



# ENVIRONMENTAL SCOPING REPORT

in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014.

## Environmental Authorisation and Water Use Licensing for the construction of a dam on the Farm Strathmore 214 JU.

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March 2018  
(DRAFT)

### Prepared for Approval By

Mpumalanga Department of Agriculture, rural Development, Land, and Environmental Affairs (DARDLEA)

Department Ref. No.:

## Checklist

**Table 1:** Content of Scoping Report in terms of Appendix 2 of the EIA Regulations, 2014

***“A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include-“***

	YES	NO
<b>(a) details of-</b>		
(i) the EAP who prepared the report; and	✓	
(ii) the expertise of the EAP, including a curriculum vitae;	✓	
<b>(b) the location of the activity, including-</b>		
(i) the 21 digit Surveyor General code of each cadastral land parcel;	✓	
(ii) where available, the physical address and farm name;	✓	
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	✓	
<b>(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it</b>	✓	
(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	N/A	
(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	N/A	
<b>(d) a description of the scope of the proposed activity, including-</b>	✓	
(i) all listed and specified activities triggered;	✓	
(ii) a description of the activities to be undertaken, including associated structures and infrastructure;	✓	
<b>(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;</b>	✓	
<b>(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;</b>	✓	
<b>(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including -</b>	✓	
(i) details of all the alternatives considered;	✓	
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	✓	
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	✓	
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	✓	
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	✓	
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	✓	
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	✓	
(viii) the possible mitigation measures that could be applied and level of residual risk;	✓	
(ix) the outcome of the site selection matrix;	✓	
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/A	
(xi) a concluding statement indicating the preferred alternatives, including preferred	✓	

location of the activity;		
<b>(i) a plan of study for undertaking the environmental impact assessment process to be undertaken, including-</b>	✓	
(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	✓	
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	✓	
(iii) aspects to be assessed by specialists;	✓	
(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	✓	
(v) a description of the proposed method of assessing duration and significance;	✓	
(vi) an indication of the stages at which the competent authority will be consulted;	✓	
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	✓	
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	✓	
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	✓	
<b>(j) an undertaking under oath or affirmation by the EAP in relation to-</b>	✓	
(i) the correctness of the information provided in the report;	✓	
(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and	✓	
(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	✓	
<b>k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;</b>	✓	
<b>(l) where applicable, any specific information required by the competent authority; and</b>	✓	
<b>(m) any other matter required in terms of section 24(4)(a) and (b) of the Act.</b>	N/A	

## 1 EXECUTIVE SUMMARY

### INTRODUCTION

Steven Henwood, as an independent environmental consultant and impact assessor, has been appointed by Radley Landgoed (Edms) Bpk, to facilitate the Integrated Environmental Management (IEM) procedure, for Environmental Authorisation and Water Use Licensing for the construction of a dam on the Farm Strathmore 214 JU.

The property earmarked for the proposed development are approximately 296,8814 ha. Of this an area of 130 ha is to be cleared and utilized for agriculture. The farm is situated approximately 10 km north of the town centre of Barberton, Ehlanzeni District, Mpumalanga. It lies between the gravel D576 Snymansbult road in the north and a low rocky ridge running parallel to the Suidkaap River in the south.

The Radley Landgoed (Edms) Bpk has a vision to develop existing unused land on their property to cultivate crops. There are large portions of land that have not been fully developed and it is the intention of the land owner to utilise this land to its full potential in the future. As responsible employers and investors the applicant has commissioned an EIA to ensure the future investment is fully sustainable.

See Preferred Layout (Appendix A; Annexure A).

### ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS

The proposed development involves listed activities, as defined by the National Environmental Management Act: NEMA, 1998 (Act No. 107 of 1998) as amended and the Environmental Impact Assessment Regulations, 2014. Listed activities are activities, which may have potentially detrimental impacts on the environment and therefore require environmental authorisation from the relevant authorising body. The proposed development occurs in the Mpumalanga Province and thus the Mpumalanga Department of Agriculture, rural Development, Land and Environmental Affairs (DARDLEA) is the responsible regulatory authority.

The purpose of scoping is to define the boundaries of the environmental impact assessment – both geographically and in terms of which aspects of the activities will be investigated – to proceed to a full EIA.

This document outlines the scoping process followed, describes the proposed development and the context in which it will take place, and identifies the potential environmental impacts.

It represents the initial identification of key issues or concerns as highlighted by the relevant authorities, Interested and/or Affected Parties (I&AP) and professional judgement of the Environmental Assessment Practitioner. Scoping allows for the identification of the anticipated impacts, particularly those, which require specialist investigations. The results of the specialist studies, a full assessment of the impacts and proposed alternatives will form part of the EIA Report.

### PUBLIC PARTICIPATION

The public participation process started in January 2018. Site notices were placed in prominent positions, for the public to view. An advertisement was placed in the local newspaper (The Lowvelder) on Tuesday the 26<sup>th</sup> January 2018. All those people with a border directly abutting the proposed development site, as well as people resident in the adjoining communities were notified in writing or telephonically of the proposed meeting, as well as given a BID for the proposed development.

The Draft Scoping Report will be made available for public review for a period of 30 days from the date of submission of the report. Comments on the report will be incorporated in the Draft Environmental Impact Report (EIR), which will once again be made available for public review.

## **IDENTIFICATION OF KEY ENVIRONMENTAL ISSUES**

A baseline description of the environment was gathered through visual inspections of the site and its surroundings, desktop studies as well as preliminary specialist findings. This information was used to assess the potential areas of study, as a result of the proposed development.

The key issues identified include:

- Access roads, maintenance, and potential erosion.
- Impact that the proposed clearing and cultivation may have on fauna and flora.
- Impact of the proposed fields on wet areas.
- General land degradation.
- Runoff

As a result of the above-mentioned anticipated impacts, the specialist studies as listed below, will be undertaken during the EIA phase of the process. Such specialist studies assist with the development of an understanding of the processes involved and the potential positive and negative impacts of the proposed development on both the social and biophysical environments:

1. Wetland Delineation and Functionality Assessment
2. Cultural and Historical Assessment
3. Ecological Sensitivity Assessment

## **CONCLUSION**

The EIA report will assess the impacts of each of the activities as well as ascertain the cumulative impacts of the development in its entirety. The EIA Report will outline the necessary mitigation measures to put into place in order to minimise negative impacts and optimise positive impacts.

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### 3 ABBREVIATIONS/DEFINITIONS

**Table 2:** Abbreviations and acronyms

<b>BID</b>	Background Information document
<b>CBO</b>	Community Based Organisation
<b>CONTRACTOR</b>	Person and/or company appointed to complete project
<b>DAFF</b>	Department of Agriculture, Forestry and Fisheries
<b>DME</b>	Department of Minerals and Energy
<b>DWS</b>	Department of Water and Sanitation
<b>ECO</b>	Environmental Control Officer – A person appointed by the project manager, developer, engineer or contractor to oversee compliance to the emp. This person can be an internal appointment or an external consultant/specialist depending on the authorities' requirements.
<b>EIA</b>	Environmental Impact assessment
<b>EIR</b>	Environmental Impact Report
<b>EMPr</b>	Environmental Management Programme
<b>GPS</b>	Global Positioning System
<b>I&amp;AP</b>	Interested and affected party
<b>IDP</b>	Integrated Development Plan
<b>IEM</b>	Integrated Environmental Management
<b>MAGL</b>	Meters above ground level
<b>DARDLEA</b>	Mpumalanga Department of Agriculture and Land Affairs
<b>NEMA</b>	National Environmental Management Act, 1998 (act no. 107 of 1998) as amended and the Environmental Impact Assessment Regulations, 2010.
<b>NEMWA</b>	National Environmental Management –Waste Act (2010)
<b>NGO</b>	Non-Governmental Organisation
<b>NWA</b>	National Water Act (no 36 of 1998)
<b>PROJECT MANAGER / ENGINEER</b>	Designated project manager / engineer for the construction project
<b>PROPONENT / CLIENT / DEVELOPER</b>	Person or company responsible for proposing the project
<b>SAHRA</b>	South African Heritage Resources Agency

<b>SDF</b>	Spatial Development Framework (2009/2010)
<b>TCLM</b>	Thaba Chweu Local Municipality
<b>HES</b>	Henwood Environmental Solutions

#### 4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Steven Henwood, as an independent environmental consultant and impact assessor, has been appointed by Radley Landgoed (Edms) Bpk to facilitate the Integrated Environmental Management (IEM) procedure, for the proposed Environmental Authorisation and Water Use Licensing for the construction of a dam on the Farm Strathmore 214 JU.

**Table 3:** Details of EAP

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<b>E-mail:</b>	<a href="mailto:shenwood@mweb.co.za">shenwood@mweb.co.za</a>		
<b>Qualifications &amp; relevant experience</b>	Nat. Dip. Nature Conservation <ul style="list-style-type: none"> <li>• Environmental Assessment Practitioner from November 2006 to date.</li> </ul>		
<b>Professional affiliation(s) (if any)</b>	IAIAsa		

## 5 PROPOSED ACTIVITY

### 5.1 DESCRIPTION AND BACKGROUND

Steven Henwood, as an independent environmental consultant and impact assessor, has been appointed by Radley Landgoed (Edms) Bpk, to facilitate the Integrated Environmental Management (IEM) procedure, for the proposed Environmental Authorisation and Water Use Licensing for the construction of a dam on the Farm Strathmore 214 JU, The site is located approximately 10 km west of the town of Malelane, Ehlanzeni District, Mpumalanga (Figure 1).

The property earmarked for the proposed development is approximately 5 072.3 ha in extent and of this an area of 6.7 ha is to be utilized for the dam. (Total surface area). The proposed dam site is situated on an unnamed stream to the south east of the existing Strathmore Magnesite Mine. This stream joins the Crocodile River 4.5 km further downstream and is dammed both upstream and downstream of the proposed Strathmore Dam. Most of the area to the south is planted to orchards while most of the area to the north is mined. Some natural vegetation is present to the east and west of the site. The topography of the general area is gently to moderately undulating, but reasonably steep gradients are found in some parts of the surrounding areas. The study area is situated in the quarter-degree grid 2531 CB at an altitude of approximately 360 mamsl.

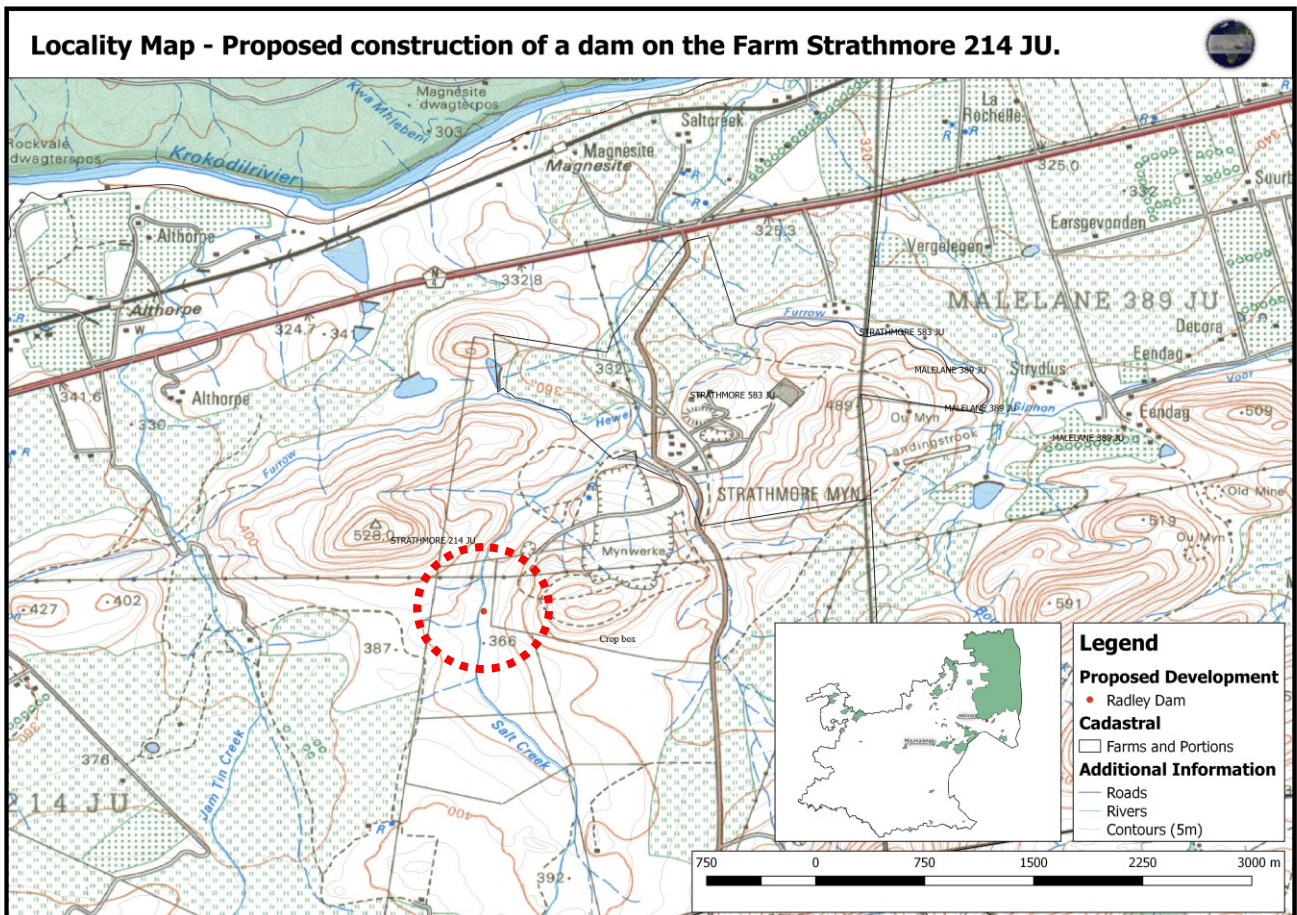


Figure 1: Locality.

## 5.2 FEASIBILITY

### 5.2.1 Necessity

The applicant has initiated the EIA and WULA process in response to their wanting to develop a dam to provide balancing storage for water delivered via the Malelane Canal.

#### Location

The proposed development has been strategically positioned so as to provide additional storage to the owner to irrigate nearby crops. Water from the nearby canal will be utilized and diverted into the dam.

#### Design/Layout

The proposed design is deemed to be desirable due to the contour layout which is restricted by a canal on the left bank and steep hill on the right bank. There is also a geological fault zone which had to be avoided downstream. Several centreline positions have been surveyed and analysed as part of the design to utilize the best layout.

#### Technology

The most modern of technologies will be used to ensure practical, cost effective and proper construction. These include taking material from the dam basin and constructing the retaining wall at the spillway with Rock Masonry by using stones from the area and local labour.

## 5.3 ALTERNATIVES IDENTIFIED

The role of alternatives is to find the most effective way of meeting the **need** and **purpose** of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts.

The following alternatives have been identified and a short description is included:

### 5.3.1 No Development/Status Quo

The land earmarked for the development of the dam is natural vegetation in varying degrees of disturbance or degradation. However, there is the strong possibility that the area within which the dam is to be located, will be utilised for mining. This is not desirable.

The 'no go' option refers to the possible scenario where the current status quo regarding land use will be maintained. However, there is the strong possibility that the area within which the dam is to be located, will be utilised for mining. This is not desirable

### 5.3.2 Location

The proposed development has been strategically positioned so as to easily provide water to adjacent lands. suitable for agriculture. Where agriculture is viable, and where ecological sensitivity is deemed to be low. However, the final boundary demarcations will be subject to a detailed assessment by all the specialists and registered I&AP's involved in the EIA process.

### 5.3.3 Design/Layout

A layout plan, indicating the positioning of the proposed new fields is attached as **Annexure B**. The layout has also taken into consideration the various biophysical features of the site and thus is the best suited layout for this particular development.

### 5.3.4 Technology

The most modern of technologies will be used to ensure practical, cost effective and proper farming of the proposed fields.

## 6 PROPOSED LOCATION

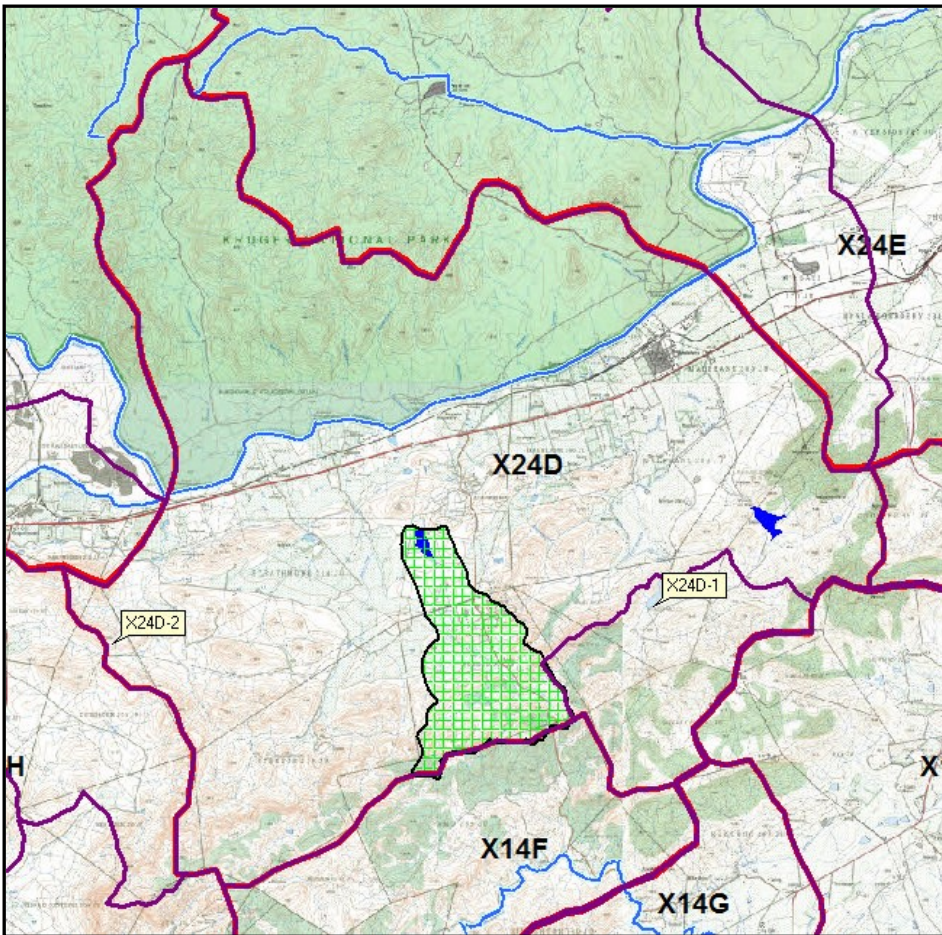
### 6.1 LOCATION

The site is located approximately 10 km west of the town of Malelane, Ehlanzeni District, Mpumalanga (Figure 1).

The property earmarked for the proposed development is approximately 5 072.3 ha in extent and of this an area of 6.7 ha is to be utilized for the dam. (Total surface area). The proposed dam site is situated on an unnamed stream to the south east of the existing Strathmore Magnesite Mine. This stream joins the Crocodile River 4.5 km further downstream and is dammed both upstream and downstream of the proposed Strathmore Dam. Most of the area to the south is planted to orchards while most of the area to the north is mined. Some natural vegetation is present to the east and west of the site. The topography of the general area is gently to moderately undulating, but reasonably steep gradients are found in some parts of the surrounding areas. The study area is situated in the quarter-degree grid 2531 CB at an altitude of approximately 360 mamsl.

The Radley Dam site is located in the X24D quaternary catchment, as indicated in Figure 2. The relevance of this is that water resources and hydrological information is readily available at quaternary catchment scale from the Inkomati Water Availability Assessment (DWA, 2009). During this study, the X24D catchment was subdivided into two quinary catchments, X24D-1 and X24D-2. The Radley Dam lies in the latter sub-catchment.





**Figure 2: Radley Dam catchment**

**Table 4: G.P.S co-ordinates**

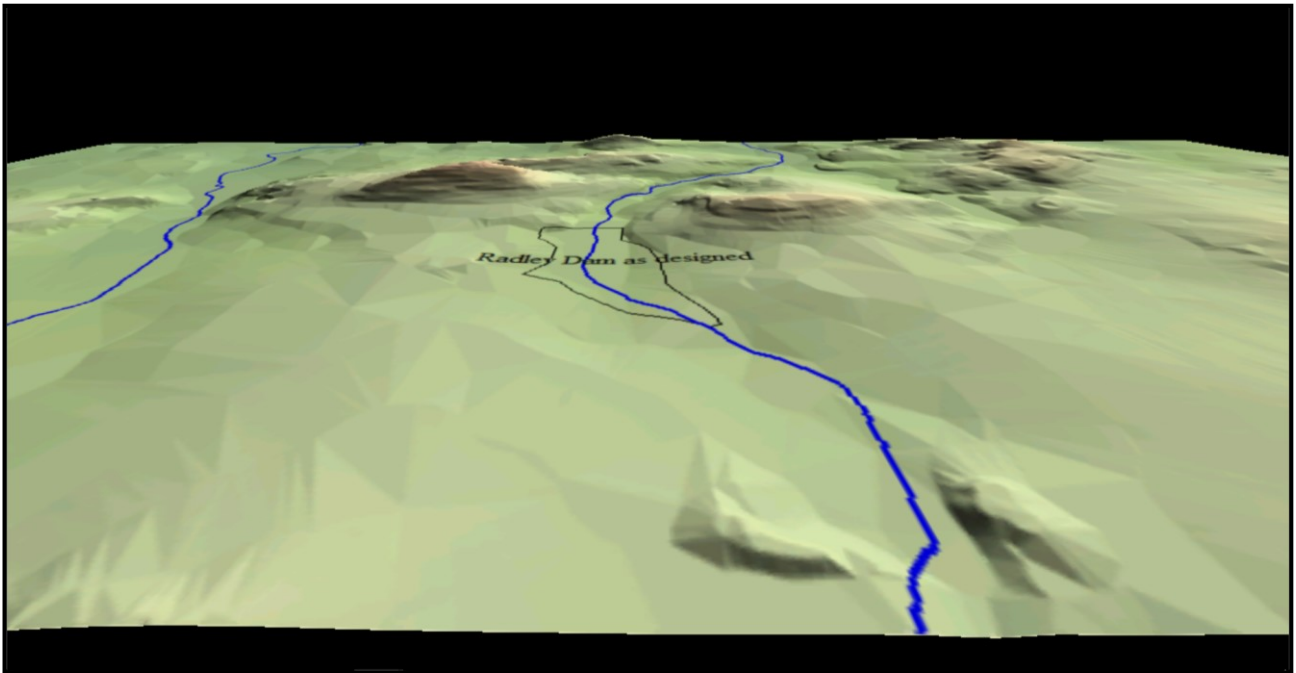
South	25° 32' 13.7760" S
East	31° 26' 37.4280" E"

## 7 THE STUDY AREA

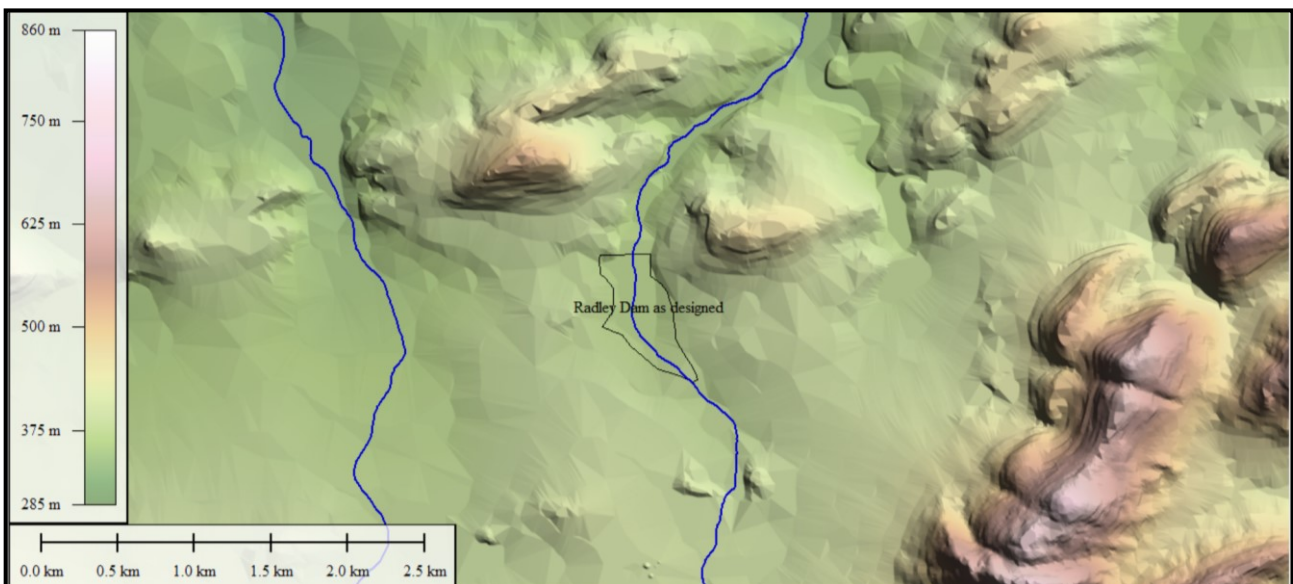
### 7.1 BIO-PHYSICAL DESCRIPTION OF THE STUDY AREA

#### 7.1.1 Topography

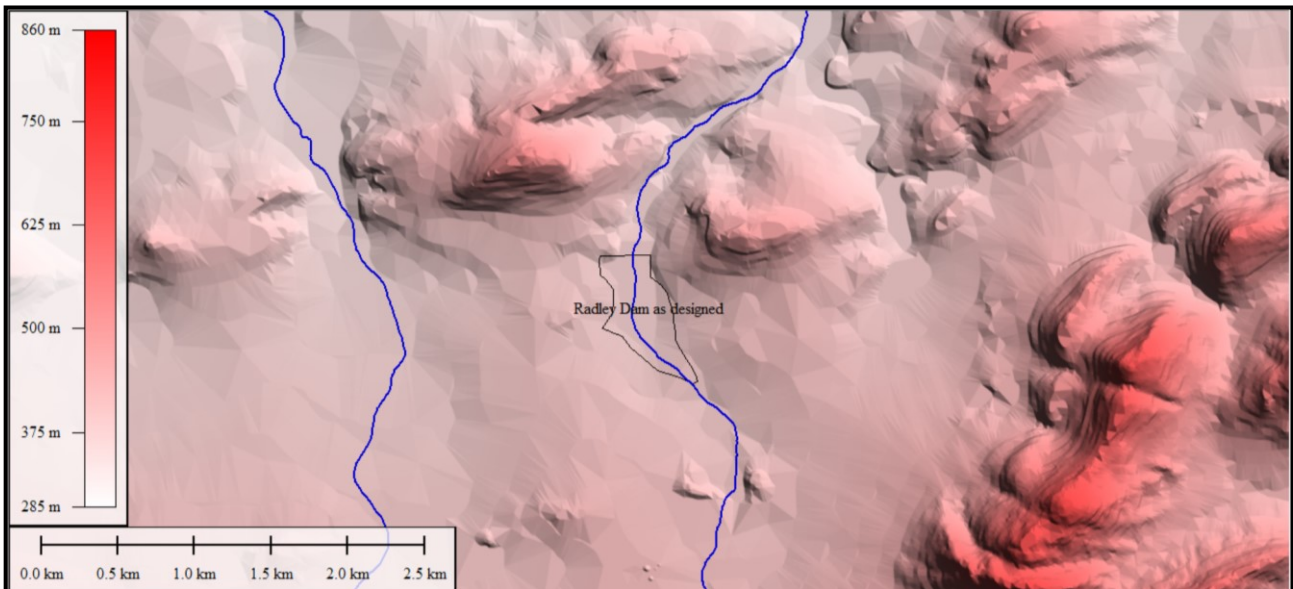
Physiographically, the topography of the general area is gently to moderately undulating, but reasonably steep gradients are found in some parts of the surrounding areas. The actual site is characterised by relatively steep valley slopes. See figure 5 and 6 below. Elevation on the property ranges between 285 and 860 m amsl.



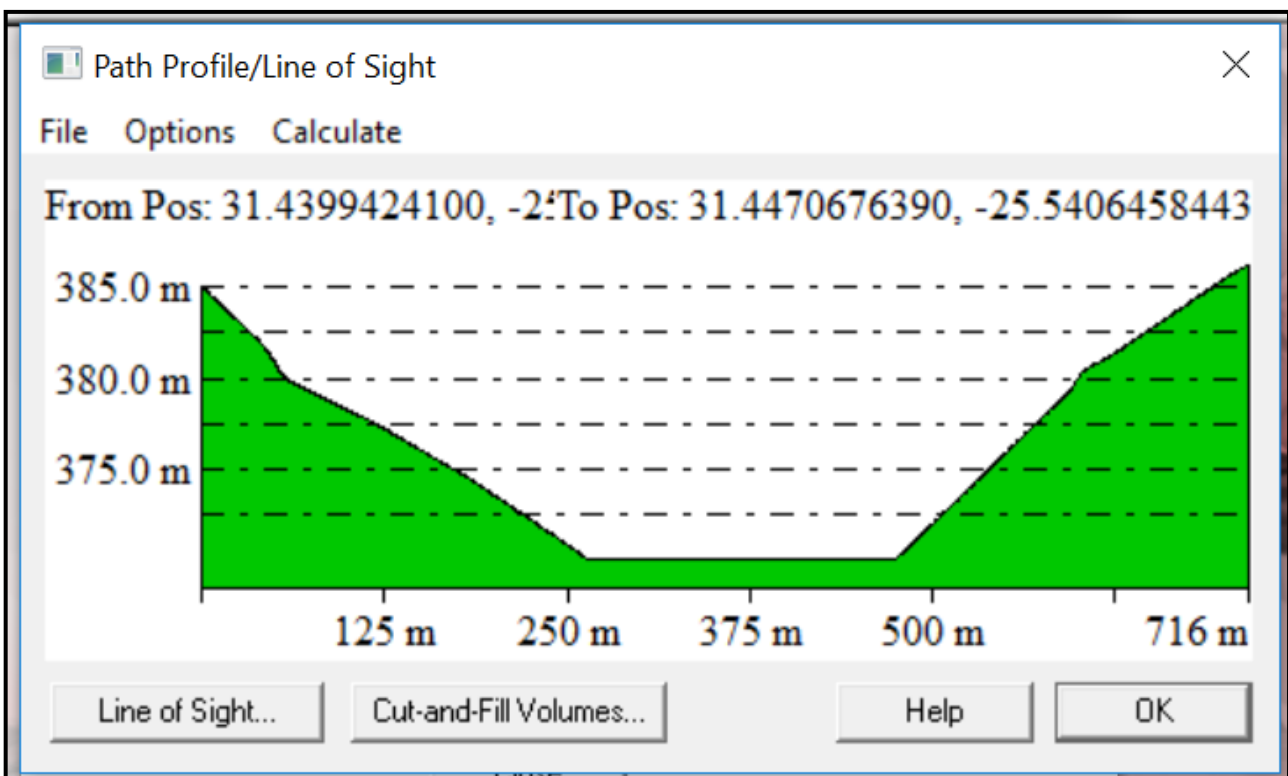
**Figure 3:** 3D Model of the site.



**Figure 4:** Topography of the site and surrounding area



**Figure 5:** The degree of slope of the site



**Figure 6:** Cross-section through the valley in which the proposed dam is to be located.

### 7.1.2 Climate

Malelane normally receives about 547mm of rain per year, with most rainfall occurring mainly during mid-summer. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Malelane range from 23.5°C in June to 30.1°C in January.

### 7.1.3 Geology and soils

Based on the available geological maps the site is underlain by the Onverwacht Group of the Barberton Sequence.



## 7.1.4 Ecology

### 7.1.4.1 Vegetation

According to Mucina & Rutherford (2006), the vegetation type present on Strathmore is Kaalrug Mountain Bushveld which is classified as **Least Threatened**. The Mpumalanga Biodiversity Sector Plan (MBSP) classifies Kaalrug Mountain Bushveld as **Least Concern** but only **Moderately Protected**. It is not listed as a Threatened Ecosystem (Notice 1002 of Government Gazette 34809, 9 December 2011). This vegetation type is endemic to Mpumalanga Province, occurring in a narrow belt on the lower foothills of the Makhonjwa Mountains between Hectorspruit in the east and Barberton in the west. Kaalrug Mountain Bushveld originally covered about 46 000 ha, of which only 18% has been transformed, mostly through cultivation and mining.

Two degraded vegetation communities were identified within the proposed development site on the basis of distinctive vegetation structure (grassland, woodland, thicket, etc.), floristic composition (dominant and diagnostic species) and position in the landscape (mid-slopes, terrace, crest, etc.). Two smaller transformed areas also occur along the southern border (homesteads) but these areas are too small to map. The untransformed vegetation communities are described in detail below:

- **Olea europaea – Schotia brachypetala Riparian Forest**

This vegetation community occurs along the centre of the study area and surrounds the small stream running south-north through the proposed dam site. Vegetation structure is mostly Short to Tall Forest (*sensu* Edwards, 1983) with the canopy reaching approximately 16 m high in places. Riparian Forest covers 7.5 ha which equates to approximately 63 % of the study area. Evergreen and deciduous trees dominate the canopy including high numbers of *Olea europaea* subsp. *africana*. Other frequently observed canopy species include *Schotia brachypetala*, *Acacia robusta* subsp. *clavigera*, *A. natalitia*, *Diospyros mespiliformis*, *Celtis africana* and *Berchemia zeyheri*. Common understory trees and shrubs located include *Kraussia floribunda*, *Monanthon affra*, *Phyllanthus reticulatus* var. *reticulatus*, *Chromolaena odorata*, *Bridelia cathartica* subsp. *Melanthesoides* and *Gymnosporia senegalensis*. Climbers are a feature of the southern portions of the vegetation community and include *Dalbergia armata*, *Abrus laevigatus*, *Capparis tomentosa*, *Cocculus hirsuta* and *Ipomoea alba*. Herbs and dwarf shrubs found on the ground layer include *Hypoestes aristata* var. *aristata*, *Jasminum fluminense* subsp. *fluminense*, *Asparagus virgatus*, *Commelina diffusa* subsp. *scandens* and *Hibiscus calyphyllus*. Grasses are generally sparse but include *Panicum deustum*, *P. maximum*, *Setaria megaphylla* and *Oplismenus hirtellus*. A total of 104 species (60 % of the entire list) was recorded from Riparian Forest; the higher of the two vegetation communities present. Species fidelity, which is closely linked to community uniqueness, is very high, with 83 species (80 % of the community list) occurring nowhere else in the study area.

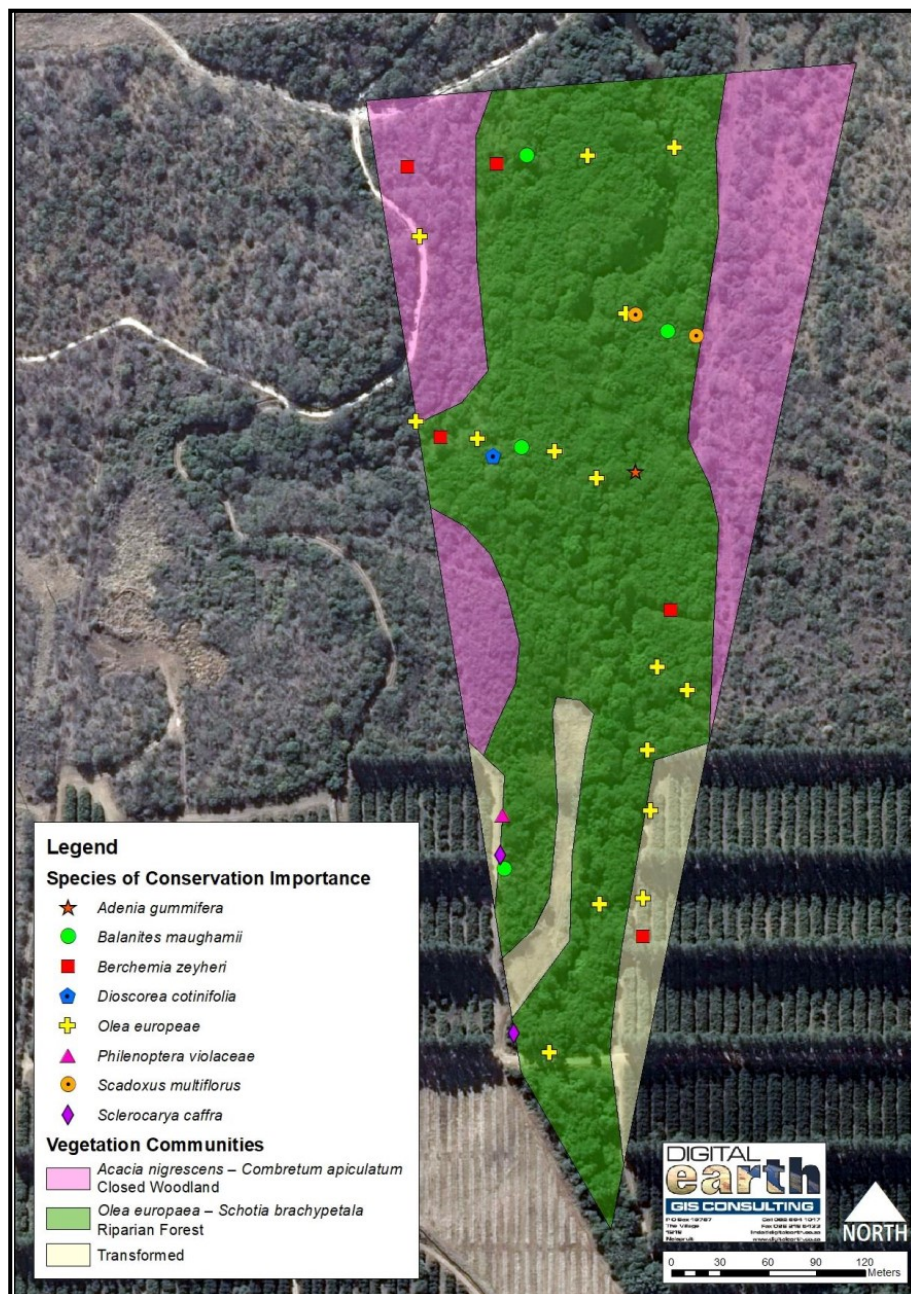
Eight conservation-important species were recorded although none are considered threatened. The trees *Sclerocarya birrea* subsp. *caffra* (rare), *Balanites maughamii* subsp. *maughamii* (rare) and *Philenoptera violacea* (rare) are protected under the National Forests Act (No. 30 of 1998) while the trees *Olea europaea* subsp. *africana* (dominant) and *Berchemia zeyheri* (frequent), the geophyte *Scadoxus multiflorus* subsp. *multiflorus* (rare), and the climbers *Dioscorea cotinifolia* (rare) and *Adenia gummifera* var. *gummifera* (rare), are all protected under the Mpumalanga Nature Conservation Act (No. 10 of 1998).

**Acacia nigrescens – Combretum apiculatum Closed Woodland** *Acacia nigrescens* – *Combretum apiculatum* Closed Woodland is found on the drier rocky slopes on either side of the Riparian Forest community. It covers 3.4 ha which equates to just over 28 % of the area surveyed. Vegetation structure is Short Open to Closed Woodland (*sensu* Edwards, 1983) with a well-developed herbaceous layer. The canopy layer is characterised by a fairly wide diversity of canopy trees including *Acacia nigrescens*, *Combretum apiculatum*, *C. hereroense*, *Euclea divinorum*, *Searsia leptodictya*, *Berchemia zeyheri*, *Ziziphus mucronata*

subsp. *mucronata*, *Pappea capensis*, *Bolusanthus speciosus*, *Olea europaea* subsp. *africana* and *Peltophorum africanum*. The shrub layer is rather poorly developed in comparison to the canopy but *Zanthoxylum capense*, *Gymnosporia buxifolia*, *Dichrostachys cinerea* subsp. *africana* and *Euclea natalensis* subsp. *angustifolia* are found throughout. The ground layer is diverse and is dominated by the grasses *Eragrostis superba*, *Heteropogon contortus*, *Digitaria eriantha*, *Panicum maximum*, *Urochloa mosambicensis* and *Setaria sphacelata* var. *sphacelata*. Herbaceous plants recorded include *Agathisanthemum bojeri* subsp. *bojeri*, *Commelina* cf. *livingstonii*, *Justicia flava*, *Orthosiphon suffrutescens* and *Ruellia cordata*.

A total of 77 species (44 % of the entire list) was recorded from Closed Woodland the lower of the two untransformed communities. Species fidelity is high, with 53 species (69 % of the community list) occurring nowhere else in the study area.

Three conservation-important species were recorded (Table 4) although none are considered to be of conservation concern as defined by Raimondo *et al.* (2009)<sup>1</sup>. The trees *Olea europaea* subsp. *africana* (uncommon) and *Berchemia zeyheri* (uncommon), and the bulb *Drimia intricata* (rare) are protected under the Mpumalanga Nature Conservation Act (No. 10 of 1998).



**Figure 7:** Vegetation communities identified within the proposed Strathmore Dam site.

#### 7.1.4.2 Wetlands

##### 7.1.4.2.2 Approach

The approach to this study will be to apply standard rapid survey techniques approved by the Department of Water Affairs & Sanitation (DWS) to determine the types and extent of aquatic ecosystems that could be impacted by the proposed dam, and to recommend an appropriate ecological Management Category needed to determine the Ecological Reserve. It is understood that the Ecological Reserve will be assessed separately as part of the hydrological assessment. Potential impacts on aquatic ecosystems will be based mainly on observed impacts of the existing dam.

##### 7.1.4.2.3 Study Area

The Study Area will comprise Salt Creek Catchment to its confluence with the Crocodile River (ie: the potential zone of Influence), but baseline data will be collected from key areas only. Delineation of aquatic ecosystems will be limited to the area within 500 m of the proposed dam and its Full Supply Level, as required in terms of Government Notice 509 (26th August 2016). Baseline data will be collected at three sites only as follows:

- control site, upstream of the proposed Full Supply Level;
- potential impact site, immediately downstream of the proposed dam; and
- potential cumulative impact site, near the confluence with the Crocodile River (ie downstream of the existing dam).

Alternatively, baseline data may be collected from the existing dam, should Salt Creek be dry at the time of the field survey.

##### 7.1.4.2.4 Level of Detail

The following components are included:

- **Classification and Delineation**

Aquatic ecosystems within 500 m of the proposed development will be classified and delineated according to the revised method of wetland delineation (DWAf 2008).

- **Surface Water Quality**

Surface water quality samples will be collected and analysed for pH, conductivity, faecal coliforms, Total Suspended Solids, nutrients and major ions. The results will be compared to the DWS Resource Quality Objectives from the nearest appropriate node that has been gazetted.

- **Benthic Diatoms**

Benthic diatoms will be collected to provide a measure of the overall biological water quality. Results will be classified into one of six Present Ecological State categories, ranging from Category A (Natural), to Category F (Critically Modified).

- **Aquatic Macroinvertebrates**

Aquatic macroinvertebrates will be sampled using the standard SASS5 biomonitoring method, where appropriate. Results will be classified into one of six Present Ecological State Categories, as above.

- **Fish**

Fish will be sampled using an electro-fisher, where appropriate. Results will be presented as a % species composition and Catch per Unit Effort, and classified into one of six Present Ecological State categories, as above. Attention will be given to species of conservation concern.

- **Riparian Vegetation**

Riparian vegetation will be assessed using the Vegetation Response Assessment Index (VEGRAI). Results will be classified into one of six Present Ecological State categories, as above.

## 7.2 SOCIO-ECONOMIC ENVIRONMENT

### 7.2.1 Introduction

The project area falls within the Ehlanzeni District and the Nkomazi Local Municipality.

### 7.2.2 Demographics

The Nkomazi Local Municipality is located in the eastern part of the Ehlanzeni District Municipality of the Mpumalanga Province. The municipality is strategically placed between Swaziland (north of Swaziland) and Mozambique (east of Mozambique). It is linked with Swaziland by two provincial roads and with Mozambique by a railway line and the main national road (N4), which forms the Maputo Corridor.

The Nkomazi Municipality is bounded by the Mozambique to the east, Swaziland to the south, Kruger National Park to the north, Umjindi Local Municipality to the south west and Mbombela Local Municipality from the northwest to west. The main urban centres are Louw's Creek; Kaapmuiden; Malelane, Hectorspruit, Marloth Park, Komatipoort, KaMhlushwa, Tonga and KaMaqhekeza.

**Table 5: Key Statistics 2011**

<b>Total population</b>	<b>393,030</b>
<b>Young (0-14)</b>	<b>35,4%</b>
<b>Working Age (15-64)</b>	<b>60,5%</b>
<b>Elderly (65+)</b>	<b>4,1%</b>
<b>Dependency ratio</b>	<b>65,4</b>
<b>Sex ratio</b>	<b>89,9</b>
<b>Growth rate</b>	<b>1,61% (2001-2011)</b>
<b>Population density</b>	<b>82 persons/km2</b>
<b>Unemployment rate</b>	<b>34,2%</b>
<b>Youth unemployment rate</b>	<b>42,3%</b>
<b>No schooling aged 20+</b>	<b>25,6%</b>
<b>Higher education aged 20+</b>	<b>6,7%</b>
<b>Matric aged 20+</b>	<b>25,6%</b>
<b>Number of households</b>	<b>96,202</b>
<b>Number of Agricultural households</b>	<b>28,004</b>
<b>Average household size</b>	<b>4,1</b>
<b>Female headed households</b>	<b>45,6%</b>
<b>Formal dwellings</b>	<b>92,5%</b>
<b>Housing owned/paying off</b>	<b>65,6%</b>
<b>Flush toilet connected to sewerage</b>	<b>7,7%</b>
<b>Weekly refuse removal</b>	<b>20,3%</b>
<b>Piped water inside dwelling</b>	<b>21%</b>
<b>Electricity for lighting</b>	<b>83,3%</b>

### **7.2.3 Land Use Currently**

The land on which the proposed dam is to be constructed is currently natural bush in various forms of disturbance, while the areas surrounding the sites are utilised for agriculture (mainly citrus and macadamia).

## **7.3 INSTITUTIONAL ARRANGEMENTS AND PLANNING DOCUMENTATION**

### **7.3.1 Relevant Authorities Within the Study Area**

The following authorities would need to have input into the EIA and WULA:

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
- Department of Water and Sanitation
- Department of Agriculture, Forestry and Fisheries
- City of Mbombela Local Municipality
- Mpumalanga Tourism and Parks Agency

### **7.3.2 Relevant Planning Documentation**

It is important to evaluate the proposal in terms of relevant documents and planning guidelines applicable to the area. These include (but are not limited to) The Nkomazi Spatial Development Framework 2016/2017 (SDF) and Nkomazi Local Municipality Integrated Development Plan (IDP).



### 7.3.3 The Nkomazi Spatial Development Framework

The Nkomazi Spatial Development Framework 2016/17 highlights that the land to be utilised for the proposed agricultural extension be utilised for Agriculture. See SDF insert for reference.

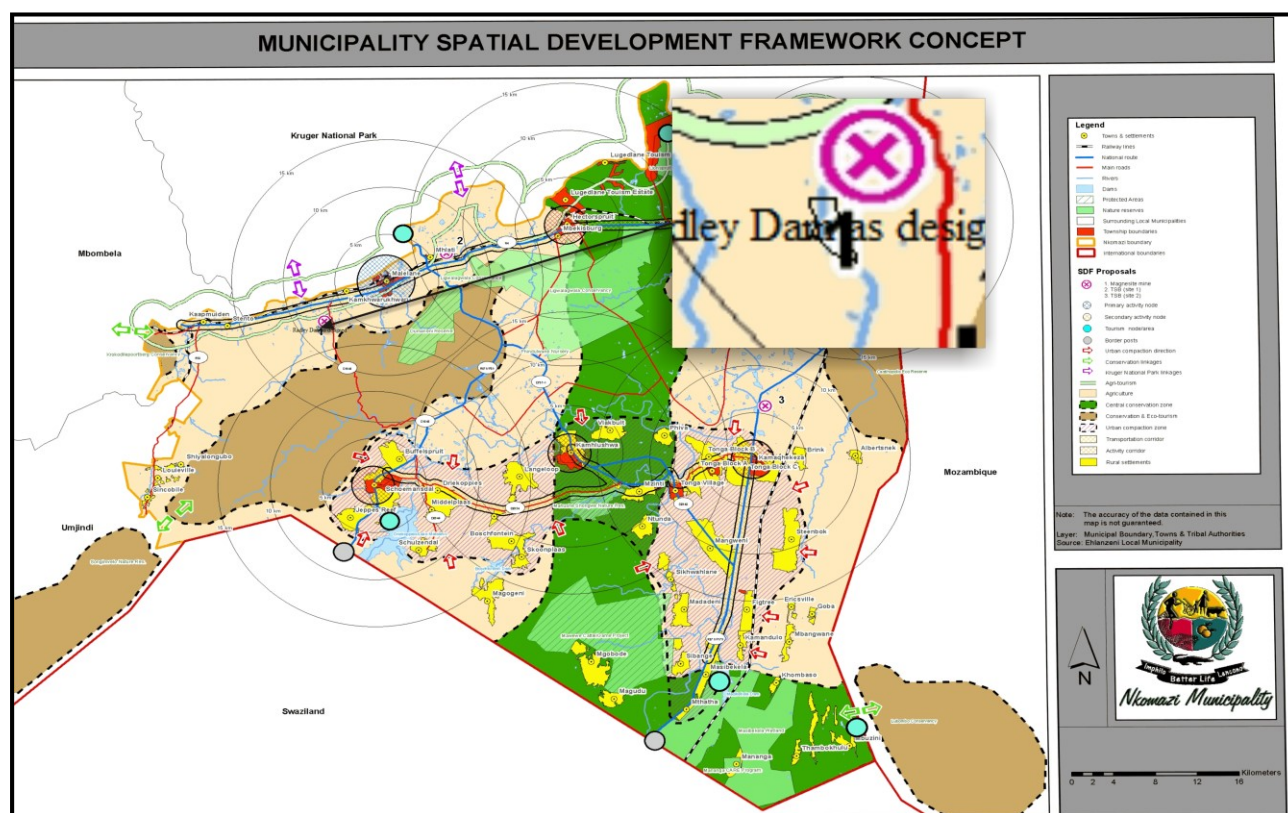


Figure 8: Nkomazi SDF 2016/17.

The Nkomazi Spatial Development Framework (NSDF 2016/17) deals with the compatibility of the proposed land uses in broad terms. The general land use classification for the land development area in terms the Nkomazi Spatial Development Framework (2016/17) is “Agriculture”. The proposed agricultural extension thus fall neatly within the ambit of the SDF.

## 8 LEGISLATION AND GUIDELINES

The Environmental Impact Assessment (EIA) process is a planning and decision-making tool that is used to identify the potential environmental impacts of a proposed development or project. It is conducted in compliance with Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The regulations identify a list of activities (Regulations 2014 GN No. 982 Listing Notice 1, 2 & 3) for which an EIA must be conducted.

This proposal has been identified as such a listed activity:

Table 6: Potential NEMA activities identified.

<p>EIA Regulations 983: Listing Notice 1 of 2014</p>	<p>12</p>	<p>The development of— <b>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</b> <b>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</b></p>
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		where such development occurs— <b>(a) within a watercourse;</b> (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;
EIA Regulations <b>983</b> : Listing Notice <b>1</b> of 2014	<b>19</b>	The infilling or depositing of any material of <b>more than 10 cubic metres into</b> , or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;
EIA Regulations <b>983</b> : Listing Notice <b>1</b> of 2014	<b>27</b>	The <b>clearance of an area of 1 hectares or more</b> , but less than 20 hectares of <b>indigenous vegetation</b> ,

EIA Regulations <b>984</b> : Listing Notice <b>2</b> of 2014	<b>16</b>	The <b>development of a dam</b> where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is <b>5 metres or higher</b> or where the high-water mark of the dam covers an area of 10 hectares or more.
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EIA Regulations <b>985</b> : Listing Notice <b>3</b> of 2014	<b>12</b>	The <b>clearance of an area of 300 square metres or more of indigenous vegetation</b> except where such clearance of indigenous vegetation is required for maintenance has been purposes undertaken in accordance with a maintenance plan.
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Steven Henwood, as an independent environmental consultant and impact assessor, has been appointed by Radley Landgoed (Edms) Bpk, to compile the EIA Report, which will be reviewed by the relevant competent authority (e.g. DARDLEA).

## 8.1 CO-OPERATIVE GOVERNANCE (CONSTITUTION ACT 108 OF 1996)

The constitution states that:

'... everyone has the right to an environment that is not harmful to their health or wellbeing: and to have the environment protected for the benefit of present and future generations.

## **8.2 NATIONAL ENVIRONMENT MANAGEMENT ACT (NO 107 OF 1998) (NEMA) AS AMENDED 2014.**

Sustainable development requires the consideration of all relevant factors including:

- (i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- (vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions

- 2.1 The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.

## **8.3 NATIONAL WATER ACT (NO 36 OF 1998) (NWA)**

Section 22.2 of the Water Act states “A person who uses water (a) must use the water subject to any condition of the relevant authorisation of that use; (b) is subject to any limitation, restriction or prohibition in terms of this Act or any other applicable law (c) in the case of the discharge or disposal of water or water containing waste contemplated in section 21(f),(g), (h) or (j) must comply with any applicable waste standards or management practices prescribed under section 26(l)(h) and (i), unless the conditions of the relevant authorisation provide otherwise: (d) may not waste that water:

The National Water Act aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchments level. The purpose of the Act is to ensure that the nation’s water resources are protected, used, developed, conserved, managed and controlled in ways, which take into account:

- (a). Meeting the basic human needs of present and future generation;
- (b). Promoting equitable access to water;
- (c). Redressing the results of past racial discrimination;
- (d). Promoting the efficient, sustainable and beneficial use of water in the public interest;
- (e). Facilitating social and economic development;
- (f). Providing for growing demand for water use;
- (g). Protecting aquatic and associated ecosystems and their biological diversity;
- (h). Reducing and preventing pollution and degradation of water resources;
- (i). Meeting international obligations;
- (j). Promoting river safety;
- (k). Managing floods and droughts.



#### **8.4 CONSERVATION OF AGRICULTURAL RESOURCES ACT 43 OF 1983 (CARA)**

The aim of the CARA is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

In terms of Section 2 of Conservation of Agricultural Resources Act (Act, 43 of 1983), an application must be made to Dept. Agriculture if:

- Regulation 2 of CARA states that “except on the authority of a written permission, no land user may cultivate any virgin soil (cultivation means any act where the topsoil is disturbed mechanically, and virgin soil is land that has at no time during the preceding 10 years been cultivated).
- Regulation 3 of CARA states that “except on the authority of a written permission, no land user may cultivate any land with a slope of more than 12%”.

#### **8.5 NATIONAL HERITAGE RESOURCES ACT 25 OF 1999**

To introduce an integrated and interactive system for the management of the national heritage resources. To promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations; to lay down general principles for governing heritage resources management throughout the Republic; to introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa; to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources at national level; to set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance; to control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries; to enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; to provide for the protection and management of conservation-worthy places and areas by local authorities; and to provide for matters connected therewith.

This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Our heritage is unique and precious, and it cannot be renewed. It helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has the power to build our nation. It has the potential to affirm our diverse cultures, and in so doing shape our national character. Our heritage celebrates our achievements and contributes to redressing past inequities. It educates, it deepens our understanding of society and encourages us to empathise with the experience of others. It facilitates healing and material and symbolic restitution, and it promotes new and previously neglected research into our rich oral traditions and customs.

## 9 ENVIRONMENTAL ISSUES, POTENTIAL IMPACTS AND MITIGATION MEASURES

The purpose of the assessment is to synthesise and analyse information relevant to the environmental impacts of a proposal. In order to achieve this, two elements, namely the outline of methodology used, and the systematic assessment of the impacts are required.

The ENVIRONMENTAL SIGNIFICANCE scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can be ecological, economic, social, or all of the aforementioned. The evaluation of the significance of an impact relies heavily on the values of the person making the judgement. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Section 8 identifies the issues associated with the proposed development, providing the significance scale and mitigation measures to reduce negative impacts and enhance positive impacts. Section 9 provides an explanatory note on the methodology adopted for assessing the significance of the identified impacts.

A number of issues have been identified during the scoping exercise.

### The bio-physical issues identified include:

- Changes to Hydrology
- Loss of Biodiversity
  - Loss of terrestrial animals
  - Loss of terrestrial plants
- Impact on wetlands
- Loss or gain of soil
- Ground and surface water impact
- Alien infestation
- Degradation

### The socio-economic impacts identified include:

- Dam failure causing damage to property and loss of life
- Pollution of air quality
- Heritage
- Land Use
- Noise pollution
- Visual pollution
- Employment Opportunities (+)
- Community upliftment (+)

### It is more important to identify likely environmental impacts than to precisely evaluate the more obvious impacts

All assessors (the different specialists) try to evaluate all the significant impacts, recognising that precise evaluation is not possible. It is better to have a *possible* or *unsure* level of certainty on important issues than to be *definite* about unimportant issues. This is the 'Probability Scale', which provides an indication of the risk or chance of an impact-taking place. There is no doubt that some impacts would occur if the development takes place, but certain other (usually secondary) impacts are not as likely and may or may not result from mining and related activities in the area. Although these impacts may be severe, the likelihood of them occurring may affect their overall significance and must therefore be taken into account. It is therefore necessary for the author to state his estimate of the likelihood of an impact occurring.

## 10 METHODOLOGY FOR ASSESSING IMPACTS

The following ratings were used to determine the significance of each impact:

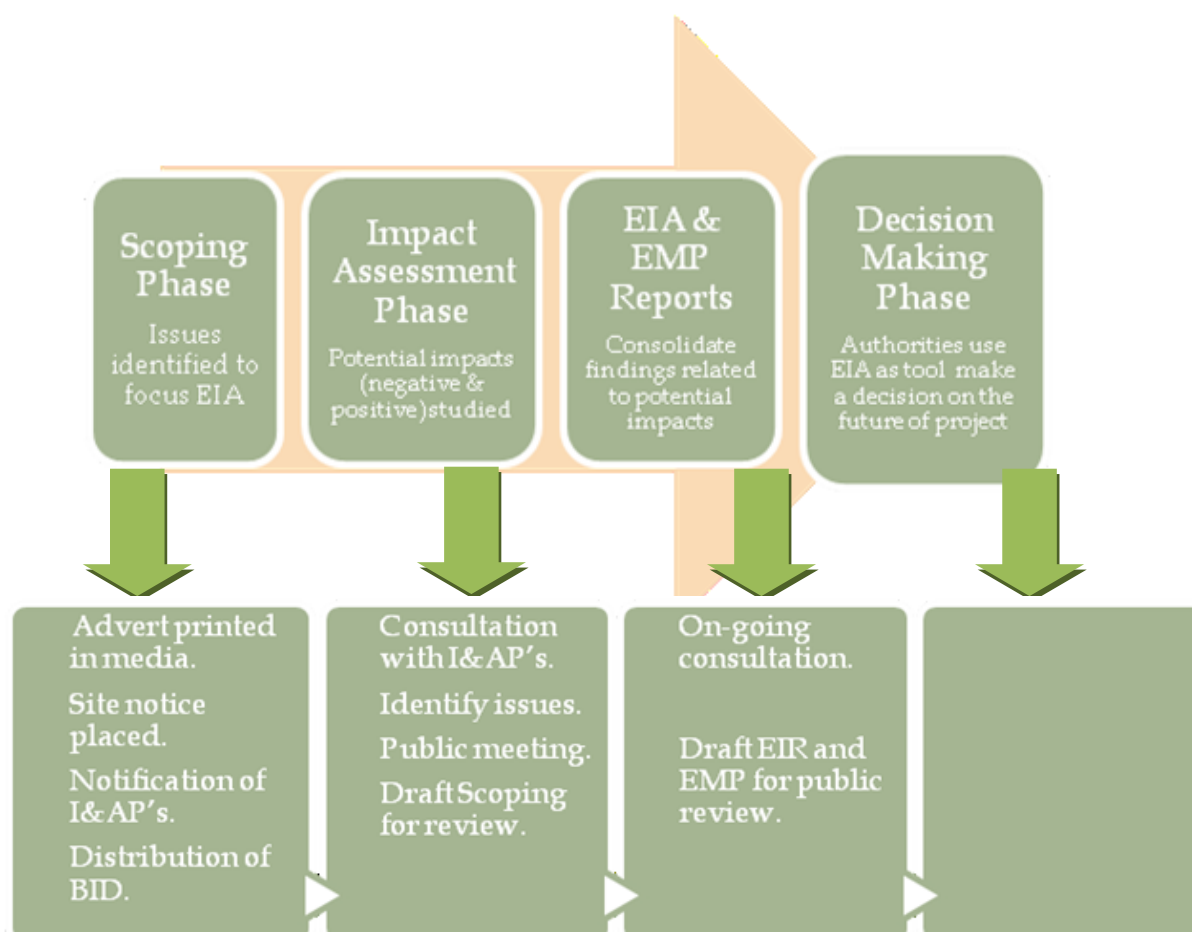
**Table 7:** Significance determination methodology.

Extent	Local	Impact limited to footprint
	Site	Impact affects site as a whole
	Regional	Impact affects neighbours
Duration	Short term	Time span shorter than the phases
	Medium term	Time span as long as the phases
	Long term	Time span as long as the operational phase
	Permanent	Mitigation will not be possible
Intensity	Low	Natural processes not affected
	Medium	Modified processes will continue
	High	Functioning of processes will cease
Probability	Improbable	Probability very low
	Probable	Possibility that impact will occur
	Highly probable	Impact will most likely occur
	Definite	Impact will occur regardless
Determination of significance without mitigation	No significance	Not substantial; does not require mitigation
	Low	Impact of little importance
	Medium	Impact of importance
	High	Impact of great importance

**For further clarification see Appendix D for both impact assessment methodology and the impact assessment.**

## 11 PUBLIC PARTICIPATION PROCESS

The public participation process was initiated in January 2018 and commenced with the notification of stakeholders on the 10<sup>th</sup> January 2018. Progress on the public participation process will be reported on in the final scoping report or the EIR report. Comment to date is attached in **Appendix C**. The figure below will diagrammatically explain the proposed phases of public participation in the full EIA process.



**Figure 9:** Public Participation Process.

### 11.1 NOTIFICATION OF INTERESTED AND AFFECTED PARTIES (I&AP'S)

An advertisement was placed in the local newspaper (the Lowvelder) on 26<sup>th</sup> January 2018 and site notices were placed in prominent positions, for the public to view. A departmental site meeting is yet to be conducted. Details of the notification process will be covered in the final scoping report, or the EIR.

### 11.2 INTERESTED AND AFFECTED PARTIES IDENTIFIED

All neighbours and those people with a border directly abutting the proposed development site, were notified in writing about the proposed public meeting. A background information document accompanied this notification. All concerned departments were notified by either fax or e-mail and

telephone of the site meeting. An issue and response sheet, summarizing the issues and responses has been included as **Appendix C**.

## **12 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT REPORT (EIR)**

### **12.1 DESCRIPTION OF TASKS**

#### **12.1.1 Initiate Specialist Studies – Ecological, Historical, Soil Suitability and Wetland**

- All issues, concerns and impacts raised during the investigation, public participation, scoping process, specialist and authority consultation will be evaluated, and the significance determined through appropriate rating and ranking techniques.
- Environmental control and mitigation measures will be proposed.
- A draft EIA report will be prepared in accordance with the EIA regulations.
- The draft EIA report will be made available to all I&AP's (including relevant departments) in accordance with the EIA regulations.

#### **12.1.2 Specialist Studies**

The following specialist studies have been highlighted, and will be included in the EIR:

- A Terrestrial Ecological Report,
- A Wetland delineation and functionality Report,
- Historical Impact Assessment,
- Palaeontological Assessment
- Water Yield Analysis.

### **12.2 STAGES OF CONSULTATION WITH COMPETENT AUTHORITIES**

The first step of the EIA and IWULA process involves consultation with the relevant authority involved with the decision-making process concerning the authorisation of the proposed project. The main purpose of this is to clarify the requirements of the regulations and procedures to be followed. During this phase the authorities also register the activity. Authority involvement undertaken during this scoping exercise has included the following:

- A project pre-application meeting was held with DARDLEA and IUCMA

Once the Scoping Report and Plan of Study has been submitted and approved, the consultant will contact the relevant authorities and hold a further meeting, if and when required. The Final EIA report will be submitted to DARDLEA for authorisation.

### 12.3 PROPOSED PUBLIC PARTICIPATION PROCESS

The public participation process was initiated in 10<sup>th</sup> January 2018. The need for a formal public meeting will be established during the Environmental Impact Assessment process. If required, this will be arranged where further issues would be discussed and explained.

Copies of the Draft Environmental Impact Assessment Report will be made available to I&AP's for their comment.

The EIA report would include the detail of the public participation process, the summary of the comments received from I&AP's during the scoping process and how these comments have been considered in the EIA report.

Comments from I&AP's on the Draft EIA report would be included before submission of the final report to DARDLEA.

### 12.4 SCHEDULE OF TASKS FOR THE EIA STUDY

**Table 8:** Schedule of tasks.

<b>EIA Process</b>			
<b>Description of task</b>	<b>Start date</b>	<b>Completion date</b>	<b>No. of days</b>
<b>Compile EIR report</b>	2018/06/01	2018/06/10	10
<b>Compile EMPr</b>	2018/06/01	2018/06/10	10
<b>Specialist Studies (EIA):</b>	2018/02/01	2018/05/01	89
Wetland	2018/02/01	2018/05/01	89
Heritage	2018/02/01	2018/05/01	89
Ecological	2018/02/01	2018/05/01	89
<b>Review of Specialist studies</b>	2018/06/01	2018/06/30	30
<b>Distribute draft EIR &amp; EMPr to I&amp;APs</b>	2018/07/02	2018/08/01	30
<b>Incorporate I&amp;AP comments into final EIR &amp; EMPR</b>	2018/08/01	2018/08/04	4
<b>Printing of EIR &amp; EMPr</b>	2018/08/04	2018/08/04	1
<b>Submission of EIR &amp; EMPr to DARDLEA</b>	2018/08/05	2018/08/05	1
<b>Acknowledgment of receipt of EIR by DARDLEA</b>	2018/08/05	2018/08/17	12
<b>DARDLEA decide to grant/refuse EA</b>	2018/08/17	2018/12/07	110
<b>DARDLEA notify applicant of EA</b>	2018/12/07	2018/12/12	5
<b>Notify I&amp;APs of the decision</b>	2018/12/12	2019/01/04	15
<b>"Cool down" period &amp; project handover</b>	2019/01/04	2019/01/24	20

## 13 FINAL CONCLUSIONS AND RECOMMENDATIONS

The principles of Ecological Sustained Development (ESD) recognise the interdependence of human welfare and the environment. It is also recognised that development cannot be sustained beyond certain environmental limits and imply that there are sustainable levels of both production and consumption.

The foundation of environmental policy in South Africa recognises the principles of Integrated Environmental Management (IEM), which essentially underpin environmental, social and economic motivation.

The completion of this application will allow the construction of a dam to take place within all relevant legal ambits.

## 14 REFERENCES

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

The Integrated Environmental Management Guideline Series published by the National Department of Environmental Affairs in 1992 was be used for the preparation of the report. These documents are: -

**The Integrated Environmental Management Procedure**, Guideline Document 1, Integrated Environmental Management Guideline Series, Department of Environment Affairs 1992.

**Guidelines for Scoping**, Guideline Document 2, Integrated Environmental Management, Guideline Series, Department of Environment Affairs 1992

**Guidelines for Report Requirements**, Guideline Document 3, Integrated Environmental Management Guideline Series, Department of Environment Affairs, 1992.

**Guidelines for Review**, Guideline Document 4, Integrated Environmental Management Guideline Series, Department of Environment Affairs, 1992.

**Checklist of Environmental Characteristics**, Guideline Document 5, Integrated Environmental Management Guideline Series, Department of Environment Affairs, 1992.

**Glossary of terms used in Integrated Environmental Management**, Guideline Document 6, Integrated Environmental Management Guideline Series, Department of Environment Affairs, 1992.

***In addition to this, the Integrated Environmental Management Information Series (CSIR 2002) consisting of the following will be used:***

Information Series 1: Screening

Information Series 2: Scoping

Information Series 3: Stakeholder Engagement

Information Series 4: Specialist Studies

Information Series 5: Impact Significance

## 15 OTHER INFORMATION REQUIRED BY REGULATIONS

### Mitigation Measures to Manage and Monitor Identified Impacts.

Please refer to the Impact Assessment in **Appendix D**.

## 16 APPOINTED INDEPENDENT EAP

*An undertaking under oath or affirmation by the EAP in relation to*

### **Report Information Accuracy.**

(i) the correctness of the information provided in the report;

### **Stakeholder and Interested and Affected Parties Feedback.**

(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and

### **Comments and Response between EAP and Interested and Affected Parties.**

(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;

## 17 ENVIRONMENTAL IMPACT ASSESSMENT AGREEMENT BETWEEN EAP AND I&AP'S

*(k) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment; EAP AFFIRMATION.*

Appendix 2 Section 2 (k) of the Environmental Impact Assessment (EIA) Regulations, 2014 (promulgated in terms of the National Environmental Management Act 107 of 1998, as amended - NEMA), require an undertaking under oath or affirmation by the Environmental Assessment Practitioner (EAP) in relation to the level of agreement between the EAP and interested and affected parties on the Plan of Study for undertaking the environmental impact assessment.

I, **Steven James Henwood**, on behalf of Henwood Environmental Solutions, hereby affirm that all comments and inputs received from stakeholders and interested and affected parties have been accurately recorded herein and, insofar as comments are relevant and practicable, accommodated in the Plan of Study submitted with the final Scoping Report to the Competent Authority, thereby attaining a desirable level of agreement for undertaking the environmental impact assessment.



Signature of the EAP

08 November 2017

DATE:



## 18 APPENDIXES

- APPENDIX A: Site Plan/s  
 ANNEXURE A: Locality  
 ANNEXURE B: Layout
- APPENDIX B: Site Photographs  
 ANNEXURE A: Site Photos
- APPENDIX C: Public Participation  
 ANNEXURE A: Site Notice Text  
 ANNEXURE B: Proof of Displayed Notice Boards  
 ANNEXURE C: Background Information Document (BID) Text  
 ANNEXURE D: Proof of given Background Information Document (BID)  
 ANNEXURE E: Advertisement Text  
 ANNEXURE G: Proof of Placed Advertisement  
 ANNEXURE H: List of Registered I&AP's  
 ANNEXURE I: Comment and Response Sheet  
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- APPENDIX D: Impact Assessment  
 ANNEXURE A: Methodology  
 ANNEXURE B: Impact Assessment
- APPENDIX E: Specialist Reports Scope of Study  
 ANNEXURE A: Terrestrial Ecology  
 ANNEXURE B: Archaeological Survey  
 ANNEXURE C: Wetland and Aquatic Assessment  
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 ANNEXURE E: Palaeontological
- APPENDIX F: Curriculum Vitae of EAP