

Resource Management Plan **FLAG BOSHIELO DAM**

REPORT – Volume 4 of 5

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WATER IS LIFE - SANITATION IS DIGNITY



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA



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- Department of Environmental Affairs;
- Department of Public Works;
- Department of Rural Development and Land Reform;
- Department of Water and Sanitation;
- Lepelle Northern Waters;
- Limpopo Department of Economic Development, Environment and Tourism;
- Limpopo Tourism Agency;
- Matlala Aloe Park;
- The community members of ward 16; and
- The Matlala Traditional Council.

Acknowledgement is also extended to other Stakeholders, not listed above, who attended and participated in the Stakeholder engagements.

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Annual Review of Business Plan	December	2018 ¹	2019	2020	2021	2022
Five (5) Year Review of RMP	December	2022				

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 Review	08/10/2015
2	Draft RMP for DWS Review	02/12/2015
3	Draft RMP for DWS Review	11/04/2016
4	Final RMP for DWS Review	16/08/2016
5	Final RMP for DWS Approval	14/12/2016

LIST OF ACRONYMS

AGIS	Agriculture Geo-Referenced Information System
AtoN	Aid(s) to Navigation
BID	Background Information Document
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sports Sector, Education and Training Authority
CD: IO MANCO	Chief Director: Infrastructure Operations Management Committee
CIWSP	Cooperative Inland Waterways Safety Programme
CMC	Co-Management Committee
CoGTA	Department of Cooperative Governance and Traditional Affairs
CPA	Communal Property Association
CPSI	Centre for Public Service Innovation
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DHS	Department of Housing Settlement
DMC	Dam Management Committee
DoT	Department of Transport
DPW	Department of Public Works
DRDLR	Department of Rural Development and Land Reform
DSR	Department of Sports and Recreation
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
ECA	Environment Conservation Act
ECC	Effective Carrying Capacity
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMLM	Ephraim Mogale Local Municipality
FSL	Full Supply Level
GIAMA	Government Immovable Asset Management Act
GP	Guideline Programme
GPS	Global Positioning System
GWWs	Government Waterworks
I& APs	Interested and Affected Parties
IA	Implementing Agency
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IMP	Integrated Management Plan
IRMP	Integrated Resource Management Plan
IUCN	International Union for Conservation of Nature
KNP	Kruger National Park
KPAs	Key Performance Areas
LAAP	Local Accountable AtoN Parties
LED	Local Economic Development
LEDET	Limpopo Department of Economic Development, Environment and Tourism

LNR	Leswena Nature Reserve
LTA	Limpopo Tourism Agency
MOA	Memorandum of Agreement
NDT	National Department of Tourism
NEMA	National Environmental Management Act
NT	National Treasury
NWA	National Water Act
NWRI	National Water Resource Infrastructure
OMC	Operations Management Committee
PCC	Physical Carrying Capacity
PFMA	Public Finance Management Act
PP	Public Participation
PPP	Public Private Partnership
PSC	Project Steering Committee
PSP	Professional Services Provider
RCC	Real Carrying Capacity
RMP	Resource Management Plan
RWU	Recreational Water Use
SAMSA	South African Maritime Safety Authority
SANBI	South African National Biodiversity Institute
SAPS	South African Police Services
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SDM	Sekhukhune District Municipality
SNR	Schuinsdraai Nature Reserve
SRSA	Sports and Recreation of South Africa
SWOT	Strengths, Weaknesses, Threats, Opportunities
TDA	Tourism Development Area
TWQR	Target Water Quality Range
WfW	Working for Water
WRC	Water Research Commission

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 Flag Boshielo 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) for Flag Boshielo 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 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: Flag Boshielo Dam is a gravity and earth fill type of a dam which impounds Olifants and Elands Rivers. It falls under ward 16 within the jurisdiction of Ephraim Mogale Local Municipality (EMLM) which forms part of the Sekhukhune District Municipality (SDM) in Limpopo Province, South Africa. Its GPS coordinates are: **24°48'48.32"S 29°26'10.47"E**.

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

The dam also currently offers recreational activities such as camping, Caravan Park, angling and canoeing.

Dam ownership and management: The DWS is responsible for the management of the dam. The DWS is in the process of appointing Limpopo Tourism Agency (LTA) for the management of the dam basin. There is currently no institutional structure to manage the recreational use of the dam. However, the structure has been proposed in this RMP. The recreational institutional structure is necessary for the effective governance of the Flag Boshielo Dam for recreational purposes.

Stakeholder engagements: 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 was formulated by the stakeholders.

The identified key common objectives are:

- To develop recreational activities that suites the climatic conditions of the area and to have sustainable measures in place for in case of natural disasters.
- To ensure non-infestation of alien invasive species in the dam and surrounding environment.
- To maintain a good water quality and protect the aquatic resource for recreational use as well as to ensure a healthy environment.
- To establish more access points which have lower tariffs to accommodate the rural communities around the dam.
- To stabilize the security system in order to be able to reduce the high level of poaching.

- To ensure that the current activities undertaken within the dam basin are permitted as per relevant legislation.
- To unlock the socio-economic potential of the dam for commercial opportunities such as fisheries and crocodile farming.
- To introduce tourism facilities (Holiday Resort) within the vicinity of the dam in order to retain the visitors around the area.
- To equip community members with the necessary skills and expertise.
- To develop a research centre within the dam where local and national tourists can conduct research regarding the faunal species within the dam (particularly the crocodiles).
- To allow local fishermen access to fish for subsistence purposes and encourage participation in the management of the dam.
- To have an improved management and communications structure in place with the appropriate power delegations to effectively manage the recreational use of the water resource in accordance with the RMP.
- To effectively zone the water resource and to assess all the relevant information that must be undertaken to ascertain both habitat and landscape sensitivity.

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

"To ensure effective co-management and sustainable use of the immaculate resource by all, without altering the tranquil surroundings to maximise the socio economic potential of Flag Boshielo Dam".

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 Flag Boshielo Dam that could enhance tourist attraction:

- Development of swimming pools and picnic areas, as the dam has a large number of crocodiles.
- Development of a bird hide for bird viewing.
- According to Sekhukhune Development Agency (SDA) (2012), the dam is also a good fishing spot, given that the dam spans over ten (10) kilometers and fishing can be done on boats.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF FLAG BOSHIELO DAM

The Flag Boshielo Dam is situated in Limpopo Province near Marble Hall. It is located at the confluence of the Olifants and Elands Rivers, at the end of quaternary catchment B51B (**GPS coordinates, 24°48'48.32"S 29°26'10.47"E**). The dam is under ward 16 of the Ephraim Mogale Local Municipality (EMLM) located in the Sekhukhune District Municipality (SDM). It forms the eastern and southern boundaries of the Schuinsdraai Nature Reserve (SNR) and approximately 4 km east of the dam is Leswena Nature Reserve (LNR). Situated on the eastern banks of the dam is Tambotie Ridge Lodge, a lodge managed by the Limpopo Tourism Agency (LTA). DWS is responsible for the management of the dam and is in the process of appointing LTA for the recreational management of the dam. See **Figure 1** for Locality Map.

The dam was established to serve primarily for domestic use, irrigation downstream of the dam and to ensure dry-season water storage for

mines in the area. In March 2006, the dam wall was raised by 5m in order to secure water for mining development, and to improve supply to rural communities through the Olifants River Water Resource Development Programme.

Limpopo Department of Economic Development, Environment and Tourism (LEDET) and LTA are currently directly responsible for the conservation and tourism management respectively of the SNR.

The activities currently taking place at the Tambotie Ridge Lodge includes angling (recreational fishing), rustic camping & Caravan Park, boating and birding. Recreational boating using motorised boats and ferries is also an attraction that brings visitors to the nature reserve or the dam specifically. The Matlala Aloe Park (Private) is situated on the eastern banks of the dam and it offers a camping facility, boating and fishing.

A more detailed description of the dam is summarized in **Table 1**.

Table 1: Flag Boshielo Dam Profile

Flag Boshielo Dam Profile	
Location	South Africa
Province	Limpopo
District Municipality	Sekhukhune District Municipality
Local Municipality	Ephraim Mogale Local Municipality
Nearest Town	Marble Hall
Completion Year	1987
Dam raise Completion date	2006
Co-ordinates	24°48'48.32"S 29°26'10.47"E
Purpose	Irrigation and domestic
Owners	Department of Water and Sanitation
Water Management Area	Olifants Catchment Area
Quaternary Catchment	B51B
Catchment area (km²)	23 605.0
River	Olifants River
Capacity (m³)	185 100 000
Surface Area (ha)	2 210

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

Flag Boshielo Dam Profile	
Wall type	Gravity (RCC) & Earth fill
Wall Height (m)	40
Length (m)	1224

Source: Department of Water Affairs (List of registered dams; March 2013)

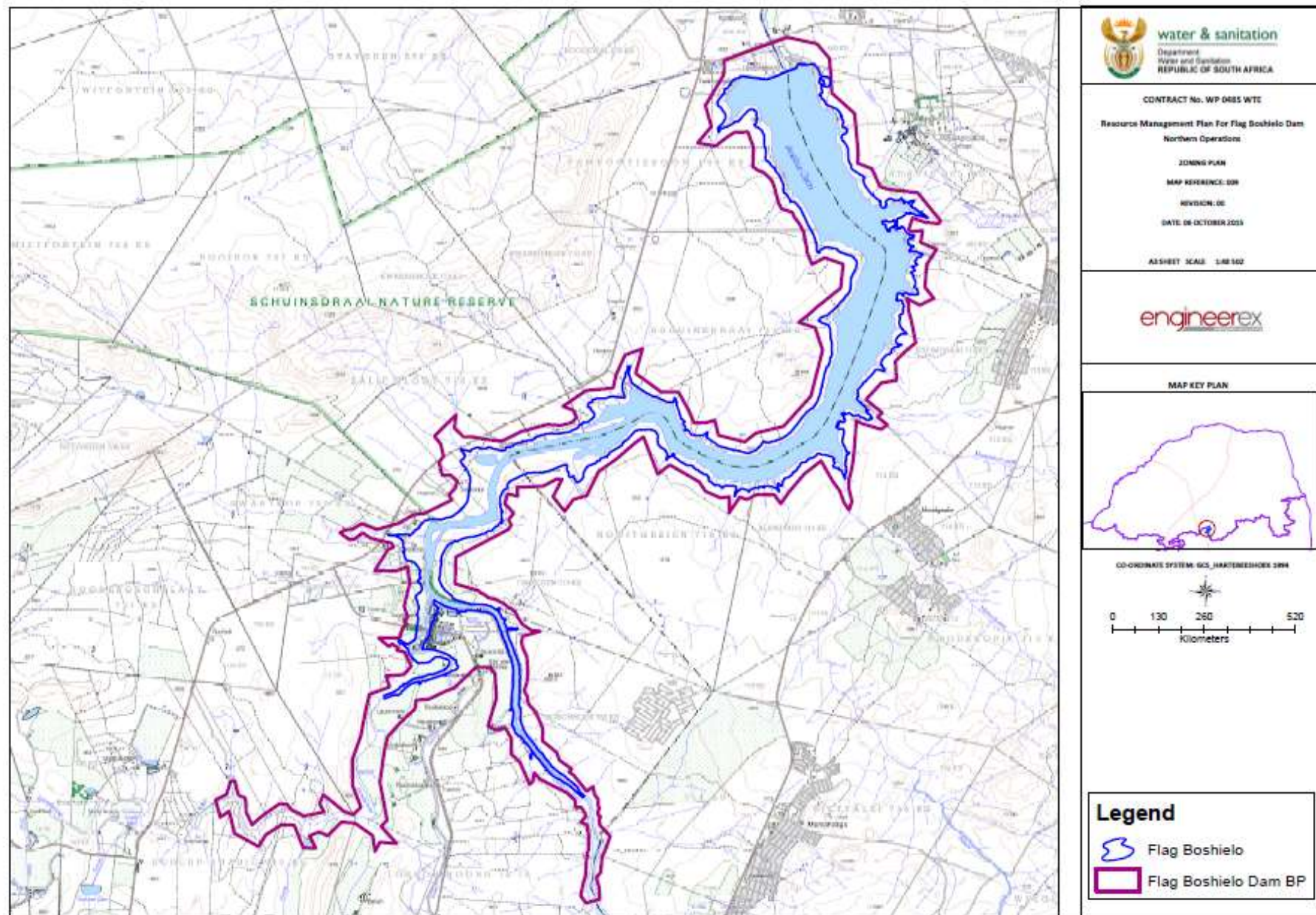


Figure 1: Flag Boshielo Dam Locality Map

1.2 BIOPHYSICAL ENVIRONMENT

Provided below are the bio-physical factors under various subsections including climate, topography, geology, flora, and fauna of the Flag Boshielo Dam.

1.2.1 Climate

The average temperatures show moderate fluctuation with average summer temperature 23°C, with a maximum of 28°C and a minimum of 18°C. In winter the average is 13, 5°C with a 0 maximum of 20°C and a minimum of 7°C as

measured at the Sekhukhune Land Weather Station (IDP, 2014/15). Frost occurs infrequently in this area. The area receives an average annual rainfall of 648 mm per year, the bulk of which is received during the summer months. The area receives the least amount of rainfall during July (with an average monthly rainfall of 3 mm per month) and the most in November (with an average monthly rainfall of 150 mm per month) (See **Figure 2**) (LEDET, 2012). A severe drought occurred between November 2002 and December 2005 (Dabrowski, et al. 2014).

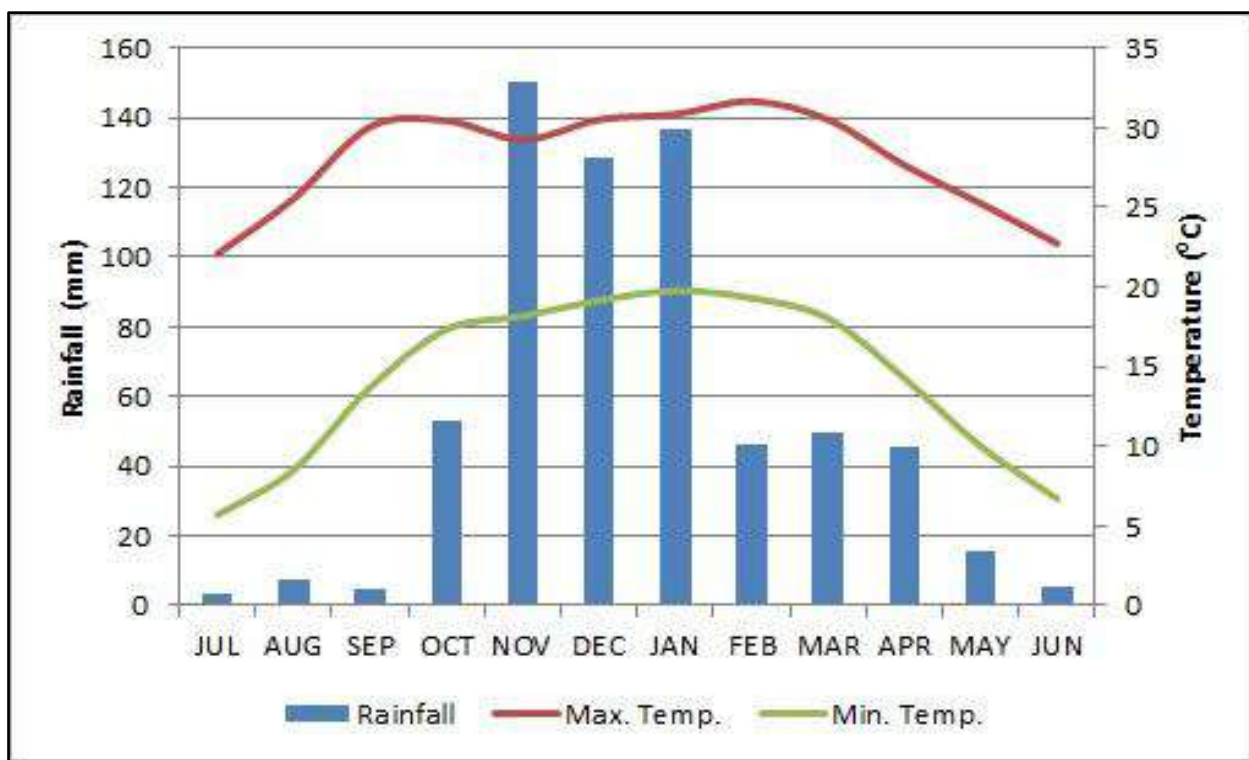


Figure 2: Average rainfall, minimum and maximum temperatures for Flag Boshielo Dam

1.2.2 Flora

The vegetation of the SNR comprises a Central Bushveld vegetation unit of the Savanna Biome (LEDET, 2012). Savanna is characterized by a herbaceous layer (usually dominated by grasses) with a woody component.

According to SANBI BGIS, (2014) there is also a Central Sandy Bushveld that is characterized by sandy plains and catenas supporting tall, deciduous *Terminalia sericea* and *Burkea*

africana woodland on deep sandy soils, with *T. sericea* often dominant on the lower slopes of sandy catenas. Low broad-leaved *Combretum* woodland is dominant on shallow, rocky or gravelly soils. Species of *Acacia*, *Ziziphus* and *Euclea* are often found on the flats and lower slopes on eutrophic sands, as well as less sandy soils. Tree and shrub species occurring in this vegetation unit include *Acacia burkei* and *A. robusta* (tall trees); *B. africana*, *C. apiculatum* and *C. zeyheri* (small trees); *C. hereroense*, *Grewia*

bicolor and *G. monticola* (tall shrubs); and *Agathisanthemum bojeri* and *Indigofera filipes* (low shrubs). Dominant grasses include *Brachiara nigropedata*, *Eragrostis pallens* and *E. rigidior*.

Protected species such as *Combretum imberbe* (See **Figure 3**), *Lydenburgia cassinoides* etc. have been identified in the area, such species are protected in terms of the National Forest Act of 1998.

As classified by SANBI (2014), the dam is situated in the veld type described as Mixed Bushveld by Ackocks (1975) (See **Figure 4**: Land Cover Map).



Figure 3: Combretum imberbe

1.2.2.1 Alien Invasive Species

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 Flag Boshielo Dam consists of the following alien invasive species; Syringa- *Melia azaderach* (Category 1b), Malberry- *Morus alba* (Category 3) and Red sesbania- *Sesbania punicea* (Category 1). *Sesbania punicea* species have been recorded along the banks of the dam. These plants have been submerged by water since the raising of the dam wall in 2006 and are not growing there at present. It is, however, possible that the *Sesbania* seeds are still present and the monitoring of wet areas should take place to ensure that this species does not re-infest (LEDET, 2012). The Department of Environmental Affairs, through the working for Water project is currently removing alien invasive species along the Olifants River (Flag Boshielo Dam included) to reduce the spread of the species.

Aquatic Alien Invasive Vegetation

Invasive aquatic plants are introduced plants that have adapted to living in, on, or next to water, and that can grow either submerged or partially submerged in water.

Their presence may harm native ecosystems or commercial, agricultural, or recreational activities dependent on these ecosystems. They may even harm human health.

These species can be spread in many ways including ships, boats, aquaculture, aquatic recreation, water gardening, connected waterways and many other pathways. Through these and other means, aquatic invasive species have been introduced into South Africa (Invasive Species South Africa, 11/04/2016).

The only aquatic alien invasive species that has been recorded at the Flag Boshielo is Kariba weed- *Salvinia molesta* (Category 1b). The species spreads only vegetatively by fragmentation. It forms dense mats of up to 50 cm thick which completely cover the water surface. The mats clog waterways and irrigation equipment, reduce water flow, impede navigation, fishing and other recreational activities, provide a breeding place for mosquitoes and bilharzia-carrying snails. Dense mats reduce light penetration, reduce oxygen levels and result in poor water quality. Dense mats threaten indigenous aquatic plant and animal life in the water. The Department of Environmental Affairs, through the working for Water project is currently working on a removal and monitoring project for aquatic alien invasive species along the Olifants River (Flag Boshielo Dam included).

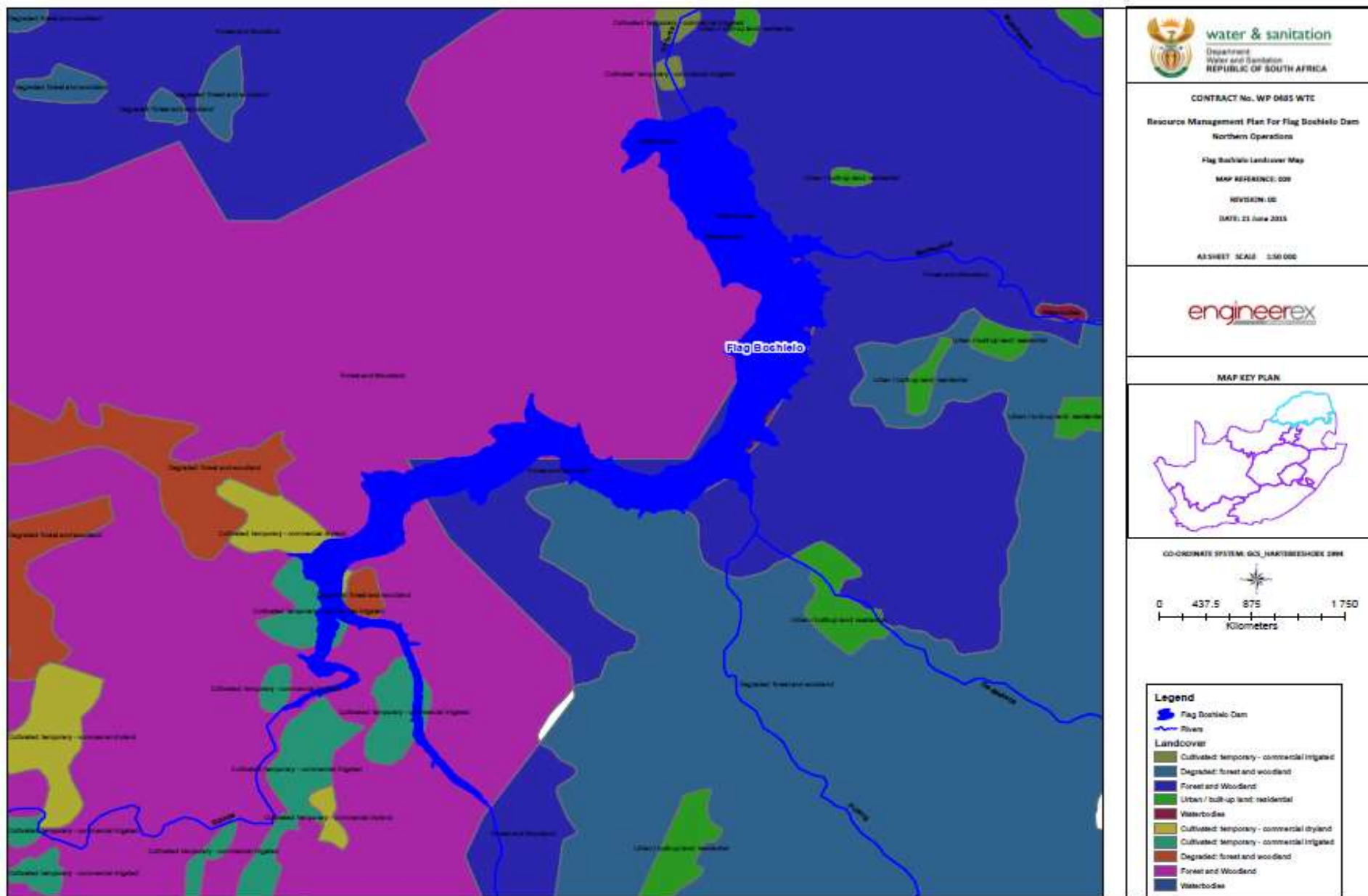


Figure 4: Land Cover Map for Flag Boshielo Dam

1.2.3 Fauna

1.2.3.1 Mammals

Large mammals (e.g. Impala & Kudu) are only found at the SNR, the most recent aerial game count conducted in the SNR was completed in 2012. A total of 3 307 head of game was recorded: 2 060 head of game in the western section and 1 247 head of game in the eastern section of the reserve (LEDET, 2012).

A total of 17 larger mammal species were recorded in the reserve in 2012, including Blue Wildebeest, Burchell's Zebra, Mountain Reedbuck, Red Hartebeest, Roan Antelope, Waterbuck and Warthog (grazers); Bushpig, Common Duiker, Eland, Impala and Steenbok (mixed feeders); Bushbuck, Giraffe and Greater Kudu (browsers); and Chacma Baboon and Black-backed Jackal (other feeders). Hippos have been sighted at the reserve on occasion, but travel up the Olifants River and do not appear to be resident.

No data exists on the smaller mammal species found at the Flag Boshielo Dam.

The Brown Hyena (*Hyena brunnea*) is the only mammal species of conservation concern that is known to occur at the SNR near the dam. It is listed as vulnerable in the IUCN Red Data List (LEDET, 2012).

1.2.3.2 Amphibians

According to the Frog map Atlas, fourteen (14) species were found in the 2429CD Quarter Degree Square (QDS) (Avian Demography Unit (ADU, 2015) and all the recorded species are of least concern.

Table 2: Amphibian Species occurring in 2429CD

Scientific Name	Common Name	Conservation Status
<i>Amietophrynus garmani</i>	Olive Toad	Least Concern
<i>Amietophrynus gutturalis</i>	Guttural Toad	Least Concern

Scientific Name	Common Name	Conservation Status
<i>Poyntonophrynus fenoulheti</i>	Northern Pygmy Toad	Least Concern
<i>Schismaderma carens</i>	Red Toad	Least Concern
<i>Kassina senegalensis</i>	Bubbling Kassina	Least Concern
<i>Phrynomantis bifasciatus</i>	Banded Rubber Frog	Least Concern
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	Least Concern
<i>Xenopus laevis</i>	Common Platanna	Least Concern
<i>Ptychadena anchietae</i>	Plain Grass Frog	Least Concern
<i>Amietia queketti</i>	Drakensberg River Frog	Least Concern
<i>Cacosternum boettgeri</i>	Common Caco	Least Concern
<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	Least Concern
<i>Tomopterna natalensis</i>	Natal Sand Frog	Least Concern

1.2.3.3 Fish Species

The dam has abundant fish species, these include: Catfish, Bass, Chinese silver carp. The poaching of fish using nets is, however, known to take place within the SNR, during which fish is caught in large quantities (LEDET, 2012).

1.2.3.4 Reptiles

Nineteen (19) reptile species were recorded within 2429CD QDS (ADU, 2015), all these species are least concern (See **Table 3**). Flag Boshielo Dam has the highest concentration of Nile crocodiles (*Crocodylus niloticus*) in the Olifants River system, outside of the Kruger National Park (KNP). Their number has reportedly decreased by 27% since 2005, before the dam wall was raised. However this decrease was attributed to habitat loss, as opposed to water quality concerns (Dabrowski, et al. 2014).

Table 3: Reptile Species occurring in 2429CD

Scientific Name	Common Name	Conservation Status
<i>Acanthocercus atricollis atricollis</i>	Southern Tree Agama	Least Concern
<i>Boaedon capensis</i>	Brown House Snake	Least Concern
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	Least Concern
<i>Platysaurus orientalis fitzsimonsi</i>	FitzSimons' Flat Lizard	Least Concern
<i>Platysaurus orientalis orientalis</i>	Sekhukhune Flat Lizard	Least Concern
<i>Smaug vandami</i>	Van Dam's Girdled Lizard	Least Concern
<i>Chondrodactylus turneri</i>	Turner's Gecko	Least Concern
<i>Hemidactylus mabouia</i>	Common Tropical House Gecko	Least Concern
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	Least Concern
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Least Concern
<i>Matobosaurus validus</i>	Common Giant Plated Lizard	Least Concern
<i>Heliobolus lugubris</i>	Bushveld Lizard	Least Concern
<i>Trachylepis margaritifer</i>	Rainbow Skink	Least Concern
<i>Trachylepis varia</i>	Variable Skink	Least Concern
<i>Kinixys lobatsiana</i>	Lobatse Hinged Tortoise	Least Concern
<i>Psammobates oculifer</i>	Serrated Tent Tortoise	Least Concern
<i>Stigmochelys pardalis</i>	Leopard Tortoise	Least Concern
<i>Varanus niloticus</i>	Water Monitor	Least Concern

Scientific Name	Common Name	Conservation Status
<i>Bitis arietans arietans</i>	Puff Adder	Least Concern

1.2.3.5 Avifauna

The presence of the perennial Olifants River, Elands River, Flag Boshie Dam and all associated drainage lines and streams, offers various breeding and foraging habitats to a wide range of waterfowl and other wetland/riparian/floodplain associated species (Botha, 2005).

There are currently Eleven (11) verified species, of which all 11 occur on the IUCN Red List of Threatened Species, occurring at the SNR and the dam, namely African Finfoot (Vulnerable), Cape Vulture (Vulnerable), Halfcollared Kingfisher (Near-threatened), Lanner Falcon (Near-threatened), Lesser Flamingo (Near threatened), Martial Eagle (Vulnerable), Red-billed Oxpecker (Near-threatened), Saddle-billed Stork (Endangered), Secretary bird (Near-threatened), Tawny Eagle (Vulnerable) and White-backed Vulture (Vulnerable). The level of endemism reflected within the current verified species inventory includes one endemic species (LEDET, 2012).

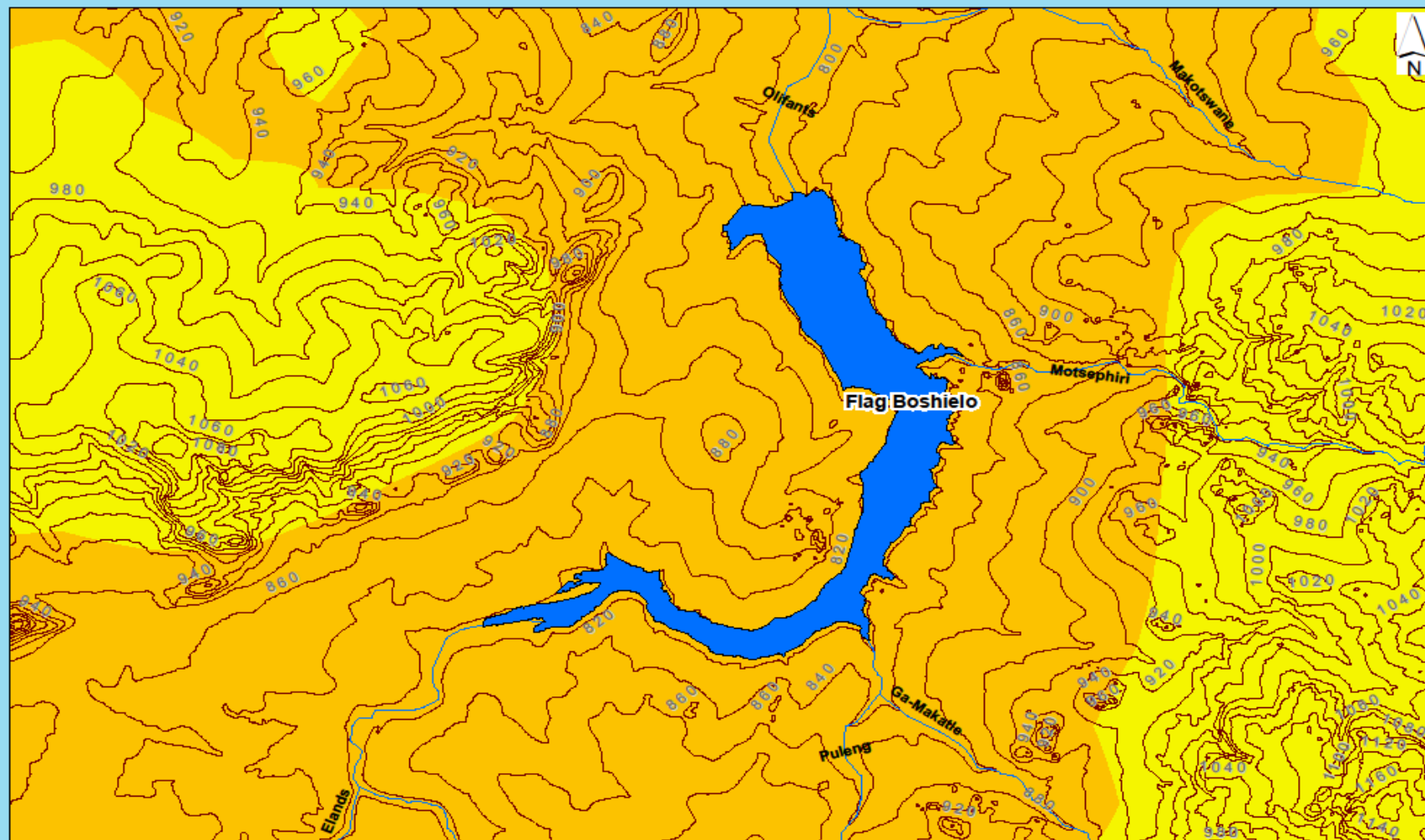
The importance of the SNR and the dam as a foraging and breeding range for IUCN listed threatened species extends beyond resident species, with the SNR offering habitat that could host three potential Palearctic breeding migrants, namely Black-winged Pratincole (Near-threatened), Lesser Kestrel (Vulnerable) and Pallid Harrier (Near-threatened). Two verified IUCN listed species, namely Martial (Vulnerable) and Tawny (Vulnerable) Eagle, not only have IUCN significance, but are apex predators in their respective ecosystems and would therefore fulfil an ecologically significant role (LEDET, 2012).

1.2.4 Topography

The topography of the area is varied from the relatively flat and rolling Highveld, through hilly

and mountainous terrain (DWA, 2014) (See **Figure 5: Elevation Map**)

Elevation:Flag Boshielo Dam



Legend

FlagBoshielo_Dam

rivers

contours

Topography

Elevation(Meters)

130.3153361 - 333.120836
333.1208361 - 535.926334
535.9263341 - 738.7318319
738.731832 - 941.5373298
941.5373299 - 1,144.342828
1,144.342829 - 1,347.148328
1,347.148327 - 1,549.953824
1,549.953825 - 1,752.759321
1,752.759322 - 1,955.564819

1:70,000

Date:22/08/2014

0 0.75 1.5 3 4.5 6 Kilometers

Figure 5: Elevation Map for Flag Boshielo Dam

1.2.5 Geology and Soil

The catchment is underlain by intrusive igneous rocks (granite) (See **Figure 6**) of the Lebowa Granite Suite (LGS), which is part of the Bushveld Igneous Complex (Dabrowski, et al. 2014). Other rock formations worth noting in the area occur to the west and south of the dam. The soil of the area is well-drained, deep Hutton or Clovelly soil, often with a centenary sequence from the Hutton at the hilltops to the Clovelly on the lower slopes; shallow, skeletal Glenrosa soil also occur (LEDET, 2012). Soils encountered in the immediate vicinity of the impoundment are described as red-yellow a pedal freely drained soils (Botha, 2005) (See **Figure 7**: Geology Map).



Figure 6: Lebowa granite hills next to the dam wall

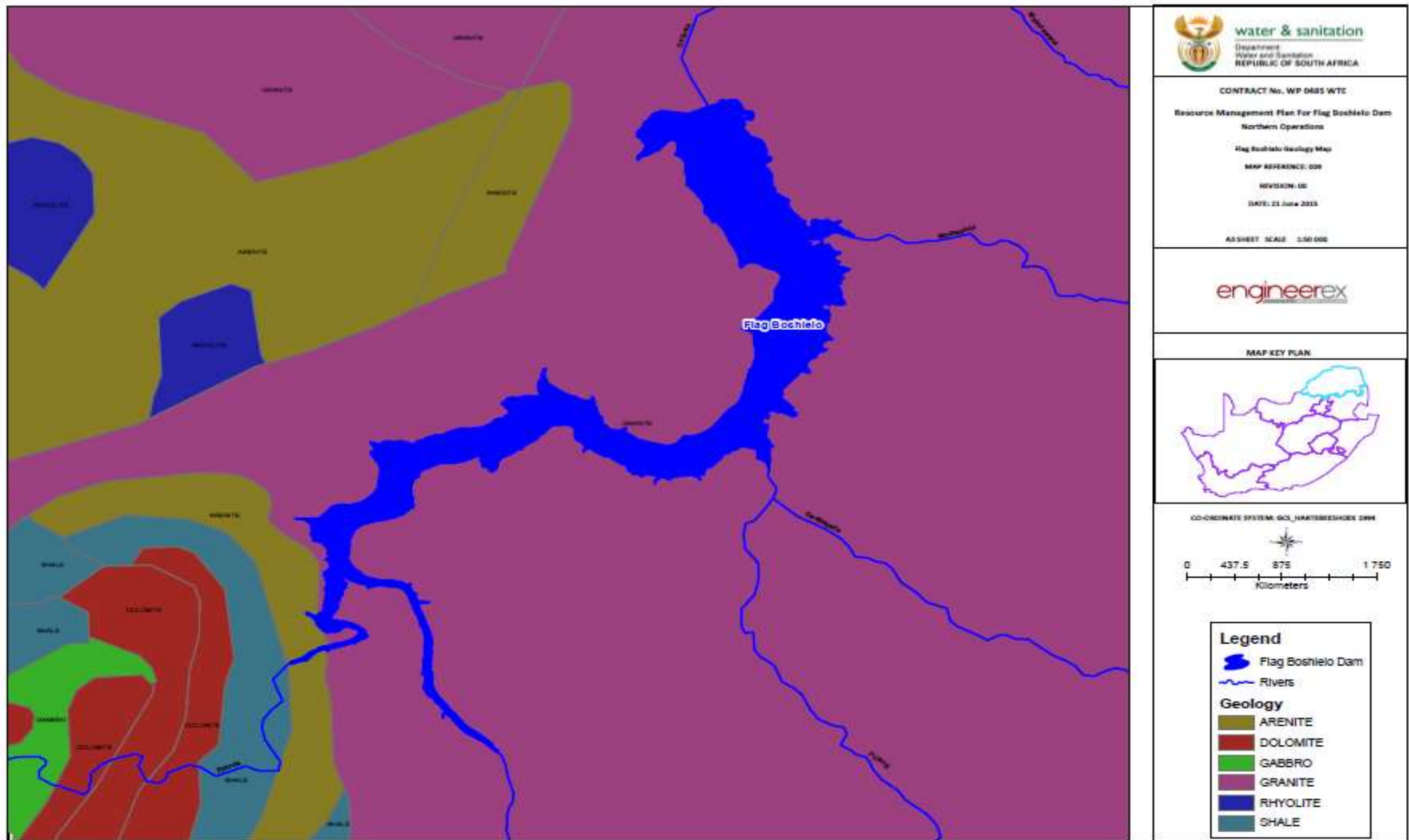


Figure 7: Geology Map for Flag Boshielo Dam

1.2.6 Hydrology

1.2.6.1 Surface Water

The Flag Boshielo Dam is located at the end of quaternary catchment B51B. There are numerous dams upstream of the dam, notably the Loskop and Mkhombo Dam. The incremental natural runoff downstream of these dams, based on the latest hydrology, is only 130.9 million m³ /a. The dam is basically on the confluence of Olifants and Elands River. The dam has a full

supply level which it can reach at the end of an average summer rainfall period, and the median level which is the water level that the dam can reach at the end of an average winter season. According to DWS (2013), the status of Flag Boshielo dam (B5R002) (See **Figure 8**) is at a storage level of 76.5% (141.71 x 106m³) and 7.6% lower than the previous year, which means that the storage volume is 14 million cubic meters less than the corresponding period last year. (DWA, Limpopo Province State Dams).

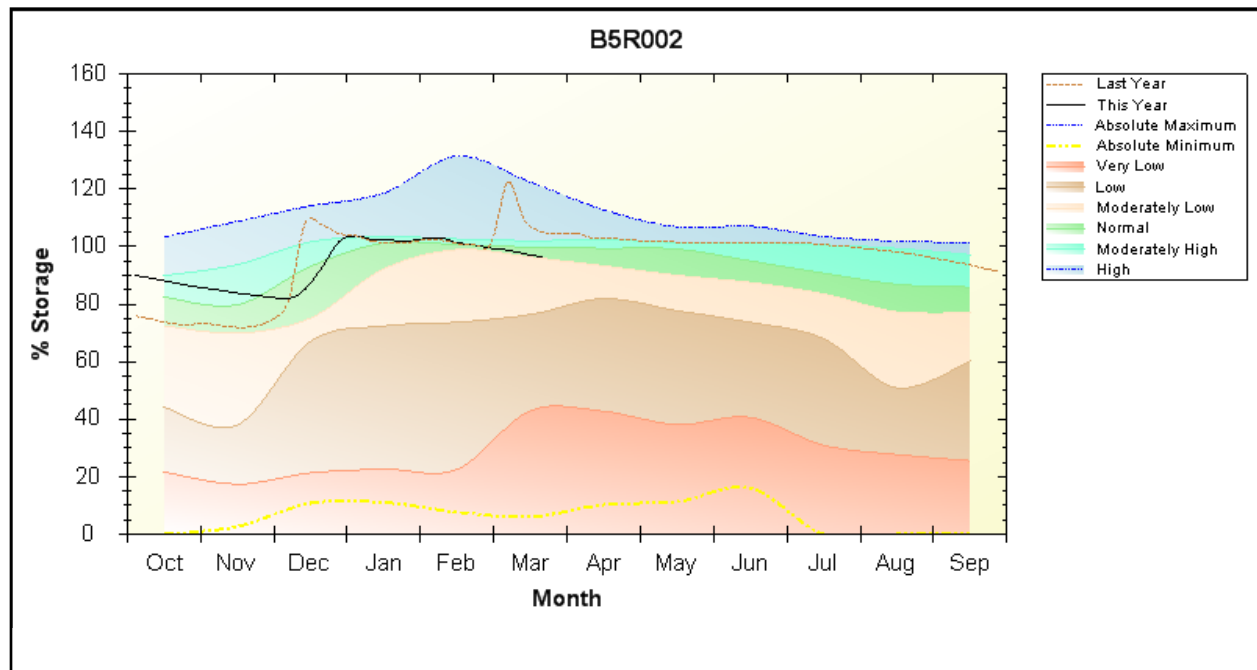


Figure 8: Fluctuation of the dam's water level over a year (DWS, 2015)

There is uncontrolled or illegal abstraction of water from the dam (See **Figure 9**) which is a direct threat to the survival of Nile crocodiles and other species in the dam. The great threat to biodiversity reduces the eco-tourism potential of the dam. (See **Figure 10: Hydrology Map**).



Figure 9: Matlala Aloe Park Water Pump

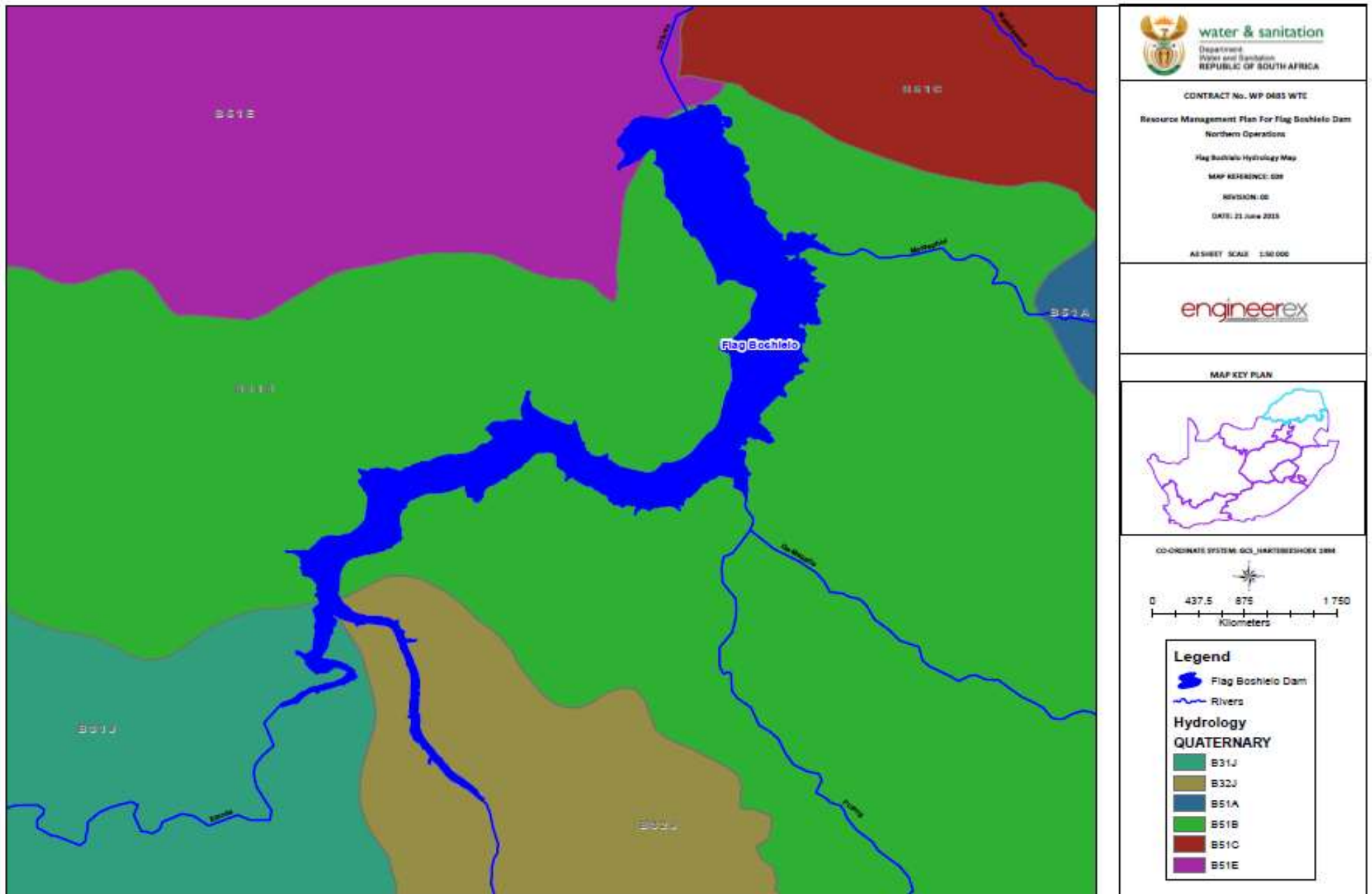


Figure 10: Flag Boshielo Dam Hydrology Map

1.2.6.2 Water Quality

The term water quality refers to the physical, chemical and microbiological properties of water that determines its fitness for use (WRC, 1998).

According to (WRC, 1998) “In nature, water rarely occurs in its pure form and normally contains a variety of substances. People generally have their own feeling for what “good” or “bad” quality water is, without giving it much thought. If water does not look clean, people think it is bad. On the other hand, clear water is not always safe. This means that good quality water sources are sometimes rejected while bad quality sources are accepted”.

Increasing demands for water, discharge of effluents from mining upstream, and variable rainfall have a negative impact on water quality in the Olifants River.

Many substances can be found in water, however only a few of these variables occur in concentrations high enough to be of concerns to recreational use. The most important substances to measure are those that often occur in concentrations high enough to cause health, aesthetic and other problems (WRC, 1998). Recreational water quality is assessed to determine the fitness of water for water-sport activities.

It was stated by Dabrowski et al (2014), that long-term monitoring data collected by DWS

were analyzed for trends using a Seasonal-Kendall trend test. Short-term monitoring showed that water quality in the dam was of a good standard for ecosystem health. A severe drought occurred between November 2002 and December 2005. Long-term monitoring showed that water quality during the drought deteriorated. However, between 1998 and 2011, inorganic Nitrate (N) showed a significant decreasing trend into the oligotrophic range, while inorganic phosphorus (P) remained in the oligo- to mesotrophic range. The inorganic Nitrate (N) to inorganic Phosphorus (P) ratio of 5:4 after the drought was indicative of Nitrate (N) limitation, and the phytoplankton assemblage was dominated by nitrogen-fixing species, especially *Cylindrospermopsis sp* (Dabrowski, et al. 2014).

Dabrowski, et al (2014) concluded that the overall short-term and long-term monitoring following the drought indicated that water quality in the dam was of a good standard from an ecosystem health perspective. No algal blooms occurred at Flag Boshielo dam, and the phytoplankton assemblage was dominated by nitrogen-fixing species.

In **Table 4**, the recreational water quality is assessed for Semi-Contact Recreation as there will be no Full Contact Recreation (e.g. Swimming etc) due to the high infestation of crocodiles in the dam.

Table 4: Water Quality of Flag Boshielo Dam

Characteristics	Analytical Results	Target Water Quality Range (Recreational Purposes)	Effects
Clarity (Secchi disc, m)	0.9	3.0	If a water body is used exclusively for non-contact recreation, then water clarity and turbidity should be such that there are minimal adverse impacts on the aesthetic appreciation of the water body.
pH (pH units)	8.1	6.5-8.5	Minimal eye irritation occurs. The pH of water is well within the buffering capacity of the lachrymal fluid of the human eye. Skin, ear and mucous membrane irritation absent.

Characteristics	Analytical Results	Target Water Quality Range (Recreational Purposes)	Effects
Algae (Chlorophyll-a method, µg/chl-a)	11.9	0-15	Nuisance conditions negligible for lower end of range, but at a mean concentration of 15 Fg/R, severe nuisance conditions encountered for < 12 % of a year. No health effects.
Phosphate (measured as Inorganic Phosphorus mg/l)	0.0185	>5	Oligotrophic conditions; usually moderate levels of species diversity; usually low productivity systems with rapid nutrient cycling; no nuisance growth of aquatic plants or blue-green algae.

Sources: Department of Water Affairs, Water Quality Guideline for Recreational Water Use, 1996. & Department of Water Affairs and Forestry, South African Water Quality Guidelines-Aquatic Ecosystems, 1996.

Saline input: The water entering the main stem of the Olifants River via Flag Boshielo Dam is already salinized, with the exceedance of the Target Water Quality Range for TDS for more than 50% of the time (DWA, 2010). The Olifants River, upstream of the Flag Boshielo Dam, is impacted by agricultural activities, runoff from commercial agricultural areas contains agro-chemicals, which cause eutrophication or contamination of water, either of which can impair the health of invertebrates and fish; (DWA, 2010).

1.3 BUILT ENVIRONMENT

1.3.1 Transport Networks

There are two access roads, the general condition of the roads are poor with severe corrugations and inadequate surface drainage in places.

The road that divides the SNR into two sections is the best for accessing the nature reserve and the dam. Minibus taxis are the most common mode of public transport on both sides of the Flag Boshielo Dam and do provide easy access to the nature reserve. There is a national road (N11) that connects Limpopo, Mpumalanga and Kwa-Zulu Natal, and also goes to the border of South Africa and Botswana (Groblersbrug) (SDA, 2012).

1.4 CONSERVATION

The dam is adjacent to the SNR, which is a conservation area administered by LEDET which composes of Tambotie Ridge Lodge which is administered by LTA. The Flag Boshielo Dam is a national asset, as a result no land within the boundary line can be restored. No permanent structures are allowed and no farming activities can take place only grazing which should be controlled by the Department of Agriculture (DoA). DWS is in the process of concluding a Memorandum of Agreement (MOA) with LTA for the management of the dam, fauna and flora (specifically for the conservation of crocodiles).

1.5 RECREATIONAL INSTITUTIONAL STRUCTURE

The Flag Boshielo Dam has no institutional plan in place. The dam is owned, managed, operated, administrated and maintained by DWS. The DWS is in the process of appointing LTA for the management of the dam basin.

The non-existence of the management structure will lead to unauthorized and uncontrolled developments on state land.

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 Events Management

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

1.5.3 Existing Zoning Plan

A proposed zoning for Flag Boshielo dam, to protect Nile crocodile nesting areas in the Olifants River and Elands River confluence area was established by the LTA (Botha, n.d). The Zoning Plan was not implemented therefore, the public still access the dam at illegal points.

The Zonal Map is demarcated separately for the **Water Surface Zones**. It is mainly to provide guidance on what activities are allowed on the water surface. The Water Surface is zoned as follows:

Environmental Reserve Zone: The area where crocodiles are most active should be zoned as an Environmental Reserve Zone. These areas are critically important to crocodiles because most social interactions such as mating, nesting, establishment of dominance, home range maintenance, hunting etc take place here. Conditions for public access to this area must be strictly controlled.

Wilderness Zone: The second area (where crocodiles are less active) should be zoned as a Wilderness Zone where public access will be strictly controlled. This area is important to crocodiles because most of the secondary important nesting areas and also primary important basking areas occur here. The area could also be joined with the first (Filter/Environmental Reserve Zone) area to form one continuous wilderness area.

Conservation Zone: The third area (where crocodiles are occasionally active) should be zoned as a Conservation Zone because important basking areas will occur here. Conditions for public access to this area must be strictly controlled.

Public Access Zone: All other areas which are visited by crocodiles from time to time but which are of minor importance to crocodiles must be zoned as a Public Access Zone.

1.6 LAND OWNERSHIP

An initial discussion with stakeholders revealed that the land surrounding the dam is owned by the following groups and at the time of compiling this report proof of such ownership was still outstanding.

- DWS;
- Department of Public Works (DPW) (Portions 441; 442; 440 of Farm Loskop North);
- Department of Agriculture, Forestry and Fisheries (DAFF);
- Department of Rural Development and Land Reform (DRDLR);
- Department of Environmental Affairs (DEA); and
- Private Land Owners.

1.6.1 Land Claims

The Seruwane Community have lodged a land claim with Commission on Restitution of Land Rights in 1998. They lodged their claim on farms Elandskraal 644 KS; Gaasterland 677 KS; Hinloopen 647 KS; Roodewal 678 KS and Zorgvliet/ Mariasgraf 650 KS. The land claim was researched and found to be compliant with Restitution of Land Rights Act 22 of 1994, as amended. In 2012 Phase 1 of the claim was finalized through paying financial compensation totalling R9 400 000.00 to 92 families/households.

Phase 2 of the land claim include the Farm Roodewal 678 KS and is in the process of being

finalized. The Roodewal Farm is comprised of 92 hectares which forms part of the SNR and Flag Boshielo Dam. The SNR is administered by LEDET and the Flag Boshielo Dam is administered by DWS. The Department of Rural Development and Land Reform Limpopo, LEDET, DWS and the Seruwane CPA are currently in the process of resolving the land claim. An agreement should be reached on how the Seruwane Community would be involved/compensated since SNR and the dam are protected areas.

1.6.2 Access and Use Agreements

All agreements for the use of the dam have been put on hold until the RMP process has been completed. Most adjacent land owners want to lease certain portions of the dam, they do not want short term contracts because their main plan is to fence out the leased portions for conservation purposes. The DWS is in the process of appointing LTA for the management of the dam basin, once that has been completed an agreement should be reached on how LTA should manage the dam.

Mr. Johan Du Preez has been appointed as the Caretaker by DWS over the properties known as: Portion 443 and 819 of the farm Loskop Noord 12 JS for an indefinite period starting on 1 March 2011. The Caretaker agreement was approved on the 25th of February 2010 and it was operational on the 1st of March 2011 and will subsist for a period of 5 (five) years after which it will be reviewed by DWS.

The Matlala Aloe Park (represented by Mr Vermuleen) has an agreement to occupy the land adjacent to the dam from the Matlala Traditional Kgoshi/ Traditional Leader.

1.7 USES AND USERS OF THE DAM

1.7.1 Primary Functions

1.7.1.1 Domestic Use

The supply for domestic use is from Flag Boshielo Dam fed by the Elands and Olifants Rivers. The

water supply level of service according to the Water Services Providers (Lepelle Northern Water) is mostly at and above Reconstruction and Development Program (RDP) standard with the major portion of the supply area receiving water through house and yard connections.

A small percentage (<20%) was reported to be receiving below RDP level of water service. Waterborne sanitation is reported to be supplied to a limited number of settlements while the major portion of the study area is served with both ventilated and non-ventilated pit latrines (DWA, 2010).

The characteristics of the Lepelle Northern Water plant is summarised in **Table 5**.

Table 5: Lepelle Northern Water Plant

Lepelle Northern Water Plant Characteristics	
Name of Plant	Lepelle Northern Water
Abstraction Source	Flag Boshielo Dam
Current Plant Capacity	2 920 Mℓ/annum
Raw water allocation	2 920 Mℓ/annum
Total raw water abstracted	3 969 Mℓ/annum
Present consumption	3 837 Mℓ/annum
Potable bulk water tariff	R 5.54/m ³
DWS Plant Classification	C Works

1.7.1.2 Irrigation Use

The water use in the catchment of the Flag Boshielo Dam has changed significantly since the ORWRDP yield analysis carried out in 2005. Better information, especially on irrigation water use, became available as a result of the Validation Study (DWAf, 2006). Details of these differences are summarised in **Table 6**.

Table 6: Irrigation uses for the Flag Boshielo Dam

Location of irrigator	Demand		Supply	
	ORWRDP	OWAAS	ORWRDP	OWAAS
Irrigation board supplied by canal	135.8	118.9	127.8	118.9
Irrigation boards supplied by releases into the river	45.8	32.8	31.8	32.8
Supplied from Rust de Winter Dam	15.2	1.8	8.3	1.8
Diffuse irrigation in the B31 catchment	14.7	55.0	14.3	27.7
Diffuse irrigation in the B32 catchment	2.2	55.6	2.2	23.3
Total	213.7	264.1	184.4	204.5

Source: Department of Water Affairs, 2010. Development of a Reconciliation Strategy for the Olifants River Water Supply System WP10197: Yield Analysis of the De Hoop and Flag Boshielo Dams.

1.7.1.3 Mining

Certain water resources development projects had been undertaken by DWA for the Olifants WMA on the strength of feasibility studies (ORWRDP) submitted in 2005. This investigation included yield assessments for the proposed De Hoop and Flag Boshielo Dams, which were intended to increase the supply of water to, inter alia, mining and industry in the catchment, in attempt to supply the assurances guaranteed in mine water permits, as well as to provide water supplies for future industrial development. The more important lawful mines in the area were listed to include Lebowa Platinum; Messina Baobab; Phalaborwa Mining Company; Foskop; Marula; Modikwa and Tubatse Ferrochrome (DWA, 2011).

In 2009, in a Systems Analysis Report as Part of the development of an integrated water resource management plan for the upper and middle Olifants catchment, it was reported that “there has been significant growth in the water requirements in the WMA with the development of the platinum and chrome mines in the Burgersfort and Steelpoort areas of the WMA.

The construction of the De Hoop Dam and the raising of the Flag Boshielo Dam has been undertaken to supply the growth in water

requirements in these areas. Despite the construction of the additional water infrastructure, the reconciliation of water requirements and available water still shows a deficit in the WMA (DWA, 2011).

1.7.2 Secondary Functions

1.7.2.1 Recreational Use

There is currently no picnic recreational facility on the Schuinsdraai Nature Reserve or Flag Boshielo Dam. Most visitors come for fishing. On the eastern portion, the Matlala Aloe Park launches boats and ferries into the dam. These activities are currently not fully authorized in accordance with the Department of Water and Sanitation’s recreational water licensing process. There is however an opportunity to develop water-based recreational facilities adjacent to the dam banks (SDA, 2012).

Some of the activities currently taking place around the dam which were evident during site inspection are depicted in **Figures 11, 12 & 13**.



Figure 11: Fishing at SNR



Figure 12: Camping at SNR



Figure 13: Matlala Aloe Park Boating

1.8 SAFETY

1.8.1 Safety of Navigation

The only AtoN² and Demarcation Markers at the dam are situated around the dam wall on the water surface, to restrict users from coming close to the dam wall. These AtoN and Demarcation Markers are inadequate and not standardised for the regulation of activities that needs to take place on the water surface.

1.8.2 Incident Management

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

1.9 SOCIO-ECONOMIC ENVIRONMENT

1.9.1 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 entirely within Ephraim Mogale Local Municipality Ward 16 as shown in **Figure 14**. An understanding of socio-economic conditions of Ward 1 and 3 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 1.9.1.1 to 1.9.1.3, respectively.

² A marine 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”



Figure 14: EMLM Ward 16 (Mobilitate, 2014)

1.9.1.1 Population Dynamics

The EMLM has a total population of 123 648, Ward 16 has a total population of 8912 which forms 7.2% of the EMLM population obtained from Census (2011). Job opportunities can be generated easily as Ward 16 only contains less percentage of the population size as shown in **Figure 15**;

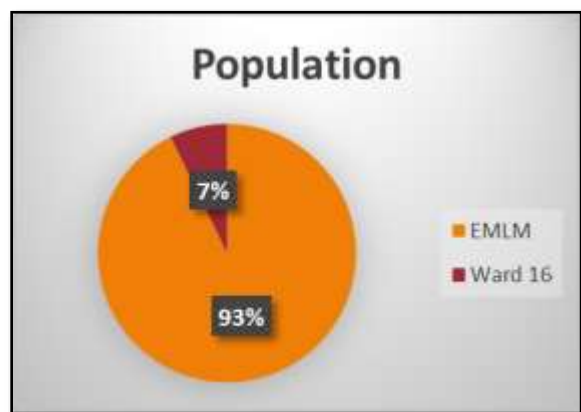


Figure 15: Population of Ward 16 (Census 2011)

1.9.1.2 Education Level

The Census (2011) breaks down educational levels into each year of study. For the purpose of this report, the educational levels are grouped into key schooling and higher educational categories. As shown in the charts below that the majority of residents in Ward 16 fall under the secondary education level. See **Table 7** & **Figure 16**;

Table 7: Educational levels of Ward 16 (Census 2011)

Description	Ward 16 (2011)
Primary Level	2647
Secondary Level	3383
Tertiary Level	362
No Schooling	1147
Not applicable	1344

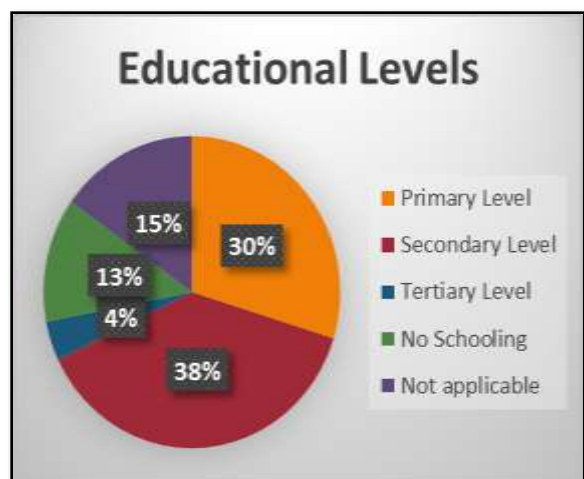


Figure 16: Ward 16 educational level (Census 2011)

1.9.1.3 Employment Status

In terms of employment levels within Ward 16, **Table 8** and **Figure 17** are indicative (Census, 2011). Only 17% of the residents of working age of Ward 16 are employed.

Table 8: Employment status of Ward 16 (Census 2011)

Official Employment Status	Population (2011)
Employed	1494
Unemployed	958
Discouraged work-seeker	412
Other not economically active	2333
Not applicable	3715



Figure 17: Employment Status of Ward 16 (Census 2011)

1.9.3 Gross Value Added

Gross Value Added (GVA) is defined as the total value of all the goods produced in a specified area during a specific period.

Quantec Research classified the major sectors within the municipality into Primary sector, which is extractive, secondary sector made of manufacturing and tertiary sectors, which comprises of services. **Figure 18** shows GVA per sector for 2005. This data is taken from EMLM IDP and the variables are explained below;

Primary Sector:

- Agriculture, forestry and fishing;
- Mining and Quarrying.

Secondary Sector:

- Manufacturing;
- Electricity, gas and water; and
- Construction.

Tertiary Sector:

- Wholesale and retail, catering and accommodation;
- Transport, storage and communication;
- Finance, insurance, real estates and business services;
- Community, social and personal services; and
- General Government.

The **Figure 18** shows that the greatest contribution is from Finance, Insurance, Real Estate and Business Service (R750 million) and General Government (R491 million).

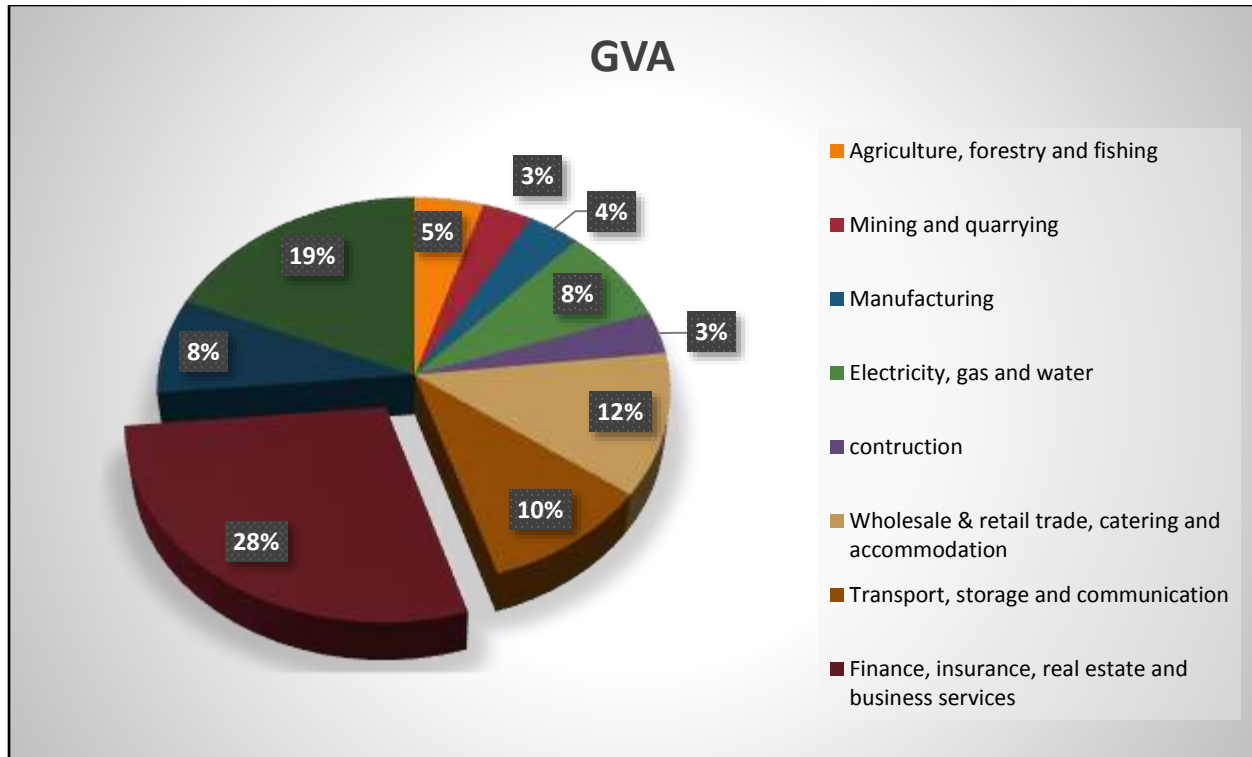


Figure 18: GVA for EMLM at R million at 2013 constant prices

1.9.4 Community Beneficiation

It is DWS's belief that Local Communities should equally share the benefits emanating from the utilisation of the dam for recreational purposes, by ensuring that they have both physical access to the resource, as well as access to the water-based recreation economy.

According to DWAF (2006), by ensuring that the Local Communities move beyond merely being affected by or living close to a water resource, but rather undertaking the transition to become participants will ensure that water resources can and will be protected by the people closest to and most affected by the dam.

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 Flag Boshielo Dam. It is informed by relevant policy, legislation and planning documents administered by other government departments. 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 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 maximise 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:

- Occupation Health and Safety Act, 1993 (Act No. 85 of 1993).
- Communal Land Rights Act, 2004 (Act No.11 of 2004).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- State Land Disposal Act, 1961 (Act No. 48 of 1961).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- Disaster Management Act, 2002 (Act No. 57 of 2002).
- National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998).
- Development Facilitation Act, 1995 (Act No. 67 of 1995).
- Government Immovable Asset Management Act 19 of 2007 (GIAMA of 2007).
- Game Theft Act, 1991 (Act No. 105 of 1991).
- Tourism Act, 1993 (Act No. 72 of 1993).
- Limpopo Conservation Plan v2 (2013).
- Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003).
- Limpopo Growth and Development Strategy (2005).
- Limpopo Province: Provincial Land Use Legislature Reform (2011).

- Draft Limpopo Spatial Planning and Land Use Management Bill (2012).
- Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).
- Sekhukhune District Municipality Spatial Development Framework (2009).
- The Integrated Development Plans of SDM and EMLM.
- Sustainable Development Goals (2015).
- **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 GWWs. 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 extensive, other legislation 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 utilization of a water resource and the surrounding state land, in ways which promote community participation and beneficiation, environmental conservation and 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 RMP

The main aim of RMPs will be to attain the objectives underlying sustainability and to compile functional, workable sustainable access and utilization 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, utilization 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 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 Flag Boshielo Dam, as illustrated in **Table 9**.

Table 9: Trigger factors for the development of Flag Boshielo Dam RMP

Trigger Factors	Description
Resource Management	<p><u>Protected Area</u></p> <ul style="list-style-type: none"> The dam forms the eastern and southern boundary of the Schuinsdraai Nature Reserve, and it is not fenced off on the southern and eastern sides. This results in high poaching of crocodiles and fish from the dam. Crocodiles from the dam are mainly poached for the value of their skin. The fish poaching by nets in the dam cause destruction of crocodile habitat due to large number of fishing activities taking place near the crocodile nests.
Recreational Industry Involvement	<p><u>Uncontrolled developments within dam basin</u></p> <ul style="list-style-type: none"> There is illegal abstraction of water by Matlala Aloe Park, which is situated on the eastern part of the dam.

Trigger Factors	Description
	<p><u>Conflict between users</u></p> <ul style="list-style-type: none"> The public have established their own unauthorised picnic area (s) on the south-western part of the dam and do not use those provided by Limpopo Tourism Agency (LTA). These causes a very high level of littering as there is no proper management or monitoring at those sites.
Community Participation and Beneficiation	<p><u>Access Control</u></p> <ul style="list-style-type: none"> The public access the dam through unauthorized points, they do not use those provided by LTA. The available access to the dam provided by LTA is through the Tambotie Ridge Lodge. <p><u>Community Participation</u></p> <ul style="list-style-type: none"> Local communities are currently not involved in recreational opportunities around the dam, they have submitted several proposals for projects that they would like to conduct and none of them have been approved by DWS.
Public Policy	<p><u>Local Planning Initiatives</u></p> <ul style="list-style-type: none"> The dam needs to be identified as a local development objective by the Ephraim Mogale Local Municipality. The dam could become an economic lever for the region. The dam should be integrated in other planning initiatives and decision support tools such as the Ephraim Mogale Local Municipality (EMLM) IDP, SDF and Local Economic Development (LED) plan as well as the Sekhukhune District Municipality (SDM) Environmental Management Framework (EMF).

3.4. RMP DEVELOPMENT PROCESS

The RMP is developed in accordance with the RMP guideline procedure (DWAF, 2006) as illustrated in Figure 19.

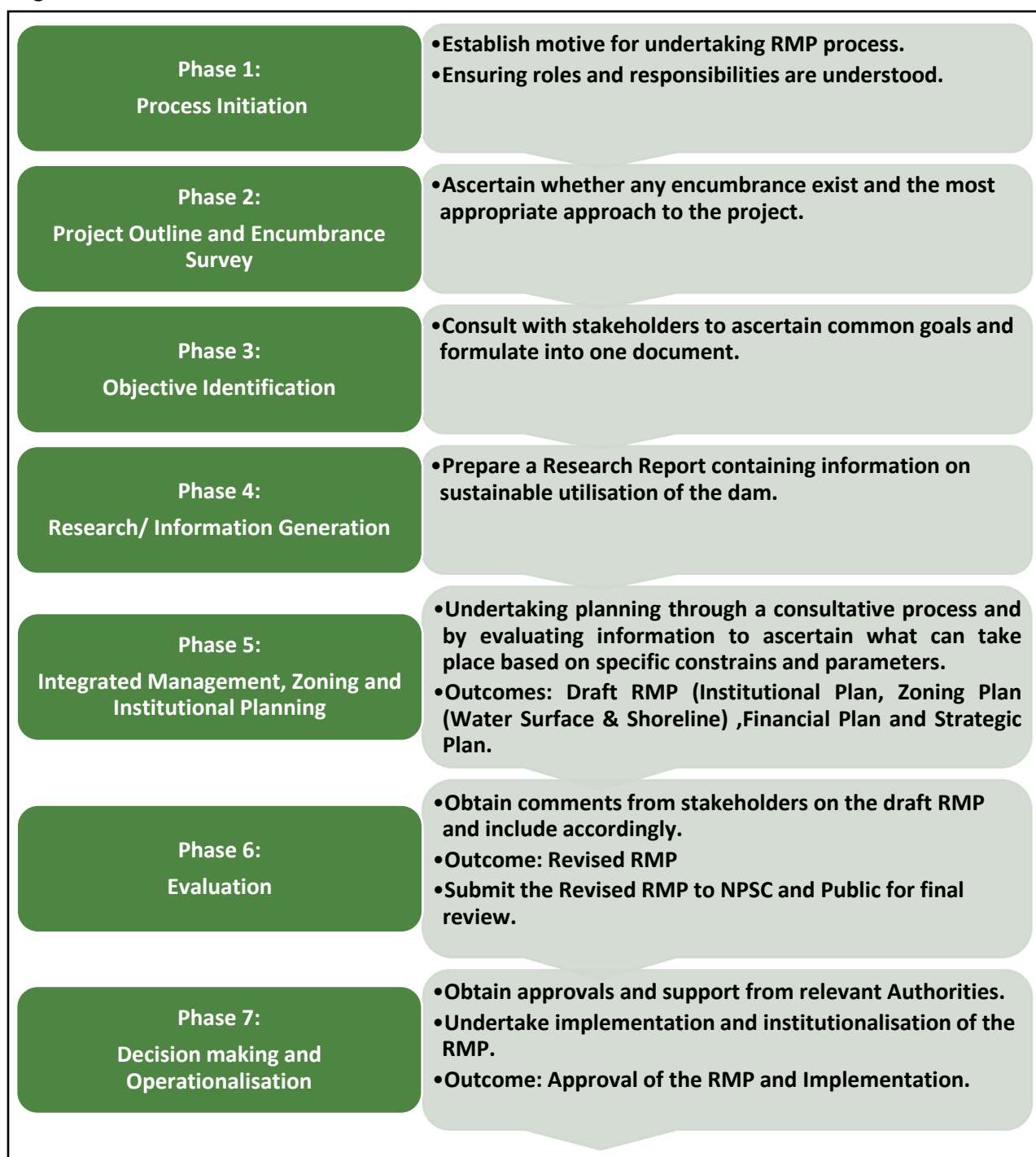


Figure 19: RMP Procedure

3.5. RMP PLANNING STAGES

3.5.1. Desktop Study

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

3.5.2. Site Inspection

A site inspection was conducted at Flag Boshielo Dam on **2 June 2014** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with the DWS delegates (DWS IEE, Chief Water Control Officer). 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. The Planning Phase

The 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 and identifying 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. **The 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 RMP process

During this phase, a draft RMP 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. *Distribution of the 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 plan. It also aimed to inform authorities and I&APs on how to fully participate in the process and to encourage active attendance in Stakeholder engagement meetings. The BID was compiled from the information collated through the desktop study and site inspection (See attached **Appendix B**).

3.5.3.4.2. *Newspaper Advert*

A Newspaper advert regarding the RMP project was placed in the **Daller Local Newspaper** on **25 July 2014**. In completion of the project Stakeholder Engagement Meetings were conducted to present the RMP project to the stakeholders. The advert regarding the draft RMP project was placed in the **Daller Local Newspaper** on **18 December 2015**. (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 Sepedi and they were distributed on **24 July 2014**.

Flyers for the Draft RMP were distributed on **15 December 2015**. (See attached **Appendix D: Flyers**).

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 notification was sent out on **28 July 2014**.

Moreover, the meeting invites for the draft RMP were sent out on **13 January 2016**. (See attached **Appendix E**: invitation emails).

3.5.3.5.2. Authority Meeting

The initial Authorities meeting was conducted on **04 August 2014** at the dam, DWS Offices.

The purpose of the meeting was:

- To present the RMP, its goal and the objectives of the project to the authorities; and
- To allow the authorities an opportunity to participate in the project by sharing information on their respective mandates.

A follow-up authorities meeting was conducted on **10 October 2014** at Limpopo Development Agency.

The draft RMP was presented to the authorities on **26 January 2016**.

3.5.3.5.3. Public Meeting

The initial public meetings were held on **04 and 05 August 2014** at **Kgorong ya Letebejane** and **Kgorong ya Phetwane**. A platform was also given to I&APs to identify encumbrances/challenges that might hinder the progress of the RMP as well as to identify objectives and vision for the Flag Boshielo Dam.

The draft RMP was presented to the public on **26 and 27 January 2016**.

3.5.3.5.4. Seruwane CPA

The DWS invited the PSP to attend the Seruwane CPA meeting that was held on **04 of September 2015** at the Schuinsdraai Nature Reserve. The meeting comprised of the following personnel

Department of Rural Development and Land Reform Limpopo, LEDET, DWS and the Seruwane CPA. It was aimed at resolving the land claim that was launched by the Seruwane CPA. The claim includes Farm Roodewal 678 KS which is comprised of 92 hectares that forms part of the Schuinsdraai Nature Reserve and Flag Boshielo Dam. The PSP was given a platform to present the RMP project to the land claimants. The Surawane CPA however took the platform and raised their issues of concern and objectives for the RMP project.

3.5.3.6. Comments and Responses Register

During the Stakeholder Engagement Process, some comments were received via emails and letters. These comments were incorporated in the report and responded to. Comments and Response Register has been attached as **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 by **Table 10**.

Table 10: Planning Partners and their Respective Mandates

Department/ Agency	Mandate
Sekhukhune District Municipality/Ephraim Mogale Local Municipality (SDM/EMLM)	The dam is within the jurisdiction of the municipality and is mandated to provide bulk water services.
Limpopo Tourism Agency (LTA)	LTA is responsible to promote, foster and develop tourism to and within the Limpopo Province. LTA has been identified as the Implementing Agency for the RMP.

Department/ Agency	Mandate
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 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, Social and Existing Plans**.

Tables 11- 14 outline the summary of limitations that might affect the development or implementation of the RMP for the dam:

Table 11: Summary of Biophysical Encumbrances

Item	Description
Climate	<ul style="list-style-type: none"> A severe drought occurred between November 2002 and December 2005 (Dabrowski, <i>et al.</i> 2014). This shows that the area is prone to droughts which might affect the tourism development potential of the dam in future.
Flora	<ul style="list-style-type: none"> Alien invasive species such as <i>Sesbania punicea</i> (Category 1) have been recorded along the banks of the dam. These plants have been submerged by water since the raising of the dam wall in 2006 and are not growing there at present. It is, however, possible that the <i>Sesbania</i> seeds are still present and the monitoring of wet areas should take place to ensure that this species does not re-infest (LEDET, 2012). The re-infestation of alien species will lead to the hindrance of some activities inside the dam. Protected species such as <i>Combretum imberbe</i>, <i>Lydenburgia cassinoides</i> etc. have been identified in the area, such species are protected in terms of the National Forest Act of 1998. Protected tree species may not be cut, disturbed, damaged or destroyed, and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold, except under license granted by the DAFF or a delegated authority. The establishment of recreational activities where protected species occur might pose a great threat to the survival of the species, which will lead to them being extinct.
Fauna	<ul style="list-style-type: none"> The SNR might experience a high poaching level due to certain portions of the reserve not being fenced. High crocodile population might prohibit certain recreational activities within the dam. Incompatibility between human activities and Nile crocodiles directly threatens the well-being of crocodiles and human in the Flag Boshie Dam.
Surface Water	<ul style="list-style-type: none"> Uncontrolled or illegal abstraction of water from the dam is a direct threat to the survival of Nile crocodiles and other species in the dam. The great threat to biodiversity reduces the eco-tourism potential of the dam.
Water quality	<ul style="list-style-type: none"> Pollution in the upper catchment of the Olifants River has a direct impact on the quality of the water in the dam, the water quality should meet the minimum standards set out in the South African Water Quality Standards for Recreational Use.

Table 12: Summary of Legal Encumbrances

Item	Description
Land Ownership	<ul style="list-style-type: none"> Supporting documents for land ownership are still outstanding. The various departments have plans for their respective lands next to the dam, if there is no cooperative governance and plans are implemented without consultation with DWS they might have a negative effect on the implementation of the RMP. E.g. LTA has a plan to fence out land which belongs to LEDET and DWS.
Land Claims	<ul style="list-style-type: none"> The land claim should be finalized by the respective departments and the Seruwane Community. The claimed part of Roodewal Farm that forms part of the Flag Boshie Dam is situated next to the dam wall. This area is determined by DWS for purposes of dam and public safety, the extent of this zone is not negotiable.
Agreements	<ul style="list-style-type: none"> There is no agreement between Matlala Aloe Park (MAP) and DWS, MAP only has an agreement with the local chief. Unauthorized developments will lead to uncontrolled development within the dam. A copy of the agreement between MAP and Matlala Traditional Council Kgoshi/ Traditional Leader has not been obtained.

Table 13: Summary of Social Encumbrances

Item	Description
Tourism Information	<ul style="list-style-type: none"> The District does not form part of any major tourism routes in Limpopo. This may be a major factor limiting the development of tourism hence the need to develop an anchor attraction around the dam. Construction of fishing camps, caravan parks, camping sites, eco lodges and weekend homes can have a negative impact on the crocodile nesting sites or habitat which will then reduce the eco-tourism potential of the dam. An ecological impact study should be conducted prior development and operating of the recreational facilities. On the eastern portion of the dam, the Matlala Aloe Park boat launches and ferries into the dam. These activities are currently not fully authorised in accordance with the DWS recreational water licensing process. There is however an opportunity to develop water based recreational facilities adjacent to the dam banks (SDA, 2012).
Social Audit	<ul style="list-style-type: none"> Only 4% of the population has moved beyond schooling to receive some kind of higher education. The implication of the project is that the majority of residents in ward 16 will not have received any kind of training to equip them to become active participants in the tourism sector. Only 26% of the residents are not economically active suggesting they no longer seek to become employed. This speaks to the fact that there is a large proportion of persons within ward 16 who have limited income sources and few hopes that this situation will change in the future. There is high expectations of employment creation from the community when developing the RMP, this can be a challenge as the RMP is not aimed at creating employment for community. About 42% of the population's employment status is unknown however, as shown above, it is unlikely that the unemployed in this region have the necessary skills to enter the tourism market. The direct impact that this has for this study is that there is a large pool of potential labour should tourism development projects be implemented that are labour intensive. Another implication of such low employment figures in the area is that this is often accompanied by poverty and high crime levels, a strong deterrent for tourism in an area.
Cultural	<ul style="list-style-type: none"> In terms of NWA (Act No. 36 of 1998), Section 21(k) any person who intend to use a water resource for recreational purposes must apply for Water Use License prior to commencement with the activity. However Matlala Aloe Park (represented by Mr Vermuleen) has the agreement only to occupy the land adjacent to the dam from the Matlala Traditional Council Kgoshi/ Traditional Leader and not to abstract water from the dam. Interference of the Traditional Councils in access and management of the dam will lead to uncontrolled development within the dam without proper authorization from relevant authorities (e.g. LEDET and DWS).

Table 14: Summary of Existing Plans Encumbrances

Item	Description
Zoning Plan	<ul style="list-style-type: none"> The existing zoning plan is non-operational, the public access the dam at illegal access points.
Institutional Plan	<ul style="list-style-type: none"> The non-existence of the management structure will lead to unauthorized and uncontrolled developments on state land.

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 were 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 15**.

Table 15: SWOT Analysis for Flag Boshielo Dam

Strengths	Weaknesses
<ul style="list-style-type: none"> The dam has a large population of fish, which can enable good projects such as Fishery. The dam is located next to SNR which is being developed and has the potential to promote eco-tourism in the area. The Nature Reserve does not have Big 5 game (Lion, Elephant, Rhino, Buffalo & Leopard) that can limit activities around the Dam. The Dam is situated next to Tompi Seleka Agricultural College which has facilities and resources for running environmental education programs. The tranquillity and beauty of the dam will be able to attract a number of tourists from various parts of the world. The dam's appealing view also makes it ideal for recreational developments along the eastern banks. The dam's location being part of the Nature Reserve. The dam is partially infested by alien invasive plant species, however this will not limit any recreational activities at the dam. 	<ul style="list-style-type: none"> The dam has a large crocodile population which can limit certain activities e.g. swimming in the dam. The dam is not fenced off on the southern and eastern sides, which pose a threat to the dam and public who access through unauthorized points. There is lack of safety and enforcement officers to monitor compliance of the dam rules. There is lack of business and tourism marketing for the dam. There is no communication structure in place to engage with Local Communities. The primary purpose of the dam for water provision is not in place, therefore surrounding communities require water for basic domestic usage before further plans can be implemented or proposed. Proposals from community members for developments around the dam that were submitted to the Traditional Authority were rejected. The tourism activities currently taking place at the dam are non-profitable.
Opportunities	Threats
<ul style="list-style-type: none"> Large population of fish and crocodiles can enable profitable projects such as fishery and crocodile skin sale. Community members can receive training for fishing and also obtain fishing licenses. Development of the Tambotie Ridge Lodge at SNR will assist to market the dam for tourism. Weather conditions in this area are mostly ideal for a variety of recreational activities. The dam is large in size and it can be able to accommodate a lot of activities. It is ideal for large camping sites, lodges and picnic areas within close proximity to the dam. The dam has sufficient land to provide drinking and grazing area for the local cattle. The dam does not allow swimming activities due to the large number of crocodiles as a result a resort can be suitable for the area. The resort should include swimming pools, picnic areas and braai area. The dam has a variety of bird species and should have a bird hide where interpretative bird talks can take place. A research centre can be developed, particularly on crocodiles as the dam comprise a large number of crocodiles and it will assist with the conservation thereof. 	<ul style="list-style-type: none"> Unauthorised water orientated activities originating from the Matlala Aloe Park private initiative on the western banks of the dam. Water pollution, mainly caused by effluent discharged from mining activities upstream of the dam in the Olifants River. Possibilities of drought in the area as one has already occurred in 2004-2006. Current activities surrounding the dam do not involve or benefit the surrounding communities. The water quality of the dam deteriorates from time to time due to pollution from mines in the upper catchment of the Olifants River. The road passing through the Schuinsdraai Nature Reserve makes it difficult to control poaching and to plan for new developments; the western and eastern portion of SNR should become one. The claimed Roodewal Farm that forms part of the Flag Boshielo Dam is situated next to the dam wall. This area is determined by DWS for purposes of dam and public safety. There are currently multiple land claims of land around and within the dam and this will later cause conflict of interest. The land claimants have high expectations from beneficiation of activities that need to take place within and around the dam.

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 Flag Boshielo Dam and have been categorized into three (3) Key Performance Areas (KPA) as illustrated below:

KPA 1: Resource Management

- To develop recreational activities that suites the climatic conditions of the area and to have sustainable measures in place for incase of natural disasters;
- To ensure non-infestation of alien invasive species in the dam and surrounding environment; and
- To maintain a good water quality and protect the aquatic resource for recreational use as well as to ensure a healthy environment.

KPA 2: Resource Utilisation

- To establish more access points which have lower tariffs to accommodate the rural communities around the dam;
- To stabilize the security system in order to be able to reduce the high level of poaching; and
- To ensure that the current activities undertaken within the dam basin are permitted as per relevant legislation.

KPA 3: Benefit Flow Management

- To unlock the socio-economic potential of the dam for commercial opportunities such as fisheries and crocodile farming;

- To introduce tourism facilities (Holiday Resort) within the vicinity of the dam in order retain the visitors around the area;
- To equip community members with the necessary skills and expertise;
- To allow local fishermen access to fish for subsistence purposes and encourage participation in the management of the dam;
- To establish a crocodile research centre in order to enable a variety of groups to conduct research on the Nile crocodiles which occurs within the dam;
- To have an improved management and communications structure in place with the appropriate power delegations to effectively manage the recreational use of the water resource in accordance with the RMP; and
- To effectively zone the water resource and to assess all the relevant information that must be undertaken to ascertain both habitat and landscape sensitivity.

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

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

"To ensure effective co-management and sustainable use of the immaculate resource by all, without altering the tranquil surroundings to maximise the socio economic potential of Flag Boshielo Dam."

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. Research / Information Generation (Phase 4)

The aim of undertaking the research process was to collect the relevant data about the dam to serve as decision-making guideline tool. The

report 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 20**.

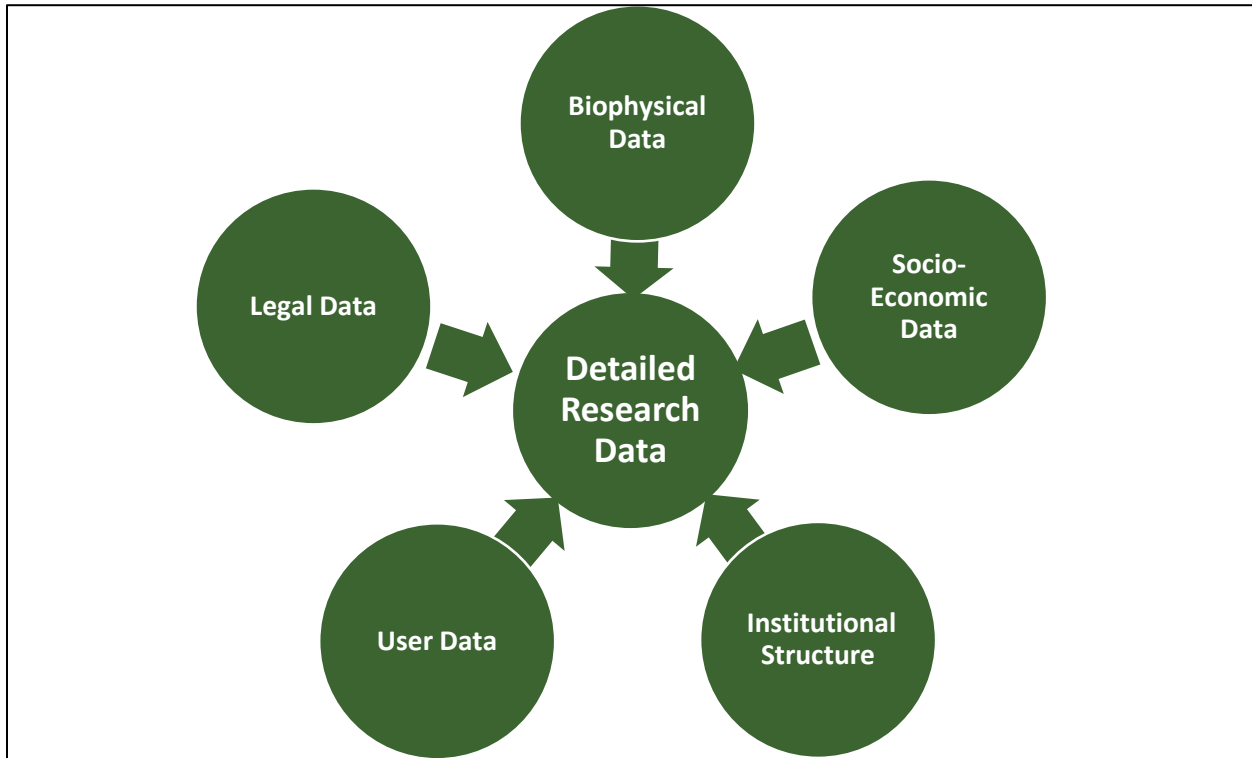


Figure 20: Research Data

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

The SDA commissioned a feasibility study in 2011 to investigate the potential of the SNR and the dam to accommodate additional tourist facilities. The study however concluded that tourism development in the Schuinsdraai and Flag Boshielo precinct has to take an integrated approach to focus on the whole area beyond the SNR.

According to SDA (2012), the dam is also a good fishing spot, given that the dam spans over 10 kilometers and fishing can be done on boats.

The following were identified as some of the potential recreational developments at Flag Boshielo Dam and could enhance the tourist attraction:

- The dam doesn't allow swimming activities due to the large number of crocodiles therefore a resort can be ideal in the area. The resort should include swimming pools and picnic areas; and
- The dam has a variety of bird species and must have a bird hide where interpretative bird walks can take place.

Figure 21 shows the areas that have been identified by SDA (2012) as the potential development sites to develop tourism facilities/activities.



Figure 21: Tourism Potential Development Sites

Site 1: It is located on the communal land on the eastern bank of the dam. The land parcel is a stretch of about eight (8) kilometres – starting from the south at the boundary of the Matlala Aloe Park to the north at the boundary of Tompi Seleka College. It is nestled between the dam and the village of Letebejane. This portion of land offers numerous tourist development opportunities including development of golf course, accommodation facilities and recreation facilities for day visitors.

Site 2: The site is located inside the boundary of Tompi Seleka College between the college and

the dam. The main issue is land release and potential of the area for tourist development.

Site 3: The final site is also a communal land. Accessibility and land use patterns are not clear; however this is a large portion of land that could be explored for high-value game breeding.

3.6.3.2 Feasibility of Potential Objectives

According to DWAF (2006), the feasibility of the proposed objectives needs to be determined in light of the local environmental conditions. **Table 16** shows the practicability of all proposed recreational objectives.

Table 16: Feasibility of Potential Recreational Objectives

KPA1: Resource Management		
Objective	Status Quo	Practicability
<ul style="list-style-type: none"> To develop recreational activities that suite the climatic conditions of the area and to have sustainable measures in place for incase of natural disasters. 	<ul style="list-style-type: none"> The weather conditions in the area are currently stable. There hasn't been any reports of droughts or floods lately. 	<ul style="list-style-type: none"> The National Disaster Management Centre (NDMC) and the management authority should work together to put appropriate measures in place such as drought preparedness, planning to reduce the risks to future events. Disasters such as drought might cause a great loss to the tourism and recreation industry. The management authority with assistance from the NDMC should draft a drought plan, containing the three basic components: monitoring & early warning, risk assessment, and mitigation & response.
<ul style="list-style-type: none"> To ensure non-infestation of Alien Invasive Species in the dam and surrounding environment. 	<ul style="list-style-type: none"> There is no record of alien invasive species in the dam, only <i>Sesbania punicea</i> species have been identified before the raising of the dam wall. These plants have been submerged by water since the raising of the dam wall in 2006 and are not growing there at present. 	<ul style="list-style-type: none"> Alien invasive control resides within the Working for Water Programme of DEA as well as Land Use Management Department with Department of Agriculture, Forestry and Fisheries (DAFF). The objective can be easily achieved as the dam is currently not infested by alien invasive species. <i>Sesbania</i> seeds are still present and the monitoring of wet areas should take place to ensure that these species do not re-infest. The relevant departments such as DEA (Working for Water) and Land Use Management Department with DAFF should assist with measures that need to be taken to ensure non-infestation and continuous monitoring of alien invasive plants.
<ul style="list-style-type: none"> To maintain a good water quality and protect the aquatic resource for recreational use as well as to ensure a healthy environment. 	<ul style="list-style-type: none"> The water quality at the dam is acceptable for recreational use. The water quality in the dam is of good standard from an ecosystem health perspective as well, no algal blooms occur at the dam, and the phytoplankton assemblage is dominated by nitrogen-fixing species. However there are some effluents discharged from mining activities upstream, which have a negative impact on water quality of the dam. 	<ul style="list-style-type: none"> It will be a challenge to achieve the listed objective if the relevant laws are not enforced to ensure compliance and performance by mines. Water quality management lies within multiple institutions as well as the dam users themselves, such cooperation between all stakeholders will ensure the possibility of maintaining the high water quality standard of the dam.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

KPA 2: Resource Utilisation		
Objective	Status Quo	Practicability
<ul style="list-style-type: none"> To establish more access points with lower tariffs to accommodate the rural communities around the dam. 	<ul style="list-style-type: none"> There is currently two official access points to the dam, namely the Tambotie Ridge Lodge and Matlala Aloe Park. The communities still access the dam through unauthorised points, stating that the tariffs of the provided points are unaffordable to them. 	<ul style="list-style-type: none"> DWS and LTA's support is required to sanction any kind of public access to the dam. Creating several access points may lead to mismanagement of the dam. The Business Plan should incorporate funding mechanism in order to aid the reduction in the tariffs especially for local communities.
<ul style="list-style-type: none"> To establish an effective safety and security system in order to reduce the high level of poaching. 	<ul style="list-style-type: none"> Certain portions of the SNR and the dam are not fenced, allowing people to access the dam at all points and resulting in a high level of poaching. There is no safety plan in place for the activities offered at the dam. 	<ul style="list-style-type: none"> As part of the RMP process, all boating activities should be compliant to SAMSA's Merchant Shipping (National Small Vessel Safety) Regulation, 2007. SAMSA's mandate is to ensure safety of life & infrastructure at the dam and also to prevent and combat pollution from vessels in the dam. LEDET and DWS should work together to stabilize the security system around the dam and the SNR.
<ul style="list-style-type: none"> To ensure that the activities undertaken within the dam are permitted as per relevant legislations. 	<ul style="list-style-type: none"> There is no agreement between Mr. Vermuleen from Matlala Aloe Park and DWS, Mr. Vermuleen only has an agreement with the Matlala Traditional Council Kgoshi/ Traditional Leader. 	<ul style="list-style-type: none"> Cooperative governance amongst the various Government Departments which are responsible for issuing permits in relation to use of the dam is essential to ensure that the activities within the dam are permitted. These Departments includes; DEA, DWS, SAMSA LEDET, DoT as well as LTA.
KPA 3: Benefit Flow Management		
Objective	Status Quo	Practicability
<ul style="list-style-type: none"> To unlock the socio-economic potential of the dam for commercial opportunities such as fisheries and crocodile farming. 	<ul style="list-style-type: none"> The District does not form part of any major tourism routes in Limpopo. The Schuinsdraai Nature Reserve dominates local tourism dynamics attracting local and national visitors mainly for game viewing, fishing, boating and bird watching. Currently there are illegal fishing at the dam where people use nets to harvest fish. 	<ul style="list-style-type: none"> Corporate governance is essential to discover the dam's commercial access, use and development activities that will be able to benefit the communities. Different government departments such as DWS, DEA, DAFF, DTI should work together into a management structure in order to assess the viability and possibility of introducing the small scale fishery as proposed by the local community. The Public Private Partnership (PPP) needs to be implemented as stipulated in the National Treasury Regulations. Alternative procurement strategies must be investigated where the PPP process is not feasible.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

		<ul style="list-style-type: none"> Studies need to be conducted to determine the feasibility of implementing fishery and crocodile farming projects at the dam. The BP will assist in identifying the marketing strategies and funding mechanisms that can assist the local communities to invest in the recreational industry at the dam.
<ul style="list-style-type: none"> To introduce tourism facilities (Holiday Resort) within the vicinity of the dam in order retain the visitors around the area. 	<ul style="list-style-type: none"> There is only a small restaurant at the Matlala Aloe Park which is of little interest to the public. There is a non-functioning restaurant and conference facilities at the Tambotie Ridge Lodge, however it is on the Schuinsdraai Nature Reserve side which is distant from the dam. The absence of a holiday resort and more restaurants at the dam has led to short stays due to lack of refreshments places and entertainment facilities. 	<ul style="list-style-type: none"> The BP will assist in identifying the marketing strategies and funding mechanisms that can assist the local communities to invest in the recreational industry at the dam.
<ul style="list-style-type: none"> To establish a crocodile research center in order to enable a variety of groups to conduct research on the Nile crocodiles which occurs within the dam. 	<ul style="list-style-type: none"> There is currently no official research center at the dam, however research can be conducted with permission from DWS. 	<ul style="list-style-type: none"> DWS and LTA's support is required to authorize any kind of access to the dam for research purposes. Researchers should be monitored regularly to minimize the disturbance of crocodiles. Only a particular number of research should be permitted on an annual basis to enable the crocodiles to function with no destruction.
<ul style="list-style-type: none"> To equip community members with the necessary skills for operation and management of the commercial activities. 	<ul style="list-style-type: none"> About 42% of the population's employment status is unknown. Only 4% of the population has moved beyond schooling to receive some kind of higher education. The implication of the project is that the majority of residents in ward 16 have not received any kind of training to equip them to become active participants in the tourism sector. 	<ul style="list-style-type: none"> The management authority should initiate capacity building and training programmes targeting local communities. Such programs should be associated with the dam (e.g. tourism management).
<ul style="list-style-type: none"> To allow local fishermen access to fish for subsistence purposes and 	<ul style="list-style-type: none"> The local community members cannot afford the gate fees, therefore 	<ul style="list-style-type: none"> DWS, DAFF and SNR need to be involved to ensure that there fishing permits which regulate local fishermen on the

FLAG BOSHELLO DAM RESOURCE MANAGEMENT PLAN

encourage participation in the management of the dam.	resulting in illegal fishing activities at the dam.	methodology of fishing is implemented. The methodology focus on the specific areas in the dam where fishing can take place and the quantity of fish to catch.
<ul style="list-style-type: none"> To have an improved management and communications structure with the appropriate power delegations, to effectively manage the recreational use of the dam in accordance with the RMP. 	<ul style="list-style-type: none"> The Flag Boshielo Dam has no Institutional Plan in place. The dam is owned, managed, operated, administrated and maintained by DWS. The dam is in the process of being proclaimed by LTA. 	<ul style="list-style-type: none"> It is essential to have functional Institutional Structure which is inclusive of all the relevant stakeholders with sufficient power to manage the recreational use of the dam. It should also encourage local economic initiatives and participation with regards to the use of the dam.
<ul style="list-style-type: none"> To effectively zone the water resource and to assess all the relevant information that must be undertaken to ascertain both habitat and landscape sensitivity. 	<ul style="list-style-type: none"> Certain portions of the dam are not fenced, this results in communities accessing the dam at any points and also not adhering to those provided in the zoning map. There is a proposed zoning of the Flag Boshielo dam to protect Nile crocodile nesting areas in the Olifants River and Elands River confluence area which was established by the LTA, this plan is non-operational. 	<ul style="list-style-type: none"> Compilation of an effective Zoning Map guided by existing Legislature and Stakeholders is essential to assist in harmonizing the conservation and recreational development at the dam. It can be guided by DWAF's Guidelines for Compilation of Zoning Plans for Government Waterworks (DWAF, 1999).

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 in **Figure 22**.

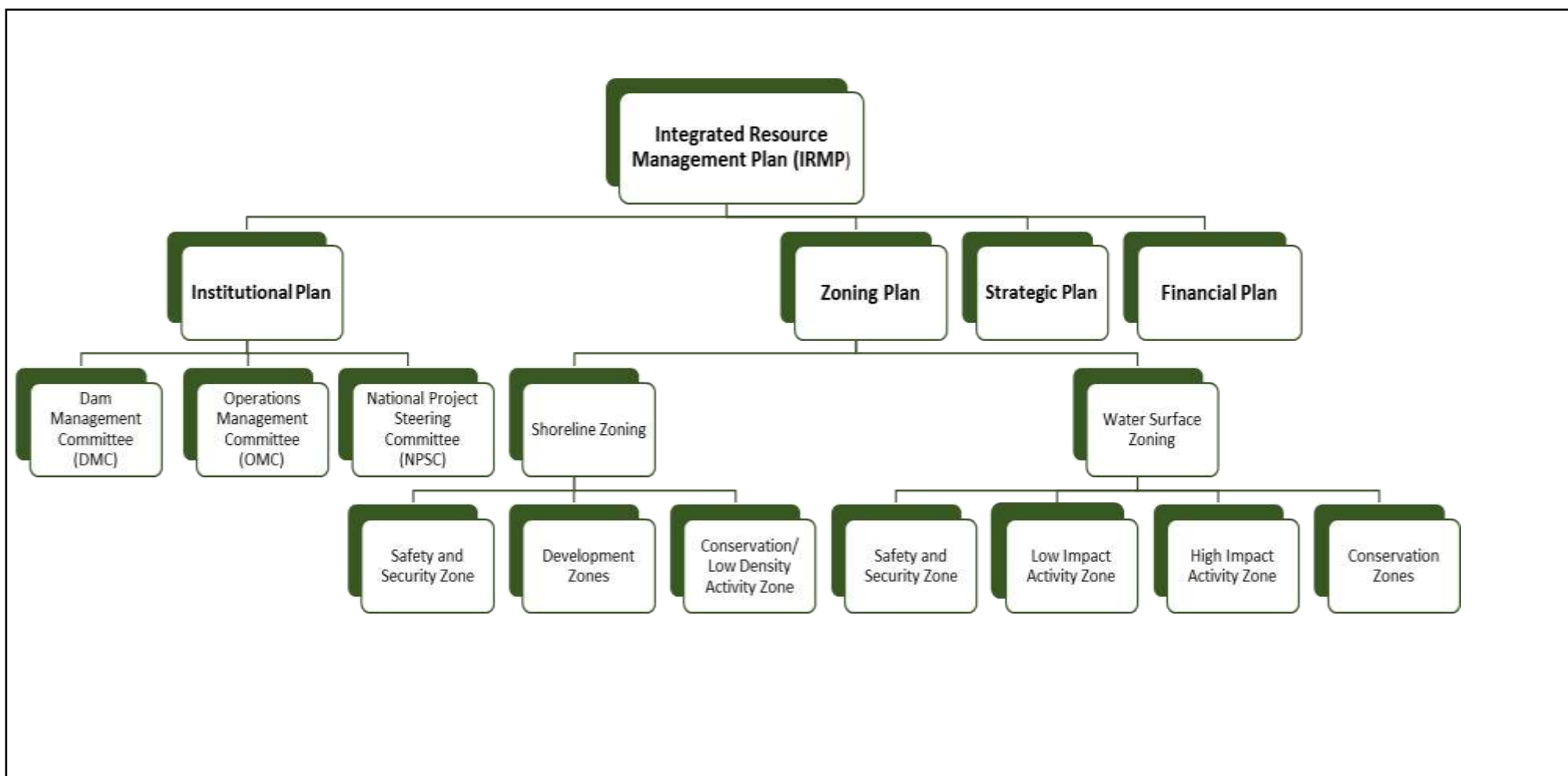


Figure 22: Integrated Resource Management Plan

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 RMP 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.

4.1.2 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 give support to Implementing Agency (IA) in the management of the dam for recreational purposes. Moreover, 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 and

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 23 illustrates the proposed user groups that will form part of the DMC.

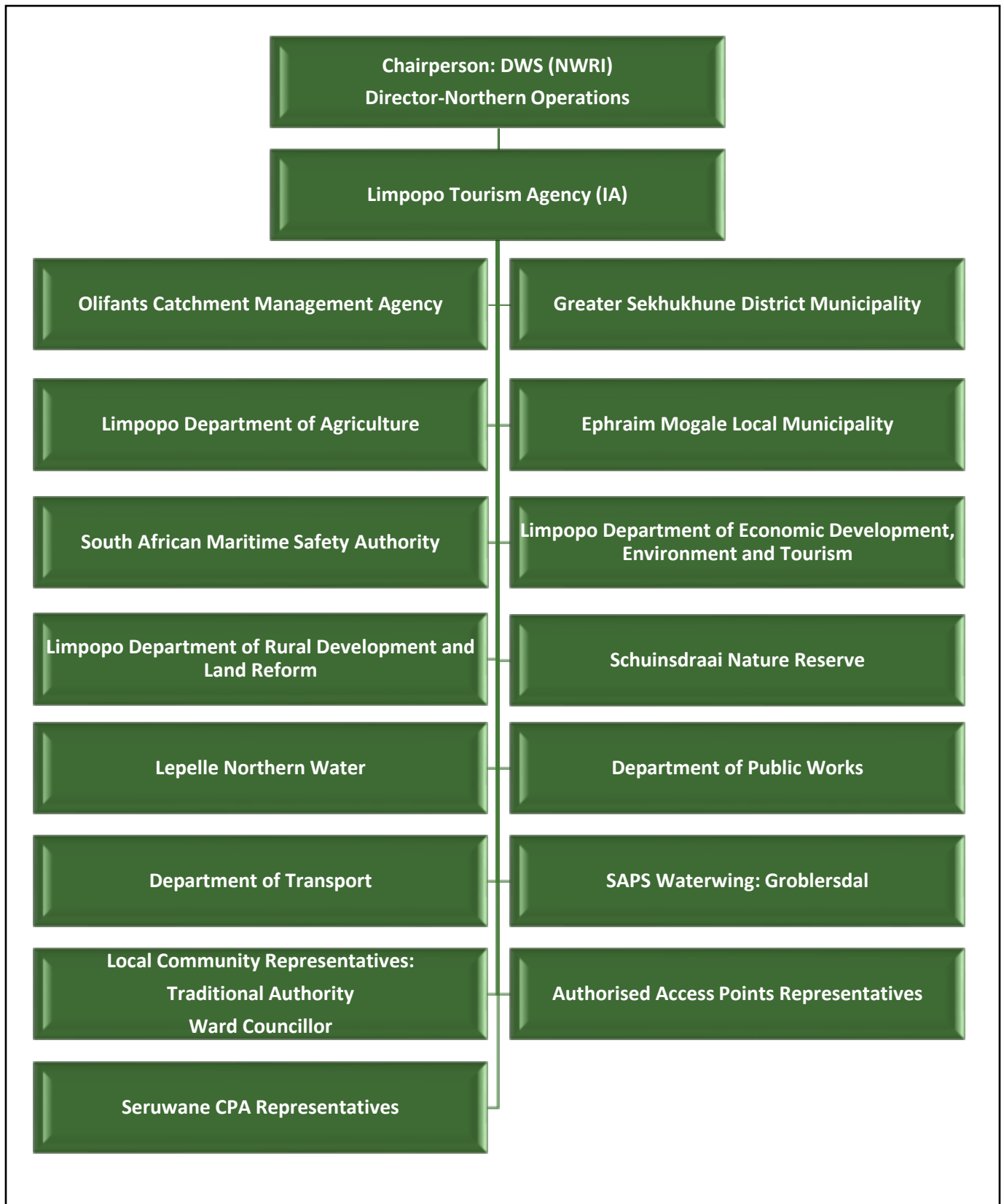


Figure 23: Proposed DMC

The DMC will have a number of management tools which will enable proper management of the dam in line with existing Legislations and Regulations 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 structure. The ToR provide guidance on the following management aspects:

- Roles and responsibility of chairperson;
- Roles and responsibilities of 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.

Agreements between DWS and Implementing Agency

LTA will be appointed as an Implementing Agency (IA) for the RMP of Flag Boshielo Dam. LTA and DWS will sign a 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 public sector body identified by DWS;
- Must have the best interest of a water resource and the community at large; 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 at 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.

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 AtoN for general navigation.

Agreements between SAMSA, DWS and 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 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.

Event Applications

All events must be managed through an event application process. In events application will be submitted to 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).

4.1.2 Operations Management Committee (OMC)

There is an existing Chief Director: Infrastructure Operations Management Committee (CD: IO MANCO) within Infrastructure Operations which comprises of all directors of four (4) operations (Northern, Southern, Eastern and Central) and is chaired by the Chief Director Infrastructure Operations within NWRI as illustrated in **Figure 24**.

The committee should meet quarterly discussing matters relating to operations and maintenance of all GWWs. A 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.

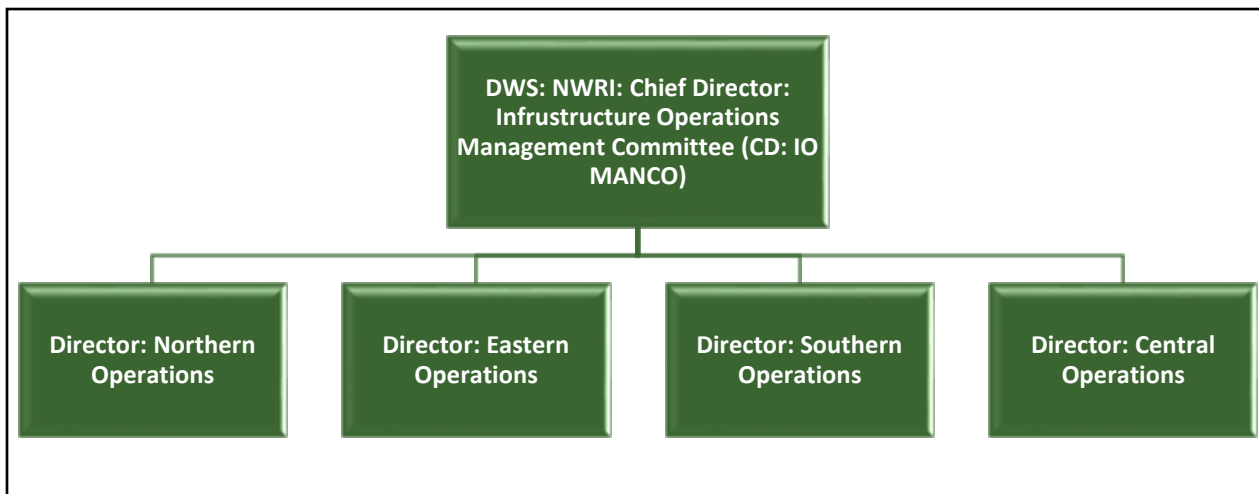


Figure 24: Existing CD: IO MANCO

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 25** illustrates a

typical example of Governmental Departments that will form part of the NPSC:

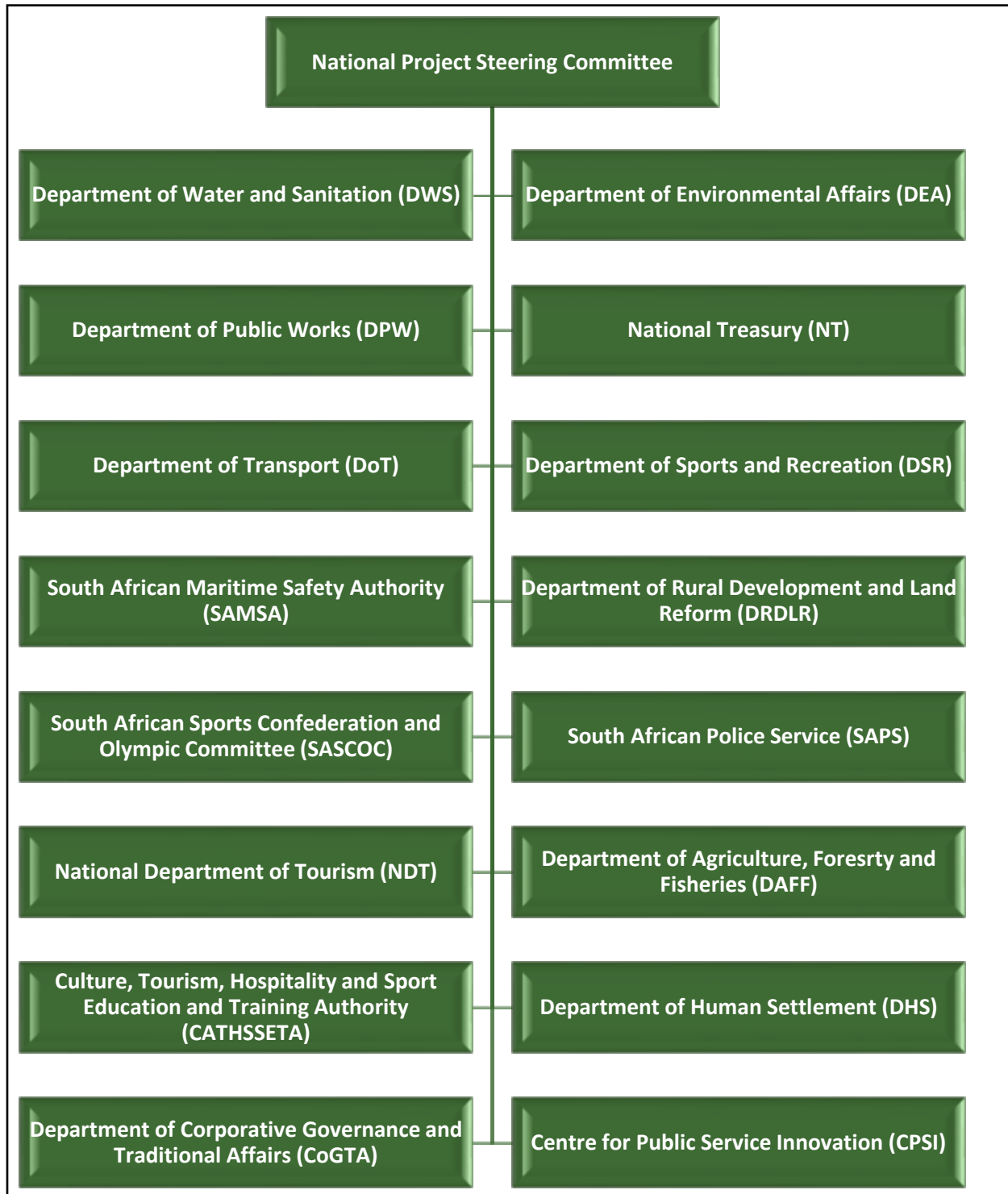


Figure 25: Proposed NPSC

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 rationalisation of the tourism sector, including measures aimed at the enhancement and maintenance of the standards of facilities and services utilised by tourists; and the co-ordination and rationalisation of the activities of those who are active in the tourism sector.

Department 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.

4.1. 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.

4.1.1. 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 motorised boating, house boating, water skiing, and para-sailing.

The water surface zoning colour coding means the following:

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

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

Table 17: Proposed Water Surface Zoning Description

Zone Name	Permissible Activities	Non-Permissible Activities	Recommendation
<ul style="list-style-type: none"> • Safety and Security Zone. 	<ul style="list-style-type: none"> • Alien invasive species clearing • DWS maintenance and management of activities and authorised personnel 	<ul style="list-style-type: none"> • Public access 	<ul style="list-style-type: none"> • Area should be demarcated by AtoN/ Demarcation Markers.
<ul style="list-style-type: none"> • Conservation Zone. 	<ul style="list-style-type: none"> • Access is limited to conservation and research staff. 	<ul style="list-style-type: none"> • Public activities in order to allow for: <ul style="list-style-type: none"> ○ Crocodile, fish and bird breeding habitats ○ To limit pollution 	<ul style="list-style-type: none"> • Area should be demarcated by AtoN/ Demarcation Markers. • No public activities should be allowed in order to allow for protection of crocodile fish breeding habitats. • These areas are critically important to crocodiles because most social interactions such as mating, establishment of dominance, home range maintenance, hunting etc take place here. • No vessels may be launched anywhere in this area. • Strict management and control of these areas is required, particularly with regards to illegal fishing and dumping.
<ul style="list-style-type: none"> • Low Impact Activity Zone. 	Activities associated with no or little wakes such as: <ul style="list-style-type: none"> ○ Fishing from boats ○ Provision of drinking area for livestock ○ Canoeing 	<ul style="list-style-type: none"> • High impact activities such as: <ul style="list-style-type: none"> ○ Power boats ○ House boats • Swimming in the dam. 	<ul style="list-style-type: none"> • Area should be demarcated by AtoN/ Demarcation Markers. • Launching and parking bay of vessels should take place at identified shoreline zones.
<ul style="list-style-type: none"> • High Impact Activity Zone. 	<ul style="list-style-type: none"> • Motorised boating • Jet powered boats • House boating 	<ul style="list-style-type: none"> • Low impact activities such as: <ul style="list-style-type: none"> ○ Fishing from boat ○ Provision of drinking area for livestock 	<ul style="list-style-type: none"> • Area should be demarcated by AtoN/ Demarcation Markers. • 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.

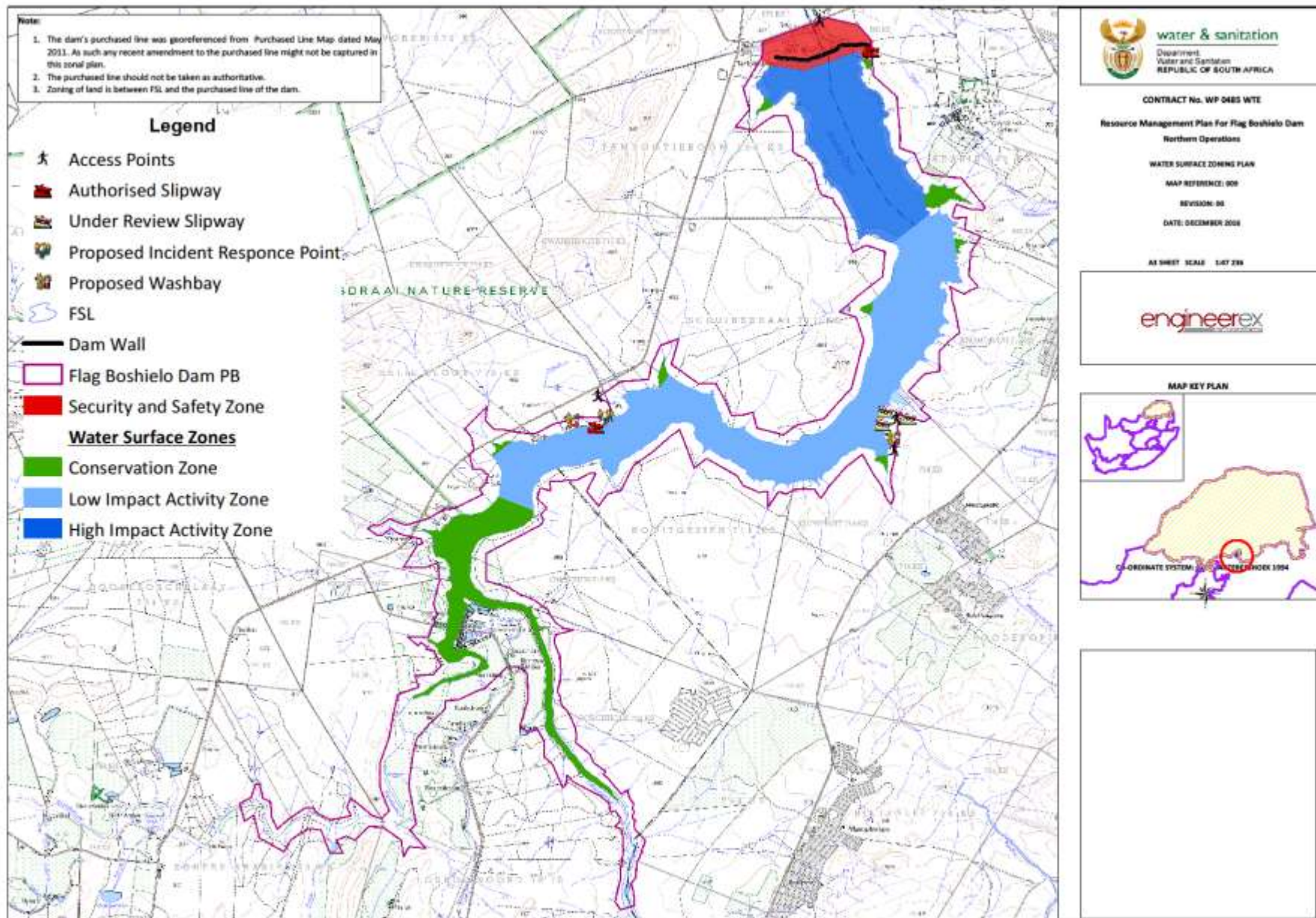


Figure 26: Proposed Water Surface Zoning Map

4.1.2. Shoreline Zoning³

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 includes:

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 authorised.

Conservation / Low Density Activity Zone:

This zone consists of ecologically sensitive areas and areas with high biodiversity. It also includes the area around the inlets of the dam. Access to this area is limited to low impact activities such as hiking, 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 colour 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

³ Permanent structures within the purchase line are not allowed. All developments should be outside 1:100 year floodline.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

Table 18: Proposed Shoreline Zoning Description

Zone Name	Permissible Activities	Non-Permissible Activities	Recommendation
<ul style="list-style-type: none"> • Safety and Security Zone. 	<ul style="list-style-type: none"> • Dam Wall viewing 	<ul style="list-style-type: none"> • Developments of tourism such as: <ul style="list-style-type: none"> ○ Chalets ○ Picnic areas ○ Ablution facilities, etc. 	<ul style="list-style-type: none"> • Access is limited to DWS and relevant authorised officials.
<ul style="list-style-type: none"> • Conservation Zone/ Low Density Activity Zone. 	<ul style="list-style-type: none"> • Conservation • Research 	<ul style="list-style-type: none"> • Activities including the destruction and transformation of conservation areas. 	<ul style="list-style-type: none"> • This area is important for crocodile nesting and basking. • No person will be allowed to approach, on foot or by boat, any crocodile nest, basking crocodile or crocodile found in the water except for bona fide conservation and research personnel.
<ul style="list-style-type: none"> • Medium Density Activity Zone. 	<ul style="list-style-type: none"> • Camping (tent/caravan) • Bank angling • Braai facilities • Picnic 	<ul style="list-style-type: none"> • High density activities such as: <ul style="list-style-type: none"> ○ Lodges ○ Parking areas ○ Construction of fisheries project facilities ○ Ablution facilities ○ Wash bays • Mixed use land development • Permanent structures 	<ul style="list-style-type: none"> • The management of this area must follow the PPP process in terms of National Treasury. • Ensure that all developments have been approved by IA and DWS. • Requirements of NWA and NEMA must be taken into account in all developments. • All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on dam and must blend in with the natural environment. • Camping, birding, hiking, picnicking, shoreline fishing and access to the water must be done in accordance to access agreements. • Camping and picnicking is allowed only in designated areas. • Noise levels to be kept at a minimum. • No littering at Camping and Picnic spots.
<ul style="list-style-type: none"> • High Density and Activity Zone. 	<ul style="list-style-type: none"> • Accommodation facilities (Lodges, resorts, etc.) • Ablution facilities • Construction of fisheries project facilities 	<ul style="list-style-type: none"> • Permanent structures 	<ul style="list-style-type: none"> • The management of this area must follow the PPP process in terms of National Treasury. • Ensure that all developments have been approved by IA and DWS.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

Zone Name	Permissible Activities	Non-Permissible Activities	Recommendation
	<ul style="list-style-type: none"> Wash bays Recreational club house Access to surface water for recreational purposes will also be within this zone. 		<ul style="list-style-type: none"> Requirements of NWA and NEMA must be taken into account in all developments. All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on dam and must blend in with the natural environment. Camping and picnicking is allowed only in designated areas. Noise levels to be kept at a minimum. No private slipways to be built without approval from DWS. All developments should be subject to EIA process and water use licence (Section 21 of NWA).
<ul style="list-style-type: none"> Community Resource Zone. 	<ul style="list-style-type: none"> Livestock access to water Subsistence fishing 	<ul style="list-style-type: none"> Permanent structures Other facilities such as the ones listed below: <ul style="list-style-type: none"> Accommodation facilities Wash bays Braai facilities Parking areas Construction of fisheries project facilities Ablution facilities 	<ul style="list-style-type: none"> Demarcation of the area by fence and have an access control.

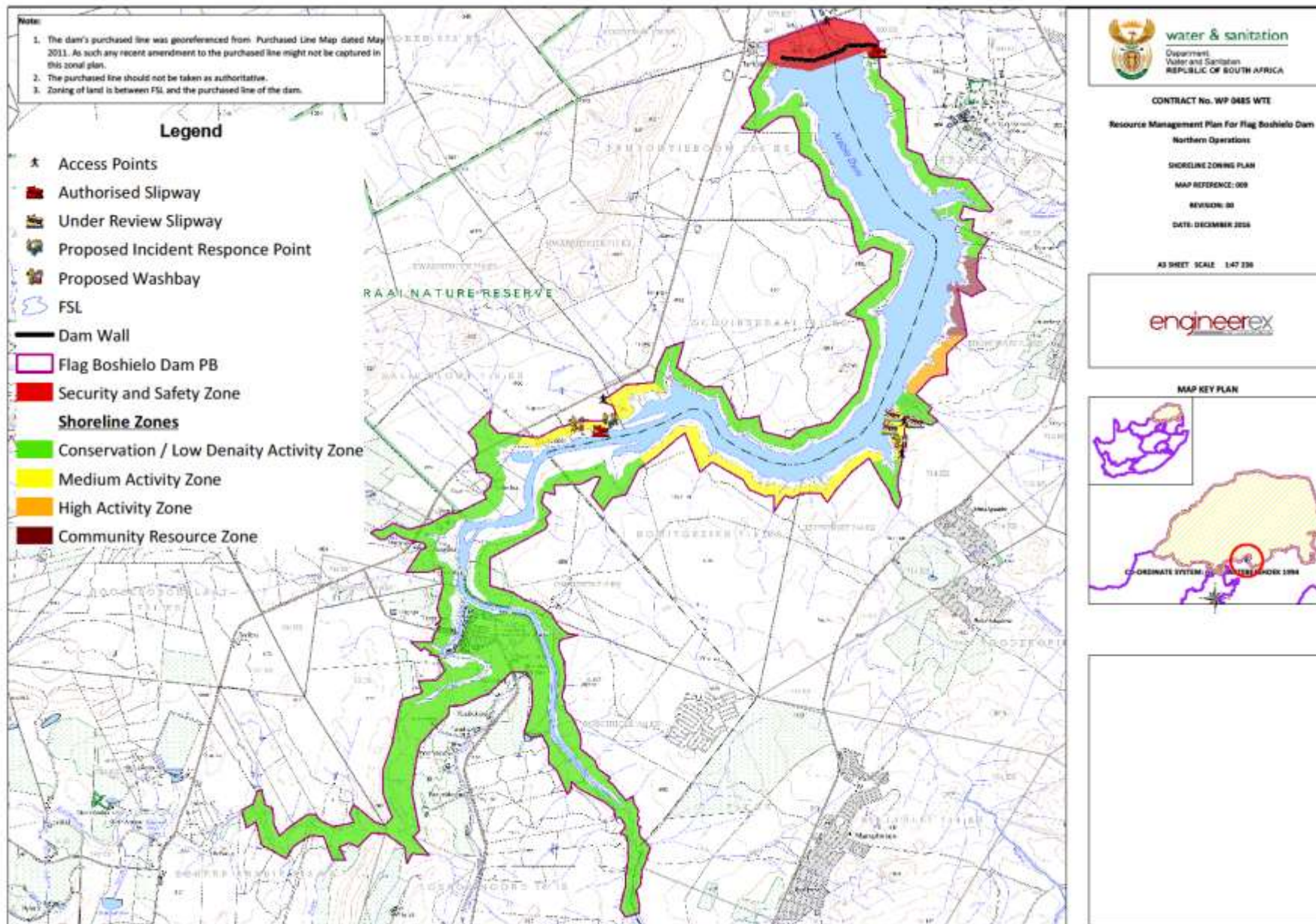


Figure 27: Proposed Shoreline Zoning Map

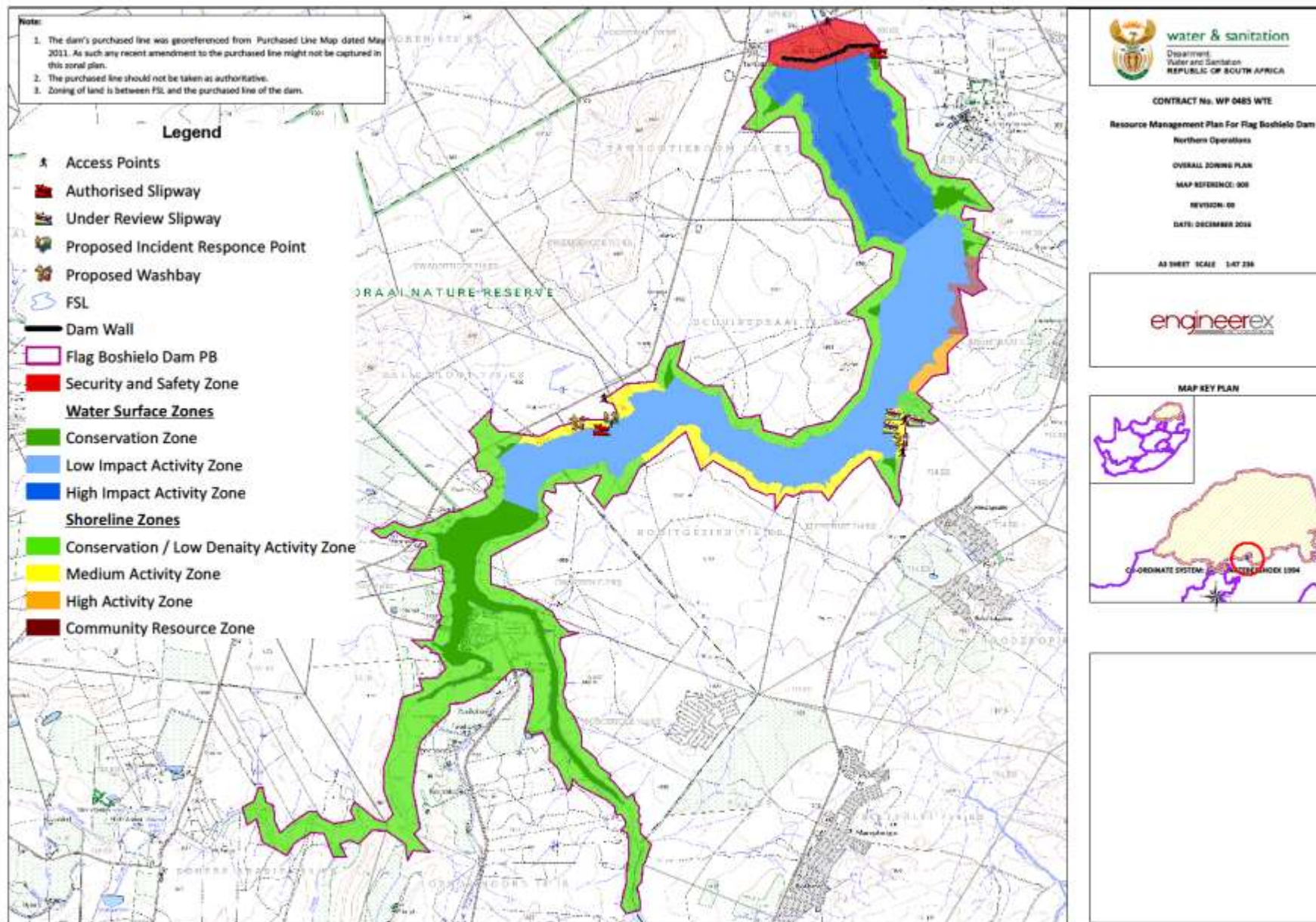


Figure 28: Proposed Overall Zoning Map

4.1.3. Carrying Capacity

The carrying capacity of a water resource represents the maximum level of users and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction, the economy and culture of the area.

In order to determine the degree of recreational use possible on the water surface, the Methodology for Carrying Capacity Assessment: Recreational Water Use (DWAF) was used as a guideline to determine the level of activity that would be sustainable at Flag Boshielo Dam.

Determining the carrying capacity ensures that recreational use of the dam is safe and that users do not feel crowded and enjoy their use of the dam. There are three kinds of carrying capacity, namely:

- **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 $RCC \geq ECC$.**

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

- Analysis of recreation and water resource management policies;
- Analysis of objectives of the water resource;
- Analysis of current recreational water use;

- Definition, strengthening or modification of policies regarding recreational water use management;
- Identification of factors influencing recreational water use; and
- Determination of the recreational water use carrying capacity.

Physical Carrying Capacity (PCC)

PCC refers to the maximum number of users that can physically fit into or onto a defined water resource, over a particular time.

Formula: $PCC = A \div U/a \times Rf$

Where **A** = available Surface area for public use

U/a = area required per user

Rf = rotation factor (number of visits/day)

A is calculated as the area of the water surface available for public use: **2210 ha.**

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

The **U/A** used for the assessment is as follows:

Craft	U/A (ha/craft)
Power Boat	4.0
Fishing from Boat	3.0
Average	3.5

Based on the fact that most activities do not require much space, the average hectare per user is 3.50 ha (35 000 m²), the value of 5.0 ha (50 000 m²) 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 Flag Boshielo Dam can further be calculated as:

$$\begin{aligned}
 PCC &= A \div U/a \times Rf \\
 &= 2210 \times 1/5 \times 1 \\
 &= 442 \text{ crafts}
 \end{aligned}$$

Real Carrying Capacity (RCC)

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.

Formula: $RCC = PCC \times (100 - Cf_1)\% \times (100 - Cf_2)\% \times \dots (100 - Cfn)\%$

Where:

Cf = a corrective factor expressed as a percentage.

The RCC takes into account factors that limit recreation use (craft based) of the dam.

RCC for Flag Boshielo Dam is therefore:

$RCC = PCC \times (100 - Cf_1)\% \times (100 - Cf_2)\% \times (100 - Cfn)\%$

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

$RCC = 442 \times (100 - 13.0)\% / 100$
= 385 crafts

Effective Carrying Capacity

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

$ECC = [Infrastructure Capacity \times Management Capacity] \times 100 / RCC$.

Infrastructure Capacity

It takes approximately 20 minutes to launch or retrieve a boat during the day. There is currently 3 slipway at the dam; at the Tambotie Ridge Lodge picnic side, Matlala Aloe Park and

opposite the Private Houses near Matlala Aloe Park = $[12 \text{ hours available per day} / 20 \text{ min}] \times 3$ slipway for public use, therefore:

$[720 / 20] \times 3 = 108$

As 20 minutes would apply either to launching or retrieving of vessel from the water, 108 would need to be halved: $108 / 2 = 54$. This is the maximum amount of boats that can be launched on a given day.

Management Capacity

Currently there is no management structure in place. The DWS is in the process of appointing LTA for the management of the dam basin, once it has been finalised the management capacity will be calculated.

4.2. 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 19 - 21**, the Strategic Plan on how to achieve the identified objectives regarding the dam is outlined.

Table 19: 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)
<p>Development:</p> <ul style="list-style-type: none"> To develop recreational activities that suites the climatic conditions of the area and to have sustainable measures in place for incase of natural disasters. 	<ul style="list-style-type: none"> A severe drought occurred between November 2002 and December 2005 (Dabrowski, et al. 2014). This shows that the area is prone to droughts which might affect the tourism development potential of the dam in future. 	<ul style="list-style-type: none"> Drought preparedness planning should be the main tool for governments at all levels to apply to reduce the risks to future events. Drought plans, containing the three basic components: monitoring and early warning, risk assessment, and mitigation and response, should be drafted. 	<ul style="list-style-type: none"> National Departments such as the National Disaster Management Centre must be involved because disasters such as drought might cause a great loss to the tourism and recreation industry. Such includes losses related to curtailed activities: fishing, bird watching, boating, etc. Other relevant departments including the Department of Agriculture, Forestry and Fisheries, Department of Environmental Affairs and Department of Water and Sanitation to assist with measures that need to be taken.
<p>Alien Invasive Species:</p> <ul style="list-style-type: none"> To ensure non-infestation of alien invasive species in the dam and surrounding environment. 	<ul style="list-style-type: none"> Alien invasive species such as <i>Sesbania punicea</i> (Category 1) have been recorded along the banks of the dam. These plants have been submerged by water since the raising of the dam wall in 2006 and are not growing there at present. It is, however, possible that the <i>Sesbania</i> seeds are still present and the monitoring of wet areas should take place to ensure that this species does not re-infest (LEDET, 2012).The re-infestation of the alien 	<ul style="list-style-type: none"> Monitoring of wet areas should take place to ensure that the <i>Sesbania punicea</i> species does not re-infest. 	<ul style="list-style-type: none"> The Department of Environmental Affairs (DEA) manages IAS under the National Environmental Management: Planning and performing eradication should be incorporation with Working for Water (WFW) within the Department of Environmental Affairs (DEA). Their involvement will assist in controlling and removing invasive species on the dam's surrounding.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

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)
	species will lead to the hindrance of some activities on the dam.		
<p><u>Water Quality:</u></p> <ul style="list-style-type: none"> To maintain a good water quality and protect the aquatic resource for recreational use as well as to ensure a healthy environment. 	<ul style="list-style-type: none"> Pollution from mines in the upper catchment of the Olifants River has a direct impact on the quality of the water and faunal species in the dam, the water quality should meet the minimum standards set out in the South African Water Quality Standards for Recreational Use. 	<ul style="list-style-type: none"> Determine water monitoring sites and add these to the national grid. Develop a programme for monitoring and reporting and initiate the monitoring of water quality. Set Resource Quality Objectives for the water quality at the dam. 	<ul style="list-style-type: none"> Government Departments such as the Department of Water and Sanitation that concern themselves with water quality and environmental health concerns need to be involved. This would include the Sekhukhune District Municipality and Ephraim Mogale Local Municipality. The management authority must have access to and be involved with the monitoring program and water quality data that is in existence for the dam as well as the rivers that feed the dam. Independent studies and research on water quality issues need to be harmonized with available water quality data and future monitoring programmes by DWS and the management authority.

Table 20: 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)
<p><u>Access:</u></p> <ul style="list-style-type: none"> To establish more access points which have lower tariffs to accommodate the rural communities around the dam. 	<ul style="list-style-type: none"> The Flag Boshielo Dam is surrounded by rural communities such as; Letebejane, Phetwane, Rooibokkop, Ditholong, Mogalatsana and Tsimanyane. Most community members access the dam through unauthorised points, stating that they cannot afford the access fees at provisional points provided by LTA. 	<ul style="list-style-type: none"> Public access and use should be equitable, compatible and safe. Entry fees can be levied for public access and use; however these need to be reasonable to ensure the dam remains an affordable destination. 	<ul style="list-style-type: none"> DWS and LTA's support is required to sanction any kind of public access to the dam.
<p><u>Improve access control:</u></p> <ul style="list-style-type: none"> To stabilize the security system in order to be able to reduce the high level of poaching. 	<ul style="list-style-type: none"> The SNR and the dam are experiencing a high poaching level due to certain portions of the reserve not being fenced. 	<ul style="list-style-type: none"> Access to the dam must be equitable and safe to all users. Establishment of fence all around the dam to prevent access of criminals to the dam. Appoint gate attendant to monitor dam access point. Establishment of dam rules in terms of DWAF Regulation R654 relating to access to the dam, fees payable for access, safety measures, speed limit applicable on the ring roads around the dam and the time in which the dam will be open to the public. Educate the Local Communities about the importance of safety measures around the dam basin in order to curb vandalism of the dam's properties. 	<ul style="list-style-type: none"> DWS with the support of LTA (IA), DMC, SAPS, LEDET.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

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)
		<ul style="list-style-type: none"> a. Access fee to the dam should be prescribed in terms of the S113 and S56 of NWA. The fees can be utilised to maintain the dam as well as to create job opportunities such as cleaners, security, etc. b. The entry fee need to be reasonable to ensure that the dam remains an affordable destination for all. 	
<p>Activities:</p> <ul style="list-style-type: none"> To ensure that the current activities undertaken within the dam basin are permitted as per relevant legislation. 	<ul style="list-style-type: none"> On the eastern portion of the dam, the Matlala Aloe Park launches boats and ferries into the dam. These activities are currently not fully authorised in accordance with the DWS licensing policies. There is however an opportunity to develop water based recreational facilities adjacent to the dam banks (SDA, 2012). 	<ul style="list-style-type: none"> The Matlala Aloe Park should apply and obtain the boating license and water abstraction authorisation from DWS. The National Treasury PPP Toolkit for tourism should be used as a guideline to assist in the process of the development of tourism based businesses on state owned land for commercial purposes. The toolkit determines which PPP route to follow by projected value of capital investment and assessment of project risks. The agreements needs to be approved according to Regulation 16 of the National Treasury. 	<ul style="list-style-type: none"> LEDET and DWS should review all existing agreements and ensure that everyone that is operating facilities within the DWS purchase land has the necessary authorization.

Table 21: 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)
<p><u>Community participation and beneficiation:</u></p> <ul style="list-style-type: none"> To unlock the socio-economic potential of the dam for commercial opportunities such as fisheries and crocodile farming. 	<ul style="list-style-type: none"> There is a high unemployment rate at the communities around the dam. Proposals from community members for possible developments around the dam were submitted to the Traditional Authority and were rejected. 	<ul style="list-style-type: none"> Implement Skills Development Programmes where opportunities exist. Implementation of environmental education to the local communities and ensure that they are always updated with environmental information. Educate the community on how to utilise the dam for other recreational activities besides fishing. This will assist in terms of uplifting the surrounding local community. Identify resources to be utilised for environmental education so that the environmental education can be established and skills to be transferred to the locals. 	<ul style="list-style-type: none"> All commercial concessions and operations within the dam will be subject to lease or management contracts with DWS. Different government departments such as DWS, DEA, DAFF, DTI should work together into a management structure in order to assess the viability and possibility of introducing the small scale fishery as proposed by the local community.
<p><u>Crocodile Centre:</u></p> <ul style="list-style-type: none"> To establish a crocodile research center in order to enable a variety of groups to conduct research on the Nile crocodiles which occurs within the dam. 	<ul style="list-style-type: none"> There is currently no official research center at the dam, however research can be conducted with permission from DWS. 	<ul style="list-style-type: none"> Existing conservation initiatives, NGO's, schools etc should be involved with social and educational programmes. Consider also developing relationships with existing Conservation Agencies and NGOs. Upliftment programmes that deal with education should ideally receive support from relevant research federations 	<ul style="list-style-type: none"> LTA (IA) with the support of the DMC.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

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)
		such as National Research Foundation (NRF).	
<p><u>Subsistence Fishing:</u></p> <ul style="list-style-type: none"> To allow local fishermen access to fish for subsistence purposes and encourage participation in the management of the dam. 	<ul style="list-style-type: none"> The local community members cannot afford the gate fees, therefore resulting in illegal fishing activities at the dam. 	<ul style="list-style-type: none"> Preserve the core habitats for nesting, resting, feeding and breeding of fish within the inlets. Management authority or DWS must develop a communication signage in order to effectively inform different angling groups about the dam fishing rules. Appoint a specialist to undertake a study to determine the measures of sustainable subsistence fish harvesting at the dam. Appoint safety officers that will monitor compliance of the dam fishing rules. Trainings should be provided to local subsistence fishers, to support subsistence fishing. Harvesting should be adapted to the capacity of the fish stock to renew themselves. If the decline of stocks is unavoidable, the dam can be stocked with fish naturally occurring in the dam. Generate the necessary infrastructure, such as accessible banks to fish from, slipways, Jetties, etc in order to support the growth of angling tourism at the dam. 	<ul style="list-style-type: none"> DWS, DAFF and Schuinsdraai Nature Reserve need to be involved to ensure that there are fishing permits which regulate local fishermen on the methodology of fishing is implemented. The methodology focus on the specific areas in the dam where fishing can take place and the quantity of fish to catch.

FLAG BOSHIELO DAM RESOURCE MANAGEMENT PLAN

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)
<p><u>Institutional Structure:</u></p> <ul style="list-style-type: none"> To have an improved management and communications structure in place with the appropriate power delegations to effectively manage the recreational use of the water resource in accordance with the RMP. 	<ul style="list-style-type: none"> The current management structure comprises of DWS and LTA only. However, other institutions such as Municipality Local/District, DEA, I&APs, SAMSA, etc. needs to be considered in these structure as they can play a vital role in effectively managing the dam. 	<ul style="list-style-type: none"> Ensure that roles and responsibilities of the role players are well defined and clarified. There has to be a suitable and functional institutional structure representing all the role players and also clearly defining the chain of command. 	<ul style="list-style-type: none"> DWS.
<p><u>Zoning:</u></p> <ul style="list-style-type: none"> To effectively zone the water resource and to assess all the relevant information that must be undertaken to ascertain both habitat and landscape sensitivity. 	<ul style="list-style-type: none"> A proposed zoning for Flag Boshielo dam, to protect Nile crocodile nesting areas in the Olifants River and Elands River confluence area was established by the LTA (Botha, n.d) The Zoning Plan is non-operational, the public access the dam at illegal access points. 	<ul style="list-style-type: none"> The water resource should be effectively zoned for recreation according to the relevant legislations. Following the sensitivity analysis, an assessment of the environmental characteristic must be undertaken. This assessment entails the determination of current environmental character status, opportunity for use, access and development based on a spectrum of the environmental limitations and stakeholder objectives. 	<ul style="list-style-type: none"> DWS LTA (IA)

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. People 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.

The information acquired from the RMP will be used to produce the Business Plan 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 Flag Boshielo Dam RMP. It also describes the financial management and operational requirements to implement the Objectives of the RMP

The BP will include a Financial Plan (FP) which will facilitate the implementation of the RMP by providing implementation program cost estimate for all possible economic recreational activities.

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 29** illustrates the RMP & BP review framework.

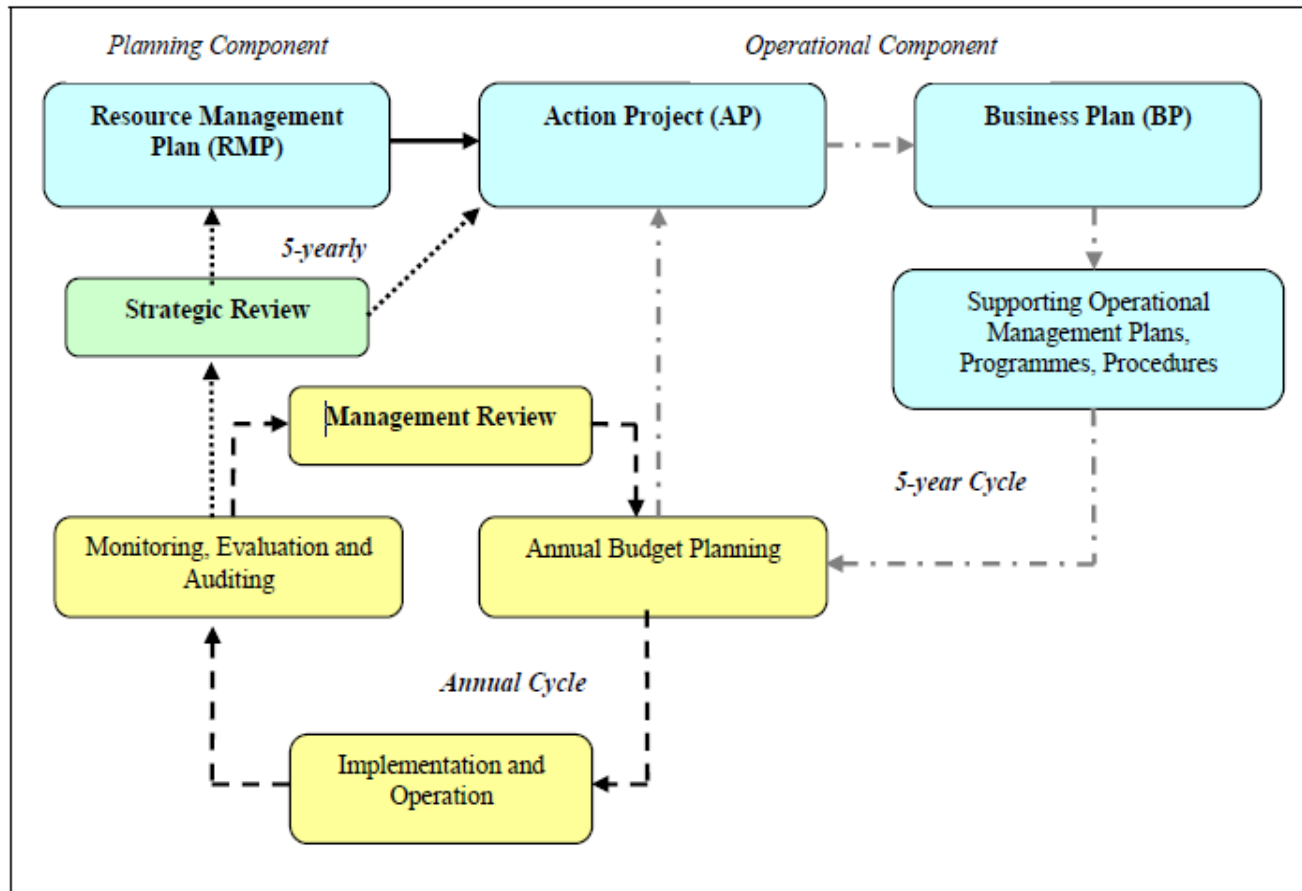


Figure 29: RMP and BP Review Framework

CONCLUSIONS

The RMP documents the challenges that exists within the Flag Boshielo 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 Flag Boshielo 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