



# SPRING GROVE DAM

## RESOURCE MANAGEMENT PLAN

### BUSINESS PLAN

## DRAFT

July 2014



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## EXECUTIVE SUMMARY

In 2000, the Department of Water Affairs (DWA) together with Umgeni Water commissioned a feasibility study for a phase 2 of the Mooi-Mgeni Transfer Scheme. This study recommended the construction of Spring Grove Dam on the Mooi River close to Rosetta with a Water Transfer System (i.e. a pumping station and pipeline to the Mpofana River).

The Spring Grove Dam and the surrounding land must be conserved and utilised in an environmentally sound and equitable manner. In this regard, Nemaï Consulting was appointed by the Trans-Caledon Tunnel Authority (TCTA) to compile the Resource Management Plan (RMP) for the dam.

This document presents the Business Plan (BP) of the RMP. The BP summarises the operational and financial objectives of the RMP and contains the interventions, resources and timeframes required to achieve these objectives.

The BP was compiled according to the following steps:

1. Identify Strategic Objectives;
2. Determine interventions;
3. List detailed actions;
4. Establish Key Performance Indicators;
5. Establish timeframes per action; and
6. Determine Funding Sources.

Note that the budgets required for each action can only be confirmed at a later stage, with further input from the parties responsible for the implementation of the interventions.

## TITLE & APPROVAL PAGE

<b>RMP PROCESS INITIATOR:</b>	Trans-Caledon Tunnel Authority
<b>RMP PROCESS FACILITATOR:</b>	Nemai Consulting
<b>PROJECT TITLE:</b>	Spring Grove Dam Resource Management Plan
<b>REPORT TITLE:</b>	Business Plan
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## RMP REVIEW PAGE

Review Period	Month	Year				
Annual Review of Business Plans	March	2015	2016	2017	2018	2019
Five (5) Yearly review of RMP	March	2019				

AMENDMENTS PAGE

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## LIST OF ACRONYMS & ABBREVIATIONS

<b>AtoN</b>	Aid to Navigation
<b>BP</b>	Business Plan
<b>CIWSP</b>	Cooperative Inland Waterways Safety Programme
<b>DAEA</b>	Department of Agriculture and Environmental Affairs
<b>DAFF</b>	Department of Agriculture, Forestry and Fisheries
<b>DEA</b>	Department of Environmental Affairs
<b>DMC</b>	Dam Management Committee
<b>DWA</b>	Department of Water Affairs
<b>EIA</b>	Environmental Impact Assessment
<b>EKZNW</b>	Ezemvelo KZN Wildlife
<b>FPA</b>	Fire Protection Association
<b>KPI</b>	Key Performance Indicator
<b>KZN</b>	KwaZulu-Natal
<b>LAAP</b>	Local Accountable AtoN Parties
<b>MMTS-2</b>	Mooi Mgeni Transfer Scheme Phase 2
<b>NWRIB:IEE</b>	Water Infrastructure Branch: Integrated Environmental Engineering
<b>O&amp;M</b>	Operation & Maintenance
<b>OMC</b>	Operational Management Committee
<b>PPP</b>	Public-Private Partnership
<b>NWA</b>	National Water Act (Act No. 36 of 1998)
<b>RMP</b>	Resource Management Plan
<b>SAMSA</b>	South African Maritime Safety Authority
<b>SAPS</b>	South African Police Service
<b>SASCOC</b>	South African Sports Confederation and Olympic Committee
<b>TCTA</b>	Trans-Caledon Tunnel Authority
<b>RMP</b>	Resource Management Plan
<b>RoD</b>	Record of Decision
<b>UPN</b>	Unique Positioning Number





## 1. INTRODUCTION

In 2000, the Department of Water Affairs (DWA) together with Umgeni Water commissioned a feasibility study for a phase 2 of the Mooi Mgeni Transfer Scheme (MMTS-2). This study recommended the construction of Spring Grove Dam on the Mooi River close to Rosetta with a Water Transfer System (i.e. a pumping station and pipeline to the Mpofana River). The construction phase was completed in October 2014.

The Spring Grove Dam and the surrounding state-owned land must be conserved and utilised in an environmentally sound and equitable manner. DWA has developed a planning procedure that aims to compile Resource Management Plans (RMPs) for recreational waters, through a process based on attaining harmony within the natural and cultural environment, while addressing the needs and expectations of the community, industry and recreational users. By providing clear

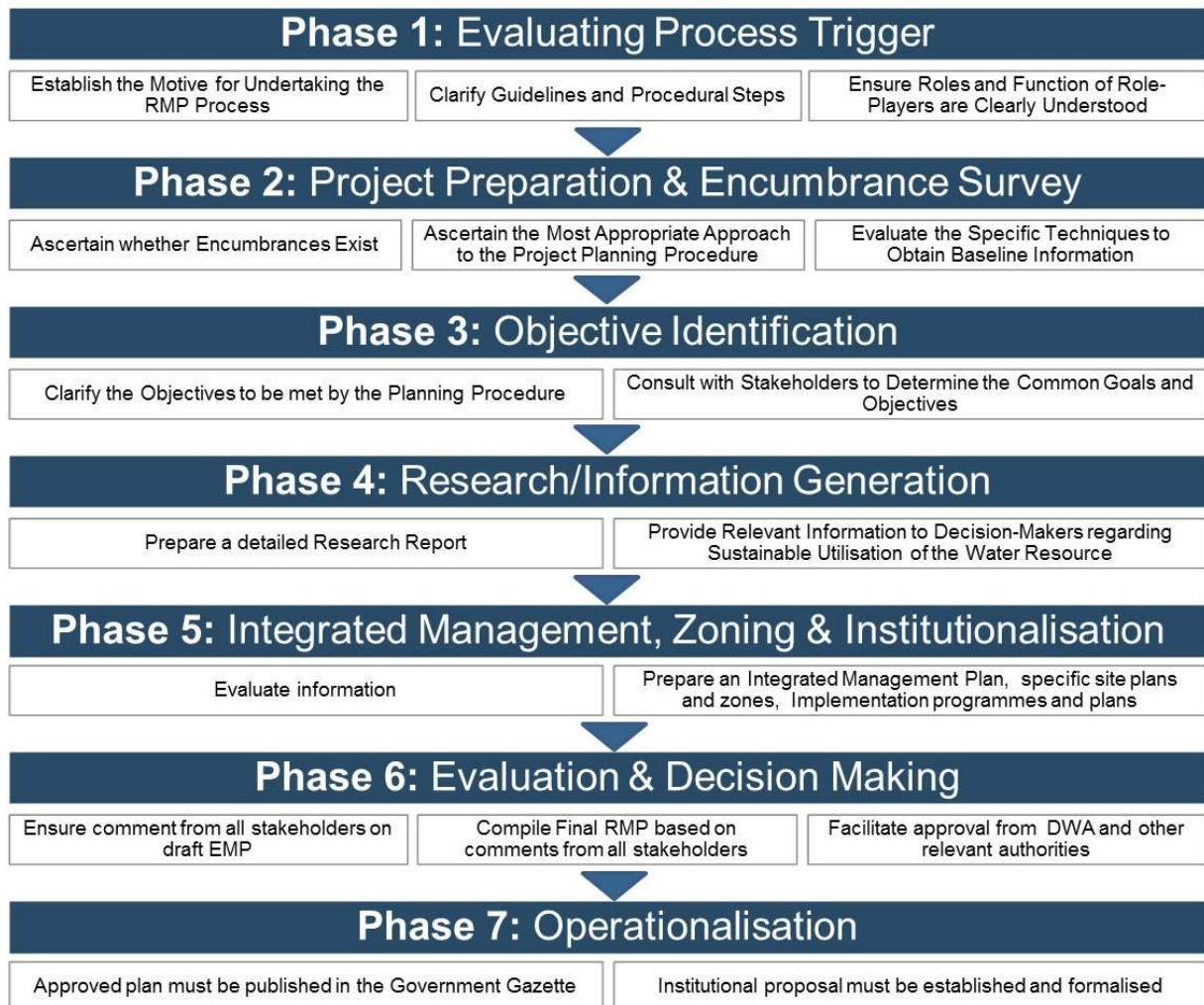
guidelines for the effective institutionalisation of management bodies, linked to performance criteria it is envisaged that these plans will not only be functional, but also workable.

Nemai Consulting (**RMP Process Facilitator**) was appointed by the Trans-Caledon Tunnel Authority (TCTA) (**RMP Process Initiator**), who is the implementing agent for MMTS-2, to compile the RMP for Spring Grove Dam.

The RMP development process for Spring Grove Dam produced the following deliverables (refer to **Figure 1**):

- ◆ Evaluating Process Triggers Report (Volume 1);
- ◆ Project Plan & Encumbrance Survey Report (Volume 2);
- ◆ Vision and Objectives Report (Volume 3);
- ◆ Research Report (Volume 4);
- ◆ RMP (Volume 5) –
  - ❖ Integrated Management Plan;

- ❖ Institutional Arrangements;
  - ❖ Zonal Plan;
  - ❖ Business Plans; and
- 💧 **Business Plan.**



**Figure 1: Phases of RMP Development Process**

This document presents the RMP Business Plan (BP). The BP summarises the operational and financial objectives of the RMP and contains the interventions, resources and timeframes required to achieve these objectives. It aims to facilitate the implementation of RMP in a pragmatic and efficient manner.

The BP was compiled according to the following steps:

- 1. Identify Strategic Objectives**, as contained in the RMP;
- 2. Determine interventions** – translate objectives into practical interventions;



- 3. List detailed actions** – disaggregate interventions into actions, in order to establish timeframes and provide guidance to the entity who will implement the BP;
- 4. Establish Key Performance Indicators (KPIs)** per intervention – KPIs allow for monitoring and evaluation;
- 5. Establish timeframes per action;**
- 6. Establish a budget per action;** and
- 7. Determine Funding Sources** – identify innovative mechanisms to obtain funding.



## 2. KEY FINDINGS FROM THE SPRING GROVE DAM RMP

### 2.1 Background to Spring Grove Dam

The Mgeni Water System in KwaZulu-Natal (KZN) supplies water to approximately five million people, as well as the industrial sectors in the Durban and Pietermaritzburg regions, the economic hubs of the province. The growth in water demand and intermittent drought periods since 2003 made it necessary for DWA to implement Phase 2 of the Mooi Mgeni Transfer Scheme (MMTS-2), which comprised the construction of a 37 metre roller compacted concrete dam (named Spring Grove Dam) with a gross storage capacity of 139,5 million m<sup>3</sup> on the Mooi River upstream of the Mearns Weir with an associated water transfer system to Mpofana River. The purpose of the MMTS-2 is to augment the growing water requirements of the Mgeni System by 60 million m<sup>3</sup> per annum.

A positive Record of Decision (RoD) was issued by the Department of Environmental Affairs and Tourism on 15 June 2009, which authorised the

undertaking of the relevant activities as part of the MMTS-2 project, subject to certain conditions. Impoundment commenced in March 2013 and full impoundment was initiated in June 2013.

### 2.2 Dam Location

Spring Grove Dam falls within the jurisdiction of the uMgungundlovu District Municipality (DC22), and is situated in two local municipalities, namely Mpofana Local Municipality (KZN223) and uMngeni Local Municipality (KZN222).

The site co-ordinates for the dam wall are 29°58'12" east and 29°19'12" south, which lies 8 km south of the existing Mearns Weir site. The dam is located 2 km south west of the Rosetta on the farms Rosetta and Spring Vale. Portions of the Vaale Kop, Inchbrakie, Riverholm, Ebernburg and Spring Grove are inundated by the impoundment with the backwaters extending upstream to above the Inchbrakie falls. See map contained in **Figure 2**.





**Figure 2: Regional Map**

## 2.3 Details of the Dam

Details of Spring Grove Dam are shown in **Table 1**.

**Table 1: Spring Grove Dam Characteristics**

<b>Dam Type</b>	Composite RCC and Embankment	<b>Total Length of Dam Wall</b>	607 m
<b>Dam Height</b>	37 m	<b>Spillway Height</b>	32 m
<b>GPS Coordinates (Dam Wall)</b>	29° 19'12" S 29° 58'12" E	<b>Spillway Length</b>	70 m
<b>Category</b>	Category III	<b>Spillway Crest</b>	Ogee Crest
<b>Gross Storage Volume</b>	139,5 million m <sup>3</sup>	<b>Firm Yield</b>	60 million m <sup>3</sup> /a
<b>Full Supply Level</b>	RL 1 433,5 m	<b>Catchment Area</b>	344 km <sup>2</sup>
<b>Water Surface Area at Full Supply Level</b>	1 022 ha	<b>Outlet Works</b>	Twin System with Multi-level Intakes
<b>Embankment Type &amp; Height</b>	Earthfill; 11,5 m	<b>Outlet Capacity</b>	29,5 m <sup>3</sup> /s

## 2.4 Encumbrances

Some of the main encumbrances related to recreational opportunities at Spring Grove Dam (RMP Volume 2) include the following:

### 💧 Access -

- ❖ There is no direct access for the public to the dam;
- ❖ The access road from the D146 to the dam will be used to access the permanent infrastructure which is required for the operation of the dam, as well as the water treatment works and substation. For the sake of public safety and to prevent any risks to the operation of the dam, no public access will be allowed from this road; and
- ❖ All other access roads around the dam traverse of are located on private property and therefore not accessible.

### 💧 Space -

- ❖ The state-owned land around the basin is a very narrow strip of land and was based on the buffer zone for the safe operation of the dam in terms of standing DWA policy;
- ❖ Very limited space is available for recreational use;

- ❖ Currently, no provision is made for public parking;
- ❖ At certain areas the topography creates steep slopes along the shoreline which discourages recreational uses; and
- ❖ If additional land is to be acquired to provide access then the mechanism through which this can be achieved will need to be investigated further. TCTA's mandate from the Minister only allows for the expropriation for a Government Water Works.

### 💧 Infrastructure – dam related -

- ❖ Management guidelines will need to be implemented to prevent negligent stocking of the watercourse upstream of the Fish Barrier with bass;
- ❖ No activities / development may jeopardise the intention of the Fish Barrier;
- ❖ The Fish Barrier serves as an instream obstacle to recreational use;
- ❖ The road embankment serves as an instream obstacle to recreational use; and
- ❖ A slipway has been built, but will be for the exclusive use of the dam operator. If required, the

slipway could be utilised for emergency purposes or for the maintenance of the submersible pumps. No public use of the slipway will be allowed. No provision has been made for any other boat ramps or launches.

#### 💧 **Infrastructure – private / other -**

- ❖ Water abstraction points and associated infrastructure, which include submersible pumps on pontoons, are located within the dam basin.

#### 💧 **Biophysical -**

- ❖ Sensitive habitat may be regarded as no-go for recreational purposes in order to protect the ecological features;
- ❖ The dam basin and surrounding area is regarded as having high biodiversity and the associated ecosystems should be suitably protected. This will influence the areas where recreational access will be allowed;
- ❖ The trophic status of the dam needs to be considered for recreational use of the impoundment; and
- ❖ The water is likely to be cold, even in summer, which will promote seasonal water based recreation.

It is therefore likely that the dam will have a high tourist season (late spring, summer and autumn) and a low season (winter and early spring).

#### 💧 **Dam Operations -**

- ❖ Fluctuations in the dam level due to transfers may adversely impact on the recreational use of the dam.

#### 💧 **Amenities -**

- ❖ The narrow strip of the shoreline area on the state-owned land, as well as its relatedness to the buffer zone for the safe operation of the dam, hampers the provision of amenities (e.g. ablution facilities, drinking water, benches) to public users; and
- ❖ Amenities and associated activities along shoreline state-owned land may be highly conspicuous to private landowners.

#### 💧 **Safety and Security -**

- ❖ The private land will be easily accessible from the adjoining state-owned land, as the boundary consists of a six-strand fence (five strands in certain areas to make provision for the movement of Oribi);



- ❖ Likewise, access can also easily be gained to the dam from state-owned land, with the potential to lead to uncontrolled use; and
- ❖ Implement standardised and harmonised AtoN and Demarcation Markers in order to improve safety of navigation.

#### • **Fire Management -**

- ❖ Due to the proximity of cultivated land, homestead and other structures to the state-owned land in certain areas, this private property may be at risk from fires that start on the state-owned land, if fire breaks are not maintained.

## 2.5 Management Objectives

The Management Objectives for Spring Grove Dam (RMP Volume 3) were identified as follows:

- Undertaking public participation, which included engaging with the community and conducting targeted consultation;
- Examining policies, strategies, plans and programmes of the various spheres of government, as well as considering objectives expressed by other institutions;

- Obtaining and reviewing existing information related to the project area and its receiving environment; and
- Evaluating recreational opportunities.

Feedback received during the public participation process revealed the following:

- The most dominant preferred use for the dam is fishing for recreational purposes, followed by canoeing and sailing;
- The primary objectives for the use of the dam include water storage (as part of a transfer scheme) and general recreational activities;
- The majority of respondents indicated that the general community needed to benefit from the use of the dam; and
- Non-motorised boats were listed as the most dominant restriction for the future use of the dam.

The Strategic Plan for Spring Grove Dam (RMP Volume 5) was informed by the objectives determined during the visioning exercise. This plan translated the objectives into practical and measurable interventions, as shown in **Table 2** (current situation – no recreational use) and **Table 3** (possible future scenario – recreational use).

**Table 2: Objectives & Interventions for Spring Grove Dam - Current Situation**

	Objective	Interventions	BP Required	Comments
Water Resource Protection	Ensure that Reserve requirements of the Mooi River are met	<ul style="list-style-type: none"> <li>Compliance with SGD: Operation &amp; Maintenance (O&amp;M) Manual</li> <li>Ensure that the yield of the dam is not compromised</li> </ul>	X	DWA to facilitate the process
	Ensure that downstream water users' requirements are met		X	DWA to facilitate the process
	Augmentation of water supply to Mgeni System		X	DWA to facilitate the process
	Management of water quality	Participation on Catchment Management Forum	X	DWA to facilitate the process
		Implementation of Catchment Management Strategy	X	DWA to facilitate the process
		Establish a water quality management and monitoring programme	✓	See <b>Section 5.11</b>
		Management Guidelines for surrounding development	✓	See <b>Section 5.10</b>
		Develop Silt Management Plan	✓	See <b>Section 5.11</b>
Environmental Protection	Safeguard sensitive areas	Management Guidelines for protection and maintenance of created habitats	✓	See <b>Section 5.1</b>
		Designation of shoreline conservation zones (as per the Zonal Map)	X	DMC to facilitate the process
		Designation of water surface conservation zones (as per the Zonal Map)	X	DMC to facilitate the process
		Develop Biodiversity Management Plan for the dam and shoreline area	✓	See <b>Section 5.1</b>
	Management of alien invasive species	Management Guidelines (including eradication programme) for alien invasive species	✓	See <b>Section 5.2</b>
		Investigate collaboration with Working for Water	X	DMC to facilitate the process
		Wash Bay system to be implemented to prevent aquatic invasive species at the dam	✓	See <b>Section 5.5</b>
	Management of Fish Barrier	Develop a management and enforcement programme for Fish Barrier	✓	See <b>Section 5.14</b>
	Create awareness	Establish an environmental awareness programme	✓	See <b>Section 5.3</b>
	Maintain fire break	Develop programme for fire break management in association with the Mooi River and Lions River Fire Protection Associations (FPAs)	✓	See <b>Section 5.4</b>

	Objective	Interventions	BP Required	Comments
	Manage erosion	Erosion Control and Monitoring Programme	✓	See <b>Section 5.15</b>
Institutional Arrangements	Establish institutional arrangements	<ul style="list-style-type: none"> <li>Ensure that the following agreements are in place (as necessary): <ul style="list-style-type: none"> <li>Agreements between DWA and Umgeni Water</li> <li>Land Management Agreements</li> <li>Access Agreements</li> </ul> </li> </ul>	X	DMC to facilitate the process
		Formation of DMC. CISWP programme to set up DMC together with UPN System	X	DWA to facilitate the process
		Formation of RMP Steering Committee. CISWP Programme to set up RMP Steering Committee together with UPN System	X	DWA to facilitate the process
Sustainable and equitable access, use and development	Investigate recreational opportunities for state-owned land and dam's surface	Feasibility Study to explore recreational opportunities. Equitable PPPs to be considered – promote community beneficiation	✓	See <b>Section 5.6</b>
	Manage risks from surrounding development	Establish mechanism to comment on surrounding development	X	Part of DMC mandate
		Management Guidelines for surrounding development	X	DMC to facilitate the process
	Ensure legal compliance	Develop legal register for all activities. Screen activities against relevant legislation.	X	DMC to facilitate the process
		Environmental Non Compliance must be linked to UPN System	X	Part of CIWSP
Protect landowners' rights	Involve landowners in management of state-owned land and dam's surface	Include representatives from landowners on DMC	X	DMC to facilitate the process
		Mechanism for landowners to raise comments	X	DMC to facilitate the process

**Table 3: Objectives & Interventions for Spring Grove Dam - Possible Future Scenario**

	Objective	Interventions	BP Required	Comments
Water Resource Protection	As per provisions in <b>Table 2</b>			
Environmental Protection	As per provisions in <b>Table 2</b>			

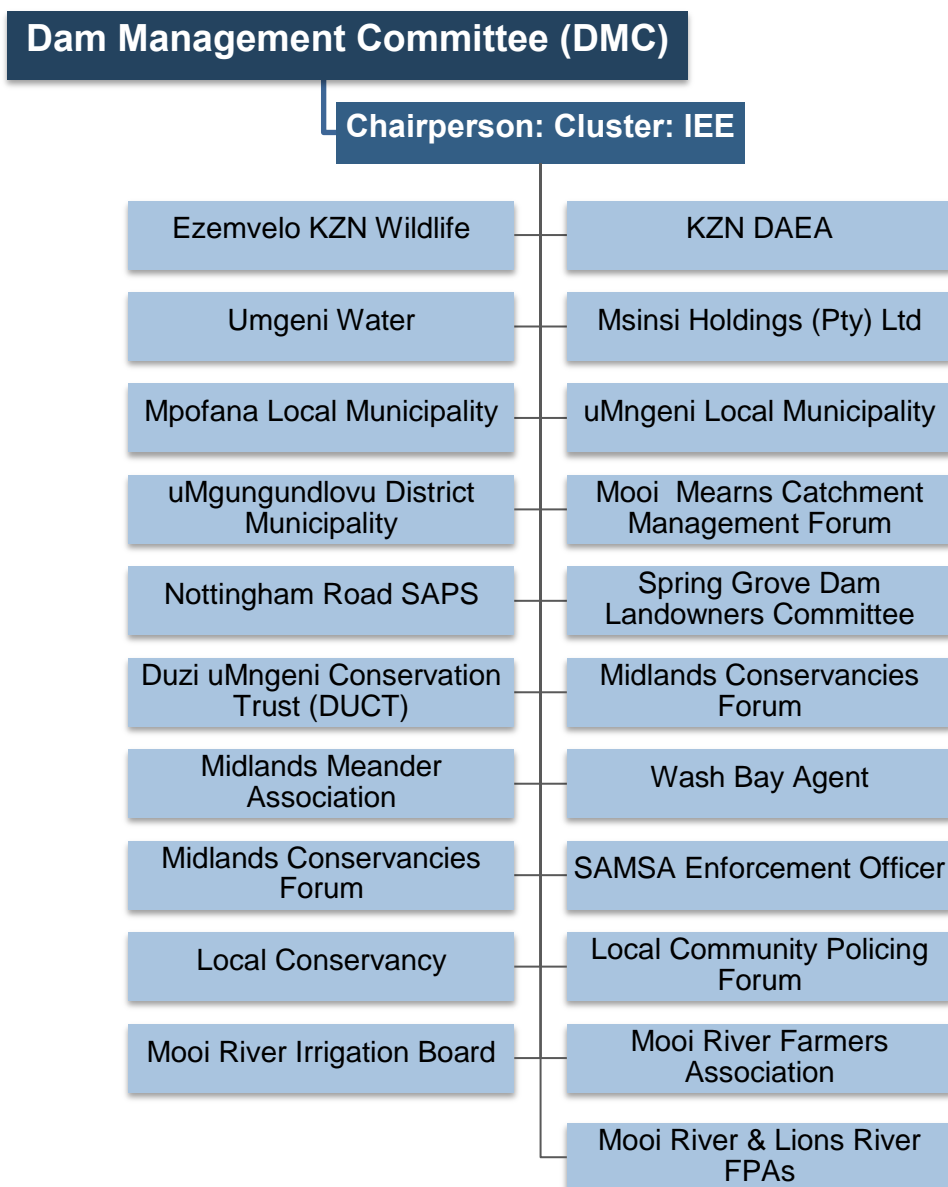
	Objective	Interventions	BP Required	Comments
Safety Management	Recreational use to be undertaken in a safe and compliant manner	Formalised Safety System in place at the dam's public access area(s) to ensure all recreational users have the correct licenses and that all vessels are water-worthy.	✓	See <b>Section 5.5</b>
		Control of Access through the provision of a Wash Bay and the implementation of the UPN System.	✓	See <b>Section 5.5</b>
		Formal appointment of SAMSA Enforcement Officer at the dam. The officer will be able to utilise the UPN system to alert SAPS of any illegal activity.	X	DMC to facilitate the process
		Formalised Safety System in place for Private Zone, where shoreline landowners access the water surface.	✓	See <b>Section 5.5</b>
		Unofficial access points to be surveyed and then closed (depending on allowances for recreational use).	X	DMC to facilitate the process
		Determine safety requirements for all dam-related infrastructure (including Fish Barrier, road embankment, gauging weir).	X	DMC to facilitate the process
		Implement and maintain standardised and harmonised Aids to Navigation and Demarcation Markers.	✓	See <b>Section 5.13</b>
	Communicate water levels to recreational users	Maintain communication system (currently provided on <a href="http://www.springgrovedam.co.za/Impoundment%20Stats.html">http://www.springgrovedam.co.za/ Impoundment%20Stats.html</a> ) with dam users to report on water levels.	X	DMC to facilitate the process
Skills Development	Development of swimming and rowing	Feasibility study for co-funded Rowing and Swimming Development School. Coordination between DMC, SwimSA, RowSA and SASCO to determine availability of funds.	✓	See <b>Section 5.7</b>
	Wash Bay Officer(s) and SAMSA Enforcement Officer(s) to be trained.	<ul style="list-style-type: none"> <li>DEA Working for Water to provide Wash Bay Officer Training</li> <li>SAMSA to provide Vessel Safety Training to Wash Bay Officer</li> <li>SAMSA to provide SAMSA Enforcement Officer training</li> <li>First Aid Training for officers</li> </ul>	X	DMC to facilitate the process
	Future clubs to be affiliated with national sporting bodies	<ul style="list-style-type: none"> <li>Protocol for ensuring future clubs are affiliated with national sporting bodies</li> </ul>	X	DMC to facilitate the process
Institutional Arrangements	Establish institutional arrangements	<ul style="list-style-type: none"> <li>Ensure that the following agreements are in place (as necessary): <ul style="list-style-type: none"> <li>Recreational Use Agreements</li> <li>Access Agreements</li> </ul> </li> </ul>	X	DMC to facilitate the process
		Remaining interventions as per provisions in <b>Table 2</b>		

	Objective	Interventions	BP Required	Comments
Sustainable and equitable access, use and development	Access to resource to be considered on an equitable basis	Implementation of local community access card which takes into account socio-economic status of the community.	X	Dependent on outcome of Feasibility Study (see <b>Section 5.6</b> )
		Promote community beneficiation.	✓	See <b>Section 5.12</b>
	Investigate recreational opportunities for state-owned land and dam's surface	Feasibility Study to explore recreational opportunities. Equitable PPPs to be considered – promote community beneficiation.	✓	See <b>Section 5.6</b>
		Establish sustainable fish stocking programme, based on recreational requirements.	X	Dependent on outcome of Feasibility Study (see <b>Section 5.6</b> )
		Establish dedicated shore fishing areas (as per Shoreline Zonal Pan).	X	DMC to facilitate the process
		Feasibility study for dam wall tours.	✓	See <b>Section 5.9</b>
	Manage risks from surrounding development	As per provisions in <b>Table 2</b>		
	Ensure legal compliance	As per provisions in <b>Table 2</b>		
Protect landowners' rights	Manage access to prevent impacts to landowners	Access based on criteria that safeguard landowners' rights.	✓	See <b>Sections 5.5 &amp; 5.6</b>
		Prepare rules for recreational use and issue to all users.		
	Involve landowners in management of state-owned land and dam's surface	As per provisions in <b>Table 2</b>		

### 3. MANAGEMENT OF THE RMP & BP

The Institutional Plan (refer to RMP Volume 5) contains the requisite arrangements and structure for the collective and coordinated management of Spring Grove Dam, which is to be achieved through the implementation of the RMP.

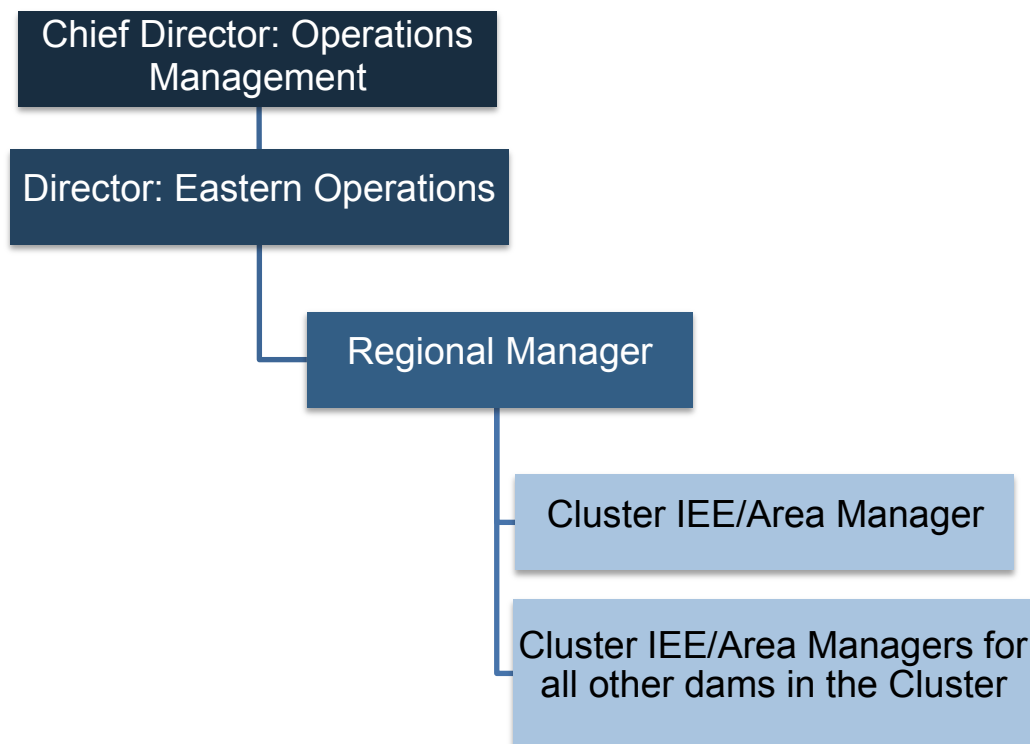
The operational functions of the dam management will be overseen by the Dam Management Committee (DMC) and includes a large pool of representatives, as shown in **Figure 3**. This committee is chaired by the delegated DWA Official.



**Figure 3: Members of the DMC**

The next level of management is the Operational Management Committee (OMC) (shown in **Figure 4**) which will provide high level guidance for all dams that are situated within one catchment.

An existing reporting line exists for Midmar Dam between the Area Manager for the scheme, the Regional Manager for the cluster (in this case, Eastern Operations) and the Chief Director: Operations Management. It is suggested that this existing channel be utilised.



**Figure 4: Members of the OMC**

The RMP Steering Committee (shown in **Figure 5**) is made up of representatives from National Government. The main focus of this committee is to ensure both the DMC and OMC are performing all necessary functions. The committee will also provide high level guidance to the

last-mentioned bodies. The RMP Steering Committee allows for a formal reporting structure between the Chief Director: Operations and the National Water Infrastructure Branch: Integrated Environmental Engineering (NWRIB:IEE).





## 4. MONITORING & EVALUATION

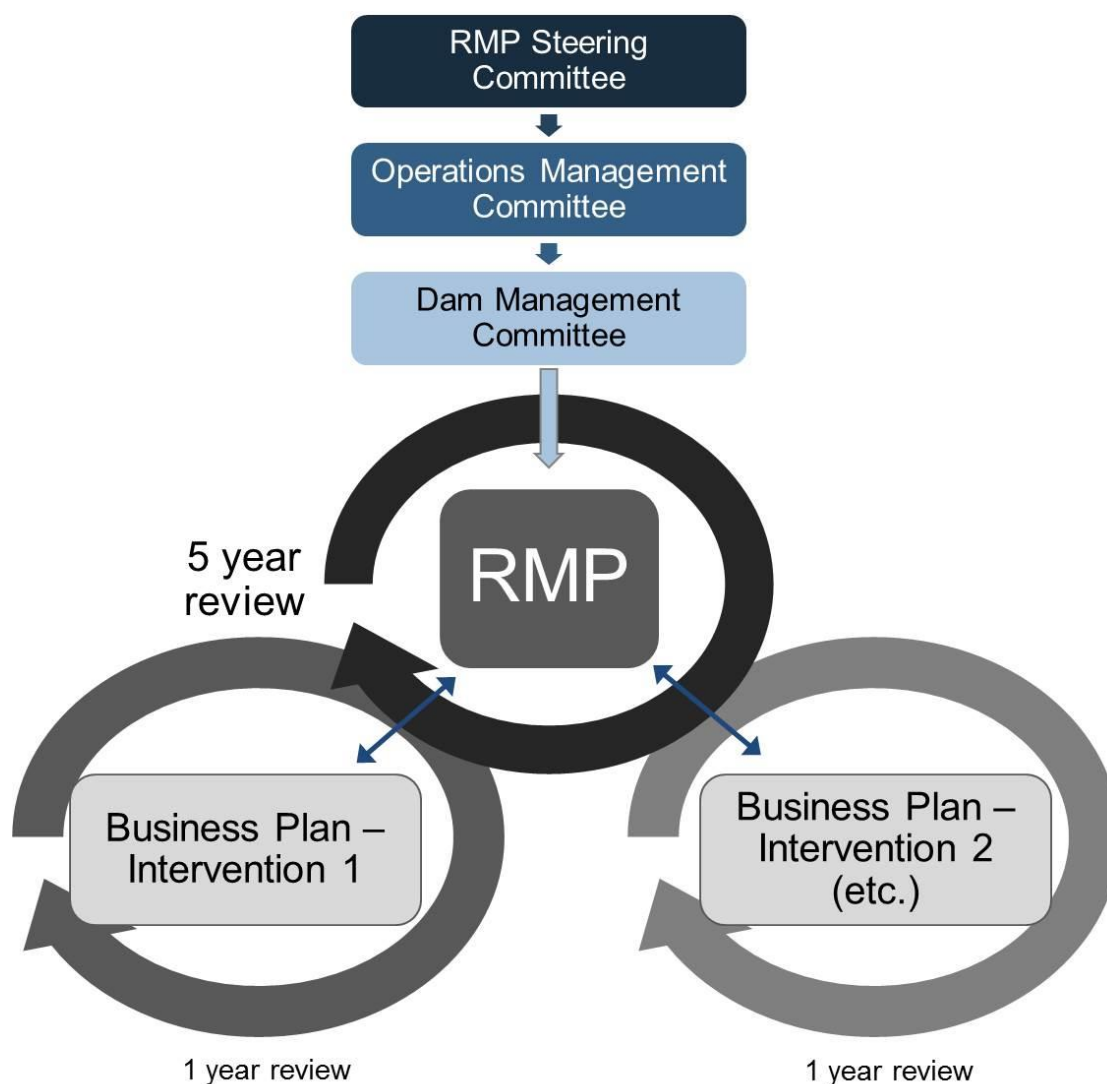
The functions of the DMC include the following (amongst others):

- Daily operations at the dam and shoreline area;
- Monitoring the practical implementation of the RMP;
- Monitoring overall performance in terms of achieving the Management

Objectives and implementing the associated actions; and

- Overseeing the implementation of the Business Plans.

The review periods for the RMP and BP are shown in **Figure 6**.



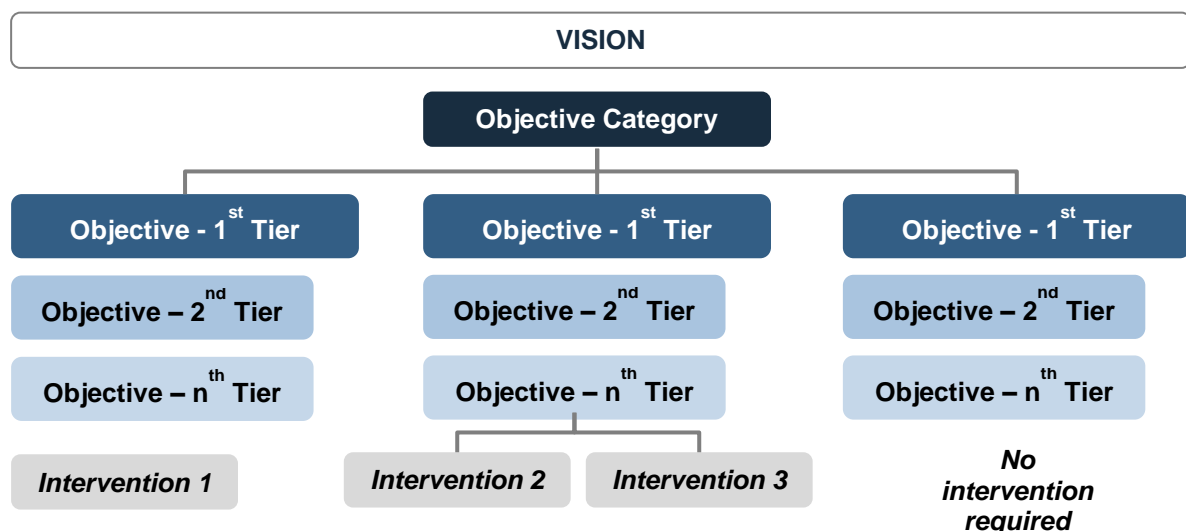
**Figure 6: RMP & BP Review**

## 5. INTERVENTIONS

The realisation of the desired state relies on the disaggregation of the vision into Management Objectives. These objectives are best presented in a hierarchy, which begins at its coarsest level with the vision and ends in a series of management objectives linked to interventions of increasing focus, rigour and practical achievability.

As shown in **Table 2** not all of the interventions require Business Plans, as some are directly related to the mandates of DWA and the DMC or the standard operational requirements of the dam.

The Business Plans for the prioritised interventions that follow start off with providing the motivation for pursuing these interventions, and the associated opportunities and benefits. The key considerations and possible constraints that need to be overcome are also listed. The interventions are then rendered into implementable action items with accompanying key performance indicators (KPIs). A period is suggested for the execution of the action items, which is linked to the various parties that would need to be involved.



**Figure 7:** From visioning to intervention

## 5.1 INTERVENTION NO. 1: Manage the Dam's Biodiversity

### Motivation & Opportunities

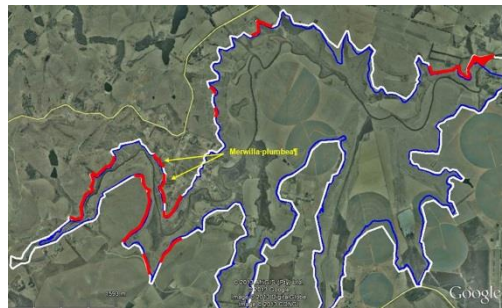
The following sensitive features need to be appropriately managed and safeguarded:

- Four habitat areas were created as part of the fauna and flora search, rescue and relocations efforts that took place during the construction phase of the dam;
- Sensitive areas such as wetlands, tributaries, inlets and grassland areas along the shoreline;
- Population of *Merwillia plumbea*, which is sought after for its medicinal properties, should be protected from illegal harvesting; and
- Habitat for sensitive fauna species.

This intervention will ensure the future preservation of the dam's biodiversity, which will also enhance the ecological health and visual quality of the shoreline area. Collaboration with shoreline landowners is crucial.

### Key Considerations & Possible Constraints

- Consider requirements listed in **Appendix A**
- Input from all authorities with associated mandate
- Dedicated and competent resources required
- Ease of access to sensitive areas
- Monitoring of management measures
- Specialist input required
- Community buy-in required



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Develop Biodiversity Management Plan (including implementation plan) for the dam and shoreline area.	Approved Plan & Implementation	12/01/15	31/07/15						<ul style="list-style-type: none"> <li>DWA</li> <li>DEA</li> <li>DAEA</li> <li>DMC</li> <li>DAFF</li> <li>EKZNW</li> </ul>	DWA

## 5.2 INTERVENTION NO. 2: Manage Alien Invasive Species

### Motivation & Opportunities

- Linked to Intervention 1.
- Managing alien invasive species will support the overall ecological health and aesthetic value of the dam and shoreline area.
- Collaboration with shoreline landowners is crucial.

### Key Considerations & Possible Constraints

- Dedicated and competent resources required
- Ease of access to entire shoreline area
- Input from all authorities with associated mandate
- Monitoring of growth of alien invasive species and success of eradication measures
- Align eradication programme with similar efforts in the catchment.
- Specialist input required
- Community buy-in



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Develop eradication programme for alien invasive species (aquatic and terrestrial)	Approved Eradication Programme & Implementation	12/01/15	31/07/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> <li>▪ DEA</li> <li>▪ KZN DAEA</li> <li>▪ EKZNW</li> </ul>	DWA
Rehabilitate infested areas with suitable endemic species.	Established growth	Ongoing							<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> <li>▪ DMC</li> <li>▪ WfW</li> </ul>	DEA and WfW funding



### 5.3 INTERVENTION NO. 3: Create Environmental Awareness

#### Motivation & Opportunities

Awareness needs to be created on the environmental significance of Spring Grove Dam. Apart from the sensitive features associated with the aquatic environment as well as the shoreline area, it forms part of the Midlands Meander and a part of the dam is situated within a conservancy as well as the uKhahlamba Drakensberg Park World Heritage Site Buffer Zone. With the dam surrounded by private land it is also pivotal that support is garnered from the immediate community in terms of the preservation of the dam's environment.

#### Key Considerations & Possible Constraints

- Dedicated and competent resources required
- Community buy-in required



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Establish an environmental awareness programme	Approved Awareness Programme & Implementation	12/01/15	31/07/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA

## 5.4 INTERVENTION NO. 4: Manage Fire Breaks

### Motivation & Opportunities

- Managing fire risk is a key priority in the area.
- Due to the proximity of cultivated land, homestead and other structures to the state-owned land in certain areas, this private property may be at risk from fires that start on the state-owned land.
- Collaboration with shoreline landowners is crucial to ensure that the transitional area between the purchase line and private land is effectively maintained.

### Key Considerations & Possible Constraints

- Dedicated and competent resources required
- Community buy-in required
- Coordination with fire break management on private land
- Liability associated with damages caused by poor fire risk management
- Ease of access to all areas



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Develop programme for fire break management in association with the Mooi River and Lions River FPAs and other relevant parties.	<ul style="list-style-type: none"> <li>Approved Programme &amp; Implementation</li> <li>Agreement with MRFPA</li> </ul>	12/01/15	30/04/15						<ul style="list-style-type: none"> <li>DWA</li> <li>DMC</li> <li>MFRPA</li> </ul>	DWA
Agreements with adjacent landowners should include fire management in line with the fire management programme.	Agreement in place	29/05/15	Ongoing						<ul style="list-style-type: none"> <li>DWA</li> <li>DMC</li> </ul>	DWA



## 5.5 INTERVENTION NO. 5: Control of Access, Safety and Invasive Species through the Wash Bay and UPN System

### Motivation & Opportunities

- There are a number of aquatic invasive species in the province and the spread of these species to Spring Grove Dam should be prevented.
- The necessary measures need to be implemented to manage safe access to the dam and shoreline area.

### Key Considerations & Possible Constraints

- Difficulty in applying the requirements of the Wash Bay and UPN System for all the adjoining private landowners, as there are various private access points that will bypass this system.
- Dedicated and competent resources required.
- Community buy-in required.
- Compliance and enforcement.



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Construction of Wash Bay	Functioning Wash Bay and UPN System	To be confirmed							<ul style="list-style-type: none"><li>DWA</li><li>DMC</li></ul>	DWA
Provision of Spray Tanks, Herbicides and Training of Wash Bay Officer*									DEA: Working for Water	DEA: Working for Water
Implementation of UPN System**									DWA	DWA
Investigate the need for additional Wash Bay(s)	All access to the waterbody to be compliant	12/01/15	30/04/15						<ul style="list-style-type: none"><li>DWA</li><li>DMC</li></ul>	DWA
Develop Safety and Security Management Plan to safeguard private shoreline landowners from any activities at the dam or on the state-owned land	No incidents to shoreline landowners as a result of activities at the dam	12/01/15	30/04/15						<ul style="list-style-type: none"><li>DWA</li><li>DMC</li></ul>	DWA

\* Part of DEA: Working for Water's funding programme.

\*\* DWA is currently in the process of rolling out the UPN system to all its dams.

## 5.6 INTERVENTION NO. 6: Explore Potential Recreational Use of the Dam and Shoreline Area

### Motivation & Opportunities

According to the district and local municipal Integrated Development Plans and Spatial Development Frameworks, it is anticipated that Spring Grove Dam will offer tourism opportunities. The area forms part of the Midlands Meander, which is an important tourist node and one of the most successful tourist circuits in the country.

In light of the various encumbrances that exist with regard to pursuing recreational use at Spring Grove Dam, a specific study needs to be conducted to explore the viability of allowing the dam to be opened up to recreational use. Equitable access in terms of the general public will first need to be confirmed and facilitated before the recreational use of the dam can be realised. Based on the outcomes of this study and the approval by DWA and Umgeni Water (and other relevant parties), the RMP Zonal Maps would need to be updated.

### Key Considerations & Possible Constraints

- ◆ Absence of suitable public access
- ◆ Lack of space on state-owned land
- ◆ Lack of space for parking
- ◆ Dam surrounded by private land
- ◆ Steep gradient in certain areas
- ◆ Proximity of shoreline area to private property
- ◆ Safety and security of private landowners
- ◆ Mechanism for DWA to acquire additional land
- ◆ Fluctuations in the dam level
- ◆ Water Quality
- ◆ Water temperature
- ◆ Underwater topography



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Feasibility study to explore recreational use of dam and shoreline area. Consider the possible role of PPPs or co-management options.	Documented Feasibility Study & Implementation	12/01/15	31/07/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA

## 5.7 INTERVENTION NO. 7: Rowing, Angling and Swimming Development School at the Dam

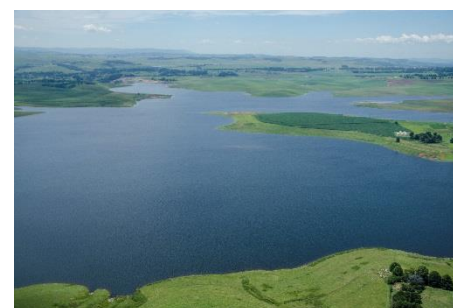
*Note: This intervention is dependent on the outcome of the Feasibility Study that will explore future recreational use (see Section 5.6)*

### Motivation & Opportunities

- In order to promote equitable use, programmes need to be implemented to allow community members to benefit from the dam.
- All sporting initiatives need to be affiliated with formal bodies that are associated with SASCOC.

### Key Considerations & Possible Constraints

- Coordination between DMC, SwimSA, RowSA, SASCOC and other relevant parties.
- Community beneficiation.
- The school will be costly to fund and operate therefore co-funding will need to be explored.



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Feasibility study for co-funded Rowing, Angling and Swimming Development School. Explore PPPs.	Documented Feasibility Study & Implementation	01/10/15	02/05/16						<ul style="list-style-type: none"> <li>DWA</li> <li>DMC</li> <li>SwimSA</li> <li>RowSA</li> <li>SASCOC</li> </ul>	Department of Sports and Recreation

## 5.8 INTERVENTION NO. 8: Investigate Fishing at Spring Grove Dam

*Note: This intervention is dependent on the outcome of the Feasibility Study that will explore future recreational use (see Section 5.6)*

### Motivation & Opportunities

Recreational fishing was highlighted as the most popular desired use of the dam during the RMP public participation process. Considering the sense of place and the current use of watercourses in the Midlands for angling, this activity deserves particular attention in terms of possible uses of Spring Grove Dam.

### Key Considerations & Possible Constraints

- Sustainability
- Input from all authorities with associated mandate
- Regulation
- Access
- Suitable fishing areas
- Negligent stocking upstream of the Fish Barrier with bass



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Feasibility Study for fishing at Spring Grove Dam. Consider the possible role of PPPs or co-management options.	Documented Feasibility Study & Implementation	01/10/15	02/05/16						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> <li>▪ DAFF</li> <li>▪ DEA</li> <li>▪ DAEA</li> <li>▪ EKZNW</li> </ul>	DWA
Establish sustainable fish stocking programme, based on recreational requirements	Approved Programme & Implementation	To be confirmed								
Compile Fish Management Plan	Documented plan & Implementation	To be confirmed								
Develop Management Plan to prevent negligent stocking of the watercourse upstream of the Fish Barrier with bass	Documented plan & Implementation	12/01/15	30/04/15							



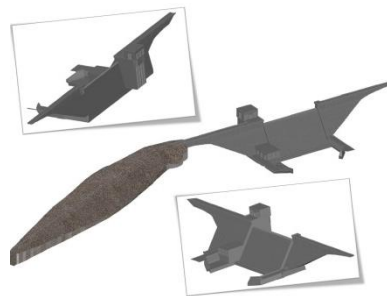
## 5.9 INTERVENTION NO. 9: Dam Wall Tours

### Motivation & Opportunities

With the significance of tourism in the local area, the opportunity of establishing dam wall tours should be investigated. It could also be extended to an educational programme for schools.

### Key Considerations & Possible Constraints

- Dedicated resources
- Access arrangements
- Safety of visitors



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Feasibility study for dam wall tours. Consider community beneficiation and PPPs.	Documented Feasibility Study & Implementation	12/01/15	31/07/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA

## 5.10 INTERVENTION NO. 10: Guide Surrounding Development

### Motivation & Opportunities

It is important that surrounding development on private land does not jeopardise the management objectives of the dam. Management guidelines thus need to be developed to prevent disparate activities and developments on the properties adjoining the dam.

A host of government departments with mandates that pertain to the management of the dam and its surrounding environment need to be involved in the drafting of these guidelines within standing law.

### Key Considerations & Possible Constraints

The RMP cannot dictate management requirements for privately owned land. However, it can actively comment on development proposals, especially in terms of formal process such as Environmental Impact Assessments, Water Use Authorisations and town planning approvals. It can also present guidelines to assist compatible development of surrounding land.



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Convene workshop with relevant authorities to discuss the management guideline	Minutes of workshop and documented way forward	30/01/15							<ul style="list-style-type: none"><li>DWA</li><li>DMC</li><li>DEA</li><li>DAEA</li><li>Municipalities</li></ul>	DWA
Develop management guidelines for surrounding development and activities to safeguard the resource quality of the dam	Approved guidelines & Implementation	27/02/15	29/05/15							

## 5.11 INTERVENTION NO. 11: Water Quality Management

### Motivation & Opportunities

- ◆ Poor water quality may influence the treatment of the raw water as part of the MMTS-2, and may adversely affect any other uses of the dam and downstream water resource (e.g. abstraction for domestic use, irrigation or livestock watering).
- ◆ The upper reaches of the Mooi Catchment are extensively used for agriculture and grazing induced erosion is a major source for suspended materials.

### Key Considerations & Possible Constraints

As part of the programme the followings needs to be taken into consideration:

- ◆ Routine water quality monitoring;
- ◆ Establish a communication system with existing water users to report on water quality;
- ◆ Investigate pollution sources that jeopardise the safe operation and management of the dam;
- ◆ Establish protocol to pro-actively deal with pollution incidents; and
- ◆ Establish a programme for the management of inlets - reduce high levels of siltation.



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Establish a water quality monitoring programme	Functional programme & Implementation	12/01/15	27/02/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA mandate
Develop a Silt Management Plan	Approved Plan & Implementation	12/01/15	30/04/15							



## 5.12 INTERVENTION NO. 12: Promote Community Beneficiation

*Note: This intervention is dependent on the outcome of the Feasibility Study that will explore future recreational use (see **Section 5.6**)*

### Motivation & Opportunities

The use of the dam must benefit the community at large and enable equitable use. Opportunities for community beneficiation need to be explored.

### Key Considerations & Possible Constraints

Key areas for potential beneficiation may include (amongst others):

- Tourism;
- Environmental education;
- Biodiversity management; and
- Rehabilitation and management of alien vegetation.



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Feasibility Study to explore community beneficiation from Spring Grove Dam	Documented Feasibility Study & Implementation	01/10/15	02/05/16						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA

### 5.13 INTERVENTION NO. 13: Implement and Maintain Aids to Navigation and Demarcation Markers

#### Motivation & Opportunities

In addition to its common law responsibility, DWA is, in terms of the requirements described in the National Water Act, Act No 36 of 1998, amongst others, responsible for the safety of Government's waterways and watercourses, including its dams. DWA, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide and maintain the required fixed and/or floating Aids to Navigation<sup>1</sup> (AtoN) for general navigation. In addition to the DWA, 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 and maintained after obtaining the necessary support from DWA and thereafter the permission by SAMSA.

In order to demarcate specific zones/areas, standardised demarcation markers are to be used in conjunction with the relevant AtoN.

#### Key Considerations & Possible Constraints

AtoN are expensive to obtain, deploy and maintain. It also requires very specific resources, both human and otherwise, to maintain these to the required standard. Provision would have to be made to ensure that AtoN are deployed and maintained.

Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Undertake site visits to identify areas and features of interest and areas which pose danger to vessels. Decide which areas should be made available for recreational usage and which areas should have limited, or no access by the public. Compile AtoN plan, indicating where, what type of fixed, floating AtoN and demarcation markers should be positioned	Site visits undertaken Initial AtoN Plan	To be confirmed							<ul style="list-style-type: none"> <li>• SAMSA</li> <li>• DWA</li> <li>• DEA</li> <li>• SAPS</li> <li>• Local community</li> </ul>	Various Departments' mandate
Obtain the best position to locate the AtoN, as well as the relevant coordinates and water depths, where applicable.	Surveys completed Final AtoN Plan								<ul style="list-style-type: none"> <li>• DWA</li> <li>• SAMSA</li> </ul>	
Conclude agreements between SAMSA and DWA/other relevant Parties/Bodies to allow: <ul style="list-style-type: none"> <li>• Exhibit the relevant AtoN</li> <li>• Establish or deploy the relevant fixed and/or floating AtoN</li> </ul>	Signed agreements in place								<ul style="list-style-type: none"> <li>• SAMSA</li> <li>• DWA</li> <li>• Relevant Parties</li> </ul>	

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

## 5.14 INTERVENTION NO. 14: Develop a Management and Enforcement Programme for the Fish Barrier

### Motivation & Opportunities

A Fish Barrier was built at a substantial cost to prevent the smallmouth bass (downstream) from mixing with the trout population (upstream), as the former will out-compete the other species and impact on the existing trout-fishing industry.

### Key Considerations & Possible Constraints

- Management guidelines will need to be implemented to prevent negligent stocking of the watercourse upstream of the Fish Barrier with bass, as this may nullify the Fish Barrier's intentions.
- No activities / development may jeopardise the intention of these structure.
- The structure serves as an instream obstacle to recreational use.
- The use of the impoundment behind the Fish Barrier needs to confirm to the relevant regulatory requirements.



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Provision of a Wash Bay	Functional Wash Bay system	12/01/15	30/04/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA
Enforcement audits	Documented audits	01/05/15	Ongoing							

## 5.15 INTERVENTION NO. 15: Erosion Control and Monitoring Programme

### Motivation & Opportunities

Erosion can be caused by various factors, such as fluctuating water levels, uncontrolled access to the shoreline area, runoff from areas with poor vegetative cover, water facilitated erosion at civil components (e.g. concrete structures, weirs, embankments), etc.

### Key Considerations & Possible Constraints

- Ease of access to all areas
- Risk to infrastructure
- Siltation of watercourse



Action Item	KPI	Start Date	Target Date	Budget					Roles & Responsibilities	Funding sources
				2014/15	2015/16	2016/17	2017/18	2018/19		
Develop an Erosion Control and Monitoring Programme	Functional programme & Implementation	12/01/15	30/04/15						<ul style="list-style-type: none"> <li>▪ DWA</li> <li>▪ DMC</li> </ul>	DWA

## 6. CONCLUSIONS

The need for a RMP varies according to the party who initiated the process and the context of the water resource in terms of its location, opportunities and constraints. This is reflected in the types of interventions that are identified during the culmination of the RMP process once the encumbrances, environmental profile, management aspirations and all other relevant factors are evaluated and strategically interpreted.

This document presents the final deliverable produced as part of the RMP development process. Once the RMP is reviewed, accepted and gazetted the Business Plan provides the interventions that need to be implemented to address the prioritised management objectives for Spring Grove Dam. The interventions remain relatively undetailed and would need to be sufficiently elaborated on through Terms of Reference, implementation plans or other suitable means. This is especially the case for those interventions that are less self-

explanatory or uncommon when considering the normal operations of a dam.

It should be kept in mind that unlike most other RMPs that were previously developed for national dams, this management plan is for a new dam (impoundment underway at the time when this report was being developed). The RMP for Spring Grove Dam is thus more centred on preventative and proactive management and application of best practices, as opposed to dealing with historic problems.

All parties must be encouraged to seek the necessary funding well in advance to implement the plan. The DMC must play a critical function in terms of monitoring and evaluating the implementation of the BP, in accordance with the predetermined KPIs. All parties must be held account for their performance in terms of the BP.



## APPENDIX A

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### SITE-SPECIFIC REQUIREMENTS FOR BIODIVERSITY MANAGEMENT

## SITE-SPECIFIC REQUIREMENTS FOR BIODIVERSITY MANAGEMENT AT SPRING GROVE DAM

Note: *This feedback was received from the ecological specialists that were involved in the search, rescue and relocation efforts during the construction phase of the dam.*

### 1) Monitoring

- Annual monitoring for rodents – compile list.
- Invite local birding group to visit the areas a couple of times a year for a few years and submit a bird list.
- Conduct monitoring mid-spring to check survival rate of species at created habitat areas. Repeat once a year for the next three years.
- Chameleon enthusiasts to check for chameleons once or twice a year and to document findings.
- Trampling and browsing damage to trees caused by cows near the centre pivot, to be checked in spring once the kikuyu "greens up" and observations to be recorded.

### 2) Management Actions

- Plots to be mown at least once a year to keep fuel load down (especially in plot where there is kikuyu) and control invasive alien species.
- Weed eaters not to be allowed in the plots as this could easily result in the ring-barking of the trees.
- Careful use of registered herbicides by adequately trained persons to control weeds, especially in the areas between the tree clumps, is an option if the cutting does not prove to be adequate for effective control of invasive alien plants.
- Maintain fire breaks around the plots to prevent the trees being burnt for at least the following three years.
- Signage to be displayed and if necessary a barrier to be erected around the plots to prevent vehicles of any kind driving through or over the plots.

- Action to be taken to prevent the on-going browsing and trampling of the trees on the plot near the centre pivot by the cows in the basin.

### **Important**

- Monitoring results and management actions to be presented regularly to appropriate forum responsible for biodiversity management at the dam. Decisions taken to be recorded together with the persons responsible for the actions where necessary and time frames provided.
- Biodiversity monitoring and management to be undertaken by an appropriately trained / competent person who will assume accountability for effective and efficient management of this area.