

**APPLICATION**  
**DRAFT SCOPING REPORT**  
in support of an  
**ENVIRONMENTAL AUTHORIZATION**

for the

**PROPOSED DAM ON ARBEIDSGENOT FARM, MOORREESBURG  
REMAINDER OF FARM BAKOVEND 403, GOUDA DISTRICT**

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**MARCH 2019**

## PROJECT DETAILS

		<b>Title:</b> Proposed Dam on Arbeidsgenot Farm, Moorreesburg Remainder of Farm Bakovend 403, Gouda District.		
<b>Eco Impact No:</b> 1-03/2019		<b>Date:</b> March 2019	<b>Report Status:</b> Draft Scoping Report	
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Verification	Capacity	Name	Signature	Date
Author	Principle EAP	Nicolaas Hanekom		06/03/2019

Eco Impact Legal Consulting Pty Ltd has been appointed by the applicant to undertake the Environmental Impact Assessment (EIA) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA). As required by NEMA, the qualifications and experience of the key independent Environmental Assessment Practitioner (EAP) undertaking the EIA are detailed below and Curriculum Vitae provided in Appendix A.

Nicolaas Hanekom is a registered Professional Natural Scientist (Ecology) with the South African Council for Natural Scientific Professions ("SACNASP") and a qualified Environmental Assessment Practitioner ("EAP") who holds a Masters Technologiae, Nature Conservation ("Vegetation Ecology and Biodiversity Assessment") degree from the Cape Peninsula University of Technology.

He further qualified in Environmental Management Systems ISO 14001:2004, at the Centre for Environmental Management, North-West University, as well as Environmental Management Systems ISO 14001:2004 Audit: Internal Auditors Course to ISO 19011:2003 level, from the Centre for Environmental Management, North-West University qualifying him to audit to ISO/SANS environmental compliance and EMS standards.

Nicolaas has presented lectures in two subjects at the Cape Peninsula University of Technology. He has 26 years of environmental planning experience, working for Free State and Western Cape departments of environmental affairs, where he reviewed and commented on development (EIA) and mine permit or right applications in the West Coast Region.

Hanekom grew up on the farm in the Overberg district and studied at Grootfontein Agricultural College with subjects Soil Science, Botany, Crop Production, Agricultural Engineering, Animal Breeding, Animal Nutrition, Small Stock Production, Animal Health, Large Stock Production and Agricultural Management. He did his first Agricultural Impact assessment in 2009.

He has also been involved in the implementation of numerous environmental management programmes and systems, environmental auditing, environmental impacts for environmental authorizations, mine rights and permits, waste licenses, atmospheric emissions licenses, applications for water use authorizations, specialist ecological studies, freshwater specialist studies, agricultural specialist studies and management and rectification of environmental impacts on sites and facilities (Refer to **Appendix A** for CV).

### **Statement of Independence**

Neither Eco Impact Legal Consulting (Pty) Ltd nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of Eco Impact Legal Consulting (Pty) Ltd.

Eco Impact Legal Consulting (Pty) Ltd has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

### **Disclaimer**

The opinions expressed in this report have been based on the information supplied to Eco Impact Legal Consulting (Pty) Ltd by the applicant. Eco Impact Legal Consulting (Pty) Ltd has exercised all due care in reviewing the supplied information, but conclusions from the review are reliant on the accuracy and completeness of the supplied data. Eco Impact Legal Consulting (Pty) Ltd does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of Eco Impact Legal Consulting (Pty) Ltd investigations, and those reasonably foreseeable. These opinions do not necessarily apply to

conditions and features that may arise after the date of this Report, about which Eco Impact Legal Consulting (Pty) Ltd had no prior knowledge nor had the opportunity to evaluate.

### **EAP Affirmation**

Section 16 (1) (b) (iv), Appendix 1 Section 3 (1) (r), Appendix 2 Sections 2 (i) and (j) and Appendix 3 Section 3 (s) 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 correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties;
- 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; and
- The level of agreement between the EAP and interested and affected parties on the Plan of Study for undertaking the environmental impact assessment.

Eco Impact Legal Consulting (Pty) Ltd and the EAPs managing this project hereby affirm that:

- To the best of our knowledge the information provided in the report is correct, and no attempt has been made to manipulate information to achieve a particular outcome. Some information, especially pertaining to the project description, was provided by the applicant and/or their sub-contractors. In this respect, Eco Impact Legal Consulting (Pty) Ltd standard disclaimer (inserted in this report) pertaining to information provided by third parties applies.
- To the best of our knowledge all comments and inputs from stakeholders and interested and affected parties have been captured in the report and no attempt has been made to manipulate such comment or input to achieve a particular outcome. Written submissions are appended to the report while other comments are recorded within the report. For the sake of brevity, not all comments are recorded verbatim and are mostly captured as issues, and in instances where many stakeholders have similar issues, they are grouped together, with a clear listing of who raised which issue(s).
- Information and responses provided by the EAP to interested and affected parties are clearly presented in the report. Where responses are provided by the applicant (not the EAP), these are clearly indicated.
- With respect to EIA Reports, Eco Impact Legal Consulting (Pty) Ltd will take account of interested and affected parties' comments on the Plan of Study and, insofar as comments are relevant and practicable, accommodate these during the Impact Assessment Phase of the EIA process.

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## GLOSSARY

<p><b>"Activity"</b> means an activity identified in the 4 December 2014 promulgated regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), viz, the Environmental Impact Assessment Amendment Regulations ("EIA Regulations), 2014 (Government Notice No. R. 982, R. 983, R. 984, R. 985 in Government Gazette No. 38282 of 4 December 2014). These regulations came into effect on 8 December 2014.</p>
<p><b>"Alternatives"</b>, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to property, activity, design or technology.</p>
<p><b>"Applicant"</b> means a person who has submitted or intends to submit an application.</p>
<p><b>"Application"</b> means an application for an Environmental Authorization in terms of the EIA regulations, 2014 (as amended in April 2017).</p>
<p><b>"Associated Infrastructure,"</b> means any building or infrastructure that is necessary for the functioning of a facility or activity or that is used for an ancillary service or use from the facility.</p>
<p><b>"Biodiversity"</b> The variety of life occurring in an area, including the number of different species, the genetic wealth within each species, and the natural habitat where they are found.</p>
<p><b>"Cultural significance"</b> This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.</p>
<p><b>"Cumulative impact"</b> in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.</p>
<p><b>"Environmental Impact Assessment"</b> in relation to an application to which scoping must be applied, means the process of collecting, organizing, analysing, interpreting and communicating information that is relevant to the consideration of that application.</p>
<p><b>"Environment"</b> The environment has been defined as "The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group". These circumstances include biophysical, social, economic, historical, cultural and political aspects.</p>
<p><b>"Environmental Assessment Practitioner"</b> Person or company, independent of the applicant (developer), that manages the environmental assessment process of a proposed project on behalf of the applicant.</p>
<p><b>"Environmental Impact Report"</b> In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.</p>
<p><b>"Environmental Management Programme"</b> means a programme presenting management and mitigation measures in relation to identified or specified activities envisaged in Chapter 5 of the National Environmental Management Act and described in regulation 34.</p>
<p><b>"Heritage resources"</b> This means any place or object of cultural significance. It also includes archaeological resources.</p>
<p><b>"Interested and Affected Party"</b> means an interested and affected party contemplated in section 24(4) (d) of the Act, and which in terms of that section includes -</p> <ul style="list-style-type: none"> <li>(a) Any person, group of persons or organization interested in or affected by an activity; and</li> <li>(b) Any organ of state that may have jurisdiction over any aspect of the activity.</li> </ul>
<p><b>"Public Participation Process"</b> means a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters; <i>"Registered Interested and Affected Party", in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of the regulations.</i></p>

**“Species of Conservation Concern”** All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

**“Significant impact”** means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

## ABBREVIATIONS

<b>CBA:</b>	Critical Biodiversity Area
<b>DEA:</b>	Department of Environmental Affairs
<b>DEA&amp;DP</b>	Department of Environmental Affairs and Development Planning
<b>DWS:</b>	Department of Water and Sanitation
<b>EAP:</b>	Environmental Assessment Practitioner
<b>EMP:</b>	Environmental Management Programme
<b>EIA:</b>	Environmental Impact Assessment
<b>EIR:</b>	Environmental Impact Report
<b>FSR:</b>	Final Scoping Report
<b>HIA:</b>	Heritage Impact Assessment
<b>I&amp;APs:</b>	Interested and Affected Parties
<b>IDP:</b>	Integrated Development Plan
<b>LUPA</b>	Land Use Planning Act 3 of 2014
<b>MAR:</b>	Mean Annual Rainfall
<b>NEMA:</b>	National Environmental Management Act No. 107 of 1998
<b>NEM:WA:</b>	National Environmental Management: Waste Act No. 59 of 2008
<b>NWA:</b>	National Water Act No. 36 of 1998
<b>PPP:</b>	Public Participation Process
<b>SACNASP:</b>	South African Council for Natural Scientific Professions
<b>SANBI:</b>	South African National Biodiversity Institute
<b>SDF:</b>	Spatial Development Framework
<b>ToR:</b>	Terms of Reference



## SCOPING REPORT

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### SECTION 1: INTRODUCTION

This report has been prepared in compliance with the requirements of the following legislation:

- The National Environmental Management Act, 1998 (Act No. 107 of 1998) [“NEMA”];
- The Environmental Impact Assessment (“EIA”) Regulations contained in Government Notice (GN) No. R983, 984 and 985 of 2014 as promulgated in terms of the NEMA [“EIA Regulations”] as amended up to and including GN 327, 325 and 324 in GG 40772 of 07 April 2017.

The purpose of these Regulations is to regulate procedures and set criteria as contemplated in Chapter 5 of the Act to enable the submission, processing, consideration and decision making regarding applications for environmental authorization of activities and matters pertaining thereto.

#### 1.1 APPLICATION FOR ENVIRONMENTAL AUTHORIZATION AND PROPOSED PROJECT DESCRIPTION

The property and proposed dam site is situated west of the Berg River east of the Moorreesburg to Gouda gravel road approximately 23km east of Moorreesburg. The dam’s 0.2 km<sup>2</sup> catchment is located in the quaternary catchment G10J. The proposed dam will have a storage capacity of 324 000m<sup>3</sup>, dam wall height of 13.5m and a surface area of 6.2ha.

The overall area is characterised by ploughed and planted lands used for agriculture. The dam will impact on a disturbed tributary of the Berg River which has been classified as an ecological support area. Take note that the tributary has no ecological functioning left other than the transport of water from the agricultural lands.

##### **Associated infrastructure**

The farm has two existing abstraction points on the Berg River south and north-east of the farmhouse. The existing pipelines (125 & 165mm dia) from these abstraction points will be upgraded to 250mm dia each to fill the proposed dam. An additional abstraction point with a 250mm dia pipeline (130m long) is proposed just below (to the north) of the proposed dam, which will be the shortest route to fill the dam.

A new power line will be required from the north-eastern abstraction point to the new point. All areas to be irrigated from the new dam will be located within existing cultivated lands. A raft abstraction pump from the dam basin will be used for bulk conveyance to the areas. The bulk conveyance pipelines will be all less than 200mm dia and must still be designed.

**Table 1: Listed activities identified are as follows:**

Government Notice R. 983 Activity No(s) as amended:	Describe the relevant <b>Basic Assessment Activity(ies)</b> in writing as per <b>Listing Notice 1</b> (GN No. R. 983)	Describe the portion of the development as per the project description that relates to the applicable listed activity
12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; where such development occurs- (a) within a watercourse;	Proposed dam of more than 100m <sup>2</sup> in size within 32m of a watercourse and within a watercourse.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from- (i) a watercourse;	Proposed infrastructure development within a watercourse.
Government Notice R. 985 Activity No(s) as amended:	Describe the relevant <b>Basic Assessment Activity(ies)</b> in writing as per <b>Listing Notice 3</b> (GN No. R. 985)	Describe the portion of the development as per the project description that relates to the applicable listed activity
NA		
Government Notice R. 984 Activity No(s) as amended:	Describe the relevant <b>Scoping and EIA Activity(ies)</b> in writing as per <b>Listing Notice 2</b> (GN No. R. 984)	Describe the portion of the development as per the project description that relates to the applicable listed activity
16	The development of a dam 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 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more.	The proposed dam will have a storage capacity of 324 000m <sup>3</sup> , dam wall height of 13.5m and a surface area of 6.2ha.

## 1.2 BACKGROUND AND PURPOSE OF THE SCOPING REPORT

In accordance with the requirements of Regulation 3 of GN R984, also having considered the provisions of Section 24(5) of NEMA, it was determined that a scoping process be undertaken.

This report fulfils the requirement of the EIA Regulations for the documentation in the scoping phase. The structure of this report is based on section 21 of GN R.982, of the

EIA Regulations as amended, which clearly specifies the required content of a scoping report.

### **1.3 ENVIRONMENTAL ASSESSMENT PRACTITIONER**

#### **1.3.1 Role and Competence of the EAP**

The role of the Environmental Assessment Practitioner (“EAP”) is to manage the application for an Environmental Authorization on behalf of the applicant. The EAP must adhere to all relevant legislation and guidelines, ensuring that the reports contain all the necessary and relevant information required by the competent authority to make a decision. It is the responsibility of the EAP to perform all work relating to the application in an objective, appropriate and responsible manner. The EAP must comply with Regulation 13 of the EIA Regulations R982 of 2014 as amended, detailing the requirements for an EAP.

Mr. Nicolaas Hanekom of Eco Impact Legal Consulting (Pty) Ltd (referred to hereafter as “Eco Impact”) has been appointed as the independent EAP for this project as required in terms of the regulations.

Eco Impact is a Cape Town based consultancy with environmental, health and safety legal expertise. Eco Impact is suited to assist clients with obtaining and managing waste license applications, environmental authorisations, NEMA Section 24G applications, water use authorisation applications, biodiversity assessments and with ISO 14001 and OHSAS 18001 related issues.

#### **1.3.2 Professional Team**

The following are the project team members:

- Nicolaas Hanekom - Environmental Assessment Practitioner (author); and
- Consulting Engineer – Ingeprop; DJ Hagen Pr Eng

#### **1.3.3 Terms of Reference**

Eco Impact is appointed as environmental consultant with the following Terms of Reference:

- Undertake an environmental evaluation of the applicable options and sites to get an understanding of biophysical characteristics and natural processes prevailing and to assess the proposed development proposals in terms of environmental characteristics by assessing the constraints and opportunities of the situation;
- Identify any anticipated impacts that might be considered at this early stage of the EIA process to suggest any specialist studies that may be required to provide additional information on the significance of these impacts and mitigation that may be necessary to reduce negative impacts and enhance positive impacts of the proposed development;
- Co-ordinate the early start of the recommended specialist studies with the view to informing the compilation of the initial Environmental Opportunities and Constraints;

- In association with the specialist consultants, assist the appointed consulting Engineers with the development of the optimum Site Development that will have the least impact on the both the biophysical and social environments. It is understood that as more detailed information is provided by the various specialist studies and I&APs, that the Environmental Opportunities and Constraints may need revision, and similarly, the SDP may need to be adapted;
- Undertake the applicable Scoping and EIA Process in terms of the Regulations of the NEMA to provide the relevant information for the DEA&DP, and any other government officials, to be able to make informed decisions and to issue an Environmental Authorisation for the proposed development;
- As part of the Scoping and EIA Process, a comprehensive public participation process must be entered into. This process is to provide all the relevant information to the public, NGO's, CBO's and government officials, and to allow for adequate time for the public to respond to such information. The issues as raised by I&AP's must be taken into consideration in assessing the impacts of the proposed development and, making amendments to the proposed development;
- Assess alternative development options for the property in order to reduce any significant impacts that may arise. Prescribe the necessary mitigation to enhance any positive impacts and reduce any negative impacts that may arise as a result of the proposed development must be suggested;
- Facilitate any additional specialist studies that may be required to assist with the planning and future management of the proposed development; and
- Make the necessary environmental management recommendations (mitigation/enhancement) for the construction and the operational phases of the proposed development, to ensure a sustainable development in the future.

## 1.4 LEGISLATIVE ASPECTS

### 1.4.1 Legislation

The following legislation is applicable to this project and has been considered in the preparation of the Scoping Report. Allocation of applicable environmental legislation has been done with the latest legislation:

**Table 2: Applicable legislation**

<b>Environmental Legislation</b>	<b>Description of Activity</b>
National Environmental Management Act, 1998 (Act No. 107 of 1998) and relevant regulations	Various general activities as described below, including but not limited to the control of emergency incidents and the care and remediation of environmental damage.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and relevant regulations	The requirements for, waste removal and transportation, waste disposal, littering and the requirements for an integrated waste management plan
National Water Act, 1998 (Act No. 36 of 1998) and relevant regulations	The use of water, including any water purification and effluent treatment facilities, dams and irrigation systems.

<b>Environmental Legislation</b>	<b>Description of Activity</b>
Atmospheric Pollution Prevention Act, 45 of 1965 Regulations Only	Activities that result in emissions of dust, vehicle emissions and noxious or offensive gasses.
Conservation of Agricultural Resources Act, 43 Of 1983	Weeds and the tolerance thereof, which applies in both urban and other areas.
National Environmental Management: Air Quality Act, 39 Of 2004 And Relevant Regulations	Activities that may affect the air quality on site and the environment surrounding it.
Constitution of the Republic of South Africa, 1996	General application to individual rights of all on and adjacent to the Sites
National Heritage Resources Act 25 of 1999	Development of the site and dealing with graves and burial sites and any structures older than 60 years.
National Environmental Management: Biodiversity Act 10 of 2004	The management and conservation of biological diversity and the sustainable use of indigenous biological resources.
National Veld and Forest Fire Act 101 of 1998	Any activities that could result in the start of veld fires.

#### **1.4.2 Policies**

An environmental policy is derived from the guiding principle whereby an organization first defines the scope of its commitment to the environment. The policy is a public document that communicates the organization's overall approach to managing its interaction with the environment.

Various components of Environmental Management are strongly influenced by the environmental policies in terms of their scope and level of resource allocation. As a rule, objectives and targets are set to achieve compliance with the environmental policy, and overall environmental performance is evaluated against the organization's stated intent reflecting a level of commitment.

Policy must meet the following criteria:

- It must be relevant to the nature of an organization's activities, and the specific environmental aspects associated with those activities;
- It must consider specific local environmental conditions;
- It must consider relevant environmental legislation;
- It must define and formulate the organization's fundamental approach to environmental management; and
- It must set a precedent for communication and liaison with all stakeholders.

Policies considered in the compilation of this document include:

- National Spatial Development Framework;
- Provincial Spatial Development Framework for the Western Cape;
- Framework for a conservation plan for the Cape Floristic Region.

### **1.4.3 Guidelines**

The following guidelines are applicable to this project, and have been considered in the preparation of the Scoping Report:

- Guideline on Public Participation;
- Information of Generic Terms of Reference and Project Schedules;
- Interpretation guidelines under NEMA;
- Circular EADP 0028/2014: One Environmental Management System;
- Guideline for Involving Biodiversity Specialists in the EIA Process (2005);
- Guideline for Involving a Heritage Specialist in an EIA Process (2005);
- Guideline for the Review of Specialist Input in the EIA process (June 2005);
- Guideline for Environmental Management Plans (June 2005);
- Guideline on Alternatives (March 2013); and
- Guideline on Need and Desirability (March 2013).

### **1.5 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

To date, no such information has been requested.

## **SECTION 2: DESCRIPTION OF THE PROPERTY**

### **2.1 PROPERTY DESCRIPTION AND LOCATION**

The property and proposed dam site is situated west of the Berg River east of the Moorreesburg to Gouda gravel road approximately 23km east of Moorreesburg.

Property Details: Remainder of Farm Bakovend 403, Gouda district.

282.73ha

C04600000000040300000

Latitude (S) 33° 11' 34"

Longitude (E) 18° 55' 41"

### **2.2 GENERAL CHARACTERISTICS AND LAND USE**

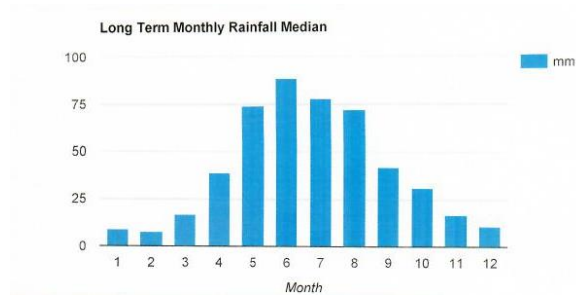
The site is currently ploughed and planted with wheat except for a small portion of the non-perennial drainage line, which was ploughed and disturbed in the past, but is currently used for grazing after the harvest is removed.

### **2.3 SPECIFIC CHARACTERISTICS**

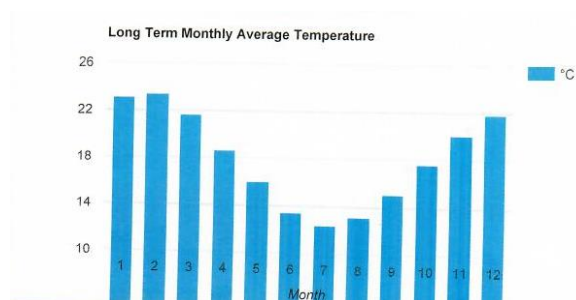
#### **2.3.1. Biophysical Elements**

##### **2.3.1.1 Climate**

The area normally receives about 471mm of rain per year, with rainfall occurring mainly from April to October. The chart below shows the average rainfall values per month. It receives the lowest rainfall (2mm) in February and the highest (88mm) in June.



The monthly distribution of average daily maximum temperatures (chart below) shows that the average midday temperatures range from 7°C in July to 23.4°C in February.



### 2.3.1.2 Topography

The area is characterised by a plain landscape with associated low slopes and an average slope of 3.02% towards the north and east (Berg River).

### 2.3.1.3 Geology and Geohydrology

The site, as shown below in Figure 1, is on the Porterville Formation of the Malmesbury Group. It appears to be underlain by phyllite shale, schist and greywacke with dark-grey limestone, sporadic quartzitic sandstone beds and conglomerate beds (Npo (dark yellow) on the map).



Figure 1: Regional geology

Several test pits were excavated near the proposed dam site in January 2017. Test

pits 3, 5 and 7 contained clayey sand and sandy lean clay under the topsoil overburden, with test pit 4 containing sand. Test pits 2 and 3 are located on the right abutment, to give an indication of the possible depth of the core trench depth. A good impermeable foundation in weathered shale at about 1.5m depth is present. Alluvial sandy material is present in the river section (test pits 1 and 4) and the depth to an acceptable shale foundation is not considered to be more than 6m. Refer to the photos in Figure 3 below.

Based on previous experience in shale foundations care must be taken to excavate the core trench foundation to below permeable features for example quartz vines<sup>1</sup> (Refer to specialist report attached for more detail).



#### **2.3.1.4 Surface Water Features**

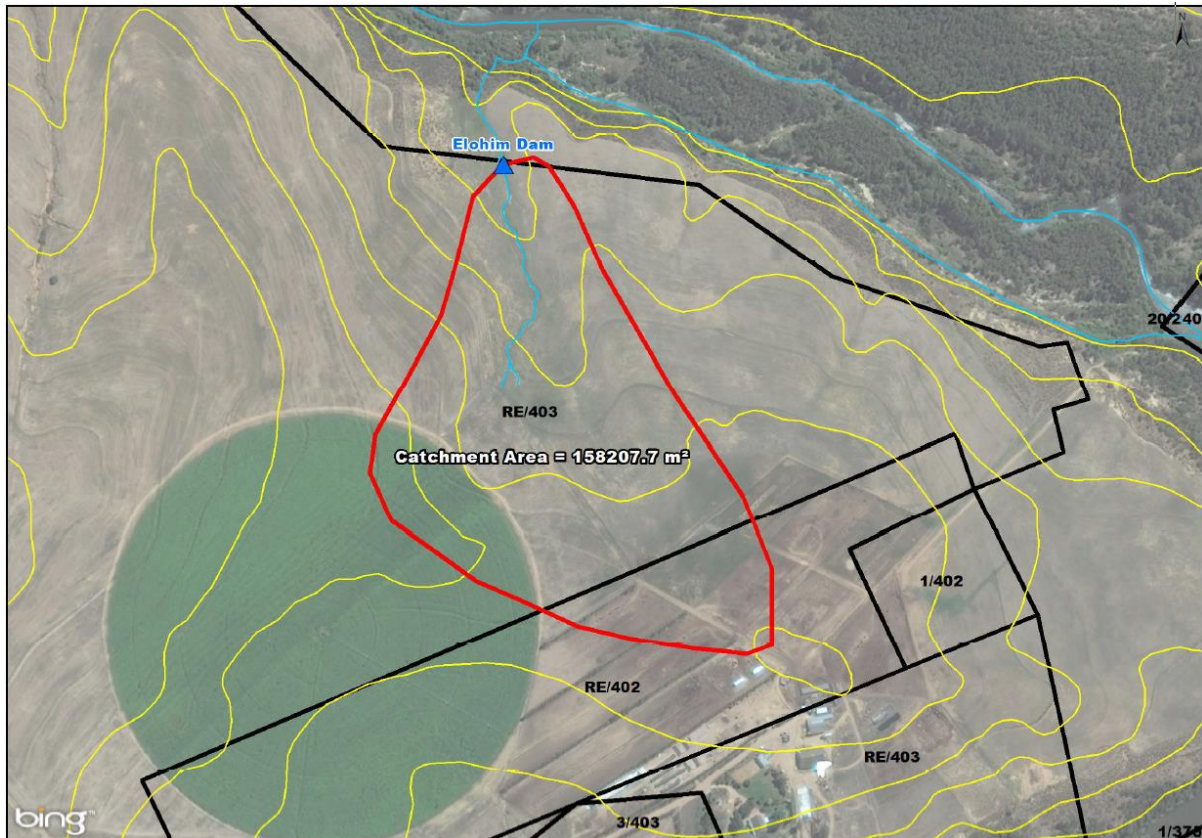
A degraded and transformed non-perennial drainage line which is a no name tributary of the Berg River runs through the proposed dam site.

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<sup>1</sup> DJ. Hagen and Joseph Mbenga, 3 April 2017. Ingeprop Elohim dam report.

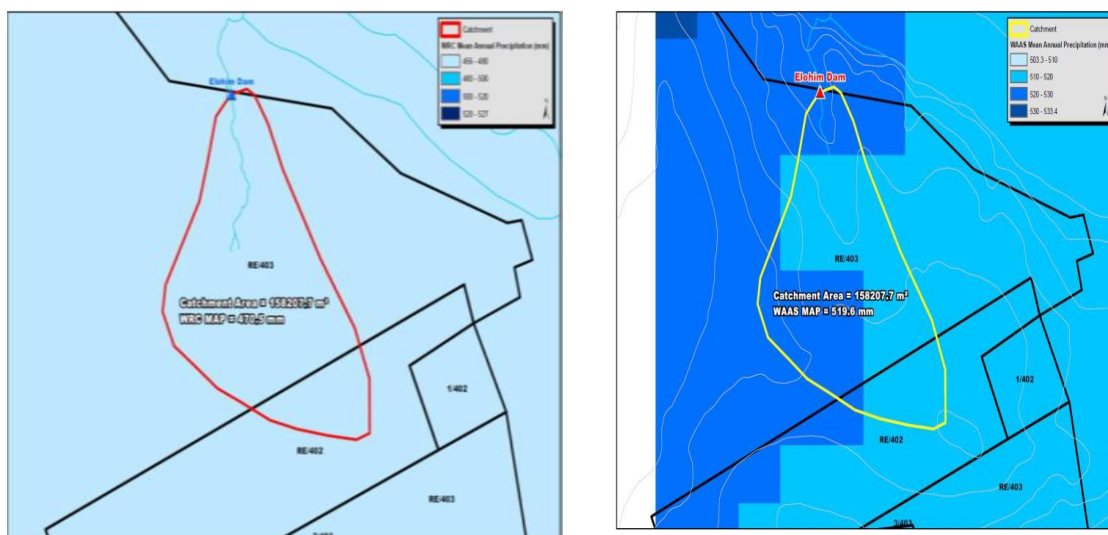


The dam's 0.2km<sup>2</sup> catchment is located in the quaternary catchment G10J. The catchment is shown in Figure 2 below.



**Figure 2:** Dam catchment

The catchment MAP's from WRC2012 study (Bailey & Pitman, 2015) and Wide Area Augmentation System (WAAS, 2007) Satellites are shown in Figure 5 below. The WRC MAP of 471 mm is considered more representative.



**Figure 3:** Catchment area and weighted MAP's

The Mean Annual Runoff (MAR) from the catchment is estimated at less than 10 000 m<sup>3</sup> (little runoff from sandy overburden soils) and therefore negligible.

### 2.3.1.5 Flora

According to Mucina and Rutherford (2006) the type of natural vegetation originally occurred on the site is classified as Swartland Shale Renosterveld (*Critically Endangered*). The vast majority of Swartland Shale Renosterveld has been lost (the target of saving 26% is now unattainable, as 90% is already completely transformed for farming). Remnants survive in tiny isolated patches within farmland, usually only on rougher, steeper ground that cannot be cultivated. Only a few pockets are actually protected, and most surviving areas are threatened by invasive alien plants such as *Acacia saligna* ("Port Jackson"), *Acacia mearnsii* and a variety of other invasive trees, grasses and herbs<sup>2&3</sup>.

Take note that the tributary has no ecological functioning left other than the transport of water from the agricultural lands. The site is currently ploughed and planted with wheat except for a small portion the non-perennial drainage line, which was ploughed and disturbed in the past, but is currently used for grazing after the harvest is removed.

### 2.3.3. Socio-Economic Elements

According to the household survey the Swartland Municipality has an urban population of 83 218<sup>4</sup>. The rural population is 11588, thus giving a total of 94 806. The table below gives a breakdown per area as indicated. The literacy rate for the West Coast District as a whole is 76.1% compared with an overall provincial rate of 82.4%. Literacy rates vary across the local municipalities with the District with a high of 85.3% in Saldanha Bay and low of 70.5% in Bergrivier. Of particular concern is the mismatch of the prevailing literacy rate across the West Coast District when compared to the Provincial literacy rate. Naturally this has major labour market implications down the line especially on the skill level composition of the labour force as well as the cost and efficiency of gearing the labour force towards the required skill levels for newly introduced industries within the region. The poverty rate is a cause for concern in general. For the year 2010, Bergrivier (33.8%); Matzikama (31.7%) and Cederberg (42.7%) recorded alarming levels of poverty. Saldanha Bay has consistently recorded low poverty rates relative to its neighbouring municipalities but there was a slight increase from 22.3% in 2001 to 23.9% in 2010. Swartland's poverty rate has declined substantially from 32.8% in 2001 to 26.8% in 2010.

### Moorreesburg Dry Land Farming

The modelling<sup>5</sup> results for the Moorreesburg case study can be summarised as follows:

- Climate data from four global climate models (GCMs) were applied in the Agricultural Production Systems Simulator (APSIM) modelling to project intermediate future yield for wheat. The different GCM projections (20-year average) range from a 4% decrease to a 4% increase compared to present yield. The overall average yield between the four models equals the average present yield.

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<sup>2</sup> <http://www.calflora.net/southafrica/capeflora.html>

<sup>3</sup> "Environmental resources and downloads. City of Cape Town. Environmental Resource Management Dept".

<sup>4</sup> [https://www.westerncape.gov.za/text/2012/11/swartland-idp-2012-2017\\_0.pdf](https://www.westerncape.gov.za/text/2012/11/swartland-idp-2012-2017_0.pdf)

<sup>5</sup> Johnston, P.A. September 2016. Modelling impacts of climate change on selected South African crop farming systems Report to the Water Research Commission and Department of Agriculture, Forestry and Fisheries.

- Data from five GCMs was used in (Crop Critical Climate Threshold) CCCT modelling. Despite relatively small variances between the different GCM projections, no major changes in yield, from the present to the intermediate future, are projected. This result concurs with the APSIM crop modelling results, which increases confidence in the CCCT modelling technique.
- Both climate change financial modelling techniques (APSIM crop modelling and CCCT modelling technique) indicate that intermediate climate scenarios from different GCMs pose a very marginal threat to the financial vulnerability of farming systems in the Moorreesburg dryland wheat producing area.
- The impact of intermediate climate scenarios on financial vulnerability will be more severe on farming systems that are highly geared (high debt levels).
- Adaptation strategies to counter the impact of climate change on financial vulnerability were included in the model. These strategies include Cropping systems and Production practices.
- The above adaptation strategies seem not only to counter the impact of climate change, but to positively impact on profitability.

The proposed dam will have a positive impact on the agricultural potential of the property. Winter water will be stored for irrigation in summer to plant pastures for animal feed that will increase the sustainability of the farm.

A provisional total project cost estimate for the project can be summarised as follows:

**Table 3: Cost estimate of the proposed dam**

<b>Item No and description</b>	<b>Cost (million R, excluding VAT)</b>
1. Construction	
1.1 Proposed Dam	4.7
1.2 Pipelines and pump stations	1.3
<b>Sub-total</b>	<b>6.0</b>
2 Professional costs	
2.1 Engineering of dam	0.4
2.2 Authorisation processes	0.3
<b>Sub-total</b>	<b>0.7</b>
<b>Total</b>	<b>6.7</b>

Proposed construction period is 5 months.

#### **2.3.4. Visual Elements**

The proposed development will not be visible from any public road and will fit in with the surrounding agricultural landscape.

#### **2.3.5. Agricultural Potential**

The proposed dam will have a positive impact on the agricultural potential of the property. Winter water will be stored for irrigation in summer to plant pastures for animal feed that will increase the sustainability of the farm.

#### **2.3.6 Existing Services**

The proposed dam will not impact on any existing services.

## **SECTION 3: NEED AND DESIRABILITY**

### **3.1 NEED AND DESIRABILITY**

The applicant would like to construct a new dam to utilize their existing winter enlistment of 45.6ha at 7 000m<sup>3</sup>/ha (320 000m<sup>3</sup>) under the Benede-Bergrivier Irrigation Board. The proposed dam is located on an unnamed tributary of the Berg River. The proposed dam will be filled solely by pumping from the Berg River under the existing irrigation scheme. The farm's only water source is the enlistment below. There are no boreholes (groundwater use) or other private surface water use. The Benede-Bergrivier Irrigation Board confirmed the enlistment of Arbeidsgenot Landgoed to be 17ha summer and 45.6ha winter with an allocation of 7 000m<sup>3</sup>/ha/a each amounting to 438 200 m<sup>3</sup>/a. Refer to **Appendix F** of attached specialist report.

Correspondence with Aurecon, who are doing the Validation & Verification (V&V) study in this area for the Department of Water and Sanitation at present, indicated that only the above enlistment will be allocated to the farm. There are therefore no other water sources. The V&V forms provided by Aurecon are also contained in **Appendix A** of the attached specialist report under Appendix F.

### **3.2 OTHER REQUIREMENTS**

#### **3.2.1 Integrated Development Plan and Spatial Development Framework**

The proposed dam is for agricultural purposes on agricultural zoned land. The application is to store water as per existing water rights and allocations.

#### **3.2.2 Urban Edge and Planning Guidelines**

Outside the urban edge and area away from infrastructure and human settlements that can be affected by dam safety.

## **SECTION 4: ALTERNATIVES ASSESSMENT**

Regulation 21(3) of EIA Regulations R982 of 2014 as amended requires that the Scoping Report include a description of any feasible and reasonable alternatives that have been identified. Regulation 1 of GN R982 as amended defines alternatives as follows:

*“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose*

*and requirements of the activity, which may include alternatives to the—*

- (a) property on which or location where the activity is proposed to be undertaken;*
- (b) type of activity to be undertaken;*
- (c) design or layout of the activity;*
- (d) technology to be used in the activity; or*
- (e) operational aspects of the activity;*

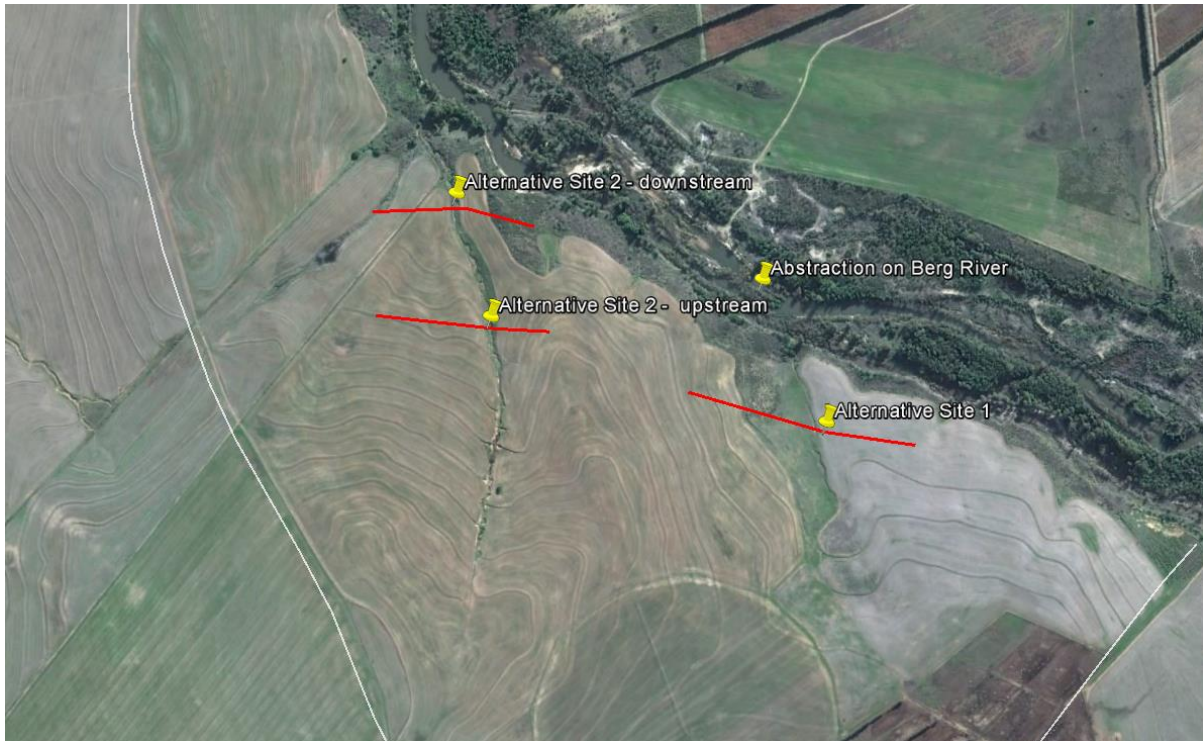
*and includes the option of not implementing the activity;*

Refer to the Plan of Study in Section 7 below for a description of the alternatives

assessment methodology. The alternatives considered for this project are described below.

#### 4.1 PROPERTY AND LOCATION/SITE ALTERNATIVES

An on-channel dam option on the Berg River was discarded due to environmental concerns and the high cost of a spillway. Three alternative site locations were considered during the planning stage on different properties in close proximity that belong to the applicant. (Site 1, Site 2-upstream and Site 2-downstream) as shown in the figure below.



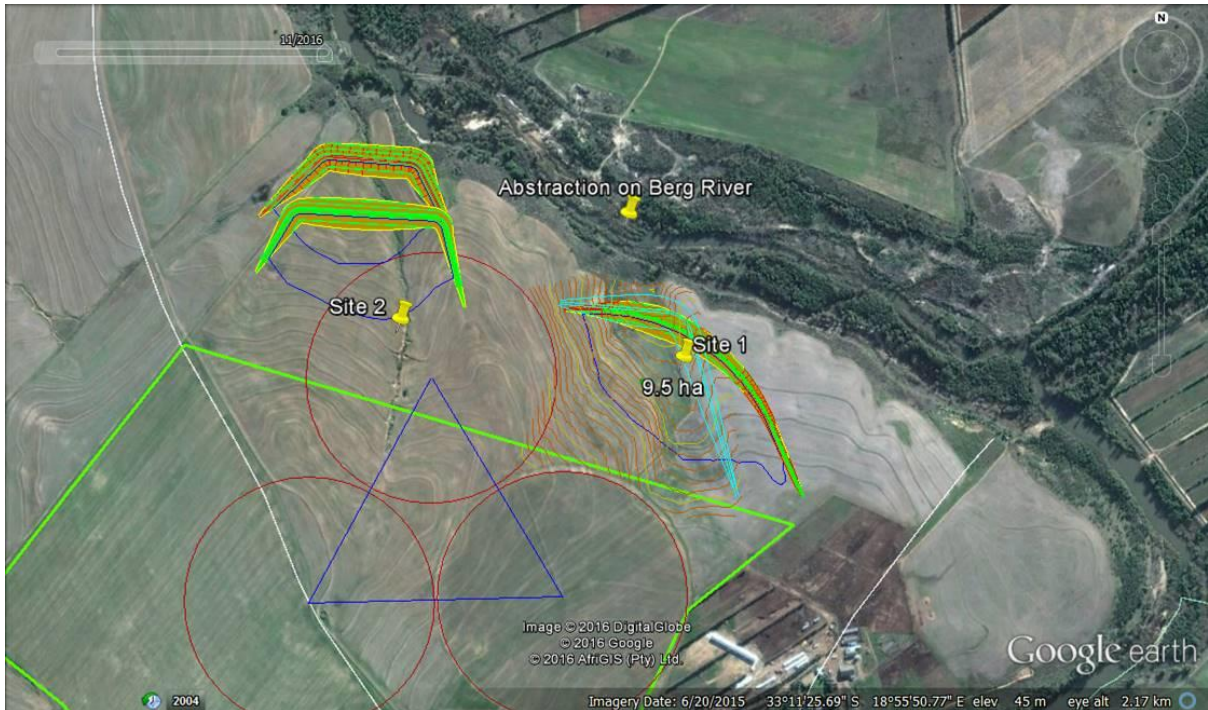
**Figure 4:** Dam location alternatives

#### 4.2 ACTIVITY ALTERNATIVES

Alternative land uses or activities were not considered as they are not feasible. The applicant must build the dam to store the winter water for irrigation in summer in order to use his existing water right.

#### 4.3 DESIGN OR LAYOUT ALTERNATIVES

Various dam options were compared based on 5m contour survey information for target storage capacities of 300 000m<sup>3</sup> and 700 000m<sup>3</sup> and dam Site 1 was found to be the most economical dam site with a water/wall ratio of 2.8 for the 300 000m<sup>3</sup> dam size. The water/wall ratio of Site 2 -upstream was 2.3 and Site 2 -downstream 2.2 for the same dam size. The dam options are shown in Figure 5 below. Full details of the options are provided in **Appendix F** of the attached specialist report).

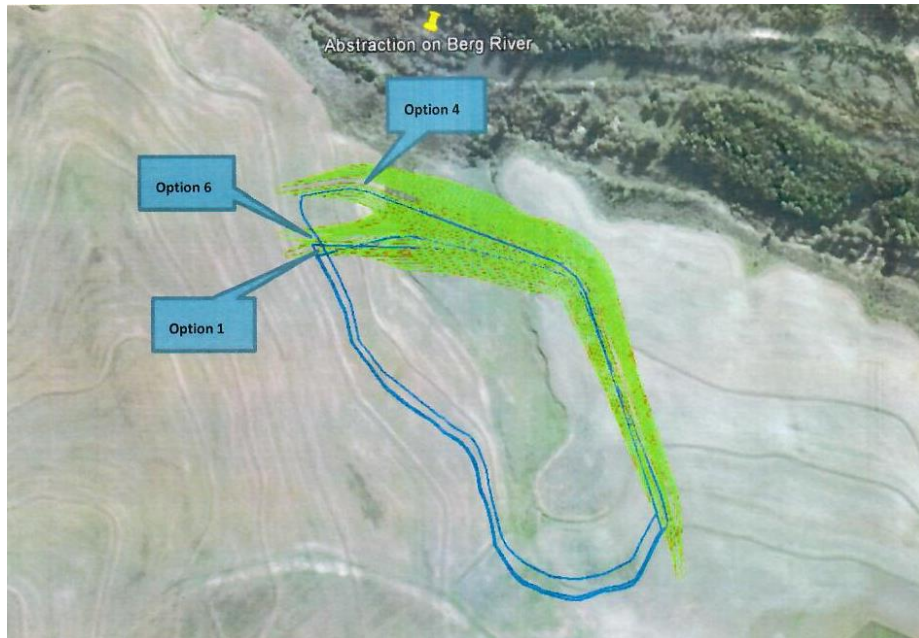


**Figure 5: Dam options for 300 000m<sup>3</sup> dam size**

The selected Site 1 was surveyed by Billy West. For the proposed zoned earth-fill dam, all the options were analysed, with the target storage capacity required of 320 000m<sup>3</sup> and compared on the basis of the water/wall ratio (the amount of earthworks required for a certain storage). Refer to the full results in **Appendix F** of the attached specialist report.

The water/wall ratio represents the volume of water gained per volume of fill required to construct the dam embankment. This is a good indication for selecting the most economical dam design alternative.

The six options analyses did not differ much in results. Option 6 (Preferred Site) was selected with straight flanks and far enough upstream of the Berg River. Refer to the layout drawing under **Appendix F** in attached specialist report and Figure 6 below. The total footprint of the dam wall and basin is 8.8ha.



**Figure 6:** Layout of the dam options

#### **4.4 TECHNOLOGY ALTERNATIVES**

No technology alternatives were assessed. No feasible technology alternatives exist. The dam is constructed as per established dam design and construction standards taking dam safety in consideration.

#### **4.5 OPERATIONAL ALTERNATIVES**

The only two operational alternatives applicable and assessed in the planning phase was the filling of the dam. Two options exist. The one is to build the dam instream in order to fill the dam when the river flows and the other option is to build the dam out of stream and the dam is filled by pumping the water into the dam. An on-channel dam option on the Berg River was discarded due to environmental concerns and the high cost of a spillway.

#### **4.6 THE OPTION OF NOT IMPLEMENTING THE ACTIVITY (THE NO-GO OPTION)**

The No-Go option will result in the site remaining as it is presently.

### **SECTION 5: PUBLIC PARTICIPATION PROCESS**

#### **5.1 INTRODUCTION**

Public participation is an integral part of the environmental assessment process and affords potentially interested and affected parties (I&APs) an opportunity to participate in the EIA process, or to comment on any aspect of the development proposals. The public participation process to be undertaken for this project complies with the requirements of the EIA Regulations. The description of the public participation process as included below itemizes the steps and actions undertaken to date and as appropriate at this stage of the project.

## 5.2 IDENTIFICATION AND REGISTRATION OF KEY DEPARTMENTS AND OTHER I&APS

Liaison with the relevant authorities plays a crucial role in the successful completion of any environmental assessment process. In addition to the DEA&DP, the key departments such as the provincial departments having jurisdiction in respect of any aspect of the project, the local municipality and municipal councillor as well as other potentially affected I&APs, including adjacent property owners and dwellers, were identified.

The parties listed in the table below were identified as potential I&APs to date as per the requirements of the Regulation 42 of R982 of 2014 as amended. A list with complete details of the I&APs is kept by the EAP and will be updated as the project progresses. Refer to Appendix D.

**Table 4: Key Departments identified to date**

Organisation
CapeNature
DEA&DP: Pollution Management
DEA&DP: Waste Management
Department of Agriculture
Department of Water and Sanitation
Heritage Western Cape
Swartland Local Municipality
West Coast District Municipality

## 5.3 NOTIFICATION OF I&APS

Potential I&AP's were notified about the project. The notification took place in the following manner (this is in compliance with Regulation 41 of the EIA Regulations, 2014).

- Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the activity to which the application relates is or is to be undertaken and any alternative site;
- Written notifications sent to potential I&APs inviting them to register and give comments on the proposed development. These notifications were in line with the requirements of Regulation 41 of GN R982 of 2014 as amended; and
- Placing an advertisement in the local newspaper in compliance with Regulation 41(2)(c)(i) of GN R982 of 2014 as amended.

All potential I&APs are afforded the opportunity to register for the project. All registered I&APs will be informed of further activities regarding the project.

## 5.4 PUBLIC MEETINGS AND WORKSHOPS

No public meetings have been held as of yet. A public participation meeting will be held if requested by any of the registered I&APs and/or key departments.



## **5.5 AVAILABILITY OF THE SCOPING REPORT**

As per the requirements of Regulation 43 of GN R982 of 2014 as amended, the pre-application draft Scoping Report will be made available for a 30 day commenting period.

The report will be included for statutory comment with the written notice as sent to the commenting organs of state.

Electronic copies (CDs) will be made available to any I&AP on request. Proof of delivery and document placement will be attached to the final Scoping Report. Additionally, the report will be made available to any I&AP upon request, as advised on the notice boards, notices and advertisements referred to in Section 5.3 above.

## **5.6 COMMENTS AND REPONSES DURING THE SCOPING PHASE**

Comments received will be responded to as per the requirements of Regulation 44 of GN R982 of 2014 as amended. The comments and response report as well as all comments received will be attached to the Scoping Report.

## **5.7 PUBLIC PARTICIPATION DURING THE EIA PHASE**

Public participation during the EIA phase involves submitting the draft EIR to the registered I&AP's and Key Departments for a 30 day period to discuss the findings of the report. Once all comments have been received, the EIR will be finalised taking into account the comments.

The final EIR will then be submitted to the DEA&DP for approval. As per the requirements of GN R982 of 2014 as amended, should any additional comments be received during this stage, these will be submitted to DEA&DP.

## **5.8 DECISION AND APPEAL PERIOD**

Once DEA&DP has reviewed the final EIR and are satisfied that it contains sufficient information to make an informed decision, they will use the information contained within the EIR to determine the environmental acceptability of the applicant's preferred options. A decision on the applications and associated reports will be made by the DEA&DP based on the findings of the EIR.

Following the issuing of the decision, I&APS will be notified. All I&APs will be provided with the opportunity to appeal the decision to the Minister in terms of the NEMA.

## **SECTION 6: ENVIRONMENTAL ISSUES IDENTIFIED TO DATE**

The potentially significant impacts associated with the proposed development have been identified by the EAP. Issues identified by Key Departments and I&APs will be taken into account in the determination of impacts. A detailed impact assessment and environmental impact statement will be provided in the EIA. The assessment will be based on the criteria as set out below in the Plan of Study (PoS).

## **6.1 CONSTRUCTION PHASE IMPACTS**

- Possible impacts on soil where soil disturbances will occur;
- Increased erosion risk due to the clearing of land for the proposed development leading to increase in storm water flow;
- Freshwater fauna and flora may be affected by the clearing and transformation of watercourses
- Water quality of the downstream water bodies may be affected due to storm water flow from construction site;
- Air quality in terms of dust generated by the clearing of land;
- Temporary job creation
- Noise Impacts
- Heritage Impacts
- Production/generation of construction waste

## **6.2 OPERATIONAL PHASE IMPACTS**

- Hydrological impacts i.e. water quality of the water draining into the drainage line from the development area and impeding drainage line water flow

## **6.3 CLOSURE AND DECOMMISSIONING PHASE IMPACTS**

It is not anticipated that decommissioning will occur in the near future. Should decommissioning occur, the expected impacts are similar to those listed in the construction phase above with the additional positive impact of rehabilitating the decommissioned area.

# **SECTION 7: PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT**

## **7.1 TASKS TO BE UNDERTAKEN**

The EIA report is informed by the scoping phase. Should the need for specialist studies be identified, input from specialists will be obtained to further advise on the potential impacts that may occur due to the proposed activities. The specialists will identify opportunities and constraints as associated with the site and the proposed development and provide their input to the concept design.

The following steps will be undertaken as part of the EIA phase:

- Alternatives will be further investigated, in a re-iterative manner, so as to avoid or minimize negative impacts and maximize potential benefits;
- The entire project team, including the specialist consultants, will be involved in the evaluation of alternatives;
- Statements regarding the potential significance of residual impacts, taking into account proposed mitigation measures will be provided in the EIA; and
- An Environmental Management Programme (EMP) covering construction, operational and decommissioning phases of the proposed development will be prepared after input from specialists, incorporating recommendations for mitigation, monitoring and evaluation are received.

## 7.2 CONSULTATION WITH COMPETENT AUTHORITY

DEA&DP as the Competent Authority regarding the Environmental Authorization application will be consulted throughout the application process.

All documentation (Draft and Final) will be sent to DEA&DP. Communication with DEA&DP will be attached to the documents to be submitted.

## 7.3 ASSESSMENT OF ENVIRONMENTAL ISSUES AND ALTERNATIVES

The objective of an impact assessment is to find the alternative having the least negative environmental impact, and which best benefits society. The assessment and evaluation of potential impacts associated with the development would thus be undertaken in a re-iterative manner, to optimally inform pro-actively the development proposal. The following methodology for assessing alternatives has been developed and will be used during the application process. GN R982 of 2014 as amended requires, in part, that the Scoping and EIA Reports include a description of any feasible and reasonable alternatives that have been identified. Regulation 1 of GN R982 of 2014 as amended defines alternatives as follows:

*“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –*

- (a) the property on which or location where it is proposed to undertake the activity (alternative properties as well as alternative sites on the same property);*
- (b) the type of activity to be undertaken;*
- (c) the design or layout of the activity;*
- (d) the technology to be used in the activity (consideration of such alternatives is to include the option of achieving the same goal by using a different method or process); and*
- (e) the operational aspects of the activity;*

The following additional alternative types (as applicable to this project) have also been suggested for inclusion, where applicable, by both the Department of Environmental Affairs (DEA) and the Department of Environmental Affairs and Development Planning (DEA&DP) in their EIA guidelines and information documents on alternatives. These alternatives are discussed where applicable.

**Demand** - when a demand for a certain product or service can be met by some alternative means;

**Input** - applicable to applications that may use different raw materials or energy sources in their process;

**Scheduling and Timing** - a number of measures might play a part in an overall programme, but the order in which they are scheduled will contribute to the overall effectiveness of the end result; and

**Scale and Magnitude** - activities that can be broken down into smaller units and can be undertaken on different scales, each may have a different impact. These were considered as well. All the above alternative types, including the no-go option (i.e. the option of not implementing the activity) have been investigated according to the methodology described below.

### **7.3.1 Alternative determination methodology**

Alternatives are described in terms of the various types of alternatives (“alternative types”) as listed above, as well as the proposed and alternative project activity(ies) (“project alternatives”) which includes a combination of all the separate factors. Both the identification, investigation, and assessment of alternatives, and the generation and consideration of modifications and changes to activities must be well documented. A reasoned explanation as to why an alternative was or was not found to be reasonable and feasible has been provided for each alternative type. The criteria in Table 3 were used during the identification and assessment of alternatives.

### **7.3.2 Role of the various parties in the consideration of alternatives<sup>6</sup>**

#### **7.3.2.1 The role of the Applicant**

- Consider the strategic planning and environmental context within which the development and alternatives are to be considered;
- Consider all feasible and reasonable alternatives (not only the preferred option); and
- Provide the EAP with access to all information at the disposal of the applicant regarding the application.

**Table 5:** Alternatives assessment methodology

Criteria	General description / methodology for alternatives assessment	Project specific action taken for alternatives assessment
Identification of alternatives	<p>Alternatives have been identified as early as possible in the process (planning and design phase). Alternatives will further be considered and assessed throughout the project life as amendments to the alternatives are made. Assessment of the alternatives will only cease once final alternatives have been decided upon. These will be the final alternatives for which Environmental Authorisation will be applied for. The identification of alternatives should be broad, objectively done and well documented.</p>	<p>Due to the nature of the project, not all alternative types as listed above could be assessed as some of the activities have only one option for implementation. Where possible, alternatives were considered.</p>
Comparative assessment	<p>The project alternatives will be determined according to the alternative types identified as feasible and reasonable and assessed comparatively.</p>	
Reasonability and feasibility	<p>All alternatives were considered in terms of reasonability, feasibility, practicability, relevancy and viability. As determined throughout the process, not all alternatives will be reasonable or feasible. These will in subsequent reports be mentioned as being considered but will not be described in detail.</p>	<p>Only alternatives considered reasonable and feasible at the scoping phase have been included in this report. Alternatives discarded prior to this phase have not been included and will not be considered further.</p>
Sustainability considerations and effectiveness of alternatives	<p>The alternatives identified have taken into account the triple bottom-line of sustainability i.e. meeting the socio-economic and ecological needs of the public. The alternatives aim to maximise the benefits and avoid or minimise the negative impacts. The primary objective has been to avoid all negative impacts (where possible), rather than to minimise them. The alternatives further took into consideration the need to maximise resource use efficiency.</p>	<p>Alternatives with regards to the proposed development considered the best practical environmental option in terms of timeframes and implementation methods/ designs.</p>

Discrete vs. incremental alternatives	Initial alternatives identified, also known as discrete alternatives were identified during the early stages of a project (pre-feasibility and feasibility) and comparatively assessed during the assessment phases. During subsequent consideration, as the project progresses, incremental modifications and changes to activities will occur. These incremental changes will be considered during the amendment to the project activities during project progression. Impacts and issues of these changes will also be considered, as and when they are identified	
Advantages and disadvantages	For each alternative, the related advantages and disadvantages have been considered for each alternative type. These have not been discussed in terms of the project alternatives.	
Impacts and aspects	Impacts and aspects related to the implementation of each alternative are listed with the alternative type descriptions. Detailed impacts are described in Section 7 for each project alternative. The aim is to address the key impacts of the proposed alternative by maximising benefits and avoiding or minimising the negative impacts. The primary objective must be to avoid all negative impacts, rather than to minimise them.	Main impacts identified to be considered in determining alternatives are as follows: <ul style="list-style-type: none"> <li>• Aquatic fauna and flora</li> <li>• Surface water quality</li> <li>• Health and safety</li> <li>• Social aspects</li> </ul>
Other considerations	The “feasibility” and “reasonability” of and the need for alternatives should be determined by considering, amongst others: <ol style="list-style-type: none"> <li>(a) the general purpose and requirements of the activity;</li> <li>(b) need and desirability;</li> <li>(c) opportunity costs;</li> <li>(d) the need to avoid negative impact altogether;</li> <li>(e) the need to minimise unavoidable negative impacts;</li> <li>(f) the need to maximise benefits; and</li> <li>(g) the need for equitable distributional consequences.</li> </ol> Also refer to Section 4 for a detailed description of the need and desirability of the project.	The need and desirability of the project took into account various strategic planning documents applicable to the area as well as socio-economic priorities. This determined the feasibility and reasonability of the project. The need and desirability influenced the timeframes and design specifications considered for the project.

I&APs	I&APs have to be notified of both the preferred and alternative activities. They should also be allowed to comment on both.	Public participation will be undertaken in line with the requirements of Regulations 39 to 44 of GN R982 of 2014 as amended.
No-go option	The option of not implementing the activity has been to the same level of detail as the other feasible and reasonable alternatives.	The option of not proceeding with the activity (no-go option) provides a reliable baseline against which to compare and evaluate feasible and reasonable alternatives.

### 7.3.2.2 The role of the EAP

- Consider the strategic planning and environmental context within which the development and alternatives are to be considered;
- Identify, investigate and assess alternatives;
- Afford opportunities for interested and affected parties to provide input into the identification, investigation and assessment of alternatives;
- Disclose all information relevant to the consideration of alternatives to the applicant and competent authority;
- Document the process of identification, investigation and assessment of alternatives (including providing the methodology and criteria used, and how the level of investigation applied to each alternative was established); and
- Provide a comprehensive consideration of the impacts of each of the alternatives assessed.

### 7.3.2.3 The role of specialists

- Assess impacts, especially the direct footprint as well as indirect and potential cumulative impacts of the development;
- Take into account the context and the intensity of the impact as related to their specific field of expertise;
- Highlight any impacts that could be irreversible or result in an irreplaceable loss of resource;
- Evaluate the significance of residual impacts associated with the proposed development, taking into account scientific information, local community and societal values attached to the environment as being impacted upon;
- Use accepted or formal standards, thresholds or targets for environmental quality, where available, as a key indicator of potential significance, since these measures reflect societal values. Where these benchmarks are absent, specialists should draw on a combination of criteria used to assess potential impacts, to indicate their potential significance, as well as feedback from key stakeholders; and

- Assess and respond to all comments made by Key Departments and Registered I&APs.

#### **7.3.2.4 The role of I&APs**

- Declare their interests;
- Assist in the identification, investigation and assessment of alternatives, particularly where local knowledge is required;
- Within the specified timeframes, provide comment on the consideration of alternatives.

### **7.4 CRITERIA FOR ASSESSMENT OF IMPACTS**

Below is the assessment methodology utilized in determining the significance of the construction, operational and decommission impacts of the proposed activities, and where applicable the possible alternatives, on the biophysical and socio-economic environment. The methodology is broadly consistent to that described in Integrated Environmental Management Series.

For each impact, the significance is determined by various factors. Significance is described prior to mitigation as well as with the most effective mitigation measure(s) in place.

The mitigation described in the Environmental Management Programme (EMP) document, to be attached to the EIA, represents the full range of plausible and pragmatic measures *but does not necessarily imply that they all should or will be implemented*. The decision as to which mitigation measures to implement lies with the applicant and ultimately with the competent authority. To facilitate informed decision-making, EIAs must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Despite the attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, EIA processes can never completely escape the subjectivity inherent in attempting to define significance. Recognising this, potential subjectivity in the EIA process will be addressed as follows:

- Be clear about the difficulty of being completely objective in the determination of significance;
- Develop an explicit methodology for assigning significance to impacts and outlining this methodology in detail. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing toward determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the EIA Report with a clear summary of how the assessor derived the assigned significance; and
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.

Although these measures may not totally eliminate subjectivity, they do provide an explicit context within which to review the assessment of impacts.



**Table 6: Assessment criteria for the evaluation of impacts**

<b>Criteria</b>	<b>Description</b>		
<b>Nature</b>	A description of what causes the effect, what will be affected, and how it will be affected.		
	<b>Type</b>	<b>Score</b>	<b>Description</b>
<b>Extent (E)</b>	None (No)	1	Footprint
	Site (S)	2	On site or within 100 m of the site
	Local (L)	3	Within a 20 km radius of the centre of the site
	Regional (R)	4	Beyond a 20 km radius of the site
	National (Na)	5	Crossing provincial boundaries or on a national / land wide scale
<b>Duration (D)</b>	Short term (S)	1	0 – 1 years
	Short to medium (S-M)	2	2 – 5 years
	Medium term (M)	3	5 – 15 years
	Long term (L)	4	> 15 years
	Permanent(P)	5	Will not cease
<b>Magnitude (M)</b>	Small (S)	0	will have no effect on the environment
	Minor (Mi)	2	will not result in an impact on processes
	Low (L)	4	will cause a slight impact on processes
	Moderate (Mo)	6	processes continuing but in a modified way
	High (H)	8	processes are altered to the extent that they temporarily cease
	Very high (VH)	10	results in complete destruction of patterns and permanent cessation of processes.
<b>Probability (P)</b> the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned	Very improbable (VP)	1	probably will not happen
	Improbable (I)	2	some possibility, but low likelihood
	Probable (P)	3	distinct possibility
	Highly probable (HP)	4	most likely
	Definite (D)	5	impact will occur regardless of any prevention measures
<b>Significance (S)</b>	Determined through a synthesis of the characteristics described above: <b>S = (E+D+M) x P</b> Significance can be assessed as low, medium or high		
<b>Low: &lt; 30 points:</b>	The impact would not have a direct influence on the decision to develop in the area		
<b>Medium: 30 - 60 points:</b>	The impact could influence the decision to develop in the area unless it is effectively mitigated		
<b>High: &lt; 60 points:</b>	The impact must have an influence on the decision process to develop in the area		
<b>No</b>	When no impact will occur or the impact will not affect the		

Criteria	Description		
significance	environment		
Status	Positive (+)		Negative (-)
The degree to which the impact can be reversed	Completely reversible (R)	90-100%	The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.
	Partly reversible (PR)	6-89%	The impact can be partly reversed providing that mitigation measures as stipulated in the EMP are implemented and rehabilitation measures are undertaken
	Irreversible (IR)	0-5%	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place
The degree to which the impact may cause irreplaceable loss of resources	Resource will not be lost (R)	1	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the EMP are implemented
	Resource may be partly destroyed (PR)	2	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the EMP are implemented
	Resource cannot be replaced (IR)	3	The resource cannot be replaced no matter which management or mitigation measures are implemented.
The degree to which the impact can be mitigated	Completely mitigatable (CM)	1	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the EMP are implemented
	Partly mitigatable (PM)	2	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the EMP are implemented. Implementation of these measures will provide a measure of mitigatability
	Un-mitigatable (UM)	3	The impact cannot be mitigated no matter which management or mitigation measures are implemented.

Cumulative impact: Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments already on the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

Degree of confidence in predictions: The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.

## **7.5 PUBLIC PARTICIPATION PROCESS**

Public participation processes will be undertaken as follows:

- The public and adjacent neighbours will be further advised as to the application process underway;
- Responding members of the public and neighbours (I&APs) are registered to the application data base and will be informed throughout the Scoping – EIA process;
- Registered I&APs will be appraised of the draft and final Scoping Reports and Plan of Study for EIA; and
- During the EIA phase, the draft EIA Report will be open for comment and input from registered I&APs.

The project team will evaluate any comment and input as may be forthcoming and will respond as appropriate to issues and concerns as raised by I&APs.

Should amendments to any Draft Reports be substantive, or should the Final Report contain substantive information that was not included in the Draft Report, registered I&APs will be afforded an opportunity to again comment on the Final Report before it is submitted to the competent authority as provided for by Regulation.

Once all comments have been addressed, the Final EIA Report will be submitted to the competent authority for evaluation.

## **7.6 TERMS OF REFERENCE (TOR) FOR SPECIALIST STUDIES TO BE UNDERTAKEN IN THE EIA PHASE**

The specialists will be provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues, inclusive of input as received from IA&Ps. These criteria are inclusive of the need to consider the no go option as the base line option. These criteria are defined in the EIA Regulations: Guideline and Information Document Series: Generic Terms of Reference for Environmental Assessment Practitioners: For Basic Assessment and Scoping-EIA. Specialists will also comply with Regulation 23 of the EIA Regulations.

The following specialist studies are proposed to be undertaken during the EIA phase:

- Risk assessment as part of the water use application (to be submitted to DWS).
- A Freshwater Ecosystem Impact Assessment – to determine potential impacts on the freshwater ecosystem of the watercourse within which developments are proposed.

## **SECTION 8: ASSUMPTIONS AND LIMITATIONS**

### **8.1 ASSUMPTIONS**

The assumption is that the information on which the report is based (such as base line studies and project information, as well as existing information) is correct. The baseline information provided is preliminary and may need more detailed investigation, which will form part of the subsequent stages of the Scoping - EIA process. Statements or indicators of significance must be considered in the light of uncertainty regarding the

extent and significance of such resources on the site.

## **8.2 LIMITATIONS**

This report is based on currently available information and, as a result, the following limitations are implicit:

- The report is based on a project description taken from design specifications for the proposed development that have not yet been finalised, and which may undergo a number of iterations and refinements before they can be regarded as definitive;
- A project description based on the final design will be provided in the EIA Phase; and
- Descriptions of the natural and social environments are based on limited fieldwork and local knowledge as well as available literature.

More information will be provided in the EIA phase based on the outcomes of the specialist studies.

## **SECTION 9: CONCLUSION**

The proposed development is necessary in order to provide storage of the allocated water right in order to improve the agricultural sustainability of the property.

The EIA phase will determine the most feasible alternatives according to the results of the specialist studies as well as the input from all I&APs and key departments. Detail impacts will be determined accordingly and appropriate management and mitigation measures provided.