Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

# Resource Management Plan

# CLANWILLIAM DAM

**REPORT** – Volume 4 of 5

**December 2016**

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation

Department:
Water and Sanitation
**REPUBLIC OF SOUTH AFRICA**

2030 NDP

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# ACKNOWLEDGEMENTS

Engineerex (Pty) Ltd would like to express its gratitude to the following Stakeholders that immensely contributed in the development of this Resource Management Plan for Clanwilliam Dam:

- Cederberg Local Municipality;
- Clanwilliam Aquatic Club;
- The community members of Clanwilliam;
- Department of Water and Sanitation;
- Department of Rural Development and Land Reform;
- Department of Environmental Affairs;
- Department of Public Works;
- Department of Transport; and
- Westcoast District Municipality.

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

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**Review:**

| Review Period | Month | Year | | | | |
|---|---|---|---|---|---|---|
| Annual Review of Business Plan | December | 2018[1] | 2019 | 2020 | 2021 | 2022 |
| Five (5) Yearly 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 | 09/10/2015 |
| 2 | Draft RMP for Public Review | 10/11/2015 |
| 3 | Final Draft RMP for DWS Review | 17/03/2016 |
| 4 | Final Draft RMP for DWS Review | 11/04/2016 |
| 5 | Final RMP for DWS Approval | 16/08/2016 |
| 6 | Final RMP for DWS Approval | 30/11/2016 |
| 6 | Final RMP for DWS Approval | 07/12/2016 |
| 7 | Final RMP for DWS Approval | 14/12/2016 |

# LIST OF ACRONYMS

| | |
|---|---|
| **ADU** | Animal Demography Unit |
| **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 |
| **CPSI** | Centre for Public Services Inn |
| **CIWSP** | Cooperative Inland Waterways Safety Programme |
| **CoGTA** | Cooperative Governance and Traditional Affairs |
| **CPSI** | Centre for Public Service Innovation |
| **DAFF** | Department of Agriculture, Forestry and Fisheries |
| **DEA** | Department of Water and Sanitation |
| **DHS** | Department of Human 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 Sport and Recreation |
| **DWAF** | Department of Water Affairs and Forestry |
| **DWS** | Department of Water and Sanitation |
| **ECC** | Effective Carrying Capacity |
| **EMF** | Environmental Management Framework |
| **FSL** | Full Supply Level |
| **GIAMA** | Government immovable Asset Management Act |
| **GP** | Guideline Programme |
| **GPS** | Global Positioning System |
| **GVD** | Gross Value Added |
| **GWW** | Governmental Water Works |
| **I&APs** | Interested and Affected Parties |
| **IALA** | International Association of Marine Aids to Navigation and Lighthouse Authorities |
| **IDP** | Integrated Development Plan |
| **IEE** | Integrated Environmental Engineering |
| **IRMP** | Integrated Resource Management Plan |
| **KPA** | Key Performance Area |
| **LAAP** | Local Accountable AtoN Parties |
| **NDT** | National Department of Tourism |
| **NEMA** | National Environmental Management Act |
| **NPSC** | National Project Steering Committee |
| **NWA** | National Water Act |
| **NWRI** | National Water Resources Infrastructure |
| **OMC** | Operations Management Committee |
| **PCC** | Physical Carrying Capacity |
| **PP** | Public Participation |
| **PPP** | Public Private Partnership |

| | |
|---|---|
| **PSP** | Professional Service Provider |
| **QDS** | Quarter Degree Square |
| **RCC** | Real Carrying Capacity |
| **RMP** | Resource Management Plan |
| **SAMSA** | South African Maritime Safety Authority |
| **SASCOC** | South African Sports Confederation and Olympic Committee |
| **SAPS** | South African Police Service |
| **SDF** | Spatial Development Framework |
| **SSA** | Swimming South Africa |
| **SWOT** | Strengths, Weaknesses, Opportunities, Threats |
| **WfW** | Working for Water |
| **WUL** | Water Use Licence |
| **WWTWs** | Waste Water Treatment Works |

# 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 Clanwilliam 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 Clanwilliam 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**: Clanwilliam Dam is a concrete gravity type of a dam which impounds Olifants River It falls under Wards 3 and 6 within the jurisdiction of Cederberg Local Municipality (CLM) which form part of the which Westcoast District Municipality (WCDM) in Western Cape Province, South Africa. Its GPS coordinates are: **32° 11'06.07''S 18° 52'26.91''E.**

**Purpose of the dam**: The primary purpose of Clanwilliam Dam is to supply raw water for domestic and irrigation uses.

The dam also currently offers recreational activities such as boating, water sports (both power and non-power), swimming, picnic and other leisure activities.

**Dam ownership and management**: The dam is owned and operated by DWS. There are two (2) access points at the dam, one of the access point is at the dam wall which is restricted to DWS for maintenance purposes. Another access point is situated within the Clanwilliam Aquatic Club and is used for recreational purposes.

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

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

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

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

ensure co-operative interests and support in the RMP project.

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

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

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

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

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

The identified key common objectives are:

- To preserve and maintain the high water quality standard of the dam;
- To construct a wash bay at the dam in order to prevent the spread of alien invasive plant species as well as to prevent pollution into the dam;
- To identify, acknowledge and conserve resources of archaeological significance within the dam basin;
- To compile a Zoning Plan which will integrate conservation, recreation and development whilst not retarding the primary functions of the dam;
- To promote, accommodate and manage a variety of activities and facilities within the dam basin in a manner that enhances the user's experience and minimizes the impact on the resource.
- To provide equitable, compactable and adequate access control at the dam;
- To establish adequate sanitation facilities at the dam;
- To promote sustainable harvesting of fish as a non-renewable resource;
- To ensure that the private property owners within the new purchased line are moved to an area with adequate basic services;
- To establish proper trails at the dam; and
- To establish an effective institutional structure that can manage the use of water for recreational purpose in an acceptable manner, which is also representative of all the Stakeholders.

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

***"To ensure sustainable utilisation of the pristine water resource based on effective resource management, sound business planning and environmental principles in order to improve the socio-economic status of the area".***

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

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

- Introduce museum and heritage sites.
- Providing picnic areas for the general public at the dam.

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# CHAPTER 1: INTRODUCTION

## 1.2 BACKGROUND OF CLANWILLIAM DAM

Clanwilliam Dam is located within Ward 3 and 6 of Cederberg Local Municipality (CLM) under West Coast District Municipality (WCDM) in the Western Cape Province. Its GPS coordinates are: **32° 01 1'37.26''S; 18° 05 2'50.50''E**. The dam falls within E10G Quaternary Catchment Area which falls within the Olifants-Doorn Catchment Management Area and it impounds the Olifants River. (Refer to **Figure 1**: Locality Map).

The dam is owned and operated by DWS and it was constructed in 1935. The wall was raised to its current height of 43 meters in 1964. Currently DWS is raising the dam wall to increase its capacity. Refer to **Table 1** for the current and future dam profile:

**Table 1:** Clanwilliam Dam Profile

| Clanwilliam Dam Profile | |
|---|---|
| **Location** | South Africa |
| **Province** | Western Cape |
| **District Municipality** | West Coast District Municipality |
| **Local Municipality** | Cederberg Local Municipality |
| **Nearest Town** | Clanwilliam |
| **Completion Year** | 1935 |
| **Initial Dam Raise Completion Year** | 1964 |
| **Second Dam Raise Completion Year** | 2016 (In progress) |
| **Co-Ordinates** | 32° 01 1'37.26''S; 18° 05 2'50.50''E |
| **Purpose** | Industrial and Domestic Use |
| **Owner** | DWS |
| **Water Management Area** | Olifants-Doorn Catchment Management Area |
| **Quaternary Catchment** | E10G |
| **Catchment Area ($km^2$)** | 2017 |
| **River** | Olifants River |
| **Capacity ($m^3$)** | 123,7 million |
| **Second Dam Raise Capacity ($m^3$)** | 330,0 million |
| **Surface Area (ha)** | 1123.6 |
| **Wall type** | Concrete Gravity |
| **Wall Height (m)** | 35 |
| **Length (m)** | 236 |

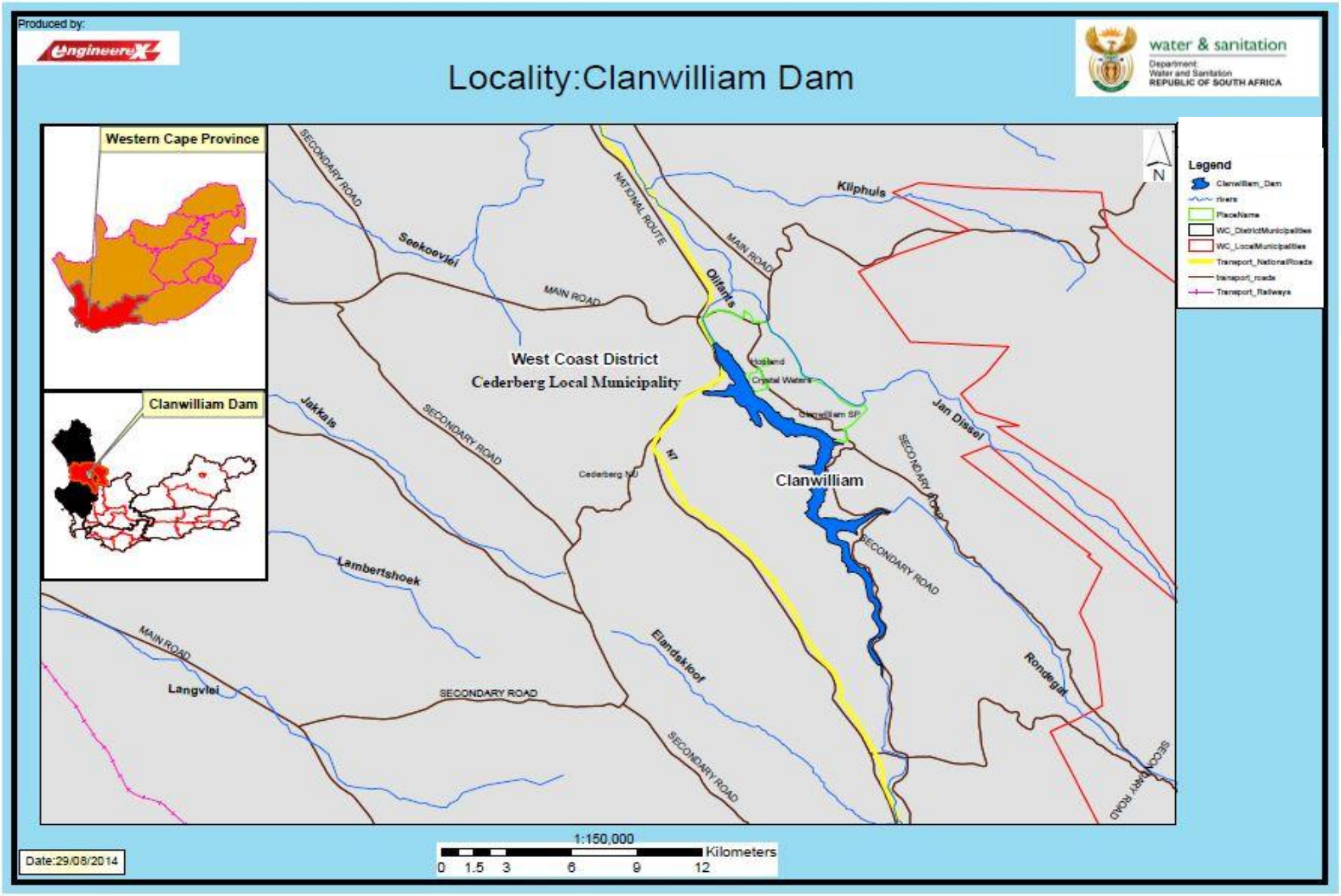


**Figure 1:** Locality Map for Clanwilliam Dam

## 1.3 BIOPHYSICAL ENVIRONMENT

### 1.2.1 Climate

Cederberg area is characterized by winter rainfall, with high precipitation ranging between 130-450mm from May to August. During winter, dense mist is common. Mean daily maximum and minimum temperatures are between 30.20°C – 6.60°C for February and July respectively (Mucina et al, 2006).

### 1.2.2 Flora

The dam is located within the Leipoldtville Sand Fynbos region and is characterized by two main vegetation types, namely the *Fynbos* and *Succulent Karoo,* while the area in the vicinity of the dam basin is characterized by *Fynbos* (West et al, 2007). According to the State of Rivers (2006), endangered Clanwilliam Ceder and Wild Fig trees are unique within the area.

According to Jayson Orton & Tim Hart (2005), little Alien Vegetation is present in the area with a few gum trees growing around the lower reaches of the dam and several stands of exotic acacia species occurring south of the river flood plain. There is also mango plantation on the eastern and western side of the dam.

#### 1.2.2.1 **Terrestrial Alien Plants Species**

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. Many of these species are prominent in riparian ecosystems. I.e. on the banks of water sources (streams, rivers, estuaries, dams and lakes).

Alien species were either intentionally or unintentionally introduced to South Africa. The intentional introduction was for aesthetic and/or economic gain. Some plants have been introduced with the intent of aesthetically improving public recreation areas or private properties, whilst others are introduced for ornamental or timber uses.

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

##### *1.2.2.1.1 Impacts of Alien Plants on Natural Environment*

- They are water guzzlers.
- They cause Eutrophication.
- They outcompete and displace the indigenous species.
- They cause soil erosion.

##### *1.2.2.1.2 Control Methods*

There are three methods to control or eradicate alien invasive species growing in the environment namely; **Physical control, Chemical and Biological control**.

**Physical removal**

Many invasive plants can be removed manually or with the help of simple tools. Shrubs can be removed by using a tree popper. The top growth of such plants can be cut, followed by the removal of the stem and roots from the ground. Larger trees can be dealt with using the ring-barking method. This involves peeling off the barks on the stem of the tree.

**Chemical control**

Herbicides can be sprayed on plants less than 2m in height for quick results. Spraying needs to be done when there is no wind in order to prevent spray drifting onto adjacent wanted plants. All plants that are subjected to the spray will be destroyed. Large tree can be cut down, leaving a stump as flat and as close to the ground as possible, and apply a recommended herbicide.

**Biological control**
Biological control consists of the use of natural enemies to reduce the vigour or reproductive potential of an invasive alien plant. Biocontrol can be achieved by the use of specially selected and carefully tested plant-feeding insects, mites, and pathogens.

1.2.2.2 **Aquatic Alien Plants Species**
Aquatic weeds is defined as "unwanted and/or undesired plants which grow and reproduce in an aquatic environment ".Whilst plants are important components of the aquatic environment, the excessive growth and spread of aquatic weeds can have a detrimental effect on water bodies and its inhabitants. Some of the problems caused by the growth and spread of aquatic weeds in water bodies are as follows:

- Interfere with or prohibit recreational activities such as swimming, fishing, and boating.
- Detract from the aesthetic appeal of a water body.
- Stunt or interfere with a balanced fish population.
- Produce quiet water areas that are ideal for mosquito breeding.
- Certain weeds can give water bad tastes and odours.
- Impede water flow in drainage ditches, irrigation canals, and culverts, causing water to back up.
- Deposition of weeds, sediment, and debris, can hinder bodies of water to fill in.

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

*1.2.2.2.1 Control Methods*

**Mechanical Control**
Mechanical control usually refers to the mowing or mechanical cutting of an invasive plant infestation to limit seed production. With mowing, timing is essential. Invasive plants must be removed before the plants go to seed in order to be an effective method of control. Plants should be cut as close to the ground as possible and may have to be treated more than once in a growing season to achieve desired results.

**Manual Control**
Manual invasive plant control usually refers to hand-pulling or digging. Manual control works well for dealing with single plants or small infestations that can be eradicated with a small amount of labour. It is most effective if invasive plants are shallow rooted and the soil is loose or moist. One should be aware this type of control may not be effective for invasive plants that also reproduce by roots and rhizomes. In these instances, limited hand-pulling or digging may actually increase the size of the infestation.

**Biological control**
Biological control often works best on large infestations, or infestations that are near the water. It is a long-term approach and often it takes many years for insects to establish and results to be seen. In some cases, a single biological control agent can adequately control an invasive plant species. However, in most cases, a variety of agents are needed to achieve control of the weed species population levels. Biological control will not eradicate the infestation directly. Rather, the agents are used to decrease the vigor and seed production of the plants in order to decrease their competitive ability. Therefore, it is important to use other weed management strategies to ensure that the infestations are contained.

Clanwilliam Dam currently do not have aquatic alien invasive species.

**1.2.3 Fauna**

**Amphibians**
According to the Avian Demography Unit (ADU), 2015 Frog map Atlas Nine (9) protected frog species were found in the 3218bb and 3218bd Quarter Degree Square (QDS) including one (1) vulnerable species (Cape Caco).

**Reptiles**

According to the (ADU, 2015), Twenty nine (29) reptile species were found in the 3218bb and 3218bd QDS including the one (1) Near Threatened species (Kasner's Dwarf burrowing skink) and Vunerable (Speckled Padloper).

**Fish Species**

Clanwilliam Dam is a home to different Indigenous Fish Species, which include the Clanwilliam Yellow Fish, Cape Kurper, Sand Fish, Catfish and Sawfish (State of Rivers, 2006). The EIA Study concluded that the raising of Clanwilliam Dam will have no impact on the Indigenous Fish Species as inundated areas will, however, provide the ideal temporary habitat when the dam is full.

**Mammals**

Thirty nine (39) mammal species were recorded within 3218bb and 3218bd QDS (ADU, 2015) including one (1) Near Threatened species (Honey Badger).

### 1.2.4 Topography

The Clanwilliam Dam is located in the relatively fertile and steep-sided Olifants River which is formed in Table Mountain Series sandstone Valley. As a result there are numerous outcrops of this rock forming cliffs, ridges, terraces and koppies along the area (Jayson et al, 2005). The landscape of the area is coastal sand plains which is flat to undulating, and also including localised inland dune fields (Mucina et al, 2006). (Refer to **Figure 2:** Slope Map)

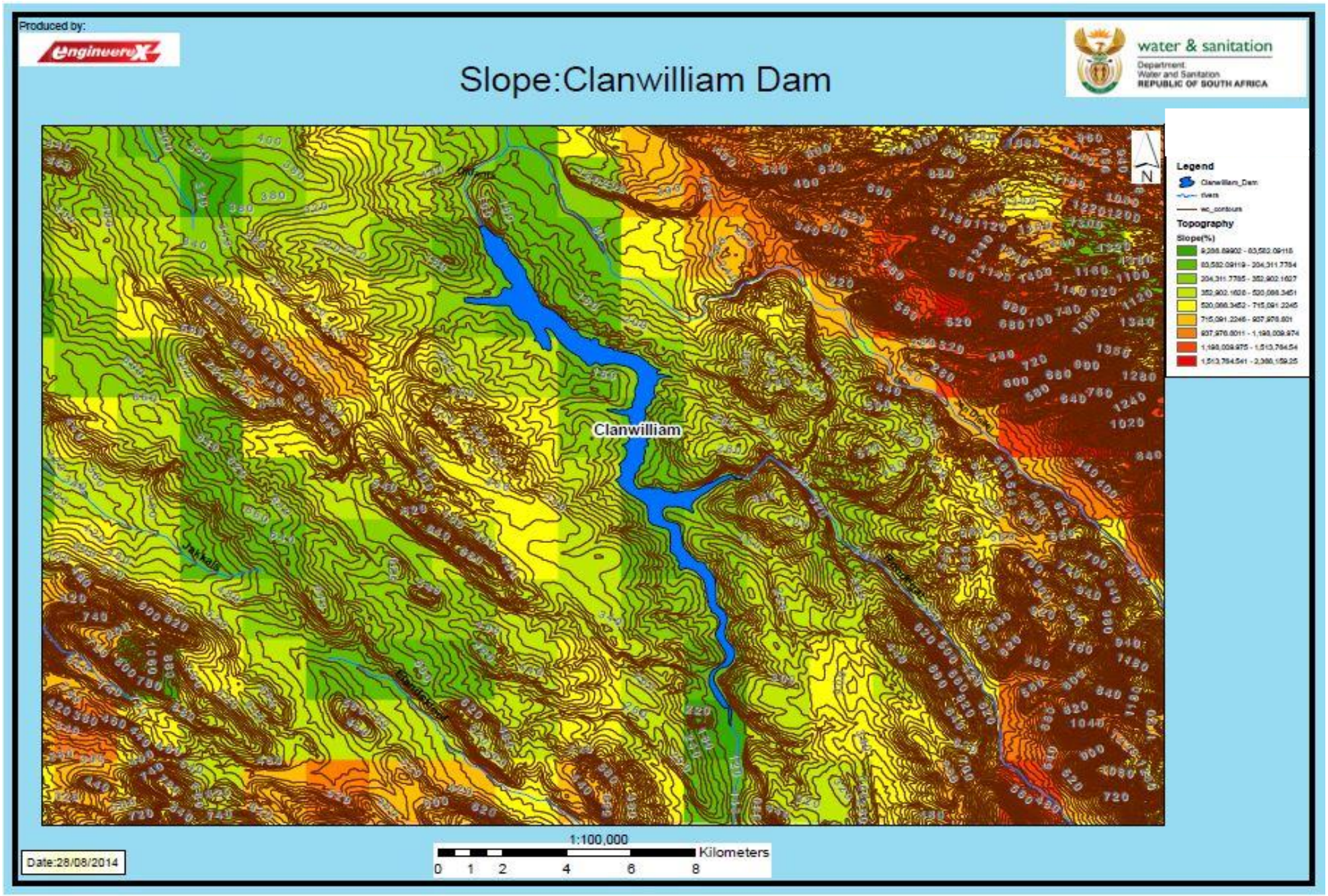


**Figure 2:** Slope Map for Clanwilliam Dam

### 1.2.5 Geology and Soil

According to Mucina et al (2006), the area surrounding the dam is dominated by Arenite rock formations (Latin Arena and sand), which is a sedimentary clastic rock with sand grain size between 0.0625 mm (0.00246 in) and 2 mm (0.08 in) and contain less than 15% matrix.

Other Arenites within the area include sandstones, arkoses, greensands, and greywackes. Some arenites contain a varying amount of Carbonatic components and thus belong to the rock-category of Carbonatic sandstones or Silicatic limestones. They often appear as massive or bedded medium-grained rocks with a middling- to wide-spaced preferred foliation and often develop a pronounced cleavage. The soil in the Cederberg area is deep, tertiary sands, generally pale-yellow to reddish brown or grey (SABI-GIS, 2006). (Refer to **Figure 4**: Geology Map)

### 1.2.6 Historical, Archaeological and Cultural Resources

According to Jayson Orton et al (2005), the dam is located in an area with numerous sites containing rock art, Stone Age tool deposits, Historic structures (19$^{th}$ century dwellings), graves and other culturally significant artefacts. The raising of the dam could result in the inundation of significant artefacts and rock paintings.

During the Public meeting, the Community of Clanwilliam Town indicated that it is of their interest to have the art removed from the dam and be put in a safe place for tourism purposes. Depicted below are some of the historical and archaeological resources at the dam.

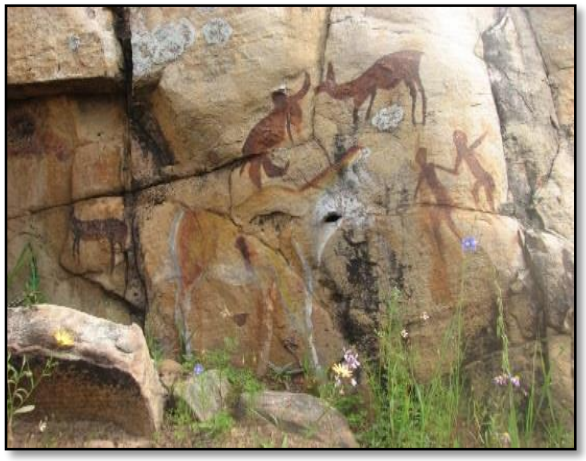

**Figure 3:** Ancient Rock Paintings

### 1.2.7 Sensitivity

According to NEMPAA Wetlands, the dam is surrounded by channeled valley-bottom wetlands. Furthermore the presence of historical and archaeological resources makes the dam to be more sensitive to some of the proposed recreational activities.

Mucina et al (2006), indicated the 55% of the vegetation within the Leipoldtville Sand Fynbos region has undergone transformation due to large growing of agricultural based activities, e.g. cultivation of mango trees, potatoes, rooibos, etc. Furthermore, water extraction for central pivot irrigation and other agricultural uses is reputedly drying out the remaining 45% of the vegetation.

### 1.2.8 Hydrology

#### 1.2.8.1 Surface Water

The dam lies within the Olifants-Doorn Catchment Management Area and it impounds the Olifants River. **Figure 5** illustrate the fluctuations of the dam's water level over a year (DWS, Western Cape Province State of Dams, 2015).

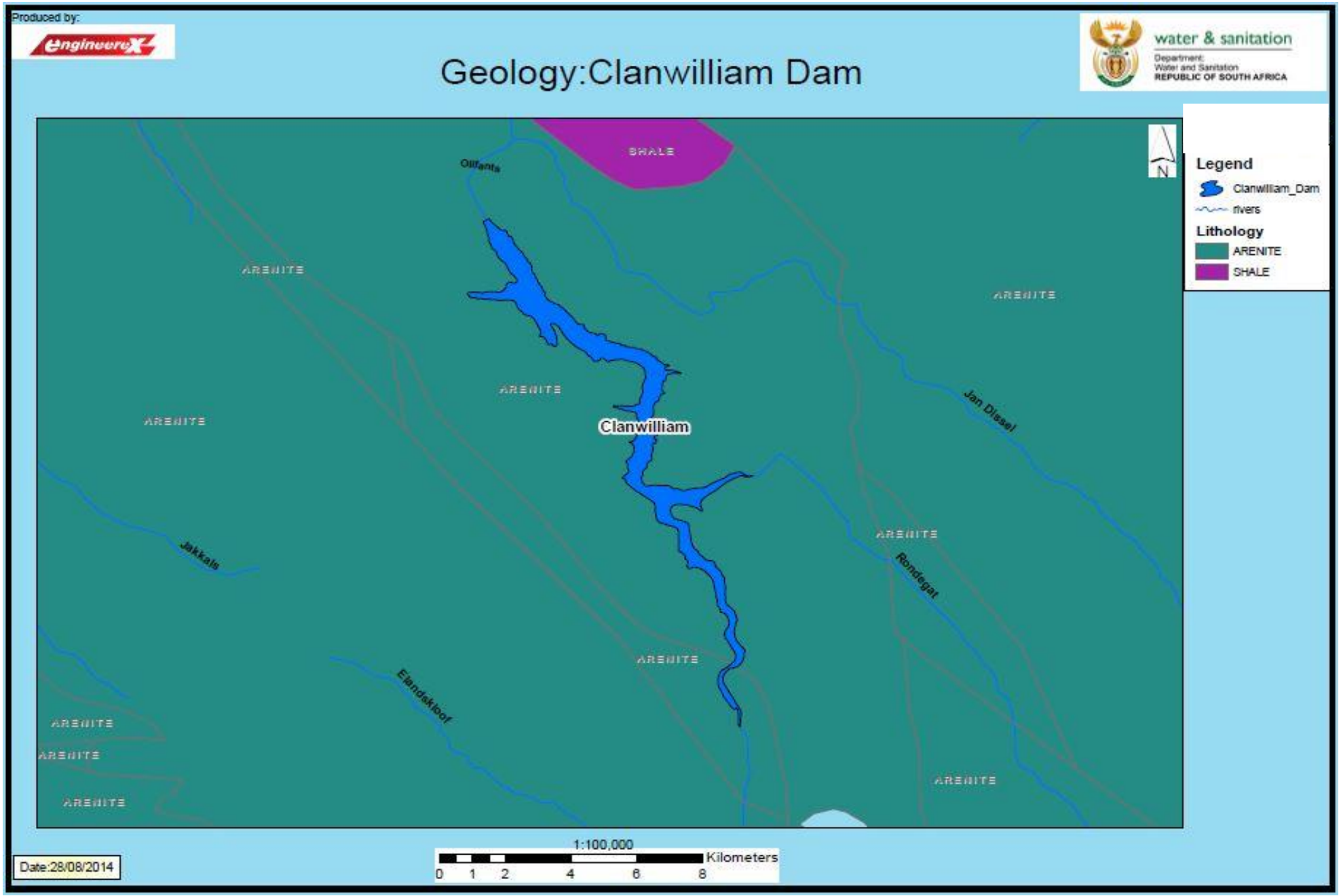


**Figure 4:** Geology Map for Clanwilliam Dam

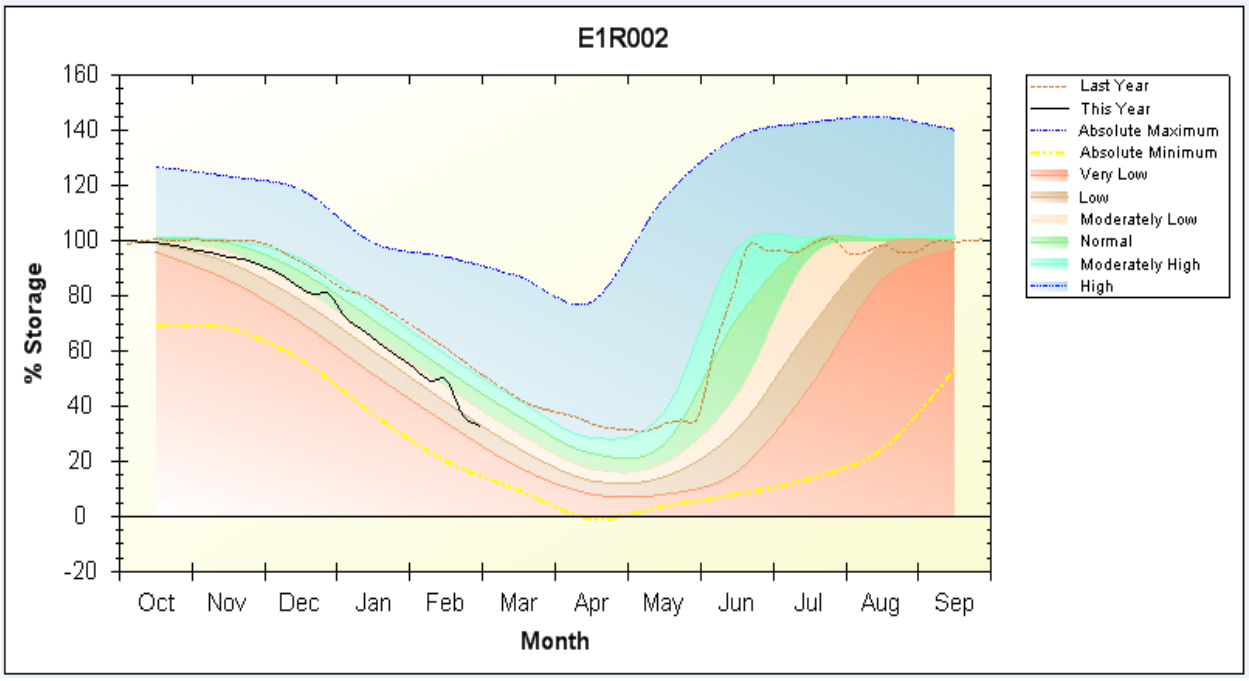


**Figure 5:** Fluctuations of the dam's water level over a year (DWS, 2015)

### 1.2.8.2 **Water Quality**

The term water quality is used to describe the physical, chemical, biological and aesthetic properties of water, all of which determine its fitness for use and its ability to maintain the health of aquatic organisms (DWAF, 1996). Water quality therefore expresses the suitability of water to sustain various uses or processes. Any particular use will have certain requirements for the physical, chemical or biological characteristics of water. Consequently, water quality can be defined by a range of variables which limit water use. Human health is directly affected by the proximity, availability and quality of water resources.

According to DWAF (2004), the dam is located in an area with naturally good water quality. The water quality data for the dam was obtained from DWS (Resource Quality Services) and the results concluded that the water quality of Clanwilliam Dam is pristine and is suitable for recreational purposes as stipulated in **Table 2**:

**Table 2:** Water Quality Data for Clanwilliam Dam (DWS RQS, 2014)

| Characteristics | Tests Results | Water Quality Target Range (Recreational Purposes) | Description |
|---|---|---|---|
| Clarity (Secchi disc, m) | - | 3.0 | No information available. |
| pH (pH units) | 7.2 | 6.5 - 8.5 | Minimal eye irritation occurs. The pH of water is well within Quality Range and the buffering capacity of the lachrymal fluid of the human eye, Skin, ear and mucous membrane irritation absent. |
| Algae (Chlorophyll-a method, µg/chl-a) | 3.8 | 0 - 15 | No nuisance conditions may be encountered. |
| Ammonia (mg/L) | 0.002 | 0 – 1.0 | No health and or aesthetic effects can occur. |
| Magnesium (mg/L) | 1.7 | 0 - 30 | No health effects. |

| Characteristics | Tests Results | Water Quality Target Range (Recreational Purposes) | Description |
|---|---|---|---|
| Potassium (mg/L) | 2.4 | 0 - 50 | No aesthetic or health effects. |
| Sulphate (mg/l) | 3.3 | 0 - 200 | No health or aesthetic effects are Experienced. |
| Electrical Conductivity (mS/m) | 12.0 | 0 - 70 | No health effects associated with electrical conductivity of water are expected < 45 mS/m |

## 1.3 USES AND USERS OF THE DAM

### 1.3.1 Primary Function of the Dam

1.3.1.1 **Domestic Use**

The main purpose of the dam is to provide irrigation water to the agricultural region downstream.

1.3.1.2 **Irrigation Use**

There are several Citrus farms that depends on the dam for irrigation, and are located along the edges of the dam and this include Mango Plantations, Grapes, etc. Some of the orchards are located within the new proposed Flood line.

### 1.3.2 Secondary Use of the Dam

1.3.2.1 **Recreational Use**

The dam is used for recreational boating, fishing and water-skiing. South of the Clanwilliam Dam is a small nature reserve (Ramskop Nature Reserve) which is popular on weekends and over holidays. However, much of the resort's land lies within the proposed inundation zone.

During spring (flowering season) tourists comes in large number to view the beauty of flowers at Clanwilliam.

## 1.4 RECREATIONAL INSTITUTIONAL STRUCTURE

There is currently no institutional structure that is managing recreational use of the dam. However, as part of the RMP, the recreational institutional structure will be established in accordance to the DWS Institutional Arrangements for Managing Use of Water for Recreational Purposes.

### 1.4.1 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.

### 1.4.2 Access

There are two (2) official access gates at the dam, where one (1) is located next to the dam wall and the second one is at the Aquatic Club. The access near the dam wall is only used by DWS for maintenance purposes and the access at the Aquatic Club is used by club members for access into the water. Other access points are on the private properties adjacent to the dam.

### 1.4.3 Event Management

Permits are currently issued by DWS prior to any event undertaken at the dam.

## 1.5 SAFETY

There is lack of adequate access control to the dam wall. Most concern is that the historical and archaeological resources as well the Conservation areas (Inlet) are not yet demarcated.

### 1.5.1 Safety of Navigation

There is currently adequate, and fixed floating Aids to Navigation (AtoN) [2] and Demarcation Markers in place.

### 1.5.2 Incident Management

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

## 1.6 SOCIO-ECONOMIC ENVIRONMENT

### 1.6.1 Social Audit

The main purpose of social audit is to examine the general status of the study area and to determine issues that need to be addressed when developing the RMP in order to overcome potential difficulties in an area. The study area falls within Ward 3 and 6 of CLM. An understanding of socio-economic conditions of Ward 3 and 6 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, employment status and monthly income was undertaken and is presented in section 1.6.1.1 to 1.6.1.4, respectively.

#### 1.6.1.1 Population Dynamics

According to the census (2011), the CLM has a population of about 49 768. This population is composed of 50.22% females and 49.78% males. **Table 3** and **Figure 6** shows the population size of the CLM:

**Table 3:** Population Percentage

| Population Group | Number of People | Percentage |
|---|---|---|
| Colored | 37, 651 | 75.65% |
| Black African | 6, 308 | 12.67% |
| White | 5, 462 | 10.97% |
| Other | 175 | 0.35% |
| Indian or Asian | 171 | 0.34% |

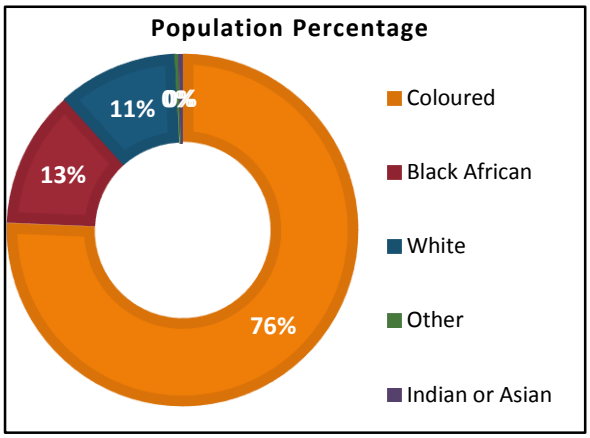


**Figure 6:** Population Dynamics of CLM

#### 1.6.1.2 Education Level

The Census (2011) breaks down educational levels into each year of study. For the purpose of this report, only the level of education for individuals of twenty (20) years and above was considered. As indicated by **Table 4**, only 5.10% of the population has furthered their studies in higher institutions.

**Table 4:** Education level

| Educational Percentage | |
|---|---|
| No Schooling | 7.70% |
| Matric | 19.40% |
| Higher Education | 5.10% |

#### 1.6.1.3 Employment Status

In terms of employment levels within the Municipality, majority of residents are employed and only 10.70% of residents are unemployed. Of greater concerned is that 13.80% of youth are not economically active (Census, 2011). Refer to **Table 5**.

[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".

**Table 5:** Employment rate

| Labour Market | Percentage |
|---|---|
| Unemployment rate (official) | 10.50% |
| Youth Unemployment Rate (official) 15-34 years | 13.80% |
| Employed | 76% |

#### 1.6.1.4 Monthly Income

**Table 6** and **Figure 7** show that 34.4% of individual within the Municipality do not have any source of income. While the rest of the individuals do have sources of income. 10.7% of them earn an income below the minimum living levels, which is R 620 per month as defined by Statistics South Africa.

This then requires concerted and integrated efforts by the Municipality to create decent work and sustainable livelihoods for the people. It is also worth noting that only 0.1% of individuals earn above R50, 000 per annum.

**Table 6:** Individual Monthly Income

| Individual monthly income level | CLM (2011) |
|---|---|
| No Income | 34.4% |
| R1 – R 400 | 6.6% |
| R 401 – R 800 | 4.1% |
| R 801 – R 1600 | 21.0% |
| R 1601 – R 3200 | 5.5% |
| R 3201 – R 6400 | 4.2% |
| R 6401 – R 12800 | 3.2% |
| R 12801 – R 25600 | 0.9% |
| R 25601– R 50000 | 0.4% |
| R 50000 and more | 0.1% |
| No Response | 4.4% |
| Institutions | 15.2% |

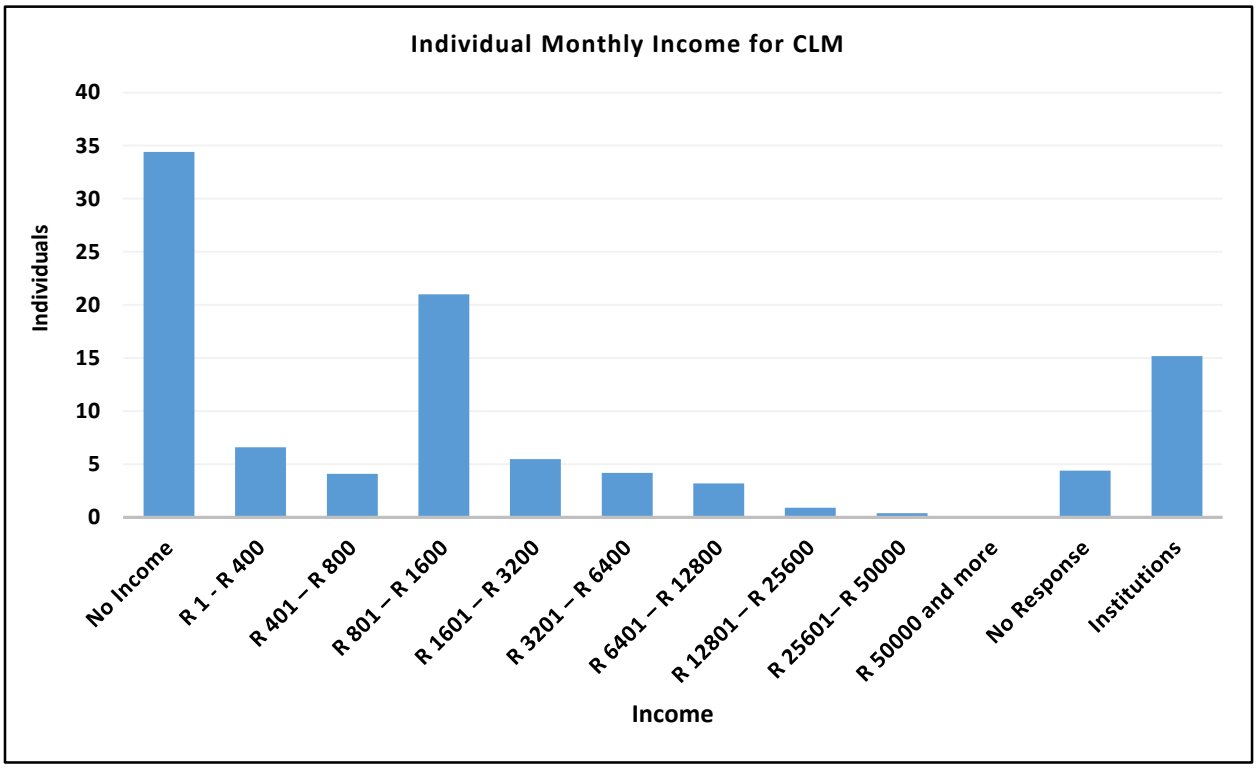


**Figure 7:** Individual Monthly income

### 1.6.2 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 CLM into Primary sector which involves direct use of natural resources, Secondary sector involving manufacturing and Tertiary sectors, which comprises of services.

According to the CLM IDP (2012-2017), the biggest sector in the Municipality is the Agricultural and fishing sectors. It is well known that both these sectors are in decline regarding employment with the fishing sector in decline due to fish stocks and the agricultural sector employing less people on a permanent basis and more people on a seasonal basis.

It further indicates that the second biggest employer in the Municipality is the institutional and the community, social and personal services sectors with just over 20% of people employed. The tourism (4% at present) and agricultural processing sectors are possibly the two sectors with the greatest chance to create sustainable jobs.

**Table 7** and **Figure 8** illustrate the CLM GVA per sector and the variables are explained below:

**Primary Sector:**

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

**Secondary Sector:**

- Manufacturing;
- Electricity 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;
- General Government;
- Institutions; and
- Unspecified.

The RMP for Clanwilliam Dam can contribute to the growth of the Municipal economic sectors, and this can be in the form of fishing, Finance, business services, catering and accommodation, Transport, and communication.

**Table 7:** CLM GVD per sector

| CLM Sectors | Percentage (%) |
|---|---|
| Agriculture, forestry, fishing | 13.6% |
| Mining | 0.4% |
| Manufacturing | 2.4% |
| Electricity and water | 0.1% |
| Construction | 2.3% |
| Wholesale, retail trade, accommodation | 4.1% |
| Transport and communication | 0.9% |
| Finance and business services | 1.4% |
| Community, social, personal services | 5.0% |
| Institutions | 15.2% |
| Unspecified | 54.6 |

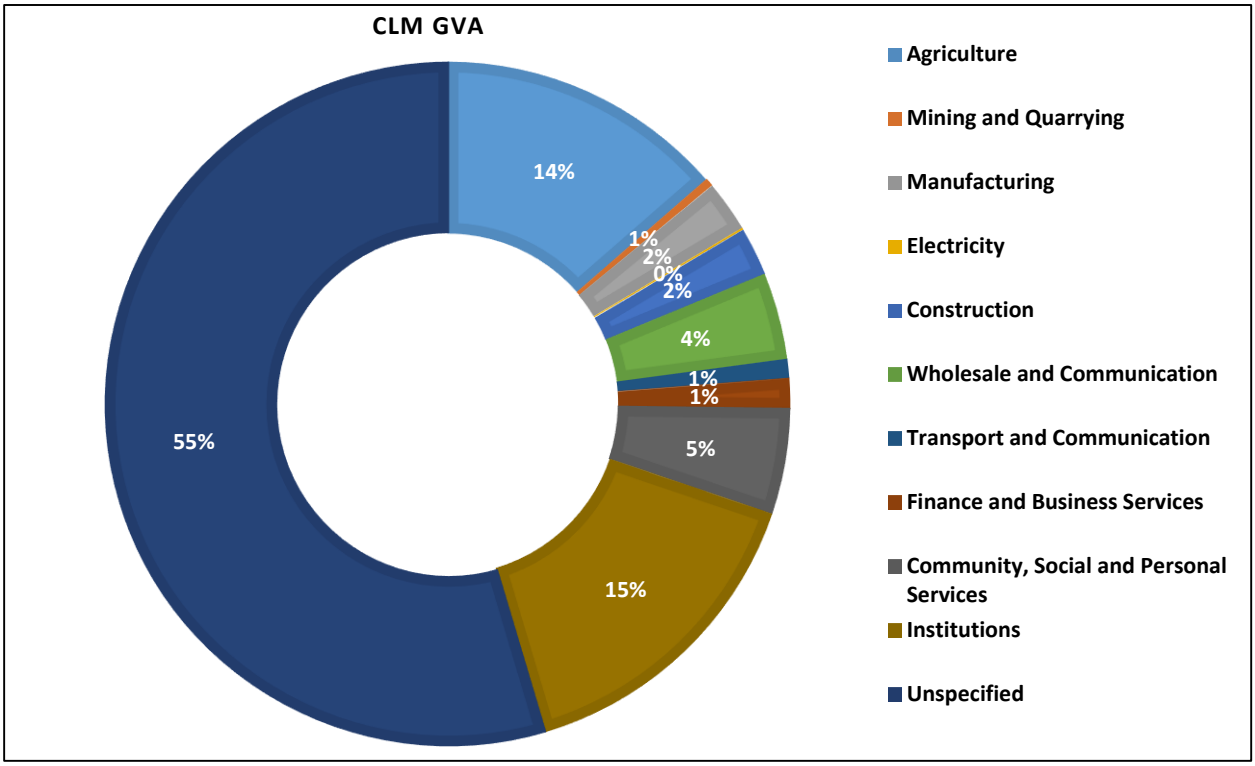


**Figure 8:** CLM GVD per Sector

### 1.6.3 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 Clanwilliam 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 same Act deals with the protection of wetlands and water courses, while regulations 15 and 16 deals with Alien Invasive Plant Species and bush encroachment**.**

III. **Consideration on Institutional Arrangement for Managing Use of Water for Recreational Purposes (DWAF, 2003):** It outlines some of the institutional issues at a local level and makes recommendations about the conditions under which different Institution Management arrangements may be considered.

IV. **General Public Participation Guidelines (DWAF, 2001):** Public Participation refers to the ongoing interaction between Role Players and all stakeholders that is aimed at improving decision making during planning, design, implementation and evaluation of all projects within the state, this includes the proposed development of the RMP.

V. **Government Immovable Asset Management Act, 2007 (Act No. 19 of 2007):** To provide for a uniform framework for the management of an immovable asset that is held or used by a national or provincial department; to ensure the coordination of the use of an immovable asset with the service delivery objectives of a national or provincial department; to provide for issuing of guidelines and minimum standards in respect of immovable asset management by a national or provincial department; and to provide for matters incidental thereto.

VI. **Government Notice R654 dated 1 May 1964, in terms of the Water Act, 1956 (Act No. 54 of 1956):** Regulates access and use of government waterworks for recreational purposes.

VII. **Guidelines for Compilation of Resource Management Plans (DWAF, 2006):** Directs and guides the development of RMPs by providing insight into the purpose and objectives of these plans, the procedure for its compilation and structure of such documents.

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

- Requirements for vessel safety;
- Crewing requirements and responsibilities;
- Controlled events such as competitions and regattas; and
- Responsibilities of authorised agencies (governing boards/clubs/organisations and regulating authorities).

These Regulations apply to the Department of Water and Sanitation as they are applicable to all inland and sheltered waters and as the Department and its agencies are allowing access to government waterworks for recreational boating vessels.

IX. **Methodology for Carrying Capacity Assessment for the Use of Water for Recreational Purposes (DWAF, 2003):** The carrying capacity of a water resource represents the maximum level of visitor/recreational use and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction or adverse impacts upon the local or host community, the economy and culture of the area.

X. **National Environmental Management Act, 1998 (Act No. 107 of 1998):** NEMA serves as South Africa's Environmental Framework Legislation. It was designed to provide for co-operative and Integrated Environmental Governance by establishing a general framework for decision-making on matters affecting the environment.

XI. **National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) and Related Regulations:** This Act aims to provide the framework, norms and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources.

The Alien and Invasive Species Regulations for this Act came into effect 01 October 2014. NEMBA together with these Regulations aim to prevent the introduction and spread of alien and invasive species across South Africa.

XII. **National Environmental Management: Protected Area Act, 2003 (Act No. 57 of 2003):** The aim of this Act is to provide for the protection and conservation of ecologically viable areas, which are representative of South Africa's Biodiversity, as well as natural landscapes and seascapes.

XIII. **National Treasury Public Private Partnership (PPP) Toolkit for Tourism, 2005:** This toolkit assist the process of development of tourism-based businesses on State-owned Land. The Toolkit make it easier for Institutions and the Private Sector to enter into tourism related partnerships on State Property managed by National and Provincial Government Institutions.

XIV. **National Water Act, 1998 (Act No. 36 of 1998):** The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and appropriate manner, for the benefit of all. Furthermore Section 113 of the Act states that the water of a government waterworks and surrounding state owned land may be made available for recreational purposes, subject to controls determined by the Minister and regulations made by the Minister.

Using water for recreational purposes is a water use under Section 21K and can be exercised as permissible use of water under Schedule 1 of the Act. However, this provision does not cater for commercial use hence the RMP should be implemented in line with General Strategic Plan for commercialisation of Tourism Public Private Partnerships at Government Waterworks, 2009 and PFMA Treasury Regulation 16.

Once the RMP has been approved, the RMP will regulate access and use of the dam. It is important to note that users will need to comply with other relevant legislation.

XV. **Operational Policy: Using Water for Recreational Purposes (DWAF, 2004):** This policy is the main guideline in support of the RMP process with regards to the basic principles, policies, strategies and actions

for regulating the use of water for recreational purposes.

XVI. **Public Finance Management Act (PFMA) (Act No. 29 of 1999**): Section 76 of the Act secures transparency, accountability and sound management of the revenue, expenditure, assets and liabilities of government departments. The Act promotes the objective of good financial management in order to 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:**

- Broad-based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003).
- Communal Land Rights Act, 2004 (Act No.11 of 2004).
- Development Facilitation Act, 1995 (Act No. 67 of 1995).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- National Heritage Resources Act, 1999 (No. 25 of 1999)
- Occupation Health and Safety Act, 1993 (Act No. 85 of 1993).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).
- The Constitution of South Africa, 1996 (Act No.108 of 1996).
- The Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970.
- Western Cape Nature Conservation Board Act, 1998 (Act No. 15 of 1998).
- Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000):
- Western Cape Provincial Development Framework (2005).
- **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 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.

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

## 3.2. PURPOSE OF THE RMP

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

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

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

## 3.3. PROCESS TRIGGERS

Triggers 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, as illustrated on **Table 8.**

**Table 8:** Triggers factors for the development of Clanwilliam Dam RMP

| Trigger Factors | Description |
|---|---|
| **Resource Management** | **Surface Water**<br>• The dam wall is currently being raised to increase the dam capacity. This will increase other possible recreational opportunities whiles impacting on the existing recreational facilities (e.g. the rock art will be relocated to the new location outside the dam flood line).<br><br>**Access control**<br>• Lack of adequate access control to the dam wall.<br><br>**Protected Areas:**<br>• The dam is located in an area where there are Rock Art, Stone Age tool deposits, historic structures (19th century dwellings), graves and other culturally significant artefacts. As a result, it must be conserved and preserved |

| Trigger Factors | Description |
|---|---|
| | in accordance with the National Heritage Resources Act, 1999 (No. 25 of 1999) as it can attract more tourists to the dam. |
| **Community Participation and Beneficiation** | **Community beneficiation**<br>• Physical access to the dam is only provided to the aquatic club members, whiles other community members are unable to access the dam.<br>• Local fishermen are currently experiencing a challenge in terms of accessing the dam as they have to pass through private properties. |
| **Public Policy** | **Local Planning Initiatives**<br>• The Clanwilliam Dam should be integrated in other local planning initiatives and decision supporting tools such as Cederberg Local Municipality (CLM) IDP and Local Economic Development (LED) plan as well as West Coast District Municipality (WCDM) 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 9.**

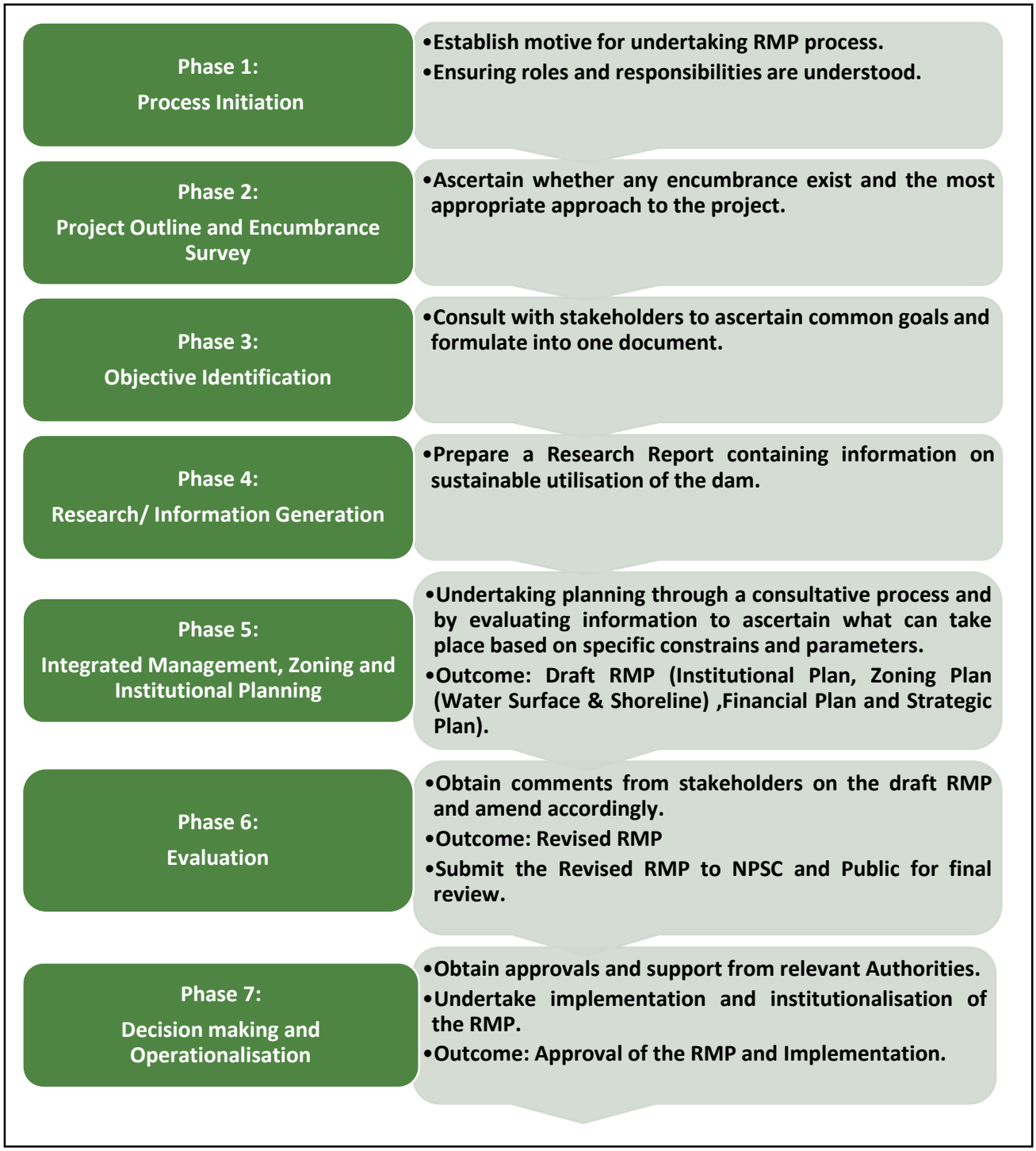


**Figure 9:** RMP Procedure

## 3.5. RMP PLANNING STAGES

### 3.5.1 Desktop Study

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

### 3.5.2 Site Inspection

A site inspection was conducted at Clanwilliam Dam on **03 July 2014** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with the DWS delegates (DWS IEE, Southern Operations Manager, Dam Manager and Southern Operations Champion). 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**

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 **The Participation Phase**

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

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

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 Compilation and Distribution of Background Information Document (BID)*

The purpose of this document was to provide Stakeholders 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 encouraged 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 **Ons Kontrei Newspaper**. The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **1 August 2014**. Furthermore, an advert for the draft RMP was advertised on **25 November 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 Afrikaans and were distributed on **24 July 2014**. Moreover, the flyers for the draft RMP were distributed on **10 November 2015** (See attached **Appendix D**).

3.5.3.5 **Direct Communication**

*3.5.3.5.1 E-mails*

Meeting invitations were sent out to authorities and I&APs notifying them about the scheduled consultative meetings, the invitation entailed the BID, meeting venue and time. The email notifications were sent out on **25 July 2014**. Moreover, the meeting invites for the draft RMP were sent out on **13 November 2015** (**See** attached **Appendix E**).

*3.5.3.5.2 Authority Meeting*

The initial authority Meeting was held on **07 August 2014** at the **Clanwilliam Kathy Johnson Hall**.

The purpose for this meeting was:

- To present the RMP, its goal and the objectives of the project to the authorities; and
- To allow the authorities an opportunity to participate in the project by sharing

information on their respective mandates.

The draft RMP was presented to the authorities on **01 December 2015.**

*3.5.3.5.3 Public Meeting*

The initial public meeting was held on **07 August 2014** at the **Clanwilliam Kathy Johnson Hall**. 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 Clanwilliam Dam. Moreover, the draft RMP was presented to the public on **01 December 2015**.

*3.5.3.5.4. Comments and Responses Register*

A copy of the draft report was circulated on **10 November 2015**. The commenting period was to elapse on **01 January 2016**. (See attached **Appendix F**).

### 3.5.4 Planning Partners

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

The RMP provides for coordination between different governments and agencies to ensure that not only the objectives of DWS are attained, but also the objectives of other relevant Government Departments are attained. Such Departments includes among others as outlined in **Table 9**.

**Table 9:** Planning Partners and their respective mandates

| Department/ Agency | Mandate |
|---|---|
| Cederberg Local Municipality (SLM) | The dam is within the jurisdiction of the Municipality. |
| Cape Nature | Cape Nature is the public institution mandated to promote and ensure biodiversity conservation within the Western Cape Province. |
| 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.<br><br>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. |

| Department/ Agency | Mandate |
|---|---|
| National Treasury (NT) | The use of State assets is governed by National Treasury Regulations, requiring DWS to plan concessions in compliance or association with National Treasury, guided by the Tourism Public Private Partnership (PPP) Toolkit of 2005. |
| South African Maritime Safety Authority (SAMSA) | One of SAMSA's three legislative mandates is "to ensure safety of life and property at sea". The Act enables SAMSA to administer and execute the relevant maritime legislation. |

## 3.6. RMP DATA ANALYSIS

### 3.6.1 Encumbrance Survey (Phase 2)

The purpose of the Encumbrance Survey is to investigate/ ascertain whether any encumbrances exist around the dam and other factors that may influence the development and implementation of the RMP. The survey also identifies the information that is required for effective decision-making regarding the RMP (DWAF, 2006).

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

**Tables 10 to Table 12** outline the summary of limitations that might affect the development or implementation of the RMP for the dam.

**Table 10:** Summary of Biophysical Encumbrances

| Item | Description |
|---|---|
| Flora and Fauna | • Endangered plant species that exist in this area may occur at areas with high potential for recreational development and this will impact negatively on these species.<br>• Alien invasive plant species like Blue gums are a threat to the indigenous flora and they consume large quantities of water which will impact on the water level and the habitat of the indigenous species. |

**Table 11:** Summary of Legal Encumbrances

| Item | Description |
|---|---|
| Land Ownership | • An agreement of relocation between DWS and affected private property owners must be reached prior to the implementation of RMP. |

**Table 12:** Summary of Social Encumbrances

| Item | Description |
|---|---|
| Social Audit | • The 7.70% of residents in the area will not have received any kind of training to equip them to become active participants in the tourism sector due to the low percentage of the population that have furthered their studies in higher education. They may be inactive to participate in the tourism sector. |
| Expectations | • The implementation of the RMP will be affected if community expectations from the dam raising are not met. This is because the community will lose their trust in the RMP project. |

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

### 3.6.2 SWOT Analysis and Objective Identification

The SWOT Analysis was conducted to gather **Strengths** and **Opportunities** that define the potential of the dam whereas the challenges regarding the dam where identified through **Weaknesses** and **Threats**. The common key objectives were formulated and identified from the **Strengths** and **Opportunities** of the dam. Moreover, the vision for the dam for a period of 20 years was formulated by stakeholders from the identified objectives.

#### 3.6.2.1 SWOT Analysis Approach

There were issues of concerns that were raised in the stakeholder engagement meetings prior to conducting the SWOT Analysis. Other challenges or encumbrances that may hinder the progress of the dam's RMP process were identified by the stakeholders following the SWOT analysis approach as illustrated in **Table 13**.

**Table 13:** SWOT Analysis for Clanwilliam Dam

| Strengths | Weaknesses |
|---|---|
| • The dam is closer to Cape Town City which attracts a lot of tourists.<br>• The raising of the dam wall will increase the dam capacity.<br>• The dam has a very good view.<br>• The dam is surrounded by archaeological and heritage resources which attracts lot of tourists to the dam.<br>• Water quality within the dam is generally good and it is suitable for both domestic and recreational purposes.<br>• The dam is a home to different Indigenous Fish Species, such as Clanwilliam Yellow Fish, Cape Kurper, Sand Fish, Catfish and Sawfish. | • The joining Fees for Boating Club are very high for an ordinary person to afford.<br>• Fishing licenses are too expensive for poor people to afford.<br>• The raising of the dam wall has restricted fishing next to the dam wall for 5 years.<br>• Most activities are limited to outside people rather than the Local Communities.<br>• Absent of overreaching safety rules for the dam. |
| **Opportunities** | **Threats** |
| • Adjacent land owners will benefit on the possible property value increase due to raising of the dam.<br>• The dam has a high tourism potential.<br>• There are job opportunities that can be created from recreational activities in order to increase the Local Economy of Clanwilliam Town. | • Poor waste management from the Local Communities poses a threat to the dam's water quality as it can be washed into the dam during heavy rains.<br>• Some properties have been built below the 1:100 year flood line. |

#### 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 Clanwilliam Dam and have been categorized into three (3) Key Performance Areas (KPAs) as illustrated below:

**KPA 1: Resource Management**

- To preserve and maintain the high water quality standard of the dam;
- To construct wash bay at the dam in order to prevent the spread of Alien Invasive plant Species as well as to prevent pollution into the dam;
- To identify, acknowledge and conserve resources of archaeological significance within the dam basin; and
- To compile a Zoning Plan which will integrate conservation, recreation and development whilst not retarding the primary functions of the dam.

**KPA 2: Resource Utilisation**

- To promote, accommodate and manage a variety of activities and facilities within the dam basin in a manner that enhances the user's experience and minimizes the impact on the resource;
- To provide equitable, compactable and adequate access control at the dam;
- To establish adequate sanitation facilities at the dam; and
- To promote sustainable harvesting of fish as a non-renewable resource.

**KPA 3: Benefit Flow Management**

- To ensure that the private property owners within the new purchased line are moved to an area with adequate basic services;
- To establish proper trails at the dam; and
- To establish an effective institutional structure that can manage the use of water for recreational purpose in an acceptable manner, which is also representative of all the Stakeholders.

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

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

***"To ensure sustainable utilisation of the pristine water resource based on effective resource management, sound business planning and environmental principles in order to improve the socio-economic status of the area".***

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 so as to assist the decision makers regarding the sustainable utilization of the dam and the surrounding State Land where applicable. The report will serve as a decision-making 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 10**.

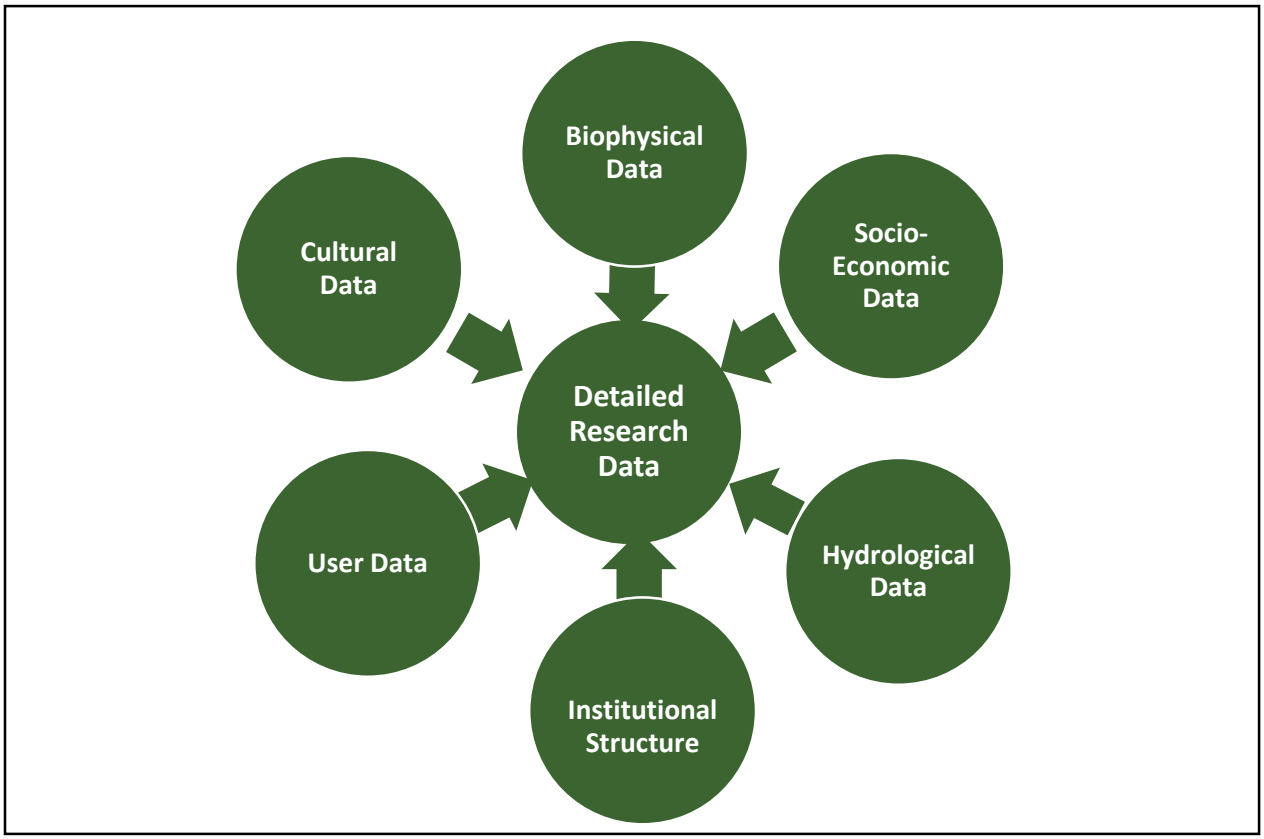


**Figure 10:** Research Data

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**

Clanwilliam Town is well known for beautiful flowers. The flowering season occurs from early August and attracts a high number of tourists to Clanwilliam Town, therefore, tourists will recognize Clanwilliam Dam. The Clanwilliam community will benefit from the different tourism activities at the dam.

3.6.3.2 **Feasibility of identified Potential Objectives**

According to DWAF (2006), the feasibility of the proposed objectives needs to be determined in light of the local environmental conditions.**Table 14** shows the practicability of all proposed recreational objectives.

**Table 14:** Feasibility of Potential Recreational Objectives

| KPA 1: Resource Management | | |
|---|---|---|
| **Objective** | **Status Quo** | **Practicability** |
| • To preserve and maintain the high standard of water quality of the dam. | • The dam is located in an area with naturally good water quality. The water quality data for the dam was obtained from DWS (Resource Quality Services) and the results concluded that the water quality of Clanwilliam Dam is fairly good. | • Enforcement of all relevant environmental legislations (e.g. NWA and NEMA) at the dam can always keep the dam's water quality pristine.<br>• The components of Cooperative Inland Water Safety Programme (CIWSP) such as Unique Position Number (UPN), should be implemented at the dam to achieve this objectives. |
| • To conserve resources of archaeological significance within the dam basin that can attract more tourists to the dam. | • The dam is located in an area where there are rock arts, Stone Age tool deposits, historic structures (19th century dwellings), graves and other culturally significant artefacts. | • All archaeological resources can be conserved by classifying them as a conservation Zone on the Zoning Map. |
| **KPA 2: Resource Utilisation** | | |
| **Objective** | **Status Quo** | **Practicability** |
| • To have a Zoning Plan for the dam. | • Currently there is no effective Zoning Plan for the dam. | • The Zoning Plan will be compiled in terms of DWAF's Guidelines for Compilation of Zoning Plans for Government Waterworks (DWAF, 1999). However, the raising of the dam wall to thirteen (13) meters will affect the development of the Zoning Plan because the new purchased line is covering other adjacent private properties. |
| • To provide equitable, compatible and safe access control at the dam. | • There is lack of adequate security and access control to the dam, which pose a risk to all users. | • The dam rules relating to the dam access, fees payable for access, safety measures, speed limit applicable to the dam and the time in which the dam will be open to the public should be established in terms of DWAF Regulation R654.<br>• The appointment of safety and enforcement officers is imperative to ensure compliance with the dam rules and other relevant legislations. |

| | | |
|---|---|---|
| | | • Access fees to the dam will be described in detail in the BP to ensure equitable access for all users. |
| • To establish of adequate sanitation facilities at the dam. | • Currently there is insufficient sanitation facilities at the dam. An increase in recreational activities will result in water pollution due insufficient sanitation facilities. | • Sanitation facilities can be established at the dam, however hydrological study should be undertaken to determine the water level in order to prevent water pollution.<br>• Provision of mobile sanitation facilities during big events will reduce the risk of water pollution.<br>• The BP will further detail the costs of the proposed sanitation facilities. |
| • To establish proper trails at the dam. | • There are no proper trails at the dam. | • Trails should be established as per the Western Cape Guideline (planning and managing sustainable off-road routes).<br>• Trails should be accompanied by clear communication signage in order to inform recreational users regarding the dam rules as this will promote safety at the dam. |
| • To promote sustainable harvesting of fish. | • Currently there are no dam rules which regulates subsistence fishing for Local Communities. | • Fishing rules should be established and enforced at the dam. |
| **KPA 3: Benefit Flow Management** | | |
| **Objective** | **Status Quo** | **Practicability** |
| • To uplift the Local Economy and increase Benefit Flows to the surrounding communities through community empowerment and job creation. | • Majority of the Local Communities are not benefitting from recreational activities conducted at the dam. | • Establishment of functional institutional structure that should have enough power to ensure that the Local Communities are benefitting from the economic benefits emanated from the dam use.<br>• The BP will discuss in details how the previously disadvantaged communities will economically benefit from recreational opportunities. |
| • To establish an effective Institutional Structure. | • There is currently no Institutional Structure for the dam. | • Establishment of functional Institutional Structure that will effectively manage the recreational utilisation of the dam and its associated state land in accordance with the RMP. |

# 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 11.**

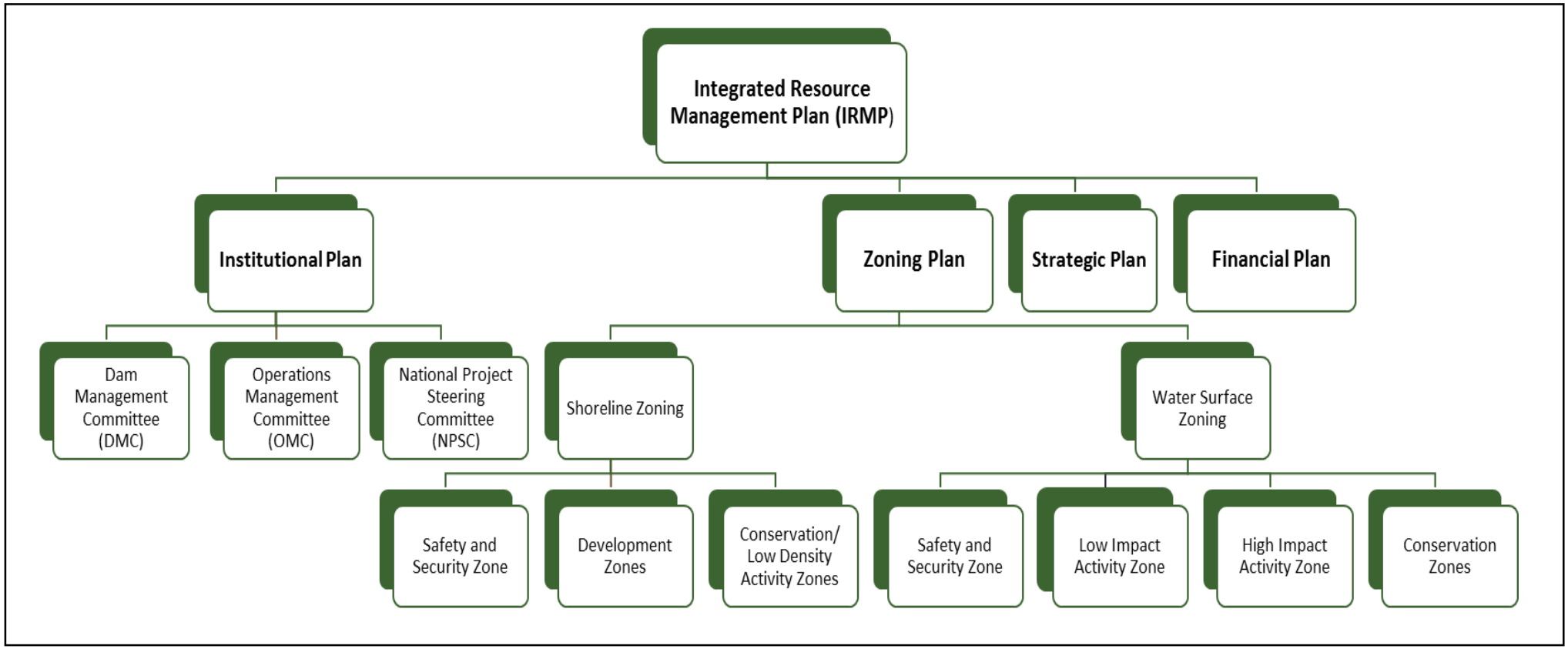


**Figure 11:** Integrated Resource Management Plan

## 4.1. INSTITUTIONAL PLAN

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

### 4.1.1 Dam Management Committee (DMC)

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

One of the main functions of the DMC is to give support to DWS 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 12** illustrates the proposed user groups that will form part of the DMC**.**

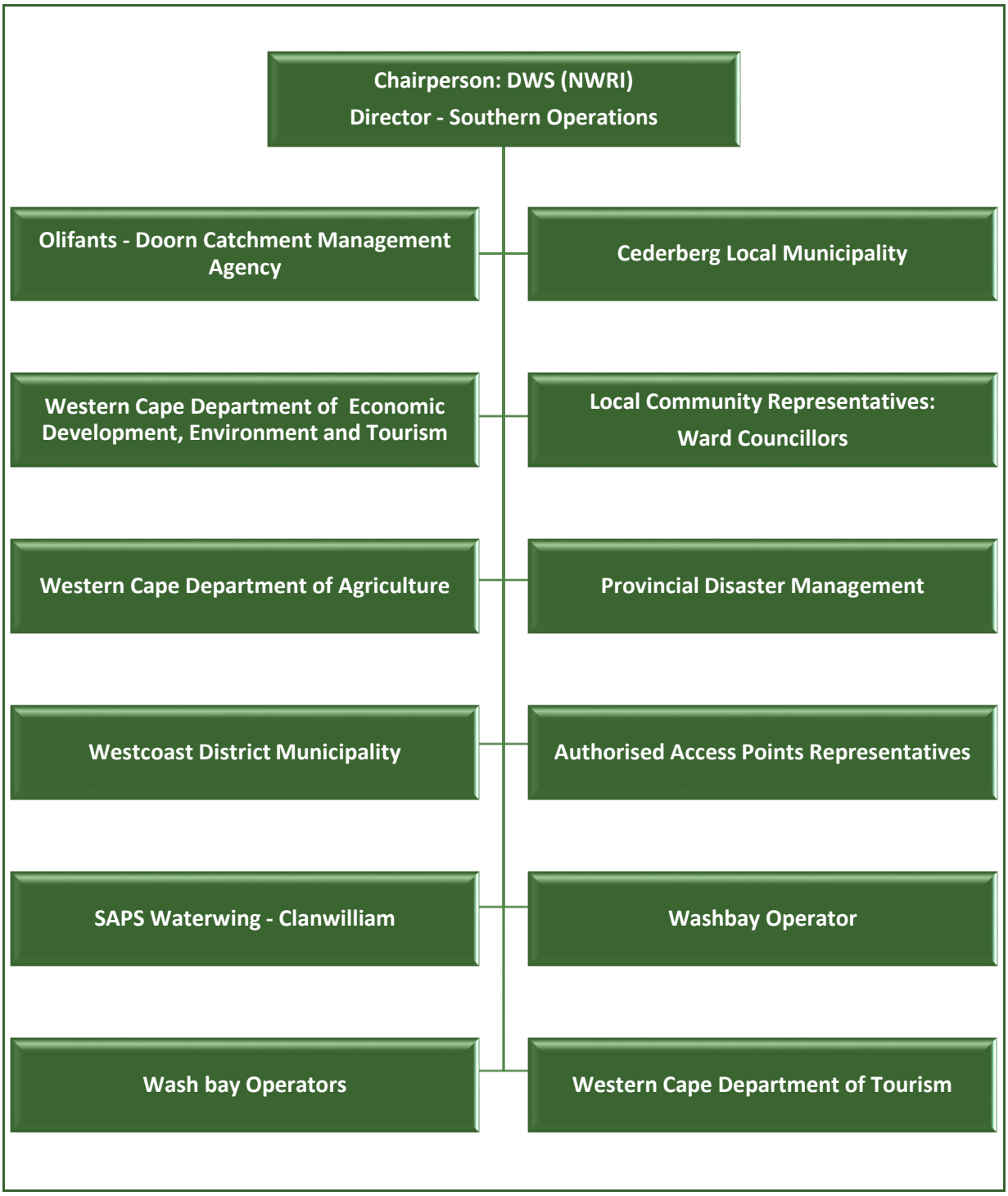


**Figure 12**: Proposed DMC

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 are not required for the OMC as this is an existing reporting structure. The ToR provides guidance on the following management aspects:

- Roles and responsibility of chairperson;
- 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.

**Recreational Use Agreements**

Recreational Clubs must enter into an agreement with the DWS who will be responsible for the surface water and shoreline management of the dam. All recreational use at the dam must be through an appropriate Legal Framework. However all agreements must be approved in writing by DWS. Recreational Use Agreements must be developed in line with the conditions stipulated in the agreement between DWS and the recreational clubs. All agreements must be finalised within twelve (12) months of the RMP being approved.

**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[3] for general navigation.

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

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

**Access Agreements**

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

All adjacent landowners and clubs must be made aware that access to the surface water as well as shoreline should only be through authorised access points. Accessing the surface water through unauthorised access points is an illegal activity unless they enter into a formal agreement with DWS. Further, a formal agreement with DWS will be required for all adjacent landowners and recreational clubs that

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

have direct access to the water surface of the dam through constructed slipways, natural slipways or jetties for angling and/or launching of vessels.

The wash bay must be built on State Property as part of the CIWSP. A formal agreement is necessary between the DWS and DEA on the management and maintenance of the facility.

**Event Applications**

The dam is used for a number of competitive angling events. All events must be managed through an event application process. The application must be made to DWS. 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 and slipways to be used.

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

**National Affiliations**

All recreational clubs should be affiliated to a SASCOC affiliated organisation. The development targets set by the National Organisations must be met.

### 4.1.2 Operations Management Committee (OMC)

There is an existing Chief Director Infrastructure Operations Management Committee (CD: IO MANCO) within 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 13.**

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

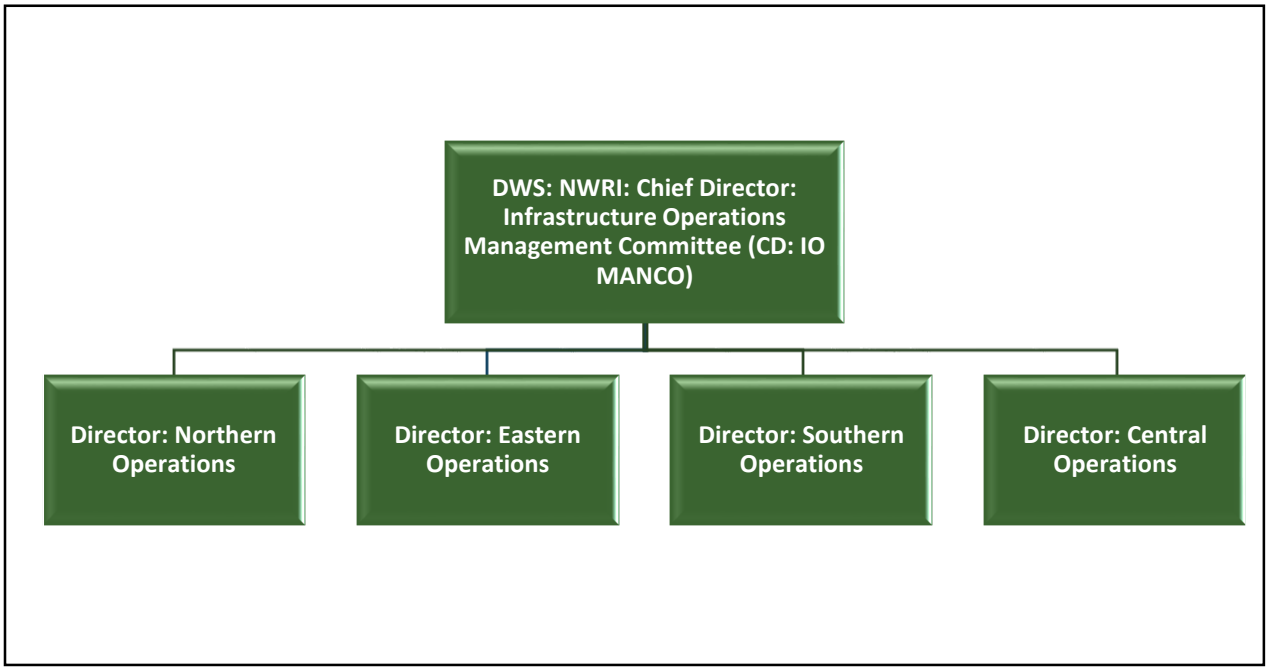


**Figure 13:** Existing CD: IO MANCO

### 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 14** illustrates a typical example of Governmental Departments that will form part of the NPSC.

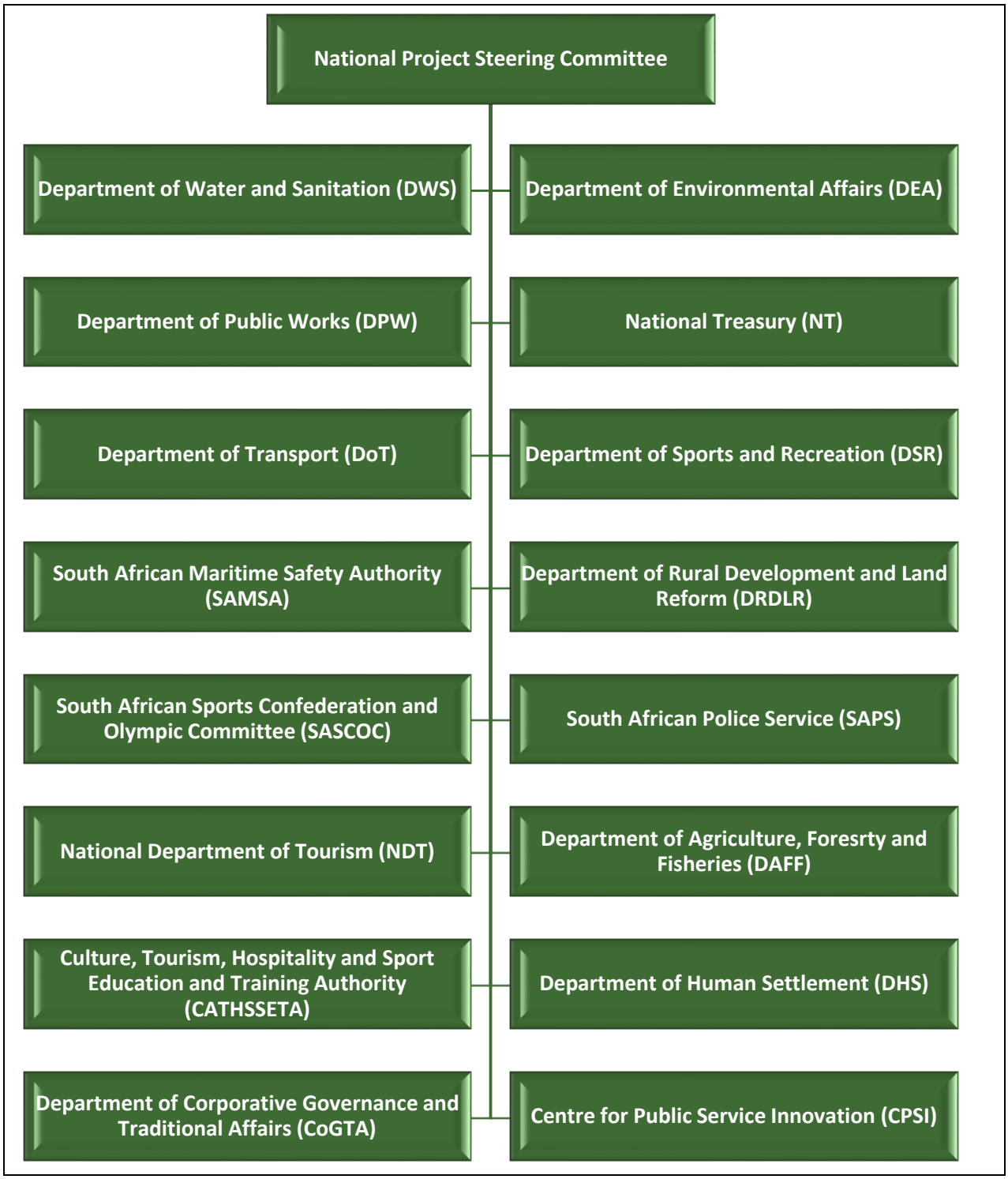


**Figure 14:** Proposed NPSC

**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.

## 4.2. ZONING PLAN

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

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

### 4.2.1 Water Surface Zoning

The water surface zoning provides guidance on permissible and non-permissible recreational activities on the water surface taking into account the biophysical factors of the dam. The Water Surface is zoned as follows:

**Safety and Security Zone:**
It covers a minimum of 100m area from the wall and outlet works indicated by demarcation markers and AtoN. This area is reserved for DWS management purposes.

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

**Conservation Zones**:
The aim of this zone is to conserve and protect sensitive aquatic habitation at the inlet(s) of the dam. According to Section 12 and 26 of NWA, the existence of these zones is thus not negotiable as it is imperative to protect the water resource for the purposes relating to basic human needs, environmental sustainability and water quality requirements. Access to these areas is generally not allowed due to the following:

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

**Low Impact Activity Zone**:
This zone act as a buffer between High Impact Activity Zones and Conservation Zones. Low Impact Activity Zone allows for low intensity activities, i.e. activities associated with little or no wake such as wind surfing, kayaking, swimming, rowing, sailing, paddle boating, float tubes, canoeing, angling, yachting, aquaculture and small scale fisheries.

**High Impact Activity Zone:**
This zone has the largest water surface area and is located where the reservoir is at its deepest. It caters for high impact activities associated with high speed, wake and noise activities such as 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 |

**Table 15:** Proposed Water Surface Zoning Description

| Zone Name | Permissible Activities | Non Permissible Activities | Recommendation |
|---|---|---|---|
| • Safety and Security Zone. | • Alien invasive species clearing<br>• Management of dam infrastructure<br>• Management and maintenance activities by DWS and authorised personnel | • Public access | • Area should be demarcated by dermacation makers and AtoN. |
| • Conservation Zones. | • None | • Public activities (in order prevent aquatic habitats disturbance) | • Area should be demarcated by demarcation makers and AtoN.<br>• Strict management and control of these areas. |
| • Low Impact Activity Zone. | • Activities associated with no or little wakes, such as<br>○ Angling<br>○ Swimming<br>○ Canoeing<br>○ Rowing<br>○ Paddle boating<br>○ Kayaks<br>○ float tubes<br>○ Rafting<br>○ Sailing | • Motorised boating<br>• Water Skiing<br>• House boats<br>• Para-sailing<br>• Kite-surfing<br>• Jet skis | • Area should be demarcated by demarcation makers and AtoN. |
| • High Impact Activity Zone. | • Motorised boating<br>• Water Skiing<br>• House boats<br>• Para-sailing<br>• Kite-surfing<br>• Jet skis | • Large vessels such as:<br>○ Angling<br>○ Swimming<br>○ Canoeing<br>○ Rowing<br>○ Paddle boating<br>○ Kayaks<br>○ float tubes<br>○ Rafting<br>○ Sailing | • Area should be demarcated by demarcation makers and AtoN.<br>• All activities within the high impact zone shall take place beyond 70m from the shoreline.<br>• 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. |

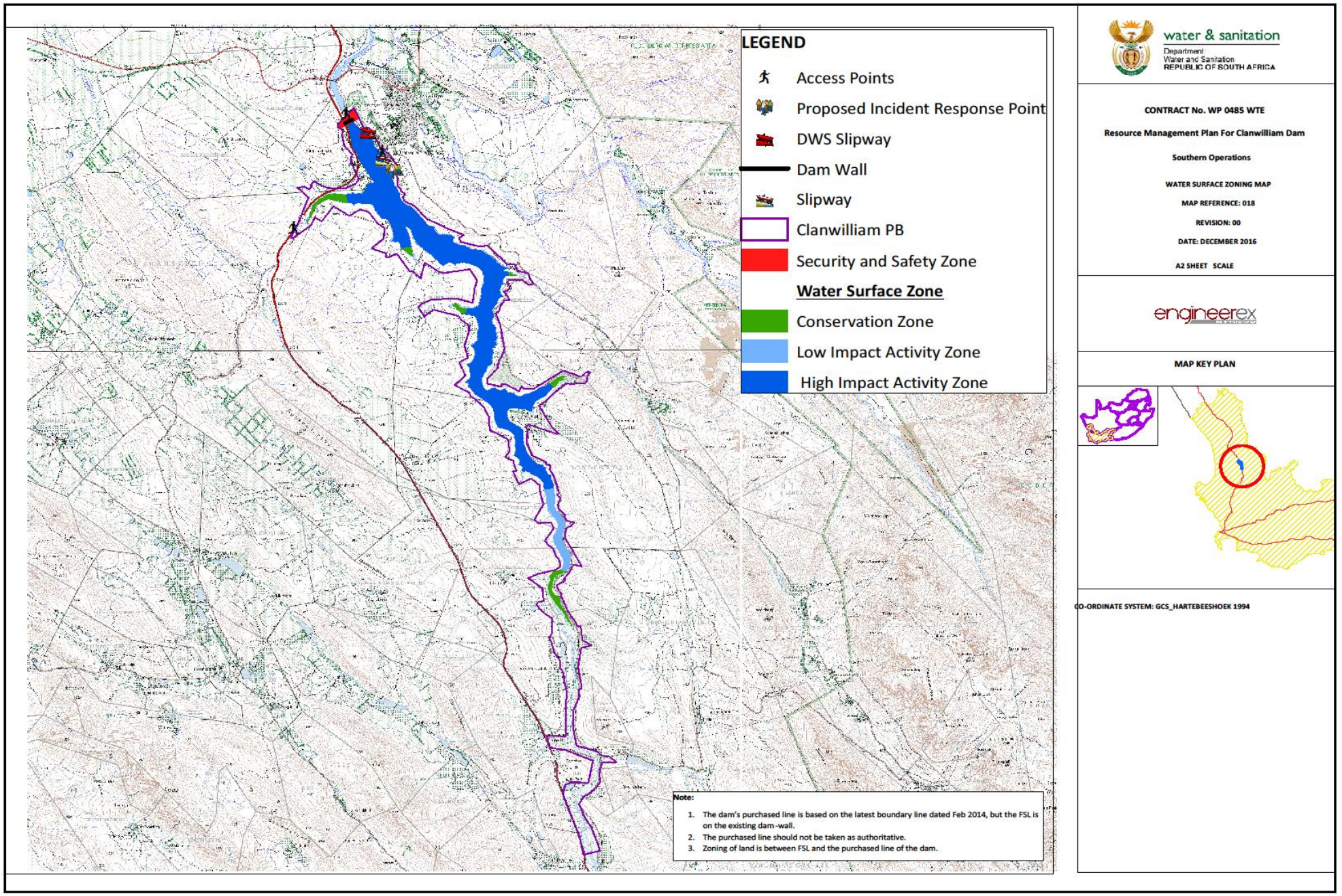


**Figure 15:** Proposed Water Surface Zoning Map

### 4.2.2. Shoreline Zoning[4]

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

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

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

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

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 |

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

**Table 16:** Proposed Shoreline Zoning Description

| Zone Name | Permissible Activities | Non-permissible Activities | Recommendation |
|---|---|---|---|
| • Safety and Security Zone. | • Fire management<br>• Alien invasive species clearing<br>• Management of dam infrastructure<br>• Management and maintenance activities by DWS and authorised personnel | • Public access | • A minimum area of 100m wide downstream the dam wall should be demarcated preventing public access and use. |
| • Conservation/ Low Density Activity Zone. | • Conservation management activities:<br>  ○ Bird watching<br>  ○ Hiking | • Development | • These zones should control access to ecological sensitive areas. |
| • Medium Density Activity Zone. | • Camping (tent and/or caravan)<br>• Day visitors<br>• Picnic<br>• Shoreline fishing<br>• Braai facilities<br>• Swimming pools<br>• Ablution facilities<br>• Infrastructure for services | • Accommodation facilities such as:<br>  ○ Chalets<br>  ○ Recreational club houses | • The management of this area should follow the PPP process in terms of National Treasury.<br>• All developments must be approved by IA and DWS.<br>• Requirements of NWA and NEMA must be taken into account in all developments.<br>• Camping, picnicking, bank angling and access to the water must be done in accordance to access agreements.<br>• Camping and picnicking is allowed only in designated areas.<br>• Noise levels to be kept at a minimum.<br>• No littering at Camping and Picnic spots. |
| • High Density Activity Zone. | • Accommodation facilities such as:<br>  ○ Chalets<br>  ○ Resorts<br>• Recreational club houses<br>• Infrastructure for services | • Day visitors<br>• Picnic<br>• Hiking<br>• Permanent structures | • The management of this area should follow the PPP in terms of National Treasury.<br>• All developments must be approved by IA and DWS.<br>• Requirements of NWA and NEMA must be taken into account in all developments.<br>• Noise levels should be kept at a minimum.<br>• No private slipways should be built without approval from DWS. |

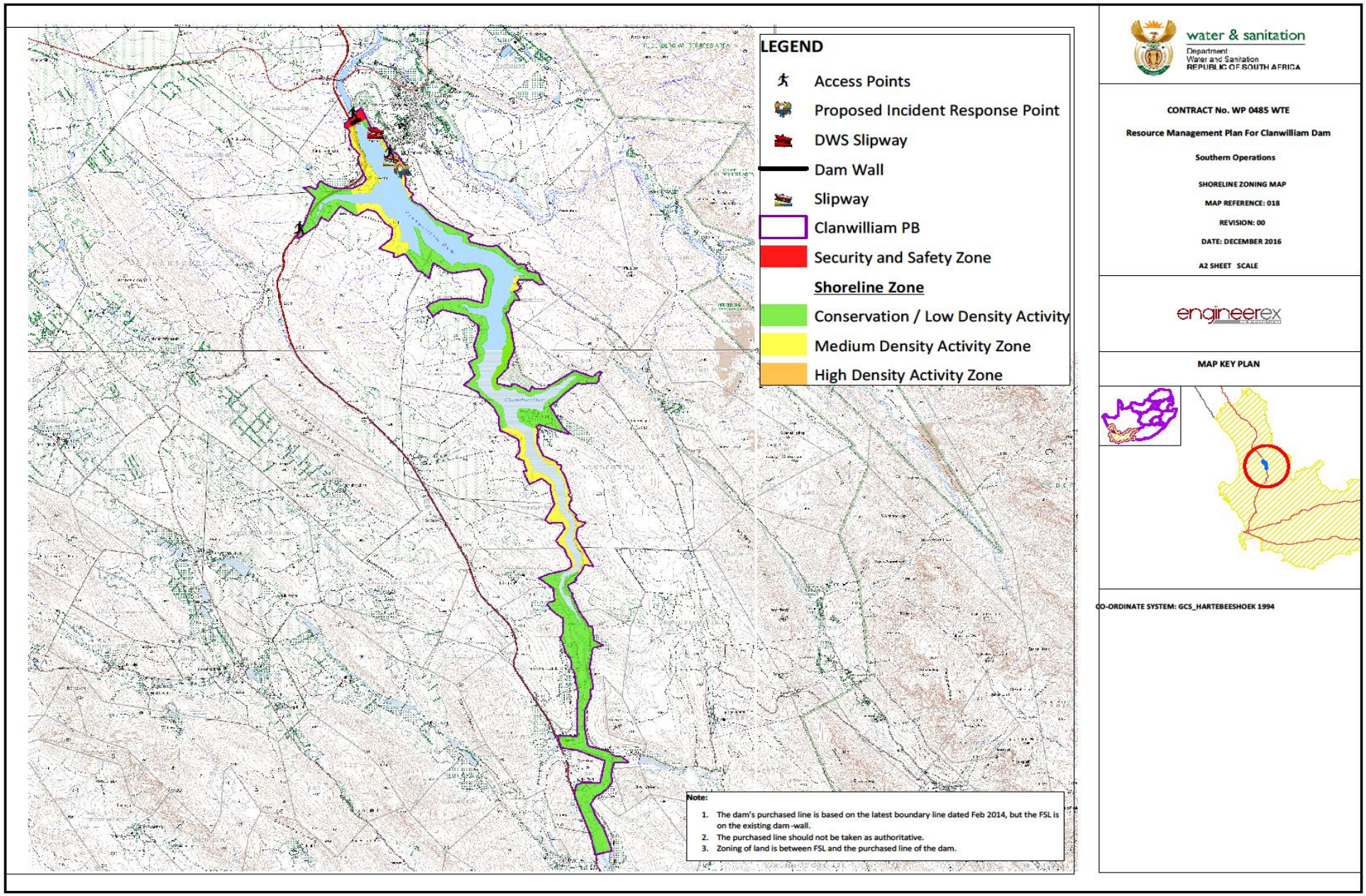


**Figure 17:** Proposed Shoreline Zoning

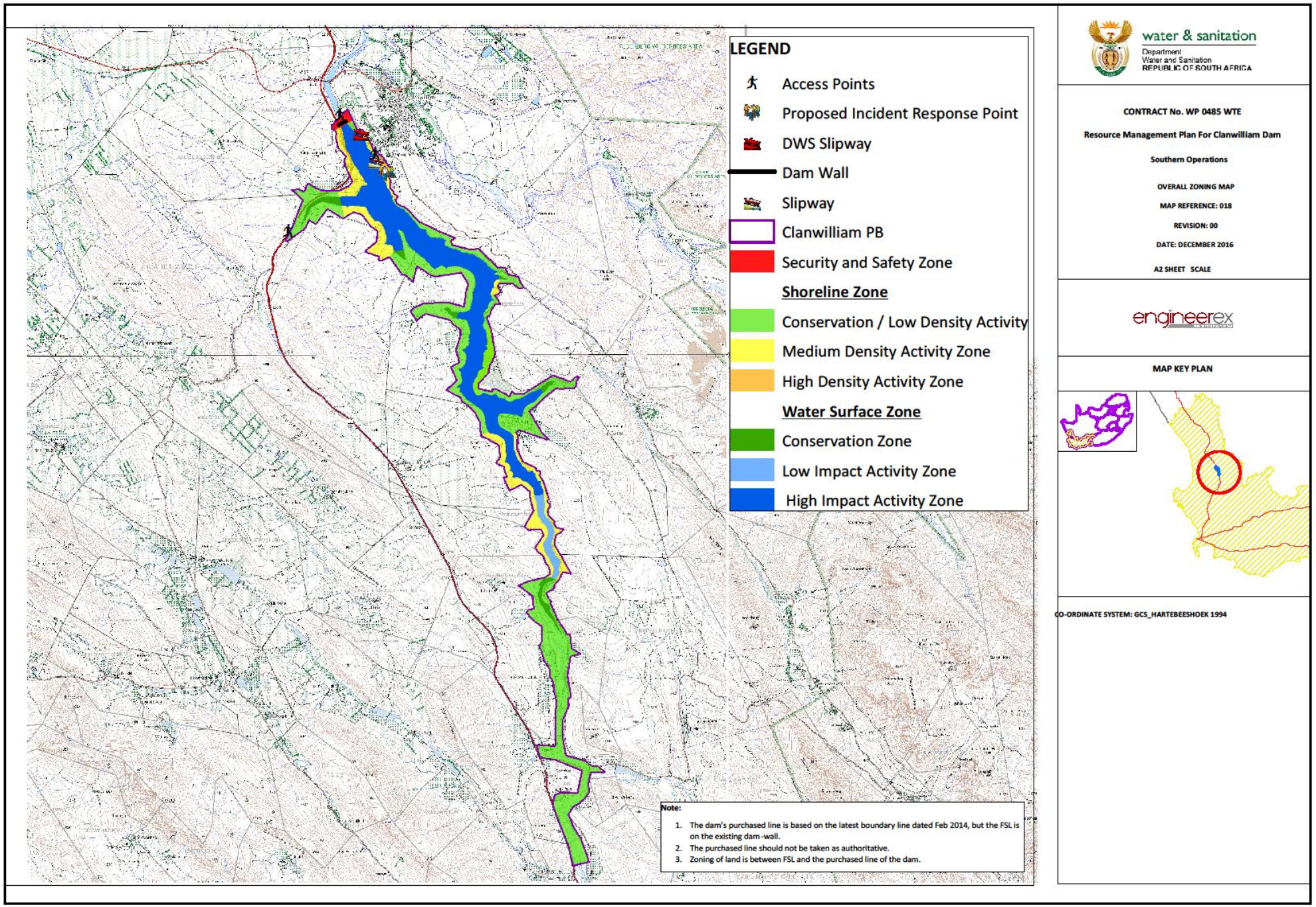


**Figure 18:** Proposed Overall Zoning Map

### 4.2.3. Carrying Capacity

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 Clanwilliam Dam. DWS recommended that the carrying capacity should be calculated using the lowest supply level, highest supply level and average supply level.

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 ≥ 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 x U/a x 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: **1 123.6 ha**

The **U/a** is assumed to be the average which was calculated as 1 craft/3 ha. And again the rotation factor (Rf) is assumed as 1 visit per day.

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

| Craft | U/A (ha/craft) |
|---|---|
| Power boats | 5.0 |
| Angling | 1.0 |
| Canoe | 0.3 |
| **Average** | **2.1** |

Based on the table above, the average hectare per user is 2.1 ha (21000 $m^2$), the value of 3 ha (30 000 $M^2$) can be acceptable area per user. This has been chosen in order to ensure that the dam is not overcrowded, as such impacting on the sense of the area.

Therefore: **PCC** = A x U/a x Rf
= 1 123.6 x (1/3) x1
= 373 crafts (**At full Supply Level**)

**PCC** = Ax U/a x Rf
= 337.08 x (1/3) x1
= 112 Crafts (**At Lowest Supply Level**)

**PCC =** Ax U/a x R
= 955.06 x (1/3) x1
= 318 Crafts **(At Average Supply Level)**

**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. The limiting factors include:

- Safety Areas/ No go Zones and
- Conservation Area

**RCC** for Clanwilliam Dam: **RCC** = **PCC** x (100 – Cf1) % x (100 – Cf2) % x (100 – Cfn) %
Where:
**Cf** = a corrective factor expressed as a percentage.
The RCC takes into account factors that limit recreation use (craft based) of the dam. For Clanwilliam Dam these factors includes sensitive areas such as conservation areas, security zones (2.0 ha) as well as aspects regarding the safe operation and management of the dam (25 ha). These factors accounts for 27 ha, which is 3%.
**RCC** = **PCC** x (100 – Cf1) % x (100 – Cf2) % x … (100 – Cfn) %
= 373 x (100 – 3) %/100
= 361. Crafts **(At Full Supply Level)**

**RCC = PCC** x (100 –Cf1) % x (100 – Cf2) % x (100 –Cfn) %
= 112 x (100-3) % /100
= 108 Crafts **(At Lowest Supply Level)**

**RCC = PCC** x (100 –Cf1) % x (100 – Cf2) % x (100 –Cfn) %
= 318 x (100 – 3) %/100
= 308 Crafts (**At Average Supply Level**)

**Effective Carrying Capacity**

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

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

Given that there are less facilities e.g. slipways at Clanwilliam Dam, the infrastructure capacity is estimated to be approximately 0.1. The management capacity is also estimated to be low as there is only one formalised recreational management structure in place and thus the ECC is currently 0. Once a proposed Institutional Structure and infrastructure capacity is in place, the ECC can be recalculated to verify if the RCC can be possible.

## 4.3. STRATEGIC PLAN

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

- Objective (What 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 **Table 17 to Table 19**, The Strategic Plan on how to achieve the identified objectives regarding the dam is outlined.

**Table 17:** Strategic Plan for KPA 1: Resource Management

| KPA 1: Resource Management | | | |
|---|---|---|---|
| **Objectives (What do we want)** | **Motivation (Why do we want to achieve this)** | **Action Projects (How do we achieve this)** | **Management and Support (Who should be involved)** |
| **Water Quality Monitoring:**<br>• To preserve and maintain the high standard of water quality of the dam. | • The catchment upstream of the dam is characterised by the plantation of citrus fruits. These agricultural activities are known to utilize fertilizers in order to maximise productivity. Fertilizers may be washed into the Olifants River during heavy rains and therefore flow into the dam. This will consequently enrich the dam with nutrients. They might lead to eutrophication of the dam in over a period of time.<br>• The upstream Waste Water Treatment works is lying in flood plain and needs to be upgraded. | • DWS must develop a programme for frequent monitoring and reporting of the water quality.<br>• Develop a storm water management policy with focus on standards for future acceptance of storm water discharge.<br>• All recreational activities must be monitored and evaluated to ascertain if there is any pollution threat to the dam.<br>• Water quality tests have to be done at a monthly interval. This will ensure that any problems in the quality of the water gets detected as soon as possible.<br>• Agricultural activities downstream are also dependent on the dam for water supply, therefore, water testing will also help in food production security in the area. | • DWS, CLM Water Quality Divisions and DEA's Working for Water Division should monitor the catchment area for any issues which might impact the water quality of the catchment. |
| **Aquatic Alien Invasive Plant Species Management:**<br>• Establishment of wash bay at the dam in order to prevent the spread of Alien Invasive Species as well as to prevent pollution to the dam. | • Clanwilliam Dam requires a wash bay in order to control Aquatic Invasive Alien Plants from entering the dam. The wash bay will ensure that all boats entering the dam are cleaned and as a results avoiding introduction and/or further spreading of Alien Invasive Aquatic Species in the dam. | • Wash bay should be established in accordance with the CIWSP best practice model. | • DWS, SAMSA and DEA should initiate and facilitate the construction of the Wash bay.<br>• The dam Management should ensure that all boats are cleaned before entering into the dam. |
| **Historical And Archeological Resource Management:**<br>• To identify, acknowledge and conserve resources of archaeological significance within the dam basin. | • The dam is located in an area where there are rock arts, Stone Age tool deposits, Historic structures (19th century dwellings), graves and other culturally significant artefacts. | • All movable Rock arts is in a process of being removed to safer areas. The public requested that it should stay in Clanwilliam Town as part of the tourism attraction as well as to preserve their heritage.<br>• Historic structures, graves and other culturally significant artefacts should be demarcated as conservation zone. | • The South African Heritage Resources Agency (SAHRA) is the national body responsible for the protection of South Africa's cultural heritage resources.<br>• The CLM, DWS and the University of Cape Town has recognized the importance of the rock art as forming part of the tourism |

| | | | |
|---|---|---|---|
| | | • Formalise a relationship with the South African Heritage Resource Authority (SAHRA). | attraction in the Clanwilliam Town, therefore, it has been requested that all the rock art which will be submerged when the water level rises should be removed but retained in the Clanwilliam Town. |
| **Zoning Plan:**<br>• To compile a Zoning Plan which will integrate conservation, recreation and development whilst not retarding the primary functions of the dam. | • According to the RMP guideline, a Zoning Plan must be compiled in terms of DWAF's Guidelines for Compilation of Zoning Plans for Government Waterworks (DWAF, 1999). | • The Zoning Plan should accommodate all feasible recreational activities within the purchased line.<br>• A RMP Zoning Plan should demarcate the archaeological sites as conservation areas in order to preserve them as they are quite variable and will retain the tourism attraction in Clanwilliam Town. | • DWS Survey Service section, PSP and other relevant Departments should be involved so that they can give their input in terms of their respective mandates. |

**Table 18:** Strategic Plan for KPA 2: Resource Utilisation

| KPA 2: Resource Utilisation | | | |
|---|---|---|---|
| **Objectives (What do we want)** | **Motivation (Why do we want to achieve this)** | **Action Projects (How do we achieve this)** | **Management and Support (Who should be involved)** |
| **Carrying Capacity:**<br>• To promote, accommodate and manage a variety of activities and facilities within the dam basin in a manner that enhances the user's experience and minimizes the impact on the resource. | • Carrying Capacity is an effective management tool to control access, utilization of the water resource and development within the dam basin. Clanwilliam Dam is extremely popular for organized events which involve trail running, hiking, motor biking, swimming, etc.<br>• Excessive use of the resource may not only impact on the water resource (pollution) and surrounding environment (soil compaction, littering, destruction of vegetation, etc.), but will also effect safety and users experience. Increasing numbers of users can cause greater | • Establish density controls for recreational activities and facilities that requires carrying capacity assessments (i.e. number of canoes per hectare)<br>• Implement density controls as per approved accepted utilization level. | • The involvement of the relevant industry with regards to user experience and other aspects such as safety is imperative.<br>• Environmental and other planning institutions including relevant government departments need to be consulted when establishing density controls. |

| | | | |
|---|---|---|---|
| | social impacts such as overcrowding, accidents, conflicts, noise, etc. | | |
| **Access Control:**<br>• To provide equitable, compatible and adequate access control at the dam. | • The dam needs a proper fence in order to control access around it. This will protect the dam as well as the surrounding communities from accessing dangerous areas of the dam. Children have to be restricted from accessing the dam without adult supervision for safety reasons. | • Access to the dam must be equitable and safe to all users.<br>• 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 to the dam and the time in which the dam will be open to the public.<br>• The entry fee need to be reasonable to ensure that the dam remains an affordable destination for all.<br>• Educate the Local Communities about the importance of safety measures around the dam basin in order to curb vandalism of the dam's properties. | • The dam rules relating to the dam access, fees payable for access, safety measures, speed limit applicable to the dam and the time in which the dam will be open to the public should be established in terms of DWAF Regulation R654.<br>• The appointment of safety and enforcement officers is imperative to ensure compliance with the dam rules and other relevant legislations.<br>Access fees to the dam will be described in detail in the BP to ensure equitable access for all users. |
| **Sanitation Facilities:**<br>• Establishment of adequate sanitation facilities at the dam. | • Currently there are not enough sanitary facilities at the dam and an increase in recreational activities (e.g. during events and competition) at the dam might further put strain on already inadequate facilities leading to possible pollution to the water resource. | • Provision of adequate sanitation facilities for day to day dam users.<br>• Event's Organizers should provide adequate sanitary facilities during their events at the dam. | • DWS and CLM should ensure that sufficient sanitation facilities are provided and proper drainage system.<br>• It is also the responsibility of the event organisers to ensure that these facilities are provided and serviced for during any organized events. |
| **Small Scale Fishery Development:**<br>• To promote sustainable harvesting of fish as a renewable resource. | • The Local Community proposed the introduction of a small scale fishery to the dam as the size of the dam is big enough to carry on this project. | • Preserve the core habitats for nesting, resting, feeding and breeding of fish within the inlets.<br>• Management Authority must develop a communication signage in order to effectively inform different angling groups about the dam fishing rules. | • Different Government Departments such as DWS, DEA, DAFF, DT, should work combine into a management structure in order to assess the viability and possibility of introducing the small scale fishery as proposed by the local community. |

| | | | |
|---|---|---|---|
| | | • Appoint Safety Officers that will monitor compliance of the dam fishing rules. | |

**Table 19**: Strategic Plan for KPA 3: Benefit Flow Management

| KPA 3: Benefit Flow Management | | | |
|---|---|---|---|
| **Objectives (What do we want)** | **Motivation (Why do we want to achieve this)** | **Action Projects (How do we achieve this)** | **Management and Support (Who should be involved)** |
| **<u>Adequate Trails:</u>**<br>• To establish proper trails at the dam. | • I&APs requested that proper trails should be developed at the dam as it assist them to maintain their physical well-being. Trails can also create job opportunities in the form of trails guides and trail maintenance. | • Clear communication signage must be put in place in order to inform recreational users about the dam rules. This will also promote safety within the dam.<br>• Provide guidance on planning, design, establishment and on-going maintenance of walkways and hiking trails.<br>• Promote best practice and give effect to relevant and applicable legislation and regulations. | • Relevant departments such as Environmental Affairs and the environmental section at CLM that are responsible for biodiversity must be consulted in order to prevent biodiversity degradation at the dam. |
| **<u>Institutional Structure:</u>**<br>• To establish an effective institutional structure that can manage the use of water for recreational purpose in an acceptable manner, which is also representative of all the Stakeholders. | • According to the RMP guidelines, an effective institutional structure must be established in terms of DWAF's considerations on the Institutional Arrangements for Managing Use of Water for Recreational Purposes guideline (2003). | • The institutional structure must be representative of all Stakeholders.<br>• The roles and responsibilities of the role players must be clearly defined and understood. | • DWS Institutional Establishment section, Process Facilitator and other relevant Departments should be involved so that they can give their input in terms of their respective mandates. |

## 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 Clanwilliam 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 19** shows the RMP & BP review framework.

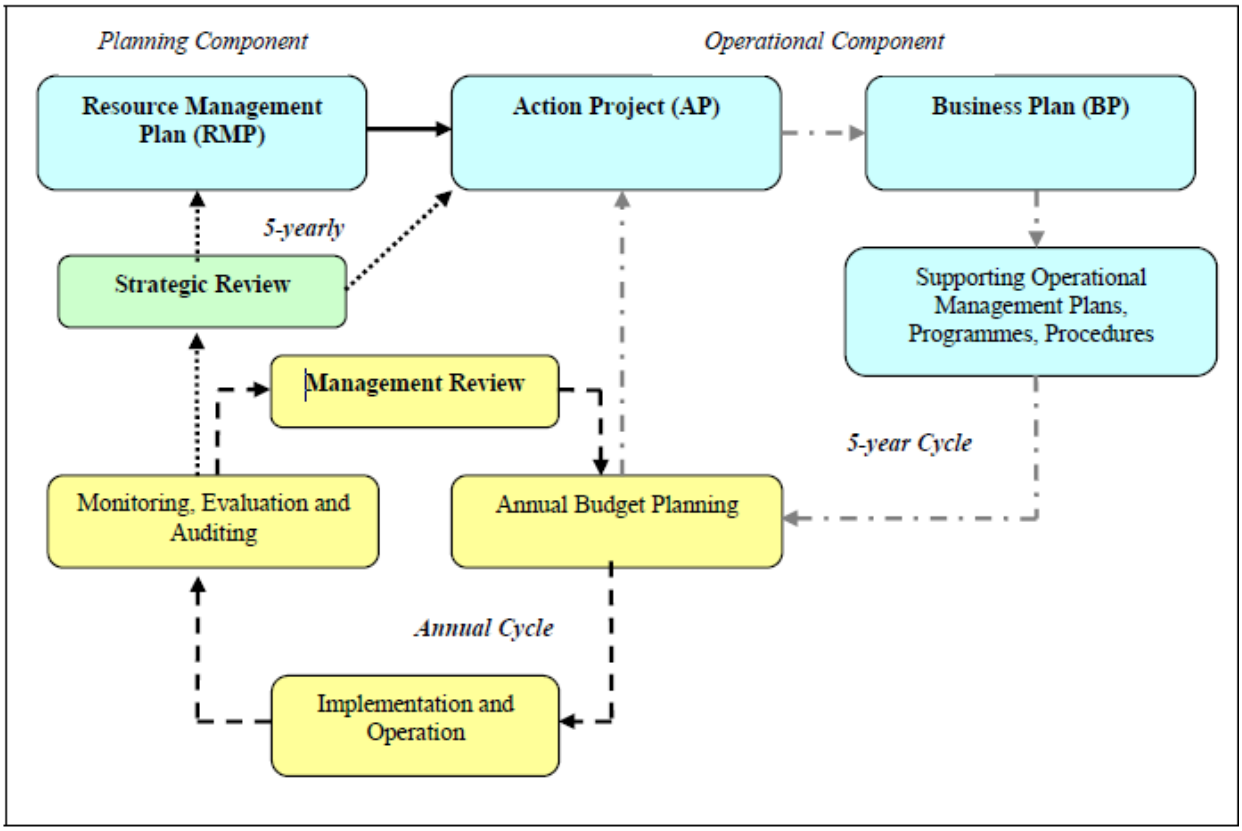


**Figure 19:** RMP and BP Review Framework

# CONCLUSIONS

The RMP documents the challenges that exists within the Clanwilliam 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 and 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**.

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 of the dam was formulated from the key common objectives identified by Stakeholders. Based on the strategic objectives identified for Clanwilliam 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 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.

# REFERENCES

**Agricultural Geo-referenced Information System** (2015) **(http://www.agis.agric.za)**

**Animal Demography Unit,** virtual Museum **(2015)** **(http://vmus.adu.org.za/vm_projects.php)**

**Census, (2011),** Statistical Release – Statistics South Africa.

**Department of Water Affairs and Forestry (1999),** guidelines for the compilation of zoning plans for governmental water works.

**Department of Water Affairs and Forestry (2003),** Guideline Methodology for carrying capacity assessment for the use of water for recreational purposes.

**Department of Water Affairs and Forestry, (1996),** South African Water Quality Guidelines, Volume 2 - Recreational Water Use Manual Guideline.

**Department of Water Affairs and Forestry, (2001),** Generic Public Participation Guideline**.**

**Department of Water Affairs and Forestry, (2006)** Guidelines for the Compilation of Resource Management Plan.

**Department of Water Affairs and Forestry, (2006),** Recreational Water Use Manual Guideline**.**

**Department of Water and Sanitation, (2015)** Objectives Matric for Morgenstond Dam.

**Mucina, L. and Rutherford, M.C (eds), (2006),** The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

**South African National Biodiversity Institution** **Www.bgis.sanbi.org** (9 July 2014).

# APPENDICES