FINAL RESOURCE MANAGEMENT PLAN

ALLEMANSKRAAL DAM

water & sanitation

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- Community members who took part in Community Interviews and Focus Group Meetings.

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Amendments Page

Date	Nature of Amendment	Amendment No.
15 September 2014	First Draft for DWS Review	1
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31 October 2014	Draft for Public Review	3
9 January 2015	Final for PSC Review	4
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Executive Summary

According to the Guidelines for the Compilation of Resource Management Plans (2006), the main aim of a Resource Management Plan is to "attain the objectives underlying sustainability and to compile workable, functional sustainable access and utilisation plans for water resources and in particular State Dams". A Resource Management Plan is thus a planning tool aimed at working within the requirements of existing policies, while taking into account the needs and interests of stakeholders.

A Resource Management Plan can also be described as a systematic process for the sustainable development and management of a water resource in the context of social, economic and environmental objectives. One of the main functions of the Resource Management Plan process is to implement an **Institutional Plan**. The focus on institutional arrangements is accompanied by a **Zonal Plan** together with a detailed **Strategic Plan**. In addition, a **Financial Plan** provides guidance on funding opportunities and how these should be used for the improved management of the Dam. Together these components provide a comprehensive guide on the "what?"; "why?"; "how?" and "who?" of the management of prioritised Government Waterworks.

Allemanskraal Dam was completed in 1960 and has a total capacity of 181 million m^3. It forms part of the Sand-Vet Government Water Scheme located along the Sand River. The Scheme is located at about 150 km North West of Bloemfontein and stretches across the areas of Bultfontein, Hoopstad and Welkom (Woyessa et al., 2004). In addition to, Allemanskraal Dam, the scheme includes Erfenis Dam as well as a 651.84 km long system of channels and drains (DWA, 2011).

The Dam was constructed by the Department of Water and Sanitation however, it is now operated and managed by the Sand-Vet Water User Association. The main purpose of the scheme was initially irrigation and the Dam still provides raw irrigation water for more 700 privately owned and government owned settlement properties. The total scheduled irrigation area in the Sand-Vet schme is 10 101 ha, of which 4 997 ha is along the Sand River, supplied from Allemanskraal Dam (WRC, 2001). However, the scheme now also supplies raw water to be purified for commercial and household use to Theunissen, Bultfontein, Brandfort and Virginia as well as Harmony Mine, Correctional Services at Virginia and the Agricultural experimental farm via Sedibeng Water (DWA, 2011). As Sedibeng Water is the main user, the main use is now domestic and commercial.

The Dam is located off the N1 highway and the closest main towns are Venterburg, Senekal and Winburg (located approximately 40 km to 50 km away from the Dam). It forms part of the Willem Pretorius Game Reserve and the surrounding vegetation types include Central Free State Grassland which (vulnerable), Winburg Grassy Shrubland (least threatened), Bloemfontein Karroid Shrubland (vulnerable) and Eastern Free State Clay Grassland (Endangered) (FS DETEA, 2011). Three Red List Species occur in the reserve including Sable (Vulnerable), Spotted necked Otter (Near threatened) and Hedgehog (Near threatened). The reserve also has important cultural heritage as it is home to Bekkersberg National Monument and has a number of Ghoya (early Bantu) sites. A number of Boer War battles were also fought in the vicinity of the area.

The following activities commonly take place at the reserve:

- Game viewing from Vehicles;
- Bird Watching;
- Walking;
- Cycling;
- Picnicking;
- Camping;

- Recreational Angling;
- Competitive Angling;
- Canoeing;
- Sailing;
- Motorised Boats;
- Swimming;
- Skiing;
- Approved Social, cultural and sporting events;
- Environmental education;
- Research;
- Viewing of Cultural Sites; and
- Hunting.

Willem Pretorius Game Reserve also offers a variety of accommodation facilities including chalets, camping and caravan facilities and single quarter accommodation. There is also a private bush camp which consists of 8 wooden chalets which are also part of the Game Reserve.

No specific recreational clubs are based at the Dam however, a number of clubs makes use of the Dam for events and these include Welkom Fishing Club, Virginia Fishing Club, North West Fishing Club and Senekal Fishing Club. National Bank Angling competitions have occurred at the Dam in the past. Angling events take place at the six block competition angling area in the eastern sector of the Dam near the Resort complex. This area can accommodate up to 200 anglers positioned 3 meters apart.

In addition, the Dam is adjacent to the privately run, Aldam Estate. The estate offers a number of activities including tennis, volley ball, rugby, swimming, hiking, mountain biking, putt-putt and kayaking. Sailing, jet skiing and power boating are also allowed. Shoreline and Boat fishing of carp, sharptooth catfish, mudfish and yellow fish is one of the main activities.

Although, there are no formal towns or villages directly adjacent to the Dam, there is one small community in place which was initially created for the staff of Aldam Estate (when it was still an Adventura Resort). People from this community are allowed access to the Dam at the public fishing area at Willem Pretorius Game Reserve. The main use by the community is subsistence fishing.

In compiling the Resource Management Plan for Allemanskraal Dam the following process was applied.

Figure 1: RMP Process (DWA, 2006)

It is important to note that the Resource Management Plan was compiled based on detailed stakeholder input and engagement. This formed the cornerstone of the Resource Management Plan through the establishment of a Vision for the Dam with a number of Key Objectives.

The key recommendations of the Allemanskraal Dam Resource Management Plan are as follows:

- Implementation of the Institutional Plan including the formation of a Dam Management Committee, Operations Management Committee and Resource Management Plan Steering Committee. As part of this Institutional Plan, it is vital that all agreements are updated to take into account the findings of the Resource Management Plan;
- Implementation of standardised and harmonised Aids to Navigation and Demarcation Markers and Unique Positioning Number System and the Wash Bay System at the Dam;
- Facilities at the Public fishing area to be created;
- Discussions between Taxi association and Setsoto Local Municipality regarding subsidized costs to enable community members from town to travel to the Dam for a lesser fee;
- Provision of a boat and skipper license training for Willem Pretorius Game Reserve manager to allow proper management and patrols of the Dam;
- Unauthorised commercial access to be regulated through agreements;
- Facilities at the Willem Pretorius Game Reserve Bank Angling events area to be put in place;
- Feasibility study for the upgrade of the Bekkerberg Iron Age Settlement Outdoor Museum;
- Marketing strategy to be compiled and implemented including the potential feasibility of small scale Public Private Partnerships for additional activities such as game viewing boat cruises down the length of the Dam, horse riding trails, and guided bird watching and hiking trails;
- Potential for small scale fisheries programme to be assessed. This should

take into account the lessons learnt from previous fishery attempts to determine whether fisheries at the Dam are viable;
- Management and control of *Azolla filiculoides* and other invasive plant species (if any);
- Rhino Protection Plan;
- Archaeological and paleontological study of cultural resources around the Dam including assessment of how these resources can be protected but opened up for educational use;
- Species Management Plan for invasive species to be compiled in line new legislation;
- Senekal Wastewater Treatment Works to be upgraded;
- Population assessment of Largemouth Yellowfish to ensure proper management of the population;
- Lifeguard skills training and first aid training to ensure safe public use of the Dam;
- Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes
- Coordination between Free State Bank Angling Association, fishing clubs and local schools to introduce bank angling development programme at the Dam;
- Upgrade of the educational facilities at Willem Pretorius Game Reserve;
- Coordination with SwimSA to introduce swimming school programme at the Dam;
- Undertake assessment of illegal water abstraction in the catchment; and
- Water Conservation and Water Demand Management Programme to be developed in conjunction with the Sand-Vet Water User Association and Sedibeng Water.

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Acronyms

ADU	Avian Demographic Unit
AGIS	Agriculture Geo-Reference Information System
AtoN	Aids to Navigation
BMAA	β-N-methylamino-L-alanine
BP	Business Plan
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CITES	Convention on the International Trade in Endangered Species
CIWSP	Cooperative Inland Waterways Safety Programme
COGTA	Department of Cooperative Governance and Traditional Affairs
CPSI	Centre for Public Service Innovation
DAFF	Department of Agriculture Forestry and Fisheries
DEA	Department of Environmental Affairs
DMC	Dam Management Commitee
DoT	Department of Transport
DPW	Department of Public Works
DRDLA	Department of Rural Development and Land Reform
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
ECC	Effective Carrying Capacity
FS DETEA	Free State Department of Economic Development, Tourism and Environmental Affairs
FSTA	Free State Tourism Authority
GDP	Gross Domestic Product
GGP	Gross Geographic Product
GVA	Gross Value Added
GWS	Government Water Scheme
Ha	Hectare
IA	Implementing Agent
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IDP	Integrated Development Plan
IMP	Integrated Management Plan
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resource Management
LAAP	Local Accountable AtoN Parties
NEMA	The National Environmental Management Act (Act 107 of 1998)

NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMPA	National Environmental Management: Protected Areas Amendment (Act 15 of 2009)
NWRI	National Water Resources Infrastructure
NWRI: IEE	National Water Resources Infrastructure: Integrated Environmental Engineering
OMC	Operations Management Committee
ORASECOM	Orange-Senqu River Commission
PCC	Physical Carrying Capacity
PFMA	Public Finance Management Ac (Act 29 of 1999)
PPP	Public Private Partnership
PSDF	Provincial Spatial Development Framework
QDS	Quarter Degree Square
RAMSAR	The Convention on Wetlands
RCC	Real Carrying Capacity
RHIB	Rigid Hulled Inflatable Boat
RMP	Resource Management Plan
RSC	RMP Steering Committee
RWU	Recreational Water Use
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMSA	South African Maritime Safety Authority
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SAPS	South African Police Service
SARCA	South African Reptile Conservation Assessment
SASCOC	South African Sports Confederation and Olympic Committee
SLM	Setsoto Local Muncipality
SPC	Strategic Plan for Commercialisation
SRSA	Department of Sports and Recreation
STPP	Pentasodium triphosphate
TAL	Total Alkalinity
TDS	Total Dissolved Salts
THETA	Tourism, Hospitality and Sports Education Training Authority
TMDM	Thabo Mofutsanyane District Municipality
ToR	Terms of Reference
TP	Total Phosphorus
UPN	Unique Positioning Number (used in the CIWSP)
WIP	Weeds and Invasive Plants
WMA	Water Management Area

WPGR	Willem Pretorius Game Reserve
WRC	Water Research Commission
WUA	Water User Association
WWTWs	Waste water Treatment Works

1 WHAT IS A RMP AND WHY IS IT NECESSARY?

A Resource Management Plan (RMP) is a management tool which provides guidance on how recreational use at Government Waterworks, such as Dams, should be managed. RMPs focus on the current and future uses of the Dam, as well as requirements that must be met, to ensure the optimal, equitable and sustainable management of the Dam.

According to the Guidelines for the Compilation of RMPs (DWAF, 2006), the main aim of the RMP is to "attain the objectives underlying sustainability and to compile workable, functional sustainable access and utilisation plans for water resources and in particular State Dams". A RMP is thus, a planning tool aimed at working within the requirements of existing Government Policy, while taking into account the needs and interests of stakeholders.

A RMP can also be explained as a systematic process for the sustainable development and management of a water resource in the context of social, economic and environmental objectives. In many ways, it shares similarities with Integrated Water Resource Management (IWRM). Hence, one of the main functions of the RMP process is to implement an **Institutional Plan** for the effective management of State Dams. The focus on institutional arrangements is accompanied by a **Zonal Plan** together with a detailed **Strategic Plan**. In addition, a **Financial Plan** provides guidance on funding requirements and funding options. Together these components provide a comprehensive guide on the "what?"; "why?"; "how?" and "who?" of the management of prioritised Government Waterworks.

The RMP lays the foundation required to consolidate objectives for the resource, within the framework of existing policy priorities. The RMP also informs decision-making which may have a direct impact on the resource. Further, the RMP creates a platform to unlock economic potential at the Dam without compromising environmental principles and recreational use of the Dam. Recreational use includes activities which range from leisure, sport to culture and religion. Although recreational use is not consumptive, it is still a major water use and needs to be managed correctly to ensure increased personal, societal and economic benefits with minimal disturbances and environmental impacts.

RMPs are managed by the National Water Resource Infrastructure Branch (NWRI) of the Department of Water and Sanitation (DWS). This Branch is tasked with developing, operating and maintaining strategic water resource infrastructure in an efficient way to ensure that the needs of the Nation are met.

The RMP also provides a platform for coordination between different spheres of government that have official mandates regarding the management of the Dam. These Departments include:

Table 1: Government Departments and Agencies

DEPARTMENT	MANDATE
Department of Transport (DoT)	Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea, including inland waterways.
Department of Environmental Affairs (DEA)	Responsible for biodiversity management within the Dam including Invasive alien species.
Nature Conservation	In the case of Allemanskraal Dam, Free State Department of Economic Development, Tourism and Environmental Affairs (FS DETEA) is responsible for the management of the shoreline and surface water as the Dam.
Sand-Vet Water User Association (WUA)	DWS signed an Operation and Maintenance Agreement with the WUA and thus they are responsible for the operation of the Dam and maintenance and management of the Dam wall.
Department of Water and Sanitation	DWS is the official custodian of all surface water in South Africa. DWS is also responsible for the establishment, operation and maintenance of Government Waterworks (as per the National Water Act, 1998 (Act 36 of 1998). This includes management of Dam Safety and operation and management of Dams.
South African Maritime Safety Authority (SAMSA)	Administers and executes maritime related legislation and regulations.

Each Government Department has its own suite of Legislation to govern the use and management of the Dam. The RMP consolidates these roles and functions into a coherent management platform.

The RMP presents the twenty-year Vision of the Dam which is distilled into 5 year goals and annual Business Plans (BPs). Hence, the RMP is a tool aimed at meeting the expectations of users without sacrificing the environment.

2 WHERE ARE WE NOW?

2.1 Overview of the Catchment

The Middle Vaal Water Management Area (WMA) is one of five WMAs that occur within the Orange/Vaal River Basin and occurs in the Free State and North West Provinces. The catchment area of the WMA is 52 563 km^2 (ORASECOM, 2011). It is situated between the Upper Vaal and Lower Vaal WMAs and also borders on the Crocodile (West) and Marico as well as the Upper Orange WMA (DWAF, 2003). The Vaal River is the main river in the WMA although other rivers do occur. Three sub-areas occur in the WMA including:

- The Rhenoster-Vals sub-area, comprising the catchments of the Rhenoster and Vals Rivers;
- The Middle Vaal sub-area, which corresponds to the portion of the Vaal water management area between the confluence of the Rhenoster River down to the confluence of the Vet River in the Bloemhof Dam reservoir, together with the Skoonspruit catchment and some smaller tributaries; and
- The Sand-Vet sub-area, which comprises the catchments of the Sand and Vet Rivers.

Climate over the WMA is temperate throughout the year, with frost occurring in winter. Mean annual rainfall ranges from 700 mm in the south-east to 400 mm in the west, and mainly occurs as summer thunder storms. The potential evaporation is approximately 1 900 mm per year and is well in excess of the rainfall. Vegetation is mainly grassland, with sparse bushveld in patches. The topography is relatively flat with no distinct features. Hilly terrain occurs to the south-east. The geology is varied, which also gave rise to different soil types. A large dolomitic formation occurs from Orkney and extends towards the northern part of the WMA (DWAF, 2003).

Diamonds are found in the north-west of the water management area, with rich gold ore in the vicinity of Klerksdorp and Welkom (DWAF, 2002).

A significant factor in the Middle Vaal WMA is its dependency on water releases from the Upper Vaal WMA for meeting the bulk of the water requirements by the urban, mining and industrial sectors, with local resources mainly used for irrigation and smaller towns. Water is also transferred via the Vaal River through this WMA, from the Upper Vaal WMA to the Lower Vaal WMA. Water quality in the Vaal River is strongly influenced by usage and management practices in the Upper Vaal WMA (DWAF, 2002).

2.1.1 Surface Water and River Systems

The Middle Vaal WMA is one of the three cascading WMAs in the Vaal River System catchment, which includes the drainage area of the Vaal River from its headwaters to the confluence of the Vaal and Orange Rivers (ORASECOM, 2011).

The main river is the Vaal River which flows in a westerly direction to the Lower Vaal WMAA (DWA, 2009b). The surface flow of the Vaal River, most of which originates in the Upper Vaal WMA, represents the bulk of the surface water in the Middle Vaal WMA. The Vaal River is fed by a number of tributaries of which the most significant are the Rhenoster, Schoonspruit, Vals and Vet Rivers. Vlei areas occur along the lower Vet River and in the upper Schoonspruit catchment. The surface water flows that originate within the WMA are highly seasonal and intermittent (DWA, 2009b). Further, most of the major tributaries of the Middle Vaal WMA support irrigation schemes. The Sand-Vet Irrigation Scheme within the Sand-Vet Government Water Scheme (GWS) is the most important in the Middle Vaal WMA. Other significant irrigation schemes in this WMA are the Schoonspruit and Rhenoster GWS (ORASECOM, 2011).

According to the River Health Programme (2003), the overall health assessments of the rivers in the Free State region catchments are fair to poor, The Sand-Vet River system is in fair to poor health. This small river system is heavily regulated and impacted by catchment activities. Very little or no flow is released out of the Dams for environmental requirements, because of the great demand for irrigation and domestic use. In some sections of these rivers, the entire flow during the dry winter

months is made up of treated sewage effluent. The main threats to river health are:

- Mining activities and irrigation return flows are the major contributing factors to the high salt concentrations in the rivers;
- Agriculture and urban development - water abstracted from the various canal systems is used by the Sand/Vet Irrigation scheme, as well as for domestic supply by Sedibeng Water;
- Sewage works in the area are notorious for spills caused by poor maintenance and under-capacity; and
- Alien fish species - stocking of bass has displaced indigenous fish species including red data species such as the largemouth yellowfish.

The main Dams in the WMA include:

- Johan Neser Dam;
- Bloemhof Dam;
- Koppies Dam;
- Allemanskraal Dam;
- Erfenis Dam;
- Schoonspruit Dam; and
- Rietspruit Dam.

2.1.2 Land Use

According to the FS DETEA (2008), agriculture accounts for 90% of land use in the Free State. Most of this is characterised by extensive dry land cultivation, particularly in the central parts (DWAF, 2002). However, irrigation is practiced downstream of dams along the main tributaries as well as at locations along the Vaal River. The Sand-Vet GWS comprises an area of 11707.6 ha, 90% of which is irrigated using Central Pivots (Woyessa et al., 2004). The farmers in the irrigation scheme grow diverse crops, such as maize, wheat, sunflower, and vegetables. Wheat constitutes 48% of the total irrigated area, followed by potato and maize. The remainder of the area is natural grassland under livestock farming.

No afforestation occurs in the WMA however infestations of alien vegetation are common. The largest urban areas are at Klerksdorp, Welkom and Kroonstad. Numerous inactive mines are found in the north and west of the WMA, many of which were small diamond claims.

2.1.3 Water Quality

Naturally the quality of surface water in WMA is good, but can be of high turbidity (DWAF, 2002). However, the water quality varies from poor in the highly developed areas to good in the less developed areas. The water quality is impacted on by point discharges from industries, wastewater treatment works, mine dewatering, irrigation return flows and diffuse sources such as runoff from mining and industrial complexes, agriculture and urban areas (DWAF, 2004). Further, due to the fact that Vaal River, contains a large proportion of urban and industrial return flows from the Johannesburg area with part of the water having been through more than one cycle of use, salinity levels can be very high (DWAF, 2002).

High nutrient concentrations also occur as a result of the large domestic component of return flows which, together with the low turbidity of the return flows, stimulates excessive algal growth (DWAF, 2002).

Pollution of the Skoonspruit has also been experienced as a result of improper diamond mining operations on the banks of the river (DWAF, 2003). The Renoster, Vals, Upper Sand (Allemanskraal Dam) and Upper Vet (Erfenis Dam) catchments are largely undeveloped. Despite increasing aridity in a westerly direction the salinity of the runoff from these catchments is low. They are also devoid of other significant pollution sources.

Gold mining in the Welkom-Virginia area elevates the salinity of the lower Sand River below Allemanskraal Dam. Bacterial pollution and eutrophication is also associated with sewage effluent and diffuse pollution from informal settlements. Various pans are also highly saline due to their use as evaporation pans. The salinity of the groundwater in this area is also elevated. Concern has arisen regarding radionuclides (DWAF, 2002).

The Lower Vet River appears to be affected by saline irrigation return flows from the Sand-Vet irrigation scheme (DWAF, 2002).

Gold mining adjacent to and north of the Vaal River in the Klerksdorp-Orkney area results in significant saline pollution. The Koekemoerspruit tributary (just west of the Vaal-Mooi River confluence) is particularly affected. High salinity levels are experienced in the Skoonspruit River before its confluence with the Vaal. Radionuclides have been identified as a potential problem associated with gold mining activities. The presence of mine dumps in close proximity to the northern bank of the Vaal River is particularly problematic. A density current rich in manganese has caused problems for water purification at Midvaal Water. This led to the installation of an ozination plant to oxidise the manganese (DWAF, 2002).

Total Dissolved Salts (TDS) concentrations in the Middle Vaal River are unacceptably high. The Middle Vaal River is also subject to severe eutrophication, with frequent algal blooms and dense growth of water hyacinth. This leads to greatly increased water purification costs at Midvaal Water and Sedibeng Water (DWAF, 2002).

Eutrophication is promoted by nutrient enrichment of Vaal Barrage water, although the Mooi River and local effluent sources could contribute to this problem. The long retention time in the Vaal River appears to promote algal blooms (DWAF, 2002).

2.1.4 The Social Environment

According to the Middle Vaal WMA: Overview of Water Resources Availability and Utilisation (DWAF, 2003), the economy in the WMA is mainly based on mining and agriculture as primary production sectors. About 4% of the Gross Domestic Product (GDP) of South Africa originates from the Middle Vaal WMA, which reflects an average level of economic activity. The largest economic sectors (in 1997) in the water management area, in terms of Gross Geographic Product (GGP), were:

- Mining 45.6%;
- Trade 12.3%; and
- Agriculture 8.9%.

More recent information is not available for the WMA at a whole but according to the Free State Provincial Spatial Development Framework (PSDF) (2013), the Free State's economy has experienced profound structural changes in the mining and agriculture sector during 1997 and 2012. The overall decline in the agriculture and mining sector is an indication of a maturing economy and of the basic trends currently visible throughout all of South Africa's provinces, namely growth in financial industries, expansion of technological and information-based enterprises, increase of tourism industries, etc. This trend however holds many challenges for the Free State, such as:

- Increasing levels of unemployment in the primary sector;
- Economic growth has been occurring in knowledge-based sectors (secondary and tertiary) meaning the unemployed population in the primary sector finds it hard/or virtually impossible to find jobs;
- Due an increasing secondary and tertiary sector, coupled with aspects of deregulation and improvements in general of infrastructure (i.e. transport), has placed enormous pressure on small towns which where historically linked to agricultural production and services; and
- The decrease of the economic viability of the agricultural and mining production has led to changing demographic patterns, especially pertaining to migration of people in the province. Unemployed population groups migrate from commercial farms and/or mining areas to the nearest urban areas and settlements. Furthermore, an increase has occurred of the unemployed people in the Free State migrating to neighbouring provinces such as Gauteng and Mpumalanga.

According to the FS PSDF (2013), the mining sector's contribution to the province decreased from 16% to 9% (from 1996 to 2010) and agriculture's economic contribution decreased from 5.3% in 1996 to below 4% in 2010. The finance sector is the only economic sector in the Free State that has shown a significant increase from 1996 to 2010, whilst the community services sector had a slight increase over the last 14 years. This trend is likely to take place at the WMA as well as at a provincial level.

2.1.5 Tourism Potential

The Tourism Enterprise Partnership found that the Free State, although third largest in terms of area, is one of South Africa's smaller tourism provinces. Further, it is estimated that the tourism sector contributes approximately 3% to the province's economy representing approximately 5% of South Africa's tourism market (Tourism Talk, 2009). The following was also noted:

- During 2008 approximately a million foreign tourists visited the Free State. The province's share of foreign visitors to South Africa increased from 10.1% in 2004 to 11.1% in 2008;
- The African and Middle East market accounted for 93.9% of foreign tourists to the Free State during 2008. This source market was dominated by short-stay visitors from neighbouring Lesotho, who accounted for 90.5% of the foreign tourists to the province;
- Of the 32.9 million domestic trips taken within South Africa during 2008, 1.5 million were to the Free State. During 2008, the Free State was the destination for 0.7 million (31.8%) fewer trips than in 2007, and the province's share of domestic trips declined from 6.1% to 4.6%; and
- The total foreign direct spending excluding capital expenditure in South Africa during 2008 was R74.2 billion, of which R4.8 billion was spent in the Free State. This is 60% higher in nominal terms (48.5% in real terms) than the R3 billion spent in the province during 2007.

The Free State Province aims to grow its tourism sector to turn what has been called a 'hidden treasure of South Africa' into a popular and repeat destination for thousands of domestic and international tourists. As part of this, the Free State Tourism Authority (FSTA) has developed various self-packaged/self-drive tourist routes to assist visitors to explore the many tourist attractions on offer in the various regions. These routes include:

- BBT Heritage Routes - This route takes one to all the diverse attractions and activities of the Bloemfontein, Botshabelo and Thaba 'Nchu Region;
- Diamond and Wine Route - This route follows in the footsteps of the diamond prospectors. Their efforts resulted in a man-made hole (diamond mine) at Jagersfontein. The wine cellars of Landzicht and Wilreza in the semi-desert Jacobsdal are also part of the route;
- Goldfields Route - this route passes through the Lejweleputswa Region of the Free State and includes historic towns and the mines around which they were established. Welkom lies at the centre of this tourist region that spans an area of some 9 000 square metres. Some of the well-known gold mining towns on this route are Virginia, Allanridge and Odendaalsrus;
- Maluti Route - this route forms the gateway to the mountain Kingdom of Lesotho and the Eastern Cape. It starts at Ladybrand and includes route passes Hobhouse, Jammersdrif, Wepener on the Lesotho border, Van Stadensrus, Zastron at the foot of the Aasvoëlberg Mountain Range and further east into the Maluti Mountains in Lesotho. It also includes the RAMSAR accredited wetlands of the Seekoeivlei Nature Reserve at Memel; and
- N6 Route – This route is along the N6 and links Bloemfontein with East London in the Eastern Cape and includes towns such as Reddersburg and Smithfield.

2.1.6 Catchment Management Agency

There is no catchment management agency in place for the Middle Vaal WMA.

2.1.7 Safety of Navigation

In addition to its common law responsibility, DWS is, in terms of the requirements described in the National Water Act (Act 36 of 1998), amongst others, responsible for the safety of Government's Waterways and watercourses, including its Dams. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required

fixed and/or floating[1] Aids to Navigation (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.

2.2 Purpose of Allemanskraal Dam

Allemanskraal Dam was completed in 1960 and has a total capacity of 181 million m^3. It forms part of the Sand-Vet GWS located along the Sand River. The Scheme is located at about 150 km North West of Bloemfontein and stretches across the areas of Bultfontein, Hoopstad and Welkom (Woyessa et al., 2004). In addition to, Allemanskraal Dam, the GWS includes Erfenis Dam as well as a 651.84 km long system of channels and drains (DWA, 2011).

The Dam was constructed by DWS however, it is now operated and managed by the Sand-Vet WUA. The main purpose of the scheme was initially irrigation and the Dam still provides raw irrigation water for more 700 privately owned and government owned settlement properties. The total scheduled irrigation area in the Sand-Vet schme is 10 101 ha, of which 4997 ha is along the Sand River, supplied from Allemanskraal Dam (WRC, 2001). However, the scheme now also supplies raw water to be purified for commercial and household use to Theunissen, Bultfontein, Brandfort and Virginia as well as Harmony Mine, Correctional Services at Virginia and the Agricultural experimental farm via Sedibeng Water (DWA, 2011). As Sedibeng Water is the main user, the main use is now domestic and commercial.

2.3 Overview of the Dam

The Allemanskraal Dam falls within the Setsoto Local Municipality (SLM) in the Thabo Mofutsanyane District Municipality (TMDM) of Free State. The main towns occurring near the Dam are some distance away and include Ventersburg (40 km away); Virginia (49 km away); Winburg (52 km away) and Senekal (53 km away). Other than Senekal, the above mentioned towns occur within differing Local Municipalities.

As discussed in the previous sections, it also falls within the Middle Vaal WMA. Below is an overview of the Dam.

Table 2: Overview of Allemanskraal Dam

Dam Characteristics	
Year of completion	1960
Purpose	Supply water to the Sand-Vet GWS & Irrigation
River	Sand River
Nearest Town and Province	Senekal, Free State Province
Type	Gravity/earth
Net Storage capacity	181 million m^3
Wall height	38 m
Wall length	1338 m
Crest length	1347 m
Material content of Dam wall	Concrete
Type and length of spillway	Uncontrolled
Capacity of spillway	2265 m^3/s
Surface area of Dam at full supply	2875.7 ha
Owner, designer and construction	Department of Water and Sanitation

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

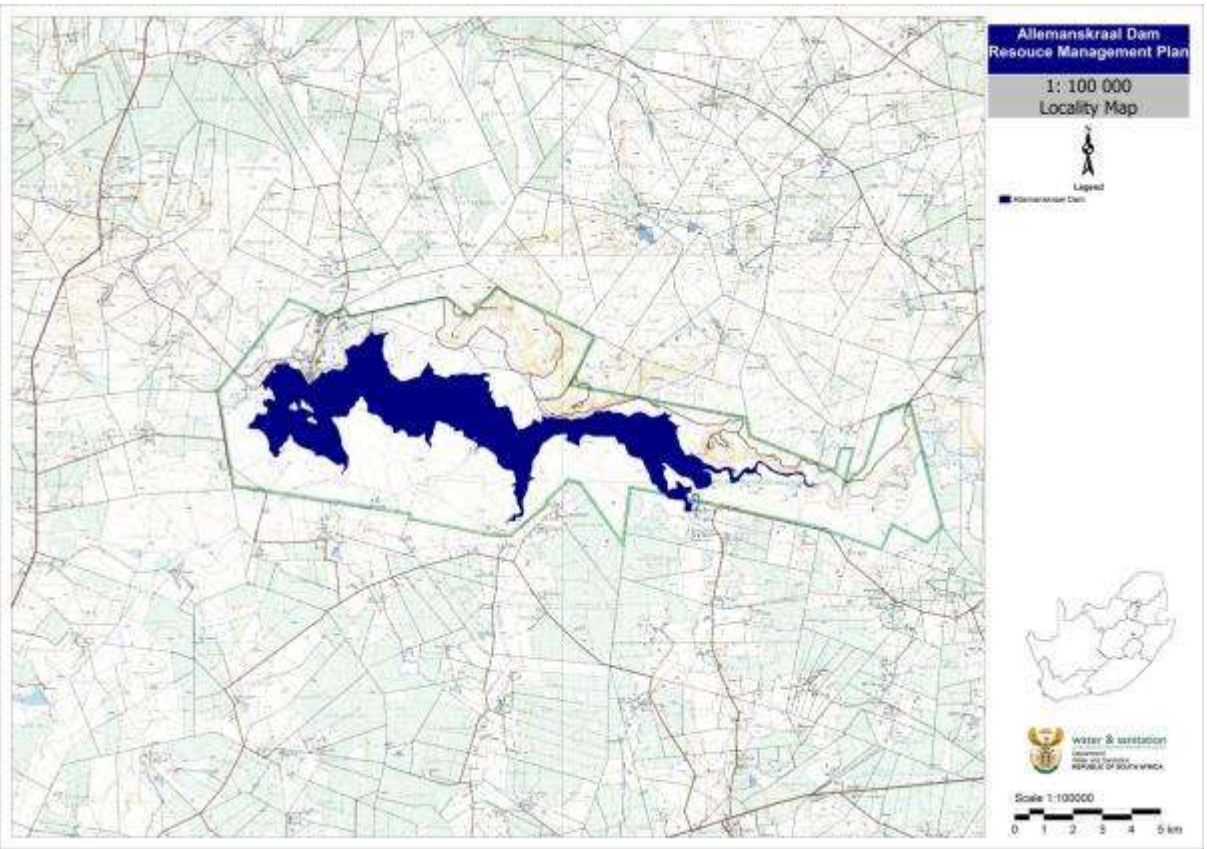

Figure 2: Location of Allemanskraal Dam

2.4 Legislative Framework

The RMP forms the overarching framework for the management of Allemanskraal 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.

The Allemanskraal Dam RMP was informed by the following policies, legislation, frameworks and strategies:

- Constitution of the Republic of South Africa, (Act 108 of 1996);
- National Water Act (Act 36 of 1998);
- Municipal Systems Act, 2000 (Act 32 of 2000);
- The Development Facilitation Act, 1995 (Act 67 of 1995);
- Communal Land Right Act, 2004 (Act 11 of 2004);
- Restitution of Land Rights Act, 1994 (Act 22 of 1994);
- Intergovernmental Relations Framework Act, (Act 13 of 2005);
- Disaster Management Act, 2002 (Act 57 of 2002);
- Water Services Act, 1997 (Act 108 of 1997);
- State Land Disposal Act, 1961 (Act 48 of 1961);
- Land Administration Act, 1995 (Act 2 of 1995);
- Environment Conservation Act (Act 73 of 1989);
- National Environmental Management Act (Act 107 of 1998);
- National Environmental Management Air Quality Act (Act 39 of 2004);

- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004);
- National Environmental Management: Protected Areas Act (Act 57 of 2003);
- National Environmental Management: Waste Act (Act 59 of 2008);
- National Veld and Forest Fire Act, (Act 101 of 1998);
- Minerals and Petroleum Resources Development Act (Act 28 of 2002);
- National Heritage Resources Act (Act 25 of 1999);
- Conservation of Agricultural Resources Act (Act 43 of 1983);
- Tourism Act (Act 72 of 1993);
- South African Maritime Safety Authority Act (Act 5 of 1998);
- National Sport and Recreation Act (Act 110 of 1998 as amended);
- Safety at Sports and Recreational Events Act (Act 2 of 2010);
- Game Theft Act (Act 105 of 1991);
- Merchant Shipping (National Small Vessel Safety) Regulations, 2007
- National Environmental Management Act EIA Regulations (2010);
- South African National Biodiversity Institute (SANBI) Biodiversity Geographic Information System information;
- (Free State) Nature Conservation Ordinance, (Act 8 of 1969);
- The Free State Tourism Authority Act, 2011 (Act 4 of 2011); and
- Sport and Recreation SA Strategic Plan - 2011-2015.

The Section below provides an overview of how the RMP has considered some of key policies, legislation and strategies.

2.4.1 National Water Act (Act 36 of 1998)

The Act aims to ensure that the Nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account (amongst other factors):

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting Dam safety; and
- Managing floods and droughts.

Further, Section 113 of the Act makes provision for the recreational use of Dams. It further allows that the Minister may control or prohibit access to Dams and make reasonable charges for the a.) use of; b.) entrance into; and c.) use of any water surface or land associated with any Government Waterworks for recreational purposes.

The definition of water use in the Act includes the use of water for recreational use (Section 21k). Based on this requirement, the Department has published guidelines for recreational use of water and requires the following:

- DWS structures or infrastructure in and around water resources need to be constantly protected and maintained;
- Enforcement through mechanisms such as a Zonal Map, which is developed as part of the RMP process, is essential to resolve conflict amongst users both within the recreational water use; e.g. skiing vs. angling, or with other uses; e.g. agriculture;
- An appropriate degree of policing of irresponsible use should be maintained;

- Establishing water management institutions for the water resource users allows the institutions to charge for their activities therefore improving management and policing which instils a sense of ownership and responsibility among users; and
- Involving Public Private Partnerships (PPPs) could address commercial use but also assist with safety management at the Dam.

Once the RMP has been gazetted, 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 including the Merchant Shipping (National Small Vessel Safety) Regulations, 2007, The National Water Act, 1998 (Act No 36 of 1998), 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 and the relevant provincial ordinances.

According to DWAF (2007) Internal Guideline: Generic Water Use Authorisation Application Process, the term Recreational Water Use (RWU) encompasses the uses of water, including the surface, for:

- The exclusive purpose of sport, tourism or leisure;
- Personal or commercial recreational water use; and
- Activities which contribute to the general health, well-being and skills development of individuals and society.

In addition, the only water use entitlement that currently applies to RWU is Schedule 1 of the Act. Currently the Act is silent on Commercial RWU (although the Strategic Plan for Commercialisation (2009) does deal with Commercial RWU) and thus it is necessary for the RMP to provide guidance this regard.

2.4.2 GN 654 of May 1964

The only Departmental Regulations limiting RWU at Government Waterworks is Government Notice (GN) R654, dated 1 May 1964.

These Regulations are read together with section 113 of the National Water Act (Act 36 of 1998) and only apply to the water surface and surrounding State Land of a State Dam, and not to other water resources.

The Regulations provide guidance on access control, use of firearms and other weapons, speed limits, parking areas, trading, reserved areas, fire management, hygiene, camping and accommodation, access to works, photography, safety rules, reckless and unseemly conduct, damage to property, prohibited areas, protection of fauna and flora, swimming, angling, boat Regulations, water skiing and hydroplaning; and general rules.

2.4.3 Water Services Act (Act 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 management of the Dam cannot compromise the purpose of the Dam especially if it is for domestic water supply.

2.4.4 National Environmental Management Act (Act 107 of 1998) as Amended

The National Environmental Management Act (Act 107 of 1998), or NEMA, as it is simply known, is the foundation piece of legislation for environmental management in South Africa.

Section 2 of the Act has the largest impact on the RMP in that future development and management of the Dam must ensure the following:

- The disturbance of ecosystems and loss of biological diversity both in and around the Dam must be avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- Pollution and degradation of the Dam is avoided, or, where it cannot be altogether avoided, is minimised and remedied;

- The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- Development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;
- A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and
- Negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

Coupled with these considerations, the following is stipulated with regards to integrating social and economic aspects into the purely biophysical aspects of the environment:

> *"Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option."* ***(National Environmental Management Act, 1998 (Act 107 of 1998)***

2.4.5 National Environmental Management: Protected Areas Amendment Act (Act 15 of 2009)

The National Environmental Management: Protected Areas Amendment Act (NEMPA) (Act 15 of 2009) ensures the protection and conservation of ecologically viable areas in the country. It further seeks to achieve co-operative environmental governance and to promote sustainable and equitable utilisation and community participation.

2.4.6 The National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004) provides for the consolidation of biodiversity legislation through establishing national norms and standards for the management of biodiversity across all sectors and by different management authorities.

Chapter 4, Part 2 of the Biodiversity Act provides a listing of species as threatened or protected. If a species is listed as threatened, it must be further classified as critically endangered, endangered or vulnerable. The Act defines these classes as follows:

- **Critically endangered species**: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future;
- **Endangered species**: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species;
- **Vulnerable species**: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species; and
- **Protected species:** any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Certain restricted activities are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the Act are keeping, moving, having in possession, importing and

exporting, and selling. The first list of threatened and protected species published under NEMBA was published in the government gazette on the 23rd of February 2007 along with the Regulations on Threatened or Protected Species. Many Dams around South Africa are likely to have threatened or protected species. The management of these species in line with NEMBA must be taken into account in the RMP and by managers at the Dam.

2.4.7 National Environmental Management: Biodiversity Act (Act 10 of 2004): Alien and Invasive Species Lists, 2014 (GN 599 of 2014)

The Alien and Invasive Species Lists were promulgated on 1 August 2014. They provide certain prohibitions of use of Invasive alien species. This includes Catch and release of a specimen of a listed invasive fresh-water fish or listed invasive fresh-water invertebrate species. However, certain exemptions apply depending on the area and species in question. The details are provided in Notice 3 of the Species List and include:

Species	Category/Area
Large-mouth bass	a. 2 in National Parks, Provincial Reserves, Mountain Catchment Areas and Forestry Reserves declared in terms of the Protected Areas Act. b. 3 in all rivers, wetlands, natural lakes and estuaries in which it occurs. c. 2 for conveying, moving or otherwise translocating a live specimen. d. d. Large-mouth bass is not listed for dams within discrete catchment systems in which it occurs (excluding (a) above).
Common carp	a. 1b in National Parks, Provincial Reserves, Mountain Catchment Areas and Forestry Reserves declared in terms of the Protected Areas Act. b. 2 for release into a dam within a discrete catchment system in which it occurs. c. 3 in all rivers, wetlands, natural lakes and estuaries in which it occurs. d. Subject to b, common carp is not listed for dams within discrete catchment systems in which it occurs.

Largemouth Bass may occur at the Dam although due to the high levels of turbidity this is unlikely. However, carp occurs in large numbers. The Dam is part of a provincial protected area, however, common carp is exempted listed as category 2 for a period of two years from the date upon which this notice takes effect, from requiring a Permit for any restricted activity in terms of the Act or Alien and Invasive Species Regulations, 2014, provided a person is in possession of a valid Provincial Permit issued in terms of Provincial legislation where required for the species.

2.4.8 The National Environmental Management: Biodiversity Act (Act 10 of 2004): Alien and Invasive Species Regulations (GN 33683 of 19 July 2013)

The Alien and Invasive Species Regulations require the development and coordination of Species Management Programmes for all Invasive Species listed in Category 1B.

These species management programmes must stipulate the following:

- The listed invasive species to which it relates;
- The measures to eradicate or control the listed invasive species;
- The areas in which the measures are to be applied; and
- The schemes to fund the measures, if applicable.

Species monitoring, control and eradication plans are also required and the Department will publish guidelines on the compilation of these documents within a year of the publication of the regulations.

The Regulations provide for a register of alien and listed invasive species to be compiled. In addition, all research on invasive species needs to be lodged. This has implications for the RMP as any small-scale fishery proposals or alien invasive management plans will need to be approved in line with these regulations.

2.4.9 *The Municipal Systems Act (Act 32 of 2000)*

The Municipal Systems Act (Act 32 of 2000) serves to provide the framework to enable municipalities to ensure access to essential services to their citizens. The Act gives priority to the basic needs of the community, but also gives local government the freedom to set tariffs, and charge for services independently of other municipalities, providing that decisions made are in the best interest of the community.

The Act is of particular relevance to the RMP process, as it requires integrated planning from all spheres of government to ensure equitable and accessible municipal services. This means that any planning or policy-making must be in line with local government policies, planning and initiatives.

2.4.10 *Conservation of Agricultural Resources Act (Act 43 of 1983)*

The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) seeks to provide for the conservation of natural agricultural resources by maintaining the production potential of land, combating and preventing erosion and weakening or destruction of water resources, protecting vegetation and combating weeds and invader plant species.

Given that much of the land surrounding the Dam is State Owned Land it needs to be managed in such a way that it reduces the threat and spreading of invasive alien species.

In addition, Invasive Alien Plants are known to use significant volumes of water in correlation to the plants biomass and thus affect the volume of water available for use.

2.4.11 *Public Finance Management Act (Act 29 of 1999)*

Section 76 of the PFMA (Act 29 of 1999) provides for the making of Regulations for governing the efficient use and financial management of State Resources.

The object of the Act is to secure 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 Public Private Partnership (PPP) agreements with the private sector for the commercial use of state assets.

2.4.12 *Treasury Regulations of 15 March 2005*

Section 16 of the Treasury Regulations provides guidance on PPP including the process that needs to be followed, procurement and management of PPPs.

2.4.13 *Safety at Sports and Recreational Events Act (Act 2 of 2010)*

The purpose of the Safety at Sports and Recreational Events Act (Act 2 of 2010) is to provide measures to safeguard the physical wellbeing and safety of people at at sports, recreational, religious, cultural or similar events held at stadiums, venues or along a route. It also provides for the accountability of event role-players. The Act also provides for Access Control Officers which can be appointed by the Event Organisers. These officers control access of both people and motor vehicles to an event and prevent a person from entering or requesting that a person leaves should the need arise. The act also allows for Peace Officers to be in charge of search and seizures at an event.

The Act also specifies that an Event Planning and Safety Committee must be set up for all events categorized as medium or high risk. This committee should include the following stakeholders:

- The National Commissioner or an authorised member;
- A local authority disaster management department or centre;
- A controlling body, in respect of high-risk events only;

- A stadium or venue owner;
- The event organiser; and
- An emergency service provider.

2.4.14 *Merchant Shipping (National Small Vessel Safety) Regulations (GN.R 705 of 8 August 2007)*

The National Small Vessel Safety Regulations, 2007 were promulgated under Section 356 of the Merchant Shipping Act (Act 57 of 1951) and provides a number of requirements including:

- Vessel Safety Requirements; and
- Crewing.

It also provides the provision of an Enforcement Officer who can board and inspect a small vessel and its appliances and equipment, ask any pertinent questions of, and demand all reasonable assistance from the owner or skipper or any person who is in charge or appears to be in charge of the vessel. The Enforcement Officer may request documents or certificate required by these regulations etc. to be produced. An Enforcement Officer may, in order to ensure compliance with these regulations and in the interests of public safety direct the movement of a vessel or prohibit the operation of the vessel.

2.4.15 *South African Maritime Safety Authority Act (Act 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.

2.4.16 *The Free State Tourism Authority Act, 2011 (Act 4 of 2011)*

The Free State Tourism Authority Act (Act 4 of 2011) mandates the Free State Tourism Authority to achieve four important goals, namely:

- Marketing of tourism,
- Promotion of tourism;
- Development of sustainable tourism within the province; and
- Promotion of major sports events to promote tourism.

2.4.17 *(Free State) Nature Conservation Ordinance, (Act 8 of 1969)*

The Act provides for the conservation of fauna and flora and the hunting of animals. The Act also deals with fishing, the requirement for fishing licenses and management of Nature Reserves.

2.5 Existing Plans

An RMP cannot function in isolation and so all associated planning initiatives must be considered and used to inform the development of the RMP.

The following planning initiatives were taken into account in developing the RMP:

- The Integrated Development Plan (IDP) of SLM and TMDM;
- The Free State PSDF;
- The Water Services Development Plan of SLM;
- The Strategic Framework of Water Services, 2003;
- The Provincial Spatial Economic Development Strategy, 2003;
- National Spatial Development Perspective, 2006;
- The New Growth Path, 2012; and
- The Cooperative Inland Waterways Safety Programme.

Figure 3 below provides an overview of how the RMPs is informed by existing plans at different spheres of government.

Figure 3: Relationship between RMP and Planning Initiatives

2.5.1. The Cooperative Inland Waterways Safety Programme

The Cooperative Inland Waterways Safety Programme (CIWSP) project is a partnership between multiple government entities and between the government and the community. 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.

Although Allemanskraal Dam is not one of the Pilot Dams for this project, this RMP integrates information from the CIWSP into the management objectives for this Dam.

2.5.2. The Willem Pretorius Game Reserve Integrated Management Plan

Allemanskraal Dam forms part of the Willem Pretorius Game Reserve (WPGR). The FS DETEA has developed an Integrated Management Plan (IMP) for the management of the reserve including the Dam. The IMP has also been taken into account in the RMP.

2.6. Socio-Economic Environment

SLM is situated in the Eastern Free State within the boundaries of the TMDM. The local municipality area measures 5 948.35 km^2 and comprises four urban areas namely Ficksburg/Meqheleng, Senekal/Matwabeng, Marquard/Moemaneng and Clocolan/Hlohlolwane, as well as some surrounding rural areas.

Unless otherwise indicated, all information in the section was obtained from the Census 2011 (Statistics South Africa, 2011) data.

2.6.1. Population

According to Census 2011, SLM has a population of 110 335, of whom 92.3% are black African, 5.7% are white, with the remaining 2% made up by other population groups.

The majority of the population, (62%), is between 15 and 64 years of age. The age group 0 to 14 years accounts for 32% of the population (Figure 4).

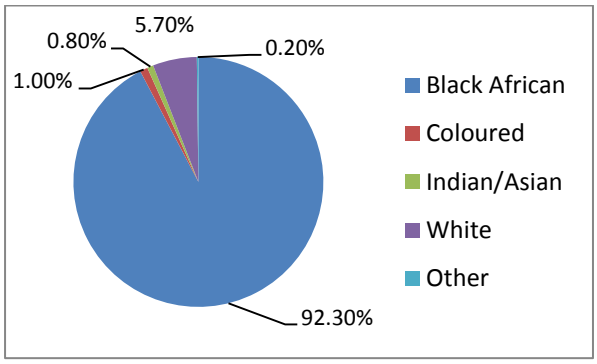

Figure 4: Population

2.6.2. Education

Of those aged 20 years and above, approximately 8.7% have no formal schooling, 22.6% have completed matric, and 6.9% have some form of higher education.

Figure 5 below shows that of the whole population, the majority (44.36%) have not completed their primary school education. Only 9.69% of the population had completed matric.

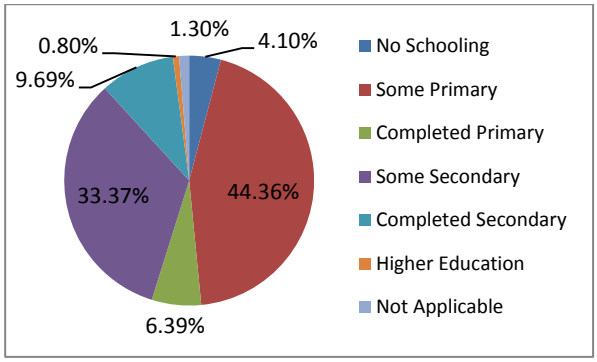

Figure 5 : Education Level

2.6.3. Employment

Figure 6 shows that 30.75% of the population in SLM are employed however, 44.52% of the population is not economically active. Of the 33 411 economically active (employed or unemployed but looking for work) people in the municipality, 35.7% are unemployed. Further, of the 17 173 economically active youth (aged 15–34) in the area, 46.1% are unemployed.

Agriculture is the main economic activity in the municipality

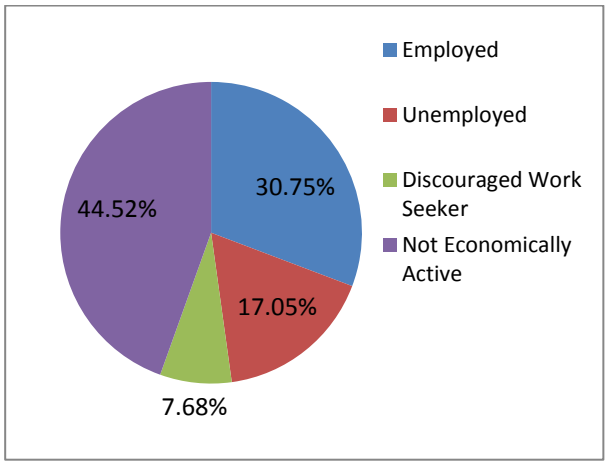

Figure 6: Employment Status

2.6.4. Average Household Monthly Income

Average income is grouped into the following brackets:

- No income;
- R1 - R4,800;
- R4,801 - R9,600;

- R9,601 - R19,600;
- R19,601 - R38,200;
- R38,201 - R76,4000;
- R76,401 - R153,800;
- R153,801 - R307,600;
- R307,601 - R614,400;
- R614,001 - R1,228,800;
- R1,228,801 - R2,457,600; and
- R2,457,601+.

Figure 7 below shows average household income per month for 2011. The majority of households are earning between R9 601 and R19 600 per month.

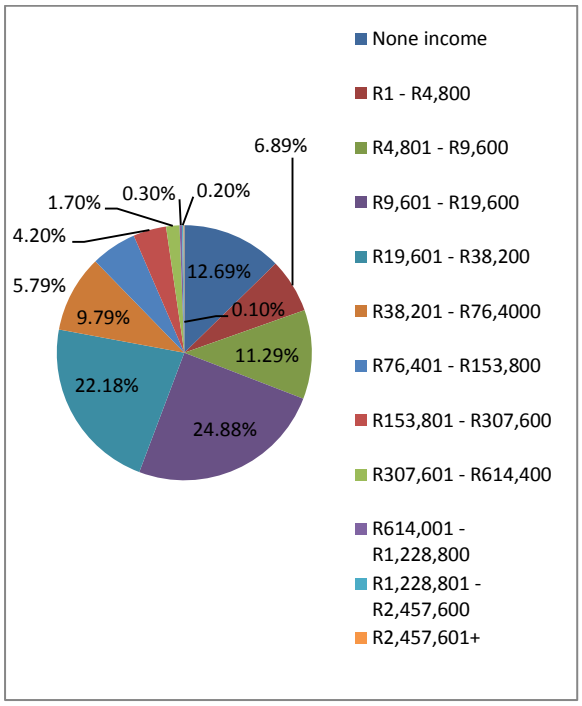

Figure 7: Income status

2.6.5. Gross Value Added

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

Quantec Research defines the major sectors into Primary Sector, which is extractive, Secondary Sector, made up of manufacturing and the Tertiary Sector, which comprises of services. Table 3 below shows the GVA per sector for 2011. This data is taken from Quantec Research and the variables are explained below.

Primary Sector:

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

Secondary Sector:

- Manufacturing. This includes food, beverages and tobacco; textiles, clothing and leather goods; wood, paper, publishing and printing; petroleum products, chemicals, rubber and plastic; other non-metal mineral products; metals, metal products, machinery and equipment; electrical machinery and apparatus; radio, TV, instruments, watches and clocks; transport equipment; and furniture and other manufacturing;
- Electricity, gas and water; and
- Construction.

Tertiary Sector:

- Wholesale and retail trade, catering and accommodation. This sector represents the tourism sector through catering and accommodation and the sale of goods through trade;
- Transport, storage and communication;
- Finance, Insurance, Real Estate and Business Services;
- Community, social and personal services; and
- General Government.

The greatest contribution is from Finance, Iinsurance, Real Estate and Business Services (R514 million) and Manufacturing (R446 million). Despite its prevalence in the region, agriculture only contributes R211 million (10%).

Table 3: Regional output and GVA by industry at basic prices by 2006 local municipality 2011 in R millions

Regional output and GVA by industry at basic prices by 2006 local municipality 2011 in R millions		
	R millions	%
Agriculture, forestry and fishing	211	10%
Mining and quarrying	16	1%
Manufacturing	446	20%
Electricity, gas and water	73	3%
Construction	41	2%
Wholesale and retail trade, catering and accommodation	272	12%
Transport, storage and communication	137	6%
Finance, insurance, real estate and business services	514	23%
Community, social and personal services	250	11%
General government	231	11%
Total	2191	100%

2.6 Development Potential

The development potential of Allemanskraal Dam is relatively high. Although the Dam is not located near any main towns, it located along the N1 highway and is easy to access. Further, according SLM IDP (2013), the tourism potential of the municipality as a whole has not been explored to its fullest. The IDP identified an eco/agri-tourism corridor from Marquard and Clocolan to the southern parts including all scenic and mountainous areas. WPGR and Allemanskraal Dam were also seen as important tourist destinations.

Further, the Allemanskraal Dam and WPGR have both historical and recreational tourist attractions:

- Water sports such as skiing, wind surfing, sailing, motor boating at Allemanskraal Dam;
- Bekkersberg National Monument and a number of Ghoya (early Bantu) sites. A number of Boer War battles were also fought in the vicinity of the area;
- WPGR including a number of sensitive species such as White Rhino;
- Horse riding;
- Bird watching;
- River rafting;
- Hiking trails;
- Sailing;
- Competitive, Recreational and Subsistence Fishing; and
- Activities such as putt-putt, rugby, netball, etc. are also available at the Aldam Estate.

FS DETEA (2008) found that in terms of tourism potential, adequate information and planning to guide informed management decisions was required to ensure that tourism was developed further in the province. The FS PSDF (2013) also noted that a more concerted effort was required at local municipal level to plan and prioritise tourism possibilities. Specific constraints to be dealt with included the under-utilisation of existing provincial nature reserves and resorts (such as WPGR).

2.7 Access and Infrastructure

Public access is available at the Dam through WPGR which allows day visitors at the Game Reserve as well as access at the public fishing area.

Willem Pretorius Game Reserve also offers a variety of accommodation facilities including chalets, camping and caravan facilities and single quarter accommodation. There is also a private bush camp which consists of 4 wooden chalets which are also part of the Game Reserve.

In addition, the Dam is adjacent to the privately run, Aldam Estate. The estate has a number of chalets as well as rugby fields, netball courts, slipways, a restaurant and camping area.

DWS has signed an operation and management agreement with the Sand-Vet WUA and thus the WUA is responsible for managing the infrastructure at the Dam wall including the canals.

The main infrastructure at the Dam includes:

- The Allemanskraal Dam Wall;
- Canals and associated infrastructure;

- WPGR infrastructure (slipways, accommodation etc.); and
- Aldam Estate infrastructure and accommodation.

2.8 Biophysical Environment

2.8.1 Water Quality and Availability

The water quality of Dam has been monitored by DWS since 1968 and levels of Total Phosphorus (TP) are high and since 2008 have fallen into the 'poor' category in terms of the Combined Domestic Health and Salinity Guideline. The average results between 1968 and 2013 are provided below for Monitoring Point C42_90809.

Table 4: Water Quality at Allemanskraal Dam

Variable	Average
Calcium (Ca)	15.04
Chloride (Cl)	8.14
Dimethyl sulphide (DMS)	169.48
Electrical Conductivity (EC)	21.95
Fluoride (F)	0.38
Potassium (K)	4.88
KJEL_N_Tot_Water	0.98
Magnesium (Mg)	6.11
Sodium (Na)	17.71
Amonia (NH4_N)	0.09
Nitrates (NO3_NO2)	0.62
Phosphorous (P)	0.15
pH	7.84
Phosphates (PO4_P)	0.15
Silicon (Si)	4.50
Sulphates (SO4)	11.64
Total Alkalinity (TAL)	84.71

Further, according to the Water Research Council (WRC) report on Phosphorus Loading Limits in South African Dams (2008), Allemanskraal Dam is hyper-eutrophic (highly nutrient rich) and is naturally prone to eutrophication due to the fact that the drainage basins is relatively flat and exhibits low rates of leaching. This is further amplified by the fact that the Dam occurs in low rainfall areas and exports high relative concentrations of nutrients from the catchment (mainly related to agricultural land use). Of more concern, the study noted that a reduction of 75% of TP would be required in order to reduce the trophic level to the desired state (mesotrophic).

The Maucha Diagram below shows that the Total Alkalinity (TAL) is high (Figure 8).

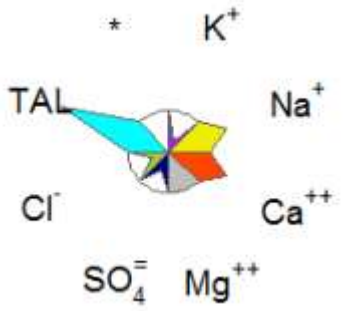

Figure 8: Maucha Diagram for Allemanskraal Dam

The trend analysis results for TP in Allemanskraal Dam were also of concern and show that TP has increased by 271% in the period between 1995 and 2008 with a 20% increase per annum (WRC, 2010). One of the reasons for this increase may be the role of phosphate contained in powdered laundry detergents where it is used as a builder in the form of pentasodium tri-polyphosphate (STPP) which acts to soften hard water by complexing calcium, ferric and magnesium ions and to assist in the cleaning process by buffering the pH of the washing solution, preventing rust and corrosion and keeping dirt particles in suspension. STPP is easily hydolysed in the presence of water to bioavailable orthophosphate (PO4), an important nutrient which, when released into the aquatic environment contributes to eutrophication in surface water bodies. If left unchecked, this trend may impact domestic and recreational use of the water in the Dam. Phosphorus is also contained in other components of detergents, such as the fluorescers and optical brightners (WRC, 2010).

Further, during consultation, concerns were raised regarding the Senekal Wastewater Treatment Works (WWTWs) which is unable to deal with the volume of raw effluent received.

Raw sewerage is thus released into the Sand Spruit which joins the Sand River approximately 2 km outside of Senekal.

The Dam is also known to be naturally turbid as are most water systems in the region (River Health Programme, 2003). According to Kotze et al. (2007) the presence of sediment reduces the water quality and provides attachment for other pollutants which might include phosphate and certain toxins. The alien invasive fish species, Carp has proliferated in the Dam. As this species is a bottom feeder, it has increased turbidity in the Dam. Turbidity also has impacts on recreational use as the water is often perceived to be 'dirty'.

The hyper-eutrophic state of the Dam also has implications for algal blooms as eutrophication can allow the formation of mass populations of cyanobacteria. The trends in Chlorophyll 'a' values at the Dam however show an anomaly as although the TP levels are high, the Chlorophyll 'a' values are relatively low. This may be due to the high levels of turbidity in the Dam which may restrict algal growth (WRC, 2008). However, turbidly may not always be able to restrict growth. In 2010, concentration of 140 000 cells per/ml of *Anabaena circinalis* in April 2010, this was followed by high concentrations of *Microcystis aeruginosa* (160 million cells/ ml) in May 2010 (Figure 9) (Janse Van Rensburg, ND).

Algal blooms have also occurred in the past at Allemanskraal Dam and are often the cause of odours which restricts domestic use (WRC, 2001). Studies on the toxicity of these blooms have also been undertaken and a study by the WRC (1992) found that at Allemanskraal Dam toxicity was 15% after 24h and 25% after 48h.

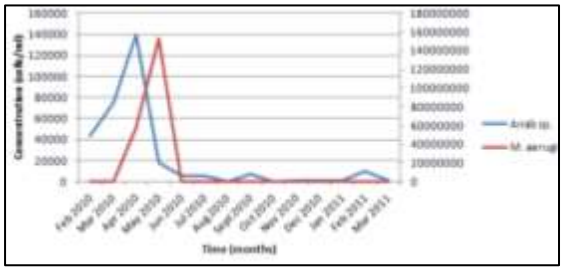

Figure 9: Concentrations of Anabaena circinalis and Microcystis aeruginosa at Allemanskraal Dam in 2010 (Janse Van Rensburg, ND).

In addition, these bacteria are capable of producing a number of toxins including β-N-methylamino-L-alanine (BMAA).

Studies by Esterhuzien-Londt (2010) evaluated BMAA which is produced in most cyanobacterial blooms. This has potential negative impacts on human health as very low BMAA concentrations are required to yield neurological damage and even motor neuron death. However, the extent of the risk to humans from direct exposure of free BMAA in these waters remains unknown (Esterhuizen-Londt, 2010). BMAA was first detected in 2005 and thus the necessary tolerable daily intake and guideline values for BMAA have not been established. In addition there is limited information on prevalence, incidence, and toxicology. The efficiency of standard water treatment processes to remove other cyanotoxins such as microcystin has been extensively studied but no studies on the removal of BMAA have been undertaken. As Allemanskraal Dam is used for domestic use, this lack of information can have extremely negative implications.

Fortunately, Esterhuzien-Londt (2010) found that in the absence of dissolved organic carbon in the water, BMAA is efficiently removed by sand filtration, chlorination by calcium hypoclorite, and powdered activated carbon during water treatment. However, flocculation was not effective in BMAA removal and the ozone concentrations achieved were not sufficient to result in BMAA removal.

In addition, BMAA was detected as both free and protein-associated fractions in *Clarias gariepinus* (Catfish), and *Crocodylus niloticus* (Crocodile) liver samples. BMAA content increased from the fish to the crocodile. BMAA content in the crocodile samples increased with age and thus bioaccumulation does appear to occur. Catfish is consumed occasionally by humans.

According to the WPGR IMP (FS DETEA, 2011), agricultural practises and soil erosion upstream have led to an increase in the siltation at the

Dam. The excessive siltation has led to the concern that the Dam wall could be raised. This would flood vast areas of the reserve area, covering a further estimated 2 135 ha.

Further, the increase in Dam siltation has resulted in habitat destruction, which in turn has led to the decreased ability of the smallmouth yellowfish (*Labeobarbus aeneus*) and largemouth yellowfish (*Labeobarbus kimberleyensis*) species to spawn as the gravel spawning grounds have been covered with silt.

Water availability also impacts management and use of the Dam. During consultation it was noted that water levels at the Dam are generally very low. The DWA Weekly State of Reservoirs shows that last year the Dam was only 25% full and although the full supply capacity of the Dam is 174.5 million m^3, it is currently at 76.3 million m3 (44.1%) (DWS, 2014) (Figure 10).

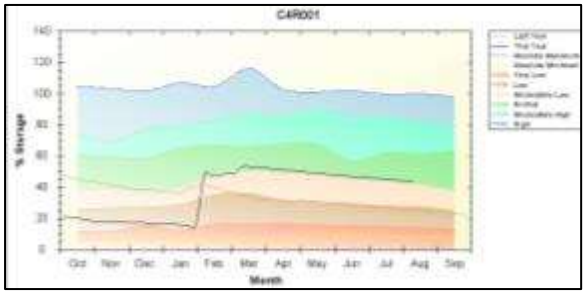

Figure 10: Water levels at Allemanskraal Dam (DWS, 2014).

This is partly due to low levels of rainfall in the catchment (approximately 571 mm precipitation per annum) and the high levels of annual evaporation (1839.2mm annually) (FS DETEA, 2011).

There are three encumbrances related to this. The first is the potential need to raise the Dam wall which would impact on the WPGR nature reserve. The second is that parts of the Dam become very shallow which also limits recreational use. Lastly, due to low water levels, the distance to the water's edge increases and planning of any recreational infrastructure on the water's edge is thus difficult.

2.8.2 Flora

2.8.2.1 Aquatic Invasive Plant Species

Currently 14 alien aquatic and wetland plant species are declared weeds or invader plants in South Africa and their control is subject to CARA, Act 43 of 1983, and amended in 2001. Another 13 species have been proposed for listing under CARA and NEMBA, Act 10 of 2004. There are also a number of indigenous or cosmopolitan (world-wide) species that can flourish and become troublesome in disturbed aquatic habitats.

No aquatic invasive plant species were noted as a problem during the stakeholder consultation however during the site visit, an aquatic species was noted which appeared to be an *Azolla* species (Figure 11) although this would need to be confirmed.

Figure 11: Potential Azolla species at Allemanskraal Dam

Further, according to the Agricultural Geo-Referenced Information System (AGIS) Weeds and Invasive Plants (WIP) Database, *A. filiculoides* occurs in the one of the Quarter Degree Square (QDS) within which the Dam occurs (2827AD). The species is a small, free floating freshwater fern, green to reddish-brown or purplish orange or red at the edges, branching freely, and breaking into smaller sections as it grows. It forms dense mats and outcompetes native plant species. These infestations can reduce light levels below the mats and cause die off of water plants and algae and reduce water oxygenation levels with serious impacts on fish and other fauna (Lusweti et al., 2011).

The species also causes a decrease in drinking water quality due to bad odours, colour and

turbidity. The economic impact of *A. filiculoides* in South Africa was calculated by McConnachie et al. (2003). Among those water-uses most seriously affected were farming (71%), recreational (24%), and municipal (5%). On average, A. filiculoides was found to cause on-site damages of US$589 per hectare per year.

Biocontrol has been effective against *A. filiculoides* and it is likely that the species encountered at the Dam is a not *A. filiculoides* but rather a newer (also invasive) related species.

Further, invasive aquatic plants are known to disrupt navigation, fishing and other recreational activities, adversely affect waterflow, increase the loss of water from storage Dams and pose a threat to hydro-electric installations. High densities of the plants degrade aquatic ecosystems and are a threat to biodiversity. They can also result in the deaths of cattle and livestock (due to walking on 'beds' of aquatic weeds which can result in drowning).

2.8.2.2 Terrestrial Invasive Plant Species

Invasive alien plants are widely regarded as the single greatest threat to South Africa's biological diversity. The water taken up by alien plants affects not only the water supply, but can also have negative impacts on water quality.

A large number of alien species occur in the 2827AD and 2827AC QDS surrounding the Dam. These include the following.

- *Agave americana;*
- *Argemone ochroleuca;*
- *Cirsium vulgare;*
- *Cuscuta campestris;*
- *Eucalyptus sp.;*
- *Gleditsia triacanthos;*
- *Melia azedarach;*
- *Opuntia ficus-indica;*
- *Opuntia robusta;*
- *Populus X canescens;*
- *Populus alba/canescens;*
- *Populus deltoides;*
- *Prosopis glandulosa;*
- *Rosa rubiginosa;*
- *Salix babylonica;*
- *Sesbania punicea;*
- *Tamarix sp.;*
- *Verbena bonariensis;* and
- *Xanthium spinosum.*

The WPGR IMP (FS DETEA, 2011) also notes the presence of alien invasive species at the Dam and Jordaan (2010) found that as WPGR is situated within an agricultural zone with crop farming to the south and cattle farming to the north (with little control of alien and invasive plants occurring), invasive plant species are one of the major challenges for the Reserve. The main plant invaders occur mainly in the wetland and hilly areas and have their origin in the catchment's area. Some alien and invasive plants noted by Jordaan (2010) included: *Cirsium vulgare, Berkheya pinnatifiola, Bidens pilosa, Conyza bonariensis, Verbena officinalis, Verbena bonariensis, Tagetes minuta* and *Zinnia peruviana*. These species constantly invade the reserve, threatening its biodiverstiy. In addition, *Asparagus* species have invaded the reserve and represent a major problem for the foreseeable future.

This is a threat to the management of the Dam as terrestrial invasive plant species are known to result in the following impacts:

- Loss of indigenous species as a result of competition for space and resources with alien species;
- Disruption of aquatic and riparian ecosystems;
- Erosion of river banks and riparian areas;
- Alterations in environmental flows as a result of water use by invasive alien plants; and
- An increased fire risk, which destroys indigenous habitats.

2.8.2.3 Floral Diversity

The vegetation types occurring around Allemanskraal Dam in WPGR include Central Free State Grassland which (vulnerable), Winburg Grassy Shrubland (least threatened), Bloemfontein Karroid Shrubland (vulnerable) and Eastern Free State Clay Grassland (Endangered) (FS DETEA, 2011). To date 427

plant species have been identified at WPGR (Jordaan, 2010).

Typical species occurring in the WPGR include prominent grasses such as *Eragrostis curvula, Digitaria eriantha, Themeda triandra, Panicum coloratum, Cynodon dactylon, Aristida congesta* and *Cymbopogon pospischili* (Jordaan, 2010). Prominent small trees include also occur such as *Acacia karroo, Ziziphus mucronata, Grewia occidentalis, Olea europea africana, Celtis africana, Euclea crispa, Searsia pyroides, Searsia lancea* and *Lycium echinatum*. Herbs recorded include *Berkheya onopordifolia, Hermannia coccocarpa* and *Mohria caffrorum*. Geophytic herb *Oxalis corniculata* and succulent herb *Crassula lanceolata* also occur in this category (Jordaan, 2010).

2.8.3 Fauna

2.8.3.1 Fresh Water Fish

Fish surveys have been undertaken at the Dam in the 2012/2013 summer seasons as well as the 2013/2014 summer seasons.

Table 5: Fish species caught at Allemanskraal Dam

Species	Total fish	Total weight (kg)	Average weight (kg)
Barbus paludinosus	8	0.043	0.005
Clarias gariepinus	5	17.206	3.441
Cyprinus carpio	**30**	**6.772**	**0.226**
Gambusia affinis	**5**	**0.005**	**0.001**
L. umbratus	134	62.667	0.468
L. umbratus X L. capensis	3	1.05	0.350
Labeo capensis	65	5.098	0.078
Labeobarbus aeneus	13	4.623	0.356
Labeobarbus kimberleyensis	10	7.215	0.722
TOTAL	**273**	**104.679**	

The red data list species, Largemouth yellowfish (*Barbus kimberleyensis*) was noted at the Dam. According to Impson and Swart (2007), the main threat to the Largemouth Yellowfish is poor water quality.

Figure 12: Largemouth yellowfish (www.theguidecompany.co.za)

Further, exotic fish species threaten the existence of the indigenous fish species by altering the habitat competing for food, aggressively preying on indigenous fish and out-competing indigenous predators.

Five hundred Largemouth bass (*Micropterus salmoides*) fingerlings were released in the Allemanskraal Dam in 1958 by Cape Nature Conservation however due to the turbidity in the Dam and the lack of bass catches, it does not appear that they occur in the Dam at this point (FS DETEA, 2011). In contrast, approximately 20 000 Carp (*Cyprinus carpio*) fingerlings were donated by the Transvaal Administration in 1965. This is the most abundant angling species in the Dam and they occur in large numbers.

Largemouth Bass and Carp are also known invasive species listed in the NEMBA: Alien and Invasive Species Lists which were promulgated on 1 August 2014.

2.8.3.2 Amphibians

The Free-State Province has 36 described frog species. Nine species were found using the South African Frog Atlas Project (www.sarca.adu.org.za) in the 2827AC and 2827AD QDS around the Dam (Table 5). These include:

Table 6: Amphibians species occurring around Allemanskraal Dam

Genus	Species	Common Name
Amietophrynus	*gutturalis*	Guttural Toad
Amietophrynus	*rangeri*	Raucous Toad
Kassina	*senegalensis*	Bubbling Kassina

Semnodactylus	*wealii*	Rattling Frog
Xenopus	*laevis*	Common Platanna
Amietia	*angolensis*	Common or Angola River Frog
Amietia	*fuscigula*	Cape River Frog
Cacosternum	*boettgeri*	Common Caco
Pyxicephalus	*adspersus*	Giant Bull Frog
Tomopterna	*cryptotis*	Tremelo Sand Frog
Tomopterna	*natalensis*	Natal Sand Frog

The Giant Bull Frog occurs in the area around the Dam and is the only Red Listed Species in the Province (Near Threatened) (Figure 13).

Figure 13: African Bullfrog ©Martin Grimm, www.inaturalist.org)

The species is common in many of the southern parts of its range which includes South Africa, Swaziland, Namibia, Botswana, and Zimbabwe, extending north to southern Angola, Zambia, Malawi, Mozambique, Tanzania, and Kenya (IUCN SSC Amphibian Specialist Group, 2013). However it has declined in South Africa, especially in Gauteng Province, but it is still locally common in some places. The major threat to the species is harvesting of frogs for local consumption, which is believed to be responsible for some population declines. In South Africa, breeding habitat has been lost due to urbanization.

2.8.3.3 Reptiles

The Free-State Province has 112 described reptile species and the. Of these, 37 are found around Allemanskraal dam (South African Reptile Assessment www.vmus.adu.org.za) (Table 7).

Table 7: Reptile species occurring around Allemanskraal Dam

Genus	***Species***	**Common Name**
Agama	*aculeata*	Distant's Ground Agama
Agama	*atra*	Southern Rock Agama
Aparallactus	*capensis*	Black-headed Centipede-eater
Homoroselaps	*dorsalis*	Striped Harlequin Snake
Homoroselaps	*lacteus*	Spotted Harlequin Snake
Boaedon	*capensis*	Brown House Snake
Crotaphopeltis	*hotamboeia*	Red-lipped Snake
Dasypeltis	*scabra*	Rhombic Egg-eater
Lamprophis	*aurora*	Aurora House Snake
Lycodonomorphus	*rufulus*	Brown Water Snake
Lycophidion	*capense*	Cape Wolf Snake
Psammophis	*crucifer*	Cross-marked Grass Snake
Psammophis	*trinasalis*	Fork-marked Sand Snake
Psammophylax	*rhombeatus*	Spotted Grass Snake
Smaug	*giganteus*	Giant Girdled Lizard
Elapsoidea	*sundevallii*	Highveld Garter Snake
Hemachatus	*haemachatus*	Rinkhals
Pachydactylus	*capensis*	Cape Gecko
Pachydactylus	*mariquensis*	Marico Gecko
Gerrhosaurus	*flavigularis*	Yellow-throated Plated Lizard
Nucras	*holubi*	Holub's Sandveld Lizard
Nucras	*intertexta*	Spotted Sandveld Lizard
Pedioplanis	*burchelli*	Burchell's Sand Lizard
Pedioplanis	*lineoocellata*	Spotted Sand Lizard
Leptotyphlops	*scutifrons*	Eastern Thread Snake
Leptotyphlops	*scutifrons*	Peters' Thread Snake
Pelomedusa	*subrufa*	Marsh Terrapin
Acontias	*gracilicauda*	Thin-tailed Legless Skink
Afroablepharus	*wahlbergii*	Wahlberg's Snake-eyed Skink
Trachylepis	*capensis*	Cape Skink
Trachylepis	*punctatissima*	Speckled Rock Skink
Trachylepis	*punctulata*	Speckled Sand Skink
Trachylepis	*varia*	Variable Skink
Stigmochelys	*pardalis*	Leopard Tortoise
Rhinotyphlops	*lalandei*	Delalande's Beaked Blind Snake
Varanus	*niloticus*	Water Monitor
Bitis	*arietans*	Puff Adder

The Giant Girdled Lizard (Figure 14) is listed as Vulnerable and the Striped Harlequin Snake is listed as Near Threatened. The other 35 species are listed as Least Concern.

Figure 14: Giant Girdled Lizard (Werner Layer/Juniors Bildachiv: www.arkive.org)
http://www.invasives.org.za/

2.8.3.4 Mammals

The Free-State has a total of 86 recorded mammal species however based on the Red Data List, one species is categorised a critically endangered, 4 endangered, 7 vulnerable and 9 near threatened (FS DETEA, 2008). Table 8 shows the 8 mammal species which were recorded in the 2827CD and 2827AC QDS (www.vmus.adu.org.za).

Table 8: Mammal species around the Allemanskraal Dam

Genus	Species	Common name
Cryptomys	*hottentotus*	Common Mole-rat
Hippotragus	*equinus*	Roan Antelope
Cercopithecus	*aethiops*	Vervet Monkey
Giraffa	*camelopardalis*	Giraffe
Lepus	*saxatilis*	Scrub / Savannah Hare
Aethomys	*namaquensis*	Namaqua Rock Mouse
Mastomys	*coucha*	Multimammate Mouse
Rhabdomys	*pumilio*	Striped Mouse

In addition, a total of 56 mammal species have been identified at the WPGR (Jordaan, 2010). These include: buffalo (*Syncerus caffer*), white rhinoceros (*Ceratotherium simum simum*), Burchell's zebra (*Equus burchelli*), black wildebeest (*Connochaetes gnou*), blesbuck (*Damaliscus pygargus phillipsi*), red hartebeest (*Alcelaphus buselaphus*), sable antelope (Hippotragus niger), eland (*Tragelaphus oryx*), impala (*Aepyceros melampus melampus*), giraffe (*Giraffa camelopardalis*), kudu (*Tragelaphus strepsiceros*), steenbuck (*Raphicerus campestris*), mountain reedbuck (*Redunca fulvorufula*), southern reedbuck (*Redunca arundinum*), grey duiker (*Sylvicapra grimmia*), bushbuck (*Tragelaphus scriptus)*, klipspringer (*Oreotragus oreotragus*), warthog (*Phacochoerus aethiopicus*) and springbuck (*Antidorcas marsupialis*).

Three Red List Species occur in the reserve including White Rhino (Near Threatened – Figure 15) Sable (Vulnerable), Spotted necked otter (Near threatened) and Hedgehog (Near threatened).

Figure 15: White Rhino (@Terry Rosenmeier, www.inaturalis.org)

White Rhino is currently listed as Near Threatened by the International Union for the Conservation of Nature (IUCN) due to the continued and increased poaching threat and increasing illegal demand for horn, increased involvement of organised international criminal syndicates in rhino poaching, increased black market prices and apparently new non-traditional medicinal uses of rhino horn). Current successful protection efforts have depended on significant range state expenditure and effort and if these were to decline (especially in South Africa) rampant poaching could seriously threaten. Declining state budgets for conservation and declining capacity in some areas are also of concern. In recent years poaching levels have increased in major range states South Africa, Zimbabwe, Kenya (Emslie, 2012).

In WPGR, two rhinos were killed by poachers in 2010. This was by another poaching incident in January 2011 where a rhino was killed (www.savingrhinos.org).

Overall, South Africa has seen a sharp increase in rhino poaching. This makes the white rhino in WPGR vulnerable.

2.8.3.5 Avifauna

A list of recorded bird species was obtained using the Avian Demography Unit MyBirdPatch database (www.mybirdpatch.adu.org.za) which includes data from the South African Bird Atlas Project 1 and 2 (ADU, 2013). An area around Allemanskraal Dam was selected and a list of bird species occurring in this area was then generated. The list contains 291 bird species.

Further, there are 16 Important Bird Areas in the Free State including Allemanskraal Dam which is listed due to the number of waterbirds which meet at the Dam (>10 000 waterbirds -C4). According to the WPGR IMP (2011), larger birds of prey such as Martial Eagle, Fish Eagle and the Secretary bird occur in the reserve.

Figure 16: Martial Eagle (@Kenneth W Fink/www.ardea.com, www.arkive.org)

Martial Eagle has recently been uplisted to Vulnerable in the IUCN Red List as it is suspected to have undergone rapid declines during the past three generations (56 years) owing to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution and collisions with power lines (Birdlife International, 2013) (Figure 16).

2.9 Climatic Conditions

According to FS DETEA (2011), there is little seasonal variation in the winds of the central interior. The dominant wind direction is northerly. However, the strongest winds occur mainly in spring between September and November. The autumn and early winter months are considered to be the seasons with the least amount of wind. Winds from the south-west are considered to be the strongest, although they are not common. These strong south-westerlies are usually of short duration and associated with thunderstorm activity. Whirlwinds and dust storms are common phenomena in the Free State during hot summer days; attributed to strong convection. (windspeeds)

The rainfall average recorded between 1976 and 1997 is about 581 mm and is experienced usually in the form of summer showers and thunderstorms.

The average summer temperature (October - March) is 21.6 °C, while the average winter temperature (April - September) is 12.3°C.

2.10 Heritage

The South African Heritage Resources Agency (SAHRA) has recently developed the South African Heritage Resources Information System (SAHRIS). As part of this, they have compiled a fossil sensitivity map for South Africa. The map provides an overview of estimated paleontological sensitivity of an area. The map shows that the sensitivity of the area around Allemanskraal Dam is rated as very high to moderate. Based on this a field assessment and protocol for finds is required or a desktop study (for the moderate sensitivity areas).

The WPGR is situated in the Beaufort series of the Karroo Super group. Rocks of the Karroo Sequence underlie about half the total area of South Africa. The Karroo Rock succession is divided into the (1) Dwyka Series, (2) Ecca Series, (3) Beaufort Series and the (4) Stormberg Series. The Beaufort Series covers a large area of South Africa with a thickness of 3 000 meters and is best known for its fossil reptiles (Mountain, 1968).

The Free State is very rich in palaeontological sites, with some 4000 fossil specimens curated in the collection of the National Museum in

Bloemfontein. The Eastern and Southern Free State areas are the prime collecting areas, with particular emphasis on the Clarens and Elliot Formations of the Beaufort Group. According to SAHRA's Archaeological Site Report, WPGR is home to a kraal-complex on Bekkersberg was one of several iron age settlements in the Free State. These stone huts are of archaeological interest and occur only in a restricted area of the north-eastern Free State, and the southern Transvaal. Although the huts are attributed to the Leghoya, there is still some doubt among scientists as to their true origin.

The general belief is that the Ghoya people were one of the first Bantu tribes coming from the North. They occupied the fertile, well-watered area between the Vet and Sand River's and built most of their settlements on the rocky ridges overlooking the rivers (FS DETEA, 2011). In the Winburg area there are many remains of these ruins, with one of the best examples being those preserved as the Bekkersberg National Monument in the WPGR. The main feature of the villages is the corbelled hut. All structures (huts, kraals and associated structures) were built entirely of untrimmed stone, with no form of cement being used at all. All stone was quarried by the Ghoya, and the disused quarries were then used as dumping places for ash and other debris. The small size of the huts with the very narrow entrances appear to indicate that the Ghoya's were of a small physical build (and gave rise to the concept that the Ghoya were a pygmy race) which is not the case (Dreyer, 2001). The huts were small due to the simple construction methods used, and the entrances narrow to allow better protection from marauding leopards and lions. The village sizes varied, most being about 10 corbelled huts with a livestock kraal in a central position. Cattle, goats and sheep were kept and some crop growing was practised along the riverbanks in the deeper well-watered soils. These people carried out a certain amount of hunting and trapping in pits of smaller game species (FS DETEA, 2011).

However, according to Dreyer (2001), the confusion regarding the builders of these corbelled huts may stem from Arbousset & Daumas (1846) as they referred to the Leghoya as the occupants of certain sites. It is however now been argued that the corbelled settlements could have been occupied by Kgatla, Taung and Tlokoa peoples. Further, judging by the description by Arbousset and Daumas, the Leghoya and the Bataung were the same people, and they specifically refer to the Bataung of Makhoana, calling them 'Lighoyas', but at the same time giving the lion (tau in Sesotho) as their totem (Arbousset & Daumas 1846). 'Lighoyas' is also used for people living at Makuabane (Makhoabane) (Arbousset & Daumas 1846), a place also known as a Bataung settlement. Regardless, the distribution of sites with corbelled huts is too widespread to have been the product of a single group (Maggs 1976). Further, the area occupied by the Bataung coincides with the distribution of the corbelled stone huts, as well as with the sites ascribed to the Leghoya (Dreyer, 2001).

Figure 17: Bekkersberg Iron Age Settlement

A heritage assessment was undertaken as part of a proposed Scoping process for Aldam Estate (Roodt, 2007). The assessment noted that there are three main classes or types of Iron Age settlements in the area.

- Type V is named after Vegkop, the Ndebele - Voortrekker battle site of 1836 south of Heilbron. Settlements classified as Type V are located in the central and eastern Free State over a considerable area roughly marked off by the towns of Marquard, Ventersburg, Senekai, Lindley and Heiibron, and in the districts of Bethlehem, Reitz, Frankfort, Warden and Vrede to the east. Village layout consists of a group of circular or oval

stone enclosures of varying sizes arranged in a rough circle, joined by connecting walls to form a large single enclosure. The pottery assemblage associated with Type V is characterised by rough finger-pinched decorations in bands below the rim and on the body of vessels, and comb-stamping in pendant triangles combined with ochre burnish;

- Type N - These settlements are named after Ntsuanatsatsi (Tafelkop), a solitary hill along the road between Frankfort and Vrede. Type N settlements are located in the north-eastern Free State around the towns of Warden, Frankfort and Vrede, where excavations have been done at the farms Helena, Frankfort (OU 1) (Ntsuanatsatsi) and Zoetbron 151, OU2(1) in the lower Klip River valley. The finger-pinched and comb-stamped pottery with ochre burnish closely resembles the Type V. The occupation of Type N settlements is linked to the eady Fokeng, and Kgatla lineages (Maggs 1976:315). Based on radio-carbon dating and lore, Type N sites were occupied during the 15th century (QUi) and 16th to early 17th century at QU2(1); and
- Type Z settlements are sparsely scattered over a relatively limited area in the vicinity of Doringberg (Maphororong) (Dreyer 1997). Also at Sandrivierspoort (Mariba), adjacent to the main road between Winburg and Ventersburg, and to the north-west along the Vats River in the districts of Kroonstad and Bothaville, including a few sites on the Renoster River, east of Viljoenskroon (Maggs 1976:231). Pottery decorations associated with Type Z are characterised by shallow line incisions in bands and triangles below the rim and on the shoulder, combined with straight or curved lines and areas of red ochre burnish on the body of vessels. Maggs (1976:293) ascribes the occupation of the sites with bilobial dwellings to Thlaping and Rolong groups.

In addition, other heritage resources do occur in the vicinity including Voortrekker sites (voortrekkers started moving into the region between 1820 and 1825). In 1838 after Andries Hendrik Potgieter, a Voortrekker leader, defeated Mzilikazi and the Zulus at the Battle of Italeni (in retaliation of the murder of Piet Retief), he returned to the Winburg district and bought the northern Free State from Makwana. The land between the Vet River and the Vaal River was exchanged with Makwana, a Bataung chief, for 49 cattle. Makwana saw Potgieter as his saviour and protector after having reckoned with the aggressive Zulus. Permanent colonisation commenced in this area after this event.

This area was then annexed by Sir Harry Smith in 1848 with mixed reactions and resistance from the Boers. The wagontrail to “riemland” involving over 200 wagons crossed the reserve area near its eastern boundary in 1861. With the outbreak of the Boer War, battles were also fought in the vicinity of the Reserve. The 1914 rebellion of General Christiaan De Wet’s forces saw the fall in battle of his son, Danie De Wet. A monument commemorating the event has been erected at Aldam Estate. Other significant events included the last inauguration of President Steyn in the vicinity of Doringberg (FS DETEA, 2011).

2.11 Current Institutional Arrangement

2.11.1 Official Institutional Structure

DWS is the official custodian of all surface water in South Africa in terms of the National Water Act, 1998. However, in terms of Allemanskraal Dam, DWS have signed over management to two main bodies.

Firstly, the operation and management of the Dam is undertaken by the Sand-Vet WUA as part of an operation and management agreement. Secondly, the management of the shoreline and surface water (and related recreational use) is undertaken by FS DETEA as the Dam forms part of the WPGR.

The conditions included in these agreements however are not known.

2.11.2 Informal Institutional Structure

A portion of the shoreline was sold by FS DETEA and is now privately owned and is known as Aldam Estate. There are no formal agreements between DWS and Aldam Estate regarding access, management of the shoreline (within the floodline) or commercial use. There are also no agreements in place between FS DETEA and Aldam Estate.

2.11.3 Management of the Water Surface

WPGR is responsible for the management of the surface water. In terms of AtoN and demarcation markers, initial payment for the AtoN and demarcation markers (for general navigation) will be undertaken by DWS. However, the provision and maintenance of the demarcation markers at WPGR and Aldam Estate will be for the cost of the latter. The Sand-Vet WUA will be responsible for maintenance of the demarcation markers around the Dam wall as part of the operation and management of the Dam.

2.11.4 Access

Public access is available at the Dam through WPGR which allows day visitors at the Game Reserve as well as access at the public fishing area. A provincial freshwater angling license is required.

Aldam Estate does not allow day visitors but has facilities for overnight guests. They also allow staff members who live in the small community near the Dam to access the Dam for fishing, however general access for this community is not allowed.

2.11.5 Permits

A Freshwater Angling License is required from FS DETEA for freshwater angling in the Free State. No specific angling licenses are required for fishing at the Dam.

2.11.6 Safety

There is no overall safety system in place at the Dam. Aldam Estate requires that skippers, boating licenses and fishing permits are in place. There does not appear to be any checks at WPGR. Further, WPGR does not have a boat available and are therefore not able to perform any rescues or patrols when required.

2.11.7 Overnight facilities

Overnight facilities are available at both Aldam Estate and WPGR.

2.11.8 Event Management

Shoreline Angling Events are the most common event at the Dam. The different recreational clubs organize these events through FS DETEA. A cycling event has also taken place in recent years.

2.12 Users and Uses of Allemanskraal Dam

2.12.1 Domestic and Commercial Use

The Sand-Vet GWS now also supplies raw water to be purified for commercial and household use to Theunissen, Bultfontein, Brandfort and Virginia as well as Harmony Mine, Correctional Services at Virginia and the Agricultural experimental farm via Sedibeng Water (DWA, 2011). As Sedibeng Water is the main user, the main use is now domestic and commercial.

2.12.2 Irrigation

As mentioned the Dam forms part of the Sand-Vet GWS and the main purpose of the Dam was initially irrigation. Although, the Dam now supplies water to Sedibeng Water for domestic and commercial use, it still provides raw irrigation water for more 700 privately owned and government owned settlement properties. The total scheduled irrigation area in the Sand-Vet GWS is 10 101 ha, of which 4997 ha is along the Sand River, supplied from Allemanskraal Dam (WRC, 2001).

2.12.3 Recreational Use

The Dam is also used for recreational use. Although no specific recreational clubs are based at the Dam, a number of clubs makes use of the Dam for events and these include Welkom Fishing Club, Virginia Fishing Club, North West Fishing Club and Senekal Fishing Club. National Bank Angling competitions have occurred at the Dam in the past.

The Dam forms part of WPGR and the following activities commonly take place at the reserve:

- Game viewing from Vehicles;
- Bird Watching;
- Walking;
- Cycling;
- Picnicking;
- Camping;
- Recreational Angling;
- Competitive Angling;
- Canoeing;
- Sailing;
- Motorised Boats;
- Swimming;
- Skiing;
- Approved Social, cultural and sporting events;
- Environmental education;
- Research;
- Viewing of Cultural Sites; and
- Hunting.

Willem Pretorius Game Reserve also offers a variety of accommodation facilities including chalets, camping and caravan facilities and single quarter accommodation. There is also a private bush camp which consists of 8 wooden chalets which are also part of the Game Reserve.

In addition, the Dam is adjacent to the privately run, Aldam Estate. The estate offers a number of activities including tennis, volley ball, rugby, swimming, hiking, mountain biking, putt-putt and kayaking. Sailing, jet skiing and power boating are also allowed. Shoreline and Boat fishing of carp, sharptooth catfish, mudfish and yellow fish is one of the main activities.

2.12.4 Subsistence Fishing

Although, there are no formal towns or villages directly adjacent to the Dam, there is one small community in place which was initially created for the staff of Aldam Estate (when it was still an Adventura Resort). People from this community are allowed access the public fishing area at WPGR. The main use by the community is subsistence fishing.

2.12.5 Commercial Fisheries

According to the FS DETEA, there have been two attempts at commercial fisheries at the Dam in the past. Both of these have failed due to the high levels of silt in the Dam.

2.12.6 Conservation

The Dam forms part of the WPGR and the surrounding vegetation types include Central Free State Grassland which (vulnerable), Winburg Grassy Shrubland (least threatened), Bloemfontein Karroid Shrubland (vulnerable) and Eastern Free State Clay Grassland (Endangered) (FS DETEA, 2011). Three Red List Species occur in the reserve including Sable (Vulnerable), Spotted necked otter (Near threatened) and Hedgehog (Near threatened). The reserve also has important cultural heritage as it is home to Bekkersberg National Monument and has a number of Ghoya (early Bantu) sites. A number of Boer War battles were also fought in the vicinity of the area. The Dam and Reserve also form part of an Important Bird Area and provide habitats for threatened species such as Martial Eagles. The Dam also provides habitat for numerous water birds.

2.13 Catchment Interactions

Based on the status quo of Allemanskraal Dam, it is clear that there are a number of factors that influence the ecological status, the use and management of the Dam.

- Land use in the catchment, especially agricultural use has impact on the water quality of the Dam. This is further impacted by WWTWs in the catchment which are sources of pollution;

- Land use in the adjacent Upper Vaal WMA (which has a number of large mines and industries) also impacts the Dam and has the potential to decrease water quality at the Dam;
- The locality of the Dam in terms of the distance to the surrounding towns makes community access difficult;
- The Dam occurs within the WPGR which has numerous positive impacts including proper management of the shoreline. However, as all the surrounding shoreline is part of the reserve, this somewhat decreases the development potential of the Dam;
- The sensitive biodiversity (both flora and fauna) provide an opportunity for conservation and education;
- Water demand and availability and the operational procedures for managing the Dam impact water levels and the Dam is kept at a relatively low level (approximately 40% full);
- Potential for Algal blooms and the hyper-eutrophic state are potential threats to recreational use;
- Important paleontological, archaeological and historical heritage resources in the area around the Dam provide an opportunity for heritage conservation as well as heritage based tourism and education;

It is important to understand how the Dam is influenced by these factors so that management of the Dam through the RMP are taken into account.

3 WHERE DO WE WANT TO BE?

3.1 Vision

A visioning exercise was carried out with a combination of stakeholder input from public meetings, authorities meetings, one on one stakeholder meetings and community focus group meetings.

The Vision for Allemanskraal Dam is a long-term, 20-year goal that is achieved through a series of objectives. While the Vision is constant for a 20 year period, RMPs are updated every five years. In addition, BPs are updated annually. This allows the objectives to be re-visited taking into account progress towards achieving the Vision.

This Vision for Allemanskraal Dam is highlighted through the unpacking of the needs, interests, requirements and uses of the dam.

Stakeholders showed a strong focus on improved equitable use, conservation of natural and cultural resources and sustainable development without impacting the primary purpose of the Dam and water availability. Clear roles and responsibilities and institutional arrangements are also key as all other objectives require a management system in place. Using the Dam as an education resource was also highlighted as important especially in light of the fact that WPGR has educational facilities in place that require upgrade.

The Dam falls within the WPGR and thus the mission statement contained in the WPGR Integrated Management Plan (IMP) (2011) also needs to be taken into account, namely: "*To manage our natural and cultural heritage through the protection and sustainable utilisation of resources for the benefit of all.*"

Operational management of the Dam is undertaken by the Sand-Vet WUA and thus cognizance of their Vision statement should also be taken into account: "*Effective and sustainable bulk water supply, over the long term, to all water users within the SAND-VET WUA operational area*."

The Vision statement that encompasses this is:

> *"Safe and sustainable utilisation and management of Allemanskraal Dam for the benefit of all without compromising the natural resources and cultural heritage of the Dam."*

3.2 Objectives

Based on the SWOT analysis as well as the Uses, Needs, Interests and Requirements, a number of objectives were identified. These are listed below together with some of the requirements needed to meet these objectives.

Improved and equitable use

- Current WPGR public fishing area to be upgraded to include ablution and picnic facilities;
- Agreements with Aldam Estate to manage access and use of the Dam and the purchase boundary;
- Feasibility study for a local community access card to be undertaken;
- Information brochures to be developed to inform communities about the potential uses of the Dam to encourage community use; and
- Discussions between Taxi association and SLM regarding subsidized costs to enable community members from town to travel to the Dam for a lesser fee.

Improved communication, management and safety

- Provision of a boat and skipper license training for WPGR manager to allow proper management and patrols of the Dam;
- Unauthorised commercial access to be regulated through agreements;
- Formalised institutional structure;
- Updated agreements taking into account RMP;
- Zonal plan to take into account different recreational activities;
- Unique Positioning Number (UPN) System to be implemented;
- Lifeguard skills training and first aid training to ensure safe public use of the Dam; and
- Standardised AtoN and demarcation markers to be implemented.

Sustainable recreation, development and utilisation

- Facilities at the WPGR Bank Angling events area to be put in place;
- Feasibility study for the upgrade of the Bekkerberg Iron Age Settlement Outdoor Museum;
- Marketing strategy to be compiled and implemented including the potential feasibility of small scale Public Private Partnerships (PPP) for additional activities such as game viewing boat cruises down the length of the Dam, horse riding trails, and guided bird watching and hiking trails; and
- Potential for small scale fisheries programme to be assessed. This should take into account the lessons learnt from previous fishery attempts to determine whether fisheries at the Dam are viable.

Natural and cultural resource management

- Potential for linking water quality monitoring to UPN System to be determined;
- Education programmes regarding the impacts of alien invasive species to be instituted;
- Species Management Plan for invasive species to be compiled in line with NEMBA;
- Senekal WWTWs to be upgraded;
- Wash bay system to be implemented to prevent alien invasive species infestations.
- Management and control of Azolla filiculoides and other invasive plant species (if any);
- Archaeological and paleontological study of cultural resources around the Dam including assessment of how these resources can be protected but opened up for educational use;
- Largemouth yellowfish population study; and
- Rhino Protection Plan.

Education and community skills development

- Coordination between Free State Bank Angling Association, fishing clubs and local schools to introduce bank angling development programme at the Dam;
- Upgrade of the educational facilities at WPGR;
- Lifeguard skills training and first aid training to ensure safe public use of the Dam;
- Coordination with SwimSA to introduce swimming school programme at the Dam; and
- Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes.

Improved Water Availability

- Undertake assessment of illegal water abstraction in the catchment; and
- Water Conservation and Water Demand Management Programme to be developed in conjunction with the Sand-Vet WUA and Sedibeng Water.

4 HOW DO WE GET THERE?

4.1 How does the RMP Work?

The overarching framework for the Allemanskraal Dam RMP is presented in Figure 19 below. It highlights the consultative nature of the RMP process where stakeholder meetings, public meetings and authority meetings were used to identify the Vision and Objectives for the Dam. The Vision and Objective forms the central tenet around which the RMP is based. The RMP is further broken down into 4 main Plans namely, the Institutional Plan, Financial Plan, Strategic Plan and Zonal Plan.

Each of the major areas of the RMP will be presented in detail further in this chapter. Briefly: The **Institutional Plan** provides a framework for the institutional arrangements at the Dam. In this case a three-tiered management system is proposed. This three-tiered approach includes a RMP Steering Committee (RSC), Operations Management Committee (OMC) and Dam Management Committee (DMC). Further, it should be noted that DWS reserves the right to appoint an Implementing Agent (IA) at the Dam. This IA would then form part of the institutional structure.

The RSC includes representatives of National Government Departments and fulfils a monitoring and high level guidance function to ensure that all functions of the DMC and OMC are being undertaken.

The OMC will be formed at an Operations or Cluster Level and is a current reporting line within DWS. The DMC will include authorised access point representatives and those who have an official mandate at the Dam. All three committees are chaired by a DWS official.

The Institutional Plan discusses requirements for agreements, development targets (in relation to community development of water sports) and information on the affiliations required. The detailed Institutional Plan is provided in the **Chapter 4.2.**

The **Financial Plan** provides information on how money generated through recreational use should be used, by whom and for what. It also provides guidelines on the financial reporting required. Further, the information from the Financial Plan is used to inform the Business Plan. The detailed Financial Plan is provided in **Chapter 4.3.**

The **Zonal Plan** has three main components:

- Shoreline Management Zones;
- Water Surface Management Zones; and
- Activities allowed in each zone.

The activities are presented in Table 10 and provide information on activities that currently allowed as well as potential activities. The detailed Zonal Plan is provided in **Chapter 4.4.**

In terms of the **Strategic Plan**, the Vision for the Dam was distilled into a number of objectives. These objectives are further distilled into actions required in order to achieve the Vision. This information was used to inform the BP for each objective. The detailed Strategic Plan is provided in **Chapter 4.5.**

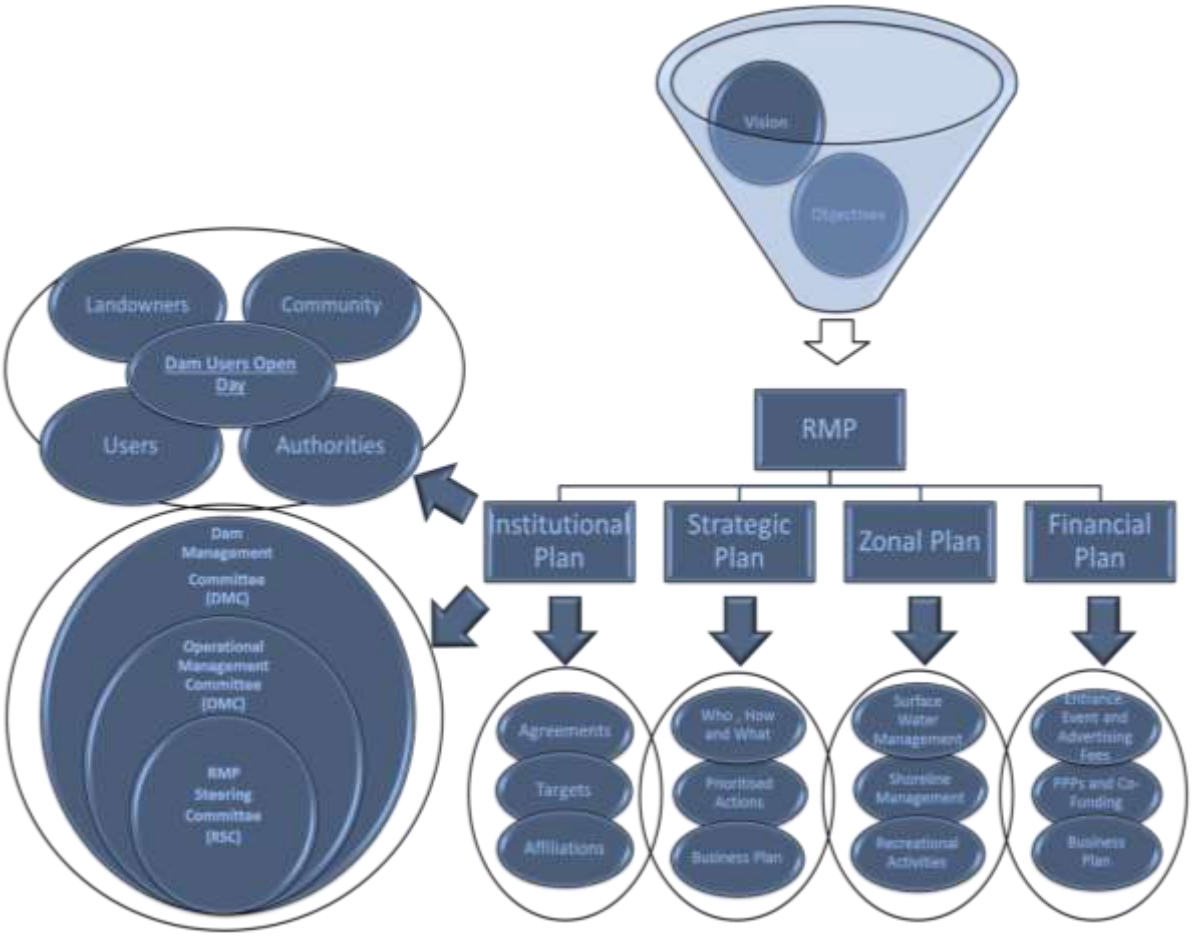

Figure 18: RMP Framework

4.2 Institutional Plan

The Institutional Plan is the backbone of the RMP as it identifies the management system which is required to ensure the objectives of the RMP are met. The Institutional Plan consists of three sets of tools which will be used to manage the Dam so that the Vision can be met.

The first toolset involves three separate but interlined committees all Chaired by the DWS because DWS is the custodian of all surface water in South Africa.

The membership of each committee and their roles and responsibilities is provided in Section 4.2.1., 4.2.2. and 4.2.3. below.

The second toolset involves an open communication forum which allows all stakeholders to be involved in the management of the Dam. The purpose of this forum is to share information and allow stakeholders to raise concerns and ideas regarding the management of the Dam. It also provides a platform for dealing with issues and challenges faced by users.

The third toolset includes a number of management tools including agreements, affiliations and targets.

Figure 19 below provides a visual representation of how these toolsets function together.

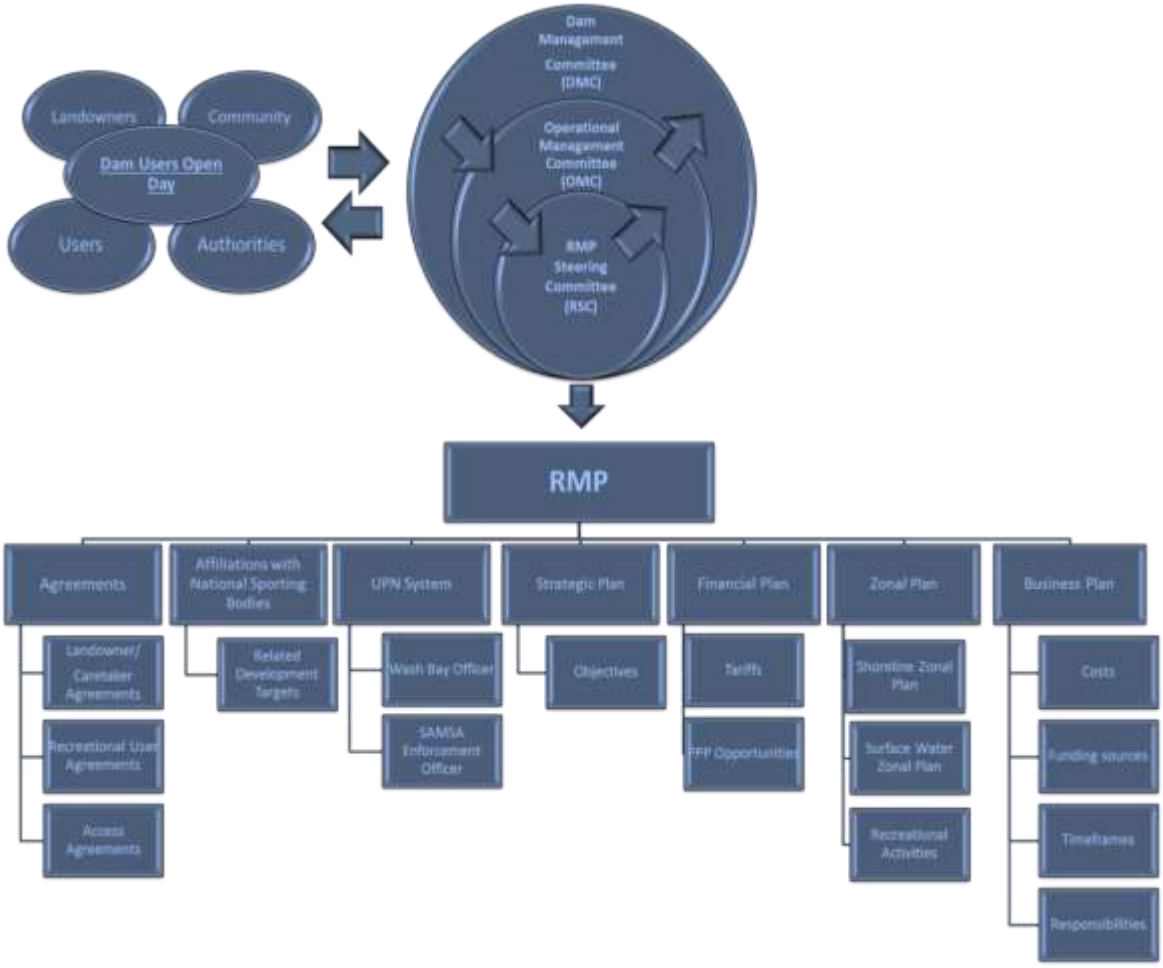

Figure 19: Institutional Framework

4.2.1 RMP Steering Committee (RSC)

The RSC is made up of representatives from National Government/Agencies. The main focus of this meeting is to ensure both the DMC and OMC are performing all necessary functions. The committee will also provide high level guidance. The RSC allows for a formal reporting structure between the Chief Director: Operations and the National Water Resources Infrastructure: Integrated Environmental Engineering (NWRI:IEE). Relevant departments from DWS including Operations, Water Quality Management and Catchment Management will be included in the RSC. The committee will meet every six months. Figure 20 below provides details of the membership of the RSC.

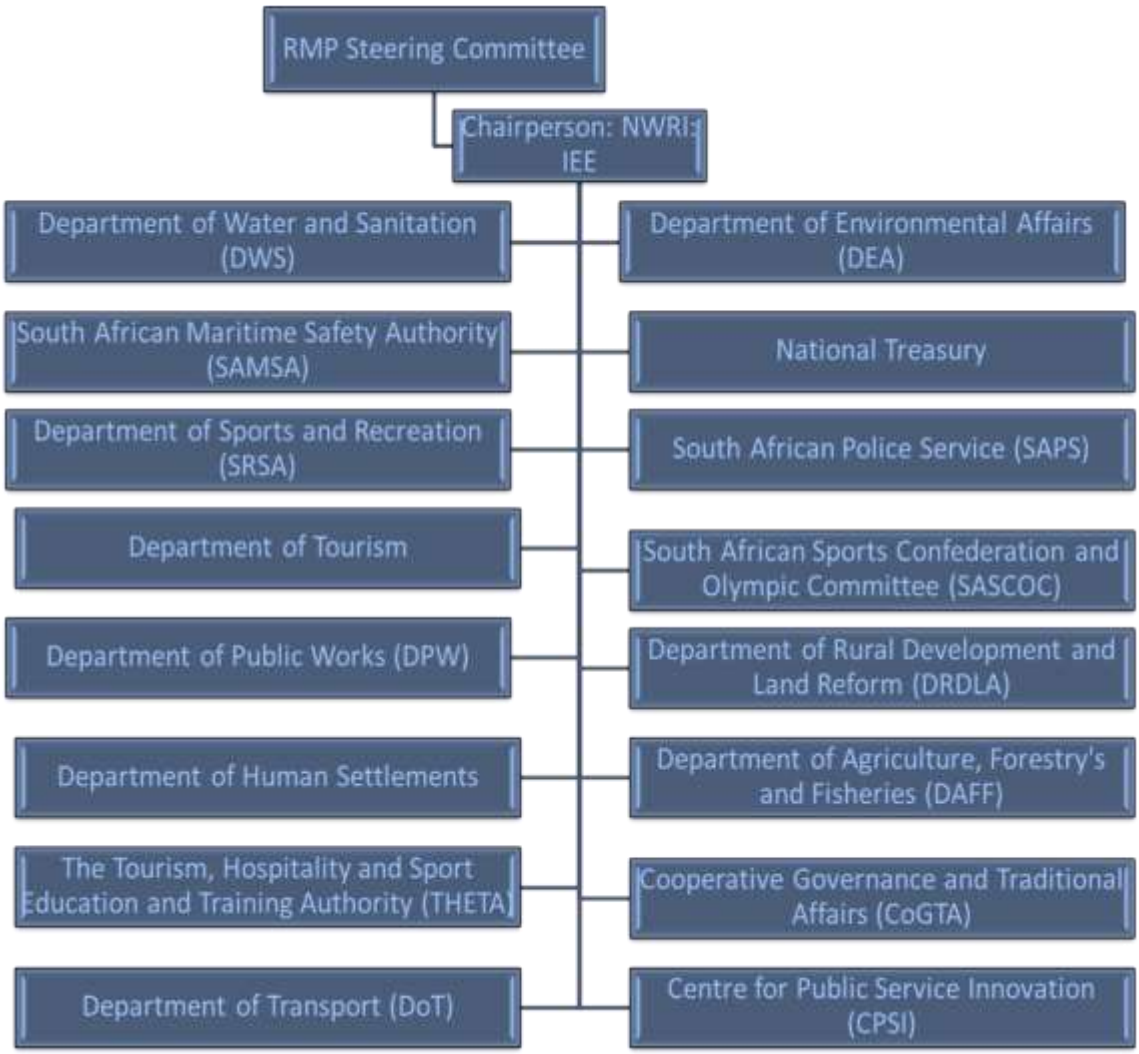

Figure 20: RSC Membership

4.2.2 Operations Management Committee (OMC)

The OMC will function at a catchment level and will provide high level guidance for all Dams occurring within one catchment. This is an existing reporting line between Area Managers for various schemes, the Regional Manager and the Director: Operations. The implementation of the RMP will be added as an agenda item, hence providing an opportunity to discuss the RMP. The Regional Manager will be fully aware of all commercial and/or recreational activities/opportunities at all Dams within the cluster.

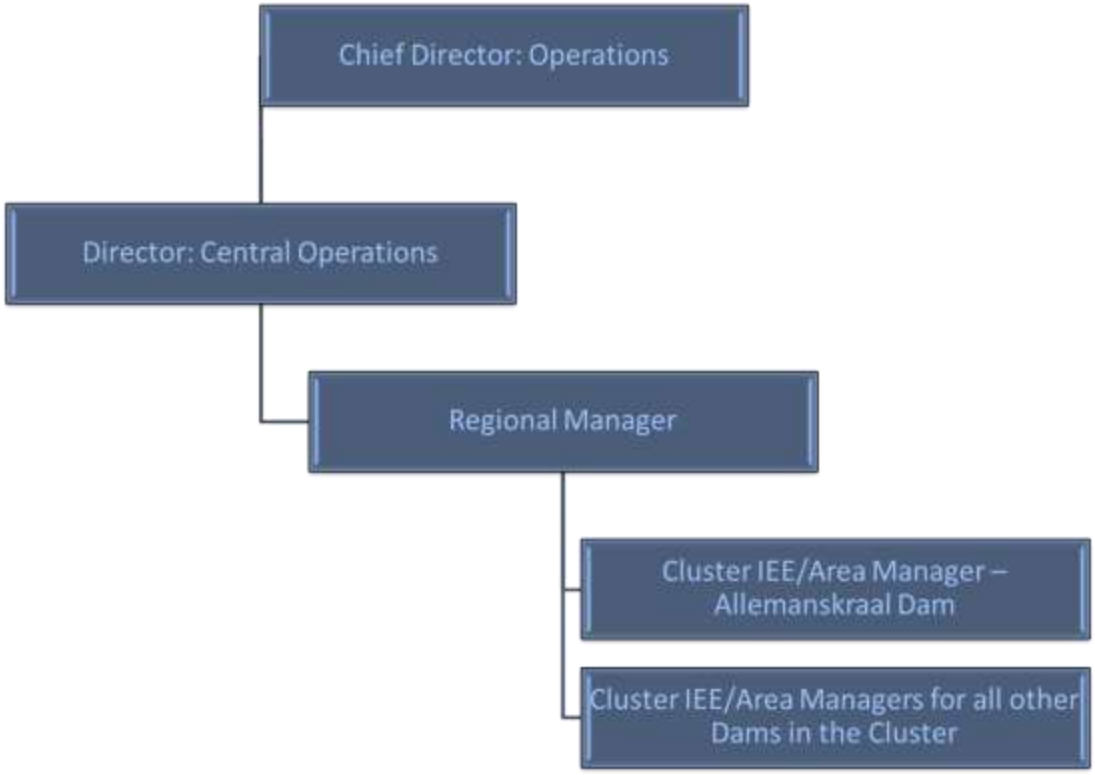

Figure 21: OMC Membership

4.2.3 Dam Management Committee (DMC)

The DMC is responsible for the operationalising of the RMP and includes a larger pool of representatives. This committee is chaired by the delegated DWS Official or IA.

Should DWS appoint an IA, the IA as part of their functions may also be asked to chair the DMC.

The DMC is involved in the management of the UPN System as part of the CIWSP and includes the following representatives:

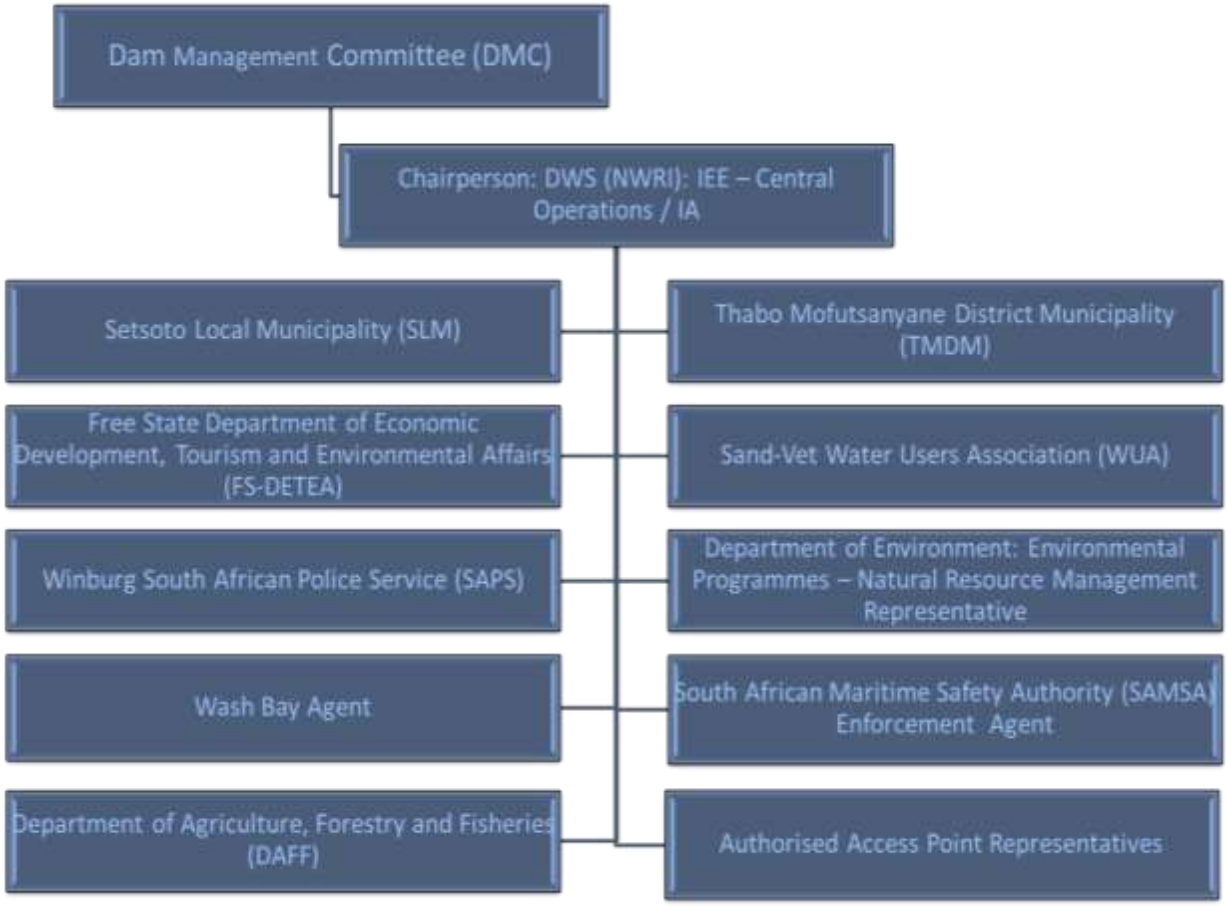

Figure 22: DMC Membership

One of the main functions of the DMC is to assess commercial opportunities at the Dam. As such, an agenda item related to the Strategic Plan for Commercialisation (SPC) 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 should meet every three months (i.e. quarterly).

Another important function of the DMC is to organise and facilitate the quarterly Dam User Open Day. All stakeholders should be invited to this meeting so that issues regarding use of the Dam can be discussed. If necessary, serious issues can be escalated from the Public Open Day to the OMC and then RSC so to ensure swift conflict resolution. The Open Day also provides an opportunity for the DMC to inform users of the Dam of all rules and regulations governing the access and use of the Dam.

Operational management of recreational activities such as ensuring the AtoN and demarcation markers system is in place and setting times for use of the Dam (within the current framework of GN 654 of 1964) will also be managed by the DMC.

The final structure of the DMC may change once agreements with Authorised Access Points Representatives are concluded. The updated DMC membership list will be added as an addendum of the Gazetted RMP.

Lastly, the DMC is also responsible for ensuring the BP is implemented.

4.2.4 Management tools

The RSC, OMC and DMC will have a number of management tools which will enable proper management of the Dam in line with Legislative requirements.

4.2.4.1 Terms of Reference

The RSC, and DMC will be guided by Terms of Reference (ToR) regarding roles and responsibilities. The ToR will provide guidance on the following management aspects:

- Meeting frequency;
- 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;
- SPC;
- Management of Water quality monitoring;
- Management of the Control of Aquatic Invasive Species;
- Management of Development Pressure; and
- Management of UPN system and wash bays.

Terms of Reference are not required for the OMC as this is an existing reporting structure.

4.2.4.2 Agreements

1.) Agreements between DWS and Implementing Agent

One of the main management tools available is the use of agreements to ensure proper use of the Dam in line with the RMP Vision and objectives.

Although the management of the surface water and shoreline is thought to be delegated to FS DETEA, the specific agreement was not available and the conditions of such an agreement are not known.

It is thus suggested that the agreement with FS DETEA (as the IA) be updated in line with the RMP. The agreement would include management of all recreational use at the Dam including:

- Management of Recreational Clubs;
- Management of Public Access Area;
- Management of Wash Bay and UPN System;
- Management of Community Skills and Training Programmes; and
- Management of commercial activities (in line with Treasury Requirements).

All agreements should be in line with the RMP requirements which as a minimum must achieve the following:

- Conditions on IA's mandate to enter into agreements with other parties on the use of the surface water for recreational use;
- Terms and conditions regarding equitable access must be included in ALL agreements;
- Guidance on the use of the State Resource for PPP in line with Treasury's requirements;
- Safety management to be in line with SAMSA requirements;
- Targets and objectives for the management of the Dam;
- Roles and responsibilities regarding the following:

- Maintenance of AtoN and Demarcation Markers;
- Maintenance of Wash Bays;
- Maintenance of Recreational Infrastructure;
- Maintenance of Fencing;
- Maintenance of the UPN System including signage;
- Management of agreements with other recreational users;
- Responsibilities on monitoring development and access targets (as part of agreements with other recreational users);
- Conditions on the use of the Dam for small scale fisheries or for commercial fisheries projects; and
- Conditions for the negotiations of agreements with recreational clubs. As a minimum, it is suggested that all agreements between the IA and any recreational clubs, should be reviewed and accepted in writing by DWS. They should also be presented to the DMC prior to signature to ensure the Vision and objectives of the RMP are met.

Irrespective of the nature of the agreement the following must be incorporated:

- Clear start and end dates and terms of renewal/extension;
- Rights and obligations of both parties;
- Access points to be used must be stipulated. The RMP makes provision for two official access points (one at WPGR and the other at the Sand-Vet WUA area at the Dam Wall) as well as one potential access point (should agreements be put in place) at Aldam Estate. Access agreements with DWS will be necessary within one year of the RMP being gazetted. Failure to do so will result in unauthorized access points being closed (see section on Access agreements for more details);
- IA's (and therefore DWS's) exclusion of liability;
- Terms and conditions of improvements made to the property should be stipulated. All improvements require consent from DWS and the DMC. Furthermore, the financial consequences should this requirement not be met should also be stipulated in the agreement. No permanent structures shall be built within the 1:100 year floodline without additional approval as required by Section 21 (c) and (i) of the National Water Act, 1998 (Act no 36 of 1998);
- The extent of the rights to use the resource should be stipulated;
- Clear instructions on the financial requirements of both parties, and where and when money must be paid should also be stipulated. All recreational clubs and societies on State Land must be managed in line with National Treasury requirements. Lease agreements for use of State Land should include fair remuneration at the current market value;
- All agreements should include a cancellation clause if requirements cannot be met;
- All clubs or associations must be affiliated to a national sporting body recognised by the South African Sports Confederation and Olympic Committee (SASCOC);
- All agreements must include a cancellation clause if clubs or associations fail to obtain affiliation within one year from date of signature of the agreement;
- Limitations of the number of people allowed to access the water surface of the Dam based on carrying capacity of Dam as well as the carrying capacity of the CIWSP wash-bays must be adhered to;
- A list of current and potential recreational activities allowed at the Dam;

- Requirements for safety, disaster management and emergency response plans;
- Duties and responsibilities of either party regarding maintenance, management and infrastructure;
- A list of prohibited activities;
- Requirements for subletting portions of the leased area (if allowed);
- Conditions on the use of the Dam for small-scale fisheries projects;
- A mandate for programmes to assist in equitable access and redressing past imbalances at the Dam, such as sponsored gate-fees for members of previously disadvantaged local communities. This should be in line with the RMP. The DMC will then be required to report against all targets at the OMC;
- All agreements must include a cancellation clause should community access targets not be met; and
- All recreational activities must be in line with the RMP, which once gazetted, becomes the mechanism to control and manage recreational use. Although no Section 21k Water Use License Application (WULA) is required, all activities must comply with all other relevant legislation requirements including the following:
    - The Merchant Shipping (National Small Vessel Safety) Regulations, 2007, - Control of Boating;
    - Section 21 (a) of the National Water Act, 1998 – abstraction;
    - Section 21 (c) and (i) of the National Water Act, 1998 – construction of slipways/infrastructure;
    - Safety at Sports and Recreational Events Act, 2010 – Events; and
    - Provincial Ordinances – Fishing.

These agreements should be updated within one year of the RMP being gazetted.

2.) Recreational Use Agreements

Recreational Clubs must enter into an agreement with the IA who will be responsible for the surface water 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 and the DMC.

Recreational Use Agreements must be developed in line with the conditions stipulated in the agreement between DWS and the IA.

All agreements must be finalised within one year of the RMP being gazetted.

3.) Land Management Agreements

The DMC should actively consider land management strategies that improve the efficiency of current practices. This could include co-management agreements with surrounding or adjacent landowners which may result in environmentally sustainable and more efficient land management.

Agreements must be developed with appropriate legal advice and consultation.

In the case of Allemanskraal Dam, the majority of the State Land is managed by FS DETEA as part of the WPGR. However, there is a portion of DWS purchase boundary adjacent to the privately owned Aldam Estate. An agreement between Aldam Estate and DWS is required.

All agreements should be should be put in place within one year of the RMP being gazetted.

4.) Access Agreements

All surface water 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 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 by all adjacent landowners and recreational clubs that have direct access to the water surface of the Dam through 1.) constructed slipways; 2.) natural slipways; or 3.) jetties for angling and/or launching of boats. Should an IA be appointed, then agreements will be entered into directly with the IA and not DWS.

The wash bay must be built on State Property as part of the CIWSP. A formal agreement is necessary between the IA and DEA on the management and maintenance of the Wash Bay. The agreement will be overseen by the DMC.

All agreements should be put in place within one year of the RMP being gazetted.

5.) Safety of Navigation Agreements

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.

6.) Event Applications

Allemanskraal Dam is used for a number of competitive events.

All events must be managed through an event application process. While the application may be made to the IA (as part of the current FS DETEA application process), DWS and the DMC must approve the application. 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);
- Access points to be used;
- Costs; and
- Films/photographs that will be generated to be in line with DWS communication requirements.

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

4.2.4.3 National Affiliations and Development Targets

All recreational clubs should be affiliated to a SASCOC affiliated organisation. The development targets set by the National Organisations must be met. The Clubs must be affiliated within two years of the RMP coming into effect.

4.2.4.4 Community Participation and Beneficiation

The RMP has suggested a number of different objectives, actions, interventions, agreements and institutional arrangements to ensure that community participation and beneficiation of the resource takes place. These are captured throughout the different plans and in the Vision and objectives. However, in order to ensure a strong focus on this aspect by the DMC, OMC and RSC going forward, the different elements of community participation and beneficiation are consolidated below.

1.) Socio-Economic Development

Socio-economic development is a key aspect of the RMP and is captured in the Vision for the Dam (sustainable utilisation). There is also a specific objective and a number of related actions regarding sustainable recreation, development and utilisation.

Sustainable recreation, development and utilisation

- Facilities at the WPGR Bank Angling events area to be put in place;
- Feasibility study for the upgrade of the Bekkerberg Iron Age Settlement Outdoor Museum;
- Marketing strategy to be compiled and implemented including the potential

feasibility of small scale Public Private Partnerships for additional activities such as game viewing boat cruises down the length of the Dam, horse riding trails, and guided bird watching and hiking trails; and
- Potential for small scale fisheries programme to be assessed.

In addition, as discussed in the Financial Plan below, Allemanskraal Dam can become a key economic lever for the region, thereby creating job opportunities for the local community.

One of the key mechanisms for this is the use PPPs. However in regards to potential PPPs, the following should be noted:

- A balance between high and small cap opportunities is required to ensure that revenue generation occurs together with the promotion of equitable access and job creation at the Dam; and
- While the tariff structure can be used for revenue generation, it should not be used to deny people access to the dam.

The BP has a specific intervention regarding the compilation of a marketing strategy including the potential feasibility of small scale PPPs for additional activities such as game viewing boat cruises down the length of the Dam, horse riding trails, and guided bird watching and hiking trails

In addition, the BP has a specific intervention regarding the potential for Small-Scale Fisheries at the Dam.

2.) Equitable Use

One of the main triggers for the RMP was the issue of inequitable access. However, Allemanskraal Dam does have public access at the WPGR resort as well as at the WPGR public fishing area however despite this the Dam is not used very often by the local community. In order to rectify this inequitable use, one of the objectives (and related actions) has aspects which are specifically related to this.

Improved and equitable use

- Current WPGR public fishing area to be upgraded to include ablution and picnic facilities;
- Agreements with Aldam Estate to manage access and use of the Dam and the purchase boundary Feasibility study for a local community access card to be undertaken;
- Information brochures to be developed to inform communities about the potential uses of the Dam to encourage community use; and
- Discussions between Taxi association and SLM regarding subsidized costs to enable local community members from town to travel to the Dam for a lesser fee.

In addition, a specific intervention in the BP is focused entirely on the creation of facilities at the public fishing area at the WPGR to allow community participation and use. It is suggested that DWS undertake the initial planning and construction while the management and maintenance of the area be included in the agreement with the IA (FS DETEA).

Section 4.2.4.1. provides guidance on the aspects which should be included in the ToR for the DMC and RSC. Specific mention is made of Management of access objectives and Management of development targets. Section 4.2.4.2. provides the guidance on the aspects which should be included in all agreements. This includes the following:

- A mandate for programmes to assist in equitable access and redressing past imbalances at the Dam, such as sponsored gate-fees for members of previously disadvantaged local communities. This should be in line with the RMP. The DMC will then be required to report against all targets at the OMC.; and
- All agreements must include a cancellation clause should community access targets not be met.

3.) Skills Development and Training

The RMP also focuses on skills development and training through one of the objectives (and related actions items – listed below).

Education and community skills development

- Coordination between Free State Bank Angling Association, fishing clubs and local schools to introduce bank angling development programme at the Dam;
- Upgrade of the educational facilities at WPGR;
- Lifeguard skills training and first aid training to ensure safe public use of the Dam;
- Coordination with SwimSA to introduce swimming school programme at the Dam; and
- Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes.

The BP has a specific intervention relating to development and implementation of a skills training programme as there is an opportunity for local community members to obtain skills (such as first aid) to be employed at the public access area as 'lifeguards'. This would have the added benefit of improving community safety at the Dam.

4.3 Financial Plan

Allemanskraal Dam is an economic lever and can become central to development in the Region. The RMP provides guidance on cost recovery mechanisms to ensure the sustained and improved management of the Dam.

Currently WPGR and Aldam Estate generate an income through entrance fees and accommodation fees.

There are opportunities for PPPs which could further unlock the economic potential of the Dam.

With PPPs, the private party assumes the financial, technical and operational risks but receives a benefit for this. PPPs allow for DWS to make State Assets such as Dams available to private parties who wish to engage in tourism related commercial operations (DWAF, 2009). This risk sharing mechanism aims to unlock socio-economic potential of State Dams. In addition, development of PPPs in remote areas often require related infrastructure upgrades and thus there is the opportunity for new infrastructure investment and development and related services which would benefit local communities.

Although high cap PPPs result mostly in revenue generation, small cap opportunities (less than R10 million (2007 figures) are more likely to fulfil socio-economic objectives such as job creation, promotion of Broad-Based Black Economic Empowerment, Local Economic Development and Small, Medium and Micro Enterprises. A balance between high and small cap opportunities is required to ensure that revenue generation occurs together with the promotion of equitable access and job creation at the Dam.

Further, Allemanskraal Dam is a State Resource and as such all profits made from the recreational use of the Dam should be used for further development of the Dam.

While the fees for use of the Dam can be used for revenue generation, it should not be used to deny people access to the Dam. Thus it should take into account the socio-economic status of recreational users. For example, a sliding scale, cross subsidy fee structure and/or contractual obligations which ensure equitable access must be considered when setting a fee.

The BP provides a financial framework to undertake certain interventions.

4.4 Zonal Plan

The Zonal Plan for Allemanskraal Dam has three main sections. The first involves the current recreational activities together with an identification of potential recreational and/or commercial opportunities. This section also

includes the determination of carrying capacity. The second involves the shoreline management zones (together with preferred activities within each zone) and the third involves surface management zones (together with preferred activities within each zone).

4.4.1 Current Recreational Uses

Although no specific recreational clubs are based at the Dam, a number of clubs makes use of the Dam for events and these include Welkom Fishing Club, Virginia Fishing Club, North West Fishing Club and Senekal Fishing Club. National Bank Angling competitions have occurred at the Dam in the past.

The Dam forms part of WPGR and the following activities commonly take place at the reserve:

- Game viewing from Vehicles;
- Bird Watching;
- Walking;
- Cycling;
- Picnicking at the Public Fishing Area;
- Camping;
- Recreational Angling;
- Competitive Angling;
- Canoeing;
- Sailing;
- Motorised Boats;
- Swimming;
- Skiing;
- Approved Social, cultural and sporting events;
- Environmental education;
- Research;
- Viewing of Cultural Sites; and
- Hunting.

Willem Pretorius Game Reserve also offers a variety of accommodation facilities including chalets, camping and caravan facilities and single quarter accommodation. There is also a private bush camp which consists of 8 wooden chalets which are also part of the Game Reserve.

In addition, the Dam is adjacent to the privately run, Aldam Estate. The estate offers a number of activities including tennis, volley ball, rugby, swimming, hiking, mountain biking, putt-putt and kayaking. Sailing, jet skiing and power boating are also allowed. Shoreline and Boat fishing of carp, sharptooth catfish, mudfish and yellow fish is one of the main activities.

4.4.2 Potential Recreational and/or Commercial Opportunities and Uses

A matrix model was used to determine the feasibility of possible recreational and eco-tourism activities in line with the operational requirements of the Dam, the biophysical environmental conditions and safety requirements. The scores utilised to determine viability are as follows:

Table 9: Scores for Recreational Use

Score	Meaning	Comment
0	Not feasible	High Negative Impact to Dam Environment + High Negative Impact to Recreational Users Text provided in red highlights the specific factors which make the activity not feasible at the Dam.
1	Likely to be feasible however feasibility study is required.	**Feasibility Study is required**
2	Likely to be feasible	Benefits appear to outweigh impacts. Allowed should there be an interest. Adequate agreements and safety measures would be required as per RMP. **No feasibility study is required.**
3	Current use	Benefits outweigh impacts. **No feasibility study is required.**

The main potential activities include:

- Guided Hiking trails around the Dam;
- Guided Horse Riding Trails;
- Guided animal viewing cruises;
- Swimming School for Local community;
- Outdoor Museum and restaurant;
- Cycling Trail;
- Upgrading facilities at the Public Access/ Fishing Area;
- Junior Angling School; and
- Potential Smallscale/Commercial fishery.

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Table 10: Potential and Current Recreational Activities

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
No Contac	Guided Hiking Walking Trail	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances but can be mitigated through well-chosen routes that do not impact bird nesting	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Due to presence of animals, a guide will be required	N/A	Not required for Day hikes	Ablution facilities would be required at overnight areas. It is suggested that ablution facilities at Heritage site are used for a stop over	Not required	Land in the purchase boundary is available	Guided trails are generally popular especially in light of the sensitive species such as rhinos in the park as well as the heritage	WPGR/ PPP for specific activity	1
	Cycling and walking in WPGR Camp	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances but can be mitigated	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	N/A	N/A	Facilities are in place at WPGR camp	Facilities are in place at WPGR camp	Not required	Land in the purchase boundary is available	Current activity	N/A	3
	Hunting	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Noise Impacts	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Guide will be required	N/A	Facilities are in place at WPGR camp	Ablution facilities would be required at overnight areas. It is suggested that ablution facilities at Heritage site are used for a stop over	Not required	Land in the purchase boundary is available	Current activity	N/A	3
	Day Cycling Trails	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances but can be mitigated through well-chosen routes that do not impact bird nesting	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Potentially dangerous due to presence of wild animals. Would suggest that a cycling trail is created in the fishing area which is fenced from the rest of the reserve	N/A	Not required	Ablution facilities would be required at Public fishing area	Not required	Land in the purchase boundary is available	Mountain biking and adventure cycling is a popular activity in the area	WPGR	1
	Heritage Museum and associated restaurant and picnic spot	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances but can be mitigated through well-chosen routes that do not impact bird nesting	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Potential conflicts with conservation as people would be accessing sensitive areas. However using the area for education purposes may also improve conservation in the area	N/A	Not required	Ablution facilities at Heritage site would need to be upgraded	Not required	Land in the purchase boundary is available	An outdoor museum was run by the Bloemfontein Museum but has fallen into disrepair however there is an opportunity to upgrade the outdoor museum and link it to a restaurant and picnic spot (similar to Mapungubwe)	WPGR/SAHRA/ PPP for specific activity	1
	Public Fishing Area	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances can be mitigated through site selection	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Already in place	No winds would be required however safety is a concern as strong winds can occur at the Dam	Picnic spots and braai facilities would be required	Ablution facilities would be required	Access agreement with DWS would be required	Available area within purchase boundary	Current area is used	WPGR to upgrade facilities	3

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
	Game Viewing and Driving routes (self-drive and 4x4)	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances can be mitigated through site selection	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Already in place	N/A	N/A	N/A	N/A	Available area within purchase boundary	WPGR allows self-drive routes	Not required	3
	Accommodation at WPGR	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	No conflicts at this point	N/A	Facilities available	Facilities available	Agreement with DWS required	Land available within purchase boundary – agreement with DWS required	Currently takes place	Not required	3
	Environmental Education and Research	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	No conflicts at this point	N/A	Facilities need to be upgraded	Facilities available	Agreement with DWS required	Land available within purchase boundary – agreement with DWS required	Currently takes place	WPGR to upgrade facilities	3
	Guided Horse Riding trails	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances can be mitigated through route selection	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	Due to presence of animals, a guide will be required	N/A	Not required.	Ablution facilities at Heritage Site could be used if upgraded	Not Required	Available area within purchase boundary	Potential for tourism in the area	WPGR/ PPP for specific activity	1
	Birding	Water levels should not impact no contact activities	No impact	N/A	N/A	N/A	N/A	Potential disturbances can be mitigated through site selection	N/A	N/A	N/A	N/A	Cell-phone reception available	Emergency response as part of IA's mandate	May be disturbed by noise from recreational users	N/A	Bird hide in place	Not Required	Not required	Available area within purchase boundary	Large number of bird species	Not Required	3
Primary Contact	Open Water Swimming - Recreational	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Would be required	Acceptable for swimming	Acceptable	Cell-phone reception available	None. Would require UPN System	Zoning would need to be adjusted to accommodate swimmers	N/A	Not required	At WPGR and Aldam Estate	Agreement with DWS required	Land available within purchase boundary.	Visitors occasionally swim	As part of WPGR and Aldam Estate	3
	Open Water Swimming – Development Programme	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Would be required	Acceptable for swimming	Acceptable	Cell-phone reception available	None. Would require UPN System	Zoning would need to be adjusted to accommodate swimmers	Not required.	Not required	Suggested it be run at WPGR Resort. No new ablution facilities required	Agreement with DWS would be required	Land available within purchase boundary.	No specific interest	SwimSA, Telkom Splash or similar foundations. Coordination with schools may also be possible.	1
	Snorkelling	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Would be required	Acceptable for swimming	Water is too turbid for snorkelling or diving	Cell-phone reception available	None. Would require UPN System	Zoning would need to be adjusted to accommodate snorkelers	N/A	Not required	Ablution facilities required at Public Access Area	Agreement with DWS required	Land available within purchase boundary.	None at present	N/A	0
	Diving	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Would be required	Acceptable for swimming	Water is too turbid for snorkelling or diving	Cell-phone reception available	None. Would require UPN System	Zoning would need to be adjusted to accommodate divers	N/A	Not required	Ablution facilities required at Public Access Area	Agreement with DWS required	Land available within purchase boundary.	None at present	N/A	0
Secondary Contact	Commercial/ Small Scale Fishery	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	Fishing of invasive species may assist indigenous population but may negatively impact Yellowfish	May disturb bird nesting	Maintenance of boats and equipment required to prevent contamination	Would be required	N/A	N/A	Cell-phone reception available	None. Would require UPN System	May reduce fish stocks and interfere with competitive fishing. May impact on conservation of Yellowfish	N/A	Facilities and infrastructure required.	Facilities and infrastructure required.	Agreement with DWS and FS DETEA required	Land available within purchase boundary.	Unknown.	PPPs	1
	Shore Fishing (Competitive and	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	The Zonal map should prevent impacts	None	None	Required	N/A	N/A	Cell-phone reception available	None. Would require UPN System	Shore fishing takes place currently	No required	Not required	Ablution facilities required at Public fishing area and events area	Access at Fishing area and	Land available within purchase	Fishing is very popular at the Dam	WPGR and DWS to fund ablution facilities	3

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
	Recreational Angling)																		WPGR	boundary.			
	Tube Fishing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	No winds would be required however safety is a concern as strong winds can occur at the Dam.	N/A	Ablution facilities required at Public Access Area	Access at Fishing area and WPGR	Access at Fishing area and WPGR	Potential interest due to large fish stock	N/A	2
	Pontoon Fishing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No current conflict	No winds would be required however safety is a concern as strong winds can occur at the Dam.	N/A	Ablution facilities required at Public Access Area	Access at Fishing area and WPGR	Access at Fishing area and WPGR	Potential interest due to large fish stock	N/A	2
	Bass Fishing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	Water is to turbid for bass	Cell-phone reception available	None. Would require UPN System	No current conflict	No	N/A	Ablution facilities required at Public Access Area	Access at Fishing area and WPGR	Access at Fishing area and WPGR	Bass was introduced to the Dam but does not appear to be in place any more. The new NEMBA Alien Invasive species list does not allow fish to be introduced.	N/A	0
	Motorised Boats	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No current conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity	N/A	3
	Jet Powered Boats	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No current conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Similar to current activity	N/A	2
	RHIB (Rigid Hulled Inflatable Boat)	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No current conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity	N/A	3
	Water-skiing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No current conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current actiivity	N/A	3

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
	Jet Ski	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	Potential use for poaching and difficult to regulate	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity at Aldam Estate but WPGR does not allow it on the Dam	N/A	0
	Dragon Boats	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	No winds would be required however safety is a concern as strong winds can occur at the Dam	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	No interest at this point	N/A	2
	Slalom Canoe	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	No winds would be required however safety is a concern as strong winds can occur at the Dam	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	No interest at this point	N/A	2
	Fishing Canoe	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	Canoeing occurs at the Dam	No winds would be required however safety is a concern as strong winds can occur at the Dam	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Fishing and kayaking are both popular	N/A	2
	Jet Ski Fishing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	Potential use for poaching and difficult to regulate	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity at Aldam Estate but WPGR does not allow it on the Dam	N/A	0
	Wind Surfing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	Yes, winds available	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity	N/A	3
	Kite Surfing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	Yes, winds available	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity	N/A	3
	Ski Jumping	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement	Access at WPGR	Current activity	N/A	3

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
																			required) or WPGR				
	Slalom Skiing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity	N/A	3
	Ski and Wakeboard Boat	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	None	None	None	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users zoning to prevent major conflict	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activity	N/A	3
	Kayaking Sprints	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	Some canoeing takes place however this is restricted to shoreline. No area for sprints available	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Unknown	N/A	0
	Kayaking Marathons	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	Some canoeing takes place however this is restricted to shoreline. The Dam is not of sufficient size for marathons	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Unknown	N/A	0
	Kayaking Water Polo	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	Some canoeing takes place however this is restricted to shoreline.	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Unknown	N/A	0
	Kayaking Touring	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No conflict – restricted to shoreline	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Not known	N/A	2
	Kayaking Fishing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No conflict – restricted to shoreline	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Not known	N/A	2
	Paddle Ski	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No conflict – restricted to shoreline	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement	Access at WPGR	Not known	N/A	2

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
																			required) or WPGR				
	Surf Ski	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Not known	N/A	2
	Pedal Boat	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Zoning AtoN and Demarcation Markers require	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No conflict – restricted to shoreline	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Potential activity	N/A	2
	Hovercraft	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	Disturbance to local fauna	Disturbance to local fauna	Disturbance to local environment	N/A	Depth is suitable	Not required	Cell-phone reception available	None. Would require UPN System	Conflicts with sense of place and current use	N/A	Not required	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	None at present	N/A	0
	Stand Up Paddling	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Zoning AtoN and Demarcation Markers require	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	None foreseen at present	Not required.	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Potential activity	N/A	2
	Parasailing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users, zoning to prevent major conflict	The Dam is known for strong winds	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Similar to current activities	N/A	2
	Sailing	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	No impact	No impact	No impact	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	May conflict with other users, zoning to prevent major conflict	The Dam is known for strong winds	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Current activities	N/A	3
	Water Toys	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Zoning AtoN and Demarcation Markers required	N/A	Safety concern as not visible to bigger craft,flags and other safety measures required	Cell-phone reception available	None. Would require UPN System	None foreseen at present	No	N/A	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate (agreement required) or WPGR	Access at WPGR	Occasional use	N/A	3
	Flying Boats/Water Planes	N/A	Possible Damage to infrastruc	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	Disturbance to local fauna	Disturbance to local fauna	Disturbance to local environm	Specific aviation requirement would need to	Dam is relatively shallow	N/A	Cell-phone reception available	None. Would require UPN System	Conflict with sense of place	N/A	Not required	Ablution facilities at Aldam Estate and WPGR	Access from Aldam Estate	Access at WPGR	None at present	N/A	0

Contact Type	Activity	Operational Management Issues		Environmental Impacts on Recreational Use			Recreational Use Impacts on the Environment			Safety Requirements					Recreational Requirements				Legal Requirements		Economic Viability		Score
		Change in Water Level	Impacts on Dam Wall	Water Quality	Health Impacts	Aquatic Invasive Species	Fish Spawning	Bird Nesting	Water Quality	AtoN and Demarcation Markers	Water Depth	Visibility	Radio Signal	Emergency Response	Conflicts with current activities	Winds required	Accommodation	Ablution facilities	Access to water	Access to Land	Interest in the activity	Funding Opportunities	
			ture						ent	be met									(agreement required) or WPGR				
	House Boats	Water levels fluctuates seasonally	Possible Damage to infrastructure	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	Possible pollution from litter	Zoning AtoN and Demarcation Markers required	Dam is relatively shallow	Zoning would be required to prevent danger to smaller crafts such as tube-fisherman	Cell-phone reception available	None. Would require UPN System	Conflicts with current recreational operating hours	N/A	N/A	Ablution facilities at Aldam Estate and WPGR	Access from WPGR	Access at WPGR	None at this time	PPP	0
	Game viewing by boat	Water levels fluctuates seasonall but should be acceptable	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	Possible pollution from litter	Zoning AtoN and Demarcation Markers required	Dam is relatively shallow	Access to restricted area may be required	Cell-phone reception available	None. Would require UPN System	May conflict with conservation	N/A	N/A	Ablution facilities at WPGR	Access from WPGR	Access at WPGR	Game viewing by boat is likely to be popular	WPGR/PPP for specific activity	1
	Junior Angling School	N/A	N/A	Water quality can be an issue	Algal blooms can occur	*Azolla filiculoides* may occur	N/A	N/A	N/A	Zoning AtoN and Demarcation Markers required	Depth is suitable	N/A	Cell-phone reception available	None. Would require UPN System	No	Not required	N/A	Ablution facilities at Event area and Fishing area required	Access from WPGR	Access at WPGR	Community showed interest in recreational fishing involvement	Angling Clubs	1

4.4.3 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 was used as a guideline to determine the level of activity that would be sustainable at Allemanskraal Dam.

Calculating carrying capacity for recreation is a vital step to ensure that recreation at the Dam is safe and that users do not feel crowded and enjoy their use of the Dam as a venue for recreation. There are three kinds of carrying capacity:

1. Physical Carrying Capacity (PCC). This is the maximum number of users that can physically fit onto the water surface at any given time.

2. Real Carrying Capacity (RCC). This is the maximum number of users that can use the resource once corrective factors (such as wildlife or weather conditions) that are unique to the dam are taken into account.

3. Effective (permissible) Carrying capacity (ECC). This is the number of visitors that can use the resource, given the management capacity available at the Dam.

4.4.3.1. Physical Carrying Capacity (PCC)

PCC is calculated as PCC = A ÷ U/a x Rf

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

A is calculated as the area of the water surface: 28.76 km ^{2}, or 2 876 hectares (ha)

U/A = There is a range of literature regarding the area required for different recreational users. The U/A used for that assessment are as follows:

Craft	Water Depth (m)	U/A (ha/ craft)
Canoes	>0.6	0.5
Windsurfers	>0.6	0.5
Rowing	>1.0	0.5
Dinghies	>1.0	1.0
Yachts	>1.8	2.0
Fishing	>1.0	4.0
Power boats	>1.4	4.0

Based on the fact that most activities do not require much space, and the largest area per user required is 4.0 ha, the U/a is assumed to 4 ha/user or0.04 km^2/user.

As Allemanskraal is quite remote it is unlikely that people would use the Dam more than once per visit. It is far more likely that visitors to the Dam would spend the majority of the day on the water surface. In this case RF = 1.

The PCC for Allemanskraal Dam can therefore be calculated as:

PCC = 2876÷ 4x 1

PCC = 719 boats on the Dam.

However, this is based on the full length of the Dam at 100% capacity. It also doesn't take into account the zoning of the Dam.

4.4.3.2. Real Carrying Capacity (RCC)

Real capacity is the PCC, taking into account factors that limit recreation. In this case limiting factors include:

- Dam Wall Buffers;
- Restricted Zones;
- Conservation No Go Zones;
- Safety No Go Zones; and
- Swimming Areas.

Further, the Dam is only kept at approximately 50% capacity. Further, the Restricted Area is a large proportion of the Dam (59%). Although, the RMP suggests that game viewing by boat takes place in this area, no other activities are allowed and thus it is not included in the carrying capacity.

The above factors result in an 81.1 % decrease in water area available for recreation at the Dam (Area available for use decreases from 2 876 ha (28.76 km^2) to 544.9 ha (5.45 km^2). Therefore, 18.9% of the surface area of the Dam is still available for recreation.

The RCC for Allemanskraal Dam is therefore:

- RCC = PCC x (100 – Cf1) % x (100 – Cf2) % x … (100 – Cfn)%
- Where Cf = a corrective factor expressed as a percentage.
- RCC = 719 x (100 –81.1)%

RCC = 136 boats on the Dam at any given time, ***Based on water surface.***

4.4.3.3. Effective (permissible) Carrying Capacity (ECC)

Effective Carrying Capacity is the maximum number of visitors that a site can sustain, given the management capacity available. Given that Allemanskraal Dam has access at WPGR, it is assumed that the management capacity and infrastructure capacity is 1. The ECC is therefore **136 boats**.

- ECC = [Infrastructure Capacity x MC]/ RCC
- Where: ECC = Effective Carrying Capacity;
- MC = Management capacity based on staff and budget;
- RCC = Real Carrying Capacity

4.4.4 Water Surface Zonal Plan

The Zonal plan for the water surface at Allemanskraal Dam is divided into nine distinct areas or zones. These zones are based on a number of factors including:

- Operational requirements of the Dam;
- Safety requirements of each activity;
- Types of activities (in terms of contact); and
- Environmental requirements.

The overall zonal map is provided in the figure below.

The zones are as follows:

- Zone A: Secondary Contact: Combination Zone. Both Sailing. Motorised activities and Fishing Activities are allowed in this zone however due to shallow nature along the shoreline and to prevent conflict between users, all activities to be kept at a no wake speed. The extent differs depending on the particular area around the Dam however in general it extends from the shoreline for approximately 150m to 350m;
- Zone B: Primary Contact – Swimming and Water Toys. This blue zone is a zone available for swimming and the use of water toys;
- Zone C: No Go Zone – Dam Wall. This is the 100m buffer area around the Dam Wall and is denoted in orange. No access to the public is allowed;
- Zone D: No Go Zone – Safety Buffer. This is the 100m buffer area around the islands and the swimming areas. No access for safety reasons;
- Zone E: Secondary Contact – Motorised Boats and Associated Activities. This zone is designated for the use of motor boats and sailboats at high speed. No Jets however are allowed on the Dam;
- Zone F: Restricted Zone Combination – This area is currently restricted as part of FS DETE's management of the Dam. It is suggested that in the future guided game viewing by boats is allowed (with the necessary agreements in place). However at this point only WPGR patrols are allowed; and
- Zone G: No Go Zone – Conservation – This is no go conservation reasons and includes the river inlets around the Dam.

Detailed information of the current and potential activities in each zone is provided in Table 11

below. Information on requirements for each zone is also provided.

Table 11: Surface Water Management Zones

Zone Name	Contact Type	Permissible Activities - Current	Permissible Activities - Potential	Access Point	Safety Requirements for Users	Safety Requirements for DMC
Zone A	Secondary Contact – Combination (no wake)	Shore Fishing Motorised Boats – no wake RHIB – no wake Wind Surfing Kite Surfing Ski Jumping Slalom Skiing Ski and Wakeboard Boat – no wake Sailing Slalom Canoe Fishing Canoe	Commercial/ Small Scale Fishery Tube Fishing Pontoon Fishing Jet Powered Boats Dragon Boats Kayaking Touring Kayaking Fishing Paddle Ski Surf Ski Pedal Boat Stand Up Paddling Game viewing by boat Junior Angling School	WPGR Aldam Estate (should access agreements be put in place)	Registered Safe for Water Vessel Valid Skipper's License First Aid Kit UPN date stamp UPN tag	AtoN and Demarcation Markers UPN Syste, Rescue Operation Point Wash Bay Rescue Boat available at all times Wash Bay Officer Enforcement Officer SAPS Patrols of Water Surface
Zone B	Primary Contact - Swimming and Water Toys	Swimming – recreational Water Toys	Swimming – development school	WPGR Aldam Estate (should access agreements be put in place)	N/A	AtoN and Demarcation Markers UPN system OPS point Rescue Boat available at all times
Zone C	No Go Zone – Dam Wall	Management and maintenance activities only No public access	None	Sand-Vet WUA	N/A	AtoN and Demarcation Markers
Zone D	No Go Zone – Safety Buffer	None	None	None	N/A	AtoN and Demarcation Markers

Zone Name	Contact Type	Permissible Activities - Current	Permissible Activities - Potential	Access Point	Safety Requirements for Users	Safety Requirements for DMC
Zone E	Secondary Contact – High speed Motorised Boats and Sailboats	Motorised Boats RHIB Water-skiing Wind Surfing Kite Surfing Ski Jumping Slalom Skiing Ski and Wakeboard Boat Surf Ski Parasailing Sailing	Jet Powered Boats Parasailing	WPGR Aldam Estate (should access agreements be put in place)	Registered Safe for Water Vessel Valid Skipper's License First Aid Kit UPN date stamp UPN tag No Jet Skis Allowed	AtoN and Demarcation Markers UPN System Rescue Operation Point Wash Bay Rescue Boat available at all times Wash Bay Officer Enforcement Officer SAPS Patrols of Water Surface
Zone F	Secondary Contact – Restricted Area (Combination)	Patrols by WPGR	Guided Game Viewing by boat (only if agreements in place with WPGR)	WPGR	Registered Safe for Water Vessel Valid Skipper's License First Aid Kit UPN date stamp UPN tag Agreement/PPP with WPGR/DWS	AtoN and Demarcation Markers UPN System Rescue Operation Point Wash Bay Rescue Boat available at all times Wash Bay Officer Enforcement Officer
Zone G	No Go Zone - Conservation	Research and management activities Control of invasive species if necessary	N/A	WPGR	Registered Safe for Water Vessel; Valid Skipper's License; First Aid Kit UPN date stamp; UPN tag. Research permits	AtoN and Demarcation Markers; UPN System Rescue Operation Point; Wash Bay; Rescue Boat available at all times; Wash Bay Officer; Enforcement Officer SAPS Patrols of Water Surface;

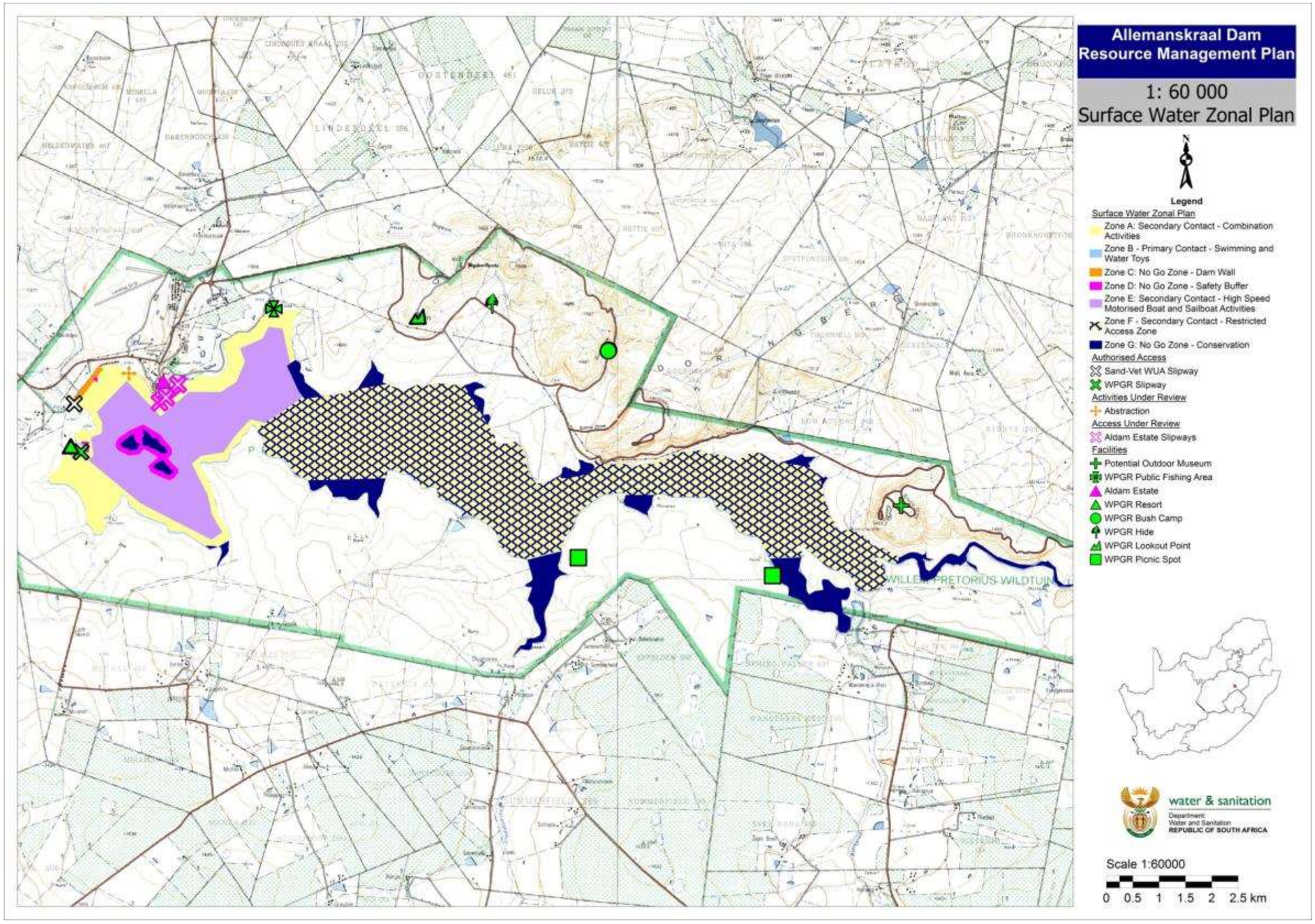

Figure 23: Map of the Water Surface Zonal Plan

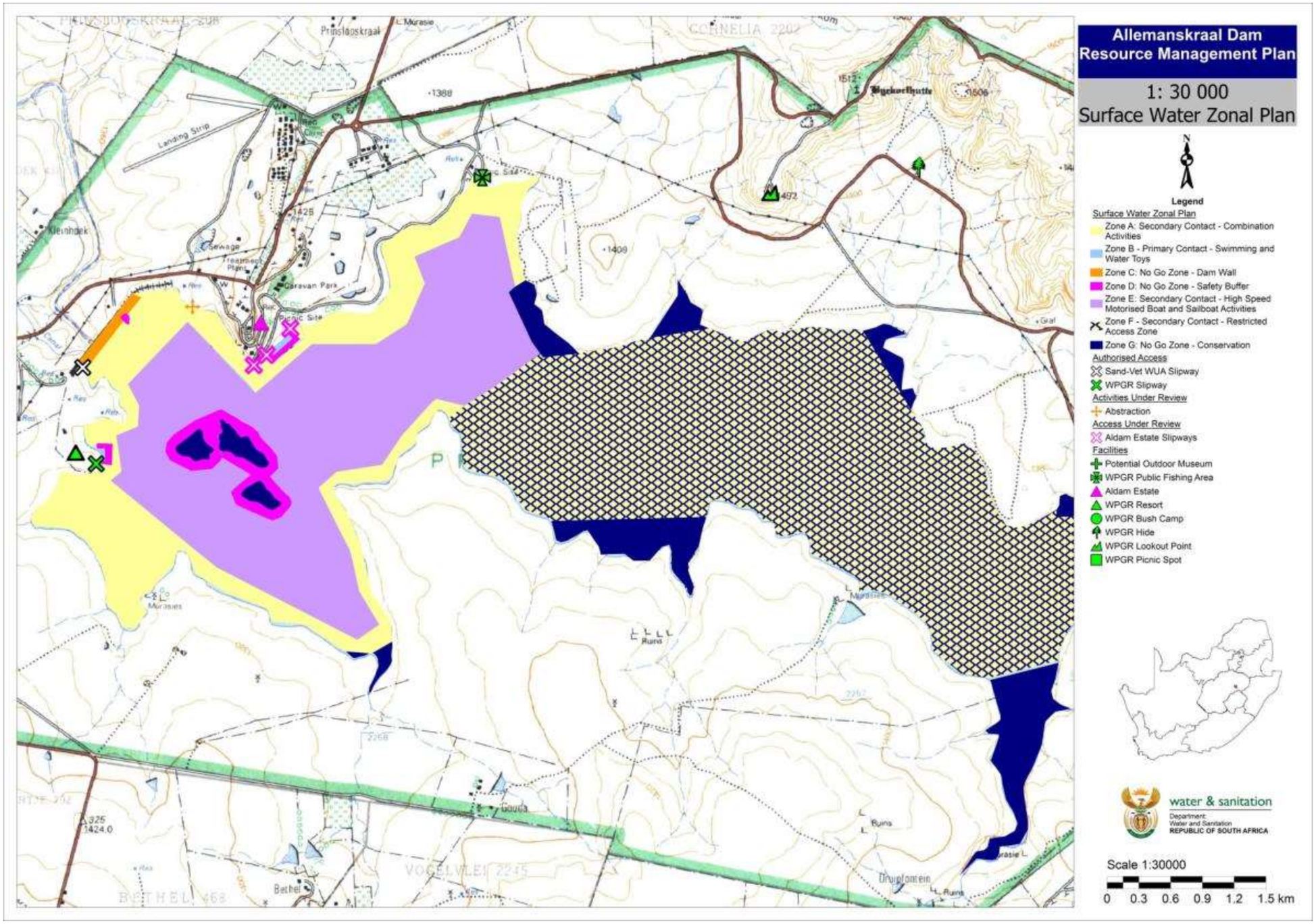

Figure 24: Map of the Water Surface Zonal Plan – Section 1

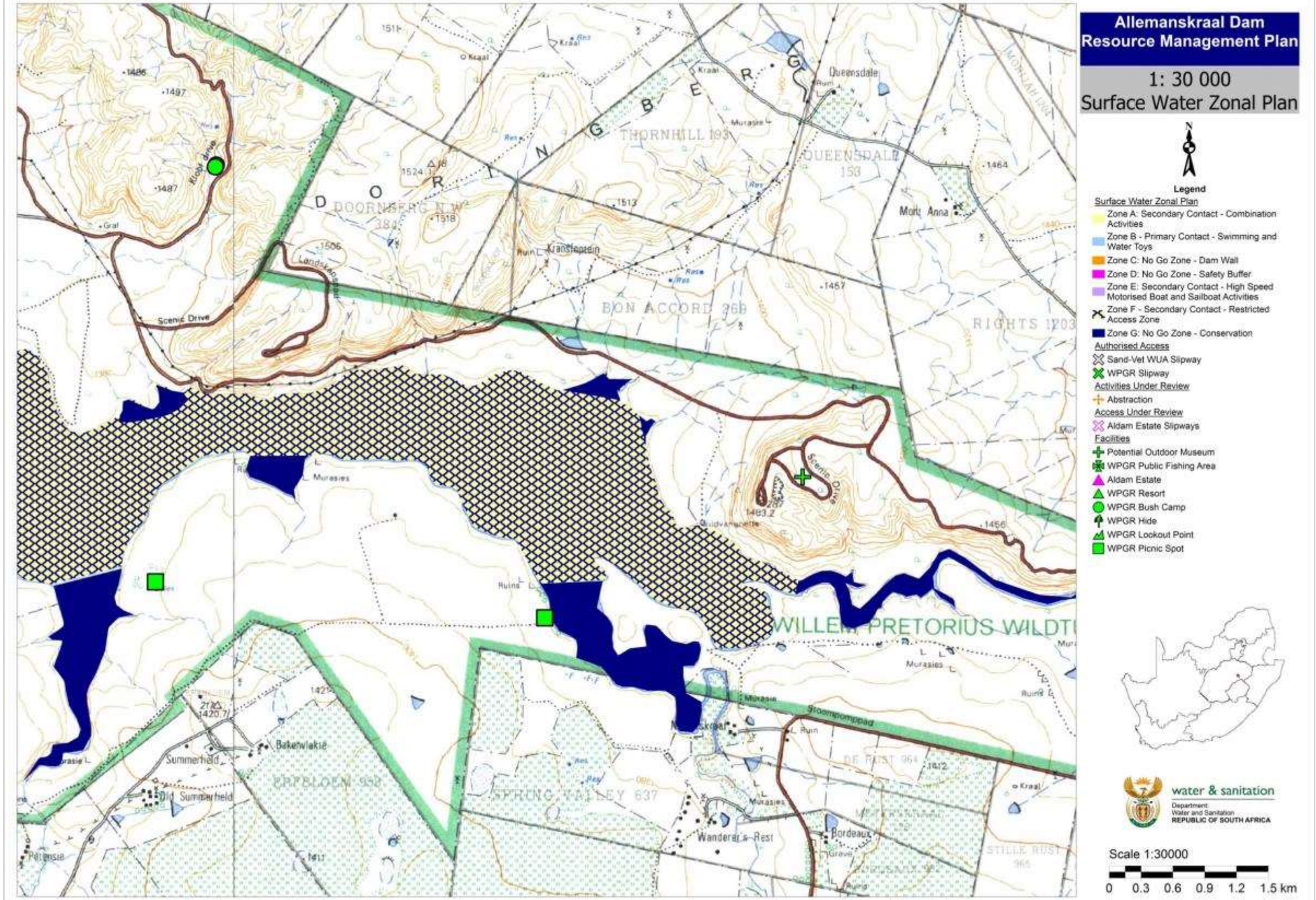

Figure 25: Map of the Water Surface Zonal Plan – Section 2

4.4.5 Shoreline Zonal Plan

In addition to the surface water Zonal Plan above, an integral part of the RMP is shoreline zoning. This provides guidance on what activities (if any) are allowed in the land adjacent to the Dam.

The management zones include:

- Zone A - Conservation and Recreation/Tourism;
- Zone B - Development and Recreation;
- Zone C- Management – No Access to the Public; and
- Zone D – Heritage Overlay.

The Zones from the WPGR IMP (FS DETEA, 2011) have also been incorporated as the shoreline of the Dam forms part of the reserve.

Zone A includes the majority of the Nature Reserves and focusses mainly on conservation and ecotourism activities such as camping, hiking, birding and game viewing. Large scale development of this area is not allowed. This ensures that the pristine and unique character of the landscape is not transformed. WPGR has an IMP in place and sub-categories have been included based on this.

This included:

- Zone A1: Primitive Zone;
- Zone A2: Low Intensity Leisure Zone; and
- Zone A3: Remote/Special Conservation.

Zone B allows for conservation, high intensity recreation and development allowing for the potential development of the following:

- WPGR public fishing and fishing events area;
- Wash Bay;
- Swimming Development Schools; and
- Upgrade of accommodation (where necessary).

Zone B is mapped in purple below.

Zone C provides for land management of state land but does not allow public use or access. This includes the area around the Dam wall. Zone C is mapped in orange below.

Zone D is the Heritage Overlay and denotes sensitive heritage areas.

Permissible and non-permissible activities are detailed in the table below.

Table 12: Shoreline Management Zones

Zone Name	Zone Type	Permissible Activities	Requirements for Users	Requirements for DMC
Zone A1	Conservation and Recreation /Tourism – Primitive Zone	Guided/unguided hiking trails Mountain biking (day cycling trails) 4 x 4 routes Horse trails	All activities must be undertaken in accordance with rules and Regulations of Nature Reserves	Agreements must be in place
Zone A2	Conservation and Recreation /Tourism – Low Intensity Leisure Zone	Picnicking Walking Cycling Game viewing Bird watching Fishing rock climbing Hiking overnight Adventure activities Self-drive game viewing	Camping, hiking, birding and game viewing must be undertaken in accordance with rules and Regulations of Nature Reserves Camping allowed only in designated areas Noise levels to be kept at a minimum. No littering at Picnic spots Access to surface water only through approved access points All users to go through Wash Bay	Enforcement Officer to check all designated picnic spots. Feasibility of employing local community members as part of "Working For Dams" programme to be assessed. Potential jobs include management of picnic sites/picking up of any litter SAPS Patrols of Water Surface; Requirements of National Water Act and National Environmental Management Act must be taken into account. All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on Dam.
Zone A3	Conservation and Recreation/ Tourism – Remote Zone/Special Conservation	Guided nature observation Non defined hiking trails Research Defined hiking trails Environmental education	All activities must be undertaken in accordance with rules and Regulations of Nature Reserves	Agreements must be in place
Zone B	Recreation and Development – High Intensity Leisure Zone	Restaurants Shops Education centres Fishing Picnicking Development of facilities/infrastructure for recreation Development of facilities/infrastructure for development/training Development of facilities/infrastructure for tourism Fishing Camping/Accomodation Birding Game Viewing Picnicking Operations related to small scale subsistence fisheries	Camping, hiking, birding and game viewing must be undertaken in accordance with rules and Regulations of Nature Reserves Camping allowed only in designated areas Noise levels to be kept at a minimum. No littering at Picnic spots Access to surface water only through approved access points All users to go through Wash Bay	Enforcement Officer to check all designated picnic spots. Feasibility of employing local community members as part of "Working For Dams" programme to be assessed. Potential jobs include management of picnic sites/picking up of any litter SAPS Patrols of Water Surface; Requirements of National Water Act and National Environmental Management Act must be taken into account. All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on Dam.

Zone Name	Zone Type	Permissible Activities	Requirements for Users	Requirements for DMC
		Access to surface water for recreational purposes		
Zone C	Management – No Public Access	Fire management Invasive alien species clearing Management of Dam Infrastructure	None	Access to this area for strictly management purposes
Zone D	Heritage Overlay	The heritage overlay zone works in conjunction with the other zones in that the either Zone A to C applies. In addition to the requirements noted for each zone, heritage related guided tours and research is also available in the zone	All activities must be undertaken in accordance with rules and Regulations of Nature Reserves	Agreements must be in place

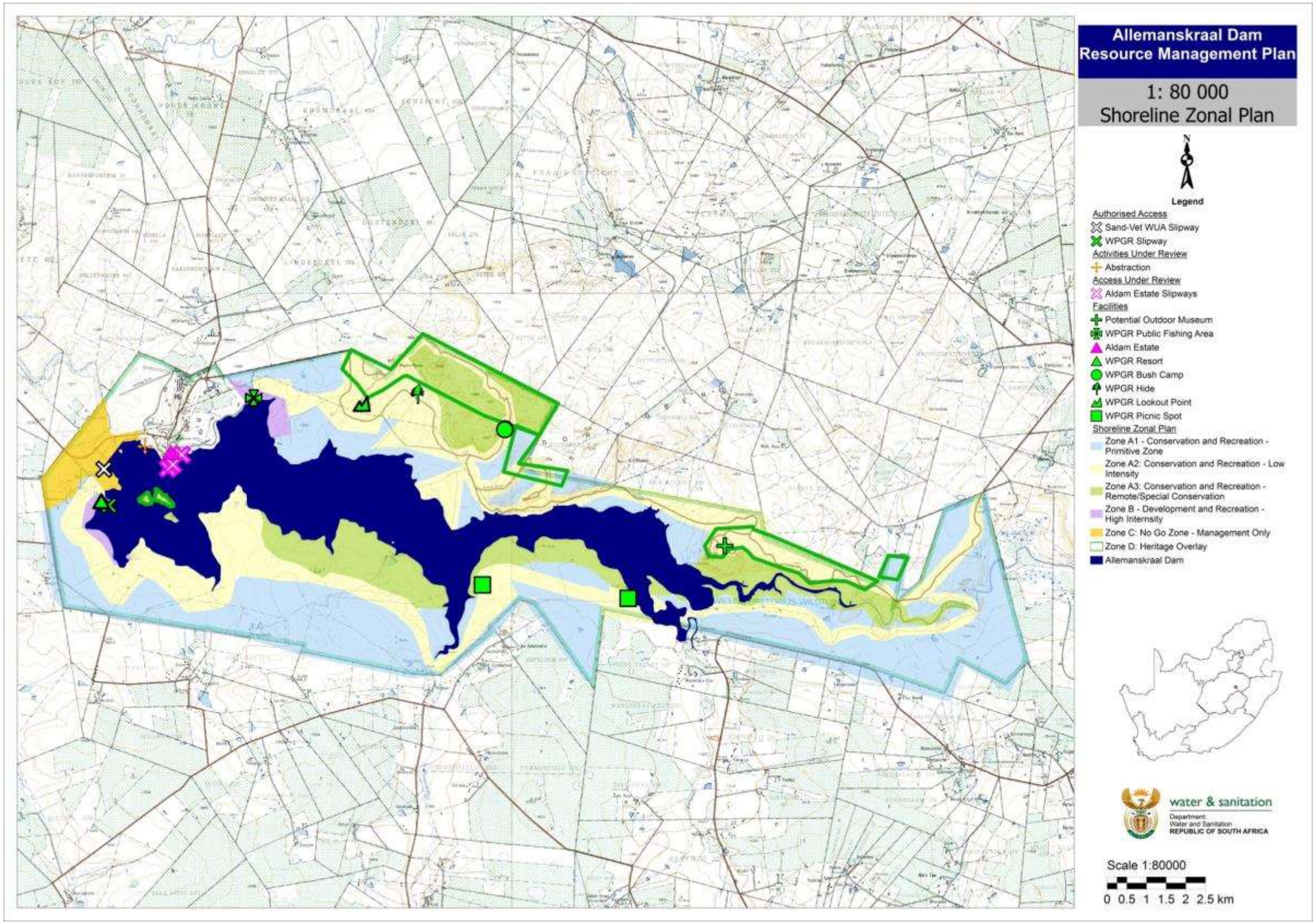

Figure 26: Map of the Shoreline Zonal Plan

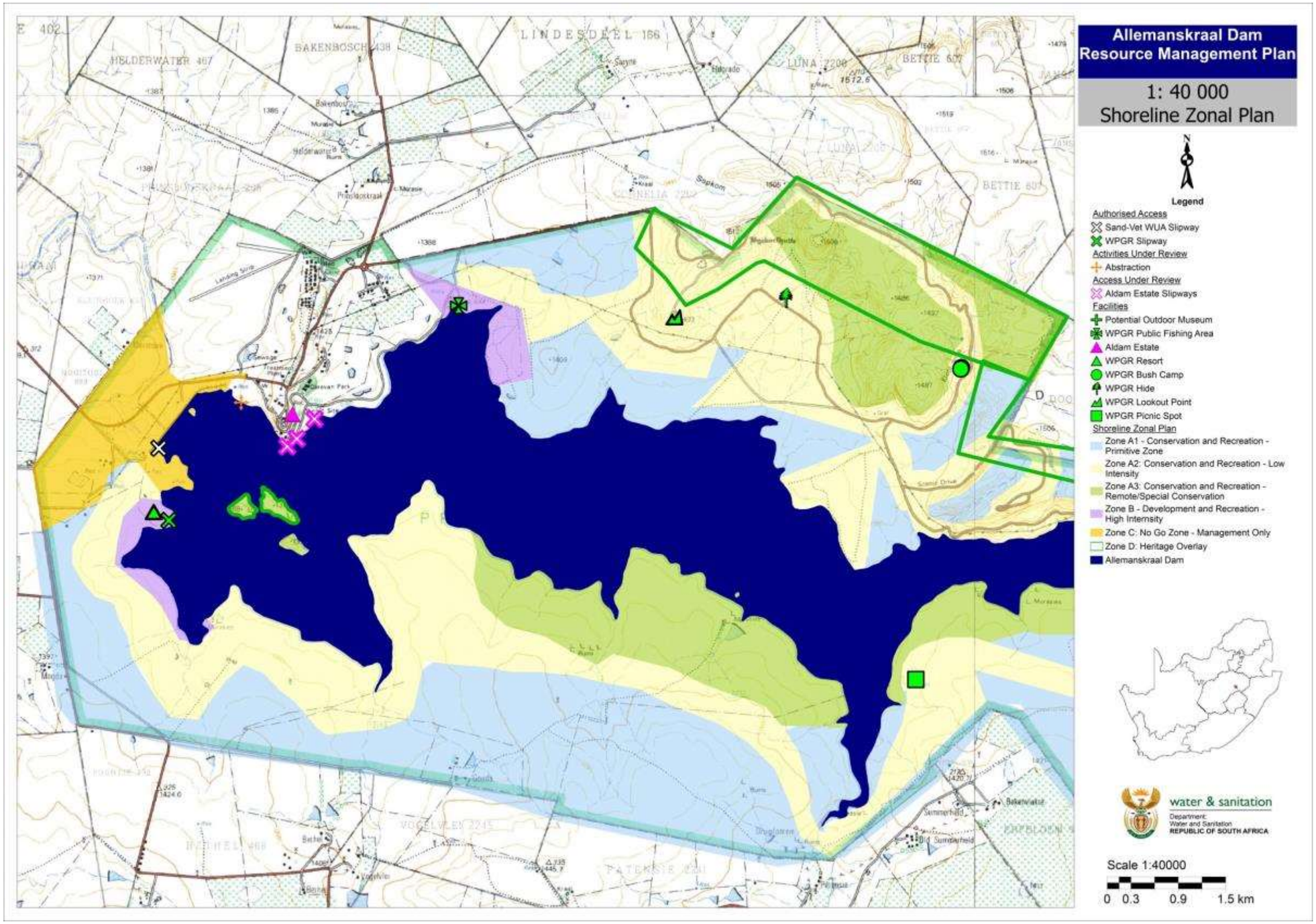

Figure 27: Map of the Shoreline Zonal Plan – Section 1

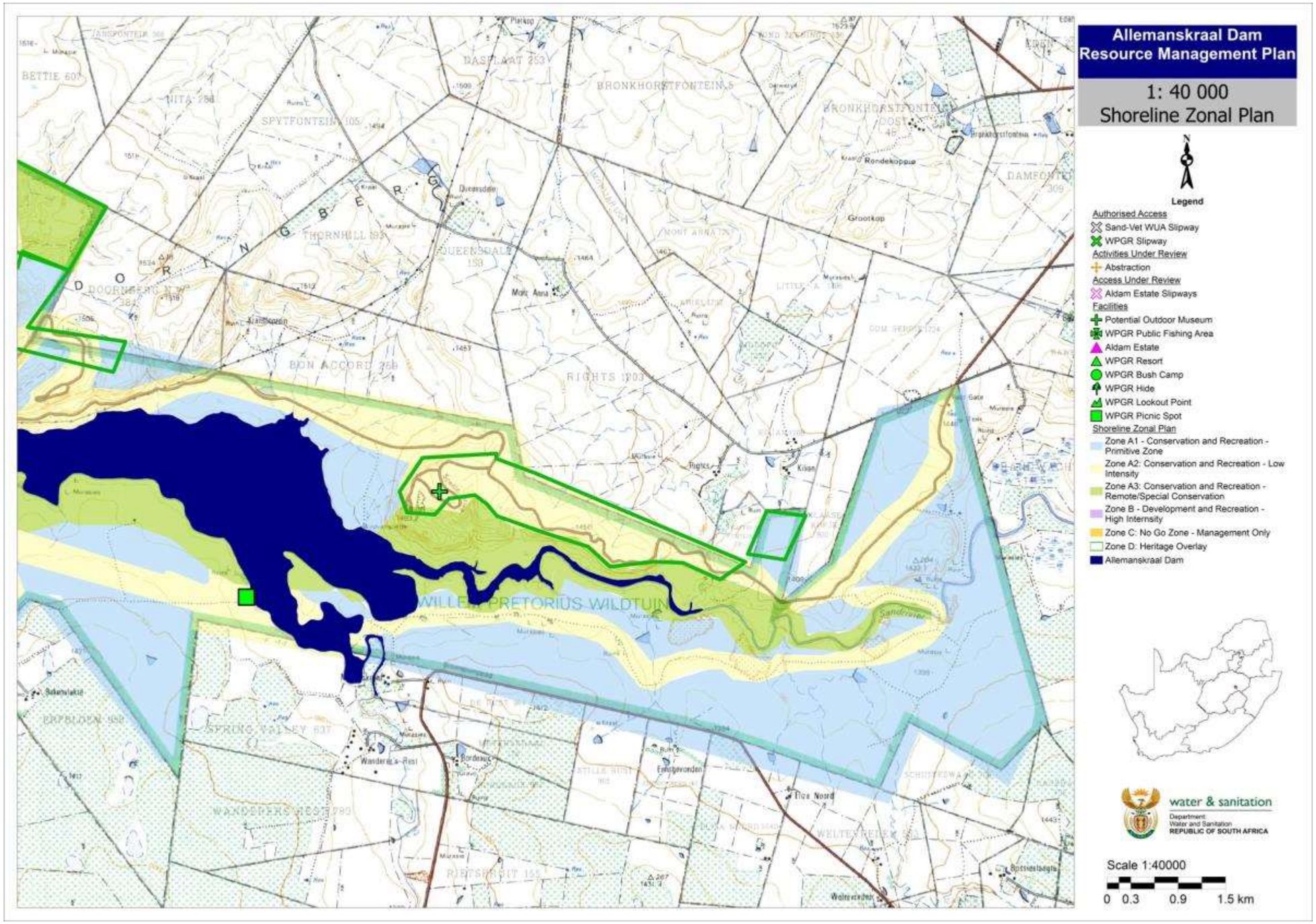

Figure 28: Map of the Shoreline Zonal Plan – Section 2

4.5 Strategic Plan

The Strategic Plan is informed by the objectives determined during the Visioning exercise and through research on feasible opportunities for the Dam.

Objective category/major objective	What	Why	How	Who
Improved and equitable use	Current WPGR public fishing area to be upgraded to include ablution and picnic facilities	At this point there are no facilities at the public fishing area at the Dam and this limits community use	DWS to update agreement with FS DETEA in line with RMP DWS to appoint landscape architect to design ablutions and picnic area Environmental authorisations to be obtained if necessary FS DETEA to manage fishing area	DWS FS DETEA
	Feasibility study for a local community access card to be undertaken	Currently the local community outside the Dam do not have many issues regarding access to the Dam as public access is available the WPGR fishing area (as long is a yearly provincial fishing license has been obtained) however this is not regulated or managed and therefore could change. A community access card would ensure the community could continue to access the Dam	DWS to initiate discussions with FS DETEA Agreements to include community access card Agreements with FS DETEA should include clause regarding community access for the community that lives near the Dam	DWS FS DETEA
	Information brochures to be developed to inform communities about the potential uses of the Dam to encourage community use	People living further afield in Ventersburg, Senekal and Welkom do not make use of the Dam. Many did not seem aware of the potential uses. Further, the community immediately adjacent to the Dam used the Dam for fishing but were not aware of other potential recreational uses	The DMC together with FS DETEA, Aldam Estate and Fishing Clubs should develop information brochures regarding the Dam It is also suggested that informative workshops/presentations be given to the Ward Councillors/Schools/Churches etc. so that partnerships can be developed	DWS FS DETEA
	Discussions between Taxi association and SLM regarding subsidized costs to enable community members from town to travel to the Dam for a lesser fee	Currently the taxi costs between the Dam and the main towns limit the use of the Dam by local community members	DWS to meet with SLM to discuss potential strategy SLM to meet with taxi associations and put agreements in place to subsidize taxi route prices to the Dam on specified dates (for example, Saturdays and Public Holidays	DWS DMC SLM
Improved communication, management and safety	Provision of a boat and skipper license training for WPGR manager to allow proper management and	WPGR does not have a boat or trained skipper at place for patrol or implementation of the rules on the Dam. There is also no rescue boat in place. This can lead to safety issues. It also can have conservation implications and there is no way	DWS and FS DETEA to discuss the potential for DWS to provide rescue/patrol boat FS DETEA to send nominated official for skippers license training	DWS FS DETEA

Objective category/major objective	What	Why	How	Who
	patrols of the Dam	to patrol access by the water		
	Unauthorised commercial access to be regulated through agreements	Aldam Estate is on private property however the main commercial activities are related to use of the Dam. There is no agreement in place regarding this	Discussions with Aldam Estate and National Treasury regarding commercial activities on the surface water DWS to draw up new agreements in line with RMP and discussions Agreements to be signed	DWS Aldam Estate National Treasury
	Formalised institutional structure	There is currently no formal institutional structure at the Dam which ensures proper communication between the various stakeholders	DWS to appoint members of the DMC, OMC and RSC as per the RMP	DWS
	Updated agreements taking into account RMP	No information was available regarding agreements between DWS and the WUA and FS DETEA etc.	Agreements to be updated in line with the RMP	DWS FS DETEA Sand Vet WUA Aldam Estate
	UPN System to be implemented	There is no overarching safety system at the Dam There is also no mechanism for reporting environmental and recreational emergencies	UPN system to be instituted at the Dam Formal ROP to be selected	DWS SAMSA FS DETEA Aldam Estate CIWSP
	Lifeguard skills training and first aid training to ensure safe public use of the Dam	By initiating lifeguard skills training and first aid training as part of a potential "Working for Dams" Project, there is an opportunity to provide skills training to local community members while at the same time ensuring safe public use	Feasibility of a "Working for Dams' Project including funding for skills training and job creation to be determined Local community members to be trained	DWS
	Standardised AtoN and demarcation markers to be implemented	There is currently no formalised and standardised AtoN and demarcation markers at the Dam	SAMSA and DWS to undertake survey of the Dam to identify obstacles and areas which require demarcation markers AtoN and Demarcation Markers to be put in place Agreements between SAMSA and DWS FS DETEA, Aldam Estate and Sand Vet WUA regarding AtoN and Demarcation markers to be put in place	DWS FS DETEA Aldam Estate Sand Vet WUA SAMSA

Objective category/major objective	What	Why	How	Who
Sustainable recreation, development and utilisation	Facilities at the WPGR Bank Angling events area to be put in place	There are no ablution facilities at the WPGR Event Angling Area. This limits use by clubs for large events	FS DETEA to meet with Fishing Clubs to discuss potential partnership In the past the ablution facilities were vandalised. It is therefore suggested that FS DETEA purchase a number of portable toilets that get put in place during events This can either be paid for by the recreational clubs and donated to the reserve or paid for by the FS DETEA	FS DETEA Fishing Clubs
	Feasibility study for the upgrade of the Bekkerberg Iron Age Settlement Outdoor Museum	The Bekkersberg Iron Age settlement is a national monument which had a small outdoor museum/information exhibition. This is no longer managed and has fallen to disrepair however as this is important cultural heritage it can be used as part of the tourism development for the reserve and the Dam. The Museum could also have a restaurant/picnic spot (as there is no restaurant facility at WPGR and could serve as the centre point or stopping point for game drives	FS DETEA to undertake feasibility study for small cap PPP for upgrade of the outdoor museum and ablution facilities and provision of restaurant and picnic area in the reserve Discussions with SANParks should be undertaken especially in regard to Mapungubwe which has similar facilities PPP to be put in place	FS DETEA SANParks
	Marketing strategy to be compiled and implemented including the potential feasibility of small scale Public Private Partnerships for additional activities such as game viewing boat cruises down the length of the Dam, horse riding trails, and guided bird watching and hiking trails	The Dam has sensitive wildlife (for example, Rhino), birds (Martial Eagle), Heritage and Water related activities. However these are not currently being used to their full potential. The marketing strategy has the potential to be linked to a feasibility assessment for additional activities such as game viewing boat cruises down the length of the Dam, horse riding trails, and guided bird watching and hiking trails	FS DETEA to undertake feasibility study for small cap PPP for additional activities such as game viewing boat cruises, horse riding trails, guided hikes and bird watching. This could be linked to the PPP for the restaurant and outdoor museum mentioned above PPP to be put in place	FS DETEA
	Potential for small scale fisheries programme to be assessed. This should take into account the lessons learnt from previous fishery attempts to determine whether fisheries at the Dam are viable.	During consultation it was noted that the Dam has extensive carp fish stocks. There is the potential to use the Dam for smallscale fisheries. However, due to the presence of Largemouth yellowfish at the Dam, the feasibility and potential impacts would need to be assessed. In addition, fisheries have been attempted in the past but were not successful due to high silt loads. The lessons learnt would need to be taken into account.	Feasibility study regarding potential smallscale fisheries to be undertaken Discussions with L Barkhuizen (Scientist: Freshwater Fishes) from FS DETEA regarding potential impacts on Yellowfish to be undertaken and the potential impacts to be included in the report	DWS FS DETEA DAFF

Objective category/major objective	What	Why	How	Who
Natural and cultural resource management	Potential for linking water quality monitoring to UPN System to be determined	Water quality (especially high TP and TAL) is an issue at the Dam. In the past this has led to Algal blooms which impact the primary use of the Dam. Water quality monitoring is undertaken however by linking this to the UPN system it may be possible for efficient response	Discussions with CIWSP to determine the potential for water quality monitoring by DWS to linked to the UPN System	DWS Sand-Vet WUA CIWSP
	Education programmes regarding the impacts of alien invasive species to be instituted	There are a number of alien invasive terrestrial and aquatic plant species in the QDS around the Dam. There are also a number of alien fish species at the Dam. An education programme regarding the impacts of these species should be compiled so to ensure better containment and management	Working for Water should compile information brochures regarding the invasive species at the Dam These should be made available at the Wash Bay Information boards with the information should be put in place at the Wash bay	DWS DEA Working for Water FS DETEA
	Species Management Plan for invasive species to be compiled in line with NEMBA	The Alien and Invasive Species Regulations require the development and coordination of Species Management Programmes for all Invasive Species listed in Category 1B. Both bass and carp occur at the Dam	A Species Management Plan should be compiled in line with the Alien Invasive Species Regulations	DWS DEA Working for Water FS DETEA
	Senekal WWTWs to be upgraded	During consultation it was noted that the Senekal WWTWs is currently operating above its design capacity. This has the potential to negatively impact water quality	The WWTW should be upgraded	SLM
	Wash bay system to be implemented to prevent alien invasive species infestations	The Dam is currently not known to be infested with aquatic invasive species however the one aquatic invasive species are known to occur in the QDS around the Dam. Further, during the site visit, a species appearing to be *A. filiculoides* was noted. Measures to prevent further infestation are required urgently	DWS to undertake site visit to determine best location for Wash Bay (it is suggested that the Wash Bay be located at the WPGR entrance gate Wash Bay to be designed Wash Bay to be constructed Wash Bay agent and SAMSA Enforcement Agent to be appointed	DWS FS DETEA DEA SAMSA
	Management and control of *Azolla filiculoides* and other invasive plant species (if any)	During the site visit, a species appearing to be *A. filiculoides* was noted. The species is also known to occur in the QDS around the Dam. The full extent of this infestation is not known. It also not known if any other aquatic invasive species occur on the Dam.	DEA to undertake site visit to confirm *A. filiculoides* at the Dam If necessary a survey of the extent of the infestation to be undertaken A management plan to prevent further spread and to control the current infestation to be developed and implemented	DWS FS DETEA DEA

Objective category/major objective	What	Why	How	Who
	Archaeological and paleontological study of cultural resources around the Dam including assessment of how these resources can be protected but opened up for educational use	The Ghoya Heritage site occurs in the WPGR The area also has a high sensitivity in terms of palaeontology and fossils may occur A study should be undertaken to determine what resources occur within the shoreline and how they can be protected and used	A Heritage Consultant should be appointed to determine the exact state of the archaeological and paleontological resources around the Dam Discussions with SAHRA should take place to ensure management guidelines are in line with their requirements The findings should be presented to the DMC and be included as part of the feasibility of the Outdoor Museum to ensure heritage resources are not negatively impacted	SAHRA DWS FS DETEA
	Largemouth yellowfish population study	Largemouth Yellowfish is known to occur at the Dam however exact information on the population size and health was not available. It is suggested that a population assessment be undertaken to ensure water quality issues and carp are not negatively impacting the species	A population assessment of Yellowfish at Allemanskraal Dam should be undertaken The study should include management guidelines to ensure the species is protected at the Dam	FS DETEA
	Rhino Protection Plan	White Rhino occurs at WPGR however poaching is becoming more and more prolific around the country. A security plan/rhino protection plan is required to identify access risks and mitigate against these issues	Potential risks and access points to be identified Mitigation measures to be put in place to decrease potential poaching risks	FS DETEA
Education and community skills development	Coordination between Free State Bank Angling Association, fishing clubs and local schools to introduce bank angling development programme at the Dam	The Dam is used by a number of Angling Clubs however there are no fishing development programmes in place for the local community members. The community already has an interest in fishing and development programmes may improve this	DWS and FS DETEA to meet with fishing clubs to discuss potential angling development programmes Recreational use agreements to be put in place	DWS FS DETEA Fishing Clubs
	Upgrade of the educational facilities at WPGR	There are education facilities at WPGR including dorm rooms etc. These need to be upgraded so the Dam can be used for school tours and school training programmes	FS DETEA to upgrade facilities	FS DETEA
	Lifeguard skills training and first aid training to ensure safe public use of the Dam	There is high level of unemployment in the area. Skills training will provide community members with skills and will improve safety at the Dam	Feasibility of a "Working for Dams' Project including funding for skills training and job creation to be determined Local community members to be trained Feasibility of Outdoor museum including training of local community to be assessed	DWS FS DETEA SAHRA

Objective category/major objective	What	Why	How	Who
	Coordination with SwimSA to introduce swimming school programme at the Dam	During public consultation it was noted that the community may be interested in swimming lessons because the area does not have a swimming pool	DWS to facilitate discussions between FS DETEA and SwimSA regarding swimming training	DWS FS DETEA SwimSA
	Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes	The Dam has unique flora, fauna, archaeological and paleontological resources. This offers opportunities for community education programmes whereby local schools and universities access the Dam for education purposes	DWS to facilitate discussions with local schools FS DETEA and SAHRA to develop education material	DWS FS DETEA SAHRA
Improved Water Availability	Undertake assessment of illegal water abstraction in the catchment	During the Authority Meeting it was noted that illegal abstraction was a threat as it decreased the water availability at the Dam. A survey of the catchment should be undertaken to identify any illegal abstraction points	DWS and Sand Vet WUA to undertake survey of the Sand River to identify illegal abstraction points Illegal abstraction to be stopped/regulated	DWS Sand-Vet WUA
	Water Conservation and Water Demand Management Programme to be developed in conjunction with the Sand-Vet WUA and Sedibeng Water	The Sand-Vet WUA highlighted the need for additional water resources and suggested that Dam wall be raised however this would have a negative impact on the WPGR. Further, there is no water conservation and demand management programme in place. Through more efficient use of water resources, more water will be available	DWS, Sand-Vet WUA and Sedibeng Water to compile and implement a water conservation and demand management programme for the Sand-Vet Catchment area	DWS Sand-Vet WUA Sedibeng Water

5 WAY FORWARD

5.1 Compilation of Business Plans

Based on the strategic objectives identified for Allemanskraal Dam, a suite of BPs were developed. The BP describes the financial management and operational requirements to implement the Objectives of the RMP. The Financial Plan will facilitate the implementation of listed and recommended activities in the RMP.

The Business Plans are approached in the following manner:

- Identify Strategic Objective – informed by RMP;
- Determine Interventions – Each objective was divided into practical interventions;
- List Detailed Activities – Interventions were further divided into activities, in order to establish timeframes and provide guidance to the entity who implements the business plan;
- Establish Key Performance Indicators per intervention – Key Performance Indicators allow for monitoring and evaluation;
- Establish timeframes per activity;
- Establish a budget per activity; and
- Determine Funding sources – Innovative mechanisms to obtain funding were identified.

5.2 Review of RMPs and Business Plans

The RMP presents a twenty-year Vision for the Dam. This Vision will be implemented through the RMP which will be revised and updated every five years, according to changing priorities, constraints and achievements. Within a five-year cycle of the RMP, the BPs will identify key objectives in line with a changing status quo and potential change in circumstances. After five years the RMP will be reviewed and updated so to identify new objectives in line with the Vision for the Dam.

The BPs are updated annually.

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