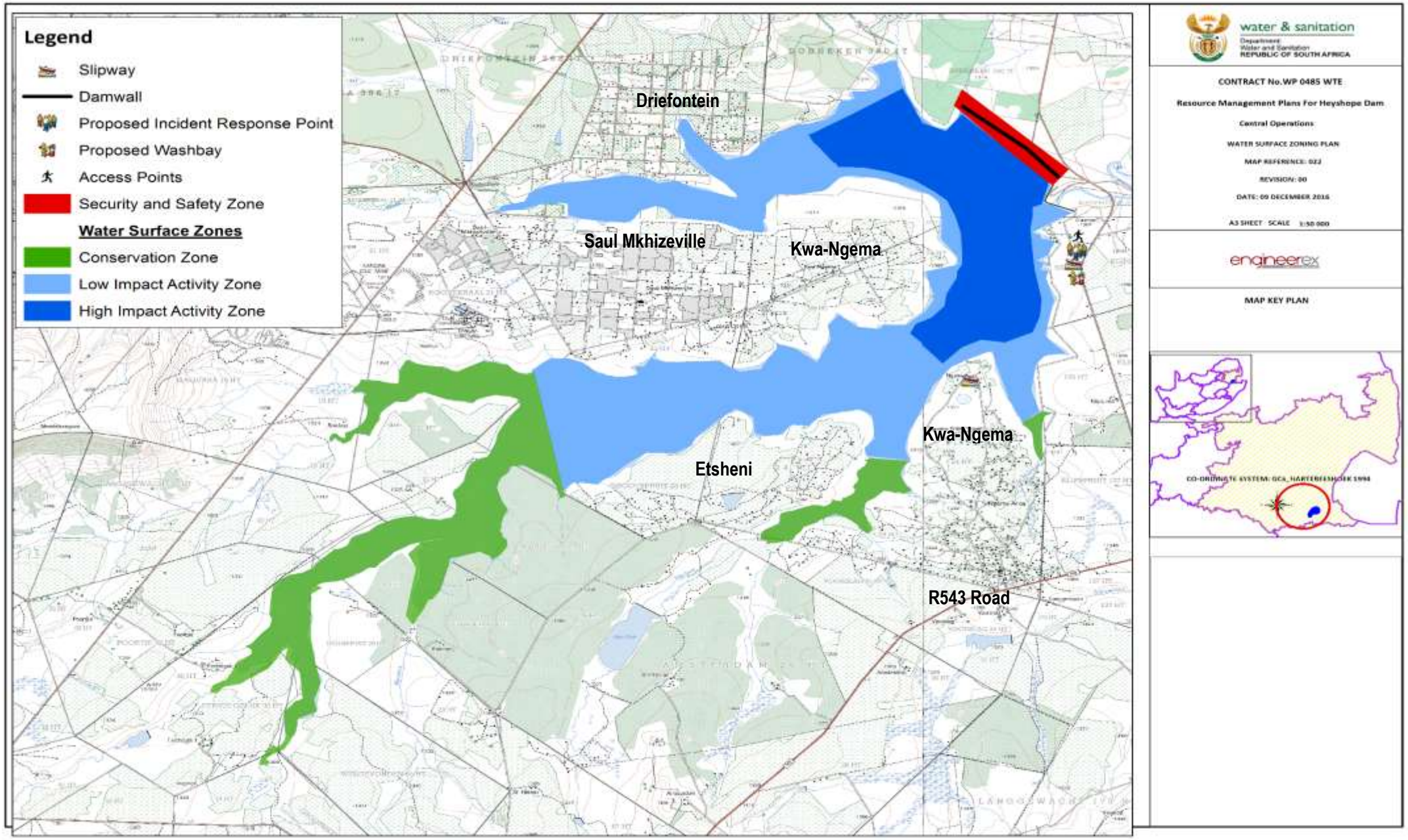

Figure 13: Proposed Water Surface Zoning Map

4.2.2 Shoreline Zoning[5]

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 and not permissible on the land adjacent to the dam (DWS purchased boundary). The management zones include:

Safety and Security Zone (dam wall and associated DWS infrastructure):

It is applicable to the area surrounding the dam wall and the outlet works. The extent of this zone is determined by 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 to ensure the safety of the public and surrounding areas. This is a no-go zone to the public unless authorized.

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, bird watching, etc. This area is reserved to prevent ecological damage due to development activities hence high impact development not permitted.

Medium Density Activity Zone:

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

High Density Activity Zone:

This area is reserved 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 livelihood is maintained and improved. Activities include subsistence fishing, livestock watering points, small scale community gardens, etc.

The shoreline zoning color coding means the following:

Colour	Zone Description
Red	Safety and Security Zone
Green	Conservation/ Low Density Activity Zone
Yellow	Medium Density Activity zone
Orange	High Density Activity Zone
Brown	Community Resource Zone

[5]Permanent structures within the purchase line are not allowed. All developments should be outside 1:100 year floodline.

Table 13: Proposed Shoreline Zoning Description

Zone Name	Permissible activities	Non Permissible activities	Recommendation
• Safety and Security Zone.	• Fire management • Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel.	• No public access	• A minimum area of 100m wide downstream the dam wall should be demarcated preventing public access and use.

• Conservation/ Low Density Activity Zone.	• Conservation management activities:
	  ○ Bird watching
	  ○ Hiking trails
		• Development	• These zone should control access to ecological sensitive areas.

• Medium Density Activity Zone.	• Day visitors
	• Picnics
	• Camping
	• Caravan Park
	• Shoreline fishing
	• Wash bay
	• Allowed facilities:
	  ○ Braai facilities
	  ○ Ablution facilities
		• Permanent structures
		• Accommodation facilities such as chalets, guesthouse
			• The management of this area should follow PPP process in terms of the National Treasury.
			• All developments must be approved by IA and DWS.
			• Requirements of NWA and NEMA must be taken into account in all developments.
			• Camping, birding, picnicking, bank angling and access to the water must be done in accordance to access agreements.
			• Camping and picnicking is allowed only in designated areas.
			• Noise level to be kept at a minimum.
			• No littering at Camping and Picnic spots.

• High Density Activity Zone.	• Accommodation facilities:
	  ○ Chalets
	  ○ Guesthouse
	• Recreational Boat House
	• Infrastructure for services Small Scale fishery project
		• Canoeing
		• Hiking
		• Camping
		• Picnicking
		• caravan park
		• Permanent structures
			• The management of this area should follow PPP process in terms of the National Treasury.
			• All developments must be approved by IA and DWS.
			• Requirements of NWA and NEMA must be taken into account in all developments.

• Community Resource Zone.	• Subsistence fishing • Livestock watering points • Small scale community gardens	• Chalets • Recreational club houses • Hiking • Braai facilities • Camping	• Demarcation of the area by fence and provision of an access control.

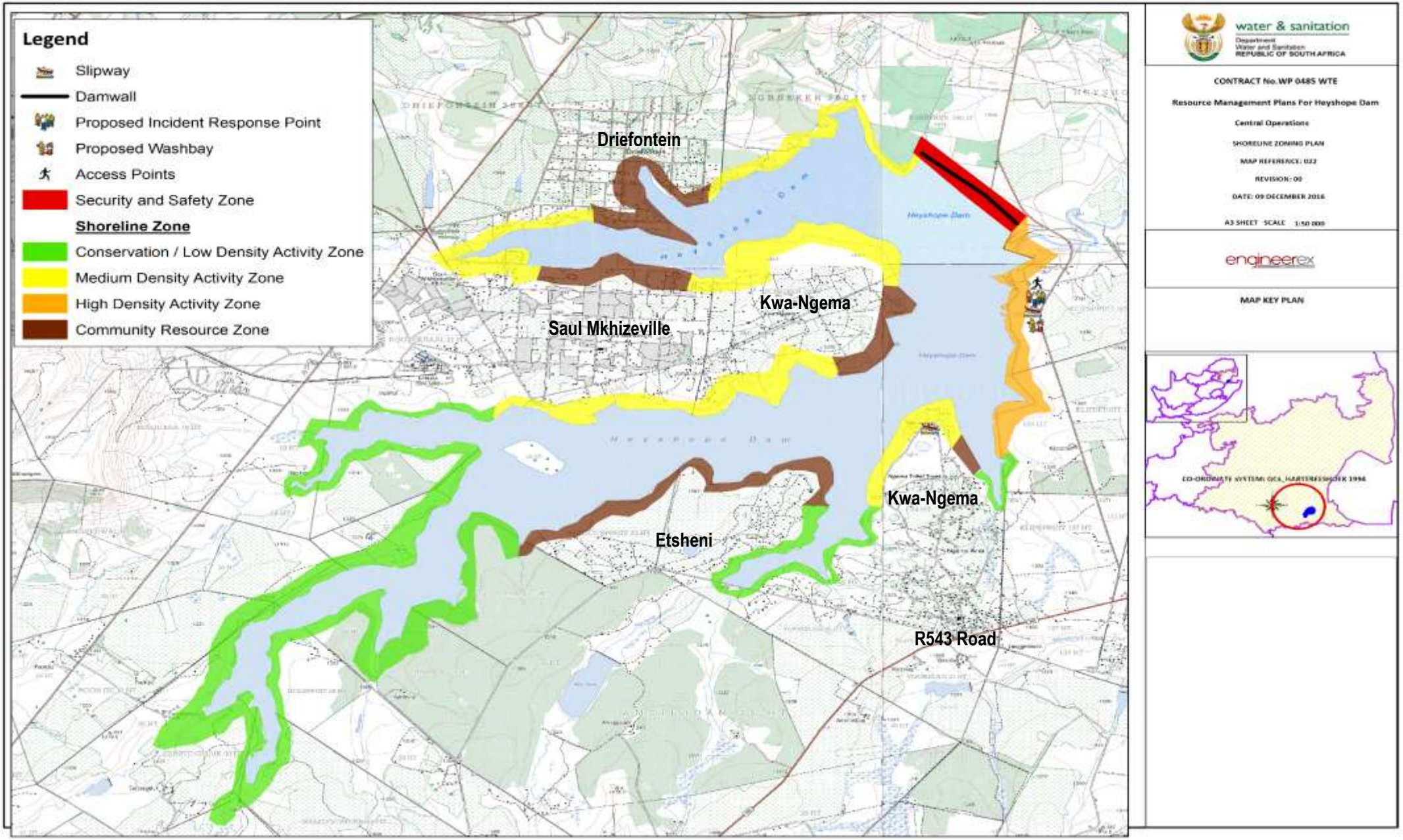

Figure 14: Proposed Shoreline Zoning Map

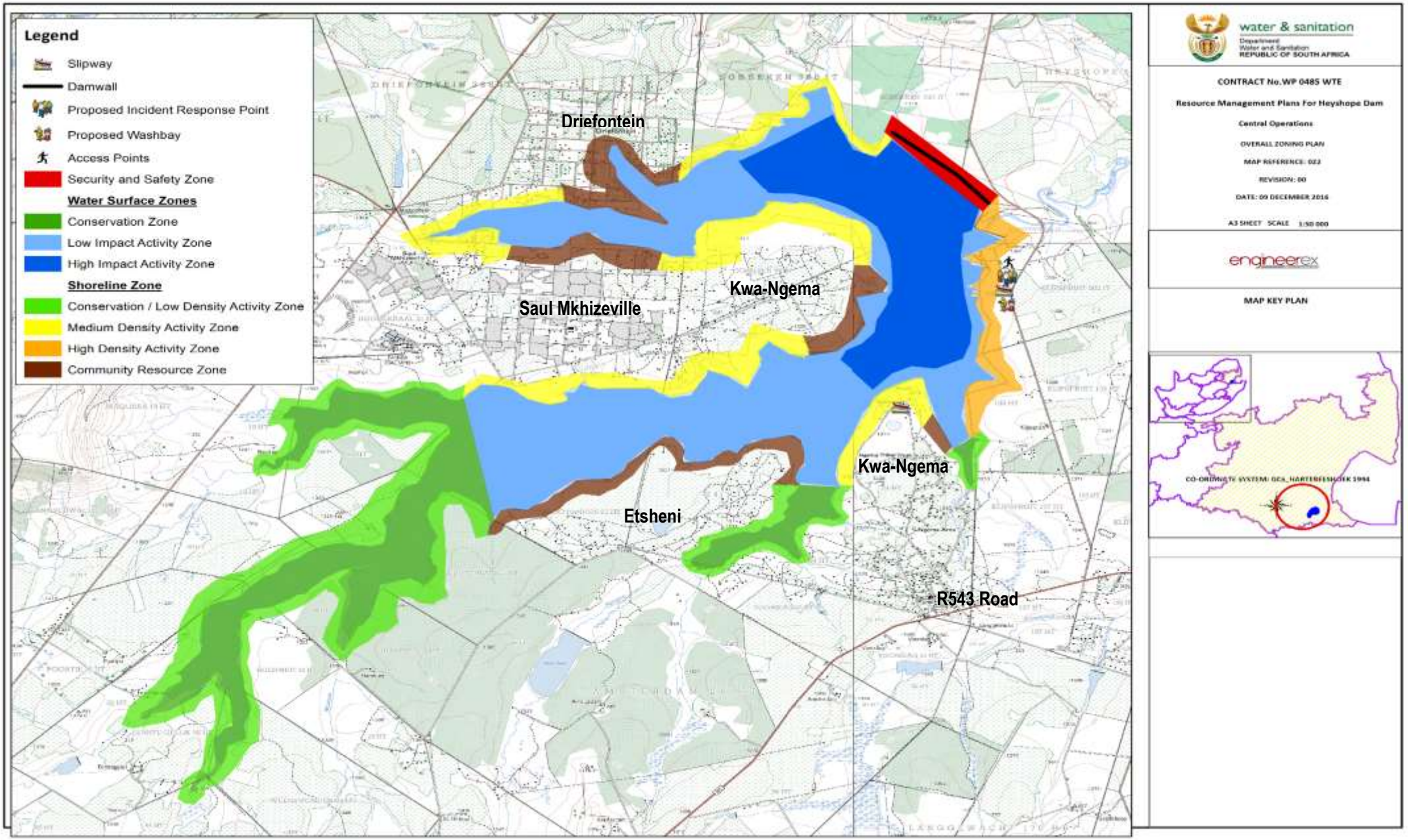

Figure 15: Proposed Overall Zoning Map

4.2.3 Carrying Capacity

In order to determine the degree or possible recreational use on the water surface, the Methodology for Carrying Capacity Assessment: Recreation Water Use (DWS 2003) was used as guideline to determine the level of activities that would be sustainable at Heyshope Dam

Carrying capacity for recreation provides a guideline to ensure that recreation at the dam is safe, that users do not feel crowded and that they enjoy the use of the dam for leisure activities.

There are three kinds of carrying capacity:

- **Physical Carrying Capacity** (PCC) – this is the maximum number of users that can physically fit onto the water surface at any given time;
- **Real Carrying Capacity** (RCC) – this is the maximum number of users that can use the resource once corrective factors that are unique to the dam are taken into account; and
- **Effective** (or permissible) **Carrying Capacity** (ECC) – this is the number of visitors that can use the resource, given the management capacity.

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, thus: **PCC > RCC and RCC ≥ 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 refers to the maximum number of users that can physically fit into or onto a defined water resource, over a particular time.

Formula: PCC = A ×U/a ×Rf

- **Where A** = Area available for public use;
- **U/a** = area required for each user; and
- **Rf** = Rotation Factor (the number of visits per day)

A is calculated as the area of the water surface available for public use: 5023.8 ha

The **U/A =** There is a range of literature regarding the area required for different recreational users.

Craft	U/A (ha/craft)
Powerboats	4.0
Angling	3.0
Canoeing	1.0
Average	**2.7**

Based on the fact that most activities do not require much space, the average hectare per user is 2.7 ha (27 000 m^2), the value of 5.0 ha (50 000 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 PCC for Heyshope Dam can further be calculated as:

PCC = A × U/a × Rf
=5023.8 × 1/5 × 1
= 1000 Vessels

Real Carrying Capacity

It refers to the maximum permissible number of users to the water resource, once the corrective factors (Cf) derived from the particular characteristics of the site have been applied to the PCC.

The RCC takes factors into account that limits recreation. The limiting factors include:

Safety Areas/ No go Zones (65 ha); and Conservation Area (456 ha).

The above factors results in 10.37 % decrease in water surface available for recreation at the dam, therefore 89.63% of the surface area of the dam is still available for recreation.

RCC for Heyshope Dam is therefore:

RCC = PCC × (100 – Cf1) % × (100 – Cf2) % × (100 – Cfn) %

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

RCC = 1000 × (100 – 10.37) %/100
= 896.Vessels

Effective Carrying Capacity

The maximum number of visitors that a site can sustain, given the management capacity (MC) available.

Currently there is no formal management structure in place, as such the ECC is 0. The ECC will be calculated after the proposed Institutional structure (as part of the RMP) have been implemented in order to manage the sustainable utilization of the dam for recreational purposes.

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 do we want?);
- Motivation (Why do we want to achieve this?);
- Action Projects (How do we achieve this?); and
- Management Support (Who will be involved?).

In **Tables 16 - 18**, the Strategic Plan on how to achieve the identified objectives identified regarding the dam is outlined.

Table 14: Strategic Plan for KPA 1**:** Resource Management

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Water quality: • To improve and maintain the water quality of Heyshope Dam**.**	• It is alleged that Kangra Coal Mine is discharging untreated wastewater into the dam, which threatens the water quality of the dam. • Community members are dumping disposable nappies in streams and river flowing into the dam.	• Water monitoring points should be established and monitored regularly in order to find out the extent of the pollution. • MLM, DEA and Department of health should educate the local communities including those communities which are adjacent to the dam through awareness campaigns, how to handle general solid waste (waste management) and the consequences (health related) of contaminating the water resource. • There should be proper waste management systems (ablution and waste bins) in the facilities around the dam.	• DWS, DMC, DEA, Department of Health (DOH), MDARDLEA and the municipalities (local and district) MLM (IA) and Gert Sibande District Municipality.
Alien Invasive Species: • To prevent the regeneration and spread of Alien Aquatic Weeds in the dam to support the proposed recreational activities.	• There used to be alien aquatic weeds at the dam and they were removed by working for water project. • Aquatic weeds are a problem in most of the dams and they need to be prevented to reoccur at Heyshope Dam.	• To construct a wash bay at the dam in order to control and eliminate the transfer of alien aquatic weeds from other dams. • Develop and implement strategy to manage and control aquatic invasive species. • Monitoring of the dam for signs of regenerating of alien aquatic plant species.	• DEA (Working for Water), DWS, DMC, MDARDLEA and MLM (IA).

T able 15: Strategic Plan for KPA 2: Resource Utilisation

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Access Control: • To ensure that there is safe and secure access to the dam.	• The dam is not fenced and can be accessed from any point. • The bridge which connects Kwa-Ngema and Etsheni has been flooded by heavy rains, this has resulted to the local communities to use a long route to go to these places.	• To establish alternative access points to be used by the public and tourists. • An agreement needs to be entered into by DWS and the entity which will manage and operate public access and facilities. • Access fees must be reasonable to ensure that the dam remains an affordable destination. • Private recreational access and use should be regulated through agreements. • All the recreational clubs adjacent to the dam need to have lease agreements with MLM (IA) in order to access and use the dam. Verify and regularize the existing recreational activities at the dam. • To upgrade all roads that led to the dam for ease access and use of the dam for recreational and emergency purposes.	• DWS with the support of the MLM (IA) and DMC.
Public Safety: • To promote public safety for local community and tourists when accessing the dam for recreational purposes.	• The dam is not fenced and it can be accessed from any point and such has resulted in tourists been targeted by criminals in the area. • Public safety is very important when developing and implementing the RMP. • The RMP should eliminate incidents assorted with recreational use of the dam by enforcing dam safety rules. • There are no AtoN demarcation markers at the dam wall and has	• Implementation of DWS incident management system. • Formal appointment of South African Maritime Safety Authority (SAMSA) Enforcement Officer at the dam. The officer must be able to utilize the Incident Management System to alert South African Police Service (SAPS) Water Wing of any illegal activity. • Educate the Local Communities about the importance of safety measures around the dam basin in order to curb criminal activities like mugging or stealing at the dam. • Ensure that the skipper and the crew comply with SAMSA Regulations at all times.	• DWS with the support of MLM (IA), DMC, DEA: WfW, SAMSA, DEDET, DoT and other departments which are concerned about public safety.

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
	resulted in drowning incidents by people practicing fishing in this area.	• Implementation of standardised and harmonised AtoN and Demarcation Markers. • To fence off all hot spots at the dam and at the canal using high security fence in order to eliminate drowning of people and livestock and also to prevent criminal activities at the dam.	
Sustainable fishing: • Promote sustainable harvesting of fish at the dam.	• There is a lot of unauthorized activities which are taking place at the dam including net fishing through unauthorized access points.	• Permits (fishing license) must be acquired and the use of gill nets must be prevented, as it has significant negative impact on fish population within the dam. • Educate people on fishing methods that are safe and sustainable. • Preserve the core habitats for nesting, resting, feeding and breeding of fish within the inlets, by demarcating areas for subsistence fishing and by installing demarcation markers.	• MDARDLEA and MLM (IA)
Aquaculture: • To introduce aquaculture at the dam.	• Fisheries have the opportunity to provide nutrition, food security, sustainable livelihoods and poverty alleviation to the local community. • Aquaculture will make an important contribution to nutrition, food security, sustainable livelihoods and poverty alleviation to the local community.	• A feasibility study must be conducted to determine the viability of aquaculture project, as well as to demarcate suitable area for such project at the dam. • Job opportunities arising should benefit all the community members and should be allocated fairly.	• DAFF, MDARDLEA, and MLM(IA)
Tourism: • To promote Heyshope Dam into a tourists attraction point.	• Heyshope Dam is one of the well-known largemouth bass fishing destination in South Africa and Recreational fishing should be enhanced in order to attract more tourists at the dam	• a. To update the feasibility study done by Gert Sibande District Municipality (GSDM) to be in line with the objectives of the RMP. The review of the feasibility study will determine activities that will be considered for recreational and commercial use.	• GSDM, MLM(IA), MDARDLEA, DMC and DWS

Table 16: Strategic Plan for KPA 3**:** Benefit Flow Management

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
<u>Community participation and beneficiation:</u> • To uplift the local economy by empowering the local community.	• Currently the dam is not contributing towards local community upliftment. • There is a two (2) hectare farm planted with various vegetables and it requires water from the dam to sustain it.	• Strengthening community participation and beneficiation (e.g. via Skill Development Programmes). • To develop a strategy on capacity building and training programmes at the dam for the youth and for cultural, heritage and tourism sectors, and implement accordingly. • To support community based projects for the local communities e.g. vegetable farming. • The job opportunities that might arise from the implementation of the RMP should follow the PPP to ensure community beneficiation.	• MLM (IA), DMC, DEA, SAMSA, MDARDLEA, IUCMA and DWS
<u>Institutional Planning:</u> • To establish an appropriate institutional structure which will effectively manage the recreational use of the water resource and the surrounding environment.	• There is no institutional structure which is managing the dam for recreational use. • The proposed institutional structure will effectively manage the dam and combat criminal activities at the dam.	• Formalization of the RMP proposed Institutional Structure. • The roles and responsibilities of the role players have to be clearly defined on the RMP implementation plan. • Ensure that the following agreements are in place (as necessary): ➢ Agreements between DWS and IA; and ➢ Access Agreements with all dam users. • To appoint MLM as an IA to manage the dam for recreational use.	• DWS

4.4. FINANCIAL PLAN

The RMP provides guidance on cost recovery mechanisms to ensure the sustained and improved management of the dam. There are opportunities for PPPs which could further unlock the economic potential of the dam. PPPs allows for DWS to make State Assets such as GWWs available to private parties who wish to engage in tourism related commercial operations (DWAF, 2009). PPPs should be established as per Regulation 16 of the National Treasury.

The dam is a State asset and as such all profits generated from the recreational use, should also be used to further develop the dam. The public should not be denied access to the dam. All fees associated with the usage of the dam for recreation should take into account the socio-economic status of the users. The access fees should make a provision for equitable access.

A more detailed Financial Plan (FP) is contained in the Business Plan (BP) (volume 5 of 5), which will facilitate the implementation of the RMP by providing implementation program cost estimate for all possible economic recreational activities.

The information acquired from the RMP will be used to produce the 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 non-economic 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 Heyshope Dam RMP. It also describes the financial management and operational requirements to implement the Objectives of the RMP.

WAY FORWARD

Once the RMP and its BP are approved by the Minister of Water and Sanitation, it will be published in the Government Gazette as a regulation in terms of Section 26 of the NWA.

Review of RMP

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

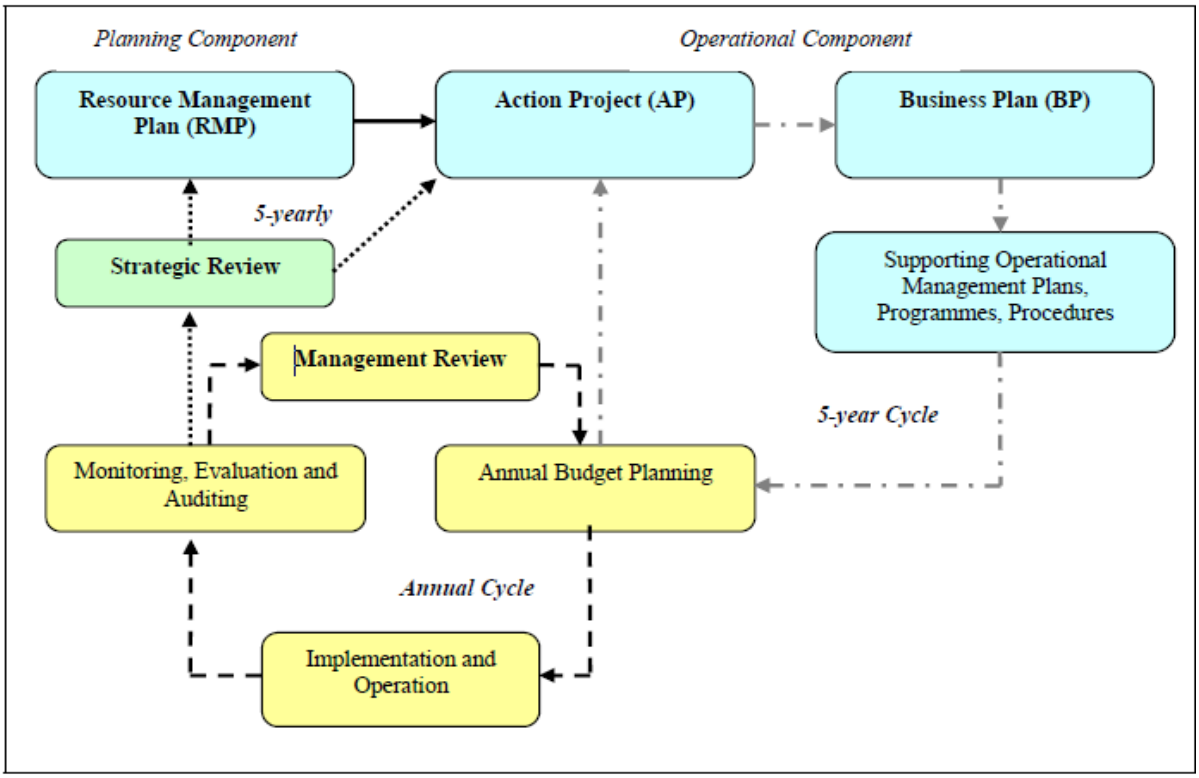

Figure 16: RMP and BP and Review Framework

CONCLUSIONS

The RMP documents the challenges that exists within the Heyshope Dam that can significantly impact on the utilisation and management of the dam and it's surrounding for recreational purposes. Such factors include legal, biophysical, socio-economic, hydrological as well as access to the resource. These factors will assist DWS with the most appropriate approach to ascertain that the issues are addressed before the implementation of the RMP.

The RMP will assist in effectively managing the dam and its surrounding environment. Furthermore its function is to implement an **Institutional Plan** for the effective management of dam. The focus on Institutional Plan is accompanied by a **Zonal Plan** which provides guidance on potential activities that are allowed on the dam, together with a **Strategic Plan**. In addition, a **Financial Plan** will provide guidance on funding requirements and funding options to implement the objectives of the RMP.

Furthermore the RMP promotes community participation and beneficiation, through Stakeholders engagement which were conducted to obtain common key objectives to be met by the RMP. The vision for the dam was formulated from the key common objectives identified by Stakeholders. Based on the strategic objectives identified for Heyshope Dam, a BP has been developed to describe a manner in which the potential recreational activities are to be financially resourced. Furthermore, by including the RMP in the Local Initiatives such as IDPs, LED, etc, can ensure effective co-operative governance as well as to provide necessary support with regards to the use of the dam for recreational purposes. Undertaken in this manner, it is believed that the potential of the water resource can be optimally unlocked in a sustainable and equitable manner.

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APPENDICES