



ECOLOGICAL IMPACT ASSESSMENT:

**PROPOSED CULTIVATION OF 100 HA FOR THE
ESTABLISHMENT OF A VINEYARD ON PORTION 10 OF
THE FARM DE EELT NO 26 NEAR PRIESKA, NORTHERN
CAPE PROVINCE**

Compiled by:

AJH Lamprecht

Externally reviewed by:

Prof. J du Preez

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Today's Impact | Tomorrow's Legacy

T +27 (0)86 198 8895 | F +27 (0)86 719 7191
E office@enviroworks.co.za

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EXECUTIVE SUMMARY

The company Mahoebe Eiendomme (Pty) Ltd has recently commenced with the process of procuring of Portion 10 of the Farm De Eelt 26 near Prieska in the Northern Cape Province with the intention of establishing a 100 ha vineyard on this portion of natural previously uncultivated land.

The potential of ecologically significant species as well as nationally and provincially protected species being present on the site had a relatively high probability and therefore had to be investigated by an ecologist. Ecological sensitivity and importance of the area also had to be determined as this will affect the probability of obtaining authorisation. An Ecological Impact Assessment was conducted for the proposed vineyard area in order to determine and evaluate the nature, significance and extent of the potential impacts that the proposed project will have on the natural environment. Proposed mitigation and management measures are also recommended in order to attempt to reduce/alleviate these identified potential impacts.

The proposed project area is approximately 147.91 ha in surface size and is situated on Portion 10 of the Farm De Eelt No 26. The farm portion is approximately 15 km north-east of the town of Prieska in the Northern Cape Province and is owned by SchalkTheron Family Trust. The property falls inside the Siyathemba Local Municipality which, in turn, forms part of the greater Pixley Ka Seme District Municipality. Access to the proposed project area is obtained by way of the R 368 provincial road which lies approximately 6 km to the west of the proposed project area.

According to Mucina & Rutherford (2006) the proposed project area forms part of the Upper Gariep Alluvial vegetation type (AZa 4) which mainly consists of flat alluvial terraces supporting complex of riparian thickets and is classified as vulnerable in terms of conservation status. The vegetation structure (organisation of individuals in space that constitutes a stand of plants) and species encountered during the site visit however indicated that the vegetation rather forms part of the neighbouring Northern Upper Karoo vegetation type (NKu 3) which is classified as least threatened (Mucina & Rutherford, 2006). This vegetation type is characterised by a shrubland dominated by dwarf karoo shrubs, grasses and low trees on a flat to gently sloping terrain.

The proposed project area was assessed on foot and visual observations/identifications of species on the footprint area were conducted. Species were listed and categorised as per the Red Data Species List, Protected Species List (National Forests Act (Act 84 of 1998); Notice of the list of protected tree species), Provincially Protected species (Northern Cape Nature Conservation Act (Act 9 of 2009) and

Invasive Species List (National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. Potential impacts of the proposed project on the natural environment were identified, evaluated and rated.

The wetland delineation guideline document titled “A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas” was used to identify and delineate any wetlands in the area.

The required four specific indicators were used to determine the outer edge of the wetland namely:

- the terrain unit indicator,
- the soil form indicator,
- the soil wetness indicator and
- the vegetative indicator.

The proposed project area can roughly be divided into the following three sections based on landscape structure and condition of vegetation/extent of degradation:

- Top flat plateau of the elevated rocky ridge
- Side-slope and lower foot-slope of the rocky ridge
- Lower lying flat areas surrounding the ridge.

Each of these identified areas is discussed in this document.

The Ecological Impact Assessment revealed that although the entire project area forms part of a Critical Biodiversity Area 1, this categorisation is only based on the endangered Upper Gariep Alluvial vegetation type. Ground truthing indicated that the area rather falls inside the adjacently located Northern Upper Karoo vegetation type instead of the Upper Gariep Alluvial vegetation type as per the vegetation map, and it is therefore rather only categorised as a Critical Biodiversity Area 2. The transformation of the Critical Biodiversity Area 2 through cultivation is not considered a fatal flaw for the proposed project and is not expected to significantly jeopardise the project application process.

The proposed project area and vast surrounding natural land is very homogenous in terms of habitat and no significant faunal or avifaunal habitat variety exists. The project area therefore provides no potentially important or unique faunal or avifaunal habitats which need to be conserved for the purposes of Red Data Listed terrestrial animal or bird species management. No Red Data Listed terrestrial animal or bird species were encountered during the site visit conducted by the specialist.

Due to the mobility of most terrestrial animal and bird species, individuals simply tend to leave an area where disturbance is taking place and disperse to other similar, adequate areas.

Various provincially protected species and the nationally protect tree *Boscia albitrunca* are present on the proposed project site. Removal and relocation permits for such individuals will have to be applied for. This however does not pose a fatal flaw to the project and it is the opinion of the specialist that this proposed development may continue in the event that all mitigation measures and recommendations as per this report are adhered to as well as all necessary permits are successfully obtained.

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ABBREVIATIONS

CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CBA	Critical Biodiversity Area
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Ecological Support Area
IBA	Important Bird and Biodiversity Areas
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMA	National Environmental Management Act (Act 107 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
WULA	Water Use License Application

DETAILS OF THE SPECIALIST

Adriaan Johannes Hendrikus Lamprecht

M.Env.Sci. Ecological remediation and sustainable utilisation (NWU: Potchefstroom)

Enviroworks

5 Walter Sisulu Street

Universitas

Bloemfontein

9321

Phone: 072 230 9598

Email: rikus@enviroworks.co.za

SHORT CV

Rikus Lamprecht was employed by Enviroworks in 2016 as a Senior Environmental Consultant. Rikus was previously employed by Fraser Alexander Tailings from 2011 to 2015 as an Environmental Contracts Manager where he was responsible for the technical and operational management of all Fraser Alexander Tailings' environmental mining rehabilitation work. He was responsible for all facets of project management as well as implementation of rehabilitation and environmental strategies by planning activities, organizing physical, financial and human resources, delegating task responsibilities, leading people, controlling risks and providing technical support.

Rikus holds a B.Sc Botany and Zoology as well as an M.Env.Sci Ecological Remediation and Sustainable Utilisation degree.

Relevant Project Experience

2016

- Management of the Environmental Authorisation and EIA processes of the proposed Meerkat Hydropower Facility Project in the Orange River in the Northern Cape Province.
- Management of the Environmental Authorisation and EIA processes of the proposed N8 Realignment Project in the Free State Province.
- Compilation of an Environmental Impact Assessment Report for the proposed cultivation of a 500 ha Vineyard for CarpeDiem in the Northern Cape
- Management of the 24G Environmental Authorisation and EIA processes of the Mooihoekdam Project in the Free State Province.

- Conducting of Waste License and Air Emissions License applications for the 24G process of Clinvet International (Pty) Ltd
- Completion of a specialist vegetation study and report for the proposed Olifantshoek Bulk Water Supply Project in the Northern Cape Province.
- Completion of a specialist vegetation study and report for the proposed N8 gravel quarries in the Free State Province.

DECLARATION OF INDEPENDENCE

I, Adriaan Johannes Hendrikus Lamprecht, ID 870727 5043 083, declare that I:

- am a senior environmental specialist at Enviroworks
- act as an independent specialist consultant in the field of botany, ecology and vegetation science;
- am assigned as specialist consultant by Enviroworks Consultants (Pty) Ltd for this proposed project;
- I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference;
- remuneration for services by the proponent in relation to this proposal is not linked to approval by decision-making authorities responsible for permitting this proposal and
- the consultancy has no interest in secondary or downstream developments as a result of the authorisation of this project.
- have no and will not engage in conflicting interests in the undertaking of the activity;
- undertake to disclose to the client and the competent authority any material, information that have or may have the potential to influence the decision of the competent authority required in terms of the Environmental Impact Assessment Regulations 2014;
- will provide the client and competent authority with access to all information at my disposal, regarding this project, whether favourable or not.

AJH Lamprecht



Signature

DETAILS OF THE EXTERNAL REVIEWER

EnviroNiche Consulting was appointed by Enviroworks to externally review the vegetation survey conducted by the specialists as part of the process in support of an application to develop the site.

Professor Johann du Preez

EnviroNiche Consulting Biodiversity and Environmental Consultants

208 PostNet Suite

Private Bag x16

Hermanus

7200

Fax: 086 645 2222

Email: greenrsa@gmail.com

SUMMARY OF EXPERTISE

- Registered professional member of The South African Council for Natural Scientific Professions (Ecological Science), registration number: 400271/07.
- Ecological consultant since 2000.
- Conducted, or co-conducted, over 1 500 specialist ecological surveys as an ecological consultant.
- Co-author of a book on ecology
- Published over 30 refereed scientific reports,
- Presented 17 scientific conference presentations,

DECLARATION OF INDEPENDENCE

I, Pieter Johannes du Preez, ID 600821 5016 087, declare that I:

- am the owner of EnviroNiche Consulting
- act as an independent specialist consultant in the field of botany, ecology and vegetation science;
- am assigned as specialist consultant by Enviroworks Consultants (Pty) Ltd for this proposed project;
- I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference;

- remuneration for services by the proponent in relation to this proposal is not linked to approval by decision-making authorities responsible for permitting this proposal and
- the consultancy has no interest in secondary or downstream developments as a result of the authorisation of this project.
- have no and will not engage in conflicting interests in the undertaking of the activity;
- undertake to disclose to the client and the competent authority any material, information that have or may have the potential to influence the decision of the competent authority required in terms of the Environmental Impact Assessment Regulations 2014;
- will provide the client and competent authority with access to all information at my disposal, regarding this project, whether favourable or not.

PJ du Preez

1. INTRODUCTION

The company Mahoebe Eiendomme (Pty) Ltd has recently commenced with the process of procuring of Portion 10 of the Farm De Eelt 26 near Prieska in the Northern Cape Province with the intention of establishing a 100 ha vineyard on this portion of natural previously uncultivated land. The grapes will be used for the production of wine. The completion of the procurement process is however dependent on a number of factors of which include the suitability of the area for vineyard establishment (soil, water, transformation of natural resources, heritage significance) as well as the successful acquisition of an Environmental Authorisation from the Northern Cape Department of Environment and Nature Conservation. The owner of Mahoebe Eiendomme (Pty) Ltd, Mr Henry Coetzee, has therefore decided to firstly complete an environmental risk assessment of the proposed vineyard area in order to determine any potential environmental risks or fatal flaws which might jeopardise the acquiring of the required Environmental Authorisation.

Enviroworks was appointed by Mahoebe Eiendomme (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to conduct the initial risk assessment process which includes the following two specialist studies:

- Ecological Impact Assessment
 - The potential of ecologically significant species as well as nationally and provincially protected species being present on the site had a relatively high probability and therefore had to be investigated by an ecologist. Ecological sensitivity and importance of the area also had to be determined as this will affect the probability of obtaining authorisation.
- Heritage Impact Assessment
 - The potential of archaeologically significant items and sites being present on the proposed project area was a realistic possibility and therefore had to be investigated by a heritage specialist.

Enviroworks was established in November 2002. Although the formal establishment of the company took place in 2002, it is backed by over 70 years of collective professional service and experience in the environmental field. The qualifications, expertise and experience of our professional team form the backbone of the company's continued success.

The vision of Enviroworks is to provide excellent, cutting edge Environmental Management Solutions and Services, underpinned by a team of professional consultants together with our associated

network of specialist partners and project managers. The company continuously engages existing and emerging legislation, guidelines and practices in order to ensure the execution of high quality and appropriate studies.

An Ecological Impact Assessment is required for the proposed vineyard area in order to determine and evaluate the nature, significance and extent of the potential impacts that the proposed project will have on the natural environment. Proposed mitigation and management measures must also be recommended in order to attempt to reduce/alleviate these identified potential impacts. A site visit/assessment was therefore conducted for the proposed vineyard area on 19 May 2016 in order to fulfil this requirement.

Preliminary preparations conducted prior to the site visit/assessment where as follows:

- Georeferenced spatial information was obtained of the outer perimeter of the proposed vineyard area in order to determine the direct impact footprint.
- A desktop study was conducted of the information available on the vegetation types as well as ecological sensitivity of the area in order to determine the ecological significance of the area as well as vegetation structure (organisation of individuals in space that constitutes a stand of plants) and potential species to be expected.

2. DATE AND SEASON OF SITE VIST

A site visit/assessment was conducted for the proposed vineyard area on 19 May 2016 in order to fulfil the project requirements. Although the date forms part of the autumn season, plant species identification could still be successfully completed.

3. ASSESSMENT RATIONAL AND PURPOSE

The protection and maintenance of the integrity of our natural resources in South Africa is essential when it comes to the wellbeing of the environment. Continued development however also forms a pillar stone in the socio-economic improvement of society and the livelihoods of communities and individuals. Socio-economic progress can therefore not simply be completely discarded for the sake of environmental conservation but solutions rather need to be determined in order to achieve a sustainable balance between the needs for environmental conservation without unreasonably jeopardising the requirements of socio-economic development. Adequate, sustainable and responsible utilisation and management of our natural resources is crucial and finding these

essential environmental/socio-economic balances to achieve sustainability should therefore always be a priority focus point during any proposed project development.

Various environmental legislation in South Africa makes provision for the protection of our natural resources and the functionality of ecological systems in order to ensure sustainability. Such acts include the National Environmental Management: Biodiversity Act (Act 10 of 2004), National Forests Act (Act 84 of 1998), Conservation of Agricultural Resources Act (Act 43 of 1983) and framework legislation such as the National Environmental Management Act (Act 10 of 2004).

The various components of ecological systems are all interrelated and it is therefore important that specialist studies of all such components be conducted prior to the commencement of any proposed project development. Only once the potential impacts and outcomes of proposed developments on the ecological systems of an area are understood, can informed decisions be made regarding the viability of projects to address and achieve the environmental and socio-economic needs of an area.

An Ecological Impact Assessment of the proposed project area was therefore conducted in order to determine and quantify the potential impacts of the proposed development on the natural environment in the area.

4. OBJECTIVES OF THE ASSESSMENT

Vegetation and habitat survey:

- Identify and list species encountered on the proposed project area and list any protected and/or Red Data Listed species.
- Determine and discuss the condition and extent of degradation and/or transformation of the vegetation on the proposed project area.
- Determine and discuss the ecological sensitivity and significance of the proposed project area.
- Identify and delineate all wetland areas present on the proposed project area.
- Identify, evaluate and rate the potential impacts of the proposed project on the natural environment.
- Provide recommendations on mitigation and management measures in order to attempt to reduce/alleviate these identified potential impacts.

5. STUDY AREA

The proposed project area is approximately 147.91 ha in surface size and is situated on Portion 10 of the Farm De Eelt No 26. The proposed water pipeline will also traverse Portion 11 of the Farm De Eelt No 26. The farm portions are approximately 15 km north-east of the town of Prieska in the Northern Cape Province. Portion 10 is owned by S & L Boerdery BK while Portion 11 is owned by Mr Henry Coetzee (the applicant).

The properties fall inside the Siyathemba Local Municipality which, in turn, forms part of the greater Pixley Ka Seme District Municipality. Access to the proposed project area is obtained by way of the R 368 provincial road and a subsequent dirt farm road which lies approximately 6 km to the west of the proposed project area.

See locality map below.

Farm Name and Number	SG 21 Digit Code	Land owner
Portion 10 of Farm De Eelt No 26	C0600000000002600010	S & L Boerdery BK
Portion 11 of Farm De Eelt No 26	C0600000000002600011	Mahoebe Eiendomme (Pty) Ltd

The four corner coordinate points for the corners of the proposed project area are as follows:

- North-western corner 29°34'28.36"S 22°50'10.05"E
- North-eastern corner 29°34'15.94"S 22°50'40.92"E
- South-eastern corner 29°35'11.41"S 22°50'59.94"E
- South-western corner 29°35'20.41"S 22°50'36.14"E

The starting split and end points of the proposed water pipeline alternatives are as follows:

- Start point 29°33'56.59"S 22°51'15.31"E
- Split point 29°34'10.36"S 22°51'04.12"E
- End point 1 29°34'30.30"S 22°50'26.91"E
- End point 2 29°34'44.81"S 22°50'41.93"E

Table 1: Details of relevant land owner of Portion 10

Company/entity name:	S & L Boerdery BK
Postal address:	PO Box 122, Prieska 8940
Contact person:	Schalk Theron
Designation:	Owner
Contact number:	082 802 2211
E-mail address:	tschalk@xsinet.co.za

Table 2: Details of relevant land owner of Portion 11

Company/entity name:	Mahoebe Eiendomme (Pty) Ltd
Postal address:	PO Box 410, Prieska 8940
Contact person:	Johannes Hendrik Coetzee
Designation:	Owner
Contact number:	072 403 8717
E-mail address:	mahoebe2@gmail.com

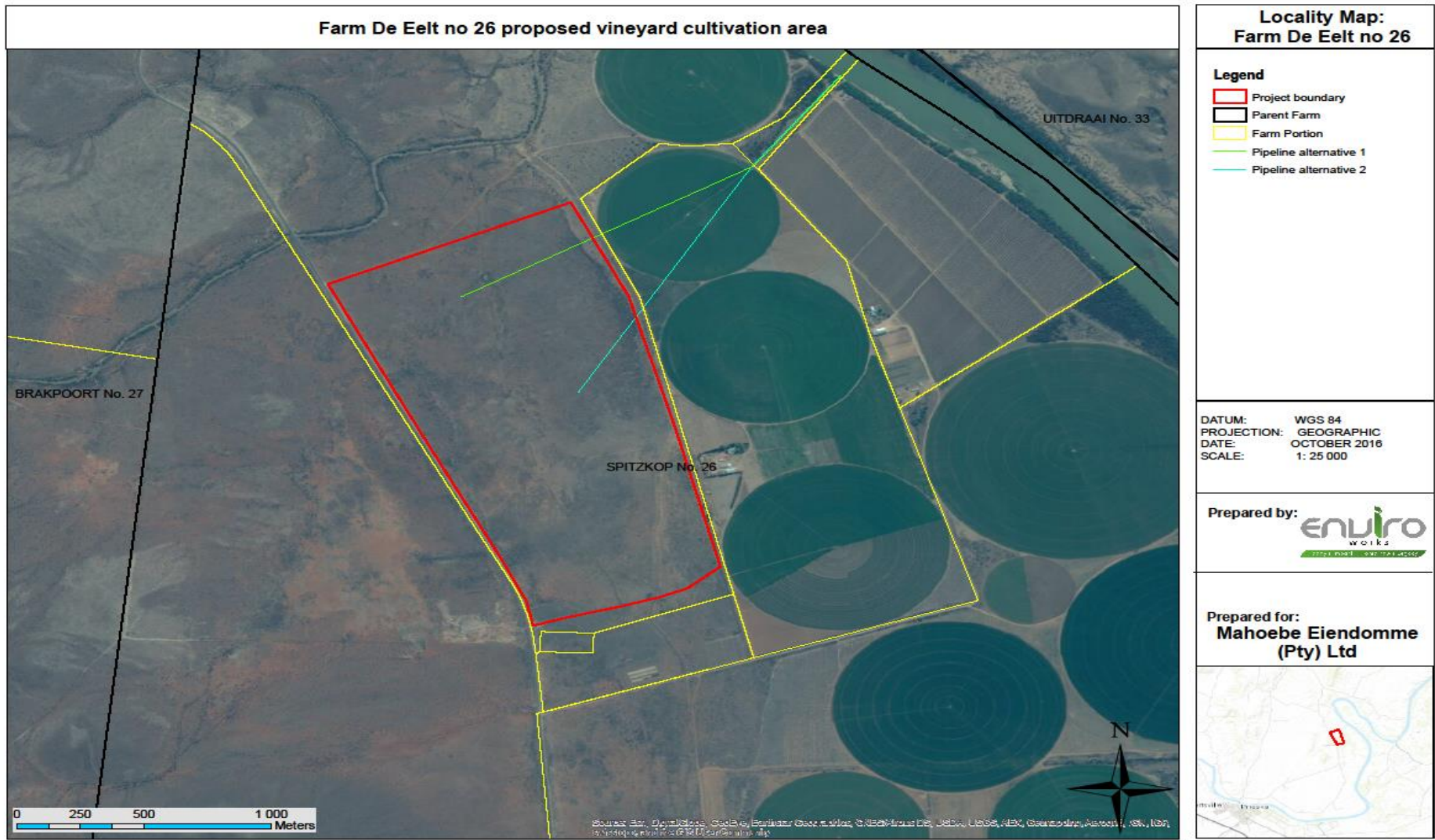


Figure 1: Locality map of the proposed project layout

According to Mucina & Rutherford (2006) the proposed project area forms part of the Upper Gariep Alluvial vegetation type (AZa 4) which mainly consists of flat alluvial terraces supporting complex of riparian thickets and is classified as vulnerable in terms of conservation status. The vegetation structure (organisation of individuals in space that constitutes a stand of plants) and species encountered during the site visit however indicated that the vegetation rather forms part of the adjacently situated Northern Upper Karoo vegetation type (NKu 3) which is classified as least threatened (Mucina & Rutherford, 2006). This vegetation type is characterised by a shrubland dominated by dwarf karoo shrubs, grasses and low trees on a flat to gently sloping terrain. The proposed project area also falls inside an area categorised by the Provincial Spatial Biodiversity Plan as a Critical Biodiversity Area 1. Critical Biodiversity Areas are areas which play an important role in conservation and reaching certain required biodiversity targets for ecosystem types, species or ecological processes. The CBA 1 categorisation is however based on the endangered vegetation type present and the ground truthing indicated that the area rather falls inside the adjacently located vegetation type and it is rather only categorised as a CBA 2.

See vegetation and sensitivity maps below.

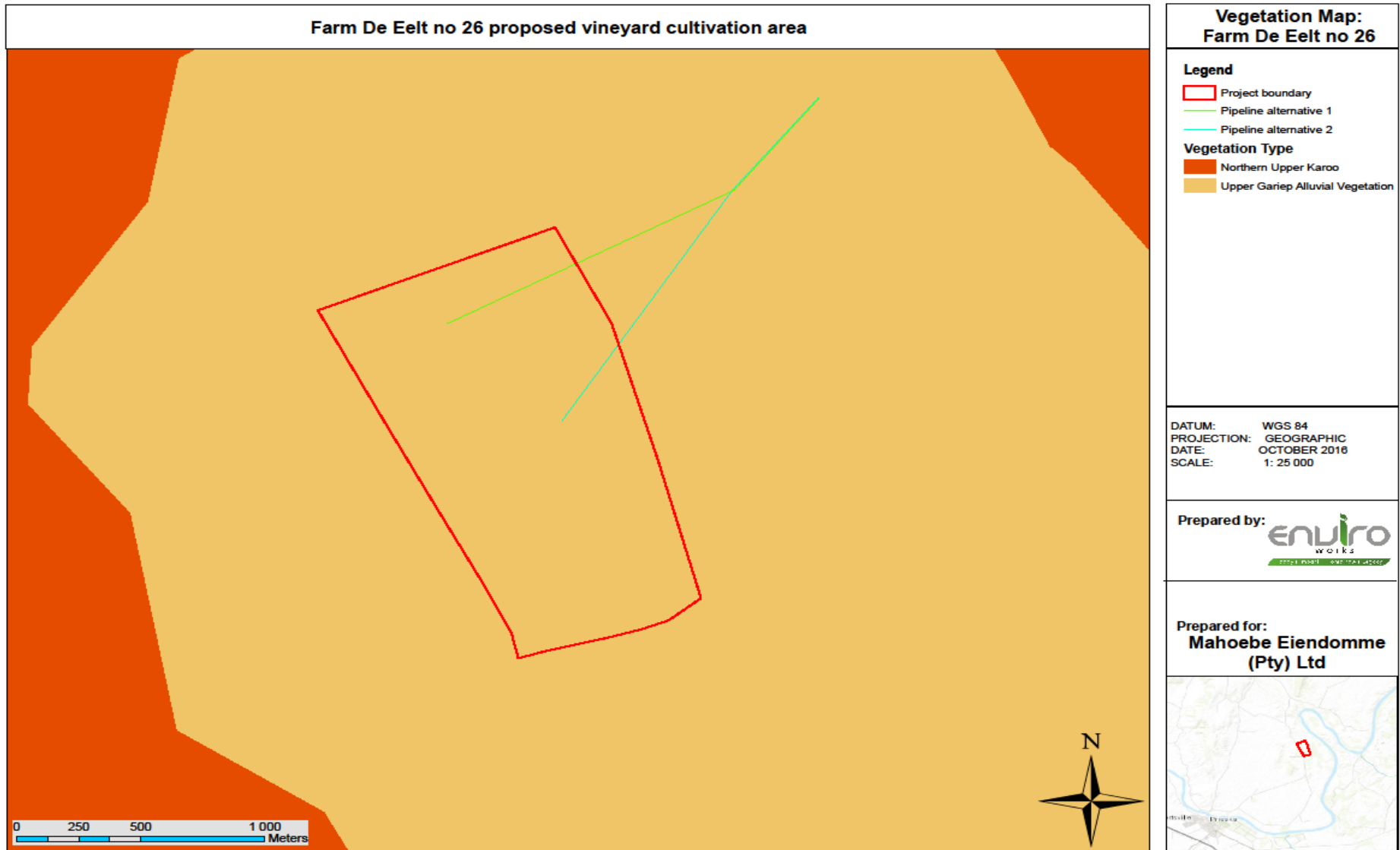


Figure 2: Vegetation map of the proposed project layout

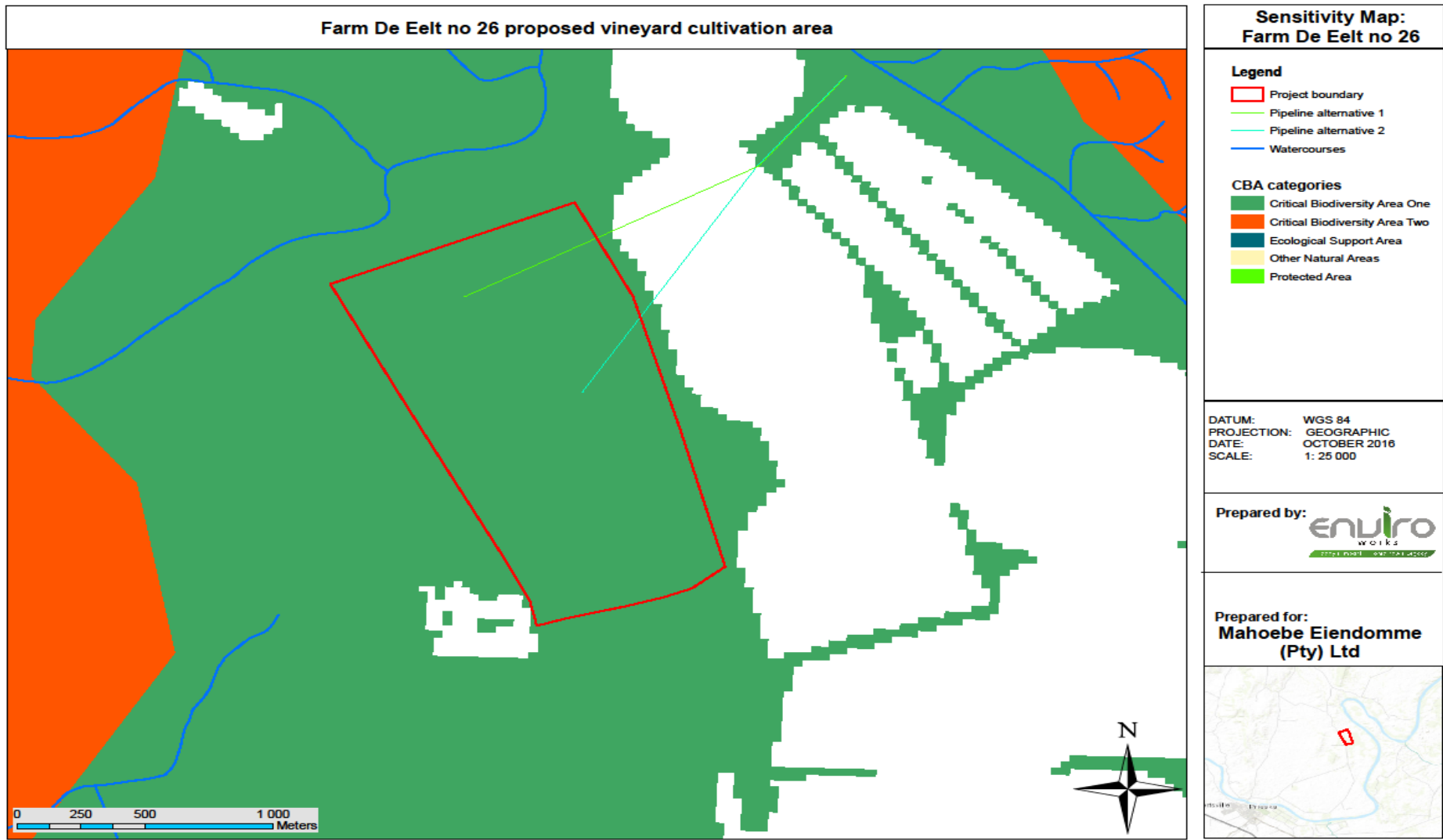


Figure 3: Sensitivity map of the proposed project layout

6. METHODOLOGY

- The proposed project area was assessed on foot and visual observations/identifications of species on the footprint area were conducted.
- Species were listed and categorised as per the Red Data Species List; Protected Species List of the National Forests Act (Act 84 of 1998), Notice of the list of protected tree species; Provincially Protected species of the Northern Cape Nature Conservation Act (Act 9 of 2009) and Invasive Species List of the National Environmental Management: Biodiversity Act (Act 10 of 2004), Alien and Invasive Species Regulations, 2014.
- Potential impacts of the proposed project on the natural environment were identified, evaluated and rated as per the methodology described below:

The **Present Ecological State (PES)** of the proposed project area was assessed and rated as per the table below.

- The Present Ecological State (PES) refers to the current state or condition of an area in terms of all its characteristics and reflects the change to the area from its reference condition. The value gives an indication of the alterations that have occurred in the wetland system.

Table 1: Criteria for PES calculations

Ecological Category	Score	Description
A	> 90-100%	Unmodified , natural.
B	> 80-90%	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.
C	> 60-80%	Moderately modified . Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.
D	> 40-60%	Largely modified . A large loss of natural habitat, biota and basic ecosystem functions has occurred.
E	> 20-40%	Seriously modified . The loss of natural habitat, biota and basic ecosystem functions is extensive.
F	0-20%	Critically/Extremely modified . Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.

The **Ecological Importance and Sensitivity (EIS)** of the proposed project area was assessed and rated as per the table below.

- The Ecological Importance and Sensitivity (EIS) of an area is an expression of its importance to the maintenance of ecological diversity and functioning on local and wider scales, and both abiotic and biotic components of the system are taken into consideration. Sensitivity refers to the system's ability to resist disturbance and its capability to recover from disturbance once it has occurred.

Table 2: Criteria for EIS calculations

EIS Categories	Score	Description
Low/Marginal	D	Not ecologically important and sensitive at any scale. Biodiversity ubiquitous and not sensitive to flow and habitat modifications.
Moderate	C	Ecologically important and sensitive on provincial/local scale. Biodiversity not usually sensitive to flow and habitat modifications.
High	B	Ecologically important and sensitive. Biodiversity may be sensitive to flow and habitat modifications.
Very High	A	Ecologically important and sensitive. On national even international level. Biodiversity usually very sensitive to flow and habitat modifications.

The tables below indicate and explain the methodology and criteria used for the evaluation of the Environmental Risk Ratings as well as the calculation of the final Environmental Significance Ratings of the identified potential environmental impacts.

Each potential environmental impact is scored for each of the Evaluation Components as per the table below.

Table 3: Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>

DURATION	<p>5 - Permanent</p> <p>4 - Long term: Impact ceases after operational phase/life of the activity > 60 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 60 years.</p> <p>2 - Short term: Impact might occur during the construction phase - < 3 years.</p> <p>1 - Immediate</p>
EXTENT (or spatial scale/influence of impact)	<p>5 - International: Beyond National boundaries.</p> <p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p> <p>0 - None</p>
IRREPLACEABLE loss of resources	<p>5 – Definite loss of irreplaceable resources.</p> <p>4 – High potential for loss of irreplaceable resources.</p> <p>3 – Moderate potential for loss of irreplaceable resources.</p> <p>2 – Low potential for loss of irreplaceable resources.</p> <p>1 – Very low potential for loss of irreplaceable resources.</p> <p>0 - None</p>
REVERSIBILITY of impact	<p>5 – Impact cannot be reversed.</p> <p>4 – Low potential that impact might be reversed.</p> <p>3 – Moderate potential that impact might be reversed.</p> <p>2 – High potential that impact might be reversed.</p> <p>1 – Impact will be reversible.</p> <p>0 – No impact.</p>
PROBABILITY (of occurrence)	<p>5 - Definite: >95% chance of the potential impact occurring.</p> <p>4 - High probability: 75% - 95% chance of the potential impact occurring.</p> <p>3 - Medium probability: 25% - 75% chance of the potential impact occurring</p> <p>2 - Low probability: 5% - 25% chance of the potential impact occurring.</p> <p>1 - Improbable: <5% chance of the potential impact occurring.</p>
Evaluation Component	Rating Scale and Description/criteria

CUMULATIVE impacts	<p>High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Low: The activity is localised and might have a negligible cumulative impact.</p> <p>None: No cumulative impact on the environment.</p>
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Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 5 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 4: Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

- Wetlands were identified and delineated on the proposed project area as per the methodology described below:

For the purposes of this investigation a wetland was defined according to the definition in the National Water Act (Act 36 of 1998) as: “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.”

In 2005 DWAF published a wetland delineation procedure in a guideline document titled “A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas”. Guidelines for the undertaking of biodiversity assessments exist. These guidelines contain a number of stipulations relating to the protection of wetlands and the undertaking of wetland assessments. These guidelines state that a wetland delineation procedure must identify the outer edge of the temporary zone of the wetland, which marks the boundary between the wetland and adjacent terrestrial areas and is that part of the wetland that remains flooded or saturated close to the soil surface for only a few weeks in the year, but long enough to develop anaerobic conditions and determine the nature of the plants growing in the soil.

The guidelines also state that locating the outer edge of the temporary zone must make use of four specific indicators namely:

- the terrain unit indicator,
- the soil form indicator,
- the soil wetness indicator and
- the vegetative indicator.

In addition the wetland and a protective buffer zone, beginning from the outer edge of the wetland temporary zone, must be designated as sensitive in a sensitivity map. The guidelines stipulate buffers to be delineated around the boundary of a wetland. A protective 32 m buffer zone, beginning from the outer edge of the wetland temporary zone, must be implemented and designated as sensitive within which no development must be allowed to occur.

7. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The processes of investigation which have led to the production of this report, harbours several **assumptions**, which include the following:

- All information provided by the applicant to the environmental specialist was correct and valid at the time that it was provided;
- Strategic level investigations undertaken by the applicant prior to the commencement of the EIA process, determined that the development site represents a potentially suitable and technically acceptable location;
- The public will receive a fair and reoccurring opportunity to participate and comment during the EIA process, through the provision of adequate public participation timeframes stipulated in the Regulations;
- The need and desirability of the project is based on strategic national, provincial and local plans and policies which reflect the interests of both statutory and public viewpoints;
- The EIA process is a project-level framework and the specialists are limited to assessing the anticipated environmental impacts associated with the construction and operational phases of the proposed project
- Strategic level decision making is conducted through cooperative governance principles with the consideration of sustainable and responsible development principles underpinning all decision making.

Given that an EIA involves prediction, **uncertainty** forms an integral part of the process. Two types of uncertainty are associated with the EIA process, namely process-related and prediction-related.

- Uncertainty of prediction is critical at the data collection phase as final certainty will only be obtained upon implementation of the proposed development. Adequate research, experience and expertise may minimise this uncertainty;
- Uncertainty of values depicts the approach assumed during the EIA process, while final certainty will be determined at the time of decision making. Enhanced communication and widespread/comprehensive coordination can lower uncertainty;
- Uncertainty of related decision relates to the interpretation and decision making aspect of the EIA process, which shall be appeased once monitoring of the project phases is undertaken.

The significance/importance of widespread/comprehensive consultation towards minimising the risk/possibility of omitting significant impacts is further stressed. The use of quantitative

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impact significance rating formulas (as utilised in this document) can further standardise the interpretation of results and limit the occurrence and scale of uncertainty.

Gaps in knowledge can be attributed to:

The EIA process is being undertaken prior to the availing of certain information which would be derived from the final project design and layout. As such, technical aspects included herein are mainly derived through personal communication with the applicant and the project manager.

The potential impacts of the cultivation induced soil hydrology and fertility changes on the protected species individuals which are not removed from site is also uncertain to a degree. It is envisaged that an adequate buffer should minimise the risk of such changes potentially impacting on the longevity of these protected individuals.

The principle of human nature provides for uncertainties with regards to the identified socio-economic impacts of the proposed development.

Enviroworks is an independent environmental consulting firm and as such, all processes and attributes of the EIA are addressed in a fair and unbiased/objective manner. It is believed that through the running of a transparent and participatory process, risks associated with assumptions, uncertainties and gaps in knowledge can be and have been acceptably reduced.

8. RESULTS AND DISCUSSION

The proposed project area can roughly be divided into the following five sections based on landscape structure and condition of vegetation/extent of degradation:

- Top flat plateau of the elevated rocky ridge
- Side-slope and lower foot-slope of the rocky ridge
- Lower lying flat areas surrounding the ridge.
- Riparian vegetation at water extraction point.
- Proposed pipeline route.

Each of these identified areas will now be discussed in detail.

All figures referred to in the text are available in the appendix.

8.1. TOP FLAT PLATEAU OF THE ELEVATED ROCKY RIDGE

A slightly elevated ridge is present in the northern section of the proposed project area. The vegetation structure (organisation of individuals in space that constitutes a stand of plants) of the flat plateau of this ridge mainly constitutes low growing shrubs and forbs with isolated woody individuals. The grass layer is very sparse with the species *Enneapogon scoparius* mainly present. The plateau is mainly dominated by the shrubs *Rhigozum trichotomum*, *Boscia foetida* (provincially protected) and *Aptosimum spinescens*.

The following species are also present:

Species name	Provincial protection status	Red Data Listing
<i>Hoodia gordonii</i>	Specially protected	Data deficient
<i>Aloe claviflora</i>	Protected	Least concerned
<i>Oxalis semiloba</i>	Protected	Least concerned
<i>Ruschia sp</i>	Protected	To be confirmed
<i>Drimia sp</i>	Not listed	To be confirmed
<i>Ledebouria sp</i>	Not listed	To be confirmed
<i>Pentzia sphaerocephala</i>	Not listed	Least concerned
<i>Schismus barbatus</i>	Not listed	Least concerned
<i>Dipcadi crispum</i>	Not listed	Least concerned
<i>Geigeria filifolia</i>	Not listed	Least concerned

<i>Heliotropium lineare</i>	Not listed	Least concerned
<i>Talinum caffrum</i>	Not listed	Least concerned

Provincial permits will have to be applied for, for the relocation of provincially protected and specially protected individuals. Only one individual of the specially protected species *Hoodia gordonii* was observed on the proposed project site while approximately 30 + individuals of the other protected species were observed respectively.

The nationally protected tree species *Boscia albitrunca* (Shepherd's tree/witgat) is also sparsely present and the locations/coordinates of all the individuals encountered during the site visit have been noted and are discussed in detail under heading 10.4.

No Red Data Listed species were found to be present.

A small, isolated wet area is present on the plateau but it is evidently a manmade structure and does therefore not constitute a wetland or watercourse.

Due to the higher localised altitude and well drained rocky soils of this ridge area, it is well suited for vineyard establishment. The presence of the listed provincially protected species however means that permits need to be applied for in order to remove/relocate these species prior to any development taking place. Due to the size and maturity of the nationally protected tree individuals identified, relocation will not be possible. Removal permits will have to be applied for at the national and provincial departments. It is however recommended that the project rather attempts to keep and protect some of the individual trees on site. A minimum 10 m buffer zone can be implemented around each individual in order to attempt to prevent any interaction with or damage to the above and below ground components of the trees during the cultivation processes as this will constitute a transgression of the law which could be criminally prosecuted. It can be a physical or hypothetical buffer. Establishment of a vineyard on this area is therefore subjective to the success of the permit application and securing of the safety of all protected tree individuals.

The **Present Ecological State (PES)** of this area is classified as **Class B** as it is **largely natural** with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.

The **Ecological Importance and Sensitivity (EIS)** of this area is classified as **Class C** as it is ecologically important and sensitive on provincial/local scale. Biodiversity is not usually sensitive to flow and habitat modifications.

8.2. SIDE-SLOPE AND LOWER FOOT-SLOPE OF THE RIDGE

This small localised side-slope portion directly beneath the flat plateau of the ridge has a distinct, significantly denser woody component when compared to the plateau. It mainly consists of *Acacia mellifera* and to a lesser extent also the nationally protected tree species *Boscia albitrunca*. The forb species as identified on the top flat plateau are all present with the species *Salsola aphylla* becoming significantly more prominent.

No Red Data Listed species were found to be present.

Once again the altitude and well drained soils result in this area being well suited for vineyard establishment if removal/relocation permits are obtained for the provincially and nationally protected species. It is again recommended that the safety of all protected tree individuals be secured with a minimum 10 m buffer zone.

The **Present Ecological State (PES)** of this area is classified as **Class B** as it is **largely natural** with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.

The **Ecological Importance and Sensitivity (EIS)** of this area is classified as **Class C** as it is ecologically important and sensitive on provincial/local scale. Biodiversity is not usually sensitive to flow and habitat modifications.

8.3. LOWER LYING FLAT AREAS SURROUNDING THE RIDGE

This is a significant portion of the proposed project footprint and is characterised by less rocky soils on the lower lying flat terrain. The area is virtually devoid of a woody component with the exception of isolated *Searsia lancea* and *Ziziphus mucronata* individuals and a clump of *Acacia* individuals in the western section. Mostly the same forb species as found on the flat plateau and side-slope are present with the exception of the provincially specially protected species *Hoodia gordonii* and provincially protected species *Aloe claviflora* which are confined to the ridge. Grasses mainly include *Enneapogon desvauxii* and *Schismus barbatus*. Additional species which are not present on the

plateau or side-slope include *Peliostomum leucorrhizum*, *Asparagus glaucus*, *Aptosimum indivisum*, *Lycium cinereum*, *Tribulus cristatus* and *Zygophyllum incrustatum*.

The Category 3 invasive species *Prosopis glandulosa* is present in isolated areas but active management and eradication processes are evident.

No Red Data Listed species were found to be present.

The southern portion of the flat terrain is more disturbed and degraded than the rest of the area. An old road is evident and a soil berm has been constructed in order to divert storm-water past the proposed project area. This constructed water diversion is not considered a natural watercourse. The vegetation is evident of the disturbance. The species *Euphorbia mauritanica* and *Nidorella hottentotta* are only present in the disturbed areas. Although the soils are suited for vineyard establishment this southern portion is not practically ideal due to the potential water runoff occurring in that area.

The **Present Ecological State (PES)** of this area is classified as **Class C** as it is **moderately modified**. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.

The **Ecological Importance and Sensitivity (EIS)** of this area is classified as **Class C** as it is ecologically important and sensitive on provincial/local scale. Biodiversity is not usually sensitive to flow and habitat modifications.

8.4. RIPARIAN VEGETATION AT WATER EXTRACTION POINT

An existing water extraction point in the Orange River with pumping system and pipeline is already present in the Orange River on Portion 11 of the Farm De Eelt no 26 which is being used for irrigation of other crops on site (see figure below). This is in accordance with the water user registration of the property. This existing extraction point and pumping system will simply be slightly widened by no more than 5 m to accommodate the proposed vineyard irrigation requirements and additional infrastructure.



Figure 4: Existing water extraction point in the Orange River

The riparian vegetation immediately surrounding the existing extraction point is largely disturbed and mainly consists of pioneer and weed species such as *Asparagus sp* (see figures below). This is mainly due to the original clearance and disturbance which took place for the establishment of the current extraction point infrastructure. No conservationally significant vegetation species are present.





Figure 5: Disturbed vegetation directly adjacent to the existing pumping system and pipeline

A narrow additional section of approximately 5 m will be cleared directly adjacent to the existing extraction point pipeline route in order to accommodate the additional piping infrastructure. This will not significantly impact on any important riparian vegetation species or ecological functions as this area is mostly disturbed already. Outside this disturbed section, the natural riparian species mainly include *Acacia karroo*, *Phragmites australis* and *Searsia pendulina*. No large trees will be removed from the riparian area for the widening of the extraction point as trees provide additional cover and protection of the infrastructure in the event of floods episodes.

The **Present Ecological State (PES)** of this area is classified as **Class C** as it is **moderately modified**. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.

The **Ecological Importance and Sensitivity (EIS)** of this area is classified as **Class C** as it is ecologically important and sensitive on provincial/local scale. Biodiversity is not usually sensitive to flow and habitat modifications.

8.5. PROPOSED PIPELINE ROUTE

The pipeline route outside of the proposed project footprint will run beside the route of the existing underground pipeline which is adjacent to an existing dirt access road of which the surface area is already degraded and where virtually no natural vegetation is still present. The area is in a highly

transformed state with pioneer vegetation species and weeds mostly dominating the route. The pipeline route will then also traverse an existing cultivated pivot field before it enters the proposed project footprint area.



Figure 6: Illustration of route of existing underground pipeline



Figure 7: Illustration of proposed pipeline route traversing an existing cultivated pivot field

The **Present Ecological State (PES)** of this area is classified as **Class E** as it is **seriously modified**. The loss of natural habitat, biota and basic ecosystem functions is extensive.

The **Ecological Importance and Sensitivity (EIS)** of this area is classified as **Class D** as it is not ecologically important and sensitive at any scale. Biodiversity ubiquitous and not sensitive to flow and habitat modifications.

8.6. BOSCIA ALBITRUNCA INDIVIDUALS IDENTIFIED

The tree species *Boscia albitrunca* is listed as a protected species under the National Forests Act (Act 84 of 1998). The Act states that no person may cut, disturb, damage or destroy any protected tree except if a permit is obtained for the desired process. The individuals present on the proposed project site are strictly confined to the well-draining rocky soils of the top flat plateau and side-slope areas of the elevated ridge. Due to the size and maturity of the individuals identified, relocation will not be possible. Removal permits will have to be applied for at the national and provincial departments. It is however recommended that the project rather attempts to keep and protect the individual trees on site. A minimum 10 m buffer zone can be implemented around each individual in order to attempt to prevent any interaction with or damage to the above and below ground components of the trees during the cultivation processes. It can be a physical or hypothetical buffer. Any such damage will constitute a transgression of the law which can be criminally prosecuted. A total of 18 individuals were encountered during the site visit and their locations/coordinates have been noted and are indicated in the figure below. The applicant will apply for a removal permit for approximately 7 individuals which will have to be removed due to operational requirements of the project. The remaining 11 individuals will be left in situ and conserved. A number of the individuals are located directly adjacent to each other and their locations are therefore not displayed as separate icons on the figure below.

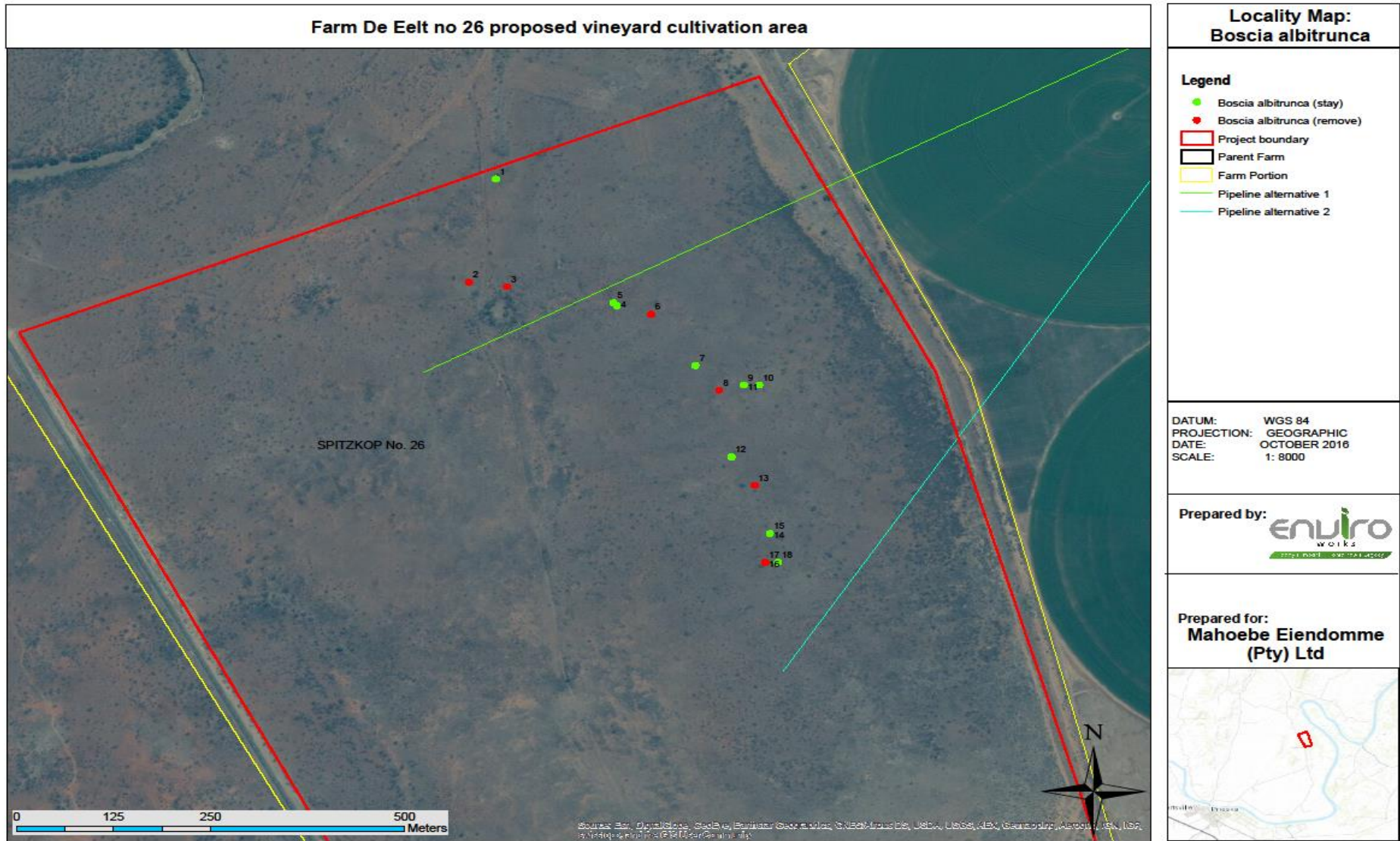


Figure 8: Locality map of the *Boscia albitrunca* individuals present on the proposed project area

8.7. AQUATIC ENVIRONMENT

Streams & Wetlands

The topography of the area is relatively flat and contour lines are wide apart. No well-developed or seasonal drainage lines or watercourses therefore occur on the proposed project site. No wetlands or wetland vegetation is present on the proposed project site.

8.8. FAUNAL HABITAT

The proposed project area and vast surrounding natural land is very homogenous in terms of habitat and no significant faunal habitat variety exists. The project area therefore provides no potentially important or unique faunal habitats which need to be conserved for the purposes of Red Data Listed animal species management. No Red Data Listed animal species were encountered during the site visit conducted by the specialist. Due to the mobility of most animal species, individuals simply tend to leave an area where disturbance is taking place and disperse to other similar, adequate areas.

The proposed project area does not fall inside any Important Bird and Biodiversity Areas (IBA) as per the latest IBA map obtained from the Birdlife SA website (www.birdlife.org.za/conservation/important-bird-areas/iba-map). The area provides no potentially important or unique avifaunal habitats which need to be conserved for the purposes of Red Data Listed bird species management. No Red Data Listed bird species were observed during the site visit conducted by the specialist. Due to the mobility of bird species, individuals simply tend to leave an area where disturbance is taking place and disperse to other similar, adequate areas.

9. ENVIRONMENTAL IMPACT ASSESSMENT

The following section identifies the potential environmental impacts (both positive and negative) which the proposed project will have on the surrounding environment.

Once the potential environmental impacts are identified, they are assessed by rating their Environmental Risk after which the final Environmental Significance is calculated and rated for each identified environmental impact.

The same Environmental Risk rating process is then followed for each environmental impact to determine the Environmental Significance if the recommended mitigation measures were to be implemented.

The objective of this section is therefore firstly to identify all the potential environmental impacts of the proposed project and secondly to determine the significance of the impacts and how effective the recommended mitigation measures will be able to reduce their significance. The potential environmental impacts which are still rated as highly significant, even after implementation of mitigations, can then be identified in order to specifically focus on implement of effective management strategies for them.

9.1. DESCRIPTION OF POTENTIAL IMPACTS AND THEIR RECOMMENDED MITIGATION MEASURES

The following section provides descriptions of the potential environmental impacts which the proposed project will have as well as the recommended mitigation measures to be implemented for each impact as identified.

9.1.1. Construction phase

The potential environmental impacts associated with the construction phase of the proposed development.

Destruction/transformation of a Critical Biodiversity Area

Critical Biodiversity Areas are areas which play an important role in conservation and reaching certain required biodiversity targets for ecosystem types, species or ecological processes.

Cultivation processes will completely transform and destroy the natural vegetation and any faunal habitats present on the proposed project area. Although this entire area forms part of a Critical

Biodiversity Area 1, this categorisation is only based on the endangered Upper Gariep Alluvial vegetation type. Ground truthing indicated that the area rather falls inside the adjacently located Northern Upper Karoo vegetation type instead of the Upper Gariep Alluvial vegetation type as per the vegetation map, and it is therefore rather only categorised as a Critical Biodiversity Area 2. The reason for the Critical Biodiversity Area 2 classification is mainly based on the areas being classified as areas where biodiversity targets can be successfully achieved.

After a discussion regarding the matter with Mr E Klopper from the provincial department (developer of the Northern Cape provincial CBA map), it was agreed that importance of that area in reaching the required conservation targets is not so significant due to the area being adjacent to already cultivated areas which separate the project area from the Orange River and therefore also isolates the water catchment away from the Orange River. The transformation of the Critical Biodiversity Area 2 through cultivation is therefore not considered a fatal flaw for the proposed project.

Mitigation measures to reduce potential impacts:

- The area only forms part of the CBA 2 and not a CBA 1 as per the discussion above. Due to the nature of the cultivation processes, no mitigation measures can be implemented which could result in acceptably reduced impacts on the area. Restrict all cultivation work to the proposed project footprint and prevent any unnecessary increase of the footprint size due to indiscriminate disturbance.

Destruction/damage to nationally protected tree species individuals

In accordance with the National Forests Act (Act 84 of 1998), no person may cut, disturb, damage or destroy any protected tree except if a permit is obtained for the desired process. Partaking in any such processes will therefore constitute a transgression of the law which can be criminally prosecuted

The nationally protected tree species *Boscia albitrunca* is present on the proposed project area. A total of 18 individuals were encountered during the site visit and their locations/coordinates have been noted. Cultivation processes could result in the potential removal of/damage to these identified individuals.

Mitigation measures to reduce potential impacts:

- A permit application must be submitted to the national and provincial departments for removal/destruction of the individuals. After a discussion with Ms J Mans from the

Department of Agriculture, Forestry and Fisheries who handles permit applications, it was confirmed that the removal permit granting of the protected tree individuals should not pose a problem to the project. Such a permit application should not take longer than 30 days to obtain.

- It is however recommended that the project rather attempts to keep and protect some of the individual trees on site. The applicant will apply for a removal permit for approximately 7 individuals which will have to be removed due to operational requirements of the project. The remaining 11 individuals will be left in situ and conserved. This will however only be finalised during the EIA phase. A minimum 10 m buffer zone can be implemented around each individual in order to attempt to prevent any interaction with or damage to the above and below ground components of the trees during the cultivation processes. It can be a physical or hypothetical buffer.

Destruction/damage to provincially protected species individuals

In accordance with the Northern Cape Nature Conservation Act (Act 9 of 2009), no person may without a permit pick (which includes the definition damage or destroy), import, export, transport, possess, cultivate or trade in a specimen of a protected plant. Partaking in any such processes will therefore constitute a transgression of the law which can be criminally prosecuted. Cultivation processes could result in the potential removal of/damage to such identified species individuals.

Mitigation measures to reduce potential impacts:

- A permit application must be submitted to the provincial department for the relocation of identified individuals. A suitable relocation environment must be identified and individuals must be adequately relocated with the assistance of a specialist. Such a permit application should not take longer than 30 days to obtain.

Alien and Invasive species establishment

The disturbance and transformation of the area by the cultivation processes will result in the increased establishment and potential spreading of undesired alien and invasive species.

Mitigation measures to reduce potential impacts:

- Continual monitoring and adequate active management (chemical or physical removal) of undesired alien and invasive species must take place during the construction phase in order to prevent significant establishment and spreading.

Impeding a water catchment

The proposed project area is directly adjacent to currently cultivated areas of significant size which separate the project area from the Orange River and therefore isolates the local water catchment. The cultivation of the proposed project area would therefore not add significant negative impact to the local water catchment feeding the Orange River as it is already isolated.

Mitigation measures to reduce potential impacts:

- Restrict all cultivation work to the proposed project footprint and prevent any unnecessary increase of the footprint size due to indiscriminate disturbance.

9.1.2. Operational phase

The potential environmental impacts associated with the operational phase of the proposed development.

Continued destruction/transformation of a Critical Biodiversity Area due to initial construction phase

The initial impact as per the construction phase will continue.

Mitigation measures to reduce potential impacts:

- Ensure no unnecessary expansion of the project footprint occurs.

The same medium cumulative impact as per the construction phase applies.

Continued destruction/damage to nationally protected tree species individuals

Activities during the operational phase could still cause harm to individuals of the protected tree species *Boscia albitrunca* (Shepherd's tree/witgat) which are intended to be preserved on site if their protection is not managed.

Mitigation measures to reduce potential impacts:

- Once the protected individuals identified for preservation have been adequately buffered, it is important that the buffer be sufficiently maintained on a continual basis to ensure its integrity and functionality. It can be a physical or hypothetical buffer.
- Complete a training and awareness intervention with the employees and any new/additional employees in order to inform them of the protected tree individuals as well as the reasoning behind the protection.

The same low cumulative impact as per the construction phase applies.

Continued destruction/damage to provincially protected species individuals

Once all identified provincially protected species individuals have been adequately relocated the project will not have an impact on them anymore.

Mitigation measures to reduce potential impacts:

- Ensure all identified provincially protected species individuals are suitably relocated with the assistance of a specialist prior to the commencement of any cultivation.

The same low cumulative impact as per the construction phase applies.

Continued impeding of a water catchment

The initial impact as per the construction phase will continue.

Mitigation measures to reduce potential impacts:

- Restrict all cultivation work to the proposed project footprint and prevent any unnecessary increase of the footprint size due to indiscriminate disturbance.

The same medium cumulative impact as per the construction phase applies.

9.1.3. Cumulative Impacts

Although complete transformation of the natural vegetation type takes place during cultivation processes, this is mostly confined to within the vicinity of the Orange River. The relevant vegetation type is large and still well represented in the area. The cumulative impact of destruction through cultivation activities is therefore only regarded to be medium.

The adequate conservation and relocation of relevant nationally and provincially protected species during the proposed project will ensure that the cumulative impact associated with agricultural developments in the area will be of low significance. The majority of the surrounding areas are still under natural veld conditions and very few protected tree species individuals are removed. Permits are required for the removal of any protected individuals and this process is well and closely managed/governed by the relevant national and provincial departments. The cumulative impact of removal after implementation of mitigation measures is therefore regarded as low.

The majority of cultivated areas are in close proximity to the Orange River for water and irrigation purposes. This results in a cumulative impediment of the local surface water catchment areas from higher laying areas downwards towards the river. The cumulative impact of the project on impeding of the surface water catchment is regarded as medium.

9.2. RISK RATINGS OF POTENTIAL IMPACTS

The following section provides the Environmental Risk as well as the Environmental Significance Ratings for the potential environmental impacts for the proposed project both before and after implementation of the recommended mitigation measures.

9.2.1. Construction phase

Table 5: Environmental Risk and Significance Ratings

	Proposed project	No-Go Alternative
Identified Environmental Impacts	Destruction/transformation of a Critical Biodiversity Area	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	High (8)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	Definite (5)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	High (105)	-

Proposed mitigation:	The area only forms part of the CBA 2 and not a CBA 1 as per the discussion above. Due to the nature of the cultivation processes, no mitigation measures can be implemented which could result in acceptably reduced impacts on the area. Restrict all cultivation work to the proposed project footprint and prevent any unnecessary increase of the footprint size due to indiscriminate disturbance.	
Cumulative impact post mitigation:	Medium	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (70)	-
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Destruction/damage to nationally protected tree species individuals	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	Medium (6)	-

Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium High	
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium High (76)	-
Proposed mitigation:	<p>A permit application must be submitted to the national and provincial departments for removal/destruction of the individuals. Such a permit application should not take longer than 30 days to obtain.</p> <p>It is however recommended that the project rather attempts to keep and protect some of the individual trees on site. The applicant will apply for a removal permit for approximately 7 individuals which will have to</p>	

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	be removed due to operational requirements of the project. The remaining 11 individuals will be left in situ and conserved. This will however only be finalised during the EIA phase. A minimum 10 m buffer zone can be implemented around each individual in order to attempt to prevent any interaction with or damage to the above and below ground components of the trees during the cultivation processes. It can be a physical or hypothetical buffer.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (34)	-
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Destruction/damage to provincially protected species individuals	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	Medium (6)	-
Duration of impact:	Permanent (5)	-

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Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Low (2)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (72)	-
Proposed mitigation:	A permit application must be submitted to the provincial department for the relocation of identified individuals. A suitable relocation environment must be identified and individuals must be adequately relocated with the assistance of a specialist. Such a permit application should not take longer than 30 days to obtain.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation	Low (32)	-

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(Low, Medium, Medium-High, High, or Very-High)		
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Alien and Invasive species establishment	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	4 (low)	-
Duration of impact:	2 (short term)	-
Extent of the impact	2 (local)	-
Degree to which local resources are irreplaceable	2 (low)	-
Degree to which the impact can be reversed:	2 (high)	-
Probability of occurrence:	3 (moderate)	-
Cumulative impact prior to mitigation:	Low	-
Significance rating of impact prior to mitigation	Low (36)	-

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(Low, Medium, Medium-High, High, or Very-High)		
Proposed mitigation:	Continual monitoring and adequate active management (chemical or physical removal) of undesired alien and invasive species must take place during the construction phase in order to prevent significant establishment and spreading.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (24)	-
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Impeding a water catchment	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	Low (4)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Local (2)	-

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Degree to which local resources are irreplaceable	Low (2)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	Medium probability (3)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	-
Proposed mitigation:	Restrict all cultivation work to the proposed project footprint and prevent any unnecessary increase of the footprint size due to indiscriminate disturbance.	-
Cumulative impact post mitigation:	Medium	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	-

9.2.2. Operational phase

Table 6: Environmental Risk and Significance Ratings

	Proposed project	No-Go Alternative
Identified Environmental Impacts	Continued destruction/transformation of a Critical Biodiversity Area due to initial construction phase	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	High (8)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	Definite (5)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High,	High (105)	-

High, or Very-High)		
Proposed mitigation:	Ensure no unnecessary expansion of the project footprint occurs.	
Cumulative impact post mitigation:	Medium	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (70)	-
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Continued destruction/damage to nationally protected tree species individuals	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	Medium (6)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Moderate (3)	-
Degree to which the impact	Low (4)	-

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can be reversed:		
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium High	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium High (76)	-
Proposed mitigation:	<p>Once the protected individuals identified for preservation have been adequately buffered, it is important that the buffer be sufficiently maintained on a continual basis to ensure its integrity and functionality. It can be a physical or hypothetical buffer.</p> <p>Complete a training and awareness intervention with the employees and any new/additional employees in order to inform them of the protected tree individuals as well as the reasoning behind the protection.</p>	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High,	Low (34)	-

High, or Very-High)		
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Continued destruction/damage to provincially protected species individuals	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	Medium (6)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Site specific (1)	-
Degree to which local resources are irreplaceable	Low (2)	-
Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	High probability (4)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High,	Medium (72)	-

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High, or Very-High)		
Proposed mitigation:	Ensure all identified provincially protected species individuals are suitably relocated with the assistance of a specialist prior to the commencement of any cultivation.	
Cumulative impact post mitigation:	Low	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (32)	-
	Proposed project	No-Go Alternative
Identified Environmental Impacts	Continued impeding a water catchment	The proposed development will not take place and as such this impact will not occur
Magnitude of Impact	Low (4)	-
Duration of impact:	Permanent (5)	-
Extent of the impact	Local (2)	-
Degree to which local resources are irreplaceable	Low (2)	-

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Degree to which the impact can be reversed:	Low (4)	-
Probability of occurrence:	Medium probability (3)	-
Cumulative impact prior to mitigation:	Medium	-
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	-
Proposed mitigation:	Restrict all cultivation work to the proposed project footprint and prevent any unnecessary increase of the footprint size due to indiscriminate disturbance.	-
Cumulative impact post mitigation:	Medium	-
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	-

10. CONCLUSIONS AND RECOMMENDATIONS

Although the entire proposed project area forms part of a Critical Biodiversity Area 1, this categorisation is based on the endangered Upper Gariep Alluvial vegetation type and due to the ground truthing indication that the area rather falls inside the adjacently located Northern Upper Karoo vegetation type, it is rather only categorised as a CBA 2. The Northern Upper Karoo vegetation type is classified as least threatened and the reason for the CBA 2 classification is mainly based on the areas being classified as areas where biodiversity targets can be successfully achieved. The project area is directly adjacent to currently cultivated areas of significant size which separate the project area from the Orange River and therefore isolates the local catchment. The cultivation of the proposed project area would therefore not add significant negative impact to the local water catchment feeding the Orange River as it is already isolated. For these reason, the transformation of the CBA 2 is not considered a fatal flaw for the proposed project and is not expected to significantly jeopardise the project application process.

Provincial permit applications must be submitted to the department for the relocation of identified individuals of provincially protected and specially protected species. Cultivation can only commence once these permits have been obtained and identified individuals have been adequately removed and relocated. Such a permit application should not take longer than 30 days to obtain. The acquiring of required permits is not expected to significantly jeopardise the project application process if an adequate removal and relocation plan is provided to the department.

National and provincial permit applications must be submitted to the departments for the removal/destruction of the identified individuals of the nationally protected tree species *Boscia albitrunca*. Cultivation can only commence once these permits have been obtained from the relevant departments. Such a permit application should not take longer than 30 days to obtain. The acquiring of required permits is not expected to significantly jeopardise the project application process. It is however recommended that the project rather attempts to keep and protect some of the individual trees on site. The applicant will apply for a removal permit for approximately 7 individuals which will have to be removed due to operational requirements of the project. The remaining 11 individuals will be left in situ and conserved. A minimum 10 m buffer zone can be implemented around each individual in order to attempt to prevent any interaction with or damage to the above and below ground components of the trees during the cultivation processes. Any such damage will constitute a transgression of the law which can be criminally prosecuted. It can be a physical or hypothetical buffer.

The proposed project area and vast surrounding natural land is very homogenous in terms of habitat and no significant faunal or avifaunal habitat variety exists. The project area therefore provides no potentially important or unique faunal or avifaunal habitats which need to be conserved for the purposes of Red Data Listed terrestrial animal or bird species management. No Red Data Listed terrestrial animal or bird species were encountered during the site visit conducted by the specialist. Due to the mobility of most terrestrial animal and bird species, individuals simply tend to leave an area where disturbance is taking place and disperse to other similar, adequate areas.

An existing water extraction point in the Orange River with pumping system and pipeline is already present in the Orange River on Portion 11 of the Farm De Eelt no 26 which is being used for irrigation of other crops on site. This existing extraction point and pumping system will simply be slightly widened by no more than 5 m to accommodate the proposed vineyard irrigation requirements and additional infrastructure. The riparian vegetation immediately surrounding the existing extraction point is largely disturbed and mainly consists of pioneer and weed species such as *Asparagus sp.* This is mainly due to the original clearance and disturbance which took place for the establishment of the current extraction point infrastructure. No conservationally significant vegetation species are present. A narrow additional section of approximately 5 m will be cleared directly adjacent to the existing extraction point pipeline route in order to accommodate the additional piping infrastructure. This will not significantly impact on any important riparian vegetation species or ecological functions as this area is mostly disturbed already. Outside this disturbed section, the natural riparian species mainly include *Acacia karroo*, *Phragmites australis* and *Searsia pendulina*. No large trees will be removed from the riparian area for the widening of the extraction point as trees provide additional cover and protection of the infrastructure in the event of floods episodes.

The following recommendations and requirements with regards to the proposed project apply:

- According to the National Environmental Management Act (No 107 of 1998) the proposed project triggers various listed activities of the Environmental Impact Assessment Regulations, 2014 (Government Notices R983, R984 and R985 in Government Gazette No. 38282 of 04 December 2014) and a full Environmental Impact Assessment (EIA) therefore needs to be conducted. This is necessary in order to obtain the required Environmental Authorisation from the relevant departments prior to commencement of the proposed project.
- Once the project commences, ensure that the identified mitigation measures and recommendations as discussed under heading 9 are adequately implemented.

- Two natural watercourses are present within a 500 m radius of the proposed project area. This will be noted in the Water Use License Application (WULA) to be submitted to the Department of Water and Sanitation.

It is the opinion of the specialist that all identified impacts can be mitigated to within acceptable levels. This proposed development may therefore continue in the event that all mitigation measures and recommendations as per this report are adhered to as well as all necessary permits are successfully obtained.

11. REFERENCES

Conservation of Agricultural Resources Act (Act 43 of 1983)

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

National Environmental Management Act (Act 107 of 1998)

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

National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014

National Forests Act (Act 84 of 1998)

National Water Act (Act 36 of 1998)

The Northern Cape Nature Conservation Act (Act 9 of 2009)

12. APPENDIX



Figure 9: Image illustrating the top flat plateau of the elevated rocky ridge



Figure 10: Image illustrating the manmade wet area on the plateau



Figure 11: Image illustrating the dense woody component of the side-slope of the ridge



Figure 12: Image illustrating the lower lying flat area



Figure 13: Image illustrating the more degraded lower lying flat areas in the southern portion of the proposed project area