

**RAPTORS VIEW HOME OWNERS ASSOCIATION
(RVHOA)**

**S24G RECTIFICATION APPLICATION ASSESSMENT AND
MANAGEMENT PLAN**

FOR THE

***CONSTRUCTION OF A DAM AND ATTENUATION PONDS
IN THE RAPTORS VIEW WILDLIFE ESTATE REMAINDER
OF PORTION 1 OF THE FARM HAPPYLANDS 214 KT***

LEDET REF: (12/1/9/S24G-M11)

April 2014

DRAFT REPORT



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1 INTRODUCTION

This document presents the Environmental Assessment and Environmental Management Plan (EMP) for the Raptors View (RV) that consist of the following property located directly to the south of Hoedspruit town and the R527, to the west of farm Welverdiend (243 KQ) and east of the farm Grovedale (239 KQ). Tellurian Environmental were appointed by the Raptors View Home Owners Association (RVHOA) to conduct an S24G Rectification Application and Environmental Assessment for the construction of a dam wall in the drainage line emanating from the storm water runoff from the town of Hoedspruit and upstream of the Sandspruit River. Small attenuation ponds upstream of the dam have also been constructed outside the drainage line. These ponds are used to attenuate grey water and storm water leaving the school grounds. The dams were constructed using a combination of materials, including sands, stone, gabion structures and relatively small amounts of concrete. The sizes of these structures is approximately 0.043 ha attenuation pond and 0.21 ha dam. The reference number for the S24G rectification application for the construction of the dam is 12/1/9/S24G-M11.

These have been constructed without prior environmental authorisation. However the Raptors View Wildlife Estate has been developed with an environmental authorisation in place. The original estates authorisation was issued under ECA (1989). The Record of Decision (RoD) is dated 25/08/2001 with the reference number: 16/1/10/3-27.

The unauthorised building of the dam and attenuation ponds was registered with the Limpopo Department of Economic Development, Environment and Tourism (LEDET) under the National Environmental Management Act (Act 107 of 1998) and the National Environmental Management Amendment Act (8 of 1004), Environmental Impact Assessment Regulations 2006. Since 2006 the Environmental Impact Assessment Regulations changed, however this unauthorised activity was committed before the coming into effect of the 2010 NEMA Regulations. The activities undertaken are listed activities in terms of Government Notice R386 of 21 April 2006. The following Activities will required rectification:

Table 1: List of activities relevant to this rectification application

Regulation	Activity No	Description of Activity
GN R. 386 of 21 April 2006	1 (m)	The construction of facilities or infrastructure, including associated structures or infrastructure, for: (m) any purpose in the one and ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use but including – (i) canals (ii) channels; (iii) bridges; (iv) dams, and: (v) weirs;
GN R. 386 of 21 April 2006	4	The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, instream dam, floodplain or wetland.

1.1 Legal Requirements of the Development

The environmental component of the project will strive to comply with the following legal requirements:

- The constitution of South Africa, 1996 (Act 108 of 1996);
- The National Environmental Management Act, 1998 (Act 107 of 1998);
- The Environmental Conservation Act, 1989 (Act 73 of 1989);
- The National Water Act, 1998 (Act 36 of 1998).

1.2 Environmental and Social Impact Assessment

Environmental impact assessment (EIA) methods were developed to: (1) identify the potential impacts of the development on the environment; (2) predict the probability of these impacts and (3) evaluate the significance of the potential impacts.

The methodology used by Tellurian is as follows:

The <u>status</u> of the impact		
Status	Description	
Positive:	a benefit to the holistic environment	
Negative:	a cost to the holistic environment	
Neutral:	no cost or benefit	
The <u>duration</u> of the impact		
Score	Duration	Description
1	Short term	Less than 2 years
2	Short to medium term	2 – 5 years
3	Medium term	6 – 25 years
4	Long term	26 – 45 years
5	Permanent	46 years or more
The <u>extent</u> of the impact		
Score	Extent	Description
1	Site specific	Within the site boundary
2	Local	Affects immediate surrounding areas
3	Regional	Extends substantially beyond the site boundary
4	Provincial	Extends to almost entire province or larger region
5	National	Affects country or possibly world
The <u>reversibility</u> of the impact		
Score	Reversibility	Description
1	Completely reversible	Reverses with minimal rehabilitation & negligible residual affects
3	Reversible	Requires mitigation and rehabilitation to ensure reversibility
5	Irreversible	Cannot be rehabilitated completely/rehabilitation not viable
The <u>affect</u> (severe or beneficial) of the impact		
Score	Severe/beneficial effect	Description
1	Slight	Little effect - negligible disturbance/benefit

2	Slight to moderate	Effects observable - environmental impacts reversible with time
3	Moderate	Effects observable - impacts reversible with rehabilitation
4	Moderate to high	Extensive effects - irreversible alteration to the environment
5	High	Extensive permanent effects with irreversible alteration

The probability of the impact

Score	Rating	Description
1	Unlikely	Less than 15% sure of an impact occurring
2	Possible	Between 15% and 40% sure of an impact occurring
3	Probable	Between 40% and 60% sure that the impact will occur
4	Highly Probable	Between 60% and 85% sure that the impact will occur
5	Definite	Over 85% sure that the impact will occur

The Consequence = Severity + Spatial Scale + Duration + Reversibility.

The Significance = Consequence x Probability.

The rating is described as follows:

Score out of 100	Significance
1 to 20	Low
21 to 40	Moderate to Low
41 to 60	Moderate
61 to 80	Moderate to high
81 to 100	High

Will **mitigation** be possible (yes or no).

Finally the negative impacts are rated according to the **degree of loss of a resource** due to the particular impact. This is only assessed from the pre-mitigation perspective of the impact. The degree of loss of a resource is evaluated in terms of:

- **Low degree of loss:** where the resource will recover on its own with no/limited rehabilitation over an observable period of time;
- **Moderate degree of loss:** where the resource will recover over extended period or with rehabilitation or remedial measures to assist recovery of resource; and
- **High degree of loss:** Where the resource cannot be recovered, or the resource will recover over extended time periods.

2 METHODOLOGY

This report has been compiled to ensure that NEMA EIA and EMP requirements are met.

3 APPLICATION DETAILS

3.1 Details of Applicant

3.1.1 Contact Details

Name of Company: Raptors View Home Owners Association

Name of Project: S24G Rectification for a dam built in the Raptors View Wildlife Estate

Postal Address: PO Box 1502
Hoedspruit
Limpopo

Telephone: 015 793 0267

Fax Number: 0866 840 514

Responsible Persons: Hugh Marshall

E-mail: rvhoa@mweb.co.za

3.2 Details of Environmental Practitioner

Name of Company: Tellurian Environmental (Pty) Ltd

Postal Address: Postnet #405
Private Bag X43
Sunninghill
2157

Physical Address: Unit D1 Knightsbridge Manor
33 Sloane str
Bryanston
2157

Telephone: 011 267 2620

Fax Number: 086 667 1720

Responsible Persons: Janavi Jardine

E-mail: janavi@tenv.co.za

3.2.1 Owner of the Land

The applicant owns the affected properties and contact details are as above.

4 LEGAL REQUIREMENTS OF THE PROPOSED DEVELOPMENT

Environmental Impact Assessment process, which includes a draft Basic Assessment Report and Final Report, is required by legislation. The process ensures that all relevant information is presented in order to facilitate good management decision-making. The legislations that require development projects to undergo through the S24G Rectification Application Process are:

- National Environmental Management Act (act 107 of 1998) as amended: This Act requires that the report concerning the impact of the construction of the dam wall on the environment must be prepared. These activities are listed in Government Notice R386, 21 April 2006. Please note that although there are new Regulations (NEMA 2010) the proposed project falls under the NEMA 2006 Regulations as the activity commenced during the period of the NEMA 2006 Regulations.
- Therefore the processes followed are as per the NEMA 2006 Regulations and not the NEMA 2010 Regulations.
- Constitution of the Republic of South Africa (Act 108 of 1996): Section 24(b)(i) encourages prevention of pollution and ecological degradation. Section 24(b) (iii) promotes ecologically sustainable development.
- The National Water Act (Act No 36 of 1998).

The following policies and guidelines were consulted:

- From the NEMA Environmental Impact Assessment Regulations Guideline and Information Document Series the following guidelines were used:
- Guideline on Public Participation in the Environmental Impact Assessment Process (October 2012)
- Draft Guideline on Need and Desirability in Terms of the Environmental Impact Assessment (EIA) Regulations, 2010 (October 2012)
- Guideline on Alternatives (August 2010)

5 ENVIRONMENTAL ASSESSMENT PROCESS

Environmental Impact Assessment was undertaken in terms of a S24G Rectification Application process that consists of three main phases. The phases of this process are the Application and Authorization Phase, Draft Report and Final Report phase.

5.1 Application and Authorisation

Terra Nova Conservation Services submitted a S24G Rectification application to the Limpopo Department of Economic Development, Environment and Tourism (LEDET) on 5 April 2014 after which authorisation was received from LEDET to proceed with the S24G process (17 April 2014), LEDET Ref: 12/1/9/S24G-M11.

5.2 Draft BAR Phase

The draft report is a requirement by EIA legislation in applying for authorization with LEDET. The study involves public consultation, gathering of information to identify potential impacts to the environment and possible alternatives to the development and compiling of a plan for EIA. This is the draft report and will be submitted to LEDET and registered I&APs.

5.3 Final BAR Phase

The Final BAR Phase will include the integration of the findings by specialists and the outcome of the draft process in order to enable documentation of one report. During this phase issues raised by the I&APs will be addressed and all issues and mitigation measures will be discussed. A detailed Environmental Impact Assessment will be done to determine the extent of the impacts the dam and attenuation ponds may have had on the environment and the surrounding community. A detailed Environmental Management Plan will also be included in this phase.

6 DETAILED PROJECT DESCRIPTION

6.1 Location of site

The Raptors View Wildlife Estate (RVWE) is located adjacent to the town of Hoedspruit in the Mopani district, in the Maruleng Municipality Limpopo Province. The site is situated close to the R527 just past Hoedspruit. Please see Table 2.

Table 2: Distance and direction to surrounding towns from the RVWE

Direction	Town	Distance
North East	Phalaborwa	49.4 km
West	Polokwane	159.2 km
South	Hazyview	80.6 km

6.1.1 Local setting (Plan 1)

The property where the dam wall and attenuation ponds have been constructed is located directly to the south of Hoedspruit town and the R527, to the west of farm Welverdiend (243 KQ) and east of the farm Grovedale (239 KQ) (Table 3).

Table 3: Location of Property

Farm	Size/ha	Member
Remainder of Portion 1 of the Farm Happylands No. 241, Registration Division K.T.	1017	Raptors View, a company incorporated in accordance with the provisions of Section 21 of the Companies Act

6.1.2 Current Land Use on Site

The current land use on the property is a Wildlife Estate with the Southern Cross Primary School and High School on the property.

6.1.3 Land Use of Immediately Adjacent Land

Land use of the adjacent area is wilderness and some homesteads. There is also land that is informally protected surrounding the site. Immediately north of the site is the town of Hoedspruit.

6.1.4 Servitudes

The R527 tarred provincial road which joins the Klaserie rd (R40) that links Hoedspruit to Phalaborwa passes the Raptors View Wildlife Estate to the north and east respectively. Various other gravel district roads criss-cross the wildlife estate area.

6.2 Nature of Activity

The guiding principles for the management of the Raptors View Wildlife Estate are summarised below. These are used as a tool when it comes to the proper management of the constructed dam and attenuation ponds. These structures have been implemented in line with the vision for the sound ecological management of the estate. Therefore the construction of the dam has been undertaken according to the management principles for the rest of the estate. The dam and attenuation ponds were constructed in order to attenuate storm water emanating from the town of Hoedspruit and to prevent downstream pollution in case of accidental spillages of the upstream Waste Water Treatment Works (WWTW) collection reservoir.

The guiding principles for the RV wildlife estate are as follows:

- Management will be aimed at realising well-defined objectives;
- An adaptive management approach will be applied;
- The aspect of „scale“ is of paramount importance and lessons from the much larger Kruger National Park and surrounding protected areas can not necessarily be directly translated to RV. The author has experience on similar sized properties in the Hoedspruit area;
- Thresholds of Potential Concern“ (TPC“s) should be developed for species, communities and systems as upper and lower level indicators for monitoring;
- The policy will not necessarily be one of “back-to-nature“ as conditions may have permanently changed thereby making such an endeavour near impossible or irrelevant;
- The distribution of permanent water should be addressed in a sensitive manner towards achieving ecological objectives whilst minimising potential negative impact on individual owners;
- Zonation should where possible be used to allow for maximum diversity of use and experience.

6.3 Water Use License Applications

The Integrated Water Use License Application (IWULA) and a Technical Document regarding the Management of the dam and attenuation structures will be compiled to address all aspects as required by DWA and will also include the Best Practice Guidelines management measures to ensure that the water resources are protected. These will be submitted to DWA and a site visit will be conducted in order to finalise the requirements for the Water Use License.

The relevant applications will be made to the Department of Water Affairs (DWA) in terms of Section 21 of the National Water Act (NWA 36 of 1998). The following water uses are triggered by the operation:

- Section 21 (c) – Impeding or diverting the flow of water in a watercourse.
- Section 21 (i) – Altering the bed, banks, course or characteristics of a water course.

6.4 Water Supply from the Dam and Attenuation Ponds

The dam is storing storm water that is emanating from the town of Hoedpsruit. This water may accidentally be contaminated with sewage that may have leaked from the towns Waste Water Treatment Works (WWTW) reservoir upstream of the dam. This potentially polluted storm water may contain low concentrations of hydrocarbons and other chemicals from the urban areas. The potential for sewage entering the water in the dam is likely during high rainfall periods when the WWTW may overflow or if leaks are experienced. If this water and sewage enters the dam it will be prevented from moving further downstream and contaminating the larger dam downstream as well as the Sandspruit below this dam.

6.5 Project Phases

The project can be divided into three phases, namely the operational phase, decommissioning phase and the post closure phase.

6.5.1 Construction Phase

The construction phase is not relevant as the dam and attenuation ponds have already been built. This will require the rectification application.

6.5.2 Operational Phase

The dam is currently operational and all operational aspects will be assessed in terms of S24G of NEMA Amendment Act (8 of 2004).

6.5.3 Closure/Decommissioning Phase

The dam is a permanent structure and is not planned for decommissioning or closure. This is due to the important role that dam plays in erosion control, storm water attenuation and grey water re-use.

7 DESCRIPTION OF AFFECTED ENVIRONMENT

All proposed activities will take place within the footprint of the wildlife estate. Below is a summary of the current environmental status for the area in general and more specifically for the dam. General descriptions are given and only sensitive issues have been discussed in greater detail. The NEMA photographs taken in the 8 cardinal directions are available in Appendix B.

7.1 Climate

Rainfall, in that it influences soil moisture and nutrient availability to plants, is a major factor in determining variation in the structure and composition of savannas. Rain is principal determinant influencing vegetation in that it determines the amount of soil moisture available to the plant. Soil moisture dynamics are in turn influenced by:

- The total amount and seasonal distribution of the rainfall which in combination with nutrients, especially nitrogen and phosphorous, determine the organic matter production and plant quality;
- The water holding capacity of the soil, which is a function of soil texture and depth; and
- The amount of evapotranspiration, which is related to the climate, soil texture, surface characteristics and vegetation type.

Precipitation in the survey area is low and erratic, characteristic of semi-arid savannas: a hot, wet season of 5-7 months (October to April) and the remainder of the year being dry. The vegetation is under moisture stress which is generally severe and of long duration. Rainfall, including total amount, distribution over a season, runoff, infiltration, storage in the soil profile, evaporation from the soil surface, uptake and transpiration, is important in determining the nature of the vegetation of an area.

The mean annual rainfall for RV, taken from gauges in the area is 477mm (21y).

7.2 Temperature

RV has hot summers and mild to cold winters. Summer temperatures range between 18°C and 45°C while winter temperatures range between 8°C and 23°C. The mean highest monthly temperature is around 40°C while the lowest mean minimum temperature is around 0°C.

7.3 Geology

7.3.1 Regional Geological Setting

Geologically, the study area is dominated by ancient granitoid rocks of Swazian and Randian age, which are grouped together as Basement complex. The majority of rocks in the Basement complex can be classified as gneiss, granite or migmatite (ARC 2011).

The rock type distinguished in the gneisses of the Swazian basement complex on RV is dominated by the Makhutswi gneiss complex (described as biotite gneiss in this area).

7.4 Topography

Altitude on RV is on average around 500 meters above sea level (m.a.s.l.).

7.5 Soils and Land Capability

In semi-arid regions there is usually a good correlation between geological formation, soil type and vegetation type. This implies that the soil and parent rock from which the soil is formed exercise a strong influence on grazing management.

Soil affects the supply of water and nutrients to the plant. The soil moisture regime, a primary determinant of savannah dynamics and by extension vegetation composition, is influenced by four factors other than the pattern and amount of rainfall namely, infiltration, percolation, root extraction and evaporation.

The role that soils play in determining vegetation patterns is vital. Land type Fb covers RV and is dominated by Glenrosa and/or Mispah soil forms (other soils may occur). This group includes pedologically young landscapes that are not principally rock, alluvial or aeolian and where the dominant soil forming processes have been rock weathering, the formation of orthic topsoil horizons and clay illuviation giving rise to lithocutanic horizons. Lime is rare or absent in the upland soils but is widespread in the bottomland soils. Lime has been used to indicate the extent to which the landscapes have been leached. Some landscapes have no lime, but soluble salt accumulations occur.

7.6 Surface Water

The major river (annual) within RV is the Sandspruit/Moditlo. The Sandspruit/Moditlo enters the reserve in the east and meanders in a westerly direction where it exits the reserve from Happyland into Grovedale. The Sandspruit/Moditlo joins the Rietspruit north of the Hoedspruit tar road and eventually drains into the Blyde River.

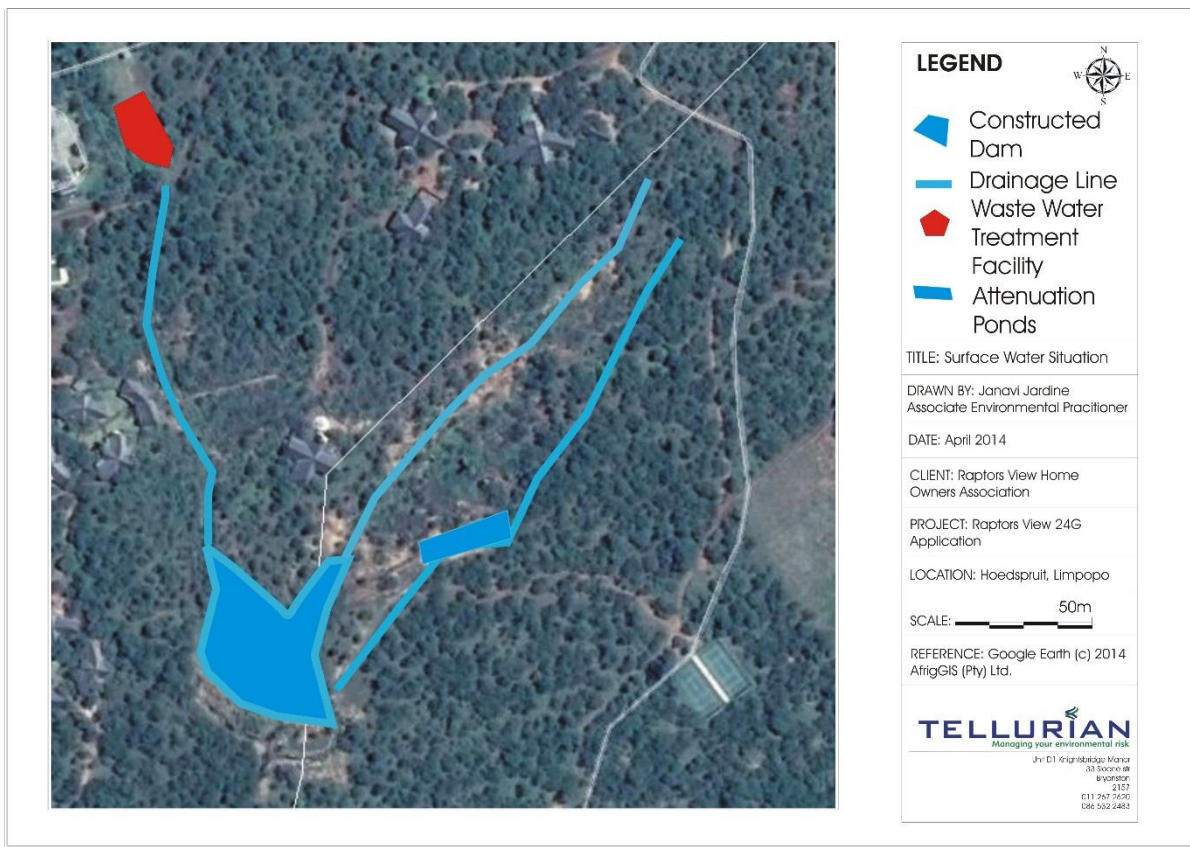


Figure 2: Surface water Situation

The construction activities have taken place on the property which falls under the B60J quaternary catchment within the lower Olifants catchment. This includes the Sandspruit and confluence with the Rietspruit and Qunduhlu rivers. The Blyde River has confluence with the Olifants and releases from the Blyderivierpoort Dam (DWA, 2011). These river systems within this quaternary catchment has an overall high ecological importance and a moderate ecological sensitivity and is classed as having a Present Ecological State (PES) of B, meaning that these systems are have experience small modifications to their hydrological integrity.



Plate 1: Photographs of water drainage and attenuation structures on site

The drainage line where the dam has been constructed enters the Sandspruit downstream of the dam. This is mostly made up of storm water emanating from the town of Hoedpsruit and from various infrastructural components. The attenuation ponds along the drainage line feeding into the dam attenuate grey water and storm water emanating from the school grounds. These are both being attenuated and prevented from entering the Sandspruit which is downstream of these structures. In this way, these structures are preventing polluted storm and grey water from entering the major river systems. The water collected in these structures is then used for irrigation on the schools sports fields. In emergencies, and in the event of a flood, the Waste Water Treatment Works can potentially overflow. This is also attenuated in this dam. However this water is measured for increased levels of faecal coliforms. If there is evidence of faecal coliforms at unacceptable levels, the water is not used for irrigation.

7.7 Flora

According to Mucina & Rutherford (2011), the vegetation unit of this area is SVI 3 Granite Lowveld. This is distributed in Limpopo and Mpumalanga Provinces as well as Swaziland and some of Northern Natal. Specifically, this vegetation type occurs in a north-south belt on the plains east of the escarpment from Thohoyandou in the north, uninterrupted in the Bolobedu area, with a southwards extension towards Abel Erasmus Pass, Mica and Hoedpsruit to the east of Bushbuckridge. See Table 4 below for a list of plant species likely to occur on site.

Table 4: Typical vegetation in the Mafikeng area

Vegetation type	Important taxa
Small trees	<i>Acacia nigrescens</i> , <i>Sclerocarya birrea subsp caffra</i> , <i>Acacia nilotica</i> , <i>Albizia harveyi</i> , <i>Combretum apiculatum</i> , <i>C. imberbe</i> , <i>C. zeyheri</i> , <i>Ficus stuhlmannii</i> , <i>Pltophorum africanum</i> , <i>Pterocarpus rotundifolius</i> , <i>Terminalia sericea</i> , <i>Acacia exuvialis</i> , <i>A. gerrardii</i> , <i>Bolusanthus speciosus</i> , <i>Cassia abbreviate subsp beareana</i> , <i>Combretum collinum subsp suluense</i> , <i>Dalbergia melanoxylon</i> , <i>Gymnosporia glaucophylla</i> , <i>Lannea schweinfurthii</i> , <i>Pavetta shumanniana</i> , <i>Plectroniella armata</i> , <i>Terminalia prunioides</i> .
Tall shrubs	<i>Combretum hereroense</i> , <i>Dichrostachys cinerea</i> , <i>Euclea divinorum</i> , <i>Strychnos madagascariensis</i> , <i>Gardenia volkensii</i> , <i>Hibiscus micranthus</i> , <i>Tephrosia polystachya</i> .
Low shrubs	<i>Abutilon austro-africanum</i> , <i>Agathisanthemum bojeri</i> , <i>Aptosimum lineare</i> , <i>Barleria elegans</i> , <i>Clerodendron ternatum</i> , <i>Commiphora africana</i> , <i>Gossypium herbaceum subsp africanum</i> , <i>Pavonia burchelli</i>
Graminoids	<i>Brachiaria nigropedata</i> , <i>Digitaria eriantha</i> , <i>Eragrostis rigidior</i> , <i>Melenis repens</i> , <i>Panicum maximum</i> , <i>Pogonarthia suqrrosa</i> , <i>Aristida congesta</i> , <i>Bulbostulis hispidula</i> , <i>Chloris mossambicensis</i> , <i>Enneapogon cenchriodes</i> , <i>Hereopogon contortus</i> , <i>Leptochloa eleusine</i> , <i>Petoris patens</i> , <i>Schmidtia pappophoroides</i> , <i>Sehima galpinii</i> , <i>Tricholaena monachne</i> , <i>Urochloa mosambicensis</i> .
Herb	<i>Achyranthes aspera</i> , <i>Aspilia mossambicensis</i> , <i>Becium filamentosum</i> , <i>Chamaecrista absus</i> , <i>Commelina benghalensis</i> , <i>C. erecta</i> , <i>Cucumis africanus</i> , <i>Evolvulus alsinoides</i> , <i>Heliotropium strigosum</i> , <i>Hermbstaedtia odorata</i> , <i>Hibiscus praeteritus</i> , <i>Indigofera filipes</i> , <i>I. sanguinea</i> , <i>Kohautia vigata</i> , <i>Kyphocarpa angustifolia</i> , <i>Leucas glabrata</i> , <i>Ocimum gratissimum</i> , <i>Phyllanthus maderaspatensis</i> , <i>Pupalia lappacea</i> , <i>Vahila capensis subsp. Vulgaris</i> , <i>Walheria indica</i> .

The conservation status of the area is considered **vulnerable** according to Mucina and Rutherford (2011) with the target for conservation being 19% and the total conserved areas making up 17% in Kruger National Park. The other conserved areas are in private reserves mainly the Selati Klaserie, Timbavati, Mala Mala and Sabi Sands reserves. More than 20% of this is already transformed by means of cultivation and settlement development. Erosion in these areas is very low to moderate.

8 PUBLIC PARTICIPATION PROCESS (PPP)

8.1 Identifying Regulatory Authorities:

The authorities contacted with regards to this project include:

- The Department of Agriculture and Environmental Affairs;
- The Department of Water Affairs and Forestry (DWA);
- The Limpopo Tourism Vacancy;
- The South African Heritage Resources Agency (SAHRA); and
- The Maruleng Municipality;
- Mopani District Municipality.

A copy of the draft report will be submitted to the authorities listed above.

8.2 Identifying all Interested and Affected Parties (I&AP's):

The public participation process (PPP) for this project was initiated in April 2014. An I&AP database will be compiled by means of identifying land owners and land users within the area of question, as well as responses received from the press advertisements; posters and the BID's circulated. The I&AP database will be made available for the final report.

A process of engagement is followed in order to ensure that all I&AP's are given the opportunity to raise concerns regarding the activity. Consultation with I&AP's takes place by the following means:

8.2.1 Background Information Letter (BID):

A BID notifying registered I&APs of the process was compiled in English and Afrikaans, these were distributed to the I&APs via e-mail, post and fax where possible.

The purpose of the Background Information Document is to:

- Invite members of the public to register as I&APs.
- Identify I&APs.
- Inform them of the current application.
- Initiate a process of public consultation to record perceptions and issues.

A copy of the BID is attached in Appendix C – Annexure 3

8.2.2 Notices & Advertisements:

8.2.2.1 Notices

A2 posters written in English and Afrikaans, informing people of the proposed application, inviting I&APs to register were placed at the entrance to the RV wildlife estate, the Municipal Library and at the Southern Cross School premises.

Copies of the Posters are attached in of Appendix C -Annexure 2.

8.2.2.2

Adverts

Two advertisements were also placed in one local newspaper, English and Afrikaans advertisements were placed in the local newspaper, “Kruger to Canyons” on the 18th of April 2014.

(Please refer to of Appendix C - Annexure 1 for these advertisements).

8.2.3 Document Review

The Draft Report will be submitted to the LEDET for review and comment simultaneously with the I&AP review period. The Report will be made available for public review and comment and all registered I&APs were informed of its availability. I&APs are given forty (40) days to submit their comments to the EAP. A copy of the report will be made available at the Municipal Library, 64 Springbok Street, Hoedspruit. Electronic copies (Adobe PDF) will also be e-mailed through to I&APs who requested a copy in writing. The report will also be made available on the Tellurian website for download (www.tenv.co.za). Furthermore a summary of all comments and concerns raised during the draft review phase will be submitted to the LEDET as an addendum to the final report.

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9 ASSESSMENT OF IMPACTS FROM ALTERNATIVE LAND USES & PROJECTS

9.1 Project motivation (Need and Desirability)

The RVHOA is a wildlife estate with the primary objectives that can be defined in different ways depending on the main emphasis placed on the area. RV was not originally formed with the main objective of conserving a tract of pristine country and its natural biodiversity. Rather, the objective has been one of setting aside a natural area for the enjoyment and benefit of its Owners. The objective of the property is thus aimed at developing and maintaining a quality wildlife residential estate which delivers a product that is more appropriate than the limited agricultural options offered by this harsh natural environment. It has also become apparent that such land use generates superior employment opportunities than that possible through say livestock farming. This is vital in today's prevailing socio-economic conditions.

It is essential that this broad objective is understood and accepted, because this underpins management decisions that may differ from those that would normally be made in a protected area that has the conservation of biodiversity as its primary objective. The following primary and secondary objectives were formulated in consultation with the "RV Home Owners Rules" document.

Under this scenario, where the area is managed mainly for the sustainable use of natural ecosystems, the broad objectives are defined as follows:

- To protect and maintain the biological diversity and other natural values of the area in the long term;
- To protect the natural resource base from being alienated for other land-use purposes that would be detrimental to the areas biological diversity;
- To promote sound management practices for sustainable production purposes;
- To contribute to regional and national development.

It is under these principles that the dam and attenuation ponds were constructed. They are tools to properly manage the water resources and the interactions of the water with the residents of the estate. They are also a low cost and low impact means to prevent downstream water pollution and erosion on the estate.

The dams and attenuation ponds also provide water for animals in places and for periods which are to approximate as closely as possible the natural past distribution of water without having a dramatic negative impact on the hydrology and consequent ecology of the reserve and to maintain natural water bodies in such a condition so as to support the naturally occurring species linked to such bodies.

9.2 Alternatives Assessment

Due to the fact that the dam and attenuation ponds have already been constructed and this report is in aid of a S24G rectification application, the alternatives have not been assessed.

10 ENVIRONMENTAL IMPACT ASSESSMENT

Table 23 indicates all the impacts that can be expected from the various activities and sub-activities during the various phases of the project associated with the construction of the dam. The table also indicates the significance of the impacts, the management measures to mitigate negative impacts, and monitoring that would be required to detect potential impacts. The Environmental Impact Matrix assessing all of the current and potential impacts and their proposed mitigation measures is attached in Appendix G of this report.

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11 CUMULATIVE IMPACTS

11.1 Topography

The topography has experienced minimal alteration as a result of the construction of the dam and attenuation ponds. This is because the dam is small in size at an approximate size of 0.12 ha and the attenuation ponds at an approximate size of 0.043 ha. This may slightly alter the function of the topography in terms of the drainage lines and their function in the landscape. The impact is negative, site specific, definite and of low significance.

11.2 Soils

The disturbance of the soil may result in erosional impact as well as disturbance of the seed bank within the soil. Thus eliciting the growth of alien invasive species and the potential loss of indigenous species within the seed bank. The cumulative impact on soils surrounding these structures is negative, local, definite and of very low significance due to the limited size of the dam.

11.3 Surface Water

11.3.1 Surface Water Quantity

The changes in surface water quantity will alter the downstream component of the water course being affected by the construction of the dam in that it will decrease water flowing downstream and will decrease water supply to the lower reaches and users downstream. It will also prevent any polluted water from entering the lower reaches of the water course.

The changes will also alter the immediate upstream component of the water course being affected in that it will increase sedimentation and water quantity in the immediate upper reaches of the water course. This may alter the biodiversity of the water body. The impact is negative, site specific, probable and of low significance.

11.3.2 Surface Water Quality

Siltation of the dam and the slowing of the upper reaches of the water course immediately upstream of the dam will have a positive impact on surface water quality for the downstream reach of the water course. Contamination of water quality to the surrounding areas will therefore be non-existent if any leaks should occur from the municipal WWTW reservoir or if excessive pollution is received from the storm water emanating from the town of Hoedspruit. Accidental spills and leaks or failure during floods will result in dilution and will minimise impacts. The impact is positive, site specific, probable and of low significance.

11.4 Vegetation and Fauna

The construction of the dam has resulted in the removal of some flora from the immediate area and the alteration of the biodiversity of the immediate area. The impacts that are

associated with the accidental release of nutrient rich water from the WWTW will increase the growth of an artificial wetland upstream of the dam. This is due to the attenuation of this nutrient rich water in this area. This may alter the hydrology and vegetation patterns of this landscape. Impacts to flora within the immediate area is considered low. The impact is negative, local, definite and of low significance.

Impacts to flora will result in impacts on the fauna dependent on that flora for food and shelter and therefore the impacts extend to fauna. The cumulative impacts on fauna are of low significance as very few wild species will be affected by a dam of this small size. The impact is negative, local, possible and of low significance.

11.5 Health and Safety

There is a significant potential for health and safety risks associated with the dam and attenuation ponds. The potential for flooding and breaching of the dam require permanent vigilance.

The potential risks include overtopping of the embankment below at the base of the dam, potential collapse of the dam wall during flood events and possible flooding of lower reaches of the stream. This will be exacerbated further downstream as there is a cluster of homes along the dam as the base of the hill. These homes may be impacted if the constructed dam overflows or breaches. The cumulative impacts are negative, low, definite and of low significance.

12 KNOWLEDGE GAPS

12.1 Surface Water

12.1.1 Knowledge Gaps

Water quality will need to be assessed on a regular basis in order to assess the health of the water being collected in the dam.

13 ENVIRONMENTAL OBJECTIVES

Environmental objectives are broad goals to guide the environmental management plan and ensure activities proceed in an environmentally responsible manner. The objectives take into account the various legislation regarding the environment.

13.1 Mitigation and Management Objectives

The objectives of the mitigation and management plan as set out in the document are to:

- Primarily pre-empt impacts and prevent the realisation of these impacts -PREVENTION. However in the case of a S24G rectification application, the prevention of impacts is not possible.
- To ensure activities that are expected to impact on the environment are undertaken and controlled in such a way so as to minimise their impacts – MODIFY and/or CONTROL.
- To ensure a system is in place for treating and/or rectifying any significant impacts that will occur due to the proposed activity – REMEDY.
- Implement an adequate monitoring programme to:
 - Ensure that mitigation and management measure are effective.
 - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
- Reduce duration of any potential negative impacts

13.2 Environmental Objectives and Goals

Environmental objectives are to:

- Protect the biophysical environment as far as possible
 - Minimise impacts to the biophysical environment.
 - Ensure relevant legislation in National Environmental Management Act is applied on site including but not limited to alien invasive management and protection of ecologically sensitive species and environments.

- Protect the water resources in the area
 - Ensure relevant legislation regarding the National Water Act are applied on site.

13.3 Socio-economic Objectives and Goals

The social objectives are:

- Ensure that the following is adhered to when implementing maintenance and rehabilitation construction work:
 - Employment strategies and opportunities
- Provide a safe environment for people to work in and:
 - Ensure safety policies are established on site in line with national policy.
 - Ensure adequate PPE for staff, contractors and visitors to the site.
- Provide a safe environment for people to live in by ensuring environmental objectives are followed.
- Provide open and transparent communication opportunity with all I&APs.

13.4 Historical and Cultural Aspects

- Ensure South African Heritage Resources Act (SAHRA) principals are applied with regard to all archaeological and cultural artefacts/sites.
- Ensure any relocation of culturally sensitive sites is done according to SAHRA principals, in a socially sensitive manner and with open and transparent communication with relevant I&APs.

14 MONITORING PROGRAMME AND REPORTING

A detailed monitoring programme and associated action plans for the site are indicated in Table 6 which includes timeframes required for monitoring, the action plans related to monitoring findings and the responsible person on site for monitoring activities. Also included are the estimated costs involved in monitoring activities and where possible the action plans. The main environmental aspects which need to be monitored during operational life of the dam and attenuation ponds have been described below. An Environmental Management Plan (EMP) is attached Appendix F.

14.1 Surface Water Monitoring

14.1.1 Water Quality Monitoring and Reporting

- The environmental or estate manager will ensure that surface water quality is monitored on a six monthly basis.
- This monitoring programme will include various upstream and downstream monitoring points and various sources on site as indicated in Figure 3.
- Database of results will be maintained by the environmental or estate manager and quarterly and annual reports will be compiled and submitted to the Home Owners Association management and will form part of the public domain. These reports will be submitted to DWA annually.
- All samples will be submitted to an accredited laboratory for analysis.
- The following chemical parameters are recommended for the analysis, but any additional parameters as included in the IWUL will also be included:
 - Total Dissolved Solids / Electrical Conductivity;
 - pH level;
 - Ammonia;
 - Nitrates; and
 - Faecal coliforms.

This water monitoring component can be incorporated into the six monthly monitoring programme for the entire wildlife estate that is currently being implemented by the ARC. The water quality monitoring will be conducted on the following three locations, upstream of the dam, in the dam and downstream of the dam. The attenuation ponds will not require monitoring as there is no risk for faecal coliforms as they are not downstream of the WWTW. Their function is to attenuate storm water and store grey water.

The co-ordinates for each proposed monitoring point are listed in Table 5.

Table 5: Locations of Proposed Surface Water Monitoring Points

Surface Monitoring Point	Co-ordinate
Upstream of dam	24°21'39.52"S

	30°56'56.09"E
The dam itself	24°21'41.12"S 30°56'55.94"E
Downstream of dam	24°21'43.27"S 30°56'55.41"E

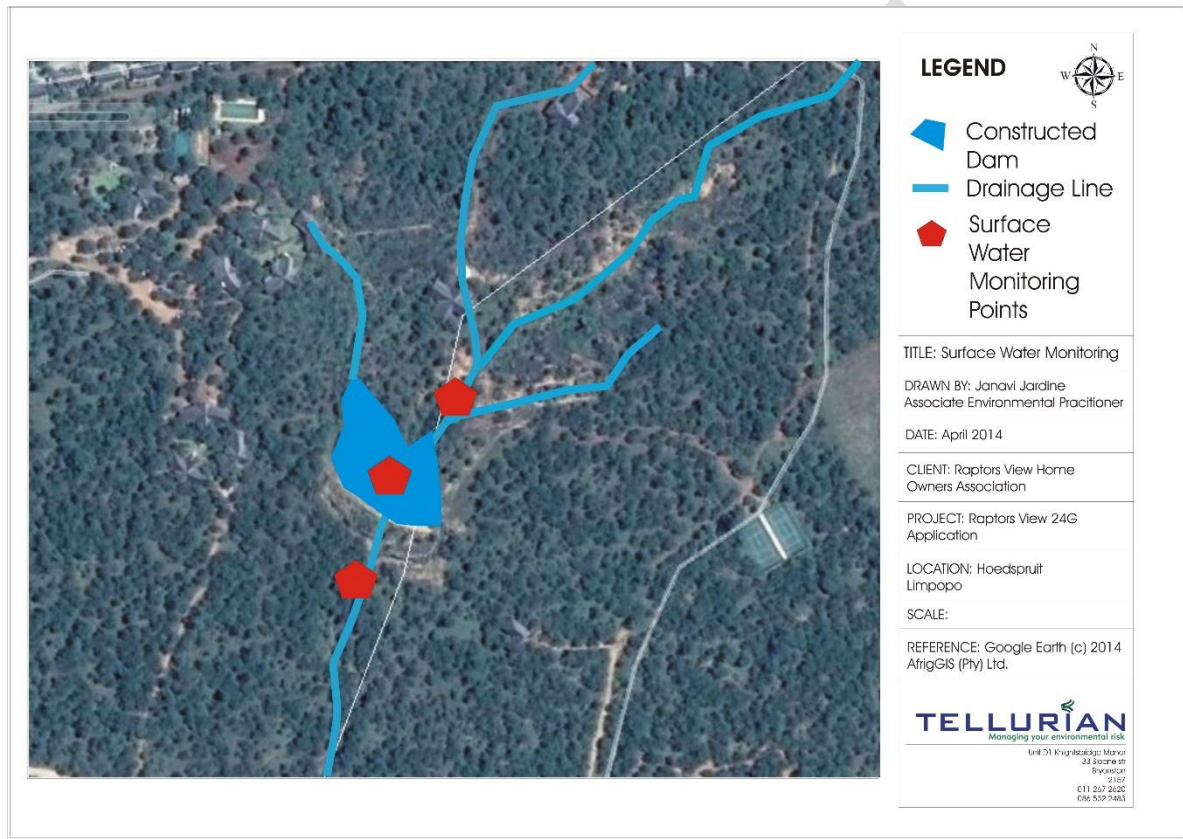


Figure 3: Surface Water Monitoring Points

14.1.2 Action required

- All water management features on site need to be inspected for erosion, which needs to be repaired immediately.
- Any issues observed will be reported to the environmental manager and respective site manager.
- Issues will be addressed immediately.
- Any large spills/leaks/dam failures will be attended to as an emergency.

14.2 Rehabilitation: Soil and Vegetation Monitoring

14.2.1 Monitoring and reporting

- Rehabilitation will be visually inspected at least monthly with regards to vegetation cover abundance.
- The area surrounding the dams will be inspected weekly for general erosion.
- Inspect area for erosion and pooling at least after rainfall.
- Floral surveys will be conducted on rehabilitated areas on an annual basis by the site manager or environmental manager. The area surrounding the dam and attenuation ponds will be inspected for alien invasive vegetation every 6 months by an environmental or ecological specialist. This will, however, be dependent on the species of alien invasive species on site.

14.2.2 Action required

- Should any erosion be observed on site, it will be reported to the site manager and environmental manager. The issue will be addressed immediately.
- Increasing vegetative cover in problem areas will be managed through manual seeding/planting.
- Implementing erosion control measures such as contour berms or gabion baskets.
- Consulting specialists.
- The areas that have been eroded downstream of the containment structures will be rehabilitated:
 - Should soil depth be inadequate in the rehabilitated areas, then more soil will be brought in and deposited on the site.
 - The area will also be inspected for erosion to determine the reason for soil loss. This will be addressed immediately.
 - All recommendations made by the specialists will be followed.
 - Manual seeding or planting should vegetative cover be inadequate.
- An alien invasive management programme will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised must be used responsibly. DWA may need to be contacted and consulted with regards to the use of some chemicals.
- The removal of alien invasive species must be done outside of the seeding season as this may distribute seeds and they may enter downstream reaches of the water body.

14.3 Performance Assessments

- All information as required by the various Government Departments will be captured and be readily available for submission when required. Therefore all inspections, incidences and remedial actions taken must be recorded and logged and be at the disposal of authorities during site visits.

- A performance assessment will be conducted against this EMP report by an external consultant annually, for a period of one year in order to ascertain the management shortfall and correct them timeously.

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Table 6: Monitoring schedule and actions

Frequency	Monitoring & inspection	Summary of actions plans to consider should monitoring indicate the need	Responsible person	Cost / annum
OPERATIONAL AND MAINTENANCE PHASE				
Weekly	Inspect area for erosion and soil compaction	Repair all erosion on site using contour berms or gabions. Consult specialist if required.	Site & Environmental manager	Internal running cost as inspection and treatment will be conducted by employees. Additional costs may include material to construct gabions but will vary depending on treatment.
Weekly	Inspect all water management facilities, including toilets	All leaks identified will be repaired immediately.	Site Manager	Internal running cost. Cleaning activities will be conducted by employees. Costs with repairs will vary depending on the damage.
Weekly	Inspect gabion areas to ensure intactness	Operators must be properly trained to ensure these areas are managed properly. Repairing of gabions must be carried out by properly trained personnel.	Site & Environmental manager	Internal running cost as inspection will be conducted by employee.
Every 6 months	Surface water monitoring	All water related activities and actions within this table will be employed if water quality deteriorates in the dam or downstream. Specialists will be consulted if required.	Environmental manager	R 6,000.00 per annum
Monthly	Inspect area for damage to flora species.	Fines will be implemented to staff, contractors and visitors to site who damage local flora.	Environmental manager	Internal running cost as inspection will be conducted by employee.
Monthly	Visually inspect rehabilitated area for cover abundance	Re-seed areas of poor germination or plant growth. Consider hand-planting with seedling plugs and ensure soils quality is adequate for plant growth in areas where germination and poor plant growth is persistent.	Environmental manager	Part of running costs and rehabilitation costs.
Every 6 months depending on species	Maintain alien invasive monitoring programme	If aliens are observed in or surrounding the dam and attenuation ponds then these will be removed, preferably using mechanical methods before consideration to chemical methods. Plants must be removed when not seeding if possible.	Environmental & Site manager	Internal running cost as inspection will be conducted by employee. Additional costs for equipment and chemicals should be minimal.
As and when required	Monitor any ecologically sensitive species should they be observed surrounding the dam.	These must be protected as far as possible. If these are disturbed by means of maintenance activities these species may be removed only if absolutely necessary with the assistance of specialists.	Environmental manager	Running cost. Cost of relocation of species will be dependent on type of species. A Conservation group may be able to offer services at no cost.

Frequency	Monitoring & inspection	Summary of actions plans to consider should monitoring indicate the need	Responsible person	Cost / annum
As required	Ensure adequate reporting network is in place to communicate issues as they occur	This system needs to be established on site as soon as possible to ensure that all issues and incidences are reported to the RVHOA immediately. Should inspection activities indicate that incidences have not been followed up on then these need to be investigated and rectified.	Site & Environmental manager	Part of the dam and attenuation ponds running costs.

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15 RECOMMENDATIONS

The following recommendations are specific to the dam and attenuation pond areas. More detailed information for the management of the entire wildlife estate can be found in the RV Management Plan (2011).

15.1 Vegetation and Fauna

The disturbance of vegetation surrounding the dam and attenuation ponds must be kept to a minimum. This will prevent the disturbance of indigenous species surrounding these two areas and will prevent the proliferation of alien invasive species on the site. An ecological approach to rehabilitation of vegetation surrounding the two areas must be adopted, as opposed to a horticultural approach. For example communities of indigenous plants enhance bio-diversity and blend well with existing vegetation. This ecological approach to landscaping costs significantly less to maintain than conventional landscaping methods and is more sustainable.

The alteration of vegetation from a riparian vegetation near and within the drainage line below the Municipal WWTW towards a more artificial wetland will improve the chances of correctly managing the potential for leakages of nutrient rich water and prevent this water from entering the constructed dam downstream of the WWTW. This will act an attenuation structure and a bio accumulator to naturally treat any accidental leakages from the WWTW. By the time any water that may have leaked from the WWTW in the event of a 1:100 year flood, reaches the newly constructed dam, it will have passed through the artificial wetland. This will slow the water and prevent eutrophication of the dam water.

Therefore the effects of the dam as a pollutant and storm water attenuation structure will be enhanced by the existence of the artificial wetland. This must be maintained and kept free of alien invasive vegetation and any obstructions.

15.2 Cultural and Heritage Aspects

The likelihood of heritage artefacts on such a small area that has already been exposed to high levels of interference from the influx and movement of water is minimal. No heritage resources are expected to be found on the areas surrounding the dam or attenuation ponds.

However, heritage resources are not necessarily visible if present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover.

Although construction and earth moving has already taken place, any additional cultural artefacts found in or around the dam or attenuation structures must be preserved. These may not be disturbed or removed in any way until such time that a heritage specialist had been able to make an assessment as to the significance of the site (or material) in question.

15.3 Soil and Erosion Management

15.3.1 Access Roads

- Access roads leading to the dam and attenuation ponds are simple well vegetated twin tracks; if they become more established which is unlikely given the nature of the dam a dust suppression management program, will be considered.

15.3.2 Dam and Attenuation Ponds Re-vegetation and Rehabilitation

- Ensure that all disturbed areas (dam wall) are re-vegetated with indigenous species only.
- Ensure that continuous rehabilitation of the affected areas is undertaken in terms of alien invasive eradication and erosion control.
- Monitoring of soil erosion of the rehabilitated area until the area can be declared as stabilized and self-sustaining.

15.3.3 Areas Surrounding and Downstream of Attenuation Structures and Dam

The areas surrounding the dam must be monitored on an ongoing basis for erosion. Disturbance of the soil surrounding the dam must be minimised in order to prevent the disturbance of the seed bank. Disturbance of this soil will also increase the incidence of alien invasive species proliferating on the surrounding areas.

15.4 Surface Water

The water stored in the dams must be managed in order to reduce sediment deposition in the dam. This will inhibit the effectiveness of the dam to store water in a flood event. Due to the size of the dam and the simple nature of the structures, the sediment can be removed by means of mechanical dredging. This sediment must be placed on land that is away from any water course. A contour berm must be built downstream of the dam in order to attenuate spill over of the dam water and erosion of the area immediately downstream of the dams.

It is also recommended that the water quality is monitored on a 6 monthly basis in order to monitor the quality of water entering the dam. This will also allow for the proper management and mitigation of upstream sources of pollution. (The costs of this monitoring must be shared with the Local municipality).

The water can continue being used for irrigation on the school field as it is in line with the environmental principles of the estate as approved by LEDET in that it allows for re-use and re-cycling of grey water thereby reducing water consumption in the estate.

15.5 Maintenance and Inspections

According to WRD (2008), regular inspections and maintenance are required to ensure it remains in a good operating condition. The dam requires the following:

- Monthly inspections of the dam walls, pipes and gabion structures.

- Maintenance on all structures must be carried out when necessary.
- A comprehensive inspections and maintenance register must be filled in on a monthly basis per inspection and kept on site.
- Seepage from the dam should be monitored on a regular basis. Increased turbidity of water seeping from the dam walls will indicate that the embankment may be eroding.
- Trees that establish themselves along or near the dam embankments or dam walls must be monitored and new trees must be kept from establishing themselves near the dam. This is because tree roots can cause the dam walls to crack leading to dam stability problems. Pasture grass is preferable to protect against erosion.
- The dam wall must have a ratio of 2:1 for the height and width of the wall. Refer to Figure 4 below.

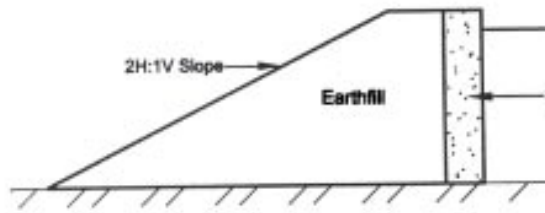


Figure 4: Earthfill Dam wall Dimensions

16 CONCLUSION

16.1 Environmental Impact Statement

The overall impact of the construction of the dam and attenuation ponds is of low significance. And their function has a positive influence on the downstream reaches of the drainage line and the eventual Sandspruit River. It is obvious that the dam is preventing pollutants in the form of storm water that may be hydrocarbon rich as well as water that has potentially been contaminated by sewage from an accidental leak or spill over in high rains from the municipal WWTW reservoir.

Potential problems facing the site due to the construction of the dam and attenuation ponds includes the following:

- Interference in the flood regime of the drainage line; although positive in recent years.
- Breakage or damaging the dam wall or gabion structures will result in erosion and silting of downstream reaches.
- Disturbance of localised area induces encroachment of alien invasive species.
- Release of water downstream may release alien invasive species into downstream water.

Potential improvements due to the construction of the dam include the following:

- Prevention of silt entering the Sandspruit and siltation downstream of the constructed dam due to collection and attenuation of storm water, the constructed attenuation ponds, the constructed dam and the larger dam downstream of the constructed dam.
- Attenuation of floods produced by excess storm water runoff.
- Preventing polluted water emanating from storm water runoff from entering the Sandspruit and the larger dam, directly adjacent to the Sandspruit, downstream of the constructed dam.
- Prevention of erosion of banks by means of slowing water.
- Preventing potential spills from the Municipal Waste Water Treatment reservoir from entering the downstream areas. Acting as vegetated bioswale and filtering water.
- Potential for re—use of grey water stored in the attenuation ponds for irrigation of the sport fields, therefore saving water.

The dam and attenuation structures must be properly managed to prevent the potential problems from arising and to enhance the positive impact associated with it.

It can be concluded that no fatal flaws for this project exist. The negative impacts from the dam and attenuation ponds are outweighed by the positive impacts as stated above. It is essential however, that the site/estate manager monitor and assess the potential impacts on a regular basis to ensure compliance with the appropriate legislation, best practice guidelines and standards.

16.2 EAP consideration

Tellurian Environmental is of the opinion that the activity should be authorised as long as water management principles are followed and proper maintenance is carried out on the dams.

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17 APPLICANT UNDERTAKING

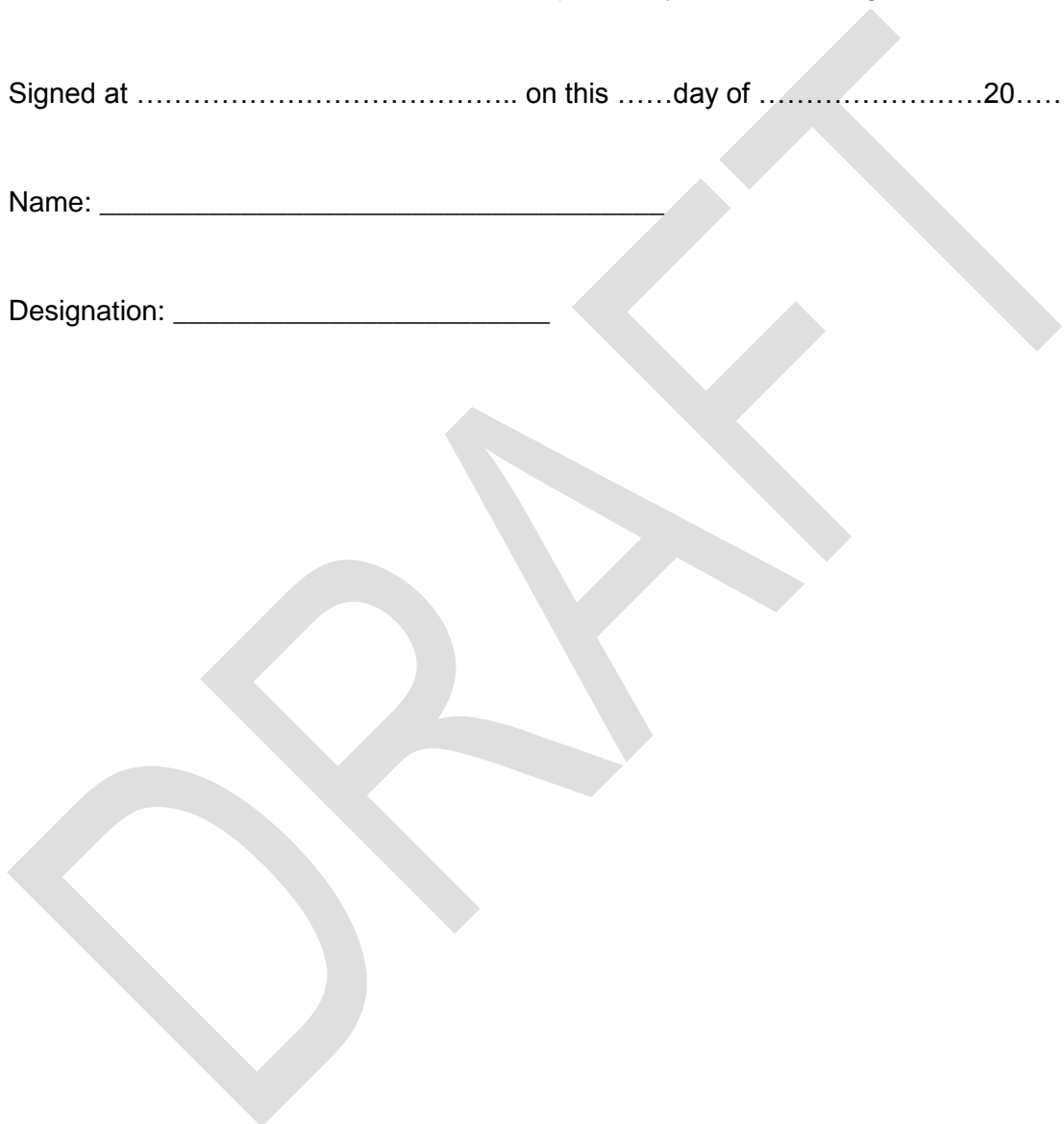
I,, the undersigned and duly authorised thereto by that will comply with the provisions of the National Environmental Management Act Amendment Act (Act 4 of 2008) and its Regulations.

I have studied and understand the contents of this document and duly undertake to adhere to the conditions as set out therein, unless specifically or otherwise agreed to in writing.

Signed at on thisday of20.....

Name: _____

Designation: _____



18 REFERENCES AND SUPPORTING DOCUMENTATION

Agricultural Research Council (ARC). 2011. Raptors View Management Plan. Raptors View Home Owners Association.

Department of Water Affairs (DWA). 2011. *Classification of significant water resources in the Olifants water management area: (WMA 4) –WP 10383*. Integrated units of analysis (IUA) Delineation report. Directorate: Water Resource Classification.

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Appendix B: Photographic Record of site (NEMA Cardinal Points Photos)

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Appendix C: PPP Information

Appendix 1: Proof of adverts

Appendix 2: Proof of site notices

Appendix 3: Background Information Document

Appendix 4: of Correspondence with Authorities.

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Appendix 4: Proof of Correspondence with Authorities

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Appendix E: Raptors View Wildlife Estate Record of Decision

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Appendix F: Environmental Management Plan (EMP)

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Appendix G: Environmental Impact Matrix (with impacts and proposed mitigation measures)

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