

**SITUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR
KIRKWOOD, EASTERN CAPE PROVINCE.**

DRAFT BASIC ASSESSMENT REPORT

DEDEAT Reference: EC06/C/LN1&3/M/09-2020

Prepared for:

Situsrand Boerdery



Prepared by:



ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

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REVISIONS TRACKING TABLE

CES Report Revision and Tracking Schedule

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Client Name & Address:	Sitrusrand Boerdery (Pty) Ltd.		
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Reviewer:	Ms Rosalie Evans		
Study Leader/ Registered Environmental Assessment Practitioner – Approval:	Dr Alan Carter Ms Caroline Evans		
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	DRAFT BASIC ASSESSMENT REPORT		

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DETAILS OF THE EAP

Details of the EAP

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Ms Caroline Evans	c.evans@cesnet.co.za	Senior Consultant	Project Manager
Ms Rosalie Evans	r.evans@cesnet.co.za	Senior Consultant	Report Reviewer
Ms Nicole Wienand	n.wienand@cesnet.co.za	Environmental Consultant	Lead Report Writer

Company Overview

CES has its head office in Grahamstown, where it was founded in 1990, to service a then fledgling market in the fields of Environmental Management and Impact Assessment. CES now has offices in South Africa (Cape Town, Port Elizabeth, East London and Johannesburg), the United Kingdom (Romsey) as well as a wholly owned subsidiary in Maputo, Mozambique (Coastal & Environmental Services LDa., registered as an Environmental Practitioner with the Mozambican authorities).

The Company has grown apace with the increased market demand for environmental and social advisory services in Southern Africa and further afield. Our principal area of expertise lies in assessing the risks and impacts of the development process on the natural, social and economic environments through, among other instruments, the environmental impact assessment (EIA) process. We believe that by offering these services we contribute meaningfully towards sustainable development.

We adopt a scientific approach to our studies, underpinned by an informed and holistic view of the environment and a pragmatic approach to sustainable development. This results in deliverables that are robust, defensible and credible. This is important for both the development and EIA processes, and as a result the outputs of our studies demonstrate objectivity, sincerity and professionalism. We believe that a balance between development and environmental protection can be achieved by skilful and careful planning, and that our outputs reflect this. Our track record across 20 African countries as well as in the Middle East and Asia is evidence of the value added we bring to the environmental and social advisory services we provide and has contributed to our deep understanding of the environmental and social challenges associated with establishing and operating facilities and infrastructure in emerging markets.

CES Project Team

Dr Alan Carter *(Role: EAP & Project Leader)*

Dr Alan Carter is an Executive and the East London Branch Manager at CES. He has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also certified ISO14001 EMS Auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 25 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA).

Caroline Evans *(Role: Project Manager)*

Ms Caroline Evans is a Senior Environmental Consultant based in the Grahamstown branch. She holds a BSc degree in Zoology and Environmental Science (with distinction) and a BSc Honours degree in Environmental Science (with distinction), both from Rhodes University. Caroline has completed accredited courses in environmental impact assessments and wetland assessments. Caroline's primary focuses include Project Management, the general Environmental Impact Assessment Process, Visual Impact Assessments and Wetland Impact Assessments. Examples of fields in which Caroline was the project manager and lead report writer include Wind Energy Facilities and the associated infrastructure (including powerlines), Solar PV, Waste Water Treatment Works, Housing Developments and Agricultural Developments. Her experience with wind energy facilities and associated infrastructure includes the project management and report writing for the Umsobomvu WEF, Dassiesridge WEF, Scarlet Ibis WEF, Albany WEF, Waaihoek WEF and the Great Kei WEF. Caroline is well versed in South African policy and legislation relating to development, particularly in the Eastern Cape Province. In addition, Caroline's project management experience has helped her gain knowledge and experience in the technical and financial management and coordination of large specialist teams, competent authority and stakeholder engagement, and client liaison.

Ms Rosalie Evans *(Role: Report Reviewer)*

Rosalie is a Senior Environmental Consultant with 5 years' experience and she is based in the Port Elizabeth branch. She holds a BA degree in Social Dynamics with majors in Geography and Psychology as well as a BA Honours degree in Geography and Environmental Studies, both from Stellenbosch University. Rosalie's honours dissertation analysed the role of small grains in soil carbon sequestration in the agricultural sector of the Western Cape. Rosalie completed the Introduction to Environmental Impact Assessment Procedure Short Course by Coastal & Environmental Services and the Department of Environmental Science Rhodes University as well as the Estuary Management Short Course by Nelson Mandela University (NMU). In addition,

Rosalie is a member of the Land Rehabilitation Society of Southern Africa (LaRSSA) and a member of the International Association for Impact Assessment (IAIA). Her focuses include the general Environmental Impact Assessment (EIA) process, the Public Participation Process, NEMA Section 24 (G) Applications and associated rectification reports, Water Use Applications and accompanying Risk Assessments, GIS Mapping, Agriculture and Soils Assessments, Estuarine Assessments and Tourism Assessments.

Ms Nicole Wienand (*Role: Lead Report Writer*)

Ms Nicole Wienand is an Environmental Consultant based in the Port Elizabeth branch. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) with majors in Botany and Geology from NMU. Nicole's honours project focused on the composition of subtidal marine benthic communities on warm temperate reefs off the coast of Port Elizabeth, while her undergraduate project focused on the investigation of dune movement in Sardinia Bay. Nicole's key interests include Marine and Terrestrial Ecology, GIS Mapping, the general EIA process, Public Participation Process (PPP) and Ecological Impact Assessments.

LIST OF ABBREVIATIONS

BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
BSP	Biodiversity Sector Plan
CBA	Critical Biodiversity Area
m ³	Cubic metres
DAFF	Department of Agriculture, Forestry and Fisheries
DBAR	Draft Basic Assessment Report
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DEFF	Department of Environment, Forestry and Fisheries
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECBCP	Eastern Cape Biodiversity Conservation Plan
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
ECPHRA	Eastern Cape Provincial Heritage Resources Agency
EIA	Environmental Impact Assessment
FBAR	Final Basic Assessment Report
GDP	Gross Domestic Product
GN	Government Notice
ha	Hectares
I&AP	Interested and/or Affected Party
IDP	Integrated Development Plan
km	Kilometres
LM	Local Municipality
NDP	National Development Plan
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas project
SABS	South African Bureau of Standards
SANBI	South African National Biodiversity Institute
SAHRA	South African Heritage Resources Agency
SBDM	Sarah Baartman District Municipality
SCC	Species of Conservation Concern
m ²	Square metres
SOTER	Soils and Terrain Database
SRVLM	Sundays River Valley Local Municipality
VU	Vulnerable



BASIC ASSESSMENT REPORT

(For official use only)

File Reference Number:

Application Number:

Date Received:

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

Kindly note that:

1. This basic assessment report is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable tick the boxes that are applicable or black out the boxes that are not applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The **use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.**
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner (EAP).
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.



SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

	NO
	X

If YES, please complete form XX for each specialist thus appointed:
Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail

1.1 Description of the Proposed Activity

CES has been appointed by Citrusrand Boerdery (Pty) Ltd (the Proponent) to apply for Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), for the clearance of approximately 19.8 hectares (ha) of indigenous vegetation for the cultivation of citrus orchards and the construction of associated farm infrastructure. The study area is located on a section of Portion 472 of Farm 42 which is situated approximately eight (8) km southwest of Kirkwood. This area falls within the jurisdiction of the Sundays River Valley Local Municipality (SRVLM) (Ward 7), seated in the Sarah Baartman District Municipality (SBDM) of the Eastern Cape Province (Figure 1). The total extent of Portion 472 of Farm 42, on which the study site is situated, is 603.22 ha. Water for the proposed development will be supplied by the Sundays-Fish Transfer Scheme (Figure 3).

The proposed Citrusrand Dwarsleegte Farm Citrus Development entails the clearance of a total of 19.8 ha of indigenous vegetation for the following:

- The cultivation of citrus orchards;
- Upgrade and extension of existing farm access roads; and
- The construction of fences and a loading area/shed (Figure 2).



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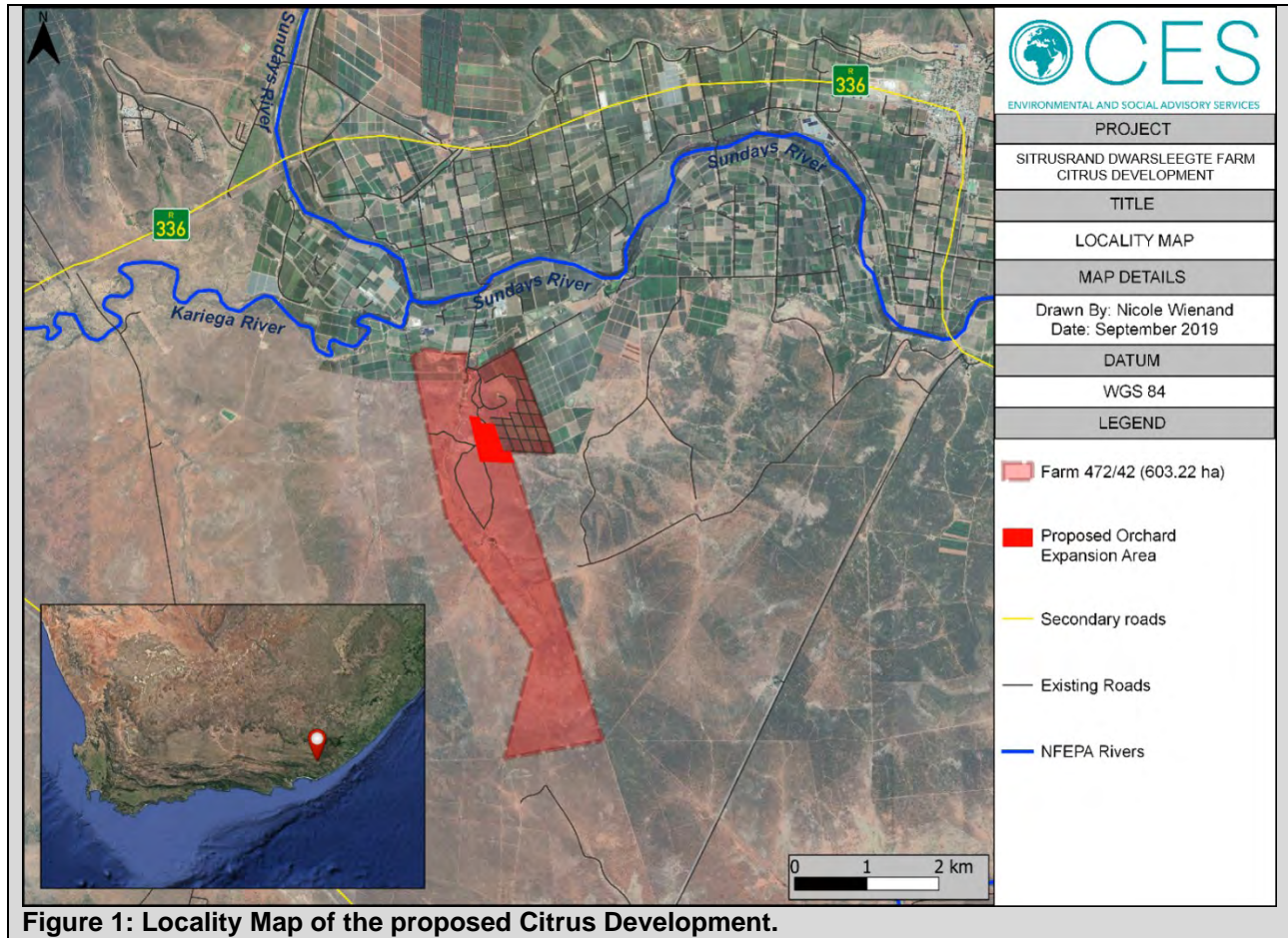


Figure 1: Locality Map of the proposed Citrus Development.

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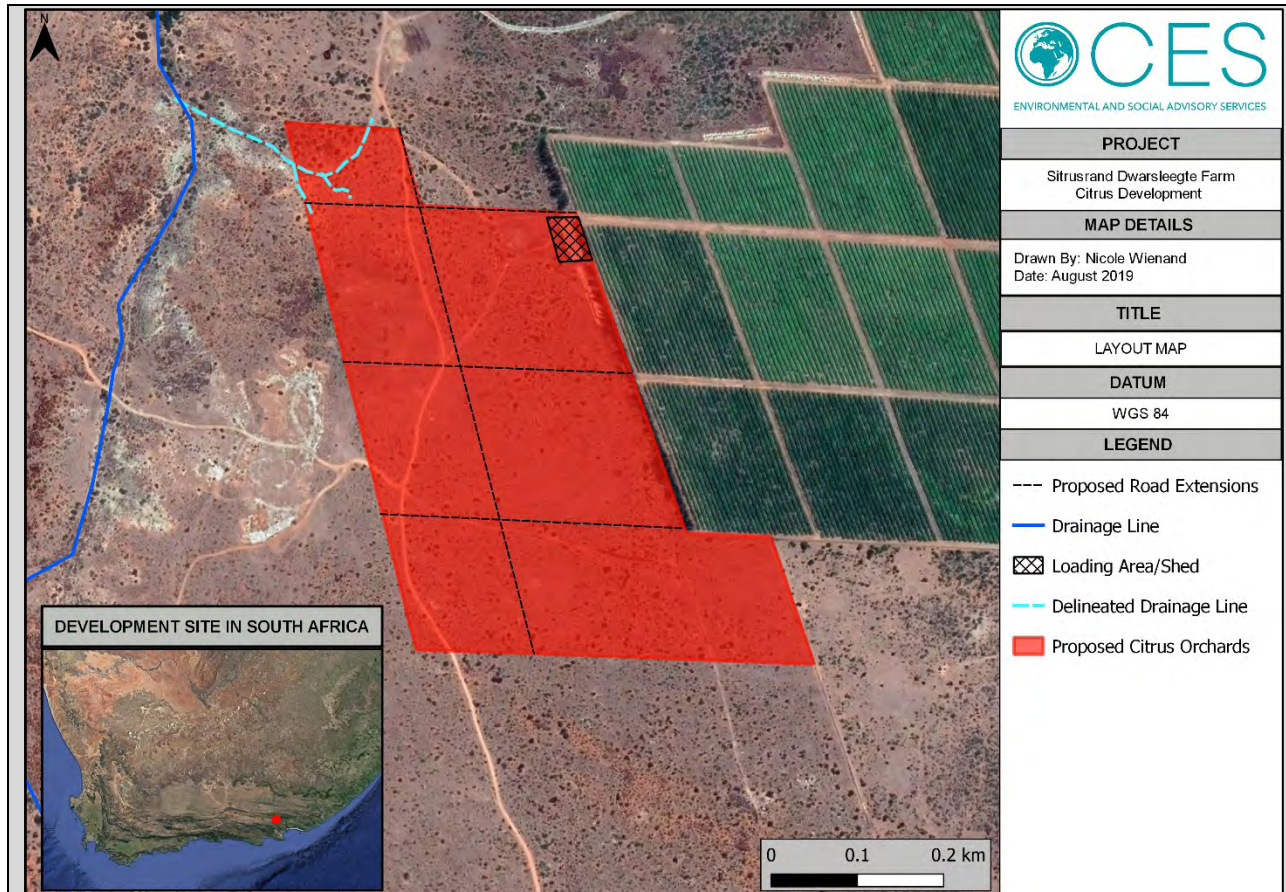


Figure 2: Layout Map of the proposed Citrus Development.

Water Supply

Water for the proposed citrus development will be supplied by the Fish-Sundays Transfer Scheme which supplies Orange River water from the Great Fish River Valley to the Sundays River Valley, thereby supplementing the existing water supply in the Eastern Cape Province.

Water from the Orange River is diverted via the Elandsdrift Weir from the Great Fish River and flows by gravity along a sixty-five kilometre (65 km) long aqueduct, which cuts through the Bosberg Chain between Cookhouse and Somerset East. This water is diverted into the 13.1 km Cookhouse tunnel which discharges into the Little Fish River near Somerset East, via a multi-stepped chute. From here, the water flows 40 km down the Little Fish to the De Mistkraal Weir which transfers water to the Darlington Dam, down the Sundays River supplying water to the citrus farms in the lower Sundays River Valley (Figure 3).



Water for the proposed citrus development will be extracted from a gravity-fed canal system containing water from the Sundays River, via an existing pump station which is located on Portion 472 of Farm 42.



Figure 3: Diagram indicating the Fish-Sundays Transfer Scheme (Pedersen et al., 2007).



Listed Activities

In terms of the NEMA (Act No. 107 of 1998 and subsequent amendments) EIA Regulations (2014 and subsequent 2017 amendments), the following relevant Listed activities will be triggered by the proposed Citrus Development:

Table 1: NEMA Listed Activities triggered by the proposed Citrus Development.

LISTING NOTICE	ACTIVITY NO.	DESCRIPTION	COMMENTS
Listing Notice 1 (GN R. 983/ GN R. 327)	12(ii)(c)	<i>The development of – (ii) infrastructure or structures with a physical footprint of 100 square meters or more: (c) if no development setback exists, within 32 meters of a watercourse, measured from the edge of a watercourse.</i>	The proposed development entails the establishment of citrus orchards and associated farm infrastructure, with a physical footprint exceeding 100 m ² , within 32 m of a watercourse.
	19	<i>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 a watercourse.</i>	The proposed development requires the infilling of material of more than 10 m ³ into the watercourse which traverses the north-western corner of the development site.
	27	<i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.</i>	The proposed development requires the clearance of 19.8 hectares of indigenous vegetation for the cultivation of citrus orchards and the construction of associated farm infrastructure.
	56(ii)	<i>The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometer – (ii) where no reserve exists, where the existing road is wider than 8 meters;</i>	The proposed development entails the lengthening of existing farm access roads by more than 1 km in an area where no reserve exists, but where the existing farm access roads are wider than 8 m.
Listing Notice 3 (GN R. 985/ GN R. 324)	12(a)(ii)(v)	<i>The clearance of an area of 300 square meters or more of indigenous vegetation – a. Eastern Cape ii. Within critical biodiversity areas identified in bioregional plans. v. On land, where, at the time of the coming into effect of this</i>	The proposed development requires the clearance of more than 300 m ² of indigenous vegetation within a terrestrial CBA 1 and an aquatic CBA 2 (ECBCP, 2007), an Addo BSP CBA (SANParks, 2012), as well as an area classified as a Private Nature Reserve, the Voetpadskloof Game Farm.



		<i>notice or thereafter such land was zoned open space, conservation, or had an equivalent zoning.</i>	
	14(ii)(c) (a)(i)(aa) (ff)(hh)	<p><i>The development of –</i></p> <p><i>(ii) infrastructure or structures with a physical footprint of 10 square meters or more;</i></p> <p><i>Where such development occurs –</i></p> <p><i>(c) if no development setback has been adopted, within 32 meters of a watercourse, measured from the edge of a water course;</i></p> <p><i>a. Eastern Cape</i></p> <p><i>(i) Outside urban areas:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies</i></p> <p><i>(ff) Critical Biodiversity Areas or ecosystem services areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p> <p><i>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</i></p>	<p>The proposed development entails the establishment of citrus orchards and associated farm infrastructure, with a physical footprint exceeding 10 m², within 32 m of a watercourse in an area classified as a terrestrial CBA 1, an Aquatic CBA 2 (ECBCP, 2007) and an Addo BSP CBA (SANParks, 2012).</p> <p>The proposed development is located within a Private Nature Reserve, the Voetpadskloof Game Farm, and it is situated approximately 8.2 km from Addo Elephant National Park (National Environmental Management Protected Areas Act (NEMPAA), 2007).</p>
	18(a)(i) (aa)(ee) (gg)(ii)	<p><i>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</i></p> <p><i>a. Eastern Cape</i></p> <p><i>(i) Outside urban areas:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p><i>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from</i></p>	<p>The proposed development entails the lengthening of existing farm access roads within an area classified as a Private Nature Reserve (the Voetpadskloof Game Farm), a terrestrial CBA 1 and an aquatic CBA 2 (ECBCP, 2007), and an Addo BSP CBA (SANParks, 2012).</p> <p>The proposed development is located approximately 8.2 km from the Addo Elephant National Park (NEMPAA, 2007) and is situated within 100 m of a watercourse.</p>



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		<p><i>any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; and</i></p> <p><i>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</i></p>	
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2. FEASIBLE AND REASONABLE ALTERNATIVES

“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;
- (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;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Paragraphs 3 – 13 below should be completed for each alternative.

Alternatives

One (1) of the objectives of the Basic Assessment (BA) Process is to investigate alternatives to the proposed development. In relation to a proposed activity, ‘Alternatives’ means different ways of meeting the general purpose and requirements of the proposed activity. There are two (2) main types of alternatives, namely Fundamental Alternatives and Incremental (development) Alternatives.

A. Fundamental Alternatives

Fundamental alternatives are developments which are entirely different from the proposed project and usually involve a different type of development on the proposed site, or a different location for the proposed development.

A1) Location Alternative

The preferred site/location for the proposed activity was selected based on the following reasons:



- The property on which the activity is proposed is owned by the Proponent (Citrusrand Boerdery (Pty) Ltd);
- The site is located directly adjacent to the Proponent's existing citrus orchards;
- The site contains a sufficient amount of undeveloped land for a citrus development;
- The site is easily accessible via existing farm access roads;
- The site is located close to a water resource (the Sundays River) and an existing pump station which is situated on Portion 472 of Farm 42;
- The types of soil within the site are suitable for the proposed citrus orchards; and
- The proximity of the site to existing infrastructure (including existing roads, water canals, and pump station).

Based on the reasons listed above, no additional location alternatives have been considered in this Basic Assessment Report (BAR) and the preferred Alternative is the only location alternative assessed further in this BAR.

A2) Activity Alternatives

In terms of an alternative development (activity) on the proposed site, the property is currently utilised for game farming and forms part of the Voetpadskloof Game Farm. As such, conservation as an alternative activity has been considered within the preferred location. The benefits of conserving the preferred location include: (1) conserving an area which is classified as a Terrestrial CBA 1 and an Aquatic CBA 2 (ECBCP, 2007); (2) protection and conservation of the Voetpadskloof Game Farm; and (3) the preservation of Sundays Arid Thicket (conservation status: **Vulnerable**) as no vegetation clearance would be required for conservation. However, conservation would not have the socio-economic benefits associated with the preferred activity alternative – citrus production. The production of citrus on Portion 472 of Farm 42 will contribute to local economic upliftment, through the creation of employment opportunities, and South Africa's Gross Domestic Product (GDP) through increased exports and foreign exchange. As the Proponent is a farmer and skilled in citrus production, this is the preferred activity alternative considered in this BAR.

B. Incremental Alternatives

Incremental alternatives are modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives which can be considered, including:

- The **technology** to be used in the activity;
- The **design** or **layout** of the activity; and
- The **operational aspects** of the activity.



B1) Technological Alternatives

Technology alternatives would potentially be relevant to the manner in which citrus is farmed on the property, rather than the actual preparation of land for citrus production. Aspects of citrus production that offer opportunities to explore technological alternatives include: savings and efficiencies relating to different irrigation methods (e.g. surface vs drip irrigation), manual vs mechanical harvesting, or economising on electricity costs and carbon footprints by making use of solar technology to power irrigation systems and monitoring devices. The technological alternatives considered for this BAR include (1) irrigation methods (sprinkler vs drip irrigation) and (2) electricity supply (Eskom vs solar).

B2) Layout Alternative

The layout of the of the proposed development is that of the traditional citrus orchard consisting of several 'blocks' separated by access roads. This allows ease of access for harvesting, irrigation and the application of fertilisers, pesticides, etc. The layout of the proposed citrus development also took into consideration the location of the existing citrus development (to the east of the proposed citrus development), gravel access roads and proximity of the existing pump station of Portion 472 of Farm 42. As such, no layout alternatives have been assessed further in this BAR.

B3) Operational Alternatives

The operational phase of the proposed development will consist of activities relating to citrus production, including the harvesting, packaging, loading and transport of citrus from the farm to local/international market(s). The implementation of the Environmental Management Programme (EMPr) during the operational phase of the proposed citrus development is the preferred operational alternative. In addition, the operational impacts section (Section D) of this report provides an assessment of the two (2) operational alternatives by providing the potential impact significance without applying suitable mitigation measures as well as the impact significance with the implementation of the recommended mitigation measures.

C. No-go Alternative

This alternative assumes that the status quo will remain and the indigenous vegetation and fauna on Portion 472 of Farm 42 will persist. Although the no-go alternative will result in minimal (if any) disturbance to the of the current indigenous vegetation, the fauna, and faunal habitats, the implementation of the no-go alternative would result in a loss of employment opportunities and no contribution to the countries GDP through international exports and foreign investments. The no-go alternative has been assessed further in this BAR (please refer to Section D).



Table 2 below illustrates the methodology used to assess the identified alternatives. The table assesses the advantages and disadvantages of each alternative and provides further comment on the alternatives selected for the assessment. It should be noted that the assessment of alternatives does not consider alternatives which are considered to be neither reasonable nor feasible.



Table 2: Alternatives which have been considered for the proposed Citrus Development.

FUNDAMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
<p>Alternative Location – Current proposed site (Preferred Alternative): Portion 472 of Farm 42.</p>	<ul style="list-style-type: none"> ➤ The Proponent owns the land on which the development is proposed. ➤ The site is located directly adjacent to the Proponent’s existing citrus orchards. ➤ Availability of sufficient undeveloped land. ➤ Easily accessible via existing farm access roads. ➤ The site is located near to a water resource (the Sundays River) and an existing pump station. ➤ Suitable soil types for the proposed citrus orchards. ➤ Proximity to existing infrastructure (including existing roads, power lines and water canals). 	<ul style="list-style-type: none"> ➤ Loss of indigenous vegetation. ➤ Loss of faunal habitat. ➤ Loss of biodiversity. ➤ Potential degradation or alteration of drainage lines. 	<p>YES</p>	<p>YES</p>	<p>The proposed location (property) is owned by the Proponent and it is therefore the preferred location, as well as the only location alternative which has been assessed further in this BAR.</p>



FUNDAMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
Alternative Activity 1 – Current proposed activity (Preferred Activity): Cultivation of citrus orchards.	<ul style="list-style-type: none"> ➤ The Proponent is a farmer and skilled in citrus production. ➤ Increased citrus production. ➤ Increased international exports. ➤ Improved foreign relations. ➤ Foreign investments. ➤ Creation of employment opportunities. ➤ Local economic upliftment and GDP contribution. ➤ In line with surrounding land use. 	<ul style="list-style-type: none"> ➤ Loss of indigenous vegetation. ➤ Loss of faunal habitat. ➤ Loss of biodiversity. ➤ Potential degradation and alteration of drainage lines. 	YES	YES	The development of citrus orchards on Portion 472 of Farm 42 is in line with surrounding land uses within the broader area, and will contribute to increased international exports, local economic upliftment and GDP contribution, and livelihood improvement through the creation of employment opportunities. Additionally, the Proponent is a farmer and skilled in citrus production. Based on the aforementioned reasons, this is the preferred activity, as well as the only activity alternative assessed further in this BAR.
Alternative Activity 2: Conservation of portion 472 of Farm 42.	<ul style="list-style-type: none"> ➤ Conserving an area which is classified as a Terrestrial CBA 1 and an Aquatic CBA 2 (ECBCP, 2007). ➤ Conservation and preservation of Sundays Arid Thicket (VU). ➤ Preservation of Voetpads Kloof Game Farm. 	<ul style="list-style-type: none"> ➤ Degradation of Sundays Arid Thicket due to grazing by game. ➤ Loss of employment opportunities. ➤ No contribution to local economic upliftment or the country's GDP. ➤ No contribution to international exports. 	YES	NO	Although this activity alternative is both reasonable and feasible, this activity has not been assessed further in this BAR as the Proponent is a farmer and skilled in citrus production.



FUNDAMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
	<ul style="list-style-type: none"> ➤ Protection of fauna and faunal habitats. ➤ Conservation of biodiversity. ➤ No potential impacts on surrounding drainage lines. 	<ul style="list-style-type: none"> ➤ Loss of international/foreign relations. 			

INCREMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
Alternative Technology: Irrigation Method 1 – Sprinkler Irrigation.	<ul style="list-style-type: none"> ➤ Suitable for all soil types. ➤ Easy and affordable installation and setup. ➤ High and frequent application possible. ➤ Concentrated water application. ➤ Possibility of adding fertilizers or pesticides to irrigation water. 	<ul style="list-style-type: none"> ➤ Significant amount of water required. ➤ Inefficient use and application of water. ➤ High initial capital costs. ➤ Sensitivity to wind, causes evaporative water loss. ➤ Sprinklers need to be manually moved at regular intervals to ensure high efficiency and uniform water distribution. ➤ Increased runoff potential may lead to erosion and deposition 	YES	NO	Based on the unsustainable use of water associated with the sprinkler irrigation method, this alternative has not been assessed further in this BAR.



INCREMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
		<p>of sediments or the input of contaminants into the nearby adjacent water course.</p> <ul style="list-style-type: none"> ➤ Unavoidable wetting of foliage in field crops results in increased sensitivity to diseases. ➤ Debris and sediments in irrigation water can cause clogging of sprinkler nozzles. 			
<p>Alternative Technology: Irrigation Method 2 – Current proposed irrigation method (Preferred Alternative): Drip Irrigation.</p>	<ul style="list-style-type: none"> ➤ Minimal loss of fertilizer and nutrients due to concentrated application and reduced leaching. ➤ Efficient water application. ➤ Reduced water loss. ➤ Reduced runoff and soil erosion. ➤ Uniform water distribution. ➤ Reduced risk of disease as foliage remains dry. ➤ Frequency of irrigation less dependent of soil type. 	<ul style="list-style-type: none"> ➤ High initial set up costs. ➤ Debris and sediments in irrigation water can cause clogging. ➤ Piping susceptible to degradation due to sun exposure. ➤ Requires careful consideration of various factors, including topography and climate. ➤ Potential salt build-up in the rooting zone of crops. 	<p style="text-align: center;">YES</p>	<p style="text-align: center;">YES</p>	<p>The Proponent plans to invest in the drip irrigation scheme due to its efficient and sustainable water use – a critical consideration in a water scarce region. Based on the advantages of drip irrigation, this is the preferred alternative assessed in terms of methods for irrigating the proposed citrus development.</p>



INCREMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
Alternative Technology: Electricity Supply 1 – Eskom.	<ul style="list-style-type: none"> ➤ Affordable installation costs. ➤ Easily accessible. ➤ Existing powerlines are within close proximity to the proposed project area. 	<ul style="list-style-type: none"> ➤ Unreliable during periods of load shedding. ➤ Additional pressure on Eskom services. 	YES	NO	The Proponent has not opted for this energy supply alternative due to the energy security concerns associated with Eskom power supply in South Africa. As such, this electricity alternative has not been assessed further in this BAR.
Alternative Technology: Electricity Supply 2 – Current proposed electricity supply (preferred Alternative) Solar.	<ul style="list-style-type: none"> ➤ Renewable energy supply. ➤ Cost saving in the long run (after installation). ➤ Energy independence and security. 	<ul style="list-style-type: none"> ➤ High installation costs. ➤ Lower production during overcast days. 	YES	YES	The Proponent has already invested in solar energy supply, primary due to the energy independence and reliability thereof, which provides power to the Proponents existing citrus orchards.
Alternative Layout – (Preferred Layout/ design). The site layout is that of a traditional citrus orchard consisting of several 'blocks' separated by access roads. This allows ease of access for harvesting,	<ul style="list-style-type: none"> ➤ Layout allows ease of access for harvesting, irrigation and the application of fertilizers, pesticides, etc. ➤ Proximity to existing citrus orchards, gravel access roads, and pump station on Portion 472 of Farm 42. 	<ul style="list-style-type: none"> ➤ Degradation and damage to the drainage line traversing the north-western boundary of the study site. ➤ Loss of Sundays Arid Thicket (VU). ➤ Loss of fauna and faunal habitats. ➤ Loss of Biodiversity. 	YES	YES	This is the only layout alternative assessed further in the BAR.



INCREMENTAL ALTERNATIVES					
ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
irrigation and the application of fertilizers, pesticides, etc.					
Operational Alternative 1 (Preferred) - Implementation of the EMPr during the operational phase of the proposed citrus development.	<ul style="list-style-type: none"> ➤ Compliance with environmental legislation and policies; ➤ A sustainable and environmentally sound citrus development; ➤ Limited damage to the surrounding natural environment. 	<ul style="list-style-type: none"> ➤ Potential increased costs and time associated with environmental monitoring and management. 	YES	YES	Implementation of the EMPr during the operational phase of the proposed citrus development is the preferred operational alternative. However, the impacts of not implementing the mitigation measures specified in the EMPr is assessed further in this report (please refer to Section D of this report).
Operational Alternative 2 – Operation of the proposed citrus development without the implementation of the EMPr.	<ul style="list-style-type: none"> ➤ Reduced costs and time associated with environmental monitoring and management. 	<ul style="list-style-type: none"> ➤ Conflicts with local, provincial and national policies and legislation, etc. ➤ Lack of institutional support for the project. ➤ Potential project failure. ➤ Undue disturbance to the natural environment. ➤ Potential for fines and penalties. 	NO	YES	



NO-GO ALTERNATIVE

ALTERNATIVE	ADVANTAGES	DISADVANTAGES	REASONABLE & FEASIBLE	FURTHER ASSESSMENT	COMMENT
No-go Option – this refers to the current status quo and the existing risks and impacts associated therewith.	<ul style="list-style-type: none"> ➤ No vegetation clearance will be required, resulting in the preservation of indigenous vegetation and faunal habitats. ➤ No impact on the Voetpadskloof Game Farm. ➤ No potential impacts on the drainage line surrounding and traversing the development site. 	<ul style="list-style-type: none"> ➤ No employment opportunities. ➤ Loss of international exports. ➤ Loss of potential foreign relations. ➤ No contribution to the country's economy or GDP. 	YES	YES	The no-go alternative has been assessed further in this BAR.



3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites if applicable.

The preferred site alternative is the only site alternative which has been assessed, as discussed in Section A1 above.

	Latitude (S):		Longitude (E):	
Alternative: Alternative S1 ¹ (preferred or only site alternative)	33°	26.414'S	25°	22.433'E
Alternative S2 (if any)				
Alternative S3 (if any)				

In the case of linear activities:

	Latitude (S):		Longitude (E):	
Alternative: Alternative S1 (preferred or only route alternative)				
● Starting point of the activity				
● Middle point of the activity				
● End point of the activity				
Alternative S2 (if any)				
● Starting point of the activity				
● Middle point of the activity				
● End point of the activity				
Alternative S3 (if any)				
● Starting point of the activity				
● Middle point of the activity				
● End point of the activity				

Please note: Although the development includes the construction of gravel access roads, these are to be included within the boundaries of the proposed development (as per Figure 2 above).

¹ "Alternative S.." refer to site alternatives.



For route alternatives that are longer than 500m, please provide an addendum with co ordinates taken every 250 meters along the route for each alternative alignment.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Alternative A1² (preferred activity alternative)

Size of the activity:

The development footprint of the proposed citrus orchards is 198 000 m² (19.8 ha).

Alternative A2 (if any)

Conservation of Portion 472 of Farm 42 with a total area of 198 000 m² (19.8 ha).

Alternative A3 (if any)

or, for linear activities:

Alternative:

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Length of the activity:

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative A1 (preferred activity alternative)

Size of the site/servitude:

Cultivation of citrus orchards 198 000 m² (19.8 ha) in extent.

Alternative A2 (if any)

Conservation of Portion 472 of Farm 42 with a total area of 198 000 m² (19.8 ha).

Alternative A3 (if any)

² "Alternative A.." refer to activity, process, technology or other alternatives.



5. SITE ACCESS

Does ready access to the site exist?

YES X

If NO, what is the distance over which a new access road will be built

Not Applicable

The study site can be accessed from Kirkwood via the R336 which links to the District Road (DR) 202151. Several unnamed gravel access roads which link to the DR 202151 can be utilised to gain access the proposed citrus orchards (Figure 4).

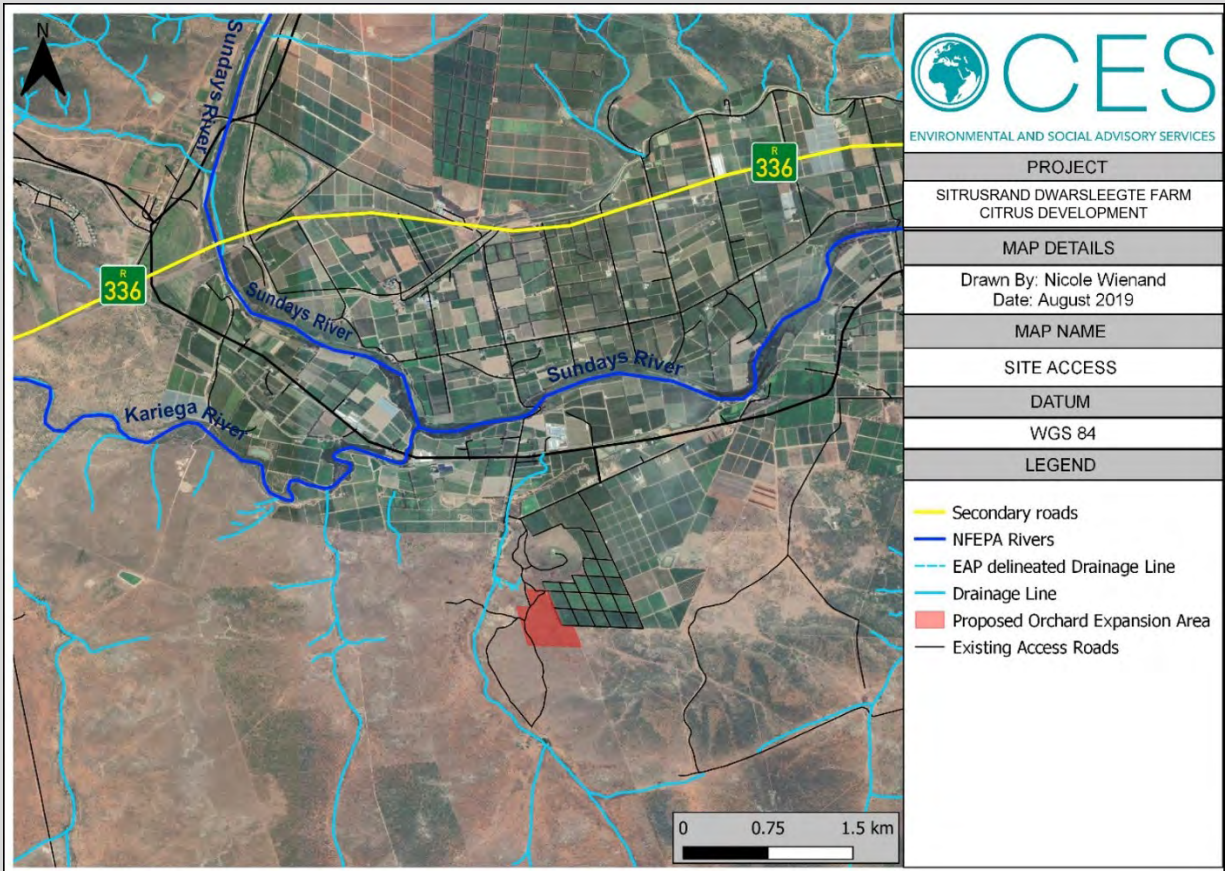


Figure 4: Access to the proposed study site.

Please note: Although the site is accessible via existing gravel access roads, these will need to be extended by approximately 2 000 m to create internal roads between the proposed citrus orchards (please refer to Figure 2 for proposed layout and extension of gravel access roads).



Describe the type of access road planned:

The proposed development entails the extension of existing gravel access roads, approximately 10-13 m wide, in order to gain access to the proposed citrus orchards (please refer to **Figure 2** above for the preferred layout).

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers;
 - the 1:100 year flood line (where available or where it is required by DWA);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.9 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.10 the positions from where photographs of the site were taken.

Please refer to **Appendix A: Site Plan(s)**.



7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Please refer to Appendix B: Photographs.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

Not applicable as the proposed activity is the development of citrus orchards on Portion 472 of Farm 42. Please refer to Appendix A for the Site Plan/Layout Map.

9. ACTIVITY MOTIVATION

9(A) SOCIO-ECONOMIC VALUE OF THE ACTIVITY

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development phase of the activity?

What is the expected value of the employment opportunities during the development phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

What percentage of this will accrue to previously disadvantaged individuals?

	R 14 million
	R 4,25 million
	NO X
	NO X
	37
	R740 000
	100%
	40 permanent opportunities and 40 seasonal opportunities
	R 18.2 million
	100%



9(B) NEED AND DESIRABILITY OF THE ACTIVITY

Motivate and explain the need and desirability of the activity (including demand for the activity):

South Africa's wealth of mineral resources, coupled with favorable agricultural conditions, traditionally rooted the country's economy in the primary sectors. Although recent years have seen a major shift from a primary and secondary based economy to an economy driven primarily by the tertiary sector, agriculture still remains a major contributor to the country's GDP and employment generation. According to DAFF (2016), the value of primary agricultural production in South Africa was R 263,2 billion in 2016, while its contribution to the GDP was estimated at R 72,2 billion in 2015. The estimated value of exports showed an increase of 13.7%, from R 86,090 million in 2015 to about R 97,901 million in 2016.

According to the National Development Plan (NDP, 2030), the agricultural sector is largely responsible for the development of rural areas and remains a significant provider of employment, providing approximately 16 000 employment opportunities to South Africans. The NDP highlights the importance of further developing the agricultural sector in the country and strives to achieve this by increasing exports and promoting the development of supplementary activities, such as agro-processing.

The agro-industrial sector contains a competitive advantage for South Africa, and it is one of the main sectors with a substantial potential for large-scale labour absorption, particularly through sector growth stimulation and/or employment generation. The NDP also places special emphasis on expanding the irrigated agricultural sector as it has an especially high job-creation potential and the ability to "transform the rural economy of South Africa". According to the NDP, government strives to create 643 000 direct and 326 000 indirect employment opportunities in the sector by the year 2030. The proposed Citrus Development aligns itself with the 2030 NDP by contributing to the development of South Africa's agricultural sector, creating employment opportunities, and increasing exports to foreign markets, thereby contributing to local and international economic growth and ultimately, the Country's GDP.

In the Sarah Baartman District Municipality (SBDM), agriculture remains one of the leading sectors in terms of 'Gross Value Added', with significant economic development opportunities (SBDM Integrated Development Plan (IDP), 2017-22). As such, the SBDM has placed special emphasis on developing its agricultural industry and aims to increase agricultural income to achieve a 1% year-on-year growth in the agriculture and agro-processing sectors. The proposed citrus development aligns itself with the SBDM's IDP (2017-22) by contributing to the development of the District's agricultural industry and increasing agricultural income, thus helping to achieve the 1% year-on-year industry growth objective.



According to the Sundays River Valley Local Municipality's (SRVLM) IDP (2017-18), the agricultural sector is an important contribution to the economy of the municipality, contributing 31.2% of the GDP and 47.7% of the employment. The agricultural sector in the SRVLM is dominated by a well-developed commercial sector. While citrus farming is the major constituent within this sector, environmental and commercial considerations are encouraging the development of the game farming industry for the dual purpose of investment and tourism within the SRVLM.

While game farming and conservation is assessed as an alternative to the proposed development, the proposed citrus development will contribute an estimated R18,2 million in employment within the first 10 years of operation, 100% of which will accrue to previously disadvantaged individuals. This will significantly contribute to poverty alleviation and food security within the region, increasing the tax base, thereby ultimately contributing to the region's economic growth and development. Increased exports could improve foreign relations, encourage investment, and increase the country's overall GDP.

Indicate any benefits that the activity will have for society in general:

The proposed Citrus Development will be beneficial to society and the local community as it will create a number of employment opportunities. Increased employment will contribute to poverty alleviation, livelihood improvement and increased food security. A greater number of employed individuals will also increase the tax base within South Africa, thereby contributing to local and national economic development.

The increase in local exports will contribute to the country's GDP, stimulate foreign relations, and encourage foreign investment within the country. This will in turn also stimulate economic development and employment creation within the agriculture and associated sectors, improving the livelihood of the country's citizens.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

- The local community will benefit from both temporary and permanent employment opportunities created during the construction and operational phase of the development;
- The economic spinoffs arising from utilising local businesses during construction and increasing the number of local employment opportunities, will manifest through local economic upliftment and livelihood improvement; and
- The proposed development will provide opportunities for unskilled workers to develop new skills in the agricultural industry.



10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Table 3: Applicable Legislation.

TITLE OF LEGISLATION, POLICY OR GUIDELINE:	ADMINISTERING AUTHORITY:	DATE:
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	Department of Justice	1996
The National Environmental Management Act (Act No. 107 of 1998, and subsequent amendments)	The national Department of Environment, Forestry and Fisheries (DEFF) and/or the provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)	1998 and subsequent amendments
National Environmental Management Act (Act No. 107 of 1998), Environmental Impact Assessment Regulations (2014 and subsequent 2017 amendments)	DEFF and/or DEDEAT	2017
The National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	DEFF and/or DEDEAT	2004
The National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation (DWS)	1998
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Department of Agriculture, Forestry and Fisheries (DAFF)	1983
Subdivision of Agricultural Land Act (Act No. 70 of 1970)	DAFF	1970
National Forests Act (Act No. 84 of 1998)	DAFF	1998
Hazardous Substances Act (Act No. 15 of 1973)	Department of Health (DoH)	1973
National Environmental Management: Waste Act (Act No. 59 of 2008)	DEFF and/or DEDEAT	2008
National Environmental Management: Air Quality Act (Act No. 39 of 2004, as amended)	DEFF and/or DEDEAT	2004
National Heritage Resources Act (Act No. 25 of 1999)	Eastern Cape Provincial Heritage Resources Authority (ECPHRA) and the South African Heritage Resources Agency (SAHRA)	1999
Occupational Health and Safety Act (Act No. 85 of 1993)	Department of Labour (DoL)	1993
National Road Traffic Act (Act No. 93 of 1996)	Department of Transport	1996
Municipal By-Laws	Sundays River Valley Local Municipality	
The Sarah Baartman District Municipality Integrated Development Framework (IDP)	Sarah Baartman District Municipality	
South African Vegetation Map	South African National Biodiversity Institute (SANBI)	2018



Eastern Cape Biodiversity Conservation plan	SANBI	2007
The National Freshwater Ecosystem Priority Areas (NFEPA) project	SANBI and DWS	2011/2014

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(A) SOLID WASTE MANAGEMENT

Will the activity produce solid construction waste during the construction/initiation phase?

If yes, what estimated quantity will be produced per month?

YES	<input type="checkbox"/>
X	<input checked="" type="checkbox"/>
100 m ³ (wood chip)	

How will the construction solid waste be disposed of (describe)?

Waste related to the construction phase mainly includes plant refuse associated with the clearance of vegetation for the cultivation of the citrus orchards. The cleared vegetation will be chipped and used a soil cover or mulch under the newly planted citrus trees to conserve water and increase the organic content of the soil. Any additional refuse, which is expected to be minimal, will be disposed of at the nearest registered waste disposal site. The nearest registered waste disposal site is located in Bontrug (Permit Reference No. B33/2/2020/15/P75), approximately 12.5 km northeast of the proposed Citrus Development, within the SRVLM.

Where will the construction solid waste be disposed of (describe)?

The construction waste which cannot be reused or recycled will be disposed of at the nearest registered waste disposal site located in Bontrug (Permit Reference No. B33/2/2020/15/P75), approximately 12.5 km northeast of the proposed Citrus Development, within the SRVLM.

Will the activity produce solid waste during its operational phase?

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

<input type="checkbox"/>	NO
<input checked="" type="checkbox"/>	X
-	

No solid waste will be generated during the operational phase of the project. Any cleared vegetation from the citrus orchards will be mulched and worked into the soil.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?



Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Not Applicable.

11(C) EMISSIONS INTO THE ATMOSPHERE

Will the activity release emissions into the atmosphere?

YES	<input type="checkbox"/>
X	<input checked="" type="checkbox"/>
<input type="checkbox"/>	NO
<input type="checkbox"/>	X

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

Dust, construction vehicle emissions, and suspended particles from pesticide and/or fertilizer application, are potential air pollutants which could be emitted into the atmosphere during the construction and operational phases of the proposed Citrus Development.

Dust is likely to be generated during the construction and operational phase, during vegetation clearance and by construction vehicles, tractors, other farm machinery such as ploughs, and transportation vehicles. The generation of dust by construction vehicles, farm machinery and transport vehicles, can be controlled by implementing the following measures:

- Dampening of exposed surfaces when necessary;
- Temporarily ceasing work during very windy conditions;
- Implementing traffic speed restrictions on site;
- Avoiding the unnecessary clearing of vegetation; and
- The use of commercial dust binders such as Hydropam or Dustex.

Exhaust emissions, emitted from construction vehicles, can be reduced by ensuring that all vehicles are adequately equipped, maintained and serviced. Air pollutants generated by the atmospheric suspension of pesticides and/or fertilizers are unlikely due to the direct, efficient application of pesticides and fertilizers via the drip irrigation scheme.

11(D) GENERATION OF NOISE

Will the activity generate noise?

YES	<input type="checkbox"/>
X	<input checked="" type="checkbox"/>



If yes, is it controlled by any legislation of any sphere of government?

	NO
	X

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Noise generated during the construction and operational phases of the activity are anticipated to be minimal and primarily related to construction vehicles, farm machinery and construction and/or farm workers. The impacts thereof are expected to be minimal due to the rural location of the proposed development and the distance between neighbouring farms. However, the following mitigation measures will ensure that the noise generated during the construction and operational phases is minimized:

- Ensure that all construction vehicles, farm machinery and transport vehicles used on site are in good working order and are serviced regularly;
- Limit construction activities to daylight hours (i.e. 6 am to 6 pm); and
- Adhere to applicable municipal by-laws regarding noise control and ensure that all staff are informed as to how they can avoid unnecessary noise pollution during working hours.

12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
	X				

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

	100 000 litres
	YES
	X

Does the activity require a water use permit from the Department of Water Affairs?

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:



The proposed citrus development will require electricity for its operation. As such, solar electricity has been considered as the preferred alternative (please refer to **Section 2** for the alternatives considered).

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

As above.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

1

- Paragraphs 1 - 6 below must be completed for each alternative.

- Has a specialist been consulted to assist with the completion of this section?

YES

X

If YES, please complete form XX for each specialist thus appointed:
All specialist reports must be contained in Appendix D.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
X						

The topography of the broader area can be described as low, undulating hills surrounding the flood plain of the Sundays River. The proposed Citrus Development site itself is relatively flat, decreasing gradually in elevation towards to the west as a result of the incision by the non-perennial water course (Figure 5). The average slope of the study site ranges from -3.6% to 3.0% (Figure 6 and 7).

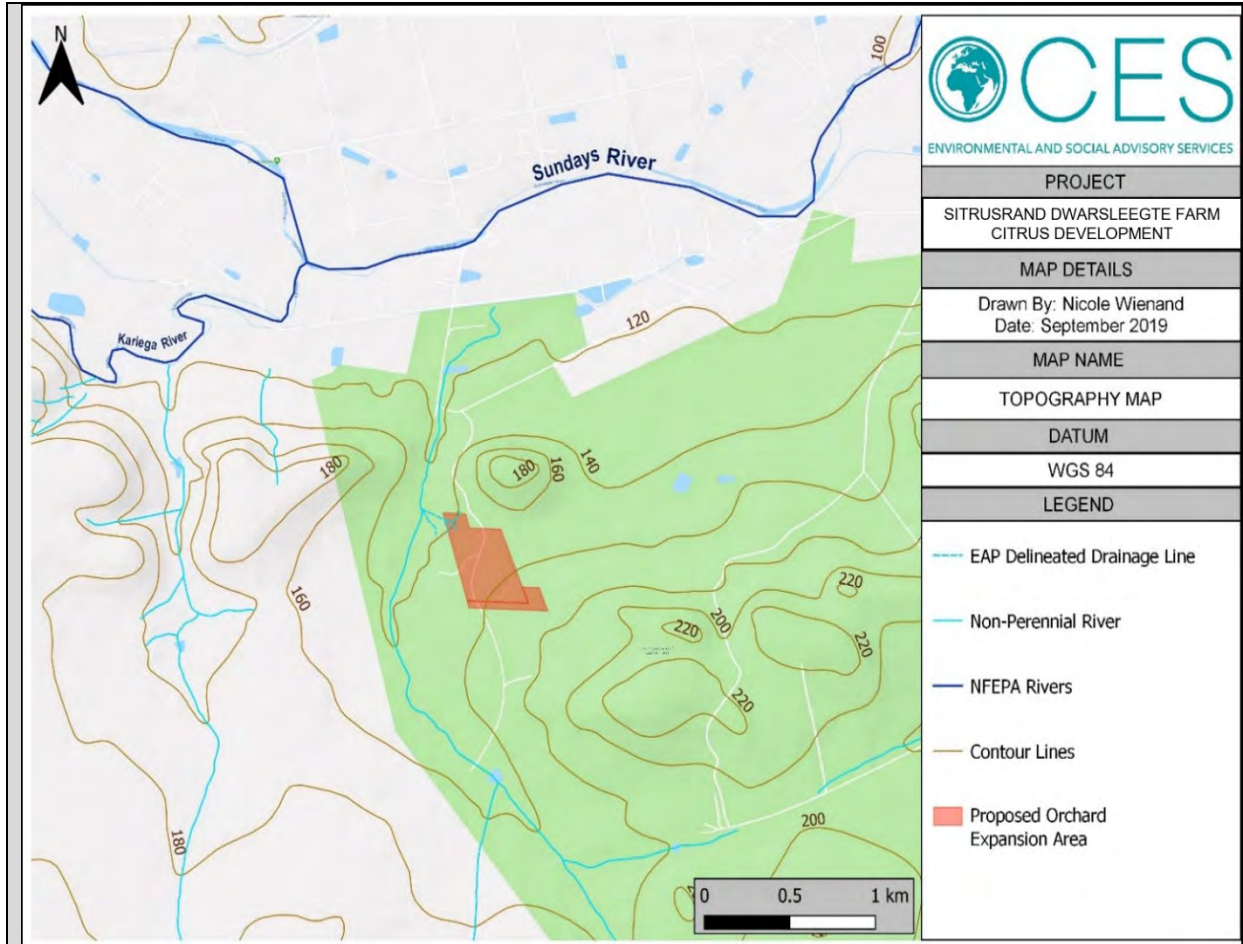


Figure 5: Topography Map of the proposed Citrus Development site.



Figure 6: Elevation profile of the study site from north to south (Google Earth, 2019).



2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley
- 2.6 Plain

2.7 Undulating plain / low hills	X
----------------------------------	---

- 2.8 Dune
- 2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	NO X		
Dolomite, sinkhole or doline areas	NO X		
Seasonally wet soils (often close to water bodies)	NO X		
Unstable rocky slopes or steep slopes with loose soil	NO X		
Dispersive soils (soils that dissolve in water)	NO X		



Soils with high clay content (clay fraction more than 40%)
Any other unstable soil or geological feature
An area sensitive to erosion

	NO		
	X		
	NO		
	X		
YES			
X			

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Soils and Geology of the study area

The soils within the study area are classified as Ferric Luvisols (Figure 8) (SOTER, 1995). Luvisols are characterised by mixed mineralogy, high nutrient content, and good drainage, making them particularly suitable for agriculture. They typically form in cool temperate to warm Mediterranean climates on flat or gently sloping landscapes. Luvisols are characterised by a lower layer consisting of mixed clay accumulation containing high levels of nutrient ions such as calcium, magnesium, sodium or potassium overlaid by a leached layer devoid of clay and iron-bearing minerals. An accumulation of humus typically forms the surface layer of Luvisols. Ferric Luvisols contain significant levels of iron (Encyclopedia Britannica, 2019).

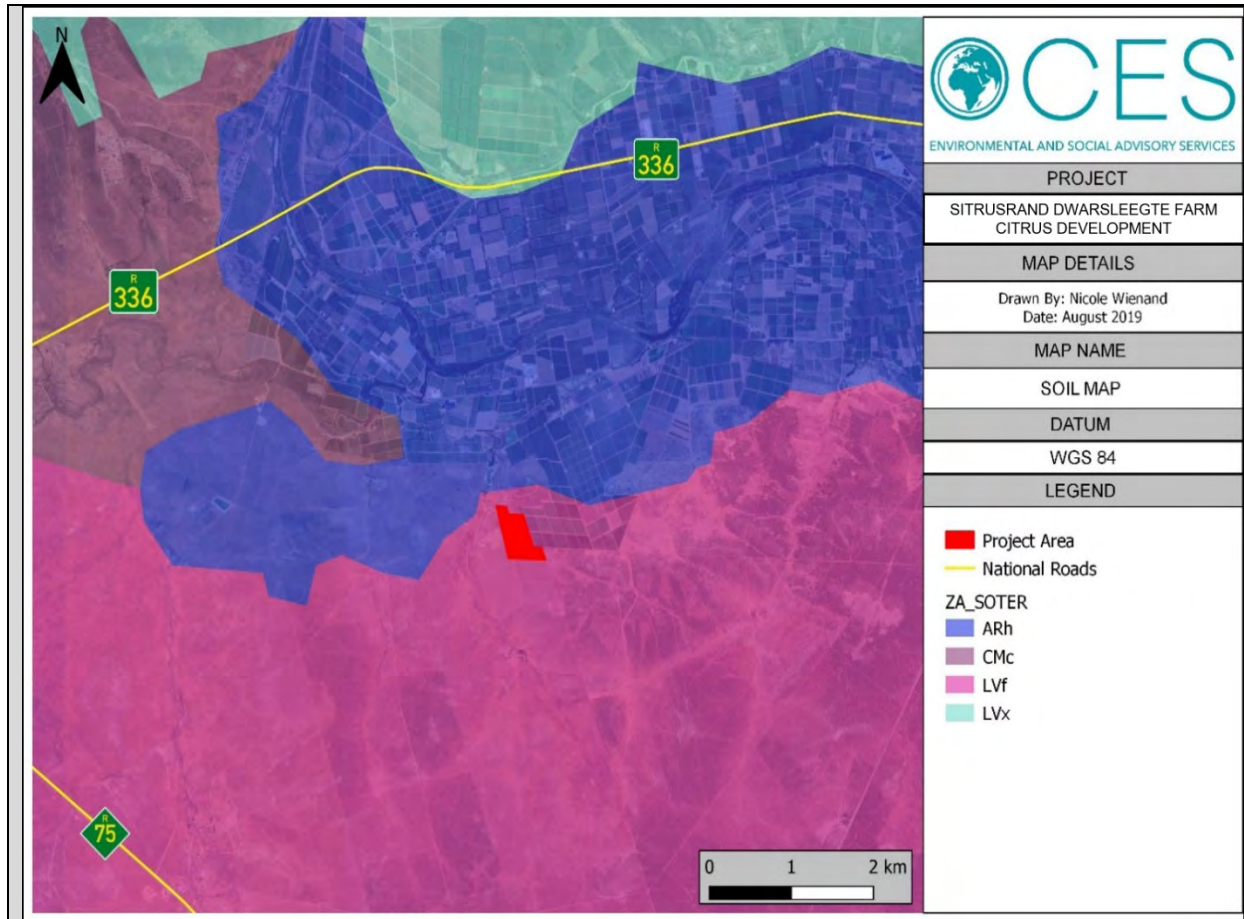


Figure 8: Soil Map of the proposed Citrus Development site.

The geology underlying the study area consists of sedimentary deposits of the Kirkwood Formation, one of four formations belonging to the Uitenhage Group of the Algoa Basin, in the Eastern Cape Province of South Africa. The Kirkwood Formation reaches a thickness of 2 000 m in parts of the basin and consists of porous and permeable, coarse- to medium-grained lithic sandstones interbedded with red and greyish-green siltstones and mudrocks. The depositional environment of the Kirkwood Formation is that of a fluvial setting, with point-bar sand deposits, overbank mud accumulations and subaerial exposure of recently deposited sediments (Figure 9).

The Kirkwood Formation is regarded as one of the most fossil rich formations of the Late Jurassic to Early Cretaceous period in South Africa, containing large fragments of wood including whole charred and silicified fossil tree trunks, ferns, cycads, and conifers, as well as vertebrate fragments and freshwater bivalve shells. Marine and brack-water microfossils found



within a grey shale of a borehole section, suggests a possible marine incursion into the Algoa Basin (Johnson et al., 2006).

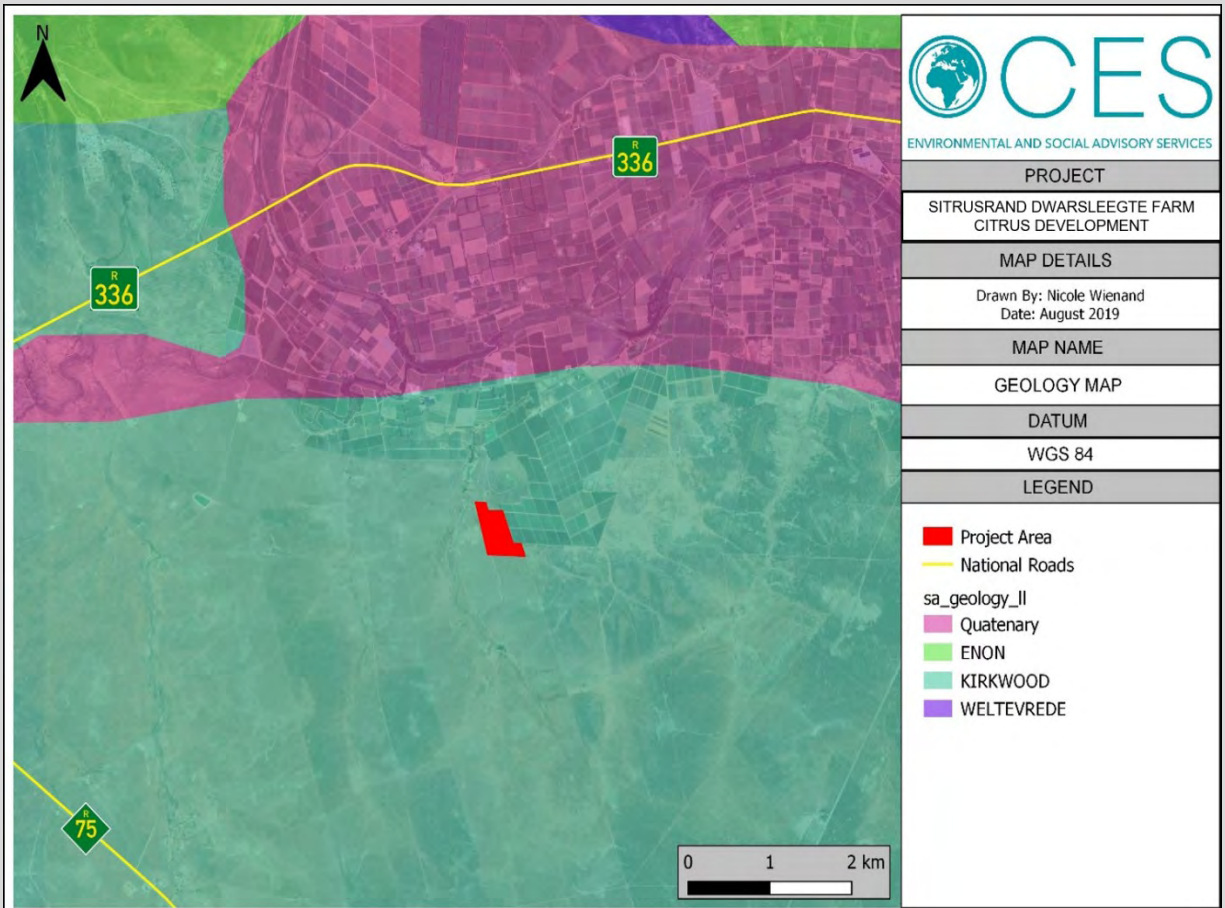


Figure 9: Geology Map of the proposed Citrus Development site.

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

4.1 Natural veld – good condition ^E	X
4.2 Natural veld – scattered aliens ^E	X
4.3 Natural veld with heavy alien infestation ^E	
4.4 Veld dominated by alien species ^E	
4.5 Gardens	
4.6 Sport field	



- 4.7 Cultivated land
- 4.8 Paved surface
- 4.9 Building or other structure

4.10 Bare soil	X
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The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition ^E X	Natural veld with scattered aliens ^E X		Bare soil X
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If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

An Ecological Impact Assessment was conducted in accordance with Appendix 6 of the NEMA EIA Regulations to supplement this BAR (please **see Appendix D**). This includes a detailed description of the biophysical and ecological environment based on a comprehensive site investigation and various spatial tools, including SANBI’s National Vegetation Map (2018), the ECBCP (2007), the NFEPA Project (2011-14), National Environmental Management: Biodiversity Act (NEM:BA), 2004: List of Threatened Ecosystems (2011), National Protected Areas Expansion Strategy (NPAES) (2010), amongst others, and recent aerial imagery.

4.1 Vegetation and Floristics

4.1.1 SANBI Classification (*Mucina et al., 2018*)

As per SANBI’s National Vegetation Map (2018), the proposed study site falls within the Albany Thicket Biome (*Mucina et al., 2018*). This species-rich, evergreen, scrubland covers an estimated 2.5% of South Africa’s total land surface area and occurs throughout most of the Eastern Cape Province, particularly in incised river valleys. The biome is characterised by sparse to dense, semi-succulent, spiny shrub vegetation often accompanied by a tree component and an herbaceous and grassy undergrowth. Albany Thicket is considered an important mitigation against climate change due to its exceptional ability to store carbon. Unfortunately, this biome has become highly fragmented due to clearing and its poor ability to regenerate once disturbed (*Mucina and Rutherford, 2012*).



The vegetation type within and surrounding the project area is classified as Sundays Arid Thicket (Figure 10). Arid thicket typically occurs inland within the coastal hinterland region of the Albany Thicket Biome and within the Cape Fold Mountains, along the steep footslopes of the Great Escarpment. Soil types common to this vegetation type include shallow, loamy-clayey soils and soils with a rich clay content. Arid thicket is the driest form of the thicket types, with a rainfall of about 200-300mm, and is characterised by a prominent succulent component and a poorly developed, sparse woody tree and shrub component. Frost is a common occurrence. Dominant and characteristic species include *Vachellia karroo*, *Aloe africana*, *A. ferox*, *A. microstigma*, *A. speciosa*, *Astroloba foliosa*, *Boscia leoides*, *Cadaba aphylla*, *Carissa haematocarpa*, *Cotyledon orbiculata*, *Crassula ovata*, *Uclea undulata*, *Euphorbia atrispina*, *Euphorbia bothae*, *E. coerulescens*, *E. ferox*, *E. pentagona*, *E. tetragona*, *Gloveria integrifolia*, *Gymnosporia polycantha*, *G. szyszyłowiczii*, *Nymanina capensis*, *Pappea capensis*, *Pegolettia baccaridifolia*, *Portulacaria afra*, *Ptaeroxylon obliquum*, *Rhigozum obovatum*, *Sarcostemma viminale*, *Schotia afra* and *Searsia longispina* (CEN IEM Unit, 2019) .

The Ecosystem Threat Status of Sundays Arid Thicket is **Vulnerable** while the Ecosystem Protected Level is considered **Moderately Protect** (Skowno et al., 2019). According to SANBI's National Vegetation Map (2018), the conservation target for Sundays Arid Thicket is 19%. While 98.3% of the dominant land cover type within Sundays Arid Thicket is classified as Natural, Sundays Arid Thicket declines by an estimated 0.008% per year (Skowno et al., 2019). According to Hoare et al (2006), Sundays Thicket is statutorily protected in the Greater Addo Elephant National Park, Groendal Wilderness Area as well as in Swartkops Valley and Springs Nature Reserves. Private conservation areas contributing to the conservation of Sundays Thicket include game farms such as Kuzuko, Koedeoskop, Schuilpatdop, Tregathlyn, Citruslandgoed, and Voetpads kloof and a couple of nature reserves. In 2006, more than 6% of Sundays Thicket had been transformed and degraded through grazing by livestock. Once degraded, Sundays Arid Thicket resembles a secondary thornveld or grassland, dominated by invasive weedy species with no to very few thicket species. Rehabilitation potential is low with erosion potential moderate to low.

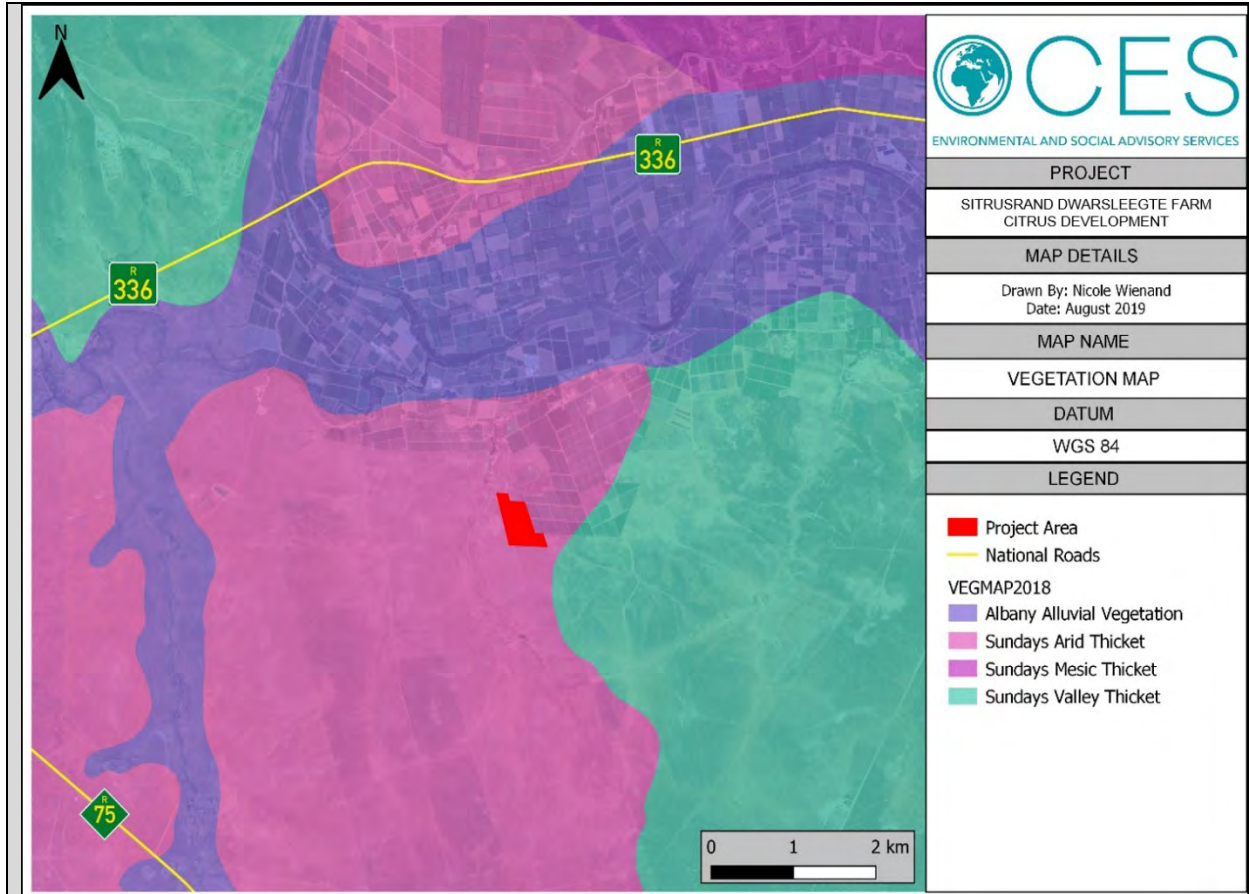


Figure 10: Vegetation Map of the proposed Citrus Development site and surrounds.

4.2 Biodiversity Indicators

4.2.1 National

The NEM:BA (Act No. 10 OF 2004) provides a National List of Ecosystems which are threatened and in need of protection – GN 1002 of 2011. Although the proposed Citrus Development site is not located within a threatened ecosystem, it is situated within 1.1 km from Albany Alluvial Vegetation (a threatened ecosystem classified as **Endangered**) with which it may share some transitional elements and species (Figure 11).

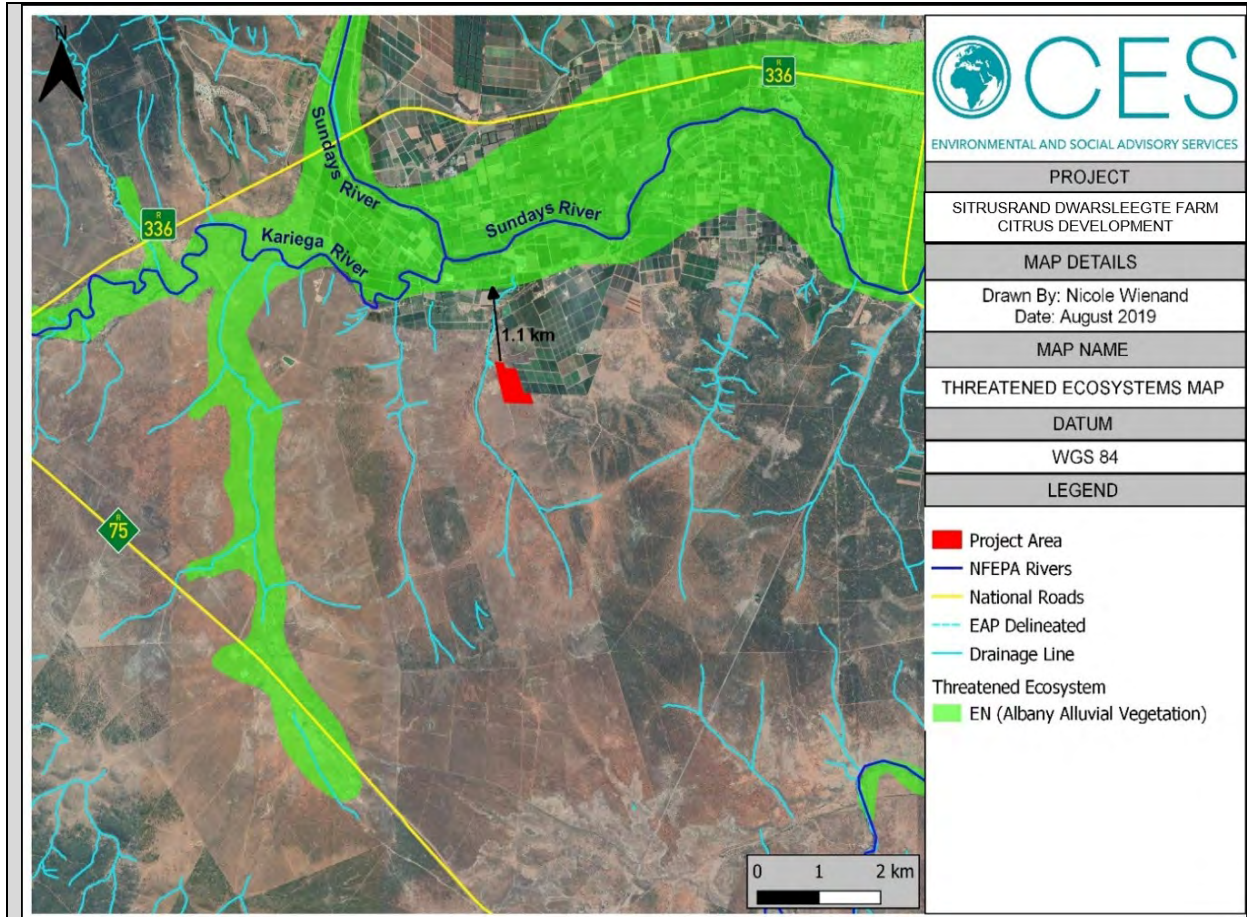


Figure 11: Threatened ecosystems surrounding the study site.

4.2.2 Provincial

Eastern Cape Biodiversity Conservation Plan (ECBCP) (2007) is a detailed, low-level conservation mapping tool for land-use planning purposes in the Eastern Cape Province. The aim of ECBCP is to map CBAs through a systematic conservation planning process. The current biodiversity plan includes the mapping of priority aquatic features, land-use pressures, and critical biodiversity areas and developed guidelines for land and resource-use planning and decision-making.

The main outputs of the ECBCP are CBAs, which are allocated the following management categories:

CBA 1 = Maintain in a natural state

CBA 2 = Maintain in a near-natural state



ECBCP maps the CBAs based on extensive biological data and input from key stakeholders. Although ECBCP is mapped at a finer scale than the National Spatial Biodiversity Assessment (Driver et al., 2005) it is still, for the large part, inaccurate and “course”. Therefore, it is imperative that the status of the environment, for any proposed development first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007). It is also important to note that in absence of any other biodiversity plan, the ECBCP has been adopted by the DEDEAT as a strategic biodiversity plan for the Eastern Cape Province.

According to the ECBCP (2007) spatial planning tool, the project area is located within a terrestrial CBA 1 and an aquatic CBA 2 (Figure 12 and 13), as well as an Addo BSP CBA (see Section 4.2.3) in terms of SANParks (2012) (Figure 14).

The management requirements for a CBA 1 areas are as follows (taken from the ECBCP 2007 Handbook):

CBA AREA	MANAGEMENT REQUIREMENTS
CBA 1	These areas are considered as natural landscapes and biodiversity must be maintained in an as natural state as possible so that there is no future biodiversity loss.
CBA 2	These areas are considered as near-natural landscapes and biodiversity must be managed in a near natural state with minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted.

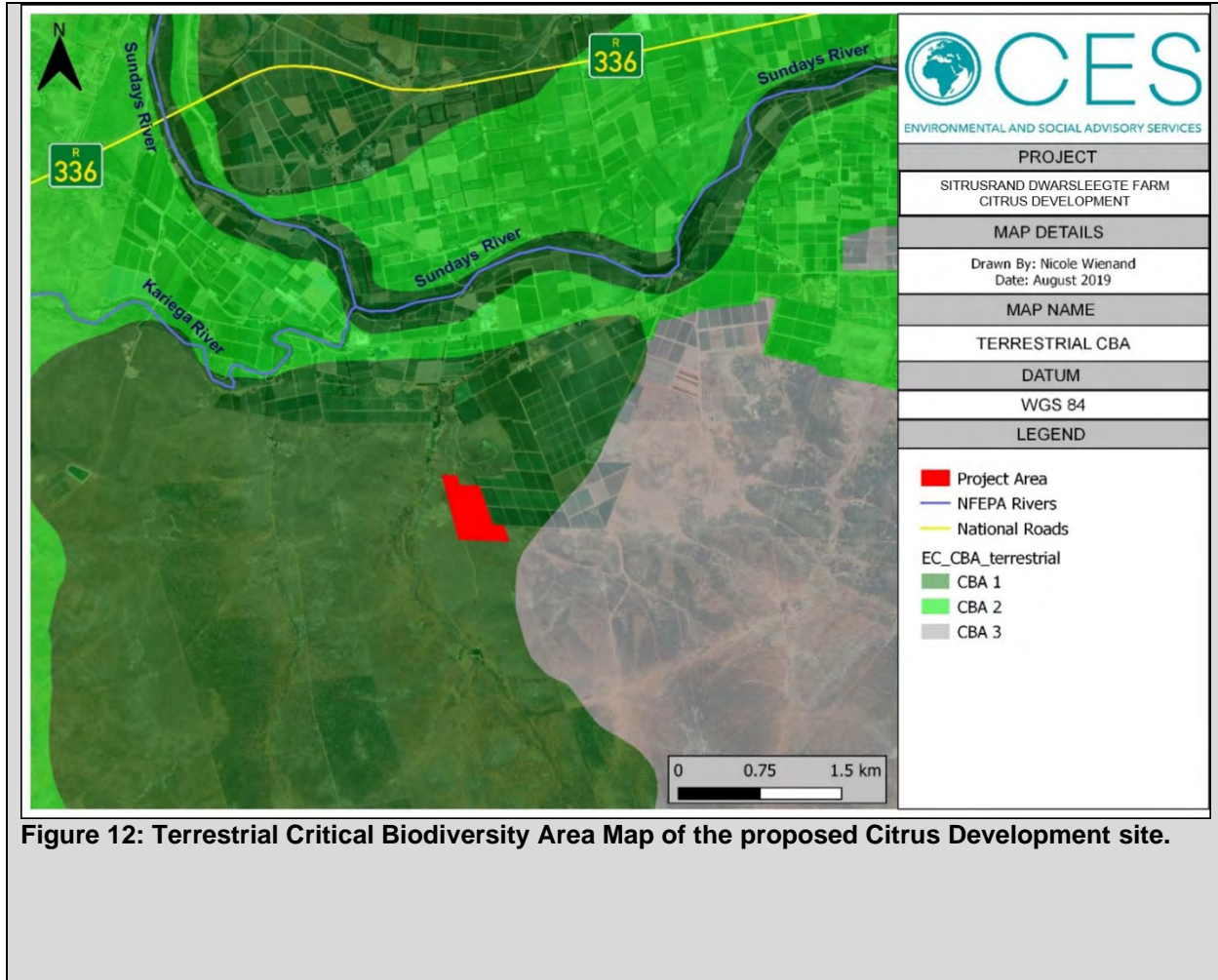


Figure 12: Terrestrial Critical Biodiversity Area Map of the proposed Citrus Development site.

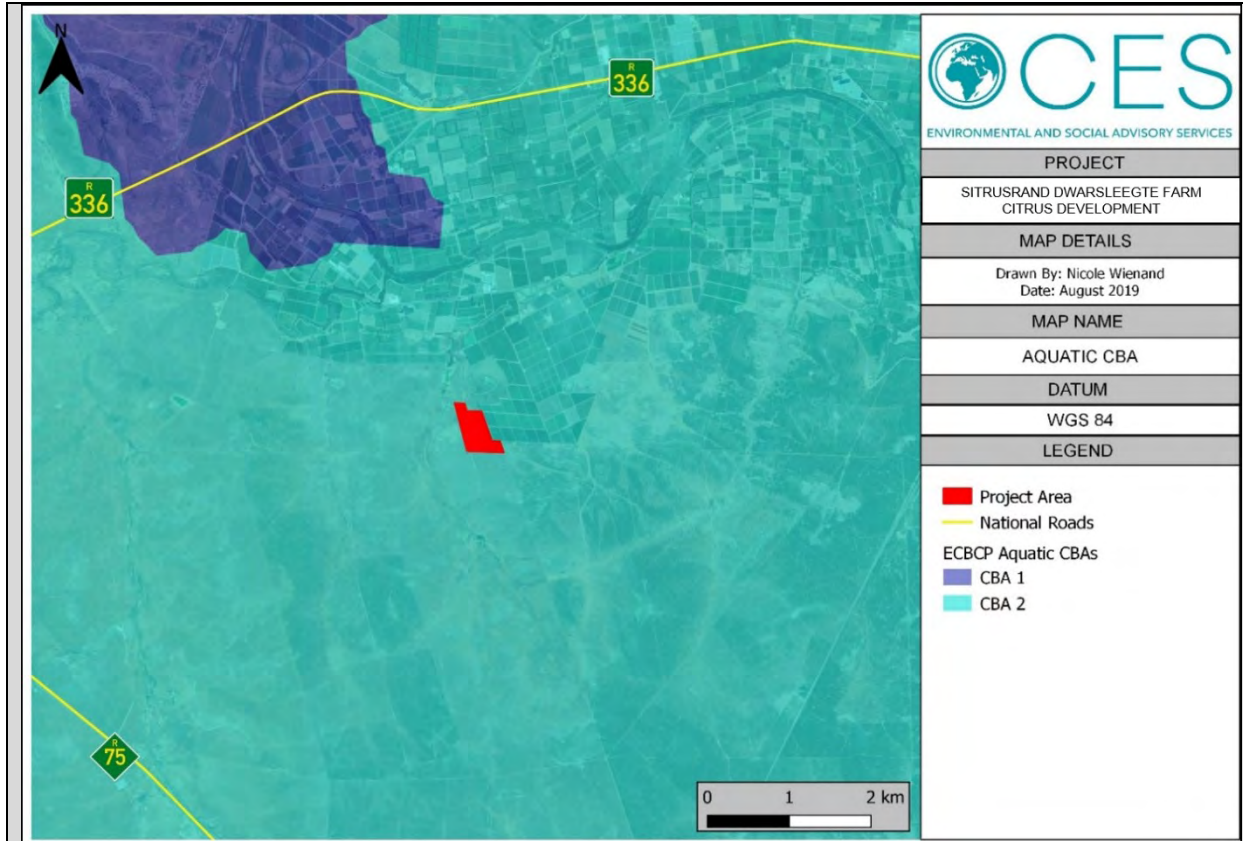


Figure 13: Aquatic Critical Biodiversity Area Map of the proposed Citrus Development site.

4.2.3 Local

The Addo Biodiversity Sector Plan (BSP, 2012) serves as a critical tool for land use planning, environmental assessments, land-use authorisations and natural resource management, ultimately guiding sustainable development within the Blue Crane Route, Ikwezi, Sundays River Valley and Ndlambe LMs. These four municipalities harbour 44.7% of South Africa’s Albany Thicket Biome and are therefore very important in terms of biodiversity. Furthermore, these LM’s occur within the southwestern Albany-Pondoland-Maputoland Hotspot, as well as South Africa’s fastest expanding National Protected Area – the Addo Elephant National Park. The Addo BSP therefore assists with mapping CBAs, ensuring that the information contained therein is utilized and considered by local municipalities, thereby informing land-use planning and decision making.



According to the Addo BSP, the study site occurs within a CBA (Figure 14). CBAs are critical for achieving biodiversity targets for species, ecosystems or ecological processes and infrastructure while Ecological Support Areas (ESAs) are important in that they support the functioning of CBAs and are often vital for the delivery of ecosystem services.

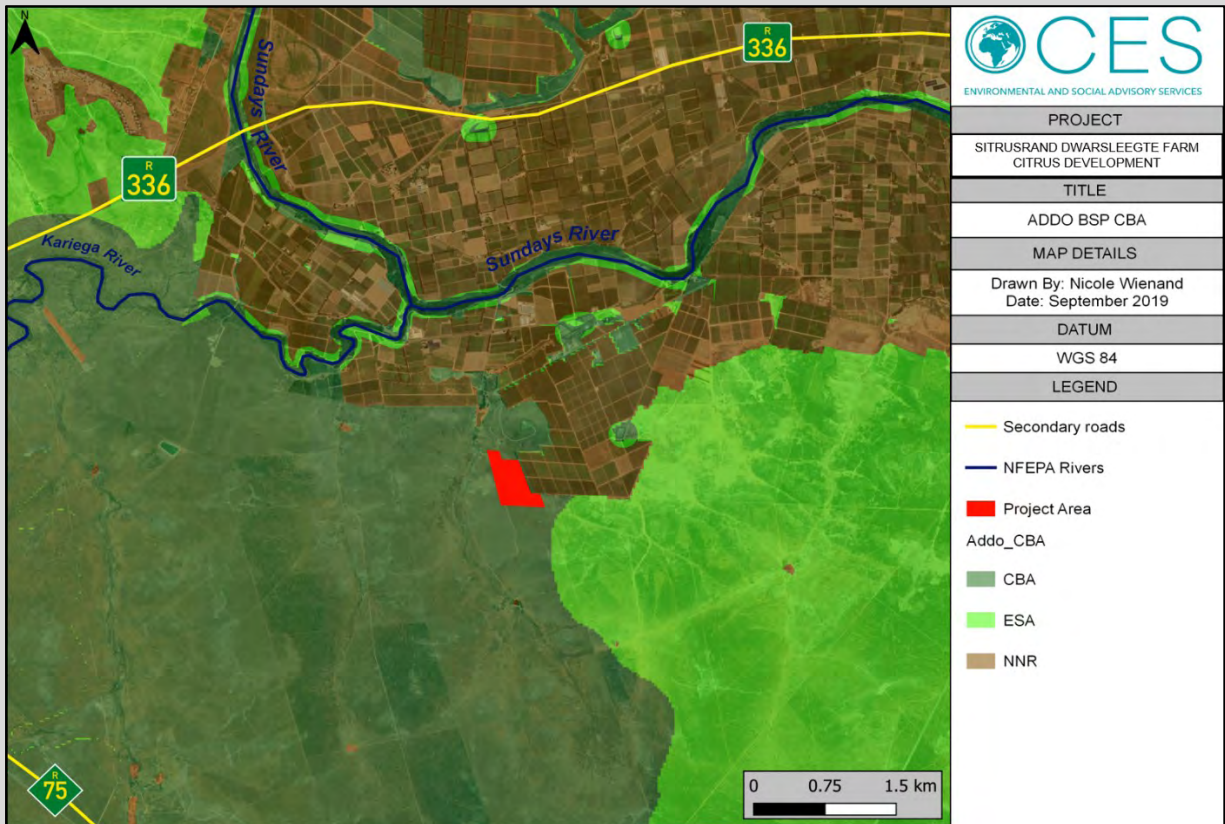


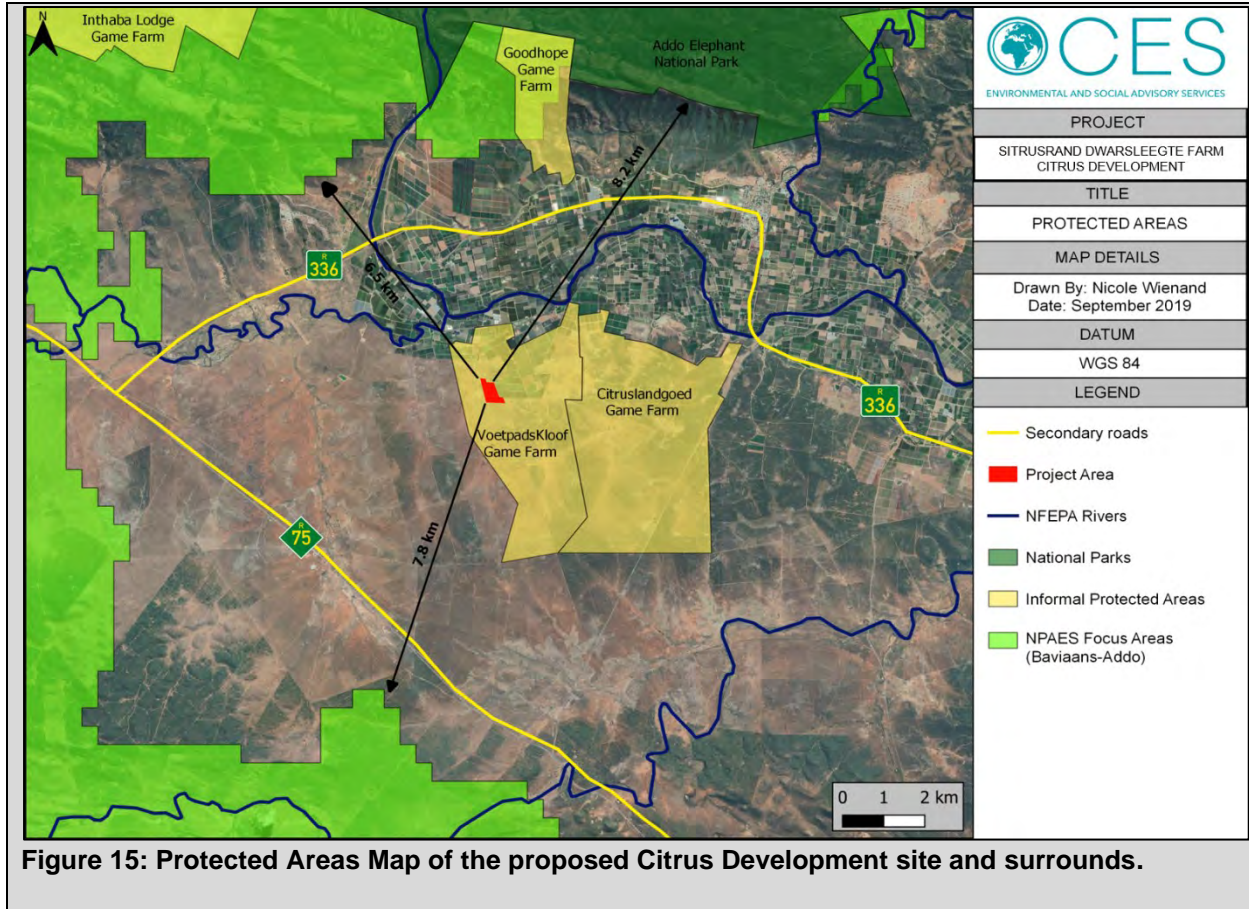
Figure 14: Addo BSP CBA Map of the proposed Citrus Development site(SANParks, 2012).

4.3 Protected Areas

The NEMPAA (Act No. 57 of 2003) was developed to provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes.

The proposed site is located within an informally conserved area – the Voetpadskloof Game Farm. The site is also located within 8.2 km of the Addo Elephant National Park and 6.5 km of an NPAES Focus Area (Figure 15).

There are no Important Bird Areas (IBAs) located within or close to the project area.



5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area	X
5.2 Low density residential	
5.3 Medium density residential	
5.4 High density residential	
5.5 Informal residential	
5.6 Retail commercial & warehousing	
5.7 Light industrial	
5.8 Medium industrial ^{AN}	
5.9 Heavy industrial ^{AN}	



- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam^A

5.14 Quarry, sand or borrow pit	X
5.15 Dam or reservoir	X

- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant^A
- 5.22 Train station or shunting yard^N
- 5.23 Railway line^N
- 5.24 Major road (4 lanes or more)^N
- 5.25 Airport^N
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station^H
- 5.31 Landfill or waste treatment site
- 5.32 Plantation

5.33 Agriculture	X
5.34 River, stream or wetland	X
5.35 Nature conservation area	X

- 5.36 Mountain, koppie or ridge
- 5.37 Museum
- 5.38 Historical building

5.39 Protected Area	X
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- 5.40 Graveyard
- 5.41 Archaeological site
- 5.42 Other land uses (describe)

If any of the boxes marked with an “^N” are ticked, how will this impact / be impacted upon by the proposed activity.

Not Applicable.



If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:

If YES, specify:

Not Applicable.

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:

If YES, specify:

Not Applicable.

South African National Land-Cover (2014)

The South African National Land-Cover Map (2014) provides a key information requirement for a wide range of landscape planning, inventory and management activities. The recent global availability of Landsat 8 satellite imagery offered the opportunity to create a new, national land-cover dataset for South Africa, circa 2013-14, replacing and updating the previous 1994 and 2000 South African National Landcover datasets.

According to the SA National Land-Cover Map (2014), the proposed Citrus Development site is located within grassland with minor portions of the boundary of the proposed site located within woodland/open bushland and forest plantation (mature trees) (Figure 16).

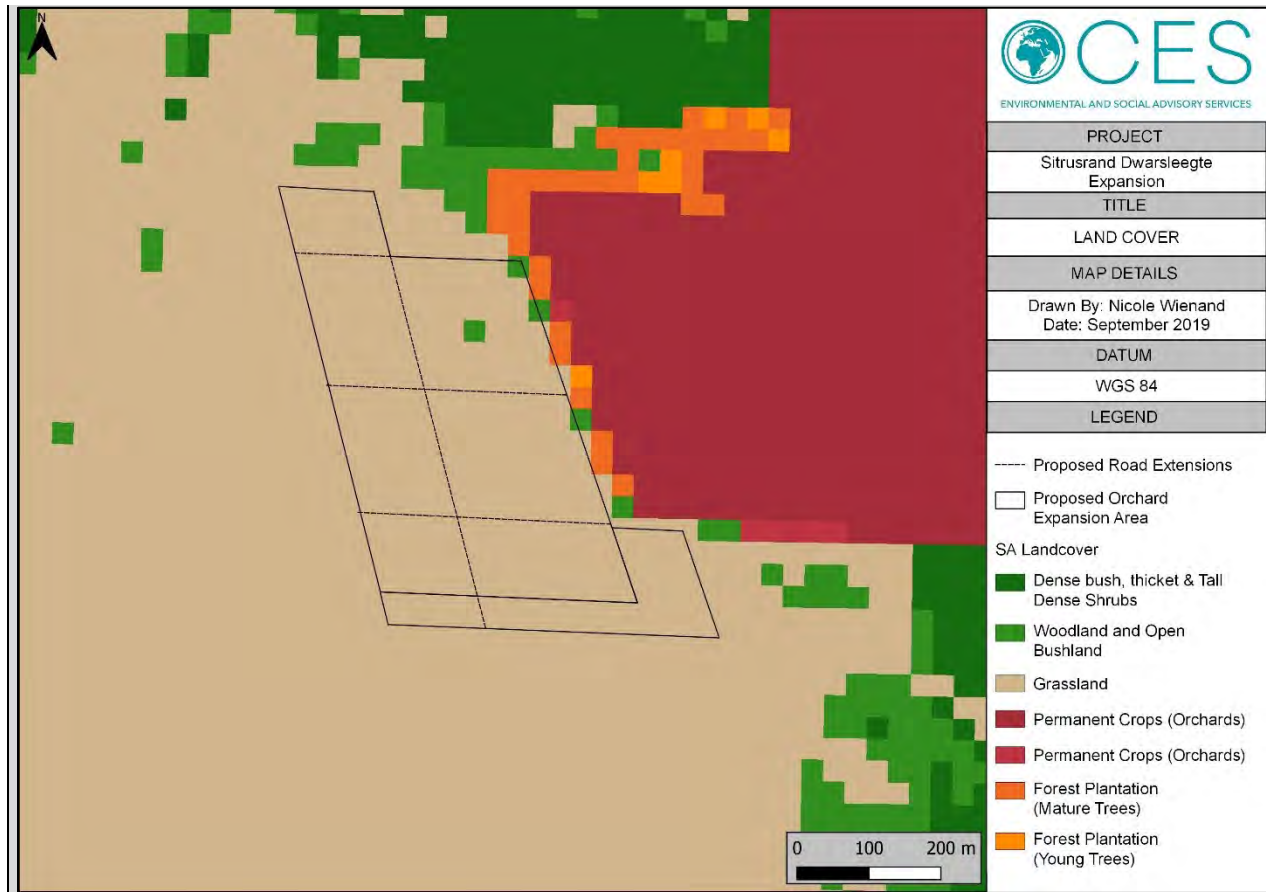


Figure 16: Land-cover Map of the proposed Citrus Development site.

Table 4: Land-cover classes for the area within and surrounding the development site.

Class Number	Class Name	Land Cover description
5	Dense Bush, Thicket & Tall Dense Shrubs	Natural / semi-natural tree and / or bush dominated areas, where typically canopy heights are between 2 - 5 m, and canopy density is typically > ± 75%, but may include localised sparser areas down to ± 60%. Includes dense bush, thicket, closed woodland, tall, dense shrubs, scrub forest and mangrove swamps. Can include self-seeded bush encroachment areas if sufficient canopy density.
6	Woodland and Open Bushland	Natural / semi-natural tree and / or bush dominated areas, where typically canopy heights are between ± 2 - 5 m, and canopy densities typically between 40 - 75%, but may include localised sparser areas down to ± 15 - 20 %. Includes sparse – open bushland and woodland, including transitional wooded grassland areas. Can include self-seeded bush encroachment areas if canopy density is within indicated range. In the arid western regions (i.e. Northern Cape), this cover class may be associated with a transitional bush / shrub cover that is lower than typical Open Bush



		/ Woodland cover but higher and/or more dense than typical Low Shrub cover.
7	Grassland	Natural / semi-natural grass dominated areas, where typically the tree and / or bush canopy densities are typically < ± 20 %, but may include localised denser areas up to ± 40 %, (regardless of canopy heights). Includes open grassland, and sparse bushland and woodland areas, including transitional wooded grasslands. May include planted pasture (i.e. grazing) if not irrigated. Irrigated pastures will typically be classified as cultivated, and urban parks and golf courses etc under urban.
16	Permanent Crops (Orchards)	Cultivated lands used primarily for the production of both rain-fed and irrigated permanent crops for commercial markets. Includes both tree, shrub and non-woody crops, such as citrus, tea, coffee, grapes, lavender and pineapples etc. In most cases the defined cultivated extent represents the actual cultivated or potentially extent. NDVI-modelled sub-divisions, based on seasonal NDVI maximum and standard deviation ranges, which can be used as qualitative indication levels of cultivation activity, crop rotations and / or productivity, with "low" representing areas of low maximum biomass growth and least seasonal variation; and "high" representing areas of high maximum biomass growth and greatest seasonal variation.
17		
32	Forest Plantations: Mature Trees	Planted forestry plantations used for growing commercial timber tree species. The class represents mature tree stands which have approximately 70% or greater tree canopy closure (regardless of canopy height), on all the multi-date Landsat images in the 2013-14 analysis period. The class includes spatially smaller woodlots and windbreaks with the same cover characteristics.
33	Forest Plantations: Young Trees	Planted forestry plantations used for growing commercial timber tree species. The class represents young tree stands which have approximately 40 - 70% tree canopy closure (regardless of canopy height), on all the multi-date Landsat images in the 2013-14 analysis period. The class includes spatially smaller woodlots and windbreaks with the same cover characteristics. Note that young saplings are very difficult to identify on 30 metre resolution Landsat imagery if the actual tree canopy cover density is below ± 30 - 40%, because the background cover, for example, grassland, then dominates the spectral characteristics in that pixel area.

Addo BSP Land Cover (SANParks, 2012)

The Addo BSP Land Cover Map (2012) provides key information for a wide range of landscape planning, inventory and management activities. According to the Addo BSP Land Cover Map (2012), the proposed Citrus Development site is located within a degraded area, largely surrounded by agricultural lands (Figure 17). The site visit confirmed this information, with the natural vegetation of the area identified as degraded Sundays Arid Thicket.

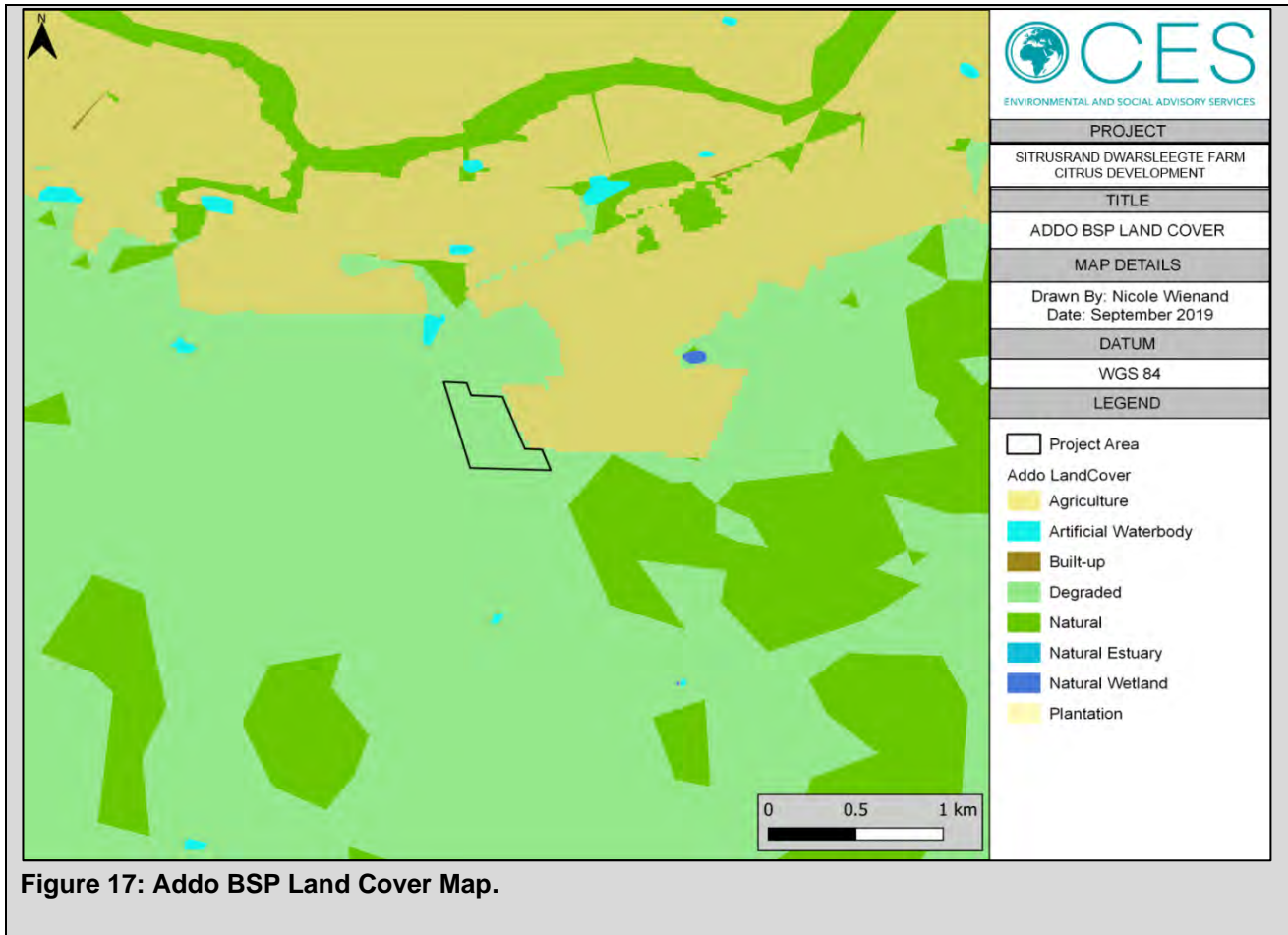


Figure 17: Addo BSP Land Cover Map.



6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?

YES	
X	

If YES, explain:

Occasional Middle Stone Age stone tools (older than 30 000 years) were observed (please refer to Appendix D for the Heritage Specialist Study).

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

Occasional Middle Stone Age stone tools (older than 30 000 years) were observed (please refer to Appendix D for the Heritage Specialist Study). The quartzite Middle Stone Age stone tools display typical faceted striking platforms and were found randomly without any recognised distribution patterns. Few points and blades were observed. Most of the tools were thick, small 'informal' flakes, chunks and cores, and were in secondary context and not associated with any other archaeological material. Apart from the occasional stone tools no other archaeological sites/materials were found. However, because the proposed development is approximately 1,8 kilometres from the Sundays River, it is possible that freshwater shell middens may be exposed during the development. There are no known graves or buildings older than 60 years on the areas surveyed and in general it would appear that these areas are of low cultural sensitivity and that it is unlikely that any sensitive archaeological remains will be exposed during the development (Binneman, 2019). According to the findings of the heritage specialist, the development may go ahead as planned.

Will any building or structure older than 60 years be affected in any way?

	NO X
--	------

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

	NO X
--	------

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.



SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;

A site notice was placed along the District Road (DR 202151) approximately 1.5 km northeast of the proposed Citrus Development site, on the 19th of June 2019. The site notice was placed at this location so that it is visible to all District Road users and surrounding land owners which make use of this road.



Figure 18: Site notice placed along the District Road (202151). Location Coordinates: 33°25'30.35"S; 25°22'44.27"E).

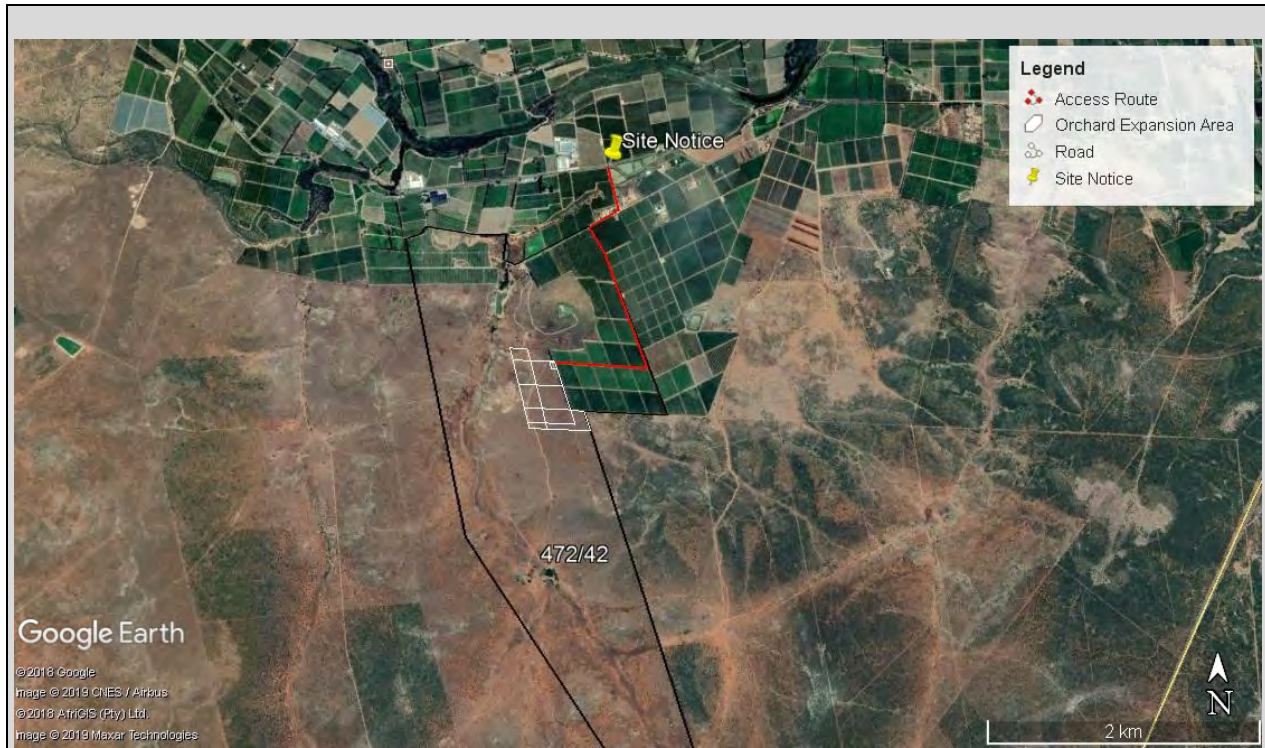


Figure 19: Location Map of site notice in relation to the proposed site on Portion 472 of Farm 42 (Google Earth, 2018).

- (b) giving written notice to—
- (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

The Proponent is the owner and in control of the land on which the development is proposed. As such, land owner notification letters were not required for this project.

- (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

Surrounding land owners were identified using WinDeed Search on the 13th of June 2019. Additional land owner contact details that could not be identified via WinDeed, were provided by the Proponent. All identified surrounding land owners were included in the I&AP Database and were notified of the project by means of an email notification, inclusive of a letter of notification and Background Information Document (BID).



- (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;

AM Ndwawo, Councillor of Ward 7 of the SRVLM, Lonwabo Nqogo (Municipal Manager of the SRVLM), Councillor MW Kebe (Executive Mayor of the SRVLM), and Greg Jones of the Kirkwood Ratepayers Association, were informed of the proposed Citrus Development via email notification, inclusive of a letter of notification and BID.

- (v) the municipality which has jurisdiction in the area;

Councillor Khunjuzwa Eunice Kekana (Executive Mayor) and Mr Ted Pillay (Municipal Manager) of the SBDM were notified of the proposed development via email notification, inclusive of a formal letter of notification and BID.

- (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and

➤ Please refer to Section 6 below.

- (vii) any other party as required by the competent authority;

A newspaper advertisement was published on the 24th of October 2019 in the UD Express in order to inform the public of the proposed development and the application for Environmental Authorisation.

Please refer to **Appendix E for proof of notifications, I&AP Database, Letter of Notification and BID.*

- (c) placing an advertisement in—
(i) one local newspaper; or
(ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and



A newspaper advertisement was published on the 24th of October 2019 in the UD Express in order to inform the public of the proposed development and the application for Environmental Authorisation.

Please refer to **Appendix E for proof of advertisement.*

- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
 - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
 - (iii) the nature and location of the activity to which the application relates;
 - (iv) where further information on the application or activity can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

Please refer to **Appendix E for all relevant Public Participation Documentation.**

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.



Advertisements and notices must make provision for all alternatives.

Please refer to **Appendix E** for all relevant Public Participation Documentation.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

Please refer to **Appendix E** for all relevant Public Participation Documentation.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

Please refer to **Appendix E** for all relevant Public Participation Documentation.

This section (the Issues and Response Trail) will be updated once the Draft BAR has undergone the mandatory 30-day public review period.

6. AUTHORITY PARTICIPATION

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

List of authorities informed:



The following organs of state were notified via email:

- Department of Environment Forestry and Fisheries (DEFF) – Biodiversity;
- Department of Agriculture, Forestry and Fisheries (DAFF) – Eastern Cape;
- Eskom;
- South African Heritage Resource Agency (SAHRA);
- Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT);
- Eastern Cape Department of Water and Sanitation (DWS);
- Eastern Cape Department of Roads and Public Works;
- Department of Rural Development and Land Reform – Land Restitution Support (Eastern Cape);
- Eastern Cape Provincial Heritage Resources Authority (ECPHRA);
- Eastern Cape Parks and Tourism Agency (ECPTA);
- Lower Sundays River Water Users Association
- Eastern Cape: Department of Rural Development and Agrarian Reform
- Wildlife and Environment Society of South Africa (WESSA); and
- Kirkwood Ratepayers Association;
- Eden to Addo Corridor Initiative; and
- SANParks.

List of authorities from whom comments have been received:

No comments have been received thus far. This section will be updated once the Draft BAR has undergone the mandatory thirty (30) day public review period.



7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the competent authority.

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

	NO X
--	---------

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

No comments have been received from stakeholders at this stage of the Basic Assessment Process. This section will be updated in the Final BAR.



SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

No comments/issues have been received from stakeholders at this stage of the Basic Assessment Process. This section will be updated once the Draft BAR has undergone the mandatory 30-day public review period.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

As above.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

A. METHODOLOGY FOR ASSESSING THE SIGNIFICANCE OF IMPACTS

The rating scale below has been developed in accordance with the requirements outlined in Appendix 1 of the NEMA EIA Regulations (2014 and subsequent 2017 amendments).

Impact significance pre-mitigation

This rating scale adopts four key factors to determine the overall significance of the impact prior to mitigation:

1. Temporal Scale: This scale defines the duration of any given impact over time. This may



extend from the short-term (less than 5 years, equivalent to the construction phase) to permanent. Generally, the longer the impact occurs the greater the significance of any given impact.

2. **Spatial Scale:** This scale defines the spatial extent of any given impact. This may extend from the local area to an impact that crosses international boundaries. The wider the impact extends the more significant it is considered to be.
3. **Severity/Benefits Scale:** This scale defines how severe negative impacts would be, or how beneficial positive impacts would be. This negative/positive scale is critical in determining the overall significance of any impacts.
4. **Likelihood Scale:** This scale defines the risk or chance of any given impact occurring. While many impacts generally do occur, there is considerable uncertainty in terms of others. The scale varies from unlikely to definite, with the overall impact significance increasing as the likelihood increases.

For each impact, these four scales are ranked and assigned a score. These scores are combined and used to determine the overall impact significance prior to mitigation.

Table 5: Pre-mitigation Evaluation Criteria.

Temporal Scale		
<i>Short term</i>	<i>Less than 5 years</i>	
<i>Medium term</i>	<i>Between 5-20 years</i>	
<i>Long term</i>	<i>Between 20 and 40 years (a generation) and from a human perspective also permanent</i>	
<i>Permanent</i>	<i>Over 40 years and resulting in a permanent and lasting change that will always be there</i>	
Spatial Scale		
<i>Localised</i>	<i>At localised scale and a few hectares in extent</i>	
<i>Study Area</i>	<i>The proposed site and its immediate environs</i>	
<i>Regional</i>	<i>District and Provincial level</i>	
<i>National</i>	<i>Country</i>	
<i>International</i>	<i>Internationally</i>	
Severity Scale	Severity	Benefit
<i>Slight</i>	<i>Slight impacts on the affected system(s) or party(ies)</i>	<i>Slightly beneficial to the affected system(s) and party(ies)</i>
<i>Moderate</i>	<i>Moderate impacts on the affected system(s) or party(ies)</i>	<i>Moderately beneficial to the affected system(s) and party(ies)</i>
<i>Severe/ Beneficial</i>	<i>Severe impacts on the affected system(s) or party(ies)</i>	<i>A substantial benefit to the affected system(s) and party(ies)</i>
<i>Very Severe/ Beneficial</i>	<i>Very severe change to the affected system(s) or party(ies)</i>	<i>A very substantial benefit to the affected system(s) and party(ies)</i>



Likelihood Scale	
<i>Unlikely</i>	<i>The likelihood of these impacts occurring is slight</i>
<i>May Occur</i>	<i>The likelihood of these impacts occurring is possible</i>
<i>Probable</i>	<i>The likelihood of these impacts occurring is probable</i>
<i>Definite</i>	<i>The likelihood is that this impact will definitely occur</i>

* In certain cases, it may not be possible to determine the severity of an impact thus it may be classified as: Don't know/Can't know.

Table 6: Description of Overall Significance Rating.

Significance Rate		Description
LOW NEGATIVE	LOW POSITIVE	<i>Impacts of low significance are typically acceptable impacts for which mitigation is desirable but not essential. The impact by itself is insufficient, even in combination with other low impacts, to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural environment or on social systems.</i>
MODERATE NEGATIVE	MODERATE POSITIVE	<i>Impacts of moderate significance are impacts that require mitigation. The impact is insufficient by itself to prevent the implementation of the project but in conjunction with other impacts may prevent its implementation. These impacts will usually result in a negative medium to long-term effect on the natural environment or on social systems.</i>
HIGH NEGATIVE	HIGH POSITIVE	<i>Impacts that are rated as being high are serious impacts and may prevent the implementation of the project if no mitigation measures are implemented, or the impact is very difficult to mitigate. These impacts would be considered by society as constituting a major and usually long-term change to the environment or social systems and result in severe effects.</i>
VERY HIGH NEGATIVE	VERY HIGH POSITIVE	<i>Impacts that are rated as very high are very serious impact which may be sufficient by itself to prevent the implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects or very beneficial effects.</i>

Impact significance post-mitigation

Once mitigation measures are proposed, the following three factors are then considered to determine the overall significance of the impact after mitigation.



1. **Reversibility Scale:** This scale defines the degree to which an environment can be returned to its original/partially original state.
2. **Irreplaceable loss Scale:** This scale defines the degree of loss which an impact may cause.
3. **Mitigation potential Scale:** This scale defines the degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 7: Post-mitigation Evaluation Criteria.

Reversibility	
<i>Reversible</i>	<i>The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.</i>
<i>Irreversible</i>	<i>The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.</i>
Irreplaceable loss	
<i>Resource will not be lost</i>	<i>The resource will not be lost/destroyed provided mitigation measures are implemented.</i>
<i>Resource will be partly lost</i>	<i>The resource will be partially destroyed even though mitigation measures are implemented.</i>
<i>Resource will be lost</i>	<i>The resource will be lost despite the implementation of mitigation measures.</i>
Mitigation potential	
<i>Easily achievable</i>	<i>The impact can be easily, effectively and cost effectively mitigated/reversed.</i>
<i>Achievable</i>	<i>The impact can be effectively mitigated/reversed without much difficulty or cost.</i>
<i>Difficult</i>	<i>The impact could be mitigated/reversed but there will be some difficulty in ensuring effectiveness and/or implementation, and significant costs.</i>
<i>Very Difficult</i>	<i>The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.</i>

The following assumptions and limitations are inherent in the rating methodology:

- **Value Judgements:** Although this scale attempts to provide a balance and rigor to assessing the significance of impacts, the evaluation relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.
- **Cumulative Impacts:** These affect the significance rating of an impact because it considers the impact in terms of both on-site and off-site sources. This is particularly problematic in terms of impacts beyond the scope of the proposed development and the EIA. For this reason, it is important to consider impacts in terms of their cumulative nature.



- **Seasonality:** Certain impacts will vary in significance based on seasonal change. Thus, it is difficult to provide a static assessment. Seasonality will need to be implicit in the temporal scale and, with management measures being imposed accordingly (e.g. dust suppression measures being implemented during the dry season).



B. IDENTIFICATION AND ASSESSMENT OF IMPACTS

PLANNING AND DESIGN PHASE

Impact 1: Legal and Policy Compliance

Cause and Comment

During the Planning and Design Phase, failure to obtain the necessary permits and/or authorisations, as well as failure to adhere to existing policies and legal obligations, could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in a lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.

Mitigation Measures

- All necessary permitting and authorisations must be obtained prior to the commencement of any vegetation clearance and/or construction activities;
- If necessary, a suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase;
- Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and
- Planning for the construction and operation of the proposed development should consider available best practice guidelines.

Significance Assessment

IMPACT 1: LEGAL AND POLICY COMPLIANCE										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Regional/National	Severe	Possible	HIGH (-)	Reversible	Resource could be lost	Achievable	LOW (-)



No-Go Alternative	<i>Not Applicable</i>
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There are no additional impacts foreseen to arise from the Planning and Design Phase of the proposed Citrus Development, as the Planning and Design Phase will solely consist of planning and no activities will be undertaken other than desktop analysis, Client consultation and a non-destructive site survey.

CONSTRUCTION PHASE

The following impacts are foreseen to result from the Construction Phase of the proposed Citrus Development:

Impact 2: Storage of hazardous substances

Cause and Comment

Spillage or leaching of hazardous substances (such as diesel, fertilisers, pesticides, etc), could result in the contamination of soils, surface and ground water, as well as pose a health and safety risk to staff.

Mitigation Measures

- Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) and the SABS Code of Practise must be adhered to;
- The individual(s) that will be handling hazardous materials must be trained to do so;
- All hazardous substances such as diesel, pesticides and fertilisers must be stored in a bunded area with an impermeable surface beneath them;
- Maintenance of any vehicles or machinery should not take place within 50 m of any watercourse and drip trays must be used;
- Spill kits must be kept on-site and maintained; and



- The appointed ECO must determine and/or approve the precise method for the treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestives.

Significance Assessment

IMPACT 2: STORAGE OF HAZARDOUS SUBSTANCES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study Area	Moderate	Possible	MODERATE (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 3: Waste Management

Cause and Comment

During the construction phase, long-term and inappropriate storage and disposal of general waste could potentially result in ground water contamination or pollution of the surrounding environment.

Mitigation Measures

- Littering must be avoided, and sufficient waste bins must be provided on site;
- All general waste must be disposed of in bins or waste skips labelled general waste;
- All waste collected on site must be disposed of at the nearest registered landfill; and
- Waste must not be buried or burned on site.

Significance Assessment



IMPACT 3: WASTE MANAGEMENT										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localized	Moderate	Possible	MODERATE (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 4: Noise Impacts

Cause and Comment

During the construction phase, construction activities could result in an increase in ambient noise levels on site and surrounding properties.

Mitigation Measures

- Applicable municipal by-laws relating to noise control must be adhered to;
- Activities which include the movement of construction vehicles and the operation of machinery should be restricted to normal working hours (06:00am – 18:00pm); and
- There must be a complaints register on site to register and record any complaints received from the public. The appointed ECO must be made aware of any complaints relating to the citrus development.

Significance Assessment

IMPACT 4: NOISE IMPACTS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION



All Alternatives	Negative	Short-Term	Localized	Slight	Definite	LOW (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 5: Air Quality and Dust Control

Cause and Comment

During the construction phase, the moving of construction vehicles and other construction activities, such as vegetation clearing, could result in air pollution in the form of dust, especially during windy conditions.

Mitigation Measures

- During windy periods, exposed soil should be dampened down if necessary;
- Vegetation should be retained, where possible, to reduce dust travel;
- Excavations and other clearing activities must only take place during agreed working times and permitting weather conditions to avoid the drifting of dust into neighbouring areas;
- Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register;
- Construction vehicles should adhere to the recommended speed limit of 30 km/h; and
- Vehicles and construction plant must be serviced regularly to reduce excessive vehicle emissions.

Significance Assessment

IMPACT 5: AIR QUALITY AND DUST CONTROL										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION



All Alternatives	Negative	Short-Term	Localized	Moderate	Probable	LOW (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 6: Cultural Heritage

Cause and Comment

During the construction phase, the clearance of vegetation and the disturbance of the soil profile could adversely impact possible heritage and paleontological artefacts on the site.

Mitigation Measures

- All recommendations and mitigation measures made by the Archaeological Specialist and relating to the cultural heritage within the site must be implemented/adhered to; and
- Should any archaeological or cultural sites or objects be located during the construction of the proposed development, they must be reported to the archaeologist at the Albany Museum (Tel.: 046 6222312) or to the ECPHRA (Tel.: 043 7450888) immediately in accordance with the National Heritage Act (Act No. 25 of 1999).

Significance Assessment

IMPACT 6: CULTURAL HERITAGE										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study Site	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be lost	Achievable	LOW (-)



No-Go Alternative	<i>Not Applicable</i>
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Impact 7: Traffic Impacts

Cause and Comment

During the construction phase, construction or delivery vehicles traveling to and from the citrus development site could increase traffic volumes on the existing gravel access roads and/or adversely affect the traffic flow in the area.

Mitigation Measures

- Construction activities must be restricted to normal working hours (06:00 am to 18:00 pm);
- All surrounding landowners must be notified once construction activities commence; and
- Vehicles must adhere to the recommended speed restrictions (preferably 30 km/hr along gravel roads).

Significance Assessment

IMPACT 7: TRAFFIC IMPACTS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Slight	Definite	LOW (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 8: Health and Safety



Cause and Comment

During the construction phase, inadequate attention to fire safety awareness and fire safety equipment could result in runaway fires, an unsafe working environment, and the potential loss of property.

Mitigation Measures

- Operational firefighting equipment must be present on site at all times as per the Occupational Health and Safety Act;
- Employees should be trained in basic fire hazard control and firefighting techniques;
- The Proponent should provide the employees with all relevant emergency contact details; and
- Burning of construction waste or debris must not occur onsite.

Significance Assessment

IMPACT 8: HEALTH AND SAFETY										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Short-Term	Localised	Severe	Possible	HIGH (-)	Reversible	Resource could be partially lost	Achievable	MODERATE (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 9: Visual and Aesthetic Impacts

Cause and Comment

During the construction phase, construction activities and the presence and use of machinery on site and along access roads, could result in a visual disturbance to nearby visual receptors. The transformation of the current, indigenous vegetation, to citrus orchards is likely to alter the aesthetic quality of the area. However, this impact is unlikely to be significant because the proposed citrus orchards are in line with the surrounding land uses.



Mitigation Measures

- Vegetation clearance must be restricted to the demarcated development footprints; and
- Any disturbed areas should be rehabilitated as soon as possible.

Significance Assessment

IMPACT 9: VISUAL AND AESTHETIC IMPACTS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study Area	Slight	Probable	LOW (-)	Irreversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 10: Creation of Employment Opportunities

Cause and Comment

During the construction phase, both permanent and temporary employment opportunities will be created by the proposed citrus development.

It should be noted that unemployment is a serious challenge within the region as well as in the broader South Africa. Thus, the creation of employment opportunities within the area will be highly beneficial to the surrounding community. The implementation of the no-go alternative would therefore result in a loss of potential employment opportunities and no contribution to the country's GDP through international exports and foreign investments.

Mitigation Measures

- Where possible, individuals residing in nearby communities should be contracted for unskilled and semi-unskilled employment opportunities.



Significance Assessment

IMPACT 10: CREATION OF EMPLOYMENT OPPORTUNITIES

IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Positive	Short-Term to Long-Term	Regional	Moderately Beneficial	Definite	MODERATE (+)	Reversible	Resource will not be lost	Achievable	HIGH (+)
No-Go Alternative	Negative	Long-Term	Regional/National	Moderate	Definite	MODERATE (-)	N/A	N/A	N/A	N/A

Impact 11: Erosion

Cause and Comment

During the construction phase, the clearance of vegetation and associated construction activities could result in erosion and the loss of top soil within the development site and surrounds.

Mitigation Measures

- An Erosion Management Plan or method statement must be compiled indicating what measures will be implemented during the construction phase;
- Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion;
- Disturbed areas must be rehabilitated as soon as possible after construction; and
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.

Significance Assessment



IMPACT 11: EROSION										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study-Area	Moderate	Possible	MODERATE (-)	Reversible	Resource could be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 12: Loss of Indigenous Vegetation (Sundays Arid Thicket)

Cause and Comment

Vegetation clearance for the cultivation of the proposed citrus orchards will result in the direct loss of Vulnerable Sundays Arid Thicket Vegetation. It must be noted that, although it is still in a natural state, the ecosystem has been transformed from Sunday Arid Thicket to a low scrub/grassland by suspected over-grazing by large game species, and the recovery of this ecosystem to its former state is unlikely.

Mitigation Measures

- A comprehensive Plant Search and Rescue should be conducted prior to vegetation clearance;
- Any Species of Conservation Concern (SCC) should be translocated to the nearest appropriate habitat;
- The clearance of vegetation at any given time should be kept to a minimum;
- Employees must not make fires and/or harvest plants within the Citrus Development site;
- Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase;
- Only indigenous species must be used for rehabilitation purposes;
- As far as practically possible, existing roads should be utilised; and
- An Alien Vegetation Management Plan must be compiled (for implementation during the phases that follow).



Significance Assessment

IMPACT 12: LOSS OF INDIGENOUS VEGETATION (SUNDAYS ARID THICKET)										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study-Area	Moderately Severe	Definite	MODERATE (-)	Irreversible	Resource will be lost	Achievable	MODERATE (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 13: Loss of Biodiversity

Cause and Comment

During the construction phase, uncontrolled construction activities, such as vegetation clearing and soil ripping, beyond the footprint of the development, could lead to unnecessary damage to and removal of natural vegetation, loss of faunal habitat, and SCC within the proposed site boundaries.

Mitigation Measures

- A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance;
- The clearance of vegetation at any given time must be kept to a minimum and restricted to demarcated development areas;
- Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas;
- Employees must not make fires and/or harvest plants within the Citrus Development site;
- Any alien vegetation, which establishes during the construction phase, must be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings must take place throughout the construction phase;
- Only indigenous species must be used for rehabilitation purposes; and
- As far as practically possible, existing roads must be utilised.



Significance Assessment

IMPACT 13: LOSS OF BIODIVERSITY										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Definite	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 14: Habitat Loss/Fragmentation

Cause and Comment

During the construction phase, the loss of vegetation coincides with the loss of faunal habitat, reducing feeding, breeding and rearing locales. Faunal populations could become locally extinct or diminish in size. However, faunal species are mobile, and it is likely that some of the species will move away during the construction phase and return once the citrus development has been established.

Mitigation Measures

- A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;
- The clearance of vegetation at any given time should be kept to a minimum;
- Vegetation clearance and trampling should be avoided in areas demarcated as no-go areas;
- Employees must not trap, hunt, handle or remove any faunal species from the site; and
- As far as practically possible, existing roads must be utilized.

Significance Assessment

IMPACT 14: HABITAT LOSS/FRAGMENTATION										
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IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Definite	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 15: Loss of Species of Conservation Concern (SCC)

Cause and Comment

During the construction phase, construction activities, including the clearance of vegetation, could permanently damage or destroy plant SCC which are present on site, contributing to the cumulative loss of plant SCC in the region.

Mitigation Measures

- A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance;
- A qualified botanical specialist must be present on-site during the clearance of vegetation; and
- Any SCC should be relocated to the nearest appropriate habitat.

Significance Assessment

IMPACT 15: LOSS OF SPECIES OF CONSERVATION CONCERN (SCC)										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study Area	Severe	Definite	HIGH (-)	Irreversible	Resource will be lost	Achievable	MODERATE (-)



No-Go Alternative	<i>Not Applicable</i>
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Impact 16: Establishment of Alien Plant Species

Cause and Comment

The removal of existing natural vegetation creates ‘open’ habitats which favour the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems.

It should be noted that there is currently existing alien vegetation within the proposed development site, and therefore the implementation of the no-go alternative would result in a moderate impact as these species will remain and most likely spread.

Mitigation Measures

- An Alien Vegetation Management Plan must be developed and implemented to prevent the establishment and spread of undesirable alien plant species during all phases of development; and
- Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase.

Significance Assessment

IMPACT 16: ESTABLISHMENT OF ALIEN PLANT SPECIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Moderately Severe	Possible	MODERATE (-)	Reversible	Resource will be lost	Achievable	LOW (-)



No-Go Alternative	Negative	Long-Term	Localised	Moderately Severe	Definite	MODERATE (-)	N/A	N/A	N/A	N/A
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Impact 17: Damage to Surface Water Features

Cause and Comment

Construction works, including vegetation clearing, levelling and earthworks for the cultivation of the proposed citrus orchards will result in the loss and damage of a section of the drainage line which traverses the northwest corner of the citrus development site.

Mitigation Measures

- The construction site must be managed in a manner that prevents the contamination or sedimentation of the main tributary into which the drainage line flows; and
- If necessary, silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further loss and degradation of the main tributary.

Significance Assessment

IMPACT 17: DAMAGE TO SURFACE WATER FEATURES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderately Severe	Possible	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 18: Wildlife Mortalities



Cause and Comment

During the construction phase, construction activities could result in faunal fatalities through collisions with moving vehicles, accidents during vegetation clearance, or the baiting and trapping of fauna by construction workers.

Mitigation Measures

- A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;
- Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- Search and clear the construction region prior to work commencing, relocating animals where found;
- No hunting, baiting and trapping will be allowed; and
- Animals must not be injured or killed by construction activities.

Significance Assessment

IMPACT 18: WILDLIFE MORTALITIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	localized	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 19: Loss of Critical Biodiversity Areas

Cause and Comment



The proposed citrus development will result in the loss of a portion of an area classified as a CBA 1 in terms of both the ECBCP and the Addo BSP. This classification was driven by the vegetation type, threat status and the established national conservation target. Even though a site is considered degraded, the systematic biodiversity planning algorithm will still select sites to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. The planning process, however, does not take the capability of the ecosystem to recover once disturbed into account. In this case, Sundays Arid Thicket has been significantly degraded and it is unlikely that any future efforts to restore the ecosystem will be successful.

Mitigation Measures

- If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented.

Significance Assessment

IMPACT 19: LOSS OF CRITICAL BIODIVERSITY AREAS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study Area	Moderate	Definite	MODERATE (-)	Irreversible	Resource will be lost	Achievable	MODERATE (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 20: Inadequate Rehabilitation and Maintenance of Disturbed Areas

Cause and Comment

During the construction phase, failure to implement rehabilitation measures could lead to the erosion of- and permanent loss of valuable soil, the unnecessary loss of indigenous vegetation and the establishment of alien invasive vegetation.

Mitigation Measures

- A Rehabilitation Plan must be developed and implemented during and post-construction;



- All temporary disturbed areas that do not form part of the citrus orchards, must be rehabilitated using only indigenous vegetation; and
- All impacted areas must be restored as per the EMP requirements.

Significance Assessment

IMPACT 20: INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS

IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource could be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

OPERATIONAL PHASE

The following impacts are likely to result from the Operational Phase of the proposed Citrus Development:

Impact 21: General Waste Management

Cause and Comment

During the operational phase, the long-term and inappropriate storage of general waste onsite could result in pollution of the surrounding environment and/or contamination of surface water features (i.e. the non-perennial water course in the northwest corner of the project site).

Mitigation Measures

- All waste generated on site must be stored in a designated waste area in lidded bins;
- Any hazardous chemicals must be stored in a designated hazardous waste area which is bunded and clearly labelled;
- Any hazardous waste must be removed in an appropriate manner and disposed of at a suitably registered waste site; and



- General waste must be disposed of at the nearest registered landfill.

Significance Assessment

IMPACT 21: GENERAL WASTE MANAGEMENT										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Moderate	Possible	MODERATE (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 22: Use of Hazardous Substances

Cause and Comment

During the operational phase, the inappropriate handling, application, storage and disposal of hazardous substances such as pesticides, fertilisers and chemicals commonly utilised in the agricultural industry, could lead to the contamination of soil, and surface and/or ground water features, as well as pose a health and safety risk to staff.

Mitigation Measures

- Only plant protection products, including pesticides, fungicides and herbicides, which are registered with the Department of Agriculture for specific uses must be used during the operation of the citrus development;
- Herbicides should not be sprayed during very windy conditions; and
- The application of plant protection products must adhere to the information displayed on the product label to avoid the misuse of these products.

Significance Assessment



IMPACT 22: USE OF HAZARDOUS SUBSTANCES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study Area	Moderate	Possible	MODERATE (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 23: Creation of Employment Opportunities

Cause and Comment

Forty (40) permanent and forty (40) temporary employment opportunities will be created during the operational phase of the development.

The implementation of the no-go alternative would therefore result in a loss of potential employment opportunities and no contribution to the country's GDP through international exports and foreign investments.

Mitigation Measures

- Where possible, individuals residing in the nearby communities should be contracted for unskilled and semi-unskilled employment.

Significance Assessment

IMPACT 23: CREATION OF EMPLOYMENT OPPORTUNITIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION



All Alternatives	Positive	Short-Term to Long-Term	<i>Regional</i>	Moderately Beneficial	Definite	MODERATE (+)	Reversible	Resource will not be lost	Achievable	HIGH (+)
No-Go Alternative	Negative	Long-Term	Regional/ National	Severe	Definite	HIGH (-)	N/A	N/A	N/A	N/A

Impact 24: Erosion

Cause and Comment

During the operational phase, failure to install erosion control and stormwater management measures could result in increased run-off and further erosion within the boundaries of Portion 472 of Farm 42. Additionally, failure to rehabilitate temporary areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable topsoil.

Mitigation Measures

- Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms;
- All erosion control mechanisms, such as silt traps, must be regularly maintained;
- Natural vegetation must be retained where possible to avoid soil erosion;
- Any cleared areas, which are not used for the cultivation of the citrus orchards, should be rehabilitated post-construction using only indigenous plant species;
- Irrigation methods must ensure minimal runoff;
- All pipelines associated with the irrigation system(s) must be monitored for leaks throughout the operational phase; and
- The quality and health status of surrounding soils should be monitored throughout the operational phase.

Significance Assessment

IMPACT 24: EROSION



IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study-Area	Moderate	Possible	MODERATE (-)	Reversible	Resource could be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 25: Loss of Soil Quality

Cause and Comment

During the operational phase, soil leaching caused by poor irrigation methods and/or stormwater management, coupled with the application of fertilisers, pesticides, and/or herbicides, could lead to the loss/alteration of soil quality and structure within the study area.

Mitigation Measures

- Disturbed areas must be rehabilitated as soon as possible after construction;
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;
- If necessary, any negative alterations in the soil quality should be remediated in line with best practices; and
- The application of fertilisers, pesticides, and/or herbicides to cultivated areas must be carefully managed.

Significance Assessment

IMPACT 25: LOSS OF SOIL QUALITY										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study-Area	Moderate	Possible	MODERATE (-)	Reversible	Resource could be partially lost	Achievable	LOW (-)



No-Go Alternative	Not Applicable
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Impact 26: Loss of Indigenous Vegetation

Cause and Comment

During the operational phase, unsustainable and irresponsible farming practises could result in the loss or damage of the surrounding indigenous vegetation, beyond the orchard development footprint.

Mitigation Measures

- The proposed vegetation clearing and ripping of soil required for cultivation must be restricted to the citrus orchards;
- Sustainable farming methods must be practiced during the operational phase, such as application of pesticides using nozzles which will assist in preventing wind-drift; and
- Vehicles should make use of existing farm roads and must refrain from driving through surrounding indigenous vegetation.

Significance Assessment

IMPACT 26: LOSS OF INDIGENOUS VEGETATION										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 27: Establishment of Alien Plant Species

“Innovation for Sustainable Development”



Cause and Comment

During the operational phase, failure to remove and manage alien vegetation could result in the establishment of alien vegetation in the study area and the potential spreading of alien vegetation. In addition, the poor rehabilitation of disturbed areas could lead to the permanent degradation of ecosystems which will permit alien vegetation species to establish and spread.

It should be noted that there is currently existing alien vegetation within the proposed development site, and therefore the implementation of the no-go alternative would result in a moderate impact as these species will remain and most likely spread.

Mitigation Measures

- An Alien Vegetation Management Plan must be implemented to prevent the establishment and prevent the spread of undesirable alien plant species during the operational phase; and
- Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide.

Significance Assessment

IMPACT 27: ESTABLISHMENT OF ALIEN PLANT SPECIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localized	Moderately Severe	Possible	MODERATE (-)	Reversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	Negative	Long-Term	Localised	Moderately Severe	Definite	MODERATE (-)	N/A	N/A	N/A	N/A

Impact 28: Damage to Surface Water Features



Cause and Comment

During the operational phase, runoff from the proposed citrus orchards could result in the subsequent sedimentation and/or contamination of downstream water features.

Mitigation Measures

- The citrus orchards must be managed in a manner that prevents the contamination or sedimentation of the main tributary to which the drainage line is connected to;
- Irrigation methods must ensure that the correct rates of agricultural application, which could potentially contaminate water course (such as fertilisers, herbicides and pesticides), are applied and ensure the minimal runoff of water; and
- If necessary, silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further degradation of the main tributary.

Significance Assessment

IMPACT 28: DEGRADATION OF SURFACE WATER FEATURES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
Preferred Layout Alternative	Negative	Permanent	Localised	Moderately Severe	Possible	MODERATE (-)	Reversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 29: Wildlife Mortalities

Cause and Comment



Operational activities could result in faunal fatalities through collisions with moving vehicles, accidents during harvesting of the citrus orchards, or the baiting and trapping of fauna by farm workers.

Mitigation Measures

- Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered within the citrus development;
- No animal shall be killed or hurt; and
- No hunting, baiting or trapping shall be allowed.

Significance Assessment

IMPACT 29: WILDLIFE MORTALITIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 30: Inadequate Rehabilitation and Maintenance of Disturbed Areas

Cause and Comment

During the operational phase, failure to rehabilitate temporary disturbed areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable soil, the degradation of the surrounding indigenous vegetation, and the establishment of alien invasive vegetation.

Mitigation Measures



- Stormwater control must be undertaken to prevent soil loss from the site;
- All erosion control mechanisms must be regularly maintained;
- Vegetation must be retained where possible to avoid soil erosion;
- Any cleared/disturbed areas, which are not used for the cultivation of citrus, should be rehabilitated post-construction using only indigenous plant species;
- Irrigation methods must ensure minimal runoff;
- The quality and health status of surrounding soils should be monitored throughout the operational phase; and
- If necessary, any negative alterations in the soil quality should be remediated in line with best practice.

Significance Assessment

IMPACT 30: INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 31: Air Quality and Dust Control

Cause and Comment

During the operational phase, the moving of transportation or delivery vehicles and other operational activities could result in air pollution in the form of dust, especially during windy conditions.

Mitigation Measures



- Fugitive/nuisance dust could be reduced by implementing one or more of the following:
 - The use of commercial dust binders such as Hydropam or Dustex;
 - Rotovating straw bales;
 - Retention of vegetation where possible;
 - Planting of open cleared space;
 - A speed limit of 30km/h must not be exceeded on gravel roads; and
- Any complaints or claims emanating from the lack of dust control should be attended to immediately by the Proponent.

Significance Assessment

IMPACT 31: AIR QUALITY AND DUST CONTROL										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Short-Term	Localized	Moderate	Probable	LOW (-)	Reversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 32: Fire Risk

Cause and Comment

Inadequate attention to fire safety awareness and the lack of fire safety equipment could result in runaway fires, an unsafe working environment and the loss of property.

Mitigation Measures

- The Proponent must ensure that operational firefighting equipment is present on site at all times as per the Occupational Health and Safety Act;



- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances;
- No open fires are to be permitted; and
- There should be no burning of general waste or debris onsite.

Significance Assessment

IMPACT 32: FIRE RISK										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
Without Mitigation	Negative	Long-Term	Localised	Severe	Possible	MODERATE (-)	Reversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

DECOMMISSIONING PHASE

It is unlikely that the proposed citrus orchards will be decommissioned in the near future. However, should the citrus orchards be decommissioned, a suitable EMPr (including specific rehabilitation guidelines) should be implemented throughout the decommissioning phase.



3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

A. ENVIRONMENTAL IMPACT STATEMENT

The impacts that were identified during the Basic Assessment Process are summarised in Table 8 below. The majority of the significant impacts identified can be reduced from a HIGH or MODERATE significance prior to mitigation to that of LOW significance post-mitigation.

Table 8: Summary of impacts identified for the proposed Citrus Development.

IMPACT	DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE AFTER MITIGATION	NO-GO OPTION
PLANNING AND DESIGN PHASE				
LEGAL AND POLICY COMPLIANCE	During the Planning and Design Phase, failure to obtain the necessary permits and/or authorisations, as well as failure to adhere to existing policies and legal obligations, could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in a lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	HIGH (-)	LOW (-)	N/A
CONSTRUCTION PHASE				
STORAGE OF HAZARDOUS SUBSTANCES	Spillage or leaching of hazardous substances (such as diesel, fertilisers, pesticides, etc), could result in the contamination of soils, surface and ground water, as well as pose a health and safety risk to staff.	MODERATE (-)	LOW (-)	N/A
WASTE MANAGEMENT	During the construction phase, long-term and inappropriate storage and disposal of general waste could potentially result in ground water contamination or	MODERATE (-)	LOW (-)	N/A



	pollution of the surrounding environment.			
NOISE IMPACTS	During the construction phase, construction activities could result in an increase in ambient noise levels on site and surrounding properties.	LOW (-)	LOW (-)	N/A
AIR QUALITY AND DUST CONTROL	During the construction phase, the moving of construction vehicles and other construction activities, such as vegetation clearing, could result in air pollution in the form of dust, especially during windy conditions.	LOW (-)	LOW (-)	N/A
CULTURAL HERITAGE	During the construction phase, the clearance of vegetation and the disturbance of the soil profile could adversely impact possible heritage and paleontological artefacts on the site.	MODERATE (-)	LOW (-)	N/A
TRAFFIC IMPACTS	During the construction phase, construction or delivery vehicles traveling to and from the citrus development site could increase traffic volumes on the existing gravel access roads and/or adversely affect the traffic flow in the area.	LOW (-)	LOW (-)	N/A
HEALTH AND SAFETY	During the construction phase, inadequate attention to fire safety awareness and fire safety equipment could result in runaway fires, an unsafe working environment, and the potential loss of property.	HIGH (-)	MODERATE (-)	N/A
VISUAL AND AESTHETIC IMPACTS	During the construction phase, construction activities and the presence and use of machinery on site and along access roads, could result in a visual disturbance to nearby visual receptors. The transformation of the current, indigenous vegetation, to citrus orchards is likely to alter the aesthetic quality of the area. However, this impact is unlikely to be significant because the	LOW (-)	LOW (-)	N/A



	proposed citrus orchards are in line with the surrounding land uses.			
CREATION OF EMPLOYMENT OPPORTUNITIES	<p>During the construction phase, both permanent and temporary employment opportunities will be created by the proposed citrus development.</p> <p>It should be noted that unemployment is a serious challenge within the region as well as in the broader South Africa. Thus, the creation of employment opportunities within the area will be highly beneficial to the surrounding community. The implementation of the no-go alternative would therefore result in a loss of potential employment opportunities and no contribution to the country's GDP through international exports and foreign investments.</p>	MODERATE (+)	HIGH (+)	MODERATE (-)
EROSION	During the construction phase, the clearance of vegetation and associated construction activities could result in erosion and the loss of top soil within the development site and surrounds.	MODERATE (-)	LOW (-)	N/A
LOSS OF INDIGENOUS VEGETATION (SUNDAYS ARID THICKET)	Vegetation clearance for the cultivation of the proposed citrus orchards will result in the direct loss of Vulnerable Sundays Arid Thicket Vegetation. It must be noted that, although it is still in a natural state, the ecosystem has been transformed from Sunday Arid Thicket to a low scrub/grassland by suspected over-grazing by large game species, and the recovery of this ecosystem to its former state is unlikely.	MODERATE (-)	MODERATE (-)	N/A
LOSS OF BIODIVERSITY	During the construction phase, uncontrolled construction activities, such as vegetation	MODERATE (-)	LOW (-)	N/A



	clearing and soil ripping, beyond the footprint of the development, could lead to unnecessary damage to and removal of natural vegetation, loss of faunal habitat, and SCC within the proposed site boundaries.			
HABITAT LOSS/ FRAGMENTATION	During the construction phase, the loss of vegetation coincides with the loss of faunal habitat, reducing feeding, breeding and rearing locales. Faunal populations could become locally extinct or diminish in size. However, faunal species are mobile, and it is likely that some of the species will move away during the construction phase and return once the citrus development has been established.	MODERATE (-)	LOW (-)	N/A
LOSS OF SPECIES OF CONSERVATION CONCERN	During the construction phase, construction activities, including the clearance of vegetation, could permanently damage or destroy plant SCC which are present on site, contributing to the cumulative loss of plant SCC in the region.	HIGH (-)	MODERATE (-)	N/A
ESTABLISHMENT OF ALIEN PLANT SPECIES	The removal of existing natural vegetation creates 'open' habitats which favour the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems. It should be noted that there is currently existing alien vegetation within the proposed development site, and therefore the implementation of the no-go alternative would result in a moderate impact as these species will remain and most likely spread.	MODERATE (-)	LOW (-)	MODERATE (-)
DAMAGE TO SURFACE WATER FEATURES	Construction works, including vegetation clearing, levelling and earthworks for the cultivation of the proposed citrus orchards will result in the loss and damage of a	MODERATE (-)	LOW (-)	N/A



	section of the drainage line which traverses the northwest corner of the citrus development site.			
WILDLIFE MORTALITIES	During the construction phase, construction activities could result in faunal fatalities through collisions with moving vehicles, accidents during vegetation clearance, or the baiting and trapping of fauna by construction workers.	MODERATE (-)	LOW (-)	N/A
LOSS OF CRITICAL BIODIVERSITY AREAS	The proposed citrus development will result in the loss of a portion of an area classified as a CBA 1 in terms of both the ECBCP and the Addo BSP. This classification was driven by the vegetation type, threat status and the established national conservation target. Even though a site is considered degraded, the systematic biodiversity planning algorithm will still select sites to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. The planning process, however, does not take the capability of the ecosystem to recover once disturbed into account. In this case, Sundays Arid Thicket has been significantly degraded and it is unlikely that any future efforts to restore the ecosystem will be successful.	MODERATE (-)	MODERATE (-)	N/A
INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	During the construction phase, failure to implement rehabilitation measures could lead to the erosion of- and permanent loss of valuable soil, the unnecessary loss of indigenous vegetation and the establishment of alien invasive vegetation.	MODERATE (-)	LOW (-)	N/A
OPERATIONAL PHASE				
GENERAL WASTE MANAGEMENT	During the operational phase, the long-term and inappropriate storage of general waste onsite could result in pollution of the	MODERATE (-)	LOW (-)	N/A



	surrounding environment and/or contamination of surface water features (i.e. the non-perennial water course in the northwest corner of the project site).			
USE OF HAZARDOUS SUBSTANCES	During the operational phase, the inappropriate handling, application, storage and disposal of hazardous substances such as pesticides, fertilisers and chemicals commonly utilised in the agricultural industry, could lead to the contamination of soil, and surface and/or ground water features, as well as pose a health and safety risk to staff.	MODERATE (-)	LOW (-)	N/A
CREATION OF EMPLOYMENT OPPORTUNITIES	Permanent and temporary employment opportunities will be created during the operational phase of the development. The implementation of the no-go alternative would therefore result in a loss of potential employment opportunities and no contribution to the country's GDP through international exports and foreign investments.	MODERATE (+)	HIGH (+)	HIGH (-)
EROSION	During the operational phase, failure to install erosion control and stormwater management measures could result in increased run-off and further erosion within the boundaries of Portion 472 of Farm 42. Additionally, failure to rehabilitate temporary areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable topsoil.	MODERATE (-)	LOW (-)	N/A
LOSS OF SOIL QUALITY	During the operational phase, soil leaching caused by poor irrigation methods and/or stormwater management, coupled with the application of fertilisers, pesticides, and/or herbicides, could lead to the	MODERATE (-)	LOW (-)	N/A



	loss/alteration of soil quality and structure within the study area.			
LOSS OF INDIGENOUS VEGETATION	During the operational phase, unsustainable and irresponsible farming practises could result in the loss or damage of the surrounding indigenous vegetation, beyond the orchard development footprint.	MODERATE (-)	LOW (-)	N/A
ESTABLISHMENT OF ALIEN PLANT SPECIES	During the operational phase, failure to remove and manage alien vegetation could result in the establishment of alien vegetation in the study area and the potential spreading of alien vegetation. In addition, the poor rehabilitation of disturbed areas could lead to the permanent degradation of ecosystems which will permit alien vegetation species to establish and spread. It should be noted that there is currently existing alien vegetation within the proposed development site, and therefore the implementation of the no-go alternative would result in a moderate impact as these species will remain and most likely spread.	MODERATE (-)	LOW (-)	MODERATE (-)
DAMAGE TO SURFACE WATER FEATURES	During the operational phase, runoff from the proposed citrus orchards could result in the subsequent sedimentation and/or contamination of downstream water features.	MODERATE (-)	LOW (-)	N/A
WILDLIFE MORTALITIES	Operational activities could result in faunal fatalities through collisions with moving vehicles, accidents during harvesting of the citrus orchards, or the baiting and trapping of fauna by farm workers.	MODERATE (-)	LOW (-)	N/A
INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	During the operational phase, failure to rehabilitate temporary disturbed areas, which were impacted during the construction phase, could lead to the erosion of and permanent loss of valuable	MODERATE (-)	LOW (-)	N/A



	soil, the degradation of the surrounding indigenous vegetation, and the establishment of alien invasive vegetation.			
AIR QUALITY AND DUST CONTROL	During the operational phase, the moving of transportation or delivery vehicles and other operational activities could result in air pollution in the form of dust, especially during windy conditions.	LOW (-)	LOW (-)	N/A
FIRE RISK	Inadequate attention to fire safety awareness and the lack of fire safety equipment could result in runaway fires, an unsafe working environment and the loss of property.	MODERATE (-)	LOW (-)	N/A

B. COMPARATIVE ASSESSMENT OF IMPACTS

Below is a comparative assessment of the above impacts in terms of the number of impacts identified for each phase of the proposed citrus development. The majority of the impacts identified pre-mitigation were classified as MODERATE significance. The HIGH impacts identified relate to compliance with legislation, health and safety, loss of indigenous vegetation, and loss of SCC. However, most of the HIGH and MODERATE impacts can be significantly reduced through the implementation of the recommended mitigation measures which will result in a LOW significance post-mitigation.

The positive impacts identified relate to the socio-economic benefits associated with the proposed citrus development, particularly employment creation.

The negative impacts identified when assessing the no-go option relate to a loss of possible employment creation and the establishment of alien plant species.

Table 9: Comparative assessment of the impacts associated with all phases of the proposed citrus development.

	PRE-MITIGATION			POST-MITIGATION		
	LOW	MODERATE	HIGH	LOW	MODERATE	HIGH
Planning and Design	0	0	1-	1-	0	0
Construction	4-	12- (1+)	2-	14-	4-	1+
Operational	1-	10- (1+)	0	11-	0	1+



No-Go	0	3-	1-	0	0	0
TOTAL	5-	25- (2+)	4-	26-	4-	(2+)

C. CONSIDERATION OF ALTERNATIVES

Section 2 provides a detailed comparison of alternatives for the proposed Citrus Development. It should be noted that the assessment of alternatives does not consider those alternatives that are not deemed to be either reasonable nor feasible.

C1) Location Alternatives

The current location alternative (preferred alternative) is the only alternative which has been assessed in the Basic Assessment Process. No alternative locations were identified as the Proponent already owns the land on which the development is proposed, the site is located adjacent to the Proponent's existing citrus orchards and is easily accessible via existing farm access roads.

C2) Activity Alternatives

The preferred activity alternative is the cultivation and production of citrus on Portion 472 of Farm 42. The production of citrus will contribute to local economic upliftment, through the creation of employment opportunities, and South Africa's Gross Domestic Product (GDP) through increased exports and foreign exchange.

C3) Technology Alternative

Technology alternatives are relevant to the manner in which citrus is farmed on the property, rather than the actual preparation of land for citrus production. The technological alternatives considered in this BAR include (1) irrigation methods (sprinkler vs drip irrigation) and (2) electricity supply (Eskom vs solar).

The Proponent has invested in the drip irrigation scheme due to its efficient and sustainable water use – a critical consideration in a water scarce region. Based on the advantages of drip irrigation, this is the preferred alternative assessed in terms of methods for irrigating the proposed citrus orchards.

Solar energy supply is the preferred electrical technological alternative assessed in this BAR primarily due to the energy independence and reliability thereof.

C4: Layout Alternative



The layout of the of the proposed citrus development is that of traditional citrus orchards consisting of several 'blocks' separated by access roads. This allows ease of access for harvesting, irrigation and the application of fertilisers, pesticides, etc.

C5) Operational Alternative

The operational phase of the proposed development will consist of activities relating to citrus production, including the harvesting, packaging, loading and transport of citrus from the farm to local/international market. The implementation of the Environmental Management Programme (EMPr) during the operational phase of the proposed citrus development is the preferred operational alternative.

D. CUMULATIVE IMPACTS

A cumulative impact means “the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities”.

The cumulative impacts arising from the proposed Citrus Development would therefore be impacts that already occur in the area and the operation of the development would therefore increase those impacts. Such impacts include the cumulative loss of Sundays Arid Thicket, biodiversity, faunal habitats, and SCC, as well as the increase in noise, traffic, and visual impacts on the surrounding environment as a result of the new citrus development.

In order to reduce the potential negative cumulative impacts associated with the new citrus development, emphasis should be placed on the implementation of all mitigation measures recommended in this report.

E. SITE SENSITIVITY

Below is a table summarising the list of criteria contributing the overall sensitivity of the site, (Figure 19) which has been developed based on the findings of the Ecological Impact Assessment.



Table 10: List of Criteria contributing to the sensitivity map.

SITE ELEMENT	SENSITIVITY MAPPING RULE	SENSITIVITY ALLOCATION
<p>Vegetated areas (Sundays Arid Thicket)</p>	<p>Topography is low, slightly undulating in the broader area; Possibility of erosion or change due to episodic events; Considerable biodiversity; Fragmented vegetation cover in area; Conservation status Vulnerable; Important ecological functions/services evident; High potential of Habitat fragmentation; Significant degree of degradation/disturbance; Scattered aliens; Rehabilitation potential low; Presence of SCC in vegetated areas.</p>	<p>Moderate sensitivity</p>
<p>Aquatic Habitat (Drainage Lines)</p>	<p><u>Drainage line:</u> Topography low, slightly sloped; Conservation status Vulnerable; Potential SCC; Sparse vegetation cover; No wetland or riparian species evident; Dry for a number of years; Rehabilitation difficult and unlikely over the long-term; Some possibility of erosion or change due to episodic events; Moderate biodiversity; Moderate ecological value – ecosystem services and various ecological processes.</p>	<p>High Sensitivity</p>



	<p>100 m buffer: Topography low, slightly sloped; Conservation status Vulnerable; Potential SCC; Sparse vegetation cover; No wetland or riparian species evident; Dry for a number of years; Rehabilitation difficult and unlikely over the long-term; Some possibility of erosion or change due to episodic events; Moderate biodiversity; Moderate ecological value – ecosystem services and various ecological processes.</p>	<p>Moderate Sensitivity</p>
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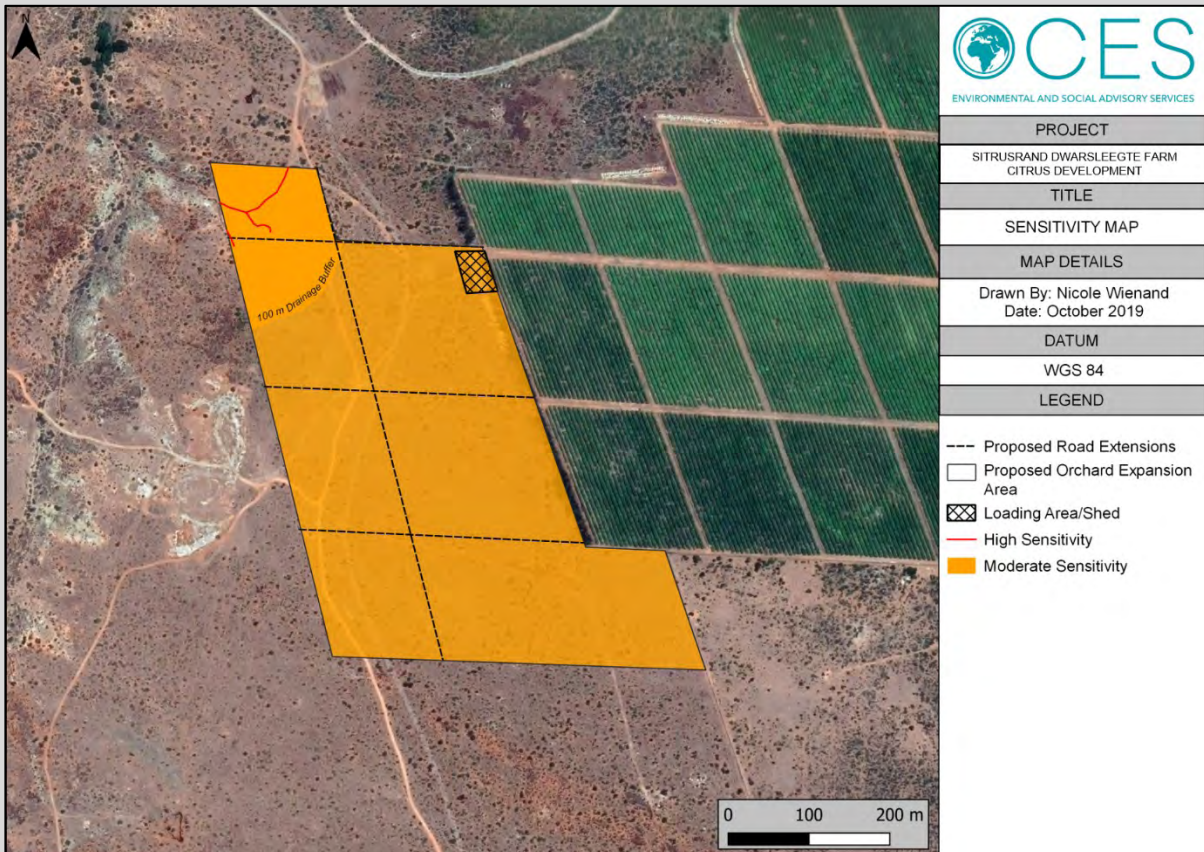
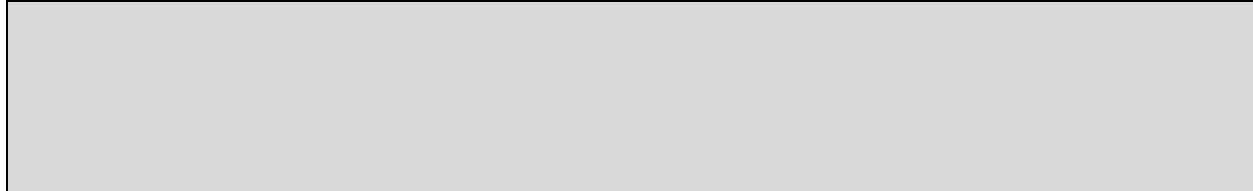


Figure 19: Site Sensitivity Map of the proposed Citrus Development site.



No-go alternative (compulsory)

Please refer to above tables for a summary of the impacts associated with the no-go alternative. This alternative assumes the status quo will remain unchanged and the indigenous vegetation and fauna on Portion 472 of Farm 42 will persist. Although the no-go alternative will result in minimal (if any) disturbance to the current indigenous vegetation, the fauna, and faunal habitats, the implementation of the no-go alternative would result in a loss of employment opportunities and no contribution to the country's GDP through international exports and foreign investments.



SECTION E. RECOMMENDATIONS OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	<input checked="" type="checkbox"/>
X	
YES	<input checked="" type="checkbox"/>
X	

Is an EMPr attached?

The EMPr must be attached as Appendix F.

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

Not Applicable – Please refer to the EMPr attached as Appendix F.

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

The following recommendations and mitigation measures should be considered for inclusion in the EA:

Recommendations

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- A suitably qualified ECO must be appointed prior to the commencement of the construction phase;
- A comprehensive Search and Rescue for fauna and flora should be conducted prior to vegetation clearance;
- All SCC must be relocated to nearest appropriate habitat;
- A qualified botanical specialist should be present on-site during vegetation clearing;
- An Erosion Management Plan/Method Statement must be developed prior to the commencement of construction activities in order to mitigate the unnecessary loss of topsoil and runoff;
- An Alien Vegetation Management Plan should be compiled and implemented during all stages of the proposed citrus development;
- A Rehabilitation Plan must be developed and implemented during construction and operation phases;
- The necessary Water Use Licence (WUL) must be obtained prior to abstraction from the watercourse.



Mitigation measures

Table 11 below lists the various mitigation measures for the impacts identified for each phase of the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

Table 11: Summary of recommended mitigation measures.

IMPACT	MITIGATION MEASURES
PLANNING AND DESIGN PHASE	
LEGAL AND POLICY COMPLIANCE	<ul style="list-style-type: none"> ➤ All necessary permitting and authorisations must be obtained prior to the commencement of any vegetation clearance and/or construction activities; ➤ If necessary, a suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase; ➤ Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and ➤ Planning for the construction and operation of the proposed development should consider available best practice guidelines.
CONSTRUCTION PHASE	
STORAGE OF HAZARDOUS SUBSTANCES	<ul style="list-style-type: none"> ➤ Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) and the SABS Code of Practise must be adhered to; ➤ The individual(s) that will be handling hazardous materials must be trained to do so; ➤ All hazardous substances such as diesel, pesticides and fertilisers must be stored in a bunded area with an impermeable surface beneath them; ➤ Maintenance of any vehicles or machinery should not take place within 50 m of any watercourse and drip trays must be used; ➤ Spill kits must be kept on-site and maintained; and ➤ The appointed ECO must determine and/or approve the precise method for the treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestives.
WASTE MANAGEMENT	<ul style="list-style-type: none"> ➤ Littering must be avoided, and sufficient waste bins must be provided on site;



	<ul style="list-style-type: none"> ➤ All general waste must be disposed of in bins or waste skips labelled general waste; ➤ All waste collected on site must be disposed of at the nearest registered landfill; and ➤ Waste must not be buried or burned on site.
NOISE IMPACTS	<ul style="list-style-type: none"> ➤ Applicable municipal by-laws relating to noise control must be adhered to; ➤ Activities which include the movement of construction vehicles and the operation of machinery should be restricted to normal working hours (06:00am – 18:00pm); and ➤ There must be a complaints register on site to register and record any complaints received from the public. The appointed ECO must be made aware of any complaints relating to the citrus development.
AIR QUALITY AND DUST CONTROL	<ul style="list-style-type: none"> ➤ During windy periods, exposed soil should be dampened down if necessary; ➤ Vegetation should be retained, where possible, to reduce dust travel; ➤ Excavations and other clearing activities must only take place during agreed working times and permitting weather conditions to avoid the drifting of dust into neighbouring areas; ➤ Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register; ➤ Construction vehicles should adhere to the recommended speed limit of 30 km/h; and ➤ Vehicles and construction plant must be serviced regularly to reduce excessive vehicle emissions.
CULTURAL HERITAGE	<ul style="list-style-type: none"> ➤ All recommendations and mitigation measures made by the Archaeological Specialist and relating to the cultural heritage within the site must be implemented/adhered to; and ➤ Should any archaeological or cultural sites or objects be located during the construction of the proposed development, they must be reported to the archaeologist at the Albany Museum (Tel.: 046 6222312) or to the ECPHRA (Tel.: 043 7450888) immediately in accordance with the National Heritage Act (Act No. 25 of 1999).



TRAFFIC IMPACTS	<ul style="list-style-type: none"> ➤ Construction activities must be restricted to normal working hours (06:00 am to 18:00 pm); ➤ All surrounding land owners must be notified once construction activities commence; and ➤ Vehicles must adhere to the recommended speed restrictions (preferably 30 km/hr along gravel roads).
HEALTH AND SAFETY	<ul style="list-style-type: none"> ➤ Operational firefighting equipment must be present on site at all times as per the Occupational Health and Safety Act; ➤ Employees should be trained in basic fire hazard control and firefighting techniques; ➤ The Proponent should provide the employees with all relevant emergency contact details; and ➤ Burning of construction waste or debris must not occur onsite.
VISUAL AND AESTHETIC IMPACTS	<ul style="list-style-type: none"> ➤ Vegetation clearance must be restricted to the demarcated development footprints; and ➤ Any disturbed areas should be rehabilitated as soon as possible.
CREATION OF EMPLOYMENT OPPORTUNITIES	<ul style="list-style-type: none"> ➤ Where possible, individuals residing in proximity to the proposed development should be contracted for unskilled and semi-unskilled employment opportunities.
EROSION	<ul style="list-style-type: none"> ➤ An Erosion Management Plan or method statement must be compiled indicating what measures will be implemented during the construction phase; ➤ Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion; ➤ Disturbed areas must be rehabilitated as soon as possible after construction; and ➤ The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.
LOSS OF INDIGENOUS VEGETATION (SUNDAYS ARID THICKET)	<ul style="list-style-type: none"> ➤ A comprehensive Plant Search and Rescue should be conducted prior to vegetation clearance; ➤ Any Species of Conservation Concern (SCC) should be translocated to the nearest appropriate habitat; ➤ The clearance of vegetation at any given time should be kept to a minimum; ➤ Employees must not make fires and/or harvest plants with the Citrus Development site;



		<ul style="list-style-type: none"> ➤ Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase; ➤ Only indigenous species must be used for rehabilitation purposes; ➤ As far as practically possible, existing roads should be utilised; and ➤ An Alien Vegetation Management Plan must be compiled (for implementation during the phases that follow).
LOSS OF BIODIVERSITY		<ul style="list-style-type: none"> ➤ A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance; ➤ The clearance of vegetation at any given time must be kept to a minimum and restricted to demarcated development areas; ➤ Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas; ➤ Employees must not make fires and/or harvest plants with the Citrus Development site; ➤ Any alien vegetation, which establishes during the construction phase, must be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings must take place throughout the construction phase; ➤ Only indigenous species must be used for rehabilitation purposes; and ➤ As far as practically possible, existing roads must be utilised.
HABITAT FRAGMENTATION	LOSS/	<ul style="list-style-type: none"> ➤ A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance; ➤ The clearance of vegetation at any given time should be kept to a minimum; ➤ Vegetation clearance and trampling should be avoided in areas demarcated as no-go areas; ➤ Employees must not trap, hunt, handle or remove any faunal species from the site; and ➤ As far as practically possible, existing roads must be utilized.
LOSS OF SPECIES OF CONSERVATION CONCERN		<ul style="list-style-type: none"> ➤ A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance;



	<ul style="list-style-type: none"> ➤ A qualified botanical specialist must be present on-site during the clearance of vegetation; and ➤ Any SCC should be relocated to the nearest appropriate habitat.
ESTABLISHMENT OF ALIEN PLANT SPECIES	<ul style="list-style-type: none"> ➤ An Alien Vegetation Management Plan must be developed and implemented to prevent the establishment and spread of undesirable alien plant species during all phases of development; and ➤ Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase.
DAMAGE TO SURFACE WATER FEATURES	<ul style="list-style-type: none"> ➤ The construction site must be managed in a manner that prevents the contamination or sedimentation of the main tributary into which the drainage line flows; and ➤ If necessary, silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further loss and degradation of the main tributary.
WILDLIFE MORTALITIES	<ul style="list-style-type: none"> ➤ A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance; ➤ Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality; ➤ Train all staff on site regarding the proper management and response should animals be encountered; ➤ Search and clear the construction region prior to work commencing, relocating animals where found; and ➤ Animals must not be injured or killed by construction activities, where possible.
LOSS OF CBA	<ul style="list-style-type: none"> ➤ If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented.
INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	<ul style="list-style-type: none"> ➤ A Rehabilitation Plan must be developed and implemented during and post-construction; ➤ All temporary disturbed areas that do not form part of the citrus orchards, must be rehabilitated using only indigenous vegetation; and ➤ All impacted areas must be restored as per the EMP requirements.
OPERATIONAL PHASE	
GENERAL WASTE MANAGEMENT	<ul style="list-style-type: none"> ➤ All waste generated on site must be stored in a designated waste area in lidded bins;



	<ul style="list-style-type: none"> ➤ Any hazardous chemicals must be stored in a designated hazardous waste area which is banded and clearly labelled; ➤ Any hazardous waste must be removed in an appropriate manner and disposed of at a suitably registered waste site; and ➤ General waste must be disposed of at the nearest registered landfill.
USE OF HAZARDOUS SUBSTANCES	<ul style="list-style-type: none"> ➤ Only plant protection products, including pesticides, fungicides and herbicides, which are registered with the Department of Agriculture for specific uses must be used during the operation of the citrus development; ➤ Herbicides should not be sprayed during very windy conditions; and ➤ The application of plant protection products must adhere to the information displayed on the product label to avoid the misuse of these products.
CREATION OF EMPLOYMENT OPPORTUNITIES	<ul style="list-style-type: none"> ➤ Where possible, individuals residing in the nearby communities should be contracted for unskilled and semi-unskilled employment.
EROSION	<ul style="list-style-type: none"> ➤ Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms; ➤ All erosion control mechanisms, such as silt traps, must be regularly maintained; ➤ Natural vegetation must be retained where possible to avoid soil erosion; ➤ Any cleared areas, which are not used for the cultivation of the citrus orchards, should be rehabilitated post-construction using only indigenous plant species; ➤ Irrigation methods must ensure minimal runoff; ➤ All pipelines associated with the irrigation system(s) must be monitored for leaks throughout the operational phase; and ➤ The quality and health status of surrounding soils should be monitored throughout the operational phase.
LOSS OF SOIL QUALITY	<ul style="list-style-type: none"> ➤ Disturbed areas must be rehabilitated as soon as possible after construction; ➤ The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;



	<ul style="list-style-type: none"> ➤ If necessary, any negative alterations in the soil quality should be remediated in line with best practices; and ➤ The application of fertilisers, pesticides, and/or herbicides to cultivated areas must be carefully managed.
LOSS OF INDIGENOUS VEGETATION	<ul style="list-style-type: none"> ➤ The proposed vegetation clearing and ripping of soil required for cultivation must be restricted to the citrus orchards; ➤ Sustainable farming methods must be practiced during the operational phase, such as application of pesticides using nozzles which will assist in preventing wind-drift; and ➤ Vehicles should make use of existing farm roads and must refrain from driving through surrounding indigenous vegetation.
ESTABLISHMENT OF ALIEN PLANT SPECIES	<ul style="list-style-type: none"> ➤ An Alien Vegetation Management Plan must be implemented to prevent the establishment and prevent the spread of undesirable alien plant species during the operational phase; and ➤ Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide.
DAMAGE TO SURFACE WATER FEATURES	<ul style="list-style-type: none"> ➤ The citrus orchards must be managed in a manner that prevents the contamination or sedimentation of the main tributary to which the drainage line is connected to; ➤ Irrigation methods must ensure that the correct rates of agricultural application, which could potentially contaminate water course (such as fertilisers, herbicides and pesticides), are applied and ensure the minimal runoff of water; and ➤ If necessary, silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further degradation of the main tributary.
WILDLIFE MORTALITIES	<ul style="list-style-type: none"> ➤ Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality; and ➤ Train all staff on site regarding the proper management and response should animals be encountered within the citrus development.
INADEQUATE REHABILITATION AND	<ul style="list-style-type: none"> ➤ Stormwater control must be undertaken to prevent soil loss from the site;



MAINTENANCE OF DISTURBED AREAS	<ul style="list-style-type: none"> ➤ All erosion control mechanisms must be regularly maintained; ➤ Vegetation must be retained where possible to avoid soil erosion; ➤ Any cleared/disturbed areas, which are not used for the cultivation of citrus, should be rehabilitated post-construction using only indigenous plant species; ➤ Irrigation methods must ensure minimal runoff; ➤ The quality and health status of surrounding soils should be monitored throughout the operational phase; and ➤ If necessary, any negative alterations in the soil quality should be remediated in line with best practice.
AIR QUALITY AND DUST CONTROL	<ul style="list-style-type: none"> ➤ Fugitive/nuisance dust could be reduced by implementing the following: - <ul style="list-style-type: none"> ➤ The use of commercial dust binders such as Hydropam or Dustex; ➤ Rotovating straw bales; ➤ Retention of vegetation where possible; ➤ Planting of open cleared space; ➤ A speed limit of 30km/h must not be exceeded on gravel roads; and ➤ Any complaints or claims emanating from the lack of dust control should be attended to immediately by the Proponent.
FIRE RISK	<ul style="list-style-type: none"> ➤ The Proponent must ensure that operational firefighting equipment is present on site at all times as per the Occupational Health and Safety Act; ➤ All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances; ➤ No open fires are to be permitted; and ➤ There should be no burning of general waste or debris onsite.

Opinion of the EAP

Although a number of impacts are associated with the proposed Citrus Development, it is the opinion of CES that:

- The vast majority of the environmental impacts identified can be adequately mitigated to reduce the impacts to an acceptable level, provided that the mitigation measures



recommended in this report are implemented and maintained throughout the life of the project;

- The proposed development involves positive impacts, such as the creation of employment opportunities;
- The preferred site/location for the proposed activity was selected based on the following reasons:
 - The property on which the activity is proposed is owned by the Proponent (Citrusrand Boerdery (Pty) Ltd);
 - The site is located directly adjacent to the Proponent's existing citrus orchards;
 - The site contains a sufficient amount of undeveloped land for a citrus development;
 - The site is easily accessible via existing farm access roads;
 - The site is located close to a water resource (the Sundays River) and an existing pump station which is situated on Portion 472 of Farm 42;
 - The types of soil within the site are suitable for the proposed citrus orchards; and
 - The proximity of the site to existing infrastructure (including existing roads, water canals, and pump station).
- The implementation of mitigation measures and recommendations must be consistently monitored by an ECO during the construction phase;
- The recommendations made by the EAP and in the EMP (Appendix F) must be implemented; and
- The information in the report is sufficient to allow DEDEAT to make an informed decision.

It is the opinion of CES that **NO FATAL FLAWS** are associated with the proposed Citrus Development.



REFERENCES

Hoare, DB., Mucina, L., Rutherford, MC., Vlok, JHJ., Euston-Brown, DIW., Palmer, AR., Powrie, LW., Lechmere-Oertel, RG., Proches, SM., Dold, AP., Ward, RA. 2006. Albany Thicket Biome. *Strelitzia* **19**, 556-557.

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Encyclopedia Britannica. 2019. Luvisol – FAO Soil Group. Available at: <https://www.britannica.com/science/Luvisol> [Accessed SEPTEMBER 2019].

Johnson, MR., Anhaeusser, CR., Thomas, R.J. (eds) 2006. *The Geology of South Africa*. The Geological Society of South Africa, Johannesburg, and the Council for Geoscience, Pretoria.

CEN IEM Unit. 2019. Ecosystem Guidelines for the Albany Thicket Biome. Available at: <https://environmentcen.co.za/wp-content/uploads/2019/02/10.-Albany-Thicket-biome-Ecosystem-Guidelines-lowres.pdf> [Accessed September 2019].



SECTION F: APPENDICES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Other information

APPENDIX A – SITE PLAN

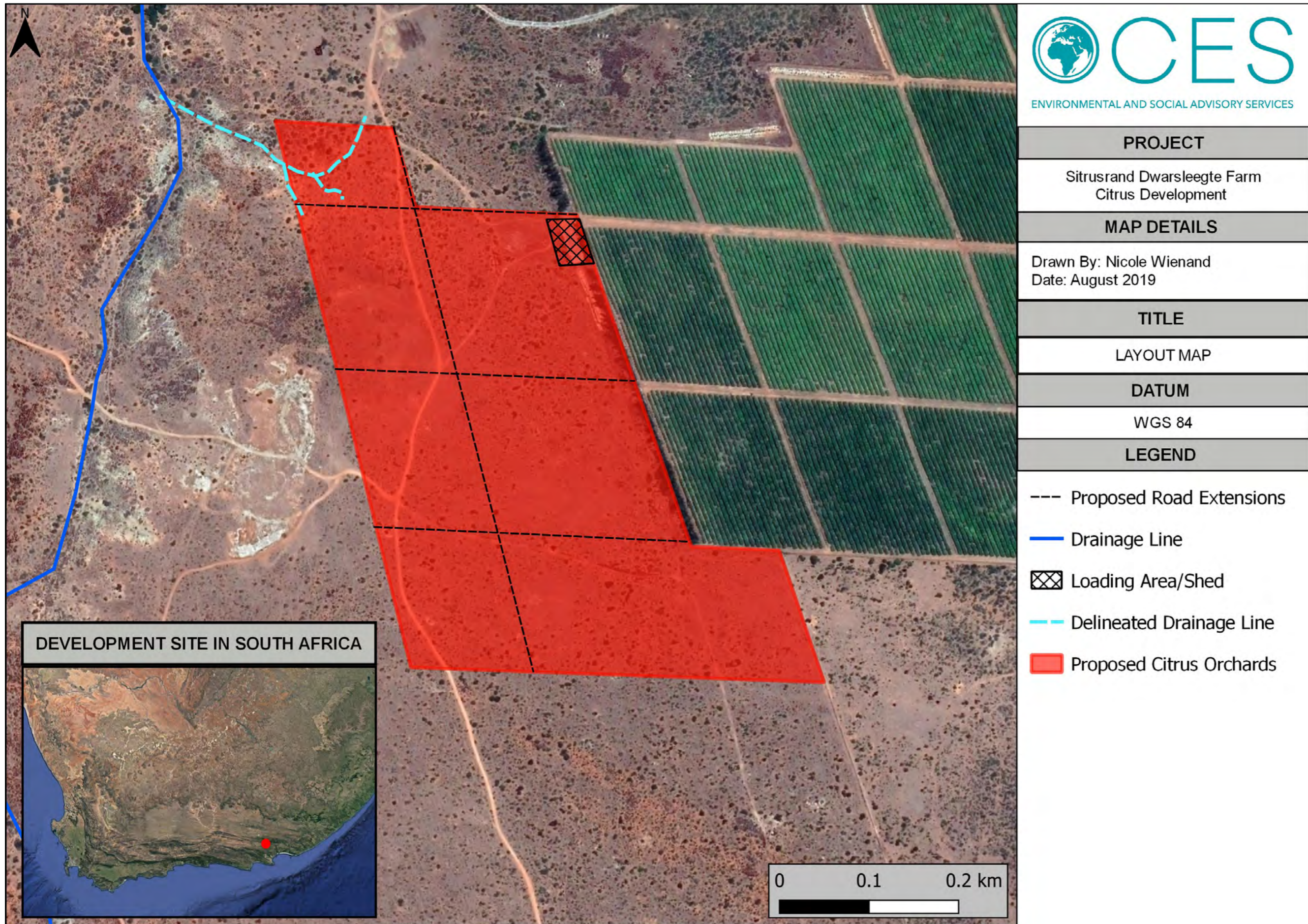


Figure A1: Site plan of the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

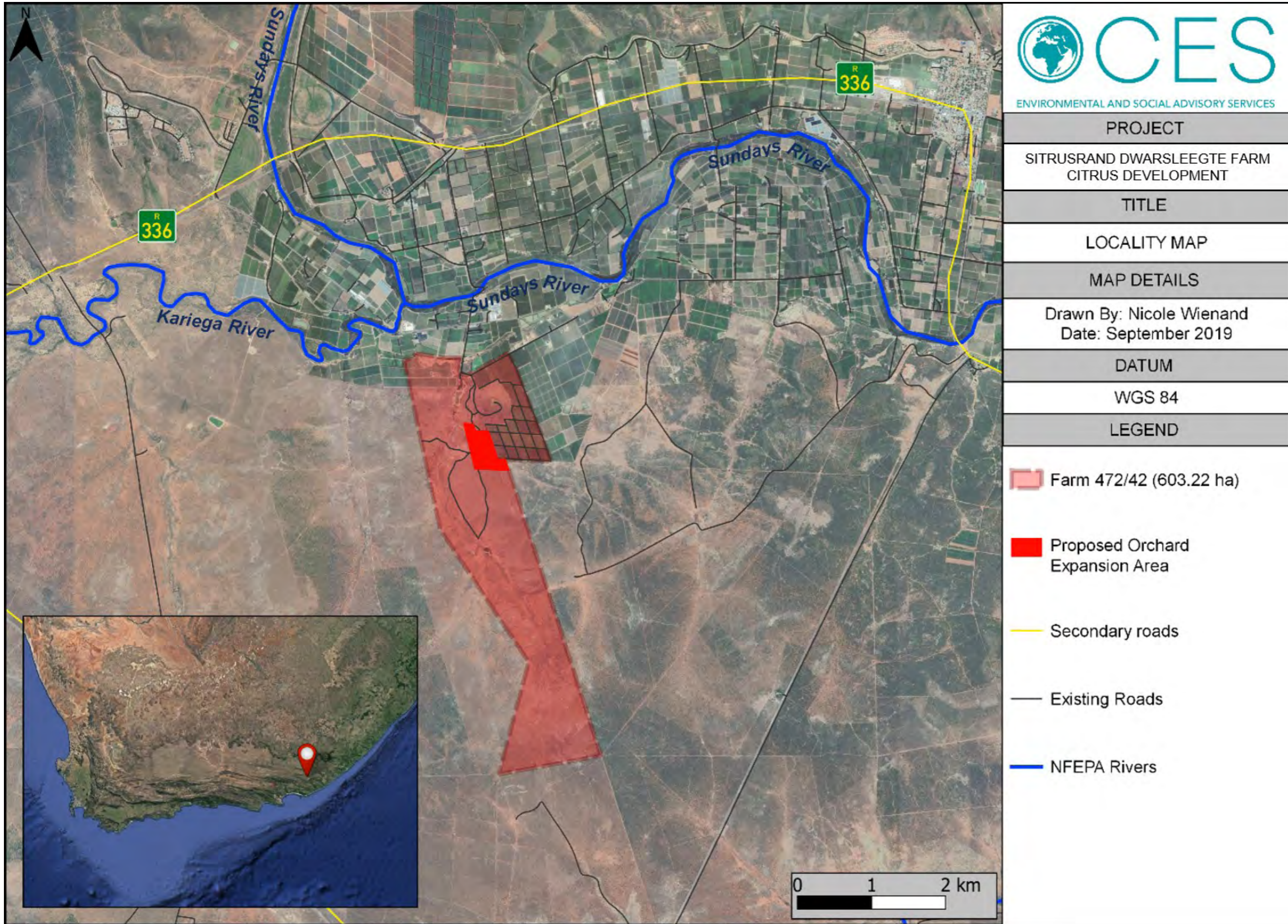
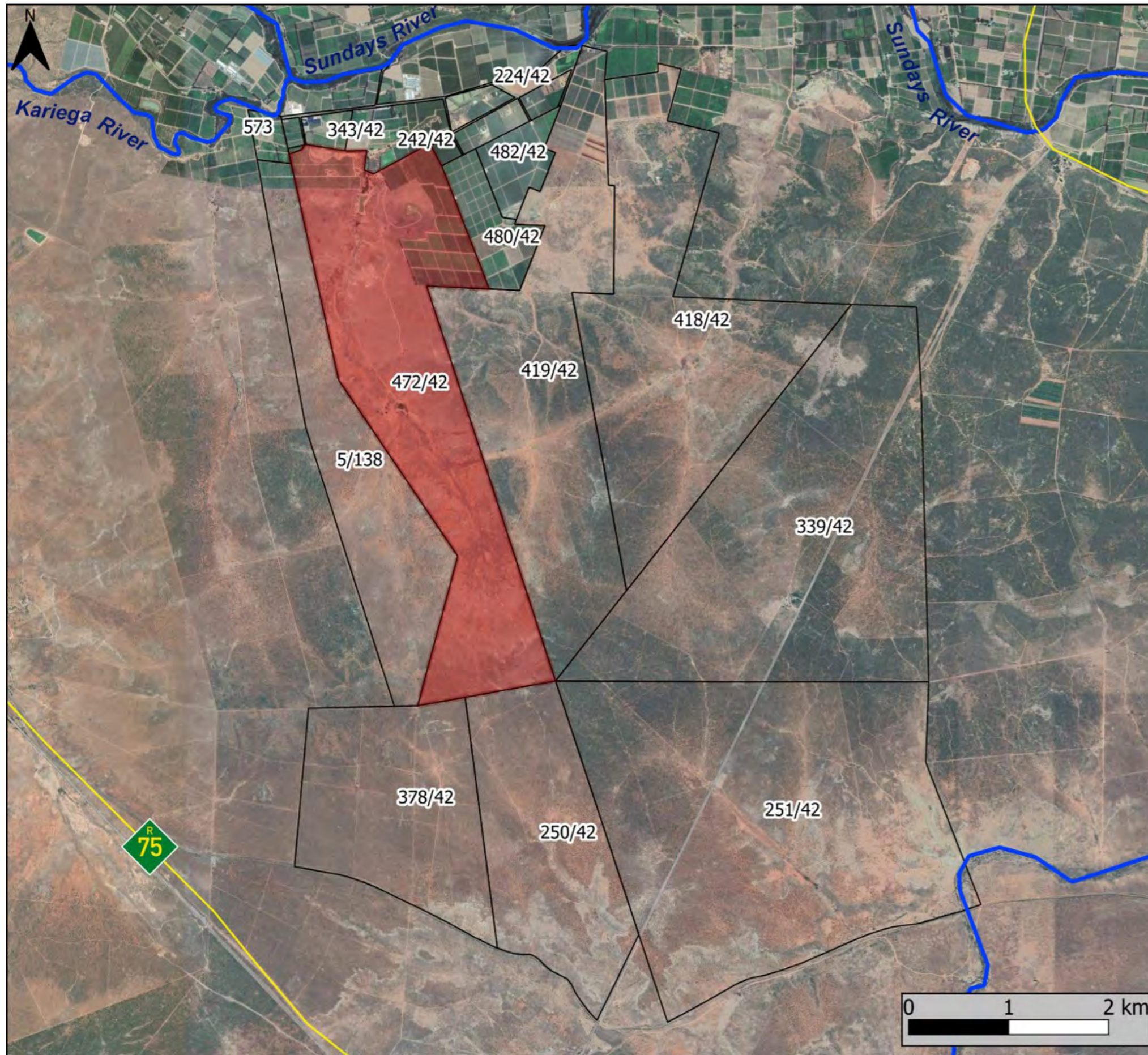


Figure A2: Locality Map of the proposed Citrus Development.



PROJECT

SITRUSRAND DWARSLEEGTE FARM
CITRUS DEVELOPMENT

TITLE

Surrounding Farm Portions

MAP DETAILS

Drawn By: Nicole Wienand
Date: September 2019

DATUM

WGS 84

LEGEND





-  Secondary roads
-  NFEPA_Rivers
-  Farm 472/42
-  Surrounding Farm Portions

Figure A3: Surrounding Farm Portions Map of the proposed Citrus Development site.

APPENDIX B – PHOTOGRAPHS

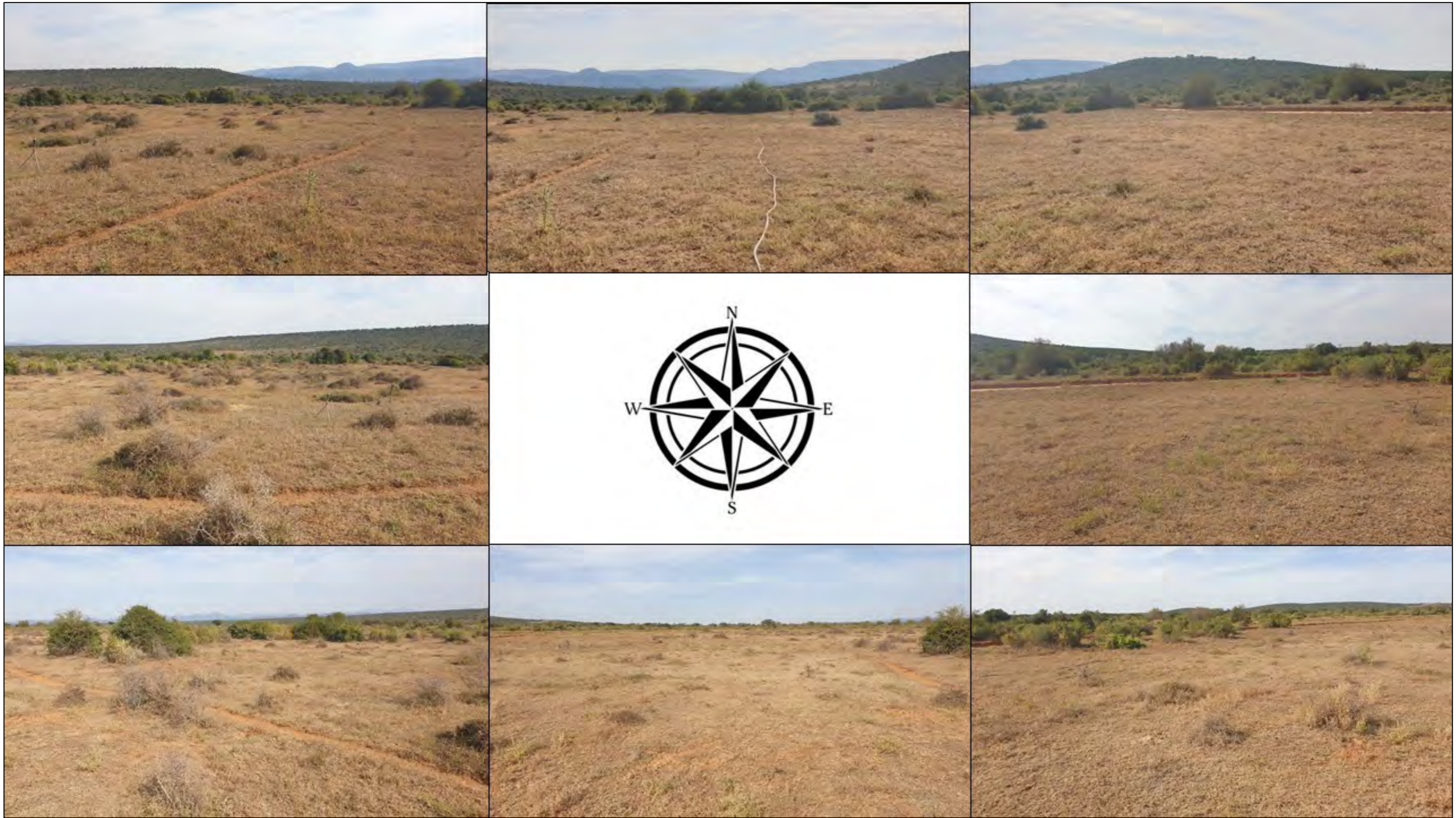


Figure B1: 8 Point view of the study site.



Entrance to the study site.



Vegetation cover of the study site.



Sundays Arid Thicket of the study site.



Degraded remnants of Sundays Arid Thicket within the study site.



Existing Quarry on Portion 472 of Farm 42.



Existing gravel access roads within the study site.



Non-perennial water course traversing the northwest corner of the study site.



Non-perennial water course traversing the northwest corner of the study site.



Non-perennial water course traversing the northwest corner of the study site.

APPENDIX C: FACILITY ILLUSTRATION

Please refer to the site plan/site layout in Appendix A. The proposed development of citrus orchards on Portion 472 of Farm 42 does not require facility illustrations.

APPENDIX D: SPECIALIST REPORTS

- Ecological Impact Assessment Report; and
- Heritage Specialist Report.



DRAFT Ecological Impact Assessment



ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

**SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR
KIRKWOOD, EASTERN CAPE PROVINCE.**

DRAFT ECOLOGICAL IMPACT ASSESSMENT REPORT

Prepared for:



Prepared by:



PORT ELIZABETH

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MARCH 2020

REVISIONS TRACKING TABLE

CES Report Revision and Tracking Schedule

Document Title:	Draft Ecological Impact Assessment for the proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.		
Client Name & Address:	Sitrusrand Boerdery (Pty) Ltd.		
Status:	Draft Ecological Impact Assessment		
Issue Date:	MARCH 2020		
Lead Author:	Ms Nicole Wienand		
Reviewer:	Dr Greer Hawley-McMaster		
Study Leader/ Registered Environmental Assessment Practitioner – Approval:	Ms Caroline Evans		
Report Distribution	<i>Circulated to</i>	<i>No. of hard copies</i>	<i>No. electronic copies</i>
Report Version	<i>SEPTEMBER 2019</i> DRAFT ECOLOGICAL IMPACT ASSESSMET		

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Contents of the Specialist Report

The contents of this specialist report complies with the legislated requirements as described in Appendix 6 of the National Environmental Management Act (No 107 of 1998; NEMA) Regulations of 2014 (as amended) (GN R. 326 of 2017).

SPECIALIST REPORT REQUIREMENTS ACCORDING TO APPENDIX 6 OF GN R. 982 OF 2014, AS AMENDED IN GN R. 326 OF 2017		SECTION OF REPORT
1.	A specialist report prepared in terms of these Regulations must contain—	
	(a) details of—	
	(i) the specialist who prepared the report; and	Section 1 and Appendix 3
	(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
	(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.2
	(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2
	(cA) an indication of the quality and age of base data used for the specialist report;	Section 2.4
	(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 9 and Section 10.1
	(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 2.4 and 2.5
	(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
	(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 7
	(g) an identification of any areas to be avoided, including buffers;	Section 10.1.3
	(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 2 and 5
	(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2.5
	(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 10
	(k) any mitigation measures for inclusion in the EMPr;	Section 10.2 and 10.3
	(l) any conditions for inclusion in the environmental authorisation;	
	(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	
	(n) a reasoned opinion—	Section 10.3
	(i) whether the proposed activity, activities or portions thereof should be authorised;	
	(iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
	(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 2.6
	(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	
	(q) any other information requested by the competent authority.	
		N/A



		(No other information has yet been requested)
2.	(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	



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1.1 Details and Expertise of the Specialists	1
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LIST OF ACRONYMS AND ABBREVIATIONS

BA	Basic Assessment
BSP	Biodiversity Spatial Plan
CARA	Conservation of Agricultural Resource Act
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species
CR	Critically Endangered
DAFF	Department of Agriculture, Forestry and Fisheries
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECBCP	Eastern Cape Biodiversity Conservation Plan
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
GIS	Geographical Information System
GN	Government Notice
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
LC	Least Concern
LM	Local Municipality
NBF	National Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan
NEMA	National Environmental Management Act



NEM:BA	National Environmental Management: Biodiversity Act
NEM:PAA	National Environmental Management: Protected Areas Act
NFA	National Forest Act
NFEPA	National Freshwater Ecosystem Priority Areas
NPAES	National Protected Areas Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NT	Near Threatened
NWA	National Water Act
PA	Protected Area
PNCO	Provincial Nature Conservation Ordinance
POSA	Plants of Southern Africa
PPP	Public Participation Process
SANBI	South African National Biodiversity Institute
SBDM	Sarah Baartman District Municipality
SCC	Species of Conservation Concern
SRVLM	Sundays River Valley Local Municipality
TOPS	Threatened or Protected Species
VU	Vulnerable
WMA	Water Management Area
WUA	Water Use Authorisation



1 PROJECT TEAM

1. (1) A specialist report prepared in terms of these Regulations must contain—
 - (a) details of—
 - (i) the specialist who prepared the report; and
 - (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;
 - (b) a declaration that the specialist is independent in a form as may be specified by the competent authority;

1.1 DETAILS AND EXPERTISE OF THE SPECIALISTS

Ms Nicole Wienand (*Junior Botanical Specialist and Report Writer*)

Ms Nicole Wienand is an Environmental Consultant based in the Port Elizabeth branch. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) with majors in Botany and Geology from NMU. Nicole's honours project focused on the composition of subtidal marine benthic communities on warm temperate reefs off the coast of Port Elizabeth, while her undergraduate project focused on the investigation of dune movement in Sardinia Bay. Nicole's key interests include marine and terrestrial ecology. Since her appointment with CES in January 2019, Nicole has conducted ecological specialist studies for the following projects: ZMY Steel Traders (Pty) Ltd., Steel Recycling Plant in Zone 5 of the Coega SEZ; Kareekrans Boerdery Agricultural Development, near Middleton, Eastern Cape Province; Uitsig Boerdery Trust Citrus Development near Kirkwood, Eastern Cape Province; and the Mosselbankfontein Coastal Dune and Ecological Impact Assessment near Witsand, in the Western Cape Province.

Mr Justin Green (*General Field Assistance*)

Justin has a BSc. degree in Zoology and Entomology as well as a Post Graduate Diploma in Enterprise Management from Rhodes University. Justin has been an Environmental Consultant with CES for 7 years and has been involved in extensive work in Renewable Energy Projects and mining based projects. Justin has played an integral part in Basic Assessments and Environmental Impact Assessments. His work experience has been completed in South Africa, Lesotho, Mozambique, Zambia, Cameroon, Tanzania, Madagascar and the DRC. He is a part of the Geographical Information Systems (GIS) team for the past 6 years with his primary experience through ArcGIS 10.1 and Quantum GIS 2.8.3. He has been involved in producing mapping data for a multitude of international projects all up to IFC and World Bank standards. Justin has also made a considerable difference using OruxMaps for the purpose of specialist fieldwork and mapping purposes. He has recently become involved in specialising in surface water quality analyses using the South African Scoring System (SASS5) methodology as well as Wetland delineation.

Dr Greer Hawley-McMaster (*Ecological Specialist - Report Review*)

Dr Greer Hawley has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She completed her PhD thesis (Microbiology) at Rhodes



University. Greer has been involved in a number of diverse activities. The core academic focus has been in the field of taxonomy both in the plant and fungal kingdom. Greer's research ranges from fresh water and marine algae, estuarine diatoms, plant species classification in the fynbos and forest vegetation and fungal species identification and ecology. Greer's study of fungi has also contributed towards an understanding of soil ecology. Greer is involved with a number of environmental impact assessments and environmental management projects and is currently managing the review of the Eastern Cape Biodiversity Conservation Plan.

Caroline Evans (*Project Manager*)

Ms Caroline Evans is a Senior Environmental Consultant based in the Grahamstown branch. She holds a BSc degree in Zoology and Environmental Science (with distinction) and a BSc Honours degree in Environmental Science (with distinction), both from Rhodes University. Caroline has completed accredited courses in environmental impact assessments and wetland assessments. Caroline's primary focuses include Project Management, the general Environmental Impact Assessment Process, Visual Impact Assessments and Wetland Impact Assessments. Examples of fields in which Caroline was the project manager and lead report writer include Wind Energy Facilities and the associated infrastructure (including powerlines), Solar PV, Waste Water Treatment Works, Housing Developments and Agricultural Developments. Her experience with wind energy facilities and associated infrastructure includes the project management and report writing for the Umsobomvu WEF, Dassiesridge WEF, Scarlet Ibis WEF, Albany WEF, Waaihoek WEF and the Great Kei WEF. Caroline is well versed in South African policy and legislation relating to development, particularly in the Eastern Cape Province. In addition, Caroline's project management experience has helped her gain knowledge and experience in the technical and financial management and coordination of large specialist teams, competent authority and stakeholder engagement, and client liaison.

1.2 DECLARATION

Role on Study Team	Declaration of independence
Report production	<ul style="list-style-type: none"> • I, Nicole Wienand, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amended Environmental Impact Assessment Regulations, 2017; • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this report are true and correct; and



	<ul style="list-style-type: none"> • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
<p>Report Reviewer & Final Sign-off</p>	<ul style="list-style-type: none"> • I, Dr Greer Hawley-McMaster, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amended Environmental Impact Assessment Regulations, 2017; • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this report are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



2. INTRODUCTION

1. (1) A specialist report prepared in terms of these Regulations must contain—
 - (c) an indication of the scope of, and the purpose for which, the report was prepared;
 - (cA) an indication of the quality and age of base data used for the specialist report;
 - (d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
 - (i) a description of any assumptions made and any uncertainties or gaps in knowledge;
 - (o) a description of any consultation process that was undertaken during the course of preparing the specialist report;
 - (p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
 - (q) any other information requested by the competent authority.

2.1 PROJECT DESCRIPTION

Sitrusrand Boerdery (Pty) Ltd., has proposed the clearance of approximately 19.8 hectares (ha) of indigenous vegetation for the cultivation of citrus orchards and the construction of associated farm infrastructure on Portion 472 of Farm 42 near Kirkwood, in the Eastern Cape Province. The proposed development triggers the need for a Basic Assessment (BA) Process as per the National Environmental Management Act (NEMA) (Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent amendments) and entails the following:

- The clearance of 19.8 ha of indigenous vegetation for the cultivation of citrus orchards;
- Upgrade and extension of existing farm access roads within the boundaries of the proposed citrus orchards; and
- The construction of a boundary fence and a loading area/shed.

CES has been appointed by Sitrusrand Boerdery (Pty) Ltd., to apply for Environmental Authorisation (EA) in terms of the above-mentioned regulations by means of conducting a BA Process, inclusive of the relevant specialist studies. This Ecological Impact Assessment forms part of the BA for the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

2.2 PROJECT LOCATION

The proposed Sitrusrand Dwarsleegte Farm Citrus Development is located on Portion 472 of Farm 42, approximately eight (8) km southwest of Kirkwood, in the Eastern Cape Province. This area falls within the jurisdiction of the Sundays River Valley Local Municipality (LM), seated in the Sarah Baartman District Municipality (SBDM) (Figure 1.1).

The study site can be accessed from Kirkwood via the R336 which links to the District Road (DR) 202151. Several unnamed gravel access roads linking to the DR 202151, can be utilised to gain access to the proposed citrus orchards (Figure 1.1).

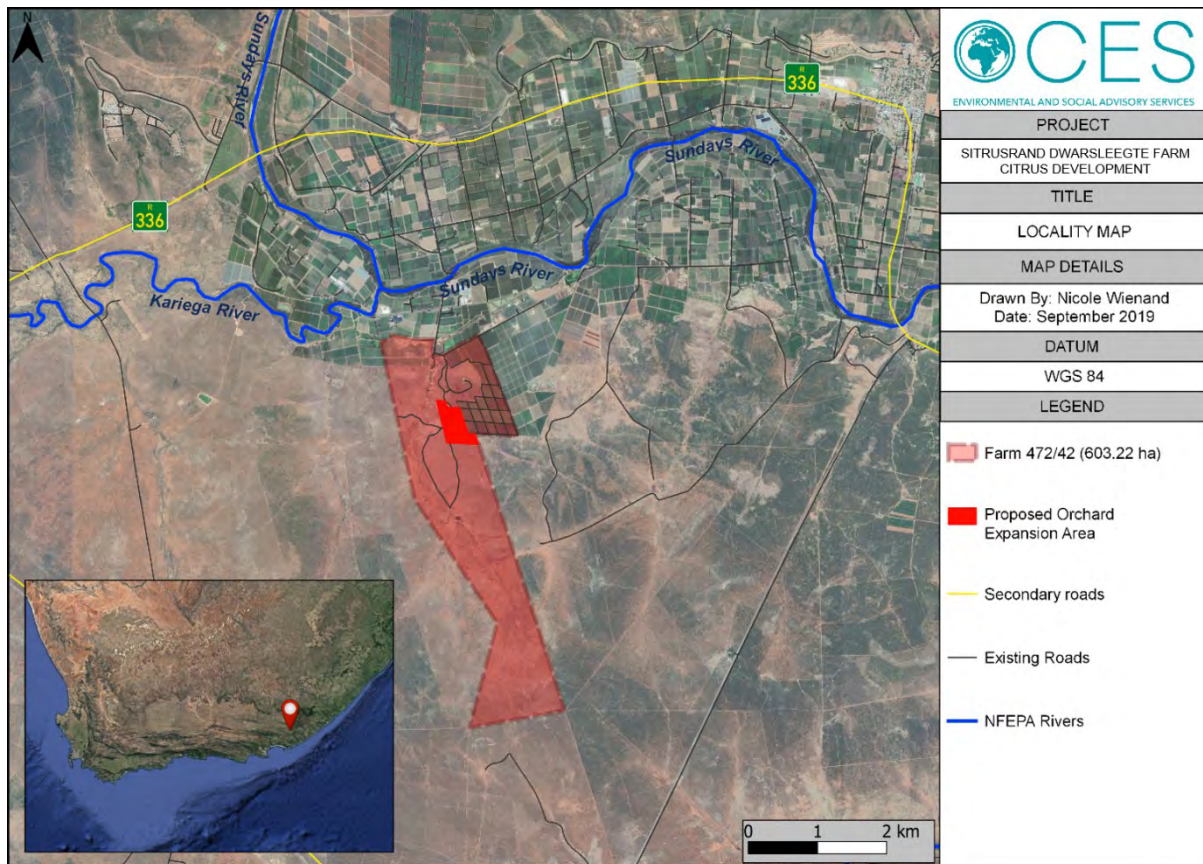


Figure 2.1: Locality map of the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

2.3 OBJECTIVES AND TERMS OF REFERENCE

The main objectives of this report is to determine the baseline terrestrial ecological environment of the study site and to assess the potential impacts the proposed development may have on the terrestrial habitat.

The following terms of reference were used for this study:

- Describe the study site in terms of land cover and terrestrial habitat. This will include a full desktop analysis of the fauna and flora.
- Review relevant legislation, policies, guidelines and standards.
- Conduct a site survey to determine the baseline ecological conditions of the study site. This will entail the identification of any Species of Conservation Concern (SCC), areas that may be susceptible to invasion by alien plant species, existing environmental degradation, and any environmentally sensitive aquatic aspects of the study site.
- Produce a sensitivity map that illustrates areas with significant development constraints.
- Describe the likely scope, scale and significance of direct and indirect positive and negative impacts resulting from the proposed development both in terms of the footprint and the immediate surrounding area during construction and operation, as well as the no-go option.
- Provide a detailed description of appropriate mitigation measures that could be adopted to reduce negative impacts for each phase of the project, where required.



- Identify any need for future permitting. **[NB: It is not the purpose of the study to comply with or apply for any permitting requirements at this stage.]**

2.4 APPROACH

The study site and surrounding areas were assessed using a two-phased approach. Firstly, a desktop and baseline assessment of the project area was conducted in terms of current vegetation classifications and biodiversity programmes and plans. Published literature on the ecology of the area was referenced in order to describe the study site in the context of the region and the Eastern Cape Province. The following documents/plans are referenced:

- SANBI National Vegetation Map (Mucina *et al.*, 2018);
- Council for Geoscience (2013);
- Soil and Terrain (SOTER) Database of South Africa (2008);
- Eastern Cape Biodiversity Conservation Plan (ECBCP, 2007);
- The Addo Biodiversity Spatial Plan (BSP) (SANParks, 2012);
- The National Freshwater Ecosystem Priority Areas (NFEPAs, 2011);
- The National Environmental Management: Biodiversity Act (NEM:BA), 2004: List of Threatened Ecosystems (2011);
- National Biodiversity Management: Biodiversity Act (NEM:BA) List of Threatened or Protected Species;
- The National Protected Areas Expansion Strategy (NPAES, 2010);
- Review of the SANBI Red Data List;
- International Union for Conservation of Nature (IUCN);
- Nature Conservation Ordinance (NCO);
- Plants of Southern Africa (POSA) – Quarter degree square level;
- National Biodiversity Management: Biodiversity Act (NEM:BA) National List of Invasive Species (2016); and
- Department of Agriculture, Forestry and Fisheries (DAFF) List of Protected Trees (2014).

A site visit was conducted on the 19th of June 2019. The purpose of the site visit was to conduct floral surveys and to identify the potential impacts the proposed development may have on the surrounding natural environment and to inform the significance of those impacts.

2.5 ASSUMPTIONS AND LIMITATIONS

This report is based on the information available at the time of compiling the report and, as a result, is subject to the following assumptions and limitations:

- The report is based on the project description and the site layout provided to CES by the Proponent;
- Descriptions of the natural and social environments are based on limited fieldwork and available literature;
- The report is pre-dominantly based on a combination of desktop and on-site analysis;



- It should be emphasised that, sampling could only be carried out at one stage in the annual or seasonal cycle – in this case winter, as this was the time available for the site inspection. As such, it is possible that some spring or summer flowering plant species may have gone undetected.
- Species of Conservation Concern (SCC) are difficult to find and identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCC will be found during construction and operation of the development. As such, should environmental authorisation for the proposed development be obtained, a comprehensive Floral Search and Rescue is recommended prior to vegetation clearance;
- It should be emphasised that information, as presented in this document, only has reference to the study site as indicated on the project maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

2.6 PUBLIC CONSULTATION

The Public Participation Process (PPP) followed to date has been described in detail in the Draft Basic Assessment Report. The Draft BAR, together with the Draft Ecological Impact Assessment Report, will be made available for a 30-day commenting and public review period. Any comments received on the Draft Ecological Impact Assessment Report will be included in the Final Ecological Impact Assessment Report.



3. ASSESSMENT METHODOLOGY

Appendix 6

Specialist Reports

1. (1) A specialist report prepared in terms of these Regulations must contain—
 - (e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;

The aim of the assessment was to identify areas of ecological importance and to evaluate these in terms of their conservation importance. In order to do so, the ecological sensitivity of the area was assessed and potential plant and animal Species of Conservation Concern (SCC) that may occur in habitats present in the area were identified. To a large extent, the condition and sensitivity of the vegetation also informed areas of high biodiversity. This study also aimed to identify areas of high sensitivity and those that may be subject to significant impacts as a result of the proposed development.

The approach used to determine the vegetation sensitivity of the study area is described below. Zones of low, moderate and highly sensitive areas were identified by the presence or absence of the following:

- Degree of disturbance and transformation;
- Presence of plant and faunal species of conservation concern;
- Vegetation types (which also constitute faunal habitats) of conservation concern;
- Areas of high biodiversity; and
- The presence of important process areas such as:
 - Ecological corridors
 - Topographical features (especially steep and rocky slopes that provide niche habitats for both plants and animals).

A Geographical Information System (GIS) map was then drawn up depicting the different zones of sensitivity using available aerial imagery and relating this to the information gathered from the field survey.

It is not the aim of this study to produce a complete list of all plant species occurring in the region, but rather to examine a representative sample. It is, however, important to note that areas of high sensitivity as well as SCC have been identified as far as possible, either from records from the site or a review of their habitat requirements, and whether or not these habitats occur within the site.

3.1 SPECIES OF CONSERVATION CONCERN

Data on the known distribution and conservation status for each potential plant SCC was obtained in order to develop a list of SCC. In general, these will be species that are already known to be threatened or at risk and which will be most affected by the proposed activity. SCC have been selected for conservation/protection by means of a combination of applicable



legislation, guidelines and conservation status lists. The following publications were utilised to cross reference conservation and protection statuses of various species:

- National Environmental Management: Biodiversity Act (No. 10 of 2004) - Chapter 4, Part 2;
- Endangered and Protected Flora in the 1974 Provincial Nature Conservation Ordinance (PNCO) – Schedule 3 and 4;
- 1976 List of Protected Trees (Government Gazette No. 9542 Schedule A) in the 1998 National Forest Act (NFA) as amended in November 2014; and
- SA Red Data List (<http://redlist.sanbi.org>).

The South African Red Data List of plants uses the internationally recognised IUCN Red List Categories and Criteria to measure a species risk of extinction.

Species that are afforded special protection and are protected by CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) are also regarded as SCC (see <http://www.cites.org/>).

3.2 SAMPLING PROTOCOL

The study area was inspected to evaluate vegetation composition and to provide more detailed information on the plant communities present. The aim of the site visit was to characterise and describe each vegetation community within the study site as well as identify areas of high sensitivity and species of conservation concern. Visible species within the study site were identified using plant identification books and other published literature. Vegetation types within the study area were assessed and surveyed and vegetation communities were then described according to the dominant species recorded from each type. These were mapped and assigned a sensitivity score.

The site inspection took into account the amount of time available for the study and limitations such as the seasonality of the vegetation.

3.3 VEGETATION MAPPING

The National Vegetation Map was initially published in 2006 in order to “provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before.” The map was developed using a wealth of data provided by a network of ecologists, biologists and conservation planners that make periodic contributions to the project. These contributions have allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. The SANBI Vegetation map (2018) informs finer scale bioregional plans and includes an additional 47 new vegetation units since its refinement in 2012.

This SANBI Vegetation map project has two main aims:

1. To determine the variation in units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and



2. To compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason, the collective expertise of vegetation scientists from various universities and state departments were harnessed to make this project as comprehensive as possible.

The map and accompanying book describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa.

This is compared to actual conditions of vegetation observed onsite during the site assessment through mapping from aerial photographs, satellite images, literature descriptions (e.g. SANBI and ECBCP) and related data gathered on the ground.

3.4 SENSITIVITY ASSESSMENT

The sensitivity assessment approach entails the identification of zones of high, moderate and low sensitivity according to a system developed by CES and used in numerous ecological studies. It must be noted that the sensitivity zonings in this study are based solely on ecological characteristics and social and economic factors have not been taken into consideration. The sensitivity analysis described here is based on twelve (12) criteria which are considered to be of importance in determining ecosystem and landscape sensitivity. The method predominantly involves identifying sensitive vegetation or habitat types, topography and land transformation, biodiversity patterns (hotspots) and biodiversity process areas (ecological infrastructure and corridors) (Table 3.1).

Although very simple, this method of analysis provides a good, yet conservative and precautionary assessment of the ecological sensitivity.

Table 3.1: Criteria used for the analysis of the sensitivity of the area.

CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
1	Topography	Level or even	Undulating; fairly steep slopes	Complex and uneven with steep slopes
2	Vegetation - Extent or habitat type in the region	Extensive	Restricted to a particular region / zone	Restricted to a specific locality / site
3	Conservation status of fauna / flora or habitats	Well conserved independent of conservation value	Not well conserved, moderate conservation value	Not conserved - has a high conservation value
4	Species of special concern - Presence and number	None, although occasional regional endemics	No endangered or vulnerable species, some indeterminate or rare endemics	One or more endangered and vulnerable species, or more than 2 endemics or rare species



CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
5	Habitat fragmentation leading to loss of viable populations	Extensive areas of preferred habitat present elsewhere in region not susceptible to fragmentation	Reasonably extensive areas of preferred habitat elsewhere and habitat susceptible to fragmentation	Limited areas of this habitat, susceptible to fragmentation
6	Biodiversity contribution	Low diversity or species richness	Moderate diversity, and moderately high species richness	High species diversity, complex plant and animal communities
7	Erosion potential or instability of the region	Very stable and an area not subjected to erosion	Some possibility of erosion or change due to episodic events	Large possibility of erosion, change to the site or destruction due to climatic or other factors
8	Rehabilitation potential of the area or region	Site is easily rehabilitated	There is some degree of difficulty in rehabilitation of the site	Site is difficult to rehabilitate due to the terrain, type of habitat or species required to reintroduce
9	Disturbance due to human habitation or other influences (alien invasive species)	Site is very disturbed or degraded	There is some degree of disturbance of the site	The site is hardly or very slightly impacted upon by human disturbance
10	Ecological function in the landscape (corridor, niche habitats)	Low ecological function. No corridors or niche habitats	N/A (There are NO moderate ecological functions. It is considered either high or low)	High ecological function. Portions of entire sections of the site contains corridors or niche habitats
11	Ecological services (food, water filter, grazing, etc.)	Low to no ecological services on site	Some sections of the site contains ecological services	Most of the site contains ecological services
12	Aquatic environments (Rivers, wetlands, drainage line etc)	Outside of the 32m watercourse buffer. Outside of the 500m wetland buffer	Within 32m of the watercourse. Within 500m of a natural wetland, but outside of 50m wetland buffer	Development within the watercourse.

A sensitivity map was developed with the aid of a satellite image so that the sensitive regions and vegetation types could be plotted (see Chapter 7). The following was also taken into account:

3.5 BIODIVERSITY REGULATORS

National:

The National Environmental Management: Biodiversity Act, (Act No. 10 OF 2004) (NEM:BA) provides a National List of Ecosystems that are threatened and in need of protection – GN



1002 of 2011, as well as a list of Threatened or Protected Species (TOPS). If applicable to the study site, these areas and species are to be included in the sensitivity map.

Provincial:

Eastern Cape Biodiversity Conservation Plan (ECBCP) (2007) is a detailed, low-level conservation mapping tool for land-use planning purposes. The aim of ECBCP is to map critical biodiversity areas through a systematic conservation planning process. The current biodiversity plan includes the mapping of priority aquatic features, land-use pressures, and critical biodiversity areas and develops guidelines for land and resource-use planning and decision-making.

The main outputs of the ECBCP are “*critical biodiversity areas*” (CBAs), which are allocated the following management categories:

CBA 1 = Maintain in a natural state

CBA 2 = Maintain in a near-natural state

ECBCP maps the CBAs based on extensive biological data and input from key stakeholders. Although ECBCP is mapped at a finer scale than the National Spatial Biodiversity Assessment (Driver *et al.*, 2005) it is still, for the large part, inaccurate and “course”. Therefore, it is imperative that the status of the environment, for any proposed development first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007). It is also important to note that in absence of any other biodiversity plan, the ECBCP has been adopted by the Provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) as a systematic biodiversity plan for the Eastern Cape Province.

Local:

The Addo Biodiversity Sector Plan (BSP) was produced for four of the nine local municipalities within the Sarah Baartman District Municipality, namely the Blue Crane Route, Ikwezi, Sundays River Valley and Ndlambe Local Municipalities. These municipalities harbour 44.7% of South Africa’s Albany Thicket Biome and form part of one of the country’s fastest expanding protected areas – the Addo Elephant National Park. The BSP provides critical biodiversity information, including spatial data, on the regions Protected Areas, Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and Land Cover classes. It thus serves as an important tool for mainstreaming important biodiversity areas and guiding land-use planning, environmental assessments, land-use authorisation, decision making and natural resources management, promoting more sustainable development.

3.6 PROTECTED AREAS

The National Environmental Management Protected Areas Act (Act No 57 of 2003; NEMPAA) was developed to provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes.



3.7 ECOLOGICAL IMPACT ASSESSMENT

3.7.1 Impact rating methodology

To ensure a balanced and objective approach to assessing the significance of potential impacts, a standardized rating scale was adopted which allows for the direct comparison of specialist studies. This rating scale has been developed in accordance with the requirements outlined in Appendix 1 of the EIA Regulations (2014 and subsequent 2017 amendments).

Impact significance pre-mitigation

This rating scale adopts four key factors to determine the overall significance of the impact prior to mitigation:

1. **Temporal Scale:** This scale defines the duration of any given impact over time. This may extend from the short-term (less than 5 years, equivalent to the construction phase) to permanent. Generally, the longer the impact occurs the greater the significance of any given impact.
2. **Spatial Scale:** This scale defines the spatial extent of any given impact. This may extend from the local area to an impact that crosses international boundaries. The wider the impact extends the more significant it is considered to be.
3. **Severity/Benefits Scale:** This scale defines how severe negative impacts would be, or how beneficial positive impacts would be. This negative/positive scale is critical in determining the overall significance of any impacts.
4. **Likelihood Scale:** This scale defines the risk or chance of any given impact occurring. While many impacts generally do occur, there is considerable uncertainty in terms of others. The scale varies from unlikely to definite, with the overall impact significance increasing as the likelihood increases.

For each impact, these four scales are ranked and assigned a score. These scores are combined and used to determine the overall impact significance prior to mitigation.

Table 3.2: Pre-mitigation Evaluation Criteria

Temporal Scale		
Short term	Less than 5 years	
Medium term	Between 5-20 years	
Long term	Between 20 and 40 years (a generation) and from a human perspective also permanent	
Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there	
Spatial Scale		
Localised	At a localised scale and a few hectares in extent	
Study Area	The proposed site and its immediate environs	
Regional	District and Provincial level	
National	Country	
International	Internationally	
Severity Scale	Severity	Benefit
Slight	Slight impacts on the affected system(s) or party(ies)	Slightly beneficial to the affected system(s) and party(ies)



Moderate	Moderate impacts on the affected system(s) or party(ies)	Moderately beneficial to the affected system(s) and party(ies)
Severe/ Beneficial	Severe impacts on the affected system(s) or party(ies)	A substantial benefit to the affected system(s) and party(ies)
Very Severe/ Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) and party(ies)
Likelihood Scale		
Unlikely	The likelihood of these impacts occurring is slight	
May Occur	The likelihood of these impacts occurring is possible	
Probable	The likelihood of these impacts occurring is probable	
Definite	The likelihood is that this impact will definitely occur	

* In certain cases, it may not be possible to determine the severity of an impact thus it may be determined: Don't know/Can't know.

Table 3.3: Description of Overall Significance Rating

Significance Rate		Description
LOW NEGATIVE	LOW POSITIVE	Impacts of low significance are typically acceptable impacts for which mitigation is desirable but not essential. The impact by itself is insufficient, even in combination with other low impacts, to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural environment or on social systems.
MODERATE NEGATIVE	MODERATE POSITIVE	Impacts of moderate significance are impacts that require mitigation. The impact is insufficient by itself to prevent the implementation of the project but in conjunction with other impacts may prevent its implementation. These impacts will usually result in a negative medium to long-term effect on the natural environment or on social systems.
HIGH NEGATIVE	HIGH POSITIVE	Impacts that are rated as being high are serious impacts and may prevent the implementation of the project if no mitigation measures are implemented, or the impact is very difficult to mitigate. These impacts would be considered by society as constituting a major and usually long-term change to the environment or social systems and result in severe effects.
VERY HIGH NEGATIVE	VERY HIGH POSITIVE	Impacts that are rated as very high are very serious impact which may be sufficient by itself to prevent the implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects or very beneficial effects.

Impact significance post-mitigation

Once mitigation measures are proposed, the following three factors are then considered to determine the overall significance of the impact after mitigation.

- 1. Reversibility Scale:** This scale defines the degree to which an environment can be returned



to its original/partially original state.

2. **Irreplaceable loss Scale:** This scale defines the degree of loss which an impact may cause.
3. **Mitigation potential Scale:** This scale defines the degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 3.4: Post-mitigation Evaluation Criteria

Reversibility	
<i>Reversible</i>	<i>The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.</i>
<i>Irreversible</i>	<i>The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.</i>
Irreplaceable loss	
<i>Resource will not be lost</i>	<i>The resource will not be lost/destroyed provided mitigation measures are implemented.</i>
<i>Resource will be partly lost</i>	<i>The resource will be partially destroyed even though mitigation measures are implemented.</i>
<i>Resource will be lost</i>	<i>The resource will be lost despite the implementation of mitigation measures.</i>
Mitigation potential	
<i>Easily achievable</i>	<i>The impact can be easily, effectively and cost effectively mitigated/reversed.</i>
<i>Achievable</i>	<i>The impact can be effectively mitigated/reversed without much difficulty or cost.</i>
<i>Difficult</i>	<i>The impact could be mitigated/reversed but there will be some difficulty in ensuring effectiveness and/or implementation, and significant costs.</i>
<i>Very Difficult</i>	<i>The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.</i>

The following assumptions and limitations are inherent in the rating methodology:

- **Value Judgements:** Although this scale attempts to provide a balance and rigor to assessing the significance of impacts, the evaluation relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.
- **Cumulative Impacts:** These affect the significance ranking of an impact because it considers the impact in terms of both on-site and off-site sources. This is particularly problematic in terms of impacts beyond the scope of the proposed development and the EIA. For this reason, it is important to consider impacts in terms of their cumulative nature.
- **Seasonality:** Certain impacts will vary in significance based on seasonal change. Thus, it is difficult to provide a static assessment. Seasonality will need to be implicit in the temporal scale and, with management measures being imposed accordingly (e.g. dust suppression measures being implemented during the dry season).



4. RELEVANT LEGISLATION

Environmental legislation relevant to the proposed development is summarised in Table 4.1 below. Biodiversity Plans and Programmes are discussed in Chapter 5 where they are used to describe the desktop ecological conditions of the study area.

4.1 THE CONSTITUTION (ACT 108 OF 1996)

The Constitution of the Republic of South Africa is the supreme law of the land. As a result, all laws, including those pertaining to this Management Plan, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:

- a) *To an environment that is not harmful to their health or well-being; and*
- b) *To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:

 - i. *Prevent pollution and ecological degradation;*
 - ii. *Promote conservation; and*
 - iii. *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.**

Relevance to the proposed development

- Obligation to ensure that the proposed activity will not result in pollution and ecological degradation; and
- Obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development.

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) (ACT 108 OF 1998), AND ITS SUBSEQUENT AMENDMENTS, AND THE NEMA AMENDED EIA REGULATIONS (GNR. 326) (2017)

Relevant Sections of the Act: Section 2, 23, 24, 24-1, 28-33

- Application of the NEMA principles (e.g. need to avoid or minimise impacts, use of the precautionary principle, polluter pays principle, etc.)
- Application of fair decision-making and conflict management procedures are provided for in NEMA.
- Application of the principles of Integrated Environmental Management and the consideration, investigation and assessment of the potential impact of existing and planned activities on the environment; socio-economic conditions; and the cultural heritage.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

In addition NEMA introduced a framework for environmental impact assessments, the Amended EIA Regulations (2017). The NEMA EIA Regulations aim to avoid detrimental environmental impacts



through the regulation of specific activities that cannot commence without prior environmental authorisation. Authorisation either requires a Basic Assessment or a Full Scoping and Environmental Impact Assessment, depending on the type of activity. These assessments specify mitigation and management guidelines to minimise negative environmental impacts and optimise positive impacts.

Relevance to the proposed development

- An application for Environmental Authorisation (as triggered by the Amended EIA Regulations) has been submitted to the Competent Authority (i.e. DEDEAT).
- In terms of Section 28, every person who causes; has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent pollution or rectify the damage caused – The undertaking of a specialist study, in this case an Ecological Impact study in order to identify potential impacts on the ecological environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA.
- This report complies with Appendix 6 of the Amended Environmental Impact Assessment Regulations (GNR. 326 of 2017) as regulated by the National Environmental Management Act (Act 107 of 1998 and amended in 2014; NEMA), which cover the requirements of the content of a Specialist Report.
- The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA.
- The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.

4.3 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (ACT 10 OF 2004), AND ITS SUBSEQUENT AMENDMENTS - THREATENED ECOSYSTEMS; THREATENED AND PROTECTED SPECIES; ALIEN INVASIVE SPECIES REGULATIONS, 2014.

The National Environmental Management: Biodiversity Act (NEMBA), No. 10 of 2004, aims to assist with the management and conservation of South Africa's biological diversity through the use of legislated planning tools. These planning tools include the declaration of bioregions and the associated bioregional plans as well as other mechanisms for managing and conserving biodiversity.

The objectives of the Act include inter alia:

To provide for:

- The management and conservation of biological diversity within the Republic and of the components of such biological diversity;
- The use of indigenous biological resources in a suitable manner;
- The fair and equitable sharing of benefits arising from bio-prospecting of genetic material derived from indigenous biological resources; and
- To give effect to ratified international agreements relating to biodiversity which are binding on the Republic.
- To provide for co-operative governance in biodiversity management and conservation; and



- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of the Act.

In addition to this, Sections 50-62 of the Act provide details relating to the protection of threatened or protected ecosystems and species, while Sections 63-77 of the Act provide details relating to alien and invasive species with the purpose of preventing their introduction and spread, managing, controlling and eradicating of alien and invasive species.

The NEMBA Alien and Invasive Species List (Government Notice 599 of 2014) lists Alien and Invasive species that are regulated by the NEMBA Alien and Invasive Species Regulations (Government Notice 98 of 2014).

Relevance to the proposed development

- The impacts of the proposed development on threatened ecosystems must be assessed;
- The study site does not occur directly within a threatened or protected ecosystem as per NEMBA. However, Albany Alluvial Vegetation (an ecosystem classified as Endangered) is located approximately 1.1 km north of the study site.
- No TOPS species may be removed or damaged without a permit; and
- Any alien vegetation which occurs on site, must be cleared using the appropriate method.

4.4 CONSERVATION OF AGRICULTURAL RESOURCES ACT, (ACT 43 OF 1983).

The Conservation of Agricultural Resources Act, No. 43 of 1983 aims to control over-utilisation of the natural agricultural resources to promote the conservation of soil, water sources and vegetation through the combat of weeds and invader plants. Regulations 15 and 16 under this Act, which relate problem plants were amended in March 2001.

Relevance to the proposed development

- Any alien vegetation which occurs on site, must be cleared using the appropriate method.

4.5 NATIONAL FOREST ACT (ACT 84 OF 1998) AND ITS SUBSEQUENT AMENDMENTS.

The NFA provides the legal framework for the protection and sustainable use of South Africa's indigenous forests. Any area that has vegetation which is characterised by a closed and contiguous canopy and under storey plant establishment is defined as a 'forest' and as a result falls under the authority of the Department of Agriculture, Forestry and Fisheries (DAFF): Forestry sector. The Act makes provision for:

- Prohibition on destruction of trees in natural forests
- Prohibition on destruction of protected trees



Relevance to the proposed development

- No forest patches were identified within the construction footprint. The nearest forest patch is situated approximately 28.2 km north east of the study site; and
- No Protected Trees species were identified on site.

4.6 NATIONAL WATER ACT (ACT 36 OF 1998)

The purpose of the Act is “to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors—

- (a) meeting the basic human needs of present and future generations;
- (b) promoting equitable access to water;
- (c) redressing the results of past racial and gender discrimination;
- (d) promoting the efficient, sustainable and beneficial use of water in the public interest;
- (e) facilitating social and economic development;
- (f) providing for growing demand for water use;
- (g) protecting aquatic and associated ecosystems and their biological diversity;
- (h) reducing and preventing pollution and degradation of water resources;
- (i) meeting international obligations;
- (j) promoting dam safety;
- (k) managing floods and droughts.”

Section 21 of the NWA describes activities defined as a water use under the Act. These activities may only be undertaken subject to the application for, and issue of, a Water Use License (WUL) or general authorisation (GA). Water use activities include—

- (a) taking water from a water resource;
- (b) storing water;
- (c) impeding or diverting the flow of water in a watercourse;
- (d) engaging in a stream flow reduction activity contemplated in section 36;
- (e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- (h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- (i) altering the bed, banks, course or characteristics of a watercourse;
- (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- (k) using water for recreational purposes.”

Relevance to the proposed development

- Construction within the 100m regulatory area of a river or drainage line or within the 500m regulatory area a wetland, will require a water use authorisation (WUA).
- According to Section 19(1) of the NWA, “an owner of land, a person in control of land or a person who occupies or uses the land on which—



- *Any activity or process is or was performed or undertaken; or*
 - *Any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.”*
- Appropriate measures must be taken to prevent the pollution of water courses and other water resources and riparian zones must be protected.

4.7 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS AMENDMENT ACT (NO. 31 OF 2004)

The purpose of this Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

Relevance to the proposed development

- The proposed site is located within an informal protected area – the Voetpadskloof Game Farm. The site is also located within 8.2 km of the Addo Elephant National Park and 6.5 km of an NPAES Focus Area.



5. DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

5.1 CLIMATE

The information provided herewith is based on the climate data for Kirkwood – the nearest urban area in proximity to the project area. Kirkwood receives an average of around 315 mm of rain per annum, with most of the rainfall occurring in the summer months. Rainfall peaks in March (44 mm), while the least rainfall occurs during July (13 mm) (Figure 5.1 – lower left). Mean monthly temperatures range between 20.5°C in winter (July) to 29.7°C in summer (February). The coldest temperatures are recorded for the month of July, when average temperatures drop to as low as 5.6°C during the night (Figure 5.1 – lower right).

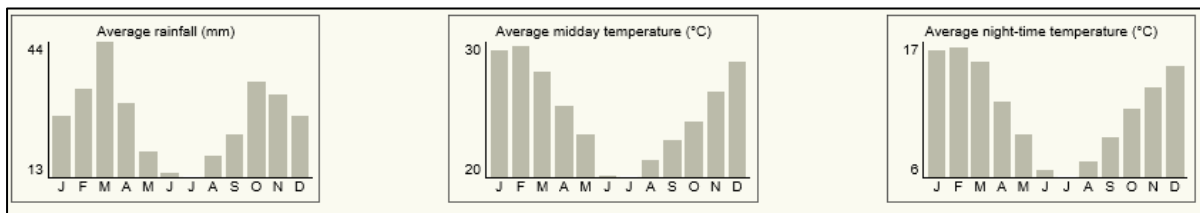


Figure 5.1 Graphs (from left to right) showing the average monthly rainfall; average monthly midday temperature; and average monthly night-time temperatures for Kirkwood (SA Explorer, 2017).

5.2 TOPOGRAPHY

The topography of the broader area can be described as low, undulating hills surrounding the flood plain of the Sundays River. The study area itself is relatively flat, decreasing gradually in elevation towards to the west as a result of the incision by the drainage line (Figure 5.2). The average slope of the study site ranges from -3.6% to 3.0% (Figure 5.3 and 5.4).

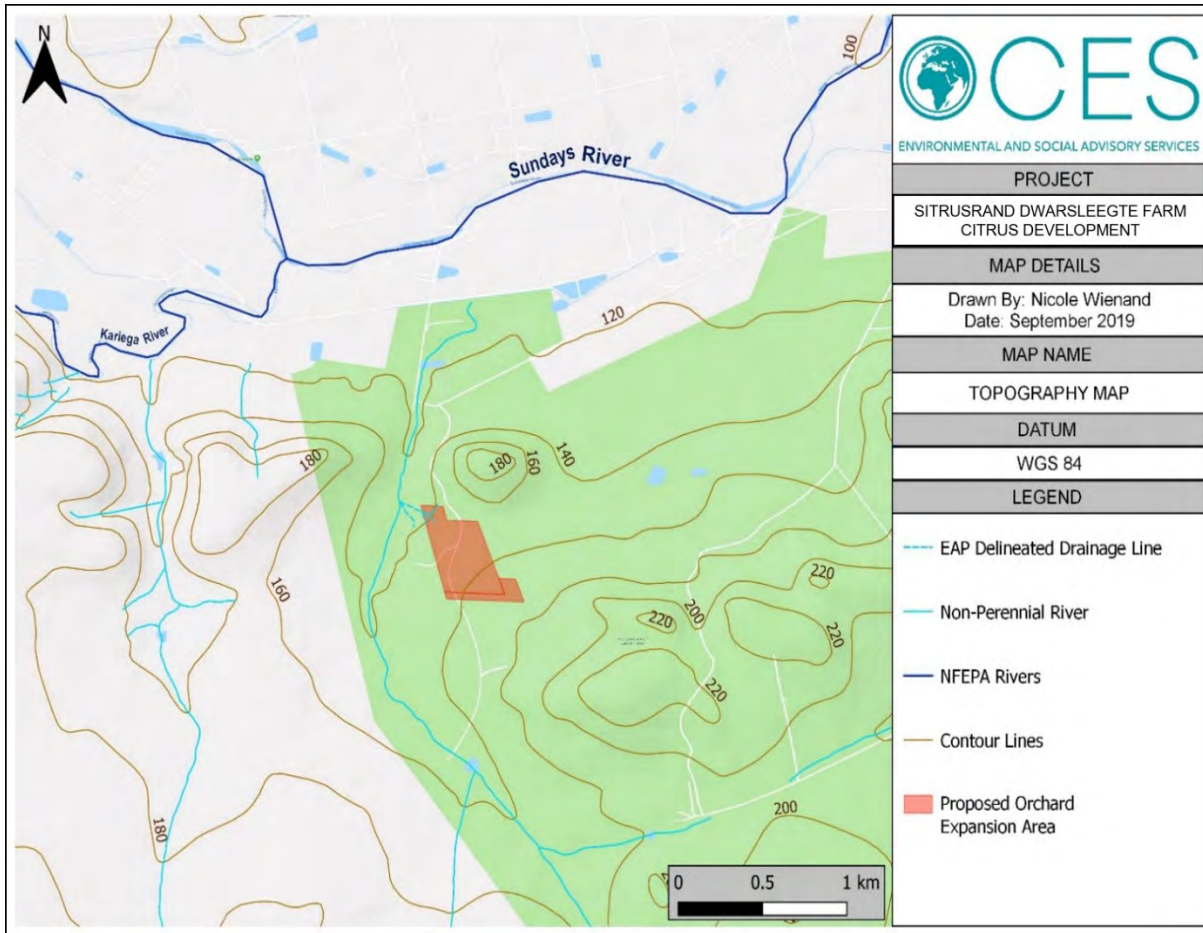


Figure 5.2 Topography of the study area.



Figure 5.3: Elevation profile of the study site from north to south.



Figure 5.4: Elevation profile of study site from east to west.

5.3 GEOLOGY AND SOILS

The soils within the study area are classified as Ferric Luvisols (Figure 5.5) (SOTER, 1995). Luvisols are characterised by mixed mineralogy, high nutrient content, and good drainage, making them particularly suitable for agriculture. They typically form in cool temperate to warm Mediterranean climates on flat or gently sloping landscapes. Luvisols are characterised by a lower layer consisting of mixed clay accumulation containing high levels of nutrient ions such



as calcium, magnesium, sodium or potassium overlaid by a leached layer devoid of clay and iron-bearing minerals. An accumulation of humus typically forms the surface layer of Luvisols. Ferric Luvisols contain significant levels of iron (Encyclopedia Britannica, 2019).

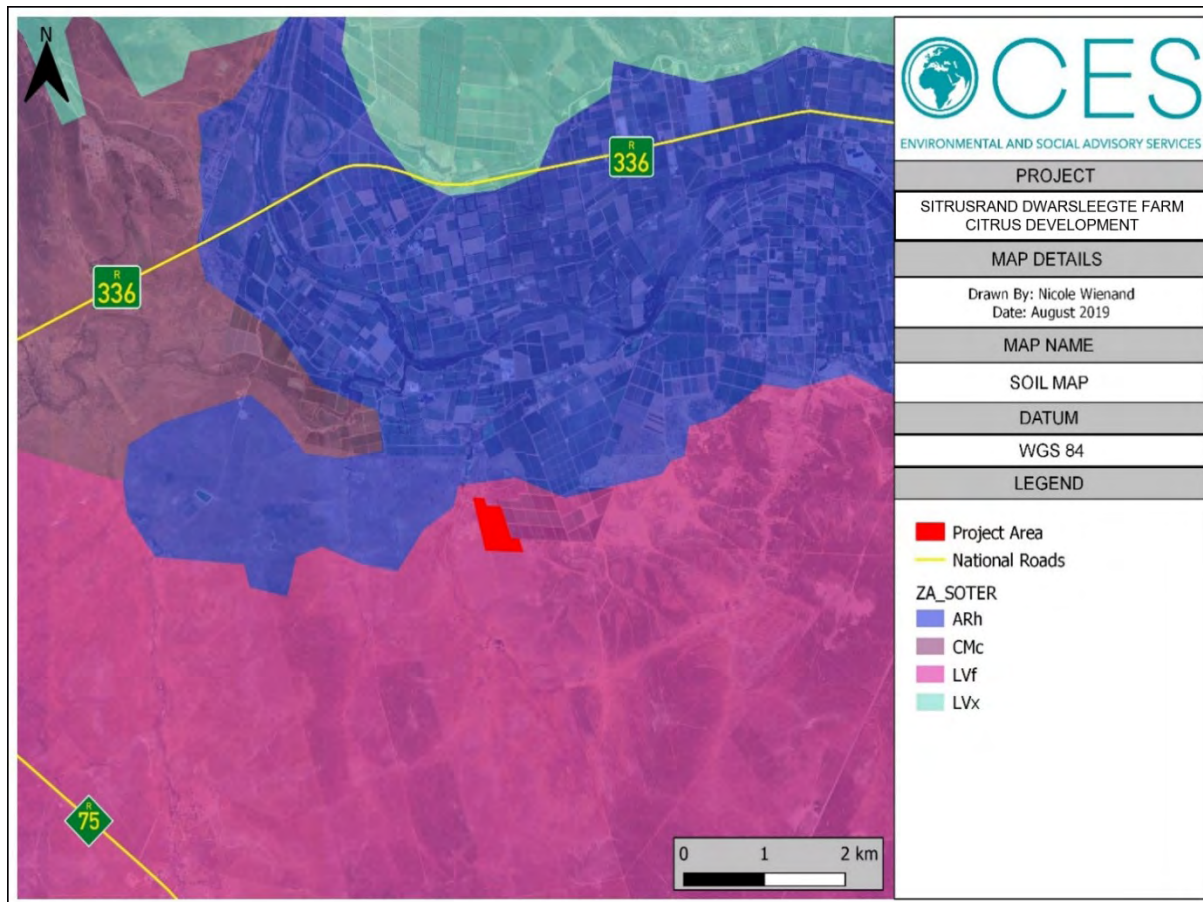


Figure 5.5: Soils of the study area.

The geology underlying the study area consists of sedimentary deposits of the Kirkwood Formation, one of four formations belonging to the Uitenhage Group of the Algoa Basin, in the Eastern Cape Province of South Africa. The Kirkwood Formation reaches a thickness of 2 000 meters in parts of the basin and consists of porous and permeable, coarse- to medium-grained lithic sandstones interbedded with red and greyish-green siltstones and mudrocks. The depositional environment of the Kirkwood Formation is that of a fluvial setting, with point-bar sand deposits, overbank mud accumulations and subaerial exposure of recently deposited sediments.

The Kirkwood Formation is regarded as one of the most fossil-rich formations of the Late Jurassic to Early Cretaceous period in South Africa, containing large fragments of wood including whole charred and silicified fossil tree trunks, ferns, cycads, and conifers, as well as vertebrate fragments and freshwater bivalve shells. Marine and brack-water microfossils found within a grey shale of a borehole section, suggests a possible marine incursion into the Algoa Basin (Johnson et al., 2006).

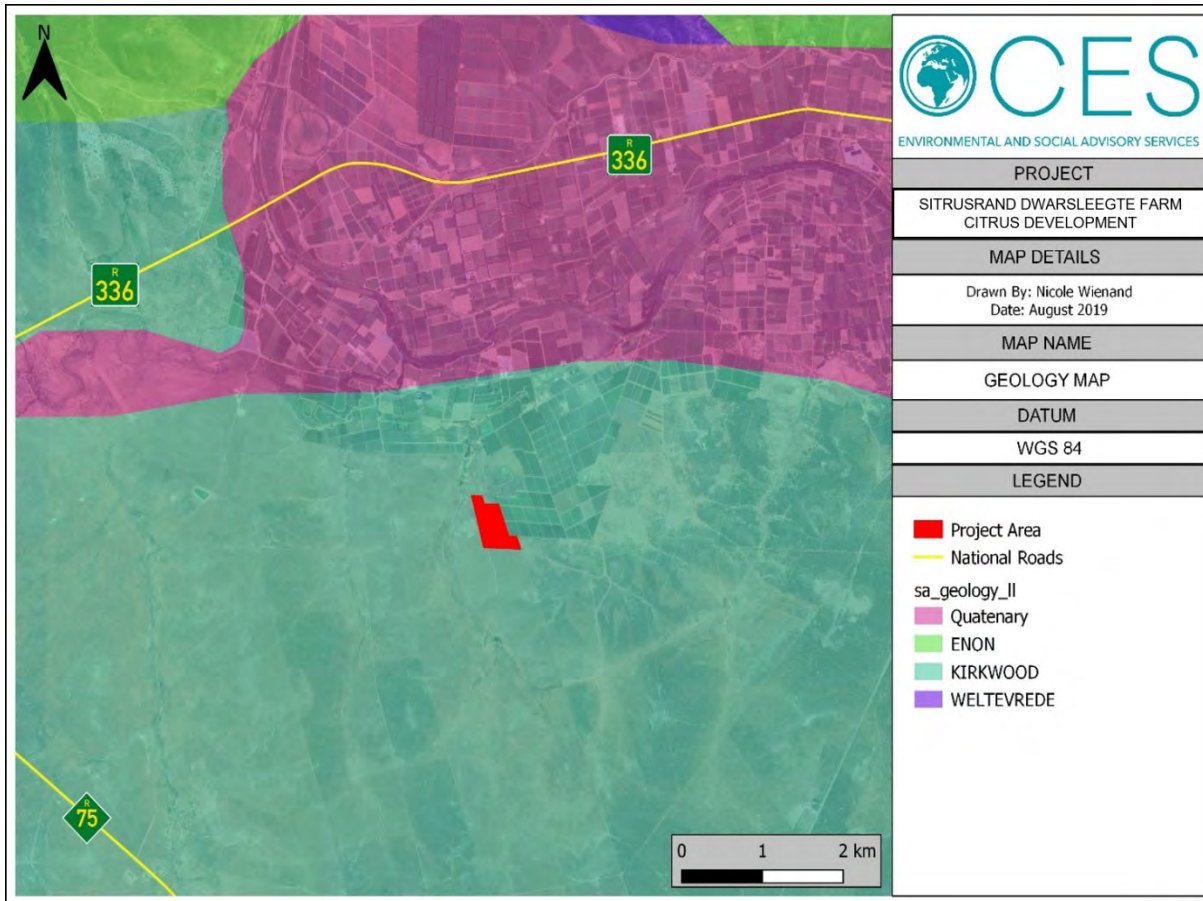


Figure 5.6: The underlying geology of the study site.

5.4 SURFACE WATER FEATURES

Figure 5.7 below illustrates the general hydrology of the area surrounding the study site. No NFEPA rivers or wetlands occur within the boundaries of the study site, however a drainage line traverses the north-west corner of the study site. The Sundays River flows approximately 1.68 km north of the study site. The proposed Sitrusrand Dwarsleegte Farm Citrus Development site falls within the N40C Quaternary Catchment of the Mzimvubu to Tsitsikama Water Management Area (WMA 7).

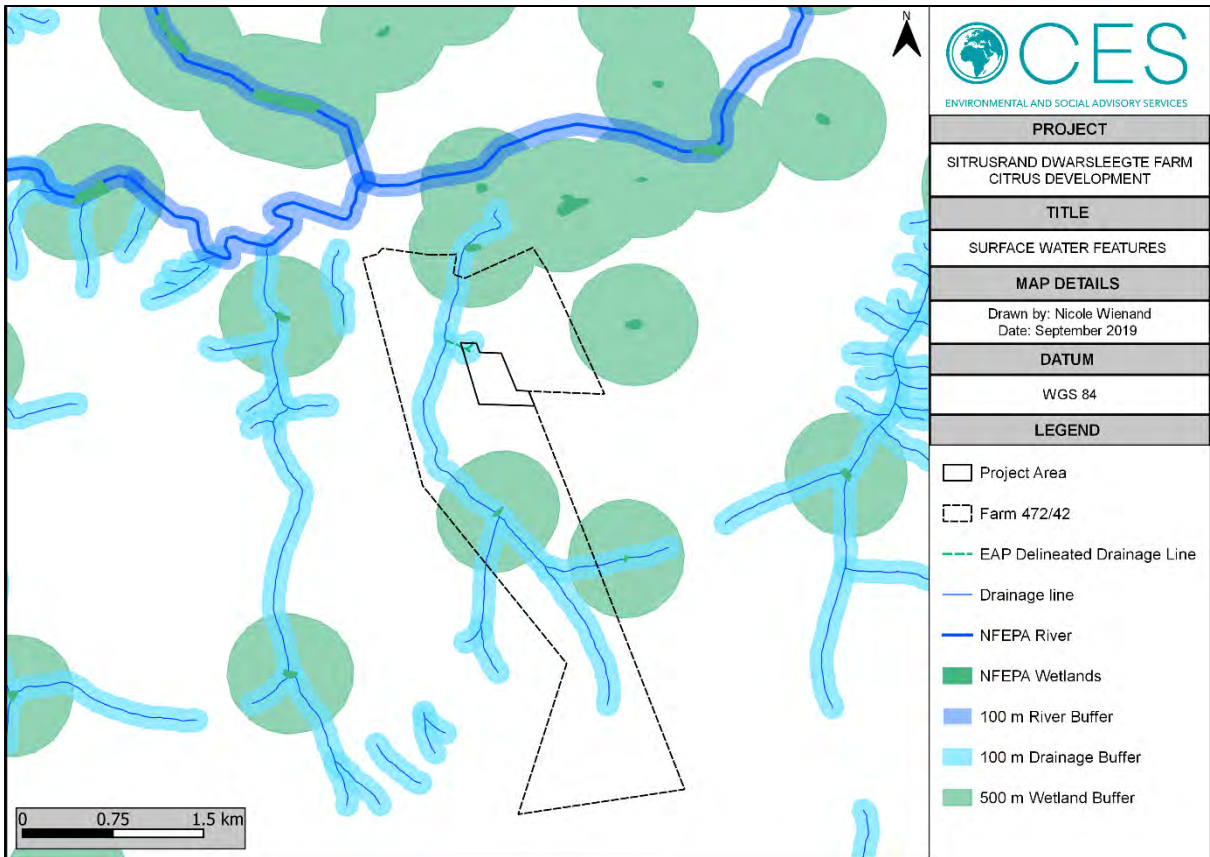


Figure 5.7: Surface water features within and surrounding the proposed study site



Plate 5.1: Drainage line traversing the north western boundary of the project area.



5.5 LAND COVER

The South African National Land-Cover Map (2014) provides important information for a wide range of landscape planning, inventory and management activities. The recent global availability of Landsat 8 imagery offered the opportunity to create a new, national land-cover dataset for South Africa, circa 2013-14, replacing and updating the previous 1994 and 2000 South African National Landcover datasets.

According to the SA National Land-Cover Map (2014), the study site is located within grassland with minor portions of the boundary of the proposed site located within woodland/open bushland and forest plantation (mature trees) (Figure 5.8).

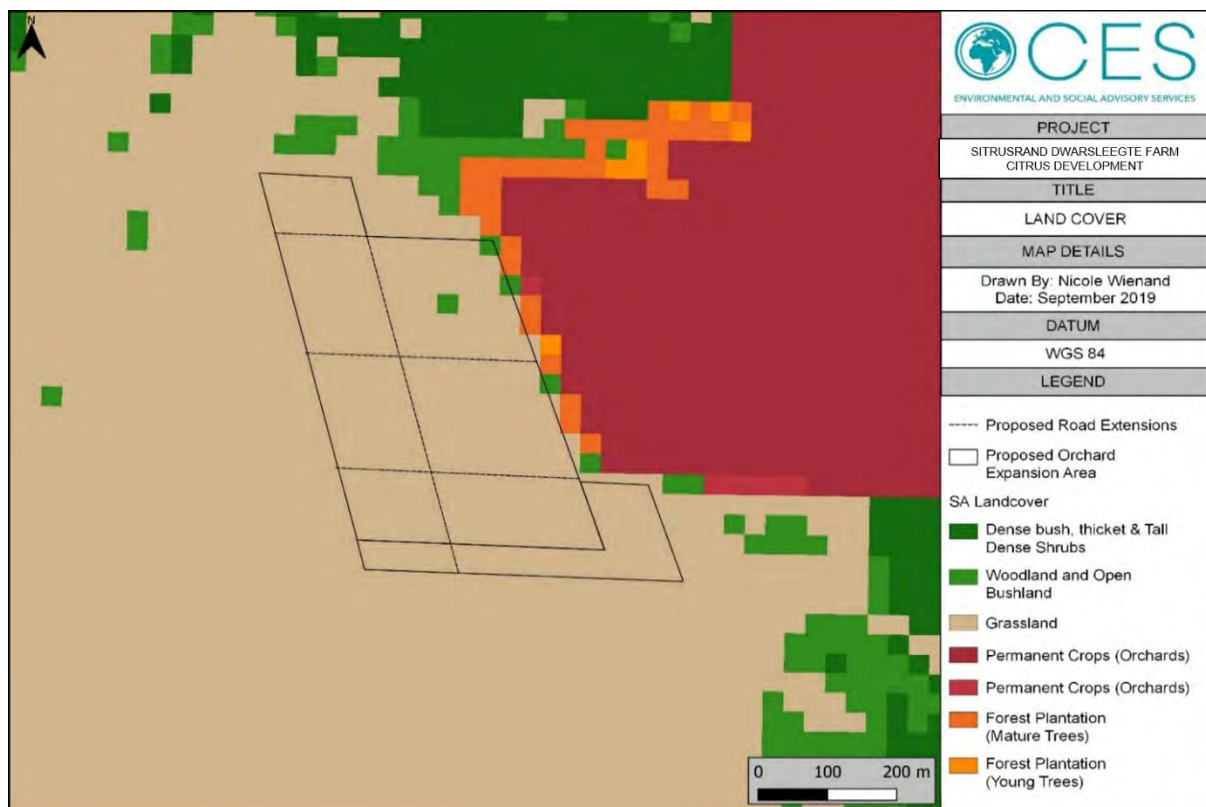


Figure 5.8: DEA Land Cover of the project area.

Table 5.1: Land-cover classes for the area within and surrounding the study site.

Class Number	Class Name	Land Cover description
5	Dense Bush, Thicket & Tall Dense Shrubs	Natural / semi-natural tree and / or bush dominated areas, where typically canopy heights are between 2 - 5 m, and canopy density is typically > ± 75%, but may include localised sparser areas down to ± 60% ²² . Includes dense bush, thicket, closed woodland, tall, dense shrubs, scrub forest and mangrove swamps. Can include self-seeded bush encroachment areas if sufficient canopy density.
6	Woodland and Open Bushland	Natural / semi-natural tree and / or bush dominated areas, where typically canopy heights are between ± 2 - 5 m, and canopy densities typically between 40 - 75%, but may include localised sparser areas down to ± 15 - 20 % ²⁸ . Includes sparse – open bushland and woodland, including transitional wooded grassland areas. Can include self-seeded bush encroachment areas if canopy density is within indicated range. In the arid western regions (i.e. Northern Cape), this cover class may be associated with a transitional bush /



		shrub cover that is lower than typical Open Bush / Woodland cover but higher and/or more dense than typical Low Shrub cover.
7	Grassland	Natural / semi-natural grass dominated areas, where typically the tree and / or bush canopy densities are typically < ± 20 %, but may include localised denser areas up to ± 40 %, (regardless of canopy heights). Includes open grassland, and sparse bushland and woodland areas, including transitional wooded grasslands. May include planted pasture (i.e. grazing) if not irrigated. Irrigated pastures will typically be classified as cultivated, and urban parks and golf courses etc under urban.
16	Permanent Crops (Orchards)	Cultivated lands used primarily for the production of both rain-fed and irrigated permanent crops for commercial markets. Includes both tree, shrub and non-woody crops, such as citrus, tea, coffee, grapes, lavender and pineapples etc. In most cases the defined cultivated extent represents the actual cultivated or potentially extent. NDVI-modelled sub-divisions, based on seasonal NDVI maximum and standard deviation ranges, which can be used a qualitative indications levels of cultivation activity, crop rotations and / or productivity, with "low" representing areas of low maximum biomass growth and least seasonal variation; and "high" representing areas of high maximum biomass growth and greatest seasonal variation.
17		
32	Forest Plantations: Mature Trees	Planted forestry plantations used for growing commercial timber tree species. The class represents mature tree stands which have approximately 70% or greater tree canopy closure (regardless of canopy height), on all the multi-date Landsat images in the 2013-14 analysis period. The class includes spatially smaller woodlots and windbreaks with the same cover characteristics.
33	Forest Plantations: Young Trees	Planted forestry plantations used for growing commercial timber tree species. The class represents young tree stands which have approximately 40 - 70% tree canopy closure (regardless of canopy height), on all the multi-date Landsat images in the 2013-14 analysis period. The class includes spatially smaller woodlots and windbreaks with the same cover characteristics. Note that young saplings are very difficult to identify on 30 metre resolution Landsat imagery if the actual tree canopy cover density is below ± 30 - 40%, because the background cover, for example, grassland, then dominates the spectral characteristics in that pixel area.

The Addo BSP Land Cover Map (2012) provides key information for a wide range of landscape planning, inventory and management activities. According to the Addo BSP Land Cover Map (2012), the study site is located within an area classified as degraded, largely surrounded by agricultural lands (Figure 5.9). The site visit confirmed the desktop findings of both the DEA and Addo Land Cover spatial data: the vegetation of the study site resembles that of a degraded grassland/thornveld interspersed by fragmented bush clumps of remnant Sundays Arid Thicket.

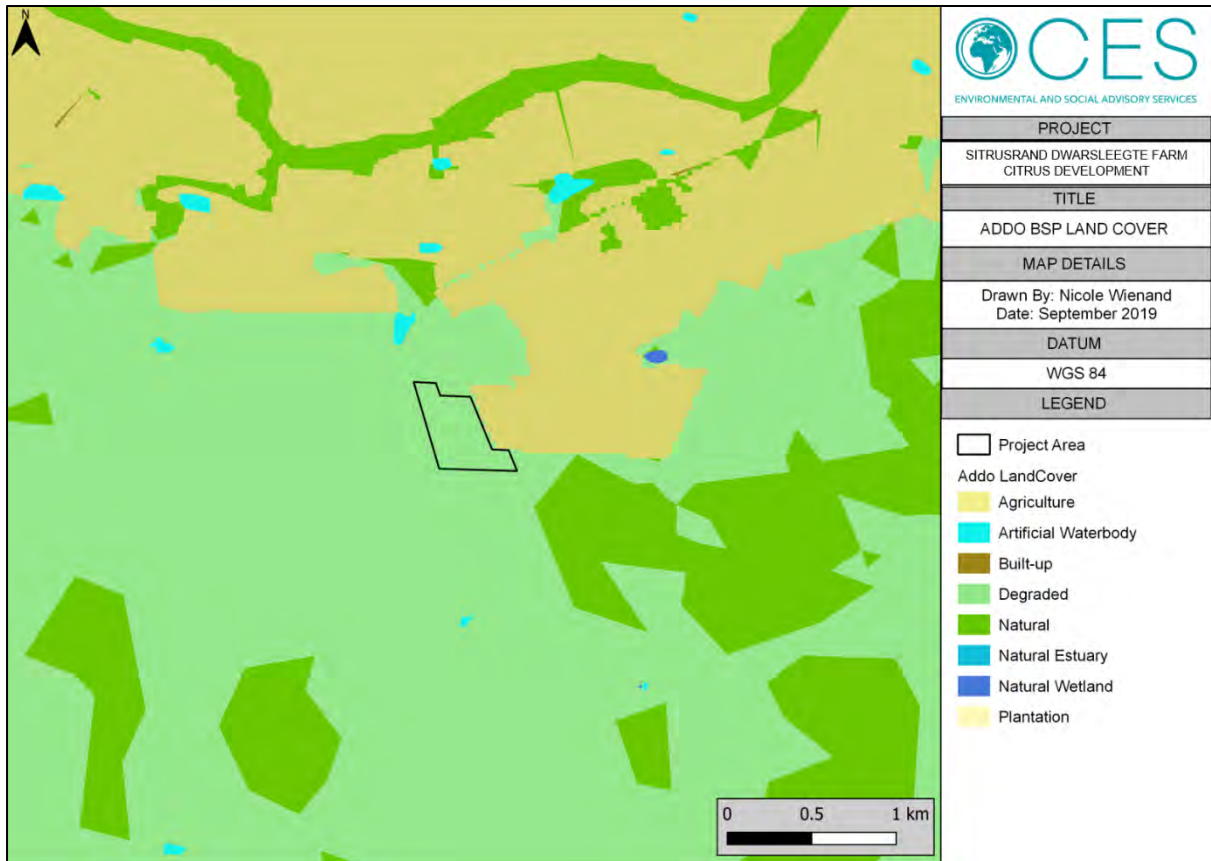


Figure 5.9: Addo Land Cover of the project area.

5.6 VEGETATION AND FLORISTICS

5.6.1 SANBI Classification (Mucina *et al.*, 2018)

The South African Vegetation Map (SA VEGMAP) of 2018 is an important resource for biodiversity monitoring and conservation management in South Africa. Under the custodianship of the South African National Biodiversity Institute (SANBI) the SA VEGMAP, (2018) was updated in order to ‘provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before’. The map provides a detailed description of each of South Africa’s unique vegetation types along with a comprehensive list of the important species associated with each, including endemic and biologically important species.

As per SANBI’s National Vegetation Map (2018), the proposed study site falls within the Albany Thicket Biome (Mucina *et al.*, 2018). This species-rich, evergreen, scrubland covers an estimated 2.5% of South Africa’s total land surface area and occurs throughout most of the Eastern Cape Province, particularly in incised river valleys. The biome is characterised by sparse to dense, semi-succulent, spiny shrub vegetation often accompanied by a tree component and an herbaceous and grassy undergrowth. Albany Thicket is considered as an important mitigation against climate change due to its exceptional ability to store carbon. Unfortunately, this biome has become highly fragmented due to current and historical clearing and its poor ability to regenerate once disturbed (Mucina and Rutherford, 2012).

The vegetation type within and surrounding the project area is classified as Sundays Arid Thicket (Figure 5.10). Arid thicket typically occurs inland within the coastal hinterland region of the Albany Thicket Biome and within the Cape Fold Mountains, along the steep footslopes



of the Great Escarpment. Soil types common to this vegetation type include shallow, loamy-clayey soils and soils with a rich clay content. Arid thicket is the driest form of the thicket types, with a rainfall of about 200-300mm, and is characterised by a prominent succulent component and a poorly developed, sparse woody tree and shrub component. Frost is a common occurrence. Dominant and characteristic species include *Vachellia karroo*, *Aloe africana*, *A. ferox*, *A. microstigma*, *A. speciosa*, *Astroloba foliosa*, *Boscia leoides*, *Cadaba aphylla*, *Carissa haematocarpa*, *Cotyledon orbiculata*, *Crassula ovata*, *Uclea undulata*, *Euphorbia atrispina*, *Euphorbia bothae*, *E. coerulescens*, *E. ferox*, *E. pentagona*, *E. tetragona*, *Gloveria integrifolia*, *Gymnosporia polycantha*, *G. szyszyłowiczii*, *Nymania capensis*, *Pappea capensis*, *Pegolettia baccaridifolia*, *Portulacaria afra*, *Ptaeroxylon obliquum*, *Rhigozum obovatum*, *Sarcostemma viminalis*, *Schotia afra* and *Searsia longispina* (CEN IEM Unit, 2019).

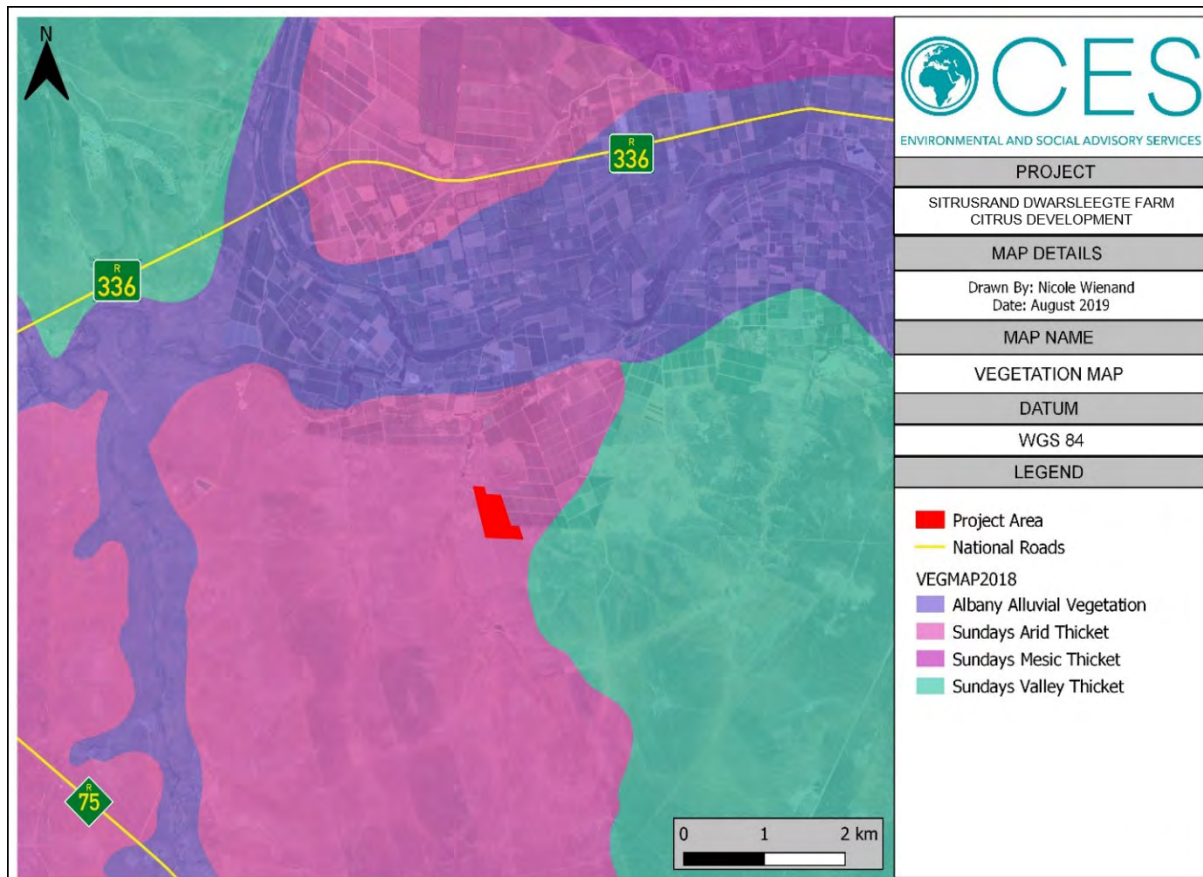


Figure 5.10: Vegetation types surrounding the project area.

The Ecosystem Threat Status of Sundays Arid Thicket is **Vulnerable** while the Ecosystem Protection Level is classified as **Moderately Protected** (Skowno *et al.*, 2019). According to SANBI's National Vegetation Map (2018), the conservation target for Sundays Arid Thicket is 19%. While 98.3% of the dominant land cover within Sundays Arid Thicket is classified as Natural, Sundays Arid Thicket declines by an estimated 0.008% per year (Skowno *et al.*, 2019). According to Hoare *et al.*, (2006), Sundays Thicket is statutorily protected in the Greater Addo Elephant National Park, Groendal Wilderness Area as well as in Swartkops Valley and Springs Nature Reserves. Private conservation areas contributing to the conservation of Sundays Thicket include game farms such as Kuzuko, Koedeoskop, Schuilpatdop, Tregathlyn, Citruslandgoed, and Voetpads kloof and a couple of nature reserves. In 2006, more than 6% of Sundays Thicket had been transformed and degraded through grazing by livestock. Once degraded, Sundays Arid Thicket resembles a secondary thornveld or grassland, dominated by invasive weedy species with no to very few thicket species. Rehabilitation potential is low with erosion potential moderate to low.



5.6.2 Forest Classification (NFA)

No natural forest will be impacted by the proposed Citrusrand Dwarsleegte Expansion Development. The nearest forest patch is located approximately 28.5 km northeast of the project area.

5.7 BIODIVERSITY INDICATORS

South Africa's policy and legislative framework for biodiversity is well developed, providing a strong basis for the conservation and sustainable use of biodiversity. South Africa is one of the few countries in the world to have a Biodiversity Act and a National Biodiversity Institute.

Key components of the national policy and legislative framework for biodiversity include:

- The White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (1997);
- The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA);
- NEMBA List of Ecosystems in need of Protection;
- NEMBA List of Threatened or Protected Species;
- NEMBA List of Alien Invasive Species;
- The National Environmental Management: Protected Areas Act (Act 57 of 2003) (NEMPAA);
- The National Biodiversity Strategy and Action Plan (NBSAP) (2015);
- The National Spatial Biodiversity Assessment (2004, currently being reviewed and updated) (NSBA);
- The National Biodiversity Framework (2008) (NBF);
- The National Protected Area Expansion Strategy (2008) (NPAES); and
- Important Bird Areas (2015) (IBA).

In addition to national legislation, some of South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution (Act 108 of 1996). The Eastern Cape Biodiversity Conservation Plan (ECBCP) covers the entire Eastern Cape Province.

5.7.1 Eastern Cape Biodiversity Conservation Plan

The Eastern Cape Biodiversity Conservation Plan (ECBCP) is a first attempt at detailed, low-level, conservation mapping for land-use planning purposes. Specifically, the aims of the ECBCP were to map critical biodiversity areas (CBAs) through a systematic conservation planning process. The current biodiversity plan includes the mapping of priority aquatic features, land-use pressures, and critical biodiversity areas and develops guidelines for land and resource-use planning and decision-making.

The main outputs of the ECBCP, the CBAs, which are allocated the following management categories:

- CBA 1 = Maintain in a natural state
- CBA 2 = Maintain in a near-natural state
- CBA 3 = Other natural areas: Functional landscapes

The ECBCP maps CBAs based on extensive biological data and input from key stakeholders. The ECBCP, although mapped at a finer scale than the National Spatial Biodiversity Assessment (Driver *et al.*, 2005) is still, for the large part, inaccurate and "course". Therefore,



it is imperative that the status of the environment, for any proposed development must first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007). The ECBCP has been adopted by DEDEAT as a systematic biodiversity plan for the Eastern Cape. According to the ECBCP spatial planning tool, the project area occurs within an area classified as a terrestrial CBA 1 (Figure 5.11), an aquatic CBA 2 (Figure 5.12) and an Addo BSP CBA (Figure 5.13). Aquatic CBA 2 areas are defined as ‘Important sub-catchments’ while terrestrial CBA 1 areas should be managed to maintain the environment in as natural state as possible to prevent any further biodiversity loss.

The project area falls within a CBA1 area according to the ECBCP (2007).

The management requirements of CBAs 1 and 2 are as follows (taken from the ECBCP 2007 Handbook):

CBA area	Management requirements
CBA 1	These areas are considered as natural landscapes and biodiversity must be maintained in an as natural state as possible so that there is no future biodiversity loss.
CBA 2	These areas are considered as near-natural landscapes and biodiversity must be managed in a near natural state with minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted.

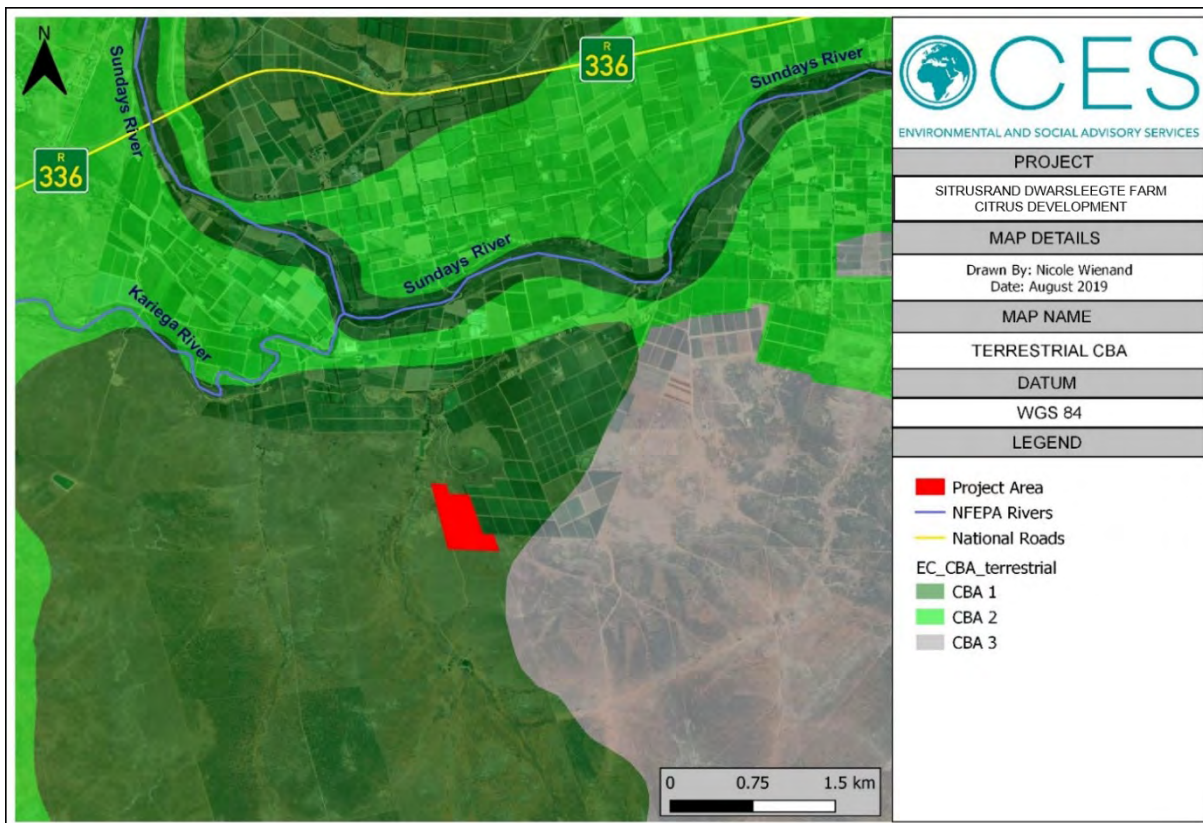


Figure 5.11: ECBCP Terrestrial Critical Biodiversity Areas (CBAs) located within the project area.

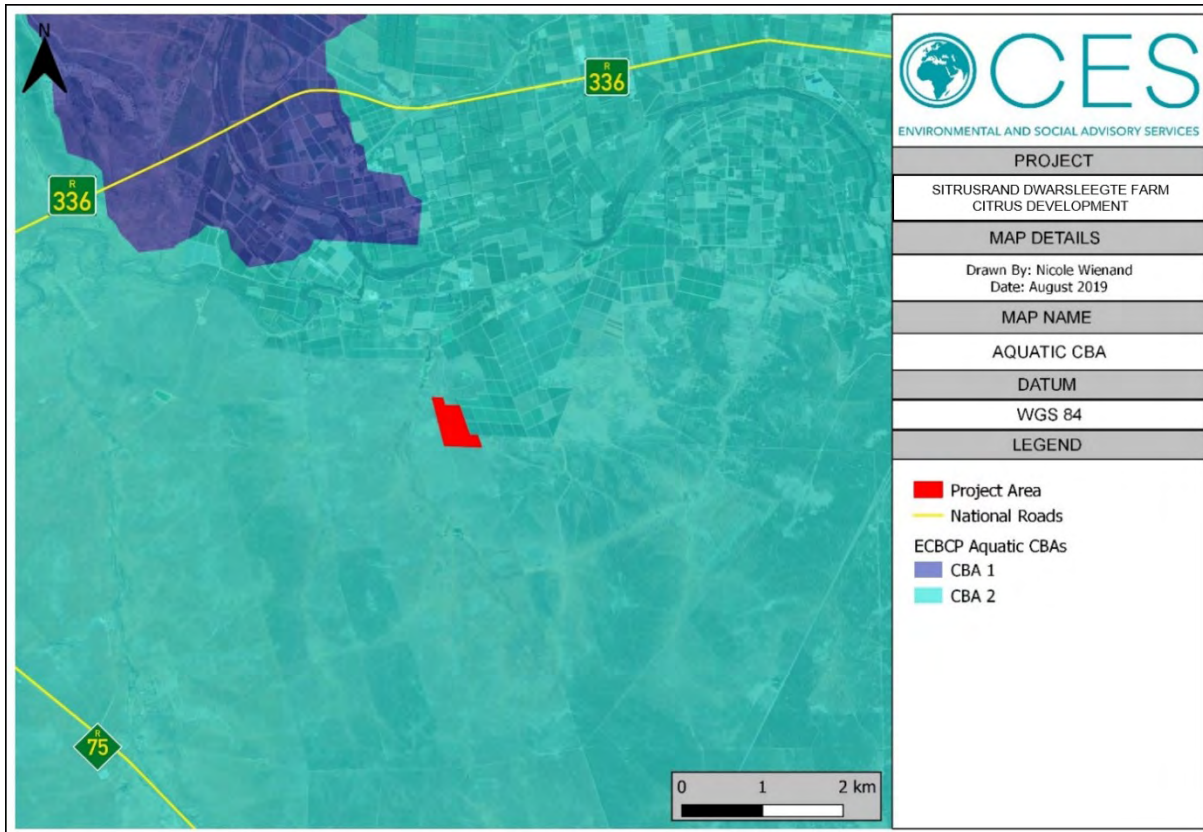


Figure 5.12: Aquatic Critical Biodiversity Areas (CBAs) located within the project area.

5.7.2 Addo Biodiversity Sector Plan

According to the Addo BSP, the study site occurs within a CBA1 (Figure 5.13). CBAs are critical for achieving biodiversity targets for species, ecosystems or ecological processes and infrastructure.

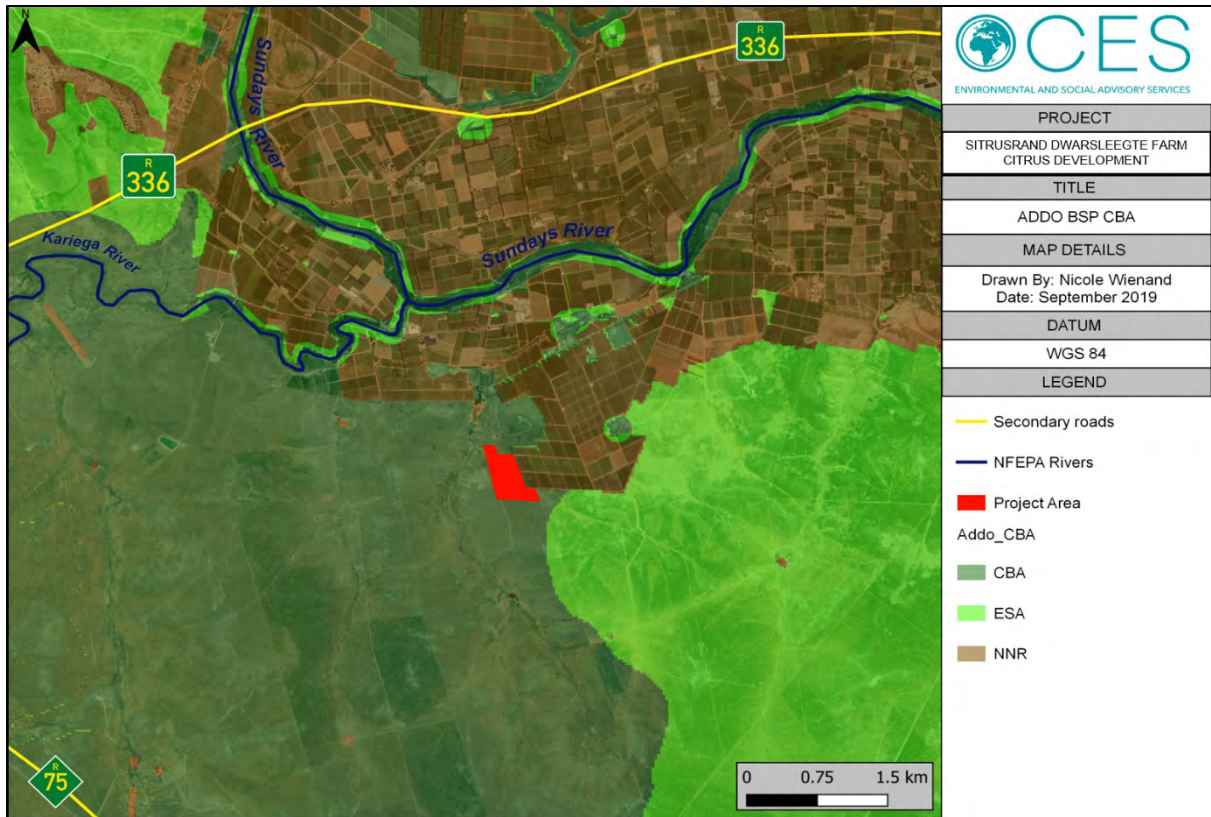


Figure 5.13: Addo BSP CBAs located within the project area.

5.7.3 Threatened Ecosystems

The National Environmental Management: Biodiversity Act, (Act No. 10 OF 2004) (NEM:BA) provides a National List of Ecosystems that are threatened and in need of protection – GN 1002 of 2011. Although the study site is not located within a threatened ecosystem, it is situated within 1.1 kilometres from Albany Alluvial Vegetation – a threatened ecosystem classified as Endangered (Figure 5.14).

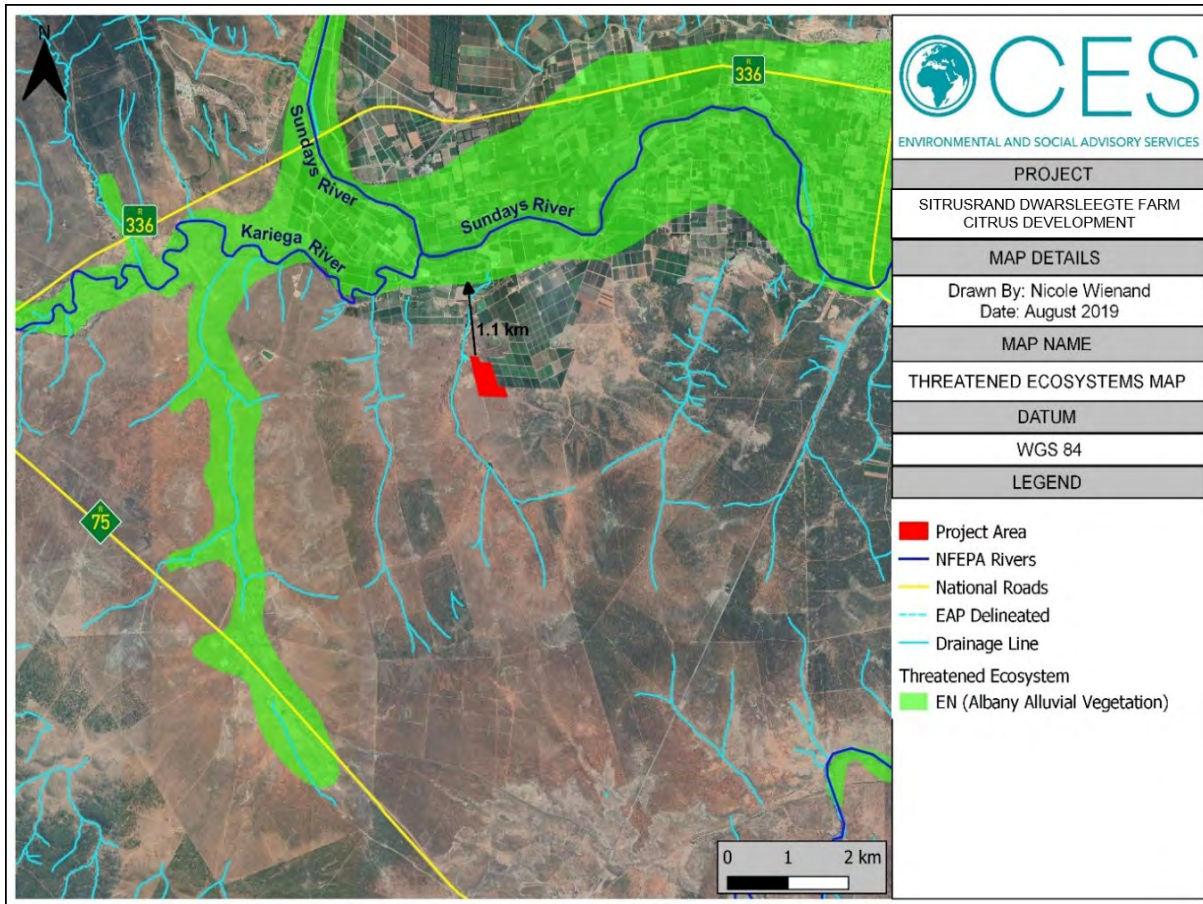


Figure 5.14: Threatened ecosystems surrounding the study site.

5.7.4 Protected areas

The National Protected Areas Expansion Strategy (NPAES, 2008) was developed to “achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change.” The NPAES originated as Government recognised the importance of protected areas in maintaining biodiversity and critical ecological process. The NPAES sets targets for expanding South Africa’s protected area network, placing emphasis on those ecosystems that are least protected.

The proposed site is located within an informally conserved area – the Voetpadskloof Game Farm. The site is also located within 8.2 km of the Addo Elephant National Park and 6.5 km of an NPAES Focus Area (Figure 5.13).

There are no Important Bird Areas (IBAs) located within or close to the project area.

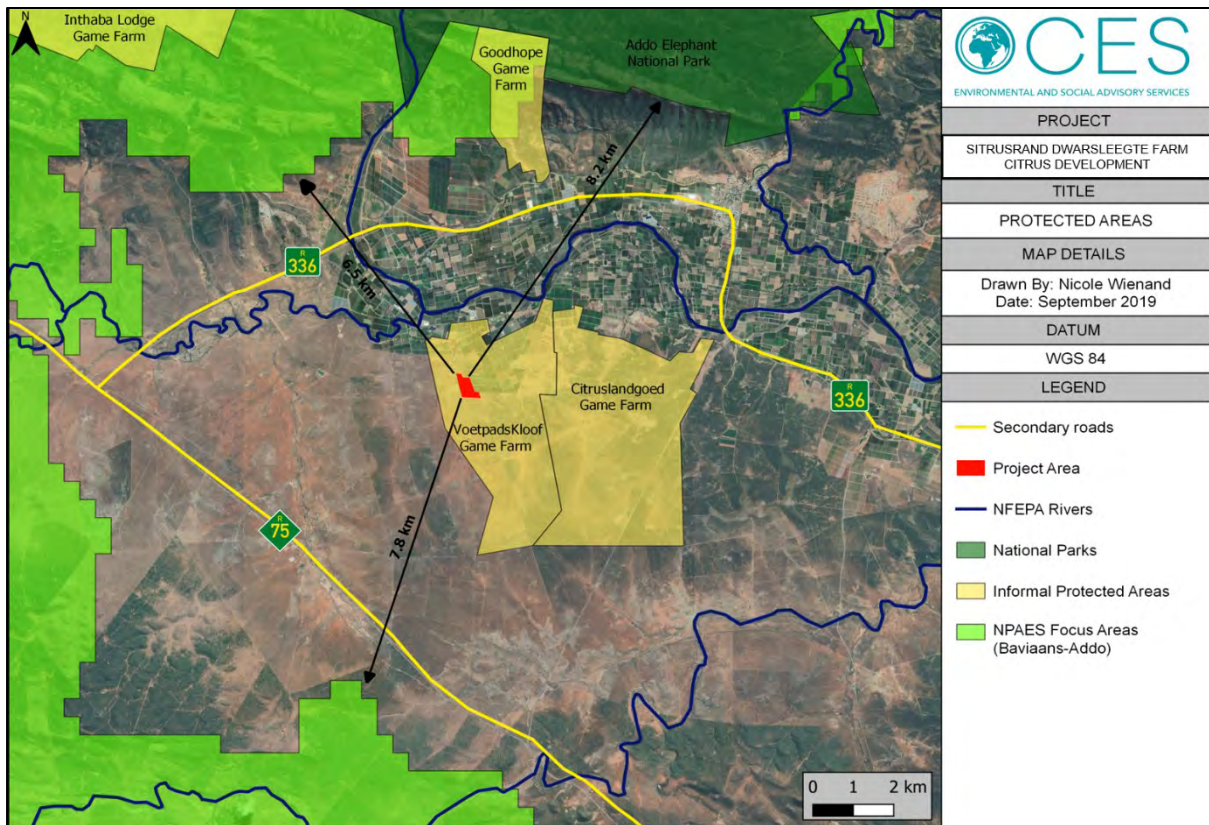


Figure 5.15: Protected Areas surrounding the study site.

5.7.5 Floristics

Plant species of conservation concern comprise those species that are either threatened (Critically Endangered, Endangered, Vulnerable), rare or declining. The South African National Biodiversity Institute (SANBI) Plants of Southern Africa (POSA) plant database (<http://posa.sanbi.org>) and the Mucina *et al* (2006) list of important taxa common to Sundays Arid Thicket Vegetation was consulted, along with the categories indicated in the SANBI Threatened Species Programme website (<http://redlist.sanbi.org/species.php?species>) to identify potential species of conservation concern within the proposed development footprint (Table 5.2).

The following list of plant SCC that may potentially be found within the development footprint has been derived from current literature for possible vegetation found in the area as well as the South African Red Data List, DAFF protected trees, the Provincial Nature Conservation Ordinance (PNCO), and CITES. The plant species identified on site are tabulated in Section 6.2.1, while a full list of the potential species that could found within the project region can be seen in Appendix 1.

Table 5.2: Species of Conservation Concern that may occur within the proposed development footprint.

FAMILY	SPECIES	ECOLOGY	Conservation status
Fabaceae	<i>Aspalathus angustifolia</i>	Indigenous; Endemic	VU
Zamiaceae	<i>Encephalartos horridu</i>	Indigenous; Endemic	EN
Euphorbiaceae	<i>Euphorbia albipollinifera</i>	Indigenous; Endemic	NT
Asphodelaceae	<i>Aloe bowiea</i>	Indigenous; Endemic	CR



Aizoaceae	<i>Bergeranthus addoensis</i>	Indigenous; Endemic	VU
Aizoaceae	<i>Orthopterum coegana</i>	Indigenous; Endemic	CR
Aizoaceae	<i>Ruschia aristata</i>	Indigenous; Endemic	RARE
Apocynaceae	<i>Huernia longii</i>	Indigenous; Endemic	RARE
Apocynaceae	<i>Brachystelma cummingii</i>	Indigenous; Endemic	EN
Apocynaceae	<i>Brachystelma schoenlandianum</i>	Indigenous; Endemic	EX
Strelitziaceae	<i>Strelitzia juncea</i>	Indigenous; Endemic	VU
Iridaceae	<i>Tritonia dubia</i>	Indigenous; Endemic	NT
Fabaceae	<i>Argyrolobium crassifolium</i>	Indigenous; Endemic	EN
Fabaceae	<i>Lotononis monophylla</i>	Indigenous; Endemic	CR
Asteraceae	<i>Senecio scaposus var. addoensis</i>	Indigenous; Endemic	EN

5.8 FAUNA

5.8.1 Birds

The Eastern Cape Province contains 62 threatened bird species, many of which are associated with wetlands or a grassland species. There are no Eastern Cape endemic birds' species, however nine species that occur in the Eastern Cape are endemic to South Africa. According to Avibase (2019), a total of 381 species of birds have been recorded in the broader Kirkwood Area. Of the 381 species, twelve (12) are **globally threatened**, seventeen (17) are **near-threatened**, seven (7) are **vulnerable**, five (5) are **endangered**, and ten (10) are **rare/accidental**.

5.8.2 Mammals

Large game makes up less than 15% of the mammal species in South Africa and a much smaller percentage in numbers and biomass. In developed and farming areas, this percentage is greatly reduced, with the vast majority of mammal's present being small or medium-sized.

According to the Animal Demography Unit (2019), twenty (20) mammal species are likely to occur within the project area. Of these, eighteen (18) are classified as **Least Concern** while two (2) – the African Bush Elephant (*Loxodonta africana*) and the Black-footed Cat (*Felis nigripes*) – are classified as **Vulnerable**. Although neither of these vulnerable species were observed on site, warthogs (*Phacochoerus africanus* – **Least Concern**) were overserved during the site visit conducted on the 19th of June 2019.

While no large game was identified within the development footprint of the proposed Sitrusrand Dwarsleegte Farm Citrus Development, it should be noted that the project area is located within the Voetpadsloof Game Farm and therefore, larger game and other mammals do inhabit the broader area.

5.8.3 Reptiles and Amphibians

South Africa has 350 species of reptiles, comprising 213 lizards, 9 worm lizards, 105 snakes, 13 terrestrial tortoises, 5 freshwater terrapins, 2 breeding species of sea turtle and 1 crocodile



(Branch, 1994). Amphibians and certain reptiles are sensitive to habitat change and are therefore good indicators of land transformation.

According to the Animal Demography Unit (2019), only ten (10) species of reptiles and seven (7) species of amphibians are likely to occur within the project area, all of which are classified as **Least Concern**.

Please refer to Appendix 2 for the comprehensive list of faunal species that are likely to occur in the project area.



6. SITE INVESTIGATION

A site investigation was conducted on the 19th of June 2019 in order to:

- Verify desktop findings;
- Assess the baseline ecological state of the environment;
- Assess current land-use;
- Identify potential sensitive ecosystems;
- Identify plant species communities associated with the proposed project activities; and
- Identify animal species associated with the proposed project activities.

The site visit served to inform the identification of potential impacts associated with the proposed development and to describe the significance of those impacts on the surrounding ecological environment. Vegetation was assessed within the boundaries of the proposed development footprint.

6.1 GENERAL SITE CHARACTERISTICS

As per Google Earth Imagery (Figure 6.1 below), the site visit confirmed that the Sundays Arid Thicket vegetation of the project area has been significantly degraded, most likely due to grazing by larger game of the Voetpadskloof Game Farm. Consequently, much of the project area is now dominated by grassland/thornveld interspersed by sparse- to semi-dense Sundays Arid Thicket bush clumps (Plate 6.1). It is unlikely that the Thicket will regenerate without significant rehabilitation effort. The drainage line in the northwest corner of the project area observed on google earth imagery was also confirmed, although it is evident that this has been dry for many years (Plate 6.2).

Two small limestone quarries were observed in the southern portion of the study site (Plate 6.3 and 6.4).





Figure 6.1: Vegetation cover of the project area (Google Earth, 2019).



Plate 6.1: Vegetation cover of the proposed site.



Plate 6.2: The drainage line traversing the north western corner of the project area.



Plate 6.3: Small Limestone quarry observed on site.



Plate 6.4: Historical quarry observed on site.

6.2 VEGETATION SURVEY

The general vegetation of the study site, as determined by the desktop analysis, is Sundays Arid Thicket. Grobler *et al.* (2018) list the important taxa of Sundays Thicket vegetation that may be affected by the proposed development (Table 6.1).

Table 6.1: List of important taxa common to Sundays Thicket Vegetation (Globlet *et al.*, 2018) (d=dominant, e=South African endemic, et=possibly endemic to a vegetation type).

Category	Dominant species
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Succulent shrub	<i>Euphorbia radyeri</i> (d), <i>Crassula ovata</i> (d, e), <i>Portulacaria afra</i> (d), <i>Aloe striata</i> (e), <i>Cotyledon campanulata</i> (e), <i>Cotyledon orbiculata</i> , <i>Cotyledon velutina</i> (e), <i>Crassula corallina</i> subsp. <i>corallina</i> , <i>Delosperma frutescens</i> (e), <i>Drosanthemum lique</i> (e), <i>Euphorbia esculenta</i> (e), <i>Euphorbia mauritanica</i> , <i>Euphorbia pentagona</i> (e), <i>Mestoklema tuberosum</i> (e), <i>Pachypodium succulentum</i> (e), <i>Trichodiadema barbatum</i> (e)
Small tree	<i>Pappea capensis</i> (d), <i>Boscia oleoides</i> (d), <i>Euclea undulata</i> , <i>Schotia afra</i> , <i>Vachellia karroo</i>
Succulent tree	<i>Aloe ferox</i> (d), <i>Aloe speciosa</i> (d, e)
Succulent herb	<i>Mesembryanthemum aitonis</i> (d, e), <i>Crassula muscosa</i> , <i>Curio radicans</i> , <i>Gasteria bicolor</i> , <i>Mesembryanthemum crystallinum</i>
Geophytic herb	<i>Drimia intricata</i> , <i>Drimia anomala</i> (e), <i>Moraea polystachya</i> , <i>Oxalis stellata</i> , <i>Sansevieria aethiopica</i> , <i>Tritonia laxifolia</i>
Herb	<i>Aizoon glinoides</i> (d), <i>Gazania krebsiana</i> (d), <i>Abutilon sonneratianum</i> , <i>Boerhavia diffusa</i> , <i>Euphorbia inaequilatera</i> , <i>Cucumis myriocarpus</i> , <i>Hermannia cernua</i> , <i>Hermannia pulverata</i> (e), <i>Hibiscus pusillus</i> , <i>Indigostrum costatum</i> subsp. <i>macrum</i> , <i>Indigofera disticha</i> (e), <i>Isoglossa ciliata</i> , <i>Lessertia pauciflora</i> , <i>Leysera tenella</i> , <i>Leobordea divaricata</i>
Low shrub	<i>Blepharis capensis</i> (d, e), <i>Lycium cinereum</i> (d), <i>Lycium oxycarpum</i> (d, e), <i>Pentzia incana</i> (d), <i>Rhigozum obovatum</i> (d), <i>Aptosimum elongatum</i> , <i>Asparagus burchellii</i> (e), <i>Asparagus crassicladus</i> (e), <i>Asparagus striatus</i> (e), <i>Asparagus suaveolens</i> , <i>Asparagus subulatus</i> (e), <i>Barleria pungens</i> (e), <i>Chrysocoma ciliata</i> , <i>Eriocephalus ericoides</i> , <i>Felicia filifolia</i> (e), <i>Felicia muricata</i> , <i>Flueggea verrucosa</i> (e), <i>Garuleum latifolium</i> (e), <i>Helichrysum rosum</i> , <i>Hermannia althaeoides</i> , <i>Hermannia gracilis</i> (e), <i>Indigofera sessilifolia</i> , <i>Lantana rugosa</i> , <i>Leonotis pentadentata</i> , <i>Lepidium africanum</i> , <i>Limeum aethiopicum</i> , <i>Justicia spartioides</i> , <i>Pelargonium aridum</i> , <i>Phymaspermum parvifolium</i> (e), <i>Rosenia humilis</i> , <i>Selago albida</i> , <i>Solanum tomentosum</i> (e)
Epiphytic parasitic shrub	<i>Viscum rotundifolium</i> .
Graminoid	<i>Aristida adscensionis</i> (d), <i>Aristida congesta</i> (d), <i>Cenchrus ciliaris</i> (d), <i>Cynodon incompletus</i> (d, e), <i>Ehrharta erecta</i> (d), <i>Eragrostis obtusa</i> (d), <i>Tragus berteronianus</i> (d), <i>Aristida congesta</i> , <i>Aristida diffusa</i> , <i>Chloris virgata</i> , <i>Cynodon dactylon</i> , <i>Digitaria argyrograpta</i> , <i>Ehrharta calycina</i> , <i>Enneapogon desvauxii</i> , <i>Eragrostis chloromelas</i> , <i>Eragrostis curvula</i> , <i>Eragrostis lehmanniana</i> , <i>Fingerhuthia africana</i> , <i>Heteropogon contortus</i> , <i>Oropetium capense</i> , <i>Panicum coloratum</i> , <i>Panicum deustum</i> , <i>Panicum maximum</i> , <i>Setaria verticillata</i> , <i>Sporobolus fimbriatus</i> , <i>Tragus racemosus</i> .
Tall shrub	<i>Grewia robusta</i> (d, e), <i>Gymnosporia polyacantha</i> (d, e), <i>Searsia longispina</i> (d, e), <i>Azima tetracantha</i> , <i>Cadaba aphylla</i> , <i>Carissa bispinosa</i> , <i>Diospyros austroafricana</i> , <i>Gymnosporia capitata</i> (e), <i>Nymania capensis</i> , <i>Putterlickia pyracantha</i> (e)
Herbaceous climber	<i>Cissampelos capensis</i> , <i>Cynanchum ellipticum</i> , <i>Cynanchum gerrardii</i> , <i>Cyphia sylvatica</i> (e), <i>Kedrostis nana</i> (e), <i>Rhoicissus digitata</i>
Woody succulent climber	<i>Cynanchum viminale</i>
Woody climber	<i>Asparagus racemosus</i>

The botanical survey aimed to identify common and dominant species, as well as Species of Conservation Concern, occurring within the development footprint and aimed to describe the general characteristics of the vegetation on site.

The site visit confirmed that a significant portion of the vegetation within development footprint has been degraded, most likely due to grazing by larger game. Consequently, a significant portion of the indigenous Sundays Arid Thicket vegetation on site has been replaced by grassland vegetation. The resultant cover of the project area can thus be described as grassland/thornveld interspersed with fragmented, sparse- to semi-dense Sundays Arid Thicket bush clumps. Although the vegetation has been degraded, the remaining vegetation cover within the project area still supports a number of indigenous species, including SCC.

6.2.1 Plant Species Observed

Approximately 38 plant species, which will be affected by the proposed Sitrusrand Dwarsleegte Farm Citrus Development, were identified during the site survey. It must be noted



that the survey was undertaken in winter and that a number of species observed on site were unidentifiable due to the lack of morphological features, such as fruit or flowers. The flowering times of certain species (especially geophytes) may have been missed. The plants observed in the study area are illustrated in Table 6.2 below. A full list of plant species that may occur in the broader area can be found in Appendix 1.



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
INDIGENOUS PLANT SPECIES						
	Aizoaceae	-	<i>Aizoon glinoides</i>	LC	-	-
	Asphodelaceae	Coral Aloe	<i>Aloe striata</i>	LC	Schedule 4	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Asparagaceae	Katbossie, Katdoring, Wild Asparagus	<i>Asparagus burchellii</i>	LC	-	-
	Asparagaceae	-	<i>Asparagus crassicladus</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Asparagaceae	-	<i>Asparagus sp.</i>	LC	-	-
	Asparagaceae	Bergappel, Bergappeltjie, Bobbejaanappel	<i>Asparagus striatus</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Salvadoraceae	Needle Bush	<i>Azima tetracantha</i>	LC	-	-
	Acanthaceae	-	<i>Blepharis capensis</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Apocynaceae	Fork-spined Carissa	<i>Carissa bispinosa</i>	LC	Schedule 4	-
	Aizoaceae	-	<i>Carpobrotus sp.</i>	LC	Schedule 4	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Asteraceae	Beesbos	<i>Chrysocoma ciliata</i>	LC	-	-
	Crassulaceae	Pigs ear	<i>Cotyledon orbiculata</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Crassulaceae	-	<i>Crassula cremnophila</i>	RARE	-	-
	Apocynaceae	Monkey Rope	<i>Cynanchum ellipticum</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Acanthaceae	-	<i>Dicliptera cernua</i>	LC	-	-
	Ruscaceae	Perdeklou	<i>Eriospermum brevipes</i>	LC	-	-



Table 6.2: Plant species observed onsite.


PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Euphorbiaceae	Blounoorsdoring	<i>Euphorbia ledienii</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Euphorbiaceae	Beesmelkbos	<i>Euphorbia mauritanica</i>	LC	-	-
	Amaranthaceae	Basterhondebossie	<i>Exomis microphylla</i>	LC	-	-



Table 6.2: Plant species observed onsite.


PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Asteraceae	Taaï-Astertjie	<i>Felicia muricata</i>	LC	-	-



Table 6.2: Plant species observed onsite.


PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Malvaceae	Karoo Cross-berry	<i>Grewia robusta</i>	LC	-	-



Table 6.2: Plant species observed onsite.


PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Celastraceae	Common Spike-thorn	<i>Gymnosporia buxifolia</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Celastraceae	Hedge Spike-thorn	<i>Gymnosporia polyacantha</i>	LC	-	-
	Scrophulariaceae	Purple phlox	<i>Jamesbrittenia microphylla</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Aizoaceae	-	<i>Lampranthus sp.</i>	Not assessed.	Not assessed.	Not assessed.
	Aizoaceae	-	<i>Lampranthus sp.</i>	Not assessed.	Not assessed.	Not assessed.



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Lamiaceae	-	<i>Leonotis pentadentata</i>	LC	-	-
	Solanaceae	Karoo Honey-thorn	<i>Lycium oxycarpum</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Solanaceae	Boksdoring	<i>Lycium cinereum</i>	LC	-	-
	Ruscaceae	Bowstring Hemp	<i>Sansevieria aethiopica</i>	LC	-	-



Table 6.2: Plant species observed onsite.


PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Fabaceae	Karoo Boer-bean	<i>Schotia afra</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Anacardiaceae	Doringtaaibos, Spiny Currant	<i>Searsia longispina</i>	LC	-	-
	Solanaceae	Kleingrysbitterappel	<i>Solanum tomentosum</i>	LC	-	-



Table 6.2: Plant species observed onsite.



PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Fabaceae	Sweet Thorn	<i>Vachellia karroo</i>	LC	-	-
	Apocynaceae	-	<i>Sarcostemma viminale</i>	LC	-	-



Table 6.2: Plant species observed onsite.




PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
ALIEN PLANT SPECIES						
			<i>Atriplex lindleyi</i>	CARA – Category 3 NEMBA – Category 1b	-	-
	Cactaceae	Prickly pear	<i>Opuntia ficus-indica</i>	CARA – Category 1 NEMBA – Category 1b	-	-



Table 6.2: Plant species observed onsite.

PHOTOGRAPH FROM SITE	FAMILY	COMMON NAME	SPECIES NAME	SANBI RED LIST	NCO	TOPS
	Cactaceae	Tiger-pear, jointed cactus or jointed prickly-pear.	<i>Opuntia aurantiaca</i>	CARA – Category 1 NEMBA – Category 1b	-	-



7. SENSITIVITY ASSESSMENT

Appendix 6

Specialist Reports

1. (1) A specialist report prepared in terms of these Regulations must contain—
 - (f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;
 - (g) an identification of any areas to be avoided, including buffers;
 - (h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;

7.1 CONSERVATION AND SPATIAL PLANNING TOOLS

In order to identify any potential site sensitivities or ecologically important areas during the early stages of a development, the conservation planning tools available for a particular area should be consulted. This could potentially assist with the fine-tuning of plans and infrastructure layouts.

The following relevant conservation planning tools were consulted for this assessment:

- SANBI Vegetation Threat Status;
- NEMBA Protected Ecosystems;
- ECBCP Critical Biodiversity Areas (Terrestrial and Aquatic);
- Addo BSP Critical Biodiversity Areas; and
- Nature and Environmental Conservation Ordinance No. 19 of 1974.

According to the National Environmental Management: Biodiversity Act (NEM:BA) *National list of ecosystems that are threatened and in need of protection*, the study site does not occur within a threatened ecosystem. However, the study site is situated within a Terrestrial CBA 1 and an Aquatic CBA 2 in terms of ECBCP (2007), as well as a CBA 1 in terms of Addo BSP (SANParks, 2012). Sundays Arid Thicket, the vegetation type within the study area, is classified as **Vulnerable** with rehabilitation potential classified as low (Skowno *et al.*, 2019). Once degraded, Sundays Arid Thicket resembles a secondary thornveld or grassland, dominated by invasive weedy species with no to very few thicket species. Previous rehabilitation and restoration efforts of this vegetation type has proven unsuccessful. The study site also occurs within an informally conservation area, the Voetpadskloof Game Farm.

The site visit confirmed the findings of both the DEA Land Cover Map and the Addo BSP Land Cover (see **Section 5.5**) which suggested that the Sundays Arid Thicket vegetation of the study site resembled that of a degraded, secondary thornveld or grassland. The remaining Sundays Arid Thicket vegetation occurred in fragmented bush clumps dominated by only a few species, including *Gymnosporia buxifolia*, *Asparagus sp.*, *Azima tetraacantha*, *Grewia robusta*, *Vachellia karroo* and *Searsia longispina*. The degradation and fragmentation of the vegetation within the study site is mostly like due to over-grazing by game, as the study site forms part of the Voetpadskloof Game Farm.



7.2 SENSITIVITY ALLOCATION

A sensitivity map for the study area was developed based on the methodology presented in Table 7.1 and 7.2 below.

Table 7.1: Criteria used for the analysis of the sensitivity of the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
1	Topography	Level or even	Undulating; fairly steep slopes	Complex and uneven with steep slopes
2	Vegetation - Extent or habitat type in the region	Extensive	Restricted to a particular region / zone	Restricted to a specific locality / site
3	Conservation status of fauna / flora or habitats	Well conserved independent of conservation value	Not well conserved, moderate conservation value	Not conserved - has a high conservation value
4	Species of special concern - Presence and number	None, although occasional regional endemics	No endangered or vulnerable species, some indeterminate or rare endemics	One or more endangered and vulnerable species, or more than 2 endemics or rare species
5	Habitat fragmentation leading to loss of viable populations	Extensive areas of preferred habitat present elsewhere in region not susceptible to fragmentation	Reasonably extensive areas of preferred habitat elsewhere and habitat susceptible to fragmentation	Limited areas of this habitat, susceptible to fragmentation
6	Biodiversity contribution	Low diversity or species richness	Moderate diversity, and moderately high species richness	High species diversity, complex plant and animal communities
7	Erosion potential or instability of the region	Very stable and an area not subjected to erosion	Some possibility of erosion or change due to episodic events	Large possibility of erosion, change to the site or destruction due to climatic or other factors
8	Rehabilitation potential of the area or region	Rehabilitation potential of the site is low.	There is some degree of rehabilitation potential of the site.	There is high rehabilitation potential of the site.
9	Disturbance due to human habitation or other influences (alien invasive species)	Site is very disturbed or degraded	There is some degree of disturbance of the site	The site is hardly or very slightly impacted upon by human disturbance
10	Ecological function in the landscape (corridor, niche habitats)	Low ecological function. No corridors or niche habitats	Moderate ecological function. Some corridors and niche habitats.	High ecological function. Portions of entire sections of the site contains corridors or niche habitats
11	Ecological services (food,	Low to no ecological services on site	Some sections of the site contain ecological services	Most of the site contains ecological services



CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	H IGH SENSITIVITY
	water filter, grazing, etc.)			
12	Aquatic environments (Rivers, wetlands, drainage line etc)	Outside of the 32m watercourse buffer. Outside of the 500m wetland buffer	Within 32m of the watercourse. Within 500m of a natural wetland, but outside of 50m wetland buffer	Development within the watercourse.

Table 7.2: List of Criteria contributing to the sensitivity map.

SITE ELEMENT	SENSITIVITY MAPPING RULE	SENSITIVITY ALLOCATION
Vegetated areas (Sundays Arid Thicket)	<p>Topography is low, slightly undulating in the broader area; Possibility of erosion or change due to episodic events; Considerable biodiversity; Fragmented vegetation cover in area; Conservation status Vulnerable; Important ecological functions/services evident; High potential of Habitat fragmentation; Significant degree of degradation/disturbance; Scattered aliens; Rehabilitation potential low; Presence of SCC in vegetated areas.</p>	Moderate sensitivity
Aquatic Habitat (Drainage Lines)	<p>Drainage line: Topography low, slightly sloped; Conservation status Vulnerable; Potential SCC; Sparse vegetation cover; No wetland or riparian species evident; Dry for a number of years; Rehabilitation difficult and unlikely over the long-term; Some possibility of erosion or change due to episodic events; Moderate biodiversity; Moderate ecological value – ecosystem services and various ecological processes.</p>	High Sensitivity
	<p>100 m buffer: Topography low, slightly sloped; Conservation status Vulnerable; Potential SCC; Sparse vegetation cover; No wetland or riparian species evident; Dry for a number of years; Rehabilitation difficult and unlikely over the long-term; Some possibility of erosion or change due to episodic events; Moderate biodiversity; Moderate ecological value – ecosystem services and various ecological processes.</p>	Moderate Sensitivity



Figure 7.1 below reflects the ecological sensitivity of the site proposed for the Sitrusrand Dwarsleegte Farm Citrus Development.

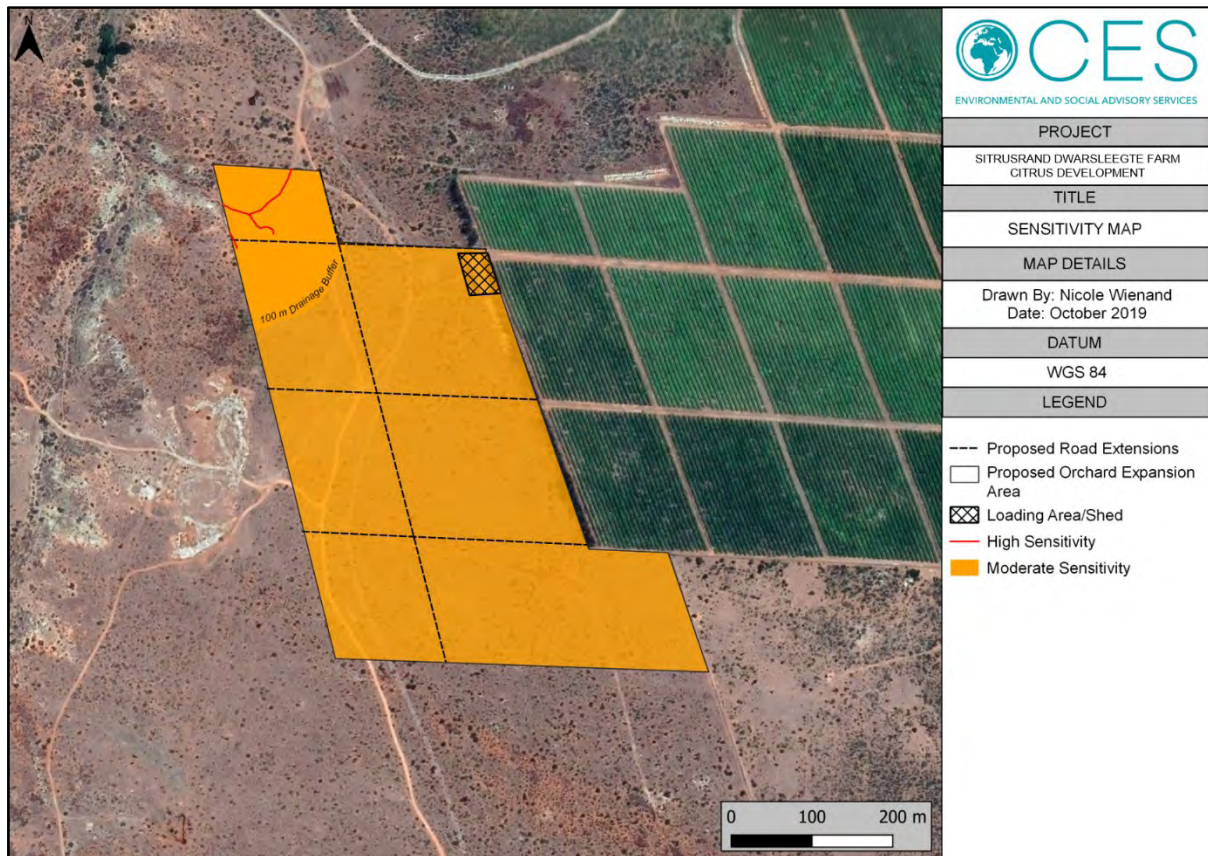


Figure 7.1: Sensitivity within the development footprint of the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

High Sensitivity

HIGH SENSITIVITY has been awarded to areas within the drainage line. Although the drainage line has been dry for a number of years (most likely due to the ongoing drought within the region), and no wetland or riparian vegetation was observed, these areas when flowing have high ecological value due to the ecosystem services they provide and ecological processes they support. As such, these areas are subject to strict mitigation measures that are critical to ensure erosion management and maintaining the integrity of the main drainage line.

Moderate Sensitivity

Moderate sensitivity has been allocated to the remainder of the study site as the remnant Sundays Arid Thicket vegetation, although fragmented and degraded, has a conservation status classified as vulnerable. This vegetation type is highly susceptible to habitat fragmentation with a very low potential for rehabilitation. Furthermore, a number of rare SCC are present which are considered highly sensitive, were present on site. As such, the relevant permits to relocate or remove these SCC must be obtained and a comprehensive Search and Rescue Operation undertaken prior to the commencement of any construction activities or vegetation clearance. Mitigation measures and best practises as identified in this report shall apply to activities within this zone, but do not prohibit development. Vegetation clearance must be kept to the minimum footprint required for the purpose of cultivating the proposed citrus orchards.



7.3 ISSUES AND IMPACTS IDENTIFIED

Various issues have been identified that will impact the local ecology of the proposed development site as a consequence of the Sitrusrand Dwarsleegte Farm Citrus Development. These issues are associated with both the Construction and Operational Phase of the development.

The following issues were identified during the sensitivity assessment:

Table 7.3: Issues identified during the sensitivity assessment of the proposed development site for the Sitrusrand Dwarsleegte Farm Citrus Development.

ISSUE IDENTIFIED	DESCRIPTION
Erosion	The clearance of vegetation for the cultivation of the proposed citrus orchards, the harvesting of plants, or soil preparation through ‘ripping’, could result in increased soil exposure to erosion and subsequent loss of topsoil within the development site and surrounds. Additionally, failure to rehabilitate temporary development areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable soil.
Loss of indigenous vegetation	Vegetation clearance for the cultivation of the proposed citrus orchards and vehicle movement will result in the direct loss of Sundays Arid Thicket vegetation. Such vegetation loss represents permanent vegetation and habitat loss from naturally vegetated areas.
Impacts on Surface Water Features	Construction works, including vegetation clearing, levelling and earthworks, for the cultivation of the proposed citrus orchards will result in the loss and damage of a section of the drainage line traversing the northwest corner of the study site. Furthermore, the development of the proposed citrus orchards could result in runoff and the subsequent sedimentation or contamination of downstream water features.
Loss of Biodiversity	During the construction phase, uncontrolled construction activities i.e. vegetation clearing, soil ripping etc., could lead to unnecessary damage to and removal of adjacent natural vegetation, loss of faunal habitat, and SCC within the proposed site boundaries.
Habitat loss/fragmentation	The loss of vegetation coincides with the loss of faunal habitat, reducing breeding and rearing locales. Endangered or rare faunal populations could become locally extinct or diminish in size.
Loss of SCC	The clearance of vegetation could permanently damage or destroy plant SCC which are present on site, contributing to the cumulative loss of plant SCC in the region.
Invasion of Alien Plant Species	The clearing of indigenous vegetation creates ‘open’ habitats which could favour the establishment of undesirable alien plant species in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems. Consequently, the lack of an effective alien vegetation management plan could lead to a large-scale alien plant invasion.
Loss of Critical Biodiversity Areas	The site has been classified as a CBA 1 in both the ECBCP and the Addo BSP. This classification was driven by the vegetation type, threat status and the established national conservation target. Even though a site is considered degraded and systematic biodiversity



	<p>planning algorithm will still select a site to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. The planning process, however, does not take in account the capability of the ecosystem to recover once disturbed. In this case, Sundays Arid Thicket has been significantly degraded and it is unlikely that any future efforts to restore the ecosystem will be successful.</p> <p>The current treatment of the loss of CBA areas is to assess the need and desirability of the development and determine whether to impose a Biodiversity Offset. If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented.</p>
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Various mitigation measures are recommended to reduce the significance of impacts associated with the proposed Sitrusrand Dwarsleegte Farm Citrus Development on the natural environment. These are discussed in more detail in Chapter 9 and 10.



8. ALIEN INVASIVE SPECIES

An “invasive species” is any species whose establishment and spread outside of its natural distribution range (i) threatens ecosystems, habitats or other species or has a demonstrable potential to threaten ecosystems, habitats or other species; and (ii) may result in economic or environmental harm or harm to human health. Invasive alien plant species are globally considered as one of the greatest threats to the environment, biodiversity, ecosystem integrity and the economy.

According to the Conservation of Agricultural Resources Act (No. 43 of 1983 - Regulation 15, 30 March 2001) (CARA), for agricultural land, and the National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA), for natural areas, invasive alien plant species should be controlled and eradicated with an emphasis on urgent action in biodiversity priority areas. NEMBA published a list of Alien and Invasive Species (No 599) in 2014 which regulates the management of alien and invasive plants in natural environments.

During the site visit conducted on the 19th of June 2019, the following invasive alien plant species were recorded on site:

- *Opuntia ficus-indica* (NEMBA Category 1b; CARA Category 1);
- *Opuntia aurantiaca* (NEMBA Category 1b; CARA Category 1); and
- *Atriplex lindleyi* (NEMBA Category 1b; CARA Category 3).

8.1 DISCUSSION

The alien plant species identified within the development footprint of the proposed Sitrusrand Dwarsleegte Farm Citrus Development are classified as Category 1b as per Notice 1 of GN. 599 of 2014 of NEMBA and Category 1 and 3 of the Conservation of Agricultural Resource Act (CARA) (Act 43 of 1983).

8.1.1 Category 1b of the National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004) Alien and Invasive Species Lists, 2014

Plants classified as **Category 1b** alien invasive species are prohibited from:

- Being imported into the Republic;
- Growing or in any other way propagating any specimen;
- Conveying, moving or otherwise translocating any specimen;
- Spreading or allowing the spread of any specimen; and
- Releasing any specimen.

All Category 1b alien and invasive plant species must be controlled during all phases of development according to the recommendations outline in the Environmental Management Programme (EMPr).

8.1.2 Conservation of Agricultural Resource Act (CARA) (Act 43 of 1983)

Category 1: Declared weeds



These are prohibited plants, which must be controlled or eradicated where possible (except in biocontrol reserves, which are areas designated for the breeding of biocontrol agents).

Category 3: Declared invaders

Invader plants may no longer be propagated or sold. Existing plants do not need to be removed.

8.2 ISSUES IDENTIFIED

The following issues were identified during the Alien and Invasive Species Assessment:

Table 8.1: Issues identified during the Alien and Invasive Species Assessment of the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

ISSUE IDENTIFIED	DESCRIPTION
Invasion of Alien Plant Species	The clearing of indigenous vegetation creates 'open' habitats which could favour the establishment of undesirable alien plant species in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems. Consequently, the lack of an effective alien vegetation management plan could lead to a large-scale alien plant invasion.

Mitigation measures for the control of alien plants species are recommended in Chapter 9 and 10 of this report.



9. MANNER IN WHICH THE ENVIRONMENT MAY BE AFFECTED

Appendix 6

Specialist Reports

1. (1) A specialist report prepared in terms of these Regulations must contain—
- (j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;
 - (k) any mitigation measures for inclusion in the EMPr;

9.1 ISSUES IDENTIFIED

Table 9.1 below lists all the issues identified during the assessment of the proposed development site for the Sitrusrand Dwarsleegte Farm Citrus Development.

Table 9.1: Mind Map of the impacts on the ecological environment associated with the proposed Citrus Development.

THEMES	CATEGORIES	PLANNING & DESIGN PHASE	CONSTRUCTION PHASE	OPERATIONAL PHASE
Legislative Environment	Legal and Policy Compliance	X	X	X
Biophysical	Erosion		X	X
	Loss of soil quality			X
	Damage to surface water features		X	X
Biological	Loss of indigenous vegetation		X	X
	Loss of Biodiversity		X	
	Loss of SCC		X	
	Loss of Critical Biodiversity Areas		X	
	Establishment of Alien Plant Species		X	X
	Habitat loss/fragmentation		X	
	Wildlife Mortalities		X	X
Rehabilitation and Maintenance	Inadequate rehabilitation and maintenance of disturbed areas		X	X



The ecological impacts that were identified during the Planning and Design, Construction and Operational Phases of the proposed citrus development are described in Table 9.2 below:

Table 9.2: Description of Impacts identified during all phases of the proposed Citrus Development.

CATEGORIES/ISSUE	PROJECT PHASE		
	PLANNING AND DESIGN	CONSTRUCTION	OPERATION
Legal and policy compliance	Failure to obtain and adhere to the necessary permits and/or authorisations, as well as failure to adhere to existing policies and legal obligations relating to the ecological environment, could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.		
Erosion	N/A	During the construction phase, the clearance of vegetation and associated construction activities could result in erosion and the loss of top soil within the development site and surrounds.	During the operational phase, failure to install erosion control and stormwater management measures could result in increased run-off and further erosion within the boundaries of Portion 472 of Farm 42. Additionally, failure to rehabilitate temporary areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable topsoil.
Loss of soil quality	N/A	N/A	During the operational phase, soil leaching caused by poor irrigation methods and/or stormwater management, coupled with the application of fertilisers, pesticides, and/or herbicides, could lead to the loss/alteration of soil quality and structure within the study area.
Damage to surface water features	N/A	Construction works, including Vegetation clearing, levelling and earthworks, for the cultivation of the proposed citrus orchards will result in the loss and damage of a section of the drainage line traversing the northwest corner of the study site.	During the operational phase, runoff from the proposed citrus orchards could result in the subsequent sedimentation and/or contamination of downstream water features.



CATEGORIES/ISSUE	PROJECT PHASE		
	PLANNING AND DESIGN	CONSTRUCTION	OPERATION
Loss of indigenous vegetation	N/A	Vegetation clearance for the cultivation of the proposed citrus orchards will result in the direct and permanent loss of Vulnerable Sundays Arid Thicket Vegetation.	During the operational phase, unsustainable and irresponsible farming practises could result in the loss or damage of the surrounding indigenous vegetation.
Loss of Biodiversity	N/A	During the construction phase, uncontrolled construction activities i.e. vegetation clearing, soil ripping etc., could lead to unnecessary damage to and removal of natural vegetation, loss of faunal habitat, and SCC within the proposed site boundaries.	N/A
Loss of SCC	N/A	During the construction phase, construction activities, including the clearance of vegetation, could permanently damage or destroy plant SCC which are present on site, contributing to the cumulative loss of plant SCC in the region.	N/A
Loss of Critical Biodiversity Area	N/A	The proposed development of citrus orchards on Portion 472 of Farm 42 will result in the loss of a portion of an area classified as a CBA 1 in both the ECBCP and the Addo BSP. This classification was driven by the vegetation type, threat status and the established national conservation target. Even though a site is considered degraded and systematic biodiversity planning algorithm will still select a site to ensure that the target is satisfied, recommending that degraded areas of	N/A



CATEGORIES/ISSUE	PROJECT PHASE		
	PLANNING AND DESIGN	CONSTRUCTION	OPERATION
		CBAs are rehabilitated. The planning process, however, does not take in account the capability of the ecosystem to recover once disturbed. In this case, Sundays Arid Thicket has been significantly degraded and it is unlikely that any future efforts to restore the ecosystem will be successful.	
Establishment of Alien Plant Species	N/A	The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems.	<p>During the operational phase, failure to remove and manage alien vegetation during construction could result in the permanent establishment of alien vegetation in the study area.</p> <p>During the Operational phase, the poor rehabilitation of disturbed areas may lead to the permanent degradation of ecosystems as well as allow alien vegetation species to spread.</p>
Habitat loss/fragmentation	N/A	During the construction phase, the loss of vegetation coincides with the loss of faunal habitat, reducing breeding and rearing locales. Faunal populations could become locally extinct or diminish in size.	N/A
Wildlife Mortalities	N/A	During the construction phase, vehicles, crew and materials may increase animal fatalities through opportunistic hunting, collisions, accidents or baiting and trapping.	During the operational phase, vehicles, crew and materials may increase animal fatalities through opportunistic hunting, collisions, accidents or baiting and trapping.
REHABILITATION			
Inadequate rehabilitation and maintenance of disturbed areas	N/A	During the construction phase, failure to implement rehabilitation measures could lead to the	During the operational phase, failure to rehabilitate temporary areas, which were impacted during the



CATEGORIES/ISSUE	PROJECT PHASE		
	PLANNING AND DESIGN	CONSTRUCTION	OPERATION
		erosion of- and permanent loss of valuable soil, the unnecessary loss of indigenous vegetation and the establishment of alien invasive vegetation.	construction phase, could lead to the erosion of- and permanent loss of valuable soil, the degradation of the surrounding indigenous vegetation, and the establishment of alien invasive vegetation.



9.2 IMPACT ASSESSMENT

The impacts identified in Section 9.1 are assessed in terms of the criteria described in Section 3.7 and are described in detail below:

PLANNING AND DESIGN PHASE

Impact 1: Legal and Policy Compliance

Cause and Comment

Failure to obtain and adhere to the necessary permits and/or authorisations, as well as failure to adhere to existing policies and legal obligations relating to the ecological environment, could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in a lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.

Mitigation Measures

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- A suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase;
- Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and
- Planning for the construction and operation of the proposed development should consider available best practice guidelines.

Significance Assessment

IMPACT 1: LEGAL AND POLICY COMPLIANCE										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Regional/ National	Severe	Possible	HIGH (-)	Irreversible	Resource could be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									



CONSTRUCTION PHASE

Impact 2: Erosion

Cause and Comment

During the construction phase, the clearance of vegetation and associated construction activities could result in erosion and the loss of top soil within the development site and surrounds.

Mitigation Measures

- An Erosion Management Plan or method statement must be compiled indicating what measures will be implemented during the Construction Phase;
- Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion;
- Disturbed areas must be rehabilitated as soon as possible after construction; and
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.

Significance Assessment

IMPACT 2: EROSION										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study-Area	Moderate	Possible	MODERATE (-)	Reversible	Resource could be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 3: Damage to Surface Water Features



Cause and Comment

Construction works, including Vegetation clearing, levelling and earthworks for the cultivation of the proposed citrus orchards will result in the loss and damage of a section of the drainage line traversing the northwest corner of the study site.

Mitigation Measures

- The construction site must be managed in a manner that prevents the contamination or sedimentation of the main tributary into which the drainage line flows; and
- Silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further loss and degradation of the main tributary.

Significance Assessment

IMPACT 3: DAMAGE TO SURFACE WATER FEATURES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderately Severe	Possible	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 4: Loss of Indigenous Vegetation (Sundays Arid Thicket)

Cause and Comment

Vegetation clearance for the cultivation of the proposed citrus orchards will result in the direct loss of **Vulnerable** Sundays Arid Thicket Vegetation. It must be noted that, although still in a natural state, the ecosystem has been transformed from Sunday Arid Thicket to a low scrub/grassland by suspected over-grazing by large game species, and the recovery of this ecosystem to its former state is unlikely.

Mitigation Measures

- A comprehensive Plant Search and Rescue should be conducted prior to vegetation clearance;
- Any SCC should be translocated to the nearest appropriate habitat;



- The clearance of vegetation at any given time should be kept to a minimum;
- Employees must be prohibited from making fires and harvesting plants;
- Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase;
- Only indigenous species must be used for rehabilitation purposes;
- As far as practically possible, existing roads should be utilised; and
- An alien vegetation management plan must be compiled (for implementation during the phases that follow).

Significance Assessment

IMPACT 4: LOSS OF INDIGENOUS VEGETATION (SUNDAYS ARID THICKET)										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study-Area	Moderately Severe	Definite	MODERATE (-)	Irreversible	Resource will be lost	Achievable	MODERATE (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 5: Loss of Biodiversity

Cause and Comment

During the construction phase, uncontrolled construction activities i.e. vegetation clearing, soil ripping etc., beyond the footprint of the development, could lead to unnecessary damage to and removal of natural vegetation, loss of faunal habitat, and SCC within the proposed site boundaries.

Mitigation Measures

- A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance;
- The clearance of vegetation at any given time must be kept to a minimum and restricted to demarcated development areas;
- Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas;
- Employees must be prohibited from making fires and harvesting plants;



- Any alien vegetation, which establishes during the construction phase, must be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings must take place throughout the construction phase;
- Only indigenous species must be used for rehabilitation purposes; and
- As far as practically possible, existing roads must be utilised.

Significance Assessment

IMPACT 5: LOSS OF BIODIVERSITY										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Definite	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 6: Loss of SCC

Cause and Comment

During the construction phase, construction activities, including the clearance of vegetation, could permanently damage or destroy plant SCC which are present on site, contributing to the cumulative loss of plant SCC in the region.

Mitigation Measures

- A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance;
- A qualified botanical specialist must be present on-site during the clearance of vegetation; and
- Any SCC should be relocated to the nearest appropriate habitat.

Significance Assessment

IMPACT 6: LOSS OF SPECIES OF CONSERVATION CONCERN (SCC)



IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study Area	Severe	Definite	HIGH (-)	Irreversible	Resource will be lost	Achievable	MODERATE (-)
No-Go Alternative	Not Applicable									

Impact 7: Loss of Critical Biodiversity Areas

Cause and Comment

The proposed development of citrus orchards on Portion 472 of Farm 42 will result in the loss of a portion of an area classified as a CBA 1 in terms of both the ECBCP and the Addo BSP. This classification was driven by the vegetation type, threat status and the established national conservation target. Even though a site is considered degraded, the systematic biodiversity planning algorithm will still select a site to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. The planning process, however, does not take in account the capability of the ecosystem to recover once disturbed. In this case, Sundays Arid Thicket has been significantly degraded and it is unlikely that any future efforts to restore the ecosystem will be successful.

Mitigation Measures

- If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented.

Significance Assessment

IMPACT 7: LOSS OF CRITICAL BIODIVERSITY AREAS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Study Area	Moderate	Definite	MODERATE (-)	Irreversible	Resource will be lost	Achievable	MODERATE (-)
No-Go Alternative	Not Applicable									



Impact 8: Establishment of Alien Plant Species

Cause and Comment

The removal of existing natural vegetation creates ‘open’ habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems.

It should be noted that there is currently existing alien vegetation within the proposed development site, and therefore the implementation of the no-go alternative would result in a moderate impact as these species will remain and most likely spread.

Mitigation Measures

- An Alien Vegetation Management Plan must be developed and implemented to prevent the establishment and spread of undesirable alien plant species during all phases of development; and
- Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase.

Significance Assessment

IMPACT 8: ESTABLISHMENT OF ALIEN PLANT SPECIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Moderately Severe	Possible	MODERATE (-)	Reversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	Negative	Long-Term	Localised	Moderately Severe	Definite	MODERATE (-)	N/A	N/A	N/A	N/A

Impact 9: Habitat Loss/Fragmentation

Cause and Comment

During the construction phase, the loss of vegetation coincides with the loss of faunal habitat, reducing breeding and rearing locales. Faunal populations could become locally extinct or diminish in size.



Mitigation Measures

- A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;
- The clearance of vegetation at any given time should be kept to a minimum;
- Vegetation clearance and trampling should be avoided in areas demarcated as no-go areas;
- Employees must not trap, hunt, handle or remove any faunal species from the site;
- As far as practically possible, existing roads must be utilized.

Significance Assessment

IMPACT 9: HABITAT LOSS/FRAGMENTATION										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Definite	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 10: Wildlife Mortalities

Cause and Comment

During the construction phase, construction activities could result in faunal fatalities through collisions with moving vehicles, accidents during vegetation clearance, or the baiting and trapping of fauna by construction workers.

Mitigation Measures

- A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;
- Vehicle speed must be limited to 30km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- Search and clear the construction region prior to work commencing, relocating animals where found;



- No animal shall be killed or hurt; and
- No hunting, baiting or trapping shall be allowed.

Significance Assessment

IMPACT 10: WILDLIFE MORTALITIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 11: Inadequate Rehabilitation and Maintenance of Disturb Areas

Cause and Comment

During the construction phase, failure to implement rehabilitation measures could lead to the erosion of- and permanent loss of valuable soil, the unnecessary loss of indigenous vegetation and the establishment of alien invasive vegetation.

Mitigation Measures

- A Rehabilitation Plan must be developed and implemented during and post-construction;
- All temporary disturbed areas that do not form part of the citrus orchards, must be rehabilitated using only indigenous vegetation; and
- All impacted areas must be restored as per the EMP requirements.

Significance Assessment

IMPACT 11: INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURB AREAS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION



All Alternatives	Negative	Permanent	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

OPERATIONAL PHASE

Impact 12: Erosion

Cause and Comment

During the operational phase, failure to install erosion control and stormwater management measures could result in increased run-off and further erosion within the boundaries of Portion 472 of Farm 42. Additionally, failure to rehabilitate temporary areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable topsoil.

Mitigation Measures

- Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms;
- All erosion control mechanisms, such as silt traps, must be regularly maintained;
- Natural vegetation must be retained where possible to avoid soil erosion;
- Any cleared areas, which are not used for the cultivation of the citrus orchards, should be rehabilitated post-construction using only indigenous plant species;
- Irrigation methods must ensure minimal runoff;
- All pipelines associated with the irrigation system(s) must be monitored for leaks throughout the operational phase; and
- The quality and health status of surrounding soils should be monitored throughout the operational phase.

Significance Assessment

IMPACT 12: EROSION



IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study-Area	Moderate	Possible	MODERATE (-)	Reversible	Resource could be partially lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 13: Loss of Soil Quality

Cause and Comment

During the operational phase, soil leaching caused by poor irrigation methods and/or stormwater management, coupled with the application of fertilisers, pesticides, and/or herbicides, could lead to the loss/alteration of soil quality and structure within the study area.

Mitigation Measures

- Disturbed areas must be rehabilitated as soon as possible after construction;
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;
- If necessary, any alteration of soil quality should be remediated in line with best practices; and
- The application of fertilisers, pesticides, and/or herbicides to cultivated areas must be carefully managed.

Significance Assessment

IMPACT 13: LOSS OF SOIL QUALITY										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Study-Area	Moderate	Possible	MODERATE (-)	Reversible	Resource could be partially lost	Achievable	LOW (-)
No-Go Alternative	Not Applicable									

Impact 14: Damage to Surface Water Features



Cause and Comment

During the operational phase, runoff from the proposed citrus orchards could result in the subsequent sedimentation and/or contamination of downstream water features.

Mitigation Measures

- The citrus orchards must be managed in a manner that prevents the contamination or sedimentation of the main tributary to which the drainage line is connected to;
- Irrigation methods must ensure that the correct rates of agricultural application which could potentially contaminate water course (such as fertilisers, herbicides and pesticides) are applied and ensure the minimal runoff of water ; and
- Silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further degradation of the main tributary.

Significance Assessment

IMPACT 14: DAMAGE TO SURFACE WATER FEATURES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderately Severe	Possible	MODERATE (-)	Irreversible	Resource will be partially lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 15: Loss of Indigenous Vegetation

Cause and Comment

During the operational phase, unsustainable and irresponsible farming practises could result in the loss or damage of the surrounding indigenous vegetation, beyond the orchard development footprint.

Mitigation Measures



- The proposed vegetation clearing and ripping of soil required for cultivation must be restricted to the citrus orchards;
- Sustainable farming methods must be practiced during the operational phase, such as application of pesticides using nozzles which will assist in preventing wind-drift; and
- Vehicles should make use of existing farm roads and must refrain from driving through surrounding indigenous vegetation.

Significance Assessment

IMPACT 15: LOSS OF INDIGENOUS VEGETATION										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Permanent	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 16: Establishment of Alien Plant Species

Cause and Comment

During the operational phase, failure to remove and manage alien vegetation during construction could result in the permanent establishment of alien vegetation in the study area. In addition, the poor rehabilitation of disturbed areas may lead to the permanent degradation of ecosystems which will permit alien vegetation species to establish and spread.

It should be noted that there is currently existing alien vegetation within the proposed development site, and therefore the implementation of the no-go alternative would result in a moderate impact as these species will remain and most likely spread.

Mitigation Measures

- An Alien Vegetation Management Plan must be implemented to prevent the establishment and prevent the spread of undesirable alien plant species during the Operational Phase; and



- Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide.

Significance Assessment:

IMPACT 16: ESTABLISHMENT OF ALIEN PLANT SPECIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localized	Moderately Severe	Possible	MODERATE (-)	Reversible	Resource will be lost	Achievable	LOW (-)
No-Go Alternative	Negative	Long-Term	Localised	Moderately Severe	Definite	MODERATE (-)	N/A	N/A	N/A	N/A

Impact 17: Wildlife Mortalities

Cause and Comment

Operational activities could result in faunal fatalities through collisions with moving vehicles, accidents during harvesting of the citrus orchards, or the baiting and trapping of fauna by farm workers.

Mitigation Measures

- Vehicle speed must be limited to 30km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- No animal shall be killed or hurt; and
- No hunting, baiting or trapping shall be allowed.

Significance Assessment

IMPACT 17: WILDLIFE MORTALITIES										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION



All Alternatives	Negative	Permanent	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will not be lost	Achievable	LOW (-)
No-Go Alternative	<i>Not Applicable</i>									

Impact 18: Inadequate Rehabilitation and Maintenance of Disturbed Areas

Cause and Comment

During the operational phase, failure to rehabilitate temporary disturbed areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable soil, the degradation of the surrounding indigenous vegetation, and the establishment of alien invasive vegetation.

Mitigation Measures

- Stormwater control must be undertaken to prevent soil loss from the site;
- All erosion control mechanisms must be regularly maintained;
- Vegetation must be retained where possible to avoid soil erosion;
- Any cleared/disturbed areas, which are not used for the cultivation of citrus, should be rehabilitated post-construction using only indigenous plant species;
- Irrigation methods must ensure minimal runoff;
- The quality and health status of surrounding soils should be monitored throughout the operational phase; and
- Any alteration of soil quality should be remediated in line with best practice.

Significance Assessment

IMPACT 18: INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS										
IMPACT	NATURE	DURATION	EXTENT	SEVERITY	LIKELIHOOD	SIGNIFICANCE BEFORE MITIGATION	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE AFTER MITIGATION
All Alternatives	Negative	Long-Term	Localised	Moderate	Possible	MODERATE (-)	Irreversible	Resource will be lost	Achievable	LOW (-)



No-Go Alternative	<i>Not Applicable</i>
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10. IMPACT STATEMENT, RECOMMENDATIONS AND CONCLUSION

Appendix 6

Specialist Reports

1. (1) A specialist report prepared in terms of these Regulations must contain—
 - (l) any conditions for inclusion in the environmental authorisation;
 - (m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;
 - (n) a reasoned opinion—
 - (i) whether the proposed activity, activities or portions thereof should be authorised;
 - (iA) regarding the acceptability of the proposed activity or activities; and
 - (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;

10.1 IMPACT STATEMENT

Approximately thirty-eight (38) plant species were present throughout the proposed study site. The proposed Sitrusrand Dwarsleegte Farm Citrus Development is situated within one (1) vegetation type – Sundays Arid Thicket (classified as **Vulnerable** according to Skowno *et al.*, 2019). Sundays Arid thicket typically occurs inland on shallow, loamy-clayey soils within the coastal hinterland region of the Albany Thicket Biome. Arid thicket is the driest form of the thicket types, with a rainfall of about 200-300mm, and is characterised by a prominent succulent component and a poorly developed, sparse woody tree and shrub component. Frost is a common occurrence.

The Sundays Arid Thicket vegetation within the study site appeared to be significantly degraded, most likely due to over-grazing by larger game of the Voetpads Kloof Game Farm. Consequently, much of the vegetation cover on site now represents a secondary grassland / thornveld interspersed with fragments of sparse- to semi-dense Sundays Arid Thicket bush clumps. Although the vegetation has been degraded, the remaining vegetation cover within the project area still supports a number of indigenous species, including rare species. As such, a comprehensive Floral Search and Rescue Operation is recommended prior to any vegetation clearance, with the translocation of any SCC to the nearest appropriate habitat. Scattered alien invasives of the genus *Opuntia* (NEMBA Category 1b; CARA Category 1) and *Atriplex* (NEMBA Category 1b; CARA Category 3) were also observed on site. As such, an Alien Management Plan must be compiled and implemented during all stages of the proposed development.

Analysis of the layout for the proposed citrus development indicated that a total area of 19.8 ha is required for the cultivation of citrus orchards on Portion 472 of Farm 42 (Dwarsleegte Farm). Due to the threat status, high potential of fragmentation and the low rehabilitation potential of Sundays Arid Thicket vegetation, it is critical that



vegetation clearance for the proposed citrus orchards be kept to the absolute minimum footprint required for the purpose of cultivation.

Although the site is degraded and probably does not meet the criteria used for classifying the area as a CBA 1 neither now NOR will be able to in the future (due to poor ecosystem regeneration and rehabilitation) in both the ECBCP and the Addo BSP, the loss of this site does signify the loss of potential sites to achieve the national target for this ecosystem. As such, if there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented

Animal species recorded during the site visit included a number of birds, warthogs, 1 dung beetle, and other insects. However, a detailed survey was not conducted, and it is likely that reptiles and other small mammals are present or utilise the area. For this reason, and the fact that that the study site forms part of the Voetpadskloof Game Farm, it is recommended that a Faunal Search and Rescue Operation be conducted prior to vegetation clearance.

10.1.1 Existing Impacts

A baseline analysis of the present condition of the study site indicated that a significant portion of the Sundays Arid Thicket vegetation has been degraded, most likely due to over-grazing by larger game of the Voetpadskloof Game Farm. Consequently, much of the vegetation within the study site has been transformed and now represents a secondary grassland/thornveld, interspersed with fragmented, short bush clumps of Sundays Arid Thicket. As such, the following existing impacts have been identified:

- Loss of indigenous vegetation;
- Loss of biodiversity,
- Habitat loss/fragmentation; and
- The establishment of alien invasive plant species.

10.1.2 Cumulative Impacts

The following cumulative impacts were identified as a result of the proposed Sitrusrand Dwarsleegte Farm Citrus Development:

Aspect	Description of Impact
Loss of Indigenous Vegetation (Sundays Arid Thicket)	Vegetation clearance for the cultivation of the proposed citrus orchards will result in the cumulative loss of Sundays Arid Thicket Vegetation applying further pressure on the ecosystem and increasing the threat status. It will also impact on cumulative biodiversity loss associated with the loss of habitats and habitat fragmentation.

10.1.3 No-go Areas

Although no no-go areas have been identified for the proposed Sitrusrand Dwarsleegte Farm Citrus Development, it is critical that vegetation clearance and activities associated with the cultivation of the proposed citrus orchards be restricted to the boundaries of the development footprint as indicated on Figure 10.1 below. It is



recommended that the boundaries of the development footprint be clearly demarcated in order to prevent encroachment into the surrounding natural areas.



Figure 10.1: Layout Point Coordinates (A– H) of the proposed citrus development Site.

Table 10.1: Coordinates of the corner points of the proposed project area (as per Figure 10.1 above).

Point	Latitude (S) (DDMMSS)			Longitude (E) (DDMMSS)		
A	33°	26′	15.65″S	25°	22′	15.61″E
B	33°	26′	15.86″S	25°	22′	20.63″E
C	33°	26′	18.76″S	25°	22′	21.57″E
D	33°	26′	18.97″S	25°	22′	28.62″E
E	33°	26′	30.90″S	25°	22′	33.49″E
F	33°	26′	31.06″S	25°	22′	37.31″E
G	33°	26′	35.95″S	25°	22′	39.26″E
H	33°	26′	35.22″S	25°	22′	21.41″E



10.2 RECOMMENDATIONS

The following recommendations must be included as conditions of environmental authorisation and integrated into the Final EMP:

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- A suitably qualified ECO must be appointed prior to the commencement of the construction phase;
- A comprehensive Search and Rescue for fauna and flora should be conducted prior to vegetation clearance;
- All SCC must be relocated to nearest appropriate habitat;
- A qualified botanical specialist should be present on-site during vegetation clearing;
- An Erosion Management Plan or method statement indicating how erosion will be prevented and controlled must be developed prior to the commencement of construction activities in order to mitigate the unnecessary loss of topsoil and runoff;
- An Alien Vegetation Management plan should be compiled and implemented during all stages of the proposed citrus development;
- A Rehabilitation Plan must be developed and implemented during construction and operation phases;
- If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented; and
- The necessary Water Use Licence (WUL) must be obtained prior to abstraction from the watercourse.

10.2.1 Mitigation Measures

The mitigation measures provided below are to be implemented during the relevant phases of the proposed citrus development:

Planning and Design Phase:

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- A suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase;
- Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and
- Planning for the construction and operation of the proposed development should consider available best practice guidelines.

Construction Phase

- An Erosion Management method statement must be compiled indicating what measures will be implemented during the Construction Phase;



- Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion;
- Disturbed areas must be rehabilitated as soon as possible after construction;
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;
- The construction site must be managed in a manner that prevents the contamination or sedimentation of the main tributary into which the drainage line flows;
- Silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further loss and degradation of the main tributary;
- A comprehensive Plant Search and Rescue should be conducted prior to vegetation clearance;
- Any SCC should be translocated to the nearest appropriate habitat;
- The clearance of vegetation at any given time should be kept to a minimum;
- Employees must be prohibited from making fires and harvesting plants;
- Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase;
- Only indigenous species must be used for rehabilitation purposes;
- As far as practically possible, existing roads should be utilised;
- An alien vegetation management plan must be compiled (for implementation during the phases that follow);
- Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas;
- A qualified botanical specialist must be present on-site during the clearance of vegetation;
- If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented;
- A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;
- Employees must not trap, hunt, handle or remove any faunal species from the site;
- Vehicle speed must be limited to 30km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- Search and clear the construction region prior to work commencing, relocating animals where found;
- No animal shall be killed or hurt where possible; and
- No hunting, baiting or trapping shall be allowed.
- A Rehabilitation Plan must be developed and implemented during and post-construction;
- All temporary disturbed areas that do not form part of the citrus orchards, must be rehabilitated using only indigenous vegetation; and
- All impacted areas must be restored as per the EMPr requirements.

Operational Phase

- Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms;
- All erosion control mechanisms, such as silt traps, must be regularly maintained;
- Natural vegetation must be retained where possible to avoid soil erosion;



- Any cleared areas, which are not used for the cultivation of the citrus orchards, should be rehabilitated post-construction using only indigenous plant species;
- Irrigation methods must ensure minimal runoff;
- The quality and health status of surrounding soils should be monitored throughout the operational phase;
- Disturbed areas must be rehabilitated as soon as possible after construction;
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;
- Any alteration of soil quality should be remediated in line with best practices;
- The application of fertilisers, pesticides, and/or herbicides to cultivated areas must be carefully managed;
- The citrus orchards must be managed in a manner that prevents the contamination or sedimentation of the main tributary to which the drainage line is connected to;
- Irrigation methods must ensure that the correct rates of agricultural application which could potentially contaminate water course (such as fertilisers, herbicides and pesticides) are applied and ensure the minimal runoff of water;
- Silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further degradation of the main tributary;
- The proposed vegetation clearing and ripping of soil required for cultivation must be restricted to the citrus orchards;
- Sustainable farming methods must be practiced during the operational phase, such as application of pesticides using nozzles which will assist in preventing wind-drift;
- An Alien Vegetation Management Plan must be implemented to prevent the establishment and prevent the spread of undesirable alien plant species during the Operational Phase;
- Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide;
- Vehicle speed must be limited to 30km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- No animal shall be killed or hurt where possible; and
- No hunting, baiting or trapping shall be allowed.

10.3 CONCLUSION

Table 10.1 below summarises the change in impact significance between pre- to post-mitigation during all phases of the proposed citrus development. The majority of the impacts were classified as moderate and high and will be reduced to a low significance if the mitigation measures as proposed in this report, are implemented and adhered to. The only impact not mitigable is the loss of indigenous vegetation (Sundays Arid Thicket) during the construction phase, which regardless of mitigation measures, will be lost as a result of clearing for the proposed citrus orchards. As such, the significance of this impact will remain moderate negative.



Table 10.2: Summary of pre- and post-mitigation measures associated with the proposed citrus development.

	PRE-MITIGATION			POST-MITIGATION		
	LOW	MODERATE	HIGH	LOW	MODERATE	HIGH
Planning and Design	0	0	1	1	0	0
Construction	0	8	1	7	2	0
Operational	0	7	0	7	0	0
No-Go	0	2	0	NA	NA	NA
TOTAL	0	17	2	15	2	0

10.3.1 Ecological Statement and Opinion of the Specialist

The ecological impacts of all aspects of the proposed Sitrusrand Dwarsleegte Farm Citrus Development were assessed and considered to be ecologically acceptable, provided the mitigation measures outlined in this report are implemented. In total, before mitigation, 0% of the impacts are rated as LOW, 90% of the impacts are considered MODERATE significance, while 10% of the impacts are rated HIGH significance (Table 10.2). Most of the impacts were identified during the construction phase. Therefore, the implementation of the recommended mitigation measures and monitoring, especially during construction is critical to ensure a development that is environmentally sound. By implementing the recommended mitigation measures, the overall impacts will be reduced from MODERATE and HIGH to 88% LOW significance and 12% MODERATE significance post-mitigation.

As the majority of the study site was demarcated as a moderately sensitive site (see Section 7 of this report), bar the drainage line traversing the northwest portion of the study site which was allocated HIGH sensitivity, the implementation of the appropriate mitigation measures provided in Section 9 of this report is of critical importance for maintaining the integrity of the environment and in order to ensure a development which is environmentally appropriate.

Loss of CBA1 areas mean that less area of a close to irreplaceable ecosystem is available to meet national conservation targets. Conservation of this specific site would then assume that, if left untouched, that the area would recover and revert to Sundays Arid Thicket. This is highly unlikely, even if active restoration is implemented, due the unsuccessful regeneration of this ecosystem. As such, if there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented

Specific mitigation measures, including the undertaking of a comprehensive Plant and Faunal Search and Rescue Operation and the relocation of the SCC to the nearest appropriate habitat, must be implemented and adhered to. It is recommended that a qualified botanical specialist be present on-site during vegetation clearance.

The development footprint of the proposed citrus orchards must be demarcated to prevent any encroachment of construction or operational activities into surrounding natural areas and vegetation clearance must be kept to the minimum footprint required for the purposes of cultivating the proposed citrus orchards. Minor location deviations from the proposed works is deemed acceptable but the footprint may not be made larger.



The proposed Sitrusrand Dwarsleegte Farm Citrus Development is **NOT considered to be Fatally Flawed**.

The no-go option refers to the proposed Sitrusrand Dwarsleegte Farm Citrus Development not taking place. This option will have a moderately positive outcome for the indigenous vegetation and surrounding natural environment relative to the proposed development, but the existing disturbed areas and alien invasive plant species on Portion 472 of Farm 42 will remain and the benefits associated with the proposed citrus orchards will be lost.



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APPENDIX 1 – LIST OF POSSIBLE PLANT SPECIES

The following list of plant species may occur within the project area of the proposed Sitrusrand Dwarsleegte Expansion Development (source: <http://posa.sanbi.org/sanbi/Explore>).

FAMILY	SPECIES	CONSERVATION STATUS (IUCN)	ECOLOGY
Poaceae	<i>Stipa dregeana</i>	LC	Indigenous
Poaceae	<i>Digitaria sp.</i>		
Proteaceae	<i>Protea eximia</i>	LC	Indigenous; Endemic
Poaceae	<i>Sporobolus ludwigii</i>	LC	Indigenous
Aizoaceae	<i>Galenia pubescens</i>	LC	Indigenous; Endemic
Poaceae	<i>Themeda triandra</i>	LC	Indigenous
Poaceae	<i>Tenaxia disticha</i>		Indigenous
Asteraceae	<i>Gazania krebsiana</i>	LC	Indigenous
Solanaceae	<i>Lycium oxycarpum</i>	LC	Indigenous; Endemic
Solanaceae	<i>Nicotiana glauca</i>		Not indigenous; Naturalised; Invasive
Crassulaceae	<i>Crassula cordata</i>	LC	Indigenous; Endemic
Asteraceae	<i>Ursinia nana</i>	LC	Indigenous
Asphodelaceae	<i>Haworthiopsis glauca</i>		Indigenous; Endemic
Iridaceae	<i>Aristea schizolaena</i>	LC	Indigenous; Endemic
Amaryllidaceae	<i>Haemanthus coccineus</i>	LC	Indigenous
Amaranthaceae	<i>Exomis microphylla</i>	LC	Indigenous; Endemic
Aizoaceae	<i>Delosperma ecklonis</i>	LC	Indigenous; Endemic
Onagraceae	<i>Oenothera stricta</i>		Not indigenous; Naturalised; Invasive
Asphodelaceae	<i>Aloe africana</i>	LC	Indigenous; Endemic
Celastraceae	<i>Mystroxydon aethiopicum</i>	LC	Indigenous; Endemic
Ericaceae	<i>Erica simulans</i>	LC	Indigenous; Endemic
Poaceae	<i>Cynodon dactylon</i>	LC	Indigenous
Scrophulariaceae	<i>Selago luxurians</i>	LC	Indigenous; Endemic
Asteraceae	<i>Ursinia discolor</i>	LC	Indigenous; Endemic
Neckeraceae	<i>Porotrichum madagassum</i>		Indigenous
Capparaceae	<i>Maerua cafra</i>	LC	Indigenous
Fabaceae	<i>Chamaecrista capensis</i>	LC	Indigenous
Iridaceae	<i>Dierama pendulum</i>	LC	Indigenous; Endemic
Asphodelaceae	<i>Gasteria acinacifolia</i>	LC	Indigenous; Endemic
Acanthaceae	<i>Dicliptera cernua</i>	LC	Indigenous
Poaceae	<i>Arundinella nepalensis</i>	LC	Indigenous
Polygalaceae	<i>Polygala virgata</i>	LC	Indigenous
Rhamnaceae	<i>Phylla willdenowiana</i>	LC	Indigenous; Endemic
Santalaceae	<i>Thesium turczaninowii</i>		Indigenous; Endemic
Apocynaceae	<i>Ceropegia carnosia</i>	LC	Indigenous
Geraniaceae	<i>Pelargonium peltatum</i>	LC	Indigenous; Endemic



Vitaceae	<i>Cyphostemma sp.</i>		
Poaceae	<i>Hyparrhenia hirta</i>	LC	Indigenous
Poaceae	<i>Eragrostis gummiflua</i>	LC	Indigenous
Asteraceae	<i>Senecio articulatus</i>		Indigenous; Endemic
Loganiaceae	<i>Strychnos decussata</i>	LC	Indigenous
Crassulaceae	<i>Crassula muscosa</i>	NE	Indigenous; Endemic
Asteraceae	<i>Senecio sp.</i>		
Iridaceae	<i>Tritonia dubia</i>	NT	Indigenous; Endemic
Asteraceae	<i>Osteospermum herbaceum</i>	LC	Indigenous; Endemic
Begoniaceae	<i>Begonia geranioides</i>	LC	Indigenous; Endemic
Capparaceae	<i>Cadaba aphylla</i>	LC	Indigenous
Aizoaceae	<i>Delosperma echinatum</i>	LC	Indigenous; Endemic
Fabaceae	<i>Aspalathus angustifolia</i>	VU	Indigenous; Endemic
Proteaceae	<i>Leucadendron salignum</i>	LC	Indigenous; Endemic
Didiereaceae	<i>Portulacaria afra</i>	LC	Indigenous
Achariaceae	<i>Acharia tragodes</i>	LC	Indigenous; Endemic
Solanaceae	<i>Nicandra physalodes</i>		Not indigenous; Naturalised; Invasive
Poaceae	<i>Ehrharta villosa</i>	LC	Indigenous; Endemic
Ericaceae	<i>Erica nutans</i>	LC	Indigenous; Endemic
Brassicaceae	<i>Heliophila subulata</i>	LC	Indigenous; Endemic
Vitaceae	<i>Rhoicissus digitata</i>	LC	Indigenous
Poaceae	<i>Elionurus muticus</i>	LC	Indigenous
Asphodelaceae	<i>Aloe lineata</i>	LC	Indigenous; Endemic
Crassulaceae	<i>Crassula rupestris</i>	LC	Indigenous; Endemic
Asteraceae	<i>Senecio angulatus</i>	LC	Indigenous; Endemic
Cyperaceae	<i>Cyperus rotundus</i>	LC	Indigenous
Iridaceae	<i>Tritonia gladiolaris</i>	LC	Indigenous
Araliaceae	<i>Cussonia thyrsoiflora</i>	LC	Indigenous; Endemic
Poaceae	<i>Cymbopogon marginatus</i>	LC	Indigenous
Asteraceae	<i>Gazania linearis</i>	LC	Indigenous
Poaceae	<i>Digitaria sanguinalis</i>	NE	Not indigenous; Naturalised
Asteraceae	<i>Syncarpha argentea</i>	LC	Indigenous; Endemic
Crassulaceae	<i>Crassula orbicularis</i>	LC	Indigenous; Endemic
Euphorbiaceae	<i>Euphorbia esculenta</i>	LC	Indigenous; Endemic
Penaeaceae	<i>Penaea cneorum</i>	LC	Indigenous; Endemic
Fabaceae	<i>Senegalia caffra</i>	LC	Indigenous
Poaceae	<i>Helictotrichon turgidulum</i>	LC	Indigenous
Poaceae	<i>Avena fatua</i>	NE	Not indigenous; Naturalised; Invasive
Crassulaceae	<i>Crassula sp.</i>		
Asteraceae	<i>Felicia flanaganii</i>	LC	Indigenous; Endemic
Anacardiaceae	<i>Searsia dentata</i>	LC	Indigenous
Poaceae	<i>Tribolium curvum</i>	LC	Indigenous
Poaceae	<i>Pentameris airoides</i>	LC	Indigenous



Fabaceae	<i>Schotia afra</i>	LC	Indigenous; Endemic
Euphorbiaceae	<i>Acalypha ecklonii</i>	LC	Indigenous; Endemic
Amaryllidaceae	<i>Haemanthus albiflos</i>	LC	Indigenous; Endemic
Scrophulariaceae	<i>Jamesbrittenia microphylla</i>	LC	Indigenous; Endemic
Proteaceae	<i>Leucospermum cuneiforme</i>	LC	Indigenous; Endemic
Euphorbiaceae	<i>Euphorbia albipollinifera</i>	NT	Indigenous; Endemic
Asphodelaceae	<i>Haworthia cymbiformis</i>	NE	Indigenous; Endemic
Poaceae	<i>Stipa dregeana</i>	LC	Indigenous; Endemic
Cucurbitaceae	<i>Kedrostis nana</i>	LC	Indigenous; Endemic
Poaceae	<i>Phragmites australis</i>	LC	Indigenous
Ericaceae	<i>Erica copiosa</i>	LC	Indigenous; Endemic
Scrophulariaceae	<i>Jamesbrittenia foliolosa</i>	LC	Indigenous; Endemic
Iridaceae	<i>Gladiolus ochroleucus</i>	LC	Indigenous
Ericaceae	<i>Erica sp.</i>		
Poaceae	<i>Digitaria eriantha</i>	LC	Indigenous
Orchidaceae	<i>Holothrix sp.</i>		
Iridaceae	<i>Gladiolus mortonius</i>	LC	Indigenous; Endemic
Scrophulariaceae	<i>Buddleja saligna</i>	LC	Indigenous
Iridaceae	<i>Gladiolus permeabilis</i>	LC	Indigenous; Endemic
Euphorbiaceae	<i>Euphorbia mauritanica</i>	LC	Indigenous
Achariaceae	<i>Ceratosicyos laevis</i>	LC	Indigenous
Poaceae	<i>Vulpia bromoides</i>	NE	Not indigenous; Naturalised; Invasive
Polygalaceae	<i>Polygala illepipa</i>	LC	Indigenous; Endemic
Poaceae	<i>Aira cupaniana</i>	NE	Not indigenous; Naturalised
Orthotrichaceae	<i>Zygodon erosus</i>		Indigenous
Malvaceae	<i>Sida ternata</i>	LC	Indigenous
Poaceae	<i>Brachiaria serrata</i>	LC	Indigenous
Poaceae	<i>Pentameris pallida</i>	LC	Indigenous
Iridaceae	<i>Ixia orientalis</i>	LC	Indigenous; Endemic
Apocynaceae	<i>Aspidoglossum heterophyllum</i>	LC	Indigenous; Endemic
Sapindaceae	<i>Pappea capensis</i>	LC	Indigenous
Lamiaceae	<i>Teucrium trifidum</i>	LC	Indigenous
Poaceae	<i>Ehrharta erecta</i>	LC	Indigenous
Poaceae	<i>Panicum deustum</i>	LC	Indigenous
Myrtaceae	<i>Eugenia zeyheri</i>	LC	Indigenous; Endemic
Neckeraceae	<i>Porotrichum elongatum</i>		Indigenous
Aizoaceae	<i>Malephora luteola</i>	LC	Indigenous; Endemic
Crassulaceae	<i>Cotyledon velutina</i>	LC	Indigenous; Endemic
Apiaceae	<i>Centella virgata</i>	LC	Indigenous; Endemic



APPENDIX 2 – LIST OF ANIMAL SPECIES

The following lists of animal species may occur within the project area of the proposed Sitrusrand Dwarsleegte Expansion Development.

Birds

COMMON NAME	SPECIES NAME	CONSERVATION STATUS
STRUTHIONIFORMES: Struthionidae		
Common Ostrich	Struthio camelus	
ANSERIFORMES: Anatidae		
White-faced Whistling-Duck	Dendrocygna viduata	
White-backed Duck	Thalassornis leuconotus	
Egyptian Goose	Alopochen aegyptiaca	
South African Shelduck	Tadorna cana	
Spur-winged Goose	Plectropterus gambensis	
Hottentot Teal	Spatula hottentota	
Cape Shoveler	Spatula smithii	
African Black Duck	Anas sparsa	
Yellow-billed Duck	Anas undulata	
Cape Teal	Anas capensis	
Red-billed Duck	Anas erythrorhyncha	
Southern Pochard	Netta erythrophthalma	
Maccoa Duck	Oxyura maccoa	Vulnerable
GALLIFORMES: Numididae		
Helmeted Guineafowl	Numida meleagris	
GALLIFORMES: Phasianidae		
Common Quail	Coturnix coturnix	
Cape Francolin	Pternistis capensis	Endemic (country/region)
Red-necked Francolin	Pternistis afer	
Red-winged Francolin	Scleroptila levaillantii	
Gray-winged Francolin	Scleroptila afra	Endemic (country/region)
PHOENICOPTERIFORMES: Phoenicopteridae		
Greater Flamingo	Phoenicopterus roseus	
Lesser Flamingo	Phoeniconaias minor	Near-threatened
PODICIPEDIFORMES: Podicipedidae		
Little Grebe	Tachybaptus ruficollis	
Great Crested Grebe	Podiceps cristatus	
Eared Grebe	Podiceps nigricollis	
COLUMBIFORMES: Columbidae		
Speckled Pigeon	Columba guinea	
Rameron Pigeon	Columba arquatrix	
Lemon Dove	Columba larvata	
Red-eyed Dove	Streptopelia semitorquata	
Ring-necked Dove	Streptopelia capicola	



Laughing Dove	<i>Streptopelia senegalensis</i>	
Emerald-spotted Wood-Dove	<i>Turtur chalcospilos</i>	
Tambourine Dove	<i>Turtur tympanistria</i>	
Namaqua Dove	<i>Oena capensis</i>	
OTIDIFORMES: Otididae		
Kori Bustard	<i>Ardeotis kori</i>	Near-threatened
Ludwig's Bustard	<i>Neotis ludwigii</i>	Endangered
Denham's Bustard	<i>Neotis denhami</i>	Near-threatened
White-bellied Bustard	<i>Eupodotis senegalensis</i>	
Blue Bustard	<i>Eupodotis caerulea</i>	Endemic (country/region) Near-threatened
Black Bustard	<i>Eupodotis afra</i>	Endemic (country/region) Vulnerable
White-quilled Bustard	<i>Eupodotis afroides</i>	
Black-bellied Bustard	<i>Lissotis melanogaster</i>	Rare/Accidental
MUSOPHAGIFORMES: Musophagidae		
Knysna Turaco	<i>Tauraco corythaix</i>	
CUCULIFORMES: Cuculidae		
White-browed Coucal	<i>Centropus superciliosus</i>	
Green Malkoha	<i>Ceuthmochares australis</i>	
Great Spotted Cuckoo	<i>Clamator glandarius</i>	
Pied Cuckoo	<i>Clamator jacobinus</i>	
Dideric Cuckoo	<i>Chrysococcyx caprius</i>	
Klaas's Cuckoo	<i>Chrysococcyx klaas</i>	
African Emerald Cuckoo	<i>Chrysococcyx cupreus</i>	
Black Cuckoo	<i>Cuculus clamosus</i>	
Red-chested Cuckoo	<i>Cuculus solitarius</i>	
Common Cuckoo	<i>Cuculus canorus</i>	
CAPRIMULGIFORMES: Caprimulgidae		
Eurasian Nightjar	<i>Caprimulgus europaeus</i>	
Fiery-necked Nightjar	<i>Caprimulgus pectoralis</i>	
CAPRIMULGIFORMES: Apodidae		
Alpine Swift	<i>Apus melba</i>	
Common Swift	<i>Apus apus</i>	
African Swift	<i>Apus barbatus</i>	
Little Swift	<i>Apus affinis</i>	
Horus Swift	<i>Apus horus</i>	
White-rumped Swift	<i>Apus caffer</i>	
African Palm-Swift	<i>Cypsiurus parvus</i>	
GRUIFORMES: Sarothruridae		
Buff-spotted Flufftail	<i>Sarothrura elegans</i>	
Red-chested Flufftail	<i>Sarothrura rufa</i>	
Striped Flufftail	<i>Sarothrura affinis</i>	
GRUIFORMES: Rallidae		
African Rail	<i>Rallus caerulescens</i>	



Eurasian Moorhen	Gallinula chloropus	
Red-knobbed Coot	Fulica cristata	
African Swampphen	Porphyrio madagascariensis	
Black Crake	Zapornia flavirostra	
GRUIFORMES: Heliornithidae		
African Finfoot	Podica senegalensis	
GRUIFORMES: Gruidae		
Blue Crane	Anthropoides paradiseus	Vulnerable
CHARADRIIFORMES: Burhinidae		
Water Thick-knee	Burhinus vermiculatus	
Spotted Thick-knee	Burhinus capensis	
CHARADRIIFORMES: Recurvirostridae		
Black-winged Stilt	Himantopus himantopus	
Pied Avocet	Recurvirostra avosetta	
CHARADRIIFORMES: Haematopodidae		
African Oystercatcher	Haematopus moquini	
CHARADRIIFORMES: Charadriidae		
Black-bellied Plover	Pluvialis squatarola	
Blacksmith Lapwing	Vanellus armatus	
Black-winged Lapwing	Vanellus melanopterus	
Crowned Lapwing	Vanellus coronatus	
Kittlitz's Plover	Charadrius pecuarius	
Common Ringed Plover	Charadrius hiaticula	
Three-banded Plover	Charadrius tricollaris	
White-fronted Plover	Charadrius marginatus	
Chestnut-banded Plover	Charadrius pallidus	Near-threatened
CHARADRIIFORMES: Rostratulidae		
Greater Painted-Snipe	Rostratula benghalensis	
CHARADRIIFORMES: Jacanidae		
African Jacana	Actophilornis africanus	
CHARADRIIFORMES: Scolopacidae		
Whimbrel	Numenius phaeopus	
Eurasian Curlew	Numenius arquata	Near-threatened
Bar-tailed Godwit	Limosa lapponica	Near-threatened
Ruddy Turnstone	Arenaria interpres	
Red Knot	Calidris canutus	Near-threatened
Ruff	Calidris pugnax	
Curlew Sandpiper	Calidris ferruginea	Near-threatened
Sanderling	Calidris alba	
Little Stint	Calidris minuta	
African Snipe	Gallinago nigripennis	
Terek Sandpiper	Xenus cinereus	
Common Sandpiper	Actitis hypoleucos	
Common Greenshank	Tringa nebularia	



Marsh Sandpiper	<i>Tringa stagnatilis</i>	
Wood Sandpiper	<i>Tringa glareola</i>	
CHARADRIIFORMES: Turnicidae		
Hottentot Buttonquail	<i>Turnix hottentottus</i>	Endemic (country/region) Endangered
CHARADRIIFORMES: Glareolidae		
Double-banded Courser	<i>Smutsornis africanus</i>	
CHARADRIIFORMES: Laridae		
Gray-hooded Gull	<i>Chroicocephalus cirrocephalus</i>	
Kelp Gull	<i>Larus dominicanus</i>	
Damara Tern	<i>Sternula balaenarum</i>	Vulnerable
Caspian Tern	<i>Hydroprogne caspia</i>	
White-winged Tern	<i>Chlidonias leucopterus</i>	
Whiskered Tern	<i>Chlidonias hybrida</i>	
Roseate Tern	<i>Sterna dougallii</i>	
CICONIIFORMES: Ciconiidae		
Black Stork	<i>Ciconia nigra</i>	
White Stork	<i>Ciconia ciconia</i>	
Yellow-billed Stork	<i>Mycteria ibis</i>	Rare/Accidental
SULIFORMES: Anhingidae		
African Darter	<i>Anhinga rufa</i>	
SULIFORMES: Phalacrocoracidae		
Long-tailed Cormorant	<i>Microcarbo africanus</i>	
Great Cormorant	<i>Phalacrocorax carbo</i>	
Cape Cormorant	<i>Phalacrocorax capensis</i>	Endemic (country/region) Endangered
PELECANIFORMES: Scopidae		
Hamerkop	<i>Scopus umbretta</i>	
PELECANIFORMES: Ardeidae		
Little Bittern	<i>Ixobrychus minutus</i>	
Gray Heron	<i>Ardea cinerea</i>	
Black-headed Heron	<i>Ardea melanocephala</i>	
Goliath Heron	<i>Ardea goliath</i>	
Purple Heron	<i>Ardea purpurea</i>	
Great Egret	<i>Ardea alba</i>	
Intermediate Egret	<i>Ardea intermedia</i>	
Little Egret	<i>Egretta garzetta</i>	
Cattle Egret	<i>Bubulcus ibis</i>	
Squacco Heron	<i>Ardeola ralloides</i>	
Striated Heron	<i>Butorides striata</i>	
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	
White-backed Night-Heron	<i>Gorsachius leuconotus</i>	
PELECANIFORMES: Threskiornithidae		
Glossy Ibis	<i>Plegadis falcinellus</i>	
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	



Hadada Ibis	Bostrychia hagedash	
African Spoonbill	Platalea alba	
ACCIPITRIFORMES: Sagittariidae		
Secretarybird	Sagittarius serpentarius	Vulnerable
ACCIPITRIFORMES: Pandionidae		
Osprey	Pandion haliaetus	
ACCIPITRIFORMES: Accipitridae		
Black-winged Kite	Elanus caeruleus	
African Harrier-Hawk	Polyboroides typus	
Bearded Vulture	Gypaetus barbatus	Near-threatened
African Cuckoo-Hawk	Aviceda cuculoides	
Cape Griffon	Gyps coprotheres	Endangered
Black-chested Snake-Eagle	Circaetus pectoralis	
Crowned Eagle	Stephanoaetus coronatus	Near-threatened
Martial Eagle	Polemaetus bellicosus	Vulnerable
Long-crested Eagle	Lophaetus occipitalis	
Booted Eagle	Hieraaetus pennatus	Rare/Accidental
Verreaux's Eagle	Aquila verreauxii	
Pale Chanting-Goshawk	Melierax canorus	
Gabar Goshawk	Micronisus gabar	
African Marsh-Harrier	Circus ranivorus	
Black Harrier	Circus maurus	Endangered
Pallid Harrier	Circus macrourus	Near-threatened
African Goshawk	Accipiter tachiro	
Little Sparrowhawk	Accipiter minullus	
Black Goshawk	Accipiter melanoleucus	
Black Kite	Milvus migrans	Rare/Accidental
African Fish-Eagle	Haliaeetus vocifer	
Common Buzzard	Buteo buteo	
Forest Buzzard	Buteo trizonatus	Endemic (country/region) Near-threatened
Jackal Buzzard	Buteo rufufuscus	
STRIGIFORMES: Tytonidae		
Barn Owl	Tyto alba	
STRIGIFORMES: Strigidae		
African Scops-Owl	Otus senegalensis	
Cape Eagle-Owl	Bubo capensis	
Spotted Eagle-Owl	Bubo africanus	
African Barred Owlet	Glaucidium capense	
African Wood-Owl	Strix woodfordii	
Marsh Owl	Asio capensis	
COLIIFORMES: Coliidae		
Speckled Mousebird	Colius striatus	
White-backed Mousebird	Colius colius	
Red-faced Mousebird	Urocolius indicus	



TROGONIFORMES: Trogonidae		
Narina Trogon	Apaloderma narina	
BUCEROTIFORMES: Upupidae		
Eurasian Hoopoe	Upupa epops	
BUCEROTIFORMES: Phoeniculidae		
Green Woodhoopoe	Phoeniculus purpureus	
BUCEROTIFORMES: Bucerotidae		
Crowned Hornbill	Lophoceros alboterminatus	
Trumpeter Hornbill	Bycanistes bucinator	
CORACIIFORMES: Alcedinidae		
Half-collared Kingfisher	Alcedo semitorquata	
Malachite Kingfisher	Corythornis cristatus	
African Pygmy-Kingfisher	Ispidina picta	
Brown-hooded Kingfisher	Halcyon albiventris	
Giant Kingfisher	Megaceryle maxima	
Pied Kingfisher	Ceryle rudis	
CORACIIFORMES: Meropidae		
White-fronted Bee-eater	Merops bullockoides	Rare/Accidental
White-throated Bee-eater	Merops albicollis	Rare/Accidental
European Bee-eater	Merops apiaster	
CORACIIFORMES: Coraciidae		
European Roller	Coracias garrulus	
PICIFORMES: Lybiidae		
Red-fronted Tinkerbird	Pogoniulus pusillus	
Pied Barbet	Tricholaema leucomelas	
Black-collared Barbet	Lybius torquatus	
PICIFORMES: Indicatoridae		
Wahlberg's Honeyguide	Prodotiscus regulus	
Lesser Honeyguide	Indicator minor	
Scaly-throated Honeyguide	Indicator variegatus	
Greater Honeyguide	Indicator indicator	
PICIFORMES: Picidae		
Rufous-necked Wryneck	Jynx ruficollis	
Cardinal Woodpecker	Chloropicus fuscescens	
Olive Woodpecker	Chloropicus griseocephalus	
Ground Woodpecker	Geocolaptes olivaceus	Endemic (country/region) Near-threatened
Knysna Woodpecker	Campethera notata	Endemic (country/region) Near-threatened
FALCONIFORMES: Falconidae		
Lesser Kestrel	Falco naumanni	
Rock Kestrel	Falco rupicolus	
Greater Kestrel	Falco rupicoloides	
Amur Falcon	Falco amurensis	
Eurasian Hobby	Falco subbuteo	



Lanner Falcon	Falco biarmicus	
Peregrine Falcon	Falco peregrinus	
PASSERIFORMES: Campephagidae		
Gray Cuckooshrike	Coracina caesia	
Black Cuckooshrike	Campephaga flava	
PASSERIFORMES: Oriolidae		
Eurasian Golden Oriole	Oriolus oriolus	
African Black-headed Oriole	Oriolus larvatus	
PASSERIFORMES: Platysteiridae		
Cape Batis	Batis capensis	
Chinspot Batis	Batis molitor	
Priirit Batis	Batis priirit	
PASSERIFORMES: Malaconotidae		
Black-backed Puffback	Dryoscopus cubla	
Southern Tchagra	Tchagra tchagra	
Southern Boubou	Laniarius ferrugineus	
Bokmakierie	Telophorus zeylonus	
Sulphur-breasted Bushshrike	Telophorus sulfureopectus	
Olive Bushshrike	Telophorus olivaceus	
Gray-headed Bushshrike	Malaconotus blanchoti	
PASSERIFORMES: Dicruridae		
Fork-tailed Drongo	Dicrurus adsimilis	
PASSERIFORMES: Monarchidae		
African Crested-Flycatcher	Trochocercus cyanomelas	
African Paradise-Flycatcher	Terpsiphone viridis	
PASSERIFORMES: Laniidae		
Red-backed Shrike	Lanius collurio	
Lesser Gray Shrike	Lanius minor	
Southern Fiscal	Lanius collaris	
PASSERIFORMES: Corvidae		
Cape Crow	Corvus capensis	
Pied Crow	Corvus albus	
White-necked Raven	Corvus albicollis	
PASSERIFORMES: Stenostiridae		
Fairy Flycatcher	Stenostira scita	
PASSERIFORMES: Paridae		
Southern Black-Tit	Melaniparus niger	
Gray Tit	Melaniparus afer	
PASSERIFORMES: Remizidae		
Southern Penduline-Tit	Anthoscopus minutus	
PASSERIFORMES: Alaudidae		
Spike-heeled Lark	Chersomanes albofasciata	
Karoo Long-billed Lark	Certhilauda subcoronata	
Eastern Long-billed Lark	Certhilauda semitorquata	Endemic (country/region)



Gray-backed Sparrow-Lark	<i>Eremopterix verticalis</i>	
Sabota Lark	<i>Calendulauda sabota</i>	
Rufous-naped Lark	<i>Mirafrā africana</i>	
Red-capped Lark	<i>Calandrella cinerea</i>	
Large-billed Lark	<i>Galerida magnirostris</i>	
PASSERIFORMES: Macrosphenidae		
Cape Crombec	<i>Sylvietta rufescens</i>	
Cape Grassbird	<i>Sphenoeacus afer</i>	
Victorin's Warbler	<i>Cryptillas victorini</i>	Endemic (country/region)
PASSERIFORMES: Cisticolidae		
Namaqua Warbler	<i>Phragmacia substriata</i>	
Green-backed Camaroptera	<i>Camaroptera brachyura</i>	
Bar-throated Apalis	<i>Apalis thoracica</i>	
Yellow-breasted Apalis	<i>Apalis flavida</i>	
Tawny-flanked Prinia	<i>Prinia subflava</i>	
Karoo Prinia	<i>Prinia maculosa</i>	
Rufous-eared Warbler	<i>Malcorus pectoralis</i>	
Rock-loving Cisticola	<i>Cisticola aberrans</i>	
Red-headed Cisticola	<i>Cisticola subruficapilla</i>	
Wailing Cisticola	<i>Cisticola lais</i>	
Levaillant's Cisticola	<i>Cisticola tinniens</i>	
Piping Cisticola	<i>Cisticola fulvicapilla</i>	
Zitting Cisticola	<i>Cisticola juncidis</i>	
Cloud Cisticola	<i>Cisticola textrix</i>	
Wing-snapping Cisticola	<i>Cisticola ayresii</i>	
PASSERIFORMES: Acrocephalidae		
Marsh Warbler	<i>Acrocephalus palustris</i>	
African Reed Warbler	<i>Acrocephalus baeticatus</i>	
Lesser Swamp Warbler	<i>Acrocephalus gracilirostris</i>	
PASSERIFORMES: Locustellidae		
Barratt's Warbler	<i>Bradypterus barratti</i>	
Little Rush-Warbler	<i>Bradypterus baboecala</i>	
PASSERIFORMES: Hirundinidae		
Plain Martin	<i>Riparia paludicola</i>	
Bank Swallow	<i>Riparia riparia</i>	Rare/Accidental
Banded Martin	<i>Riparia cincta</i>	
Rock Martin	<i>Ptyonoprogne fuligula</i>	
Barn Swallow	<i>Hirundo rustica</i>	
White-throated Swallow	<i>Hirundo albigularis</i>	
Pearl-breasted Swallow	<i>Hirundo dimidiata</i>	
Greater Striped Swallow	<i>Cecropis cucullata</i>	
Lesser Striped Swallow	<i>Cecropis abyssinica</i>	
Common House-Martin	<i>Delichon urbicum</i>	
Black Sawwing	<i>Psalidoprocne pristoptera</i>	



PASSERIFORMES: Pycnonotidae		
Sombre Greenbul	Andropadus importunus	
Terrestrial Brownbul	Phyllastrephus terrestris	
Common Bulbul	Pycnonotus barbatus	
Black-fronted Bulbul	Pycnonotus nigricans	
Cape Bulbul	Pycnonotus capensis	Endemic (country/region)
PASSERIFORMES: Phylloscopidae		
Willow Warbler	Phylloscopus trochilus	
Yellow-throated Woodland-Warbler	Phylloscopus ruficapilla	
PASSERIFORMES: Sylviidae		
Bush Blackcap	Sylvia nigricapillus	Vulnerable
Layard's Warbler	Sylvia layardi	
Chestnut-vented Warbler	Sylvia subcoerulea	
PASSERIFORMES: Zosteropidae		
Cape White-eye	Zosterops virens	
PASSERIFORMES: Buphagidae		
Red-billed Oxpecker	Buphagus erythrorhynchus	Rare/Accidental
PASSERIFORMES: Sturnidae		
European Starling	Sturnus vulgaris	Introduced species
Wattled Starling	Creatophora cinerea	
Common Myna	Acridotheres tristis	Rare/Accidental
Pale-winged Starling	Onychognathus naboroupp	
Red-winged Starling	Onychognathus morio	
Black-bellied Starling	Notopholia corusca	
African Pied Starling	Lamprotornis bicolor	Endemic (country/region)
Cape Starling	Lamprotornis nitens	
PASSERIFORMES: Turdidae		
Olive Thrush	Turdus olivaceus	
Karoo Thrush	Turdus smithi	
PASSERIFORMES: Muscicapidae		
African Dusky Flycatcher	Muscicapa adusta	
Spotted Flycatcher	Muscicapa striata	
Chat Flycatcher	Agricola infuscatus	
Fiscal Flycatcher	Melaenornis silens	
Southern Black-Flycatcher	Melaenornis pammelaina	
Karoo Scrub-Robin	Cercotrichas coryphoeus	
Brown Scrub-Robin	Cercotrichas signata	
Red-backed Scrub-Robin	Cercotrichas leucophrys	
Cape Robin-Chat	Cossypha caffra	
Chorister Robin-Chat	Cossypha dichroa	
White-starred Robin	Pogonocichla stellata	
Sentinel Rock-Thrush	Monticola explorator	Near-threatened
Cape Rock-Thrush	Monticola rupestris	Endemic (country/region)
African Stonechat	Saxicola torquatus	



Karoo Chat	<i>Emarginata schlegelii</i>	
Southern Anteater-Chat	<i>Myrmecocichla formicivora</i>	
Mountain Wheatear	<i>Myrmecocichla monticola</i>	
Arnot's Chat	<i>Myrmecocichla arnotti</i>	
Ruaha Chat	<i>Myrmecocichla collaris</i>	
Capped Wheatear	<i>Oenanthe pileata</i>	
Familiar Chat	<i>Oenanthe familiaris</i>	
PASSERIFORMES: Promeropidae		
Cape Sugarbird	<i>Promerops cafer</i>	Endemic (country/region)
PASSERIFORMES: Nectariniidae		
Collared Sunbird	<i>Hedydipna collaris</i>	
Orange-breasted Sunbird	<i>Anthobaphes violacea</i>	Endemic (country/region)
Mouse-colored Sunbird	<i>Cyanomitra veroxii</i>	
Amethyst Sunbird	<i>Chalcomitra amethystina</i>	
Scarlet-chested Sunbird	<i>Chalcomitra senegalensis</i>	
Malachite Sunbird	<i>Nectarinia famosa</i>	
Southern Double-collared Sunbird	<i>Cinnyris chalybeus</i>	
Greater Double-collared Sunbird	<i>Cinnyris afer</i>	
White-breasted Sunbird	<i>Cinnyris talatala</i>	Rare/Accidental
Dusky Sunbird	<i>Cinnyris fuscus</i>	
PASSERIFORMES: Ploceidae		
Scaly Weaver	<i>Sporopipes squamifrons</i>	
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	
Spectacled Weaver	<i>Ploceus ocularis</i>	
Cape Weaver	<i>Ploceus capensis</i>	Endemic (country/region)
African Golden-Weaver	<i>Ploceus subaureus</i>	
Southern Masked-Weaver	<i>Ploceus velatus</i>	
Village Weaver	<i>Ploceus cucullatus</i>	
Forest Weaver	<i>Ploceus bicolor</i>	
Red-billed Quelea	<i>Quelea quelea</i>	
Southern Red Bishop	<i>Euplectes orix</i>	
Yellow Bishop	<i>Euplectes capensis</i>	
Red-collared Widowbird	<i>Euplectes ardens</i>	
Grosbeak Weaver	<i>Amblyospiza albifrons</i>	
PASSERIFORMES: Estrildidae		
Sweet Waxbill	<i>Coccyzygia melanotis</i>	
Common Waxbill	<i>Estrilda astrild</i>	
Red-billed Firefinch	<i>Lagonosticta senegala</i>	
African Firefinch	<i>Lagonosticta rubricata</i>	
Red-headed Finch	<i>Amadina erythrocephala</i>	
Quailfinch	<i>Ortygospiza atricollis</i>	
Bronze Mannikin	<i>Spermestes cucullata</i>	
PASSERIFORMES: Viduidae		
Pin-tailed Whydah	<i>Vidua macroura</i>	



Village Indigobird	<i>Vidua chalybeata</i>	
Variable Indigobird	<i>Vidua funerea</i>	
PASSERIFORMES: Passeridae		
House Sparrow	<i>Passer domesticus</i>	Introduced species
Cape Sparrow	<i>Passer melanurus</i>	
Southern Gray-headed Sparrow	<i>Passer diffusus</i>	
Yellow-throated Bush Sparrow	<i>Gymnoris superciliaris</i>	
PASSERIFORMES: Motacillidae		
Cape Wagtail	<i>Motacilla capensis</i>	
Mountain Wagtail	<i>Motacilla clara</i>	
African Pied Wagtail	<i>Motacilla aguimp</i>	
Long-billed Pipit	<i>Anthus similis</i>	
Plain-backed Pipit	<i>Anthus leucophrys</i>	
Buffy Pipit	<i>Anthus vaalensis</i>	
Striped Pipit	<i>Anthus lineiventris</i>	
Orange-throated Longclaw	<i>Macronyx capensis</i>	
Yellow-throated Longclaw	<i>Macronyx croceus</i>	
PASSERIFORMES: Fringillidae		
Yellow-fronted Canary	<i>Crithagra mozambica</i>	
Forest Canary	<i>Crithagra scotops</i>	Endemic (country/region)
Black-throated Canary	<i>Crithagra atrogularis</i>	
Brimstone Canary	<i>Crithagra sulphurata</i>	
Yellow Canary	<i>Crithagra flaviventris</i>	
White-throated Canary	<i>Crithagra albogularis</i>	
Protea Canary	<i>Crithagra leucoptera</i>	Endemic (country/region) Near-threatened
Streaky-headed Seedeater	<i>Crithagra gularis</i>	
Cape Siskin	<i>Crithagra totta</i>	Endemic (country/region)
Cape Canary	<i>Serinus canicollis</i>	
Black-headed Canary	<i>Serinus alario</i>	
PASSERIFORMES: Emberizidae		
Golden-breasted Bunting	<i>Emberiza flaviventris</i>	
Cape Bunting	<i>Emberiza capensis</i>	
Lark-like Bunting	<i>Emberiza impetuani</i>	
Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>	

Amphibians

FAMILY	SPECIES	COMMON NAME	RED LIST CATEGORY
Bufoidea	<i>Sclerophrys capensis</i>	Raucous Toad	Least Concern
Bufoidea	<i>Vandijkophrynus gariensis gariensis</i>	Karoo Toad (subsp. <i>gariensis</i>)	
Hyperoliidae	<i>Hyperolius marmoratus</i>	Painted Reed Frog	Least Concern (IUCN ver 3.1, 2013)
Hyperoliidae	<i>Hyperolius semidiscus</i>	Yellowstriped Reed Frog	Least Concern
Pipidae	<i>Xenopus laevis</i>	Common Platanna	Least Concern



Pyxicephalidae	<i>Amietia delalandii</i>	Delalande's River Frog	Least Concern (2017)
Pyxicephalidae	<i>Cacosternum nanum</i>	Bronze Caco	Least Concern (2013)

Reptiles

FAMILY	SPECIES	COMMON NAME	RED LIST CATEGORY
Agamidae	<i>Agama atra</i>	Southern Rock Agama	Least Concern (SARCA 2014)
Cordylidae	<i>Cordylus cordylus</i>	Cape Girdled Lizard	Least Concern (SARCA 2014)
Gekkonidae	<i>Pachydactylus maculatus</i>	Spotted Gecko	Least Concern (SARCA 2014)
Lacertidae	<i>Pedioplanis lineocellata pulchella</i>	Common Sand Lizard	Least Concern (SARCA 2014)
Lamprophiidae	<i>Lycodonomorphus inornatus</i>	Olive House Snake	Least Concern (SARCA 2014)
Scincidae	<i>Acontias lineicauda</i>	Algoa Bay Legless Skink	Least Concern (SARCA 2014)
Scincidae	<i>Trachylepis capensis</i>	Cape Skink	Least Concern (SARCA 2014)
Scincidae	<i>Trachylepis variegata</i>	Variiegated Skink	Least Concern (SARCA 2014)
Testudinidae	<i>Stigmochelys pardalis</i>	Leopard Tortoise	Least Concern (SARCA 2014)
Varanidae	<i>Varanus niloticus</i>	Water Monitor	Least Concern (SARCA 2014)

Mammals

FAMILY	SPECIES	COMMON NAME	CONSERVATION STATUS
Bovidae	<i>Alcelaphus buselaphus</i>	Hartebeest	
	<i>Redunca fulvorufula</i>	Mountain Reedbuck	Least Concern
	<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern (2016)
Cercopithecidae	<i>Papio ursinus</i>	Chacma Baboon	Least Concern (2016)
Elephantidae	<i>Loxodonta africana</i>	African Bush Elephant	Vulnerable A2a (2008)
Equidae	<i>Equus zebra zebra</i>	Cape Mountain Zebra	Least Concern (2016)
Felidae	<i>Caracal caracal</i>	Caracal	Least Concern (2016)
	<i>Felis nigripes</i>	Black-footed Cat	Vulnerable (2016)
	<i>Panthera leo</i>	Lion	Least Concern (2016)
Muridae	<i>Aethomys namaquensis</i>	Namaqua Rock Mouse	Least Concern
	<i>Desmodillus auricularis</i>	Cape Short-tailed Gerbil	Least Concern (2016)
	<i>Gerbilliscus paeba</i>	Paeba Hairy-footed Gerbil	Least Concern (2016)
	<i>Mastomys coucha</i>	Southern African Mastomys	Least Concern (2016)
	<i>Mastomys natalensis</i>	Natal Mastomys	Least Concern (2016)
	<i>Mus (Nannomys) minutoides</i>	Southern African Pygmy Mouse	Least Concern
	<i>Otomys irroratus</i>	Southern African Vlei Rat	Least Concern (2016)
	<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	Least Concern (2016)
Nesomyidae	<i>Saccostomus campestris</i>	Southern African Pouched Mouse	Least Concern (2016)



Suidae	<i>Potamochoerus larvatus koiropotamus</i>	Bush-pig (subspecies koiropotamus)	Least Concern (2016)
	<i>Potamochoerus porcus</i>	Red River Hog	



APPENDIX 3 – CURRICULUM VITAE OF SPECIALISTS

CONTACT DETAILS

Name of Company	Coastal and Environmental Services (Pty) Ltd. t/a CES
Designation	East London Branch – Principal Consultant
Profession	Environmental Consultant
Years with firm	12 (twelve) Years
E-mail	g.hawley@cesnet.co.za
Office number	+27 (0) 43 – 7267809 / 8313
Nationality	South African
Professional Affiliations	SACNASP: South African Council for Natural Scientific Profession
Key areas of expertise	<ul style="list-style-type: none">• Environmental Impact Assessment (Aquaculture, renewable energy, waste water treatment, agriculture)• Environmental Management and Planning• Biodiversity/Conservation Management• Biodiversity/Ecological Assessments

PROFILE

Dr Greer Hawley-McMaster

Dr Greer Hawley has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She completed her PhD thesis (Microbiology) at Rhodes University. Greer has been involved in a number of diverse activities. The core academic focus has been in the field of taxonomy both in the plant and fungal kingdom. Greer's research ranges from fresh water and marine algae, estuarine diatoms, plant species classification in the fynbos and forest vegetation and fungal species identification and ecology. Greer has been involved in environmental and biodiversity impact assessments and environmental and biodiversity management projects both in South Africa and other African countries. Greer has recently assisted with the completion of the Eastern Cape Biodiversity Conservation Plan (2019), the Eastern Cape Biodiversity Strategy and Action Plan and assisted with the generation of the Western Cape State of the Coast Report. She is currently involved with developing the Environmental Management Framework for the King Cetshwayo District Municipality.

**EMPLOYMENT
EXPERIENCE**

- 1998 : Botanical consultant: University of Cape Town
- Laboratory assistant: University of Cape Town
- 1999 : Undergraduate Tutor: University of Cape Town
- 2000- 2001 : Temporary administrative positions:
- Robert Half International, London
- Assistant Office Manager: Warwick House, London
- Office administration: West London Magistrates Court, London
- 2002: Laboratory Assistant: Amphigro
- 2002- 2007: Undergraduate Tutor: Botany and Microbiology, Rhodes University
- 2006- 2007: Laboratory researcher: Abalone Probiotic isolation and testing, Rhodes University
- 2007: Laboratory assistant and product quality control: Mycoroot (Pty) Ltd, Grahamstown
- 2007- present : Principal Environmental Consultant - Coastal & Environmental Services

POST GRADUATE STUDENT SUPERVISION

- 2005 – 2007: 3 Honours students in the Mycology Unit, Rhodes University
- 2006: MSc student in the Mycology Unit, Rhodes University.
- 2016-2018: Co-supervisor of a PhD student in the Mycology Unit, Rhodes University

**ACADEMIC
QUALIFICATIONS**

- PhD Microbiology Rhodes University 2008
- BSc Hons Botany University of Cape Town 1999
- BSc Natural Science (Botany and Zoology) University of Cape Town 1998

**CONTINUING
PROFESSIONAL
DEVELOPMENT**

- Rhodes University-Coastal & Environmental Services: Environmental Impact Assessment Course 2008
- Training in Greenhouse Gas Accounting for Forest Inventories Greenhouse Gas Management Institute 2009

**PROFESSIONAL
EXPERIENCE**

ENVIRONMENTAL MANAGEMENT EXPERIENCE

Specialist studies

- Eastern Cape Biodiversity Conservation Plan review and Biodiversity Strategy and Action Plan (2016-2019). I am currently responsible for a number of roles on this project, including the following:
 - Project manager
 - Biodiversity data collection and analysis
 - Part of planning team
 - One of the report writing authors
 - Client and stakeholder liaison

- Waaihoek Wind Energy Facility (2013-2015): EIA and Ecological Sensitivity Assessment
- This assessment, located just east of Utrecht in KZN, involved two elements: an EIA and a detailed vegetation survey of Grassland and Thornveld (Savanna) culminating in an ecological sensitivity map.
- Olivewood Golf Estate (2014): EIA and Ecological Sensitivity Assessment
- This assessment, located 25km north of East London in the Eastern Cape, involved two elements: an EIA and a detailed vegetation survey of Thicket, Thornveld (Savanna) and Forest vegetation culminating in an ecological sensitivity map.
- Eastern Cape Biofuel Strategic Environmental Assessment (2014-2016)
- This assessment involved the detailed assessment of optimal grow areas against environmental constraints. The product was aimed at selecting the best clustered areas of growth potential, outlining the respective environmental constraints within these clusters, in order to guide investor interests. Detailed mapping analysis was undertaken.
- Balama Graphite Mine and Tete Iron Mine, Mozambique (2013): Biodiversity Survey and Ecological Sensitivity Assessment
- These assessments were both located in Mozambique. Detailed biodiversity surveying and assessment of ecological sensitivity (identify NO-GO areas) were undertaken.
- Addax BioEnergy (2009/2010), Biodiversity and Ecological Impact Assessment AND Carbon Stock Impact Assessment, Sierra Leone.
- The above specialist studies were submitted as separate deliverables and are described separately.
- Biodiversity and Ecological Impact Assessment: This study involved the survey of a 60 000 ha site in Sierra Leone. The vegetation types were described and assessed in terms of biodiversity and overall ecological sensitivity. In addition, the area was surveyed by local experts for the presence of rare and endangered faunal species, for inclusion into the report. All vegetation types were mapped using GIS. The assessment was compiled for international review in accordance with World Bank standards.
- Carbon Stock Impact Assessment: In accordance with the EU directive, Biofuel production needs to demonstrate a 30% reduction in carbon emissions compared to fossil fuels. For this reason, a Carbon Stock study was carried out to determine site specific carbon stocks. This study included field calculations,

vegetation and soil sampling and carbon stock calculations according to internationally accepted standards and using best practice guidelines. Using the detailed GIS vegetation maps, total carbon stocks could be calculated. Sample collection included local academic soil scientists. This study and associated methodology was compiled according to the International Panel on Climate Change (IPCC) standards.

- Wild Coast Forest Survey: (2009-2010) Department of Water and Forestry / Eastern Cape Parks Board initiative
- The forest survey included substantial field work and data collection of the following: plant species identification, GPS mapping of forest boundaries, forest-typing and identifying and quantifying disturbance impacts.
- Mncwasa Water Scheme (2009): Ecological Sensitivity Assessment
- This assessment involved a detailed vegetation survey of forest vegetation and wetlands along anticipated and alternative pipeline routes. The survey included an assessment of the environmental sensitivity along the route and recommendations for mitigation and environmentally acceptable alternatives.
- Peregrine Dunes Golf Estate (2009): Vegetation Rehabilitation Plan and Ecological Impact Assessment
- The Ecological Impact Assessment and Rehabilitation Plan were represented as two reports for the same project. The work carried out on the Ecological Impact Assessment included report revision writing.
- The Rehabilitation Plan was submitted as part of the Environmental Management Plan and incorporated elements of re-vegetation, alien plant removal and rehabilitation, landscape restoration, based on widely accepted concepts of soil ecology and plant succession ecology.

Feasibility studies

- Coega IDZ Aquaculture Feasibility Study:
- Aspects of this study included the consideration of the environmental sustainability, economic and financial viability of the proposed project as well as an assessment of environmental risks and alternative project designs.
- Ndakana Wind farm Feasibility Study
- Nkanya Lodge Feasibility Study: Eastern Cape Development Corporation (ECDC) initiative
- Aspects of this study included the consideration of the economic and financial viability of the proposed project as well as the environmental risks and alternative technologies.

Full Scoping and Environmental Impact Assessments (South African National Environmental Management: EIA regulations)

- Buffalo City Municipality R72 national road re-alignment (2007-2008): Sleeper site
- Responsibilities included: Project Management, budget management, written report, public participation and engagement with key stakeholders throughout the EIA process. Environmental approval obtained.
- Wild Coast Abalone expansion and processing plant (2008)
- Responsibilities included: Project management, budget management, written

reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- Qolora Aquaculture Development Zone (2011)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- All Saints Hospital Waste Water Treatment Works (2012)
- written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- Jamestown Waste Water Treatment Works (2012)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- Ntabankulu Waste Water Treatment Works (2012)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- Qamata: No-gate Waste Water Treatment Works (2012)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- St Patricks Hospital Waste Water Treatment Works (2014)
- Responsibilities included: Project management and report review.

State of Environment (SoER), Environmental Management Plans (EMP) and Environmental Management Frameworks (EMF) for:

- OR Tambo District Municipality SoER and EMP, Eastern Cape Province, South Africa (2009-2010). Accepted by council.
- Joe Gqabi District Municipality SoER and EMP, Eastern Cape Province, South Africa. (2011)
- Mnquma Local Municipality SoER and EMP, Eastern Cape Province, South Africa (2012)
- Western Cape Province, State of the Coast Report, South Africa (2018)
- King Cetswayo District Municipality Environmental Management Framework, KwaZulu-Natal Province, 2017-2019.

Activities:

- o Field survey of district municipality through aerial surveying and field work reporting of whole district municipality (incorporating 4-7 local municipalities).
- o Continued interaction with municipal representatives and key stakeholders
- o Workshops held with key role-players and decision-makers
- o Review of planning documents and integrated development programs.
- o Identification of key environmental issues
- o Selection of priority environmental issues
- o Development of Environmental Management Action Plans directly aimed at mitigating priority issues.
- o Collection and analysis of data

- o Reporting on selected indicators
- o Collection and analysis of spatial data

Responsibilities:

- o Project manager,
- o Project lead,
- o Budget management,
- o Report writing,
- o Team delegation and management and
- o Client liaison.

Additional Specialist studies

- o Sensitive Ecology Assessment: Mncwasa Water Scheme (2009)
- o Vegetation Rehabilitation Plan: Peregrine Dunes Golf Estate (2009)
- o Ecological Impact Assessment: Peregrine Dunes Golf Estate (2009)
- o Vegetation Assessment: Atterbury Development (2008)
- o Wild Coast Forest Survey: (current) DWAF/EC Parks initiative (2009-2010)
- o Biodiversity and Ecological Impact Assessment, Sierra Leone, Addax Biofuels (2009-2010)
- o Land use Impact Assessment, Sierra Leone, Addax Biofuels (2009-2010)
- o Thyspunt – Melkhout Eskom Power line, Ecological Impact Assessment
- o Ecological Impact Assessment: Chaba WEF
- o Ecological Impact Assessment: Thomas River WEF
- o Ecological Impact Assessment: Qunu Renewable Energy Facility
- o Ecological Impact Assessment: Ncora Renewable Energy Facility
- o Ecological Impact Assessment: Ngqamakwe Renewable Energy Facility
- o Ecological Impact Assessment: Qumbu Wind Energy Facility
- o Terrestrial Ecology Impact Assessment: Qolora Aquaculture Zone
- o Toboshane Valley Estate: Ecological Impact Assessment
- o Toboshane Valley Estate: Conservation Management Plan
- o Biodiversity and Impact Assessment: Niassa Green Resource, Mozambique
- o Biodiversity and Impact Assessment: Balama Graphite Mine
- o Biodiversity and Impact Assessment: Tete Iron Ore Mine

Alien Invasive Monitoring, Control and Eradication Plans

- ACSA East London Alien Invasive Plant assessment and eradication programme (2009 and 2016)
- Rehabilitation and Restoration (including alien plant removal) Plan: Peregrine Dunes Golf Estate (2010)
- Alien Invasive Plant Monitoring and Control Plan for the following Wind Energy Facilities:
 - o Chaba WEF (2011)
 - o Komga WEF (2016)
- 2018 (June): Hawley G and Desmet P. Eastern Cape Biodiversity Conservation Plan (Draft 3) and the Strategy and Action Plan. Thicket Forum
- 2017 (June): Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity

Sector Plan and Biodiversity Strategy and Action Plan. Biodiversity Planning Forum.

- 2017: Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. Thicket Forum
- 2016 (June): Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. Biodiversity Planning Forum.
- 2016: Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. Thicket Forum
- 2016: Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. International Association of Impact Assessment, South Africa.
- 2010: Hawley, GL, McMaster AR and Carter AR. The Environmental and Social Impact Assessment, and associated issues and challenges associated with Biofuels. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.
- 2009: Hawley, GL, McMaster AR and Carter AR. Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. International Association of Impact Assessors.
- 2008: Hawley GL and Dames JF. Ectomycorrhizal species diversity above- and below ground comparison in *Pinus patula* (Schlecht et Cham) plantations, South Africa. South African Society for Microbiology (Poster).
- 2006: Hawley, GL and Dames, JF. Morphological and molecular identification of ectomycorrhizal fungi in *Pinus* plantations. South African Society of Microbiology.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Greer Hawley-McMaster

Date: 22 January 2020

CONTACT DETAILS

Name of Company	Coastal and Environmental Services (Pty) Ltd trading as CES
Designation	Port Elizabeth Branch
Profession	Environmental Consultant / Junior Ecological Specialist
Years with firm	One (1) Year
E-mail	n.wienand@cesnet.co.za nicole.wienand@eoh.com
Office number	+27 (0)41 045 0496 +27 (0)41 393 0700
Nationality	South African
Key areas of expertise	<ul style="list-style-type: none">➤ Environmental and Ecological Impact Assessments➤ Botanical Specialist Studies➤ Environmental Auditing/Compliance Monitoring➤ GIS Mapping

PROFILE

Ms Nicole Wienand

Ms Nicole Wienand is an Environmental Consultant based in the Port Elizabeth branch. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) from NMU. Nicole's honours project focused on the composition of subtidal marine benthic communities on warm temperate reefs off the coast of Port Elizabeth and for her undergraduate project she investigated dune movement in Sardinia Bay. Nicole's key interests include marine ecology, botanical specialist assessments, GIS Mapping, the general EIA process, Public Participation Process (PPP) and Ecological Impact Assessments. Since her appointment with CES in January 2019, Nicole has undertaken a number of Ecological Impact Assessments under the guidance of Dr Greer Hawley and Tarryn Martin.

**EMPLOYMENT
EXPERIENCE**

Environmental Consultant, CES
07 January 2019 – Present

- Basic Assessment Reports
- Ecological Impact Assessments
- Environmental Audit/Compliance Monitoring
- GIS Mapping
- Public Participation

**ACADEMIC
QUALIFICATIONS**

Nelson Mandela University, Port Elizabeth
BSc Honours Botany (Environmental Management)
2018

Nelson Mandela Metropolitan University, Port Elizabeth
BSc Environmental Sciences
2015-2017

**CONSULTING
EXPERIENCE**

Basic Assessments

- Duyker Island Prospecting Right, North West Province – Assisting Report Writing
- ZMY Steel Traders (Pty) Ltd. Steel Recycling Plant, Zone 5 of the Coega SEZ, Eastern Cape Province – Basic Assessment Report;
- Fairview Sand Mine near Port Alfred, Eastern Cape Province – Basic Assessment Report;
- Kareekrans Boerdery Agricultural Development near Kirkwood, Eastern Cape Province – Report Writing; and
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province – Report Writing.

Ecological Assessments

- ZMY Steel Traders (Pty) Ltd., Steel Recycling Plant, Zone 5 of the Coega SEZ, Eastern Cape Province;
- Kareekrans Boerdery Agricultural Development near Kirkwood Eastern Cape Province, Ecological Impact Assessment and Report Writing;
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing;
- Uitsig Boerdery Trust Citrus Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing;
- Mosselbankfontein Coastal Dune and Ecological Impact Assessment near Witsand, Western Cape Province – Ecological Impact Assessment and Report Writing;
- Nomzamo Citrus Farm Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing; and
- Mangrove Forest Survey for the Kenmare Biodiversity Management Plan, Topuito, Mozambique.

Environmental Auditing

- Khayamnandi Extension on Erven 114, 609, 590 and 24337, Bethelsdorp, within the Nelson Mandela Bay Municipality;

- Aberdeen Bulk Water Supply Phase 2, Dr Beyers Naude Local Municipality, Eastern Cape Province, South Africa;
- The Milkwoods Integrated Residential Development, Remainder Erf 1953, Victoria Drive, Walmer, Nelson Mandela Bay Municipality, Eastern Cape Province;
- Fishwater Flats Wastewater Treatment Works Refurbishment, Nelson Mandela Bay Municipality, Eastern Cape Province;
- The Refurbishment of the Kwanobuhle Wastewater Treatment Plant, Nelson Mandela Bay Municipality, Eastern Cape Province, South Africa; and
- Driftsands Sewer Collector Augmentation (Phase II), Within the Nelson Mandela Bay Municipality, Eastern Cape Province.

Geographical Information Systems (GIS)

- ZMY Steel Traders – Basic Assessment Report and Biophysical Mapping;
- Duyker Island – Prospecting Area Mapping & Biophysical Mapping;
- Fairview Sand Mine near Port Alfred, Eastern Cape Province – Biophysical and Layout Mapping;
- St Francis Coastal Protection Scheme – Kromme Estuary Functional Zone Mapping; Biophysical Mapping; and Sand Source Area Mapping;
- Kareekrans Boerdery Agricultural Development – Biophysical and Layout Mapping;
- Nomzamo Citrus Farm Development near Kirkwood, Eastern Cape Province - Biophysical and Layout Mapping;
- Siyahluma Citrus Farm Development near Addo, Eastern Cape Province – Biophysical and Layout Mapping; and
- Sitrusrand Dwarsleegte Farm Citrus Development – Biophysical and Layout Mapping.

Public Participation process

- Duyker Island Prospecting Right, North West Province St Francis Coastal Protection Scheme;
- Fairview Sand Mine near Port Alfred, Eastern Cape Province;
- Kareekrans Boerdery Agricultural Development near Kirkwood Eastern Cape Province;
- Proposed Coastal Protection Scheme, St Francis Bay, Kouga Local Municipality, Eastern Cape Province; and
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

Social Auditing

- Malawi Millennium Development Trust – Resettlement Action Plan Implementation Auditing.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Nicole Wienand

Date: January 2020

A LETTER OF RECOMMENDATION (WITH CONDITIONS) FOR THE EXEMPTION OF A FULL PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED CLEARANCE OF APPROXIMATELY 19,8 HECTARES OF INDIGENOUS VEGETATION FOR THE CULTIVATION OF CITRUS ORCHARDS AND THE CONSTRUCTION OF ASSOCIATED INFRASTRUCTURE ON PORTION 472 OF FARM 42 NEAR KIRKWOOD IN THE SUNDAYS RIVER VALLEY LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE

Prepared for: CES Environmental and Social Advisory Services
36 Pickering Street
Newton Park
6045
Tel.: 041 393 0700
Contact person: Ms Rosalie Evans
Email.: r.evans@cesnet.co.za

Compiled by: Dr Johan Binneman
On behalf of: Eastern Cape Heritage Consultants
P.O. Box 689
Jeffreys Bay
6330
Tel: 042 2960399
Cell: 0728006322
Email: kobusreichert@yahoo.com
jnfbinneman@gmail.com

Date: November 2019

PROJECT INFORMATION

Type of development

The proposed development will include the clearing of 19,8 ha of indigenous vegetation for the cultivation of citrus orchards and the construction of associated infrastructure on Portion 472 of Farm 42 near Kirkwood.

Applicant

Sitrusrand Boerdery Trust

Consultant

CES Environmental and Social Advisory Services
36 Pickering Street
Newton Park
6045
Tel.: 041 393 0700
Contact person: Ms Rosalie Evans
Email: r.evans@cesnet.co.za

Purpose of the study

The original proposal was to conduct a Phase 1 Archaeological Impact Assessment (AIA) of the proposed clearance of approximately 19,8 hectares of indigenous vegetation for the cultivation of citrus orchards and the construction of associated infrastructure on Portion 472 of farm 42 near Kirkwood in the Sundays River Valley Local Municipality, Eastern Cape Province;

- the range and importance of possible exposed and *in situ* archaeological sites, features and materials,
- the potential impact of the development on these resources and,
- to make recommendations to minimize possible damage to these resources.

Site and Location

The site for the proposed clearing of vegetation for the cultivation of citrus orchards is located within the 1:50 000 topographic reference map 3325AD Kirkwood. The proposed development will take place on Portion 472 of farm 42 near Kirkwood in the Sundays River Valley Local Municipality of the Eastern Cape Province. It is situated approximately 8 kilometres directly southwest of Kirkwood and 1,8 kilometres south of the Sundays River (Map 1). A general GPS reading was taken at 33.26.479S; 25.22.440E. The property is situated on flat terrain comprises of yellowish alluvial soil covered by low shrubs and trees (Figure 1).

ARCHAEOLOGICAL INVESTIGATION

Methodology and results

The landowner was contacted prior to the investigation to inform him about the survey and to gain access to the property. During the field study we met with the manager who pointed out the proposed area for development and he was also consulted on possible locations of archaeological remains, graves and historical buildings and features. The investigation was conducted on foot by two archaeologists.

A Google Earth aerial image investigation and a literary search were also conducted of the area prior to the survey. GPS readings were taken with a Garmin and all important features were digitally recorded. The archaeological visibility was good and occasional Middle Stone Age stone tools (older than 30 000 years) were observed (Figure 1, bottom right insert). The quartzite Middle Stone Age stone tools display typical faceted striking platforms and were found randomly without any recognised distribution patterns. Few points and blades were observed. Most of the tools were thick, small 'informal' flakes, chunks and cores and were in secondary context and not associated with any other archaeological material. No further action is needed. Apart from the occasional stone tools no other archaeological sites/materials were found. However, because the proposed development is approximately 1,8 kilometres from the Sundays River, it is possible that freshwater shell middens may be exposed during the development.

There are no known graves or buildings older than 60 years on the areas surveyed and in general it would appear that these areas are of low cultural sensitivity and that it is unlikely that any sensitive archaeological remains will be exposed during the development. The development may proceed as planned.

DISCUSSION AND CONDITIONS

The development will take place approximately 1 800 metres from the Sundays River in an area where one would expect to find fresh water shell middens. These are important archaeological sites and special care must be taken that these sites are not destroyed during development. Although it is unlikely that any significant archaeological heritage remains will be exposed during the development, there is always a possibility that human remains and/or other archaeological and historical material may be uncovered during the development. Should such material be exposed then work must cease in the immediate area of the finds and it must be reported to the archaeologist at the Albany Museum (Tel.: 046 6222312) and/or to the Eastern Cape Provincial Heritage Resources Authority (Tel.: 043 7450888) immediately so that a systematic and professional investigation can be undertaken. All work must stop to allow an archaeologist to conduct a systematic and professional investigation. Sufficient time should be allowed to remove/collect such material (See Appendix B for a list of possible archaeological sites that maybe found in the area).



Figure 1. General views of the proposed area for the clearance of indigenous vegetation for the cultivation of citrus orchards on Portion 472 of farm 42 near Kirkwood and a sample of Middle Stone Age stone tools observed on the property (bottom right insert).

LETTER OF RECOMMENDATION

It is recommended that the proposed clearance of approximately 19,8 hectares of indigenous vegetation for the cultivation of citrus orchards and the construction of associated infrastructure on Portion 472 of farm 42 near Kirkwood in the Sundays River Valley Local Municipality, Eastern Cape Province, is exempted from a full Phase 1 Archaeological Heritage Impact Assessment. The proposed area for development is of low cultural sensitivity and it is therefore unlikely that any significant archaeological heritage remains will be found on the property. The proposed development may proceed as planned.

Note: This letter of recommendation only exempts the proposed development from a full Phase 1 Archaeological Heritage Impact Assessment, but not for other heritage impact assessments.

It must also be clear that this letter of recommendation for exemption of a full Phase 1 archaeological heritage impact assessment will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 35) (see Appendix A) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

GENERAL REMARKS AND CONDITIONS

It must be emphasized that this letter of recommendation for exemption of a full Phase 1 archaeological heritage impact assessment is based on the visibility of archaeological sites/material and may not therefore, reflect the true state of affairs. Sites and material may be covered by soil and vegetation and will only be located once this has been removed. In the event of such finds being uncovered, (during any phase of construction work), it must be reported to the archaeologist at the Albany Museum (Tel.: 046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel.: 043 7450888) immediately. The developer must finance the costs should additional studies be required as outlined above. The *onus* is also on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999. The consultant is responsible to forward this report to the relevant Heritage Authority for assessment, unless alternative arrangements have been made with the specialist to submit the report.

APPENDIX A: brief legislative requirements

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (4) *No person may, without a permit issued by the responsible heritage resources authority—*

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.*

Burial grounds and graves

36. (3) (a) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority—*

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.*

Heritage resources management

38. (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –*

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of the site –*
 - (i) exceeding 5000m² in extent, or*
 - (ii) involving three or more erven or subdivisions thereof; or*
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;*
- (d) the re-zoning of a site exceeding 10 000m² in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general human remains are buried in a flexed position on their side, but are also found buried in a sitting position with a flat stone capping. Developers are requested to be on alert for the possibility of uncovering such remains.

Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

Large stone cairns

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane*. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

Stone artefacts

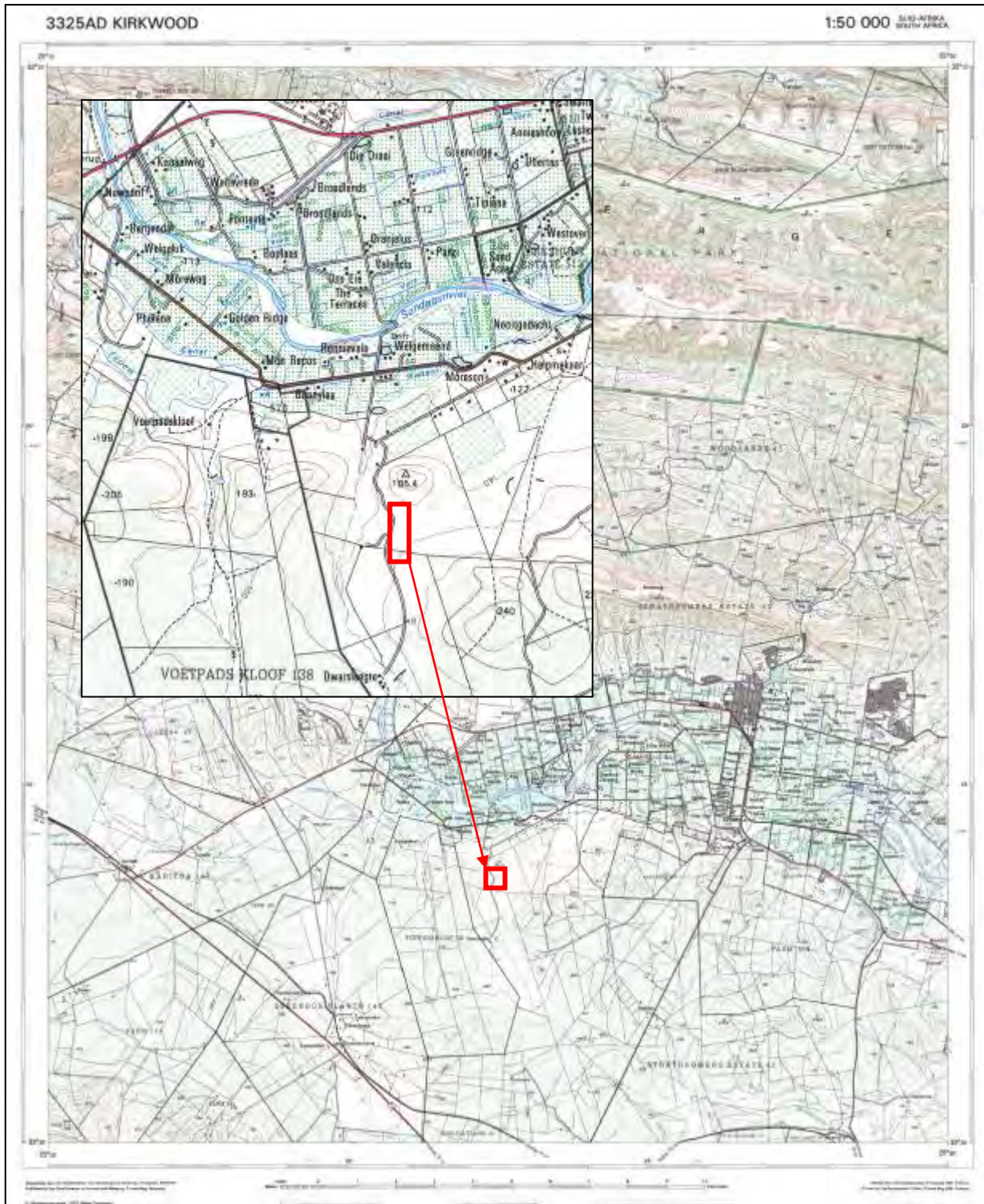
These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

Historical artefacts or features

These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities.



Map 1. 1:50 000 Topographic maps indicating the approximate location of the proposed area for development marked by the red squares.



Map 2. Aerial views of the location of the proposed area for development outlined by the white lines (map courtesy of CES Environmental and Social Advisory Services).

APPENDIX E: COMMENTS AND RESPONSES REPORT

SITE NOTICE

Co-ordinates	
Site Notice	Latitude 33°25'30.35"S
	Longitude 25°22'44.27"E
Date Placed	19 th of June 2019



Figure 18: Site notice placed along the District Road (202151). Location Coordinates: 33°25'30.35"S; 25°22'44.27"E).



Figure 19: Location of site notice in relation to the proposed site on Portion 472 of Farm 42.



NOTICE OF BASIC ASSESSMENT PROCESS FOR ENVIRONMENTAL AUTHORISATION

Coastal and Environmental Services (CES) has been appointed by Citrusrand Boerdery (Pty) Ltd (the "Applicant") to undertake an application for Environmental Authorisation for the proposed expansion of Citrusrand Dwarsleegte Farm in Kirkwood within the Eastern Cape Province. Notice is hereby given in terms of Regulation 41 (2) published in Government Notice (GN) No. 982 (GN No. 326) under Chapter 6 of the National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments) of the submission of an Application for the Citrusrand Dwarsleegte Expansion to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

The project entails the clearance of less than 20 ha of vegetation for the development of new citrus orchards directly adjacent to the Applicants existing orchards on Portion 472 of Farm 42, situated 7.8 km southwest of Kirkwood (Coordinates: -33.440719° S, 25.374024° E). The proposed project triggers activities contained in Listing Notice 1 (GN R. 983/GN R. 327) and Listing Notice 3 (GN R. 985/GN R. 324) of the of the NEMA EIA Regulations (2014 and subsequent 2017 amendments) and therefore requires a Basic Assessment Process.

You are hereby invited to register as an Interested and/or Affected Party (I&AP) on the above Project. Please direct all correspondence, comments or queries, to Ms Nicole Wienand:
Address: 36 Pickering Street, Newton Park, Port Elizabeth, 6045 | **Tel.:** +27 (0)41 393 0700 |
E-mail: n.wienand@cesnet.co.za

Site Notice as per site notice photographs above.

ADVERTISEMENT

Publication name	The UD Express
Date published	24 th of October 2019



NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR KIRKWOOD, EASTERN CAPE PROVINCE.

Notice is hereby given, in terms of Regulation 41 (2) of the National Environmental Management Act (NEMA, act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), of the submission of an Application for Environmental Authorisation for the proposed Citrusrand Dwarsleegte Farm Citrus Development, to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT). The project entails the clearance of 19.8 ha of vegetation for the cultivation of citrus orchards on Portion 472 of Farm 42, and triggers activities which are stipulated under Listing Notice 1 (GN R. 983/GN R. 327) and Listing Notice 3 (GN R. 985/GN R. 324) of the NEMA EIA Regulations. CES has been appointed by Citrusrand Boerdery (Pty) Ltd (the "Applicant") to undertake the Basic Assessment (BA) Process.

We hereby encourage all Interested and/or Affected Parties (I&APs) to register on our I&AP Database, for the above-mentioned project, by contacting Ms Nicole Wienand so that we can engage with you throughout the BA Process.

For more information, registration as an I&AP or submission of written comments, please contact **Ms Nicole Wienand:**
Address: 36 Pickering Street, Newton Park, Port Elizabeth, 6045
Tel.: +27 (0)41 393 0700 | **E-mail:** n.wienand@cesnet.co.za

Newspaper advertisement placed in the UD Express on the 24th of October 2019.

INTERESTED AND/OR AFFECTED PARTIES (I&AP) DATABASE

CONTACT		SURROUNDING LANDOWNERS	EMAIL ADDRESS	CONTACT NO.	POSTAL ADDRESS
	Bonny Lea Citrus	Farm Portion 573	wim@benmaclaw.co.za		
		Portion 343 of Farm 42 (Strathsomers Estate)	hlehlrs@srvalley.co.za		
	Anno Nortje Familietrust	Portion 5 of Farm 138 (Voetpads Kloof)	<i>Not applicable. The Applicant is the landowner of these properties.</i>		
	Sydney Daniell Family Trust	Portion 378 of Farm 42 (Strathsomers Estate)	daniell@srvalley.co.za	082 925 8613	PO Box 356, Kirkwood, 6120
Edwin Daniell		Portion 250 of Farm 42 (Strathsomers Estate)	edaniell@srvalley.co.za	082 870 7283/ 042 230 0268	PO Box 342, Kirkwood, 6120
	Louis Smith Family Trust	Portion 251 of Farm 42 (Strathsomers Estate)	imnande@gmail.com	082 722 3242	PO Box 305, Kirkwood, 6120
		Portion 339 of Farm 42			
	Chris Roets Familietrust	Portion 418 of Farm 42 (Strathsomers Estate)	roets@igen.co.za	076 531 2425	PO Box 162, Kirkwood, 6120
		Portion 419 of Farm 42			
	PJ Nortje Familietrust	Portion 480 of Farm 42	<i>Not applicable. The Applicant is the landowner of these properties.</i>		
	Sitrusrand Eiendom Trust	Portion 242 of Farm 42			
CONTACT		ORGANS OF STATE	EMAIL	CONTACT NO.	POSTAL
Stanley Tshitwamulomoni		Department of Environment Forestry and Fisheries (DEFF) - Biodiversity	stanleyt@environment.gov.za	012 399 9511	Department of Environmental Affairs, A2-2-14, 473 Steve Biko Rd, Environmental House, Pretoria
Rose Masela			rmasela@environment.gov.za		
Seoka Lekota			slekota@environment.gov.za	012 399 9573	
Thabo Nokoyo		Department of Agriculture, Forestry and Fisheries (DAFF) – Eastern Cape	NokoyoD@daff.gov.za	043 604 5446	Private Bag X 3917, North End, 6056
Dorothy Jagers			DorothyJ@daff.gov.za		
John Geeringh		Eskom	john.geeringh@eskom.co.za / GeerinJH@eskom.co.za	012 332 5305	P O Box 1091, Johannesburg, 2000.
Veliswa Baduza (Chief executive officer)		South African Heritage Resource Agency (SAHRA)	vbaduza@sahra.org.za	021 462 4502	PO Box 4637, Cape Town, 8000
Phillip Hine			phine@sahra.org.za	021 462 4502	
Andries Struwig		Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)	andries.Struwig@dedea.gov.za	041 508 5808	Private Bag X5001, Greenacres, Port Elizabeth, 6057
Charmaine Struwig			Charmaine.Mostert@dedea.gov.za	041 508 5839	
Dayalan Govender		Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) – Regional manager	Dayalan.Govender@dedea.gov.za	041 508 5893	P/Bag X5001, Greenacres, Port Elizabeth, 6057
Marisa Bloem		Eastern Cape Department of Water and Sanitation (DWS)	bloemm@dws.gov.za	041 501 0717	Private Bag X6041, Port Elizabeth, 6000
Randall Moore		EC Department of Roads and Public Works	Randall.Moore@dpw.ecape.gov.za	041 403 6001	PO Box 1110, Algoa Park, Port Elizabeth
Zukile Pityi		Department of Rural Development and Land Reform – Land Restitution Support (Eastern Cape)	zukile.pityi@drdlr.gov.za	043 700 6000/ 043 743 3687	PO Box 1375, East London, 5200
Sello Mokhanya		Eastern Cape Provincial Heritage Resources Authority (ECPHRA)	smokhanya@ecphra.org.za / info@ecphra.org.za	043 642 2811/ 043 745 0888	P.O. Box 16208, Amathole Valley, 5616
Malaika Koali-Lebona		Eastern Cape Parks and Tourism Agency (ECPTA)	Malaika.Koali-Lebona@ecpta.co.za	043 705 4400/ 079 496 7931	PO Box 11235, Southernwood, East London, 5213
Mike Primmer (Chief Executive officer)		Lower Sundays River Water Users Association	ceo@sundaysriverwater.co.za	042-234 0038	PO Box 10, Sunland 6115
Robin Peacock (Kirkwood)			info@sundaysriverwater.co.za	042 234 0044 / 071 382 7099	
Sizule Silinta		Eastern Cape: Department of Rural Development and Agrarian Reform	sizulesilinta@gmail.com	043 642 3497 040 653 1153	Private Bag X0040, Independence Avenue, Bhisho, 5605
Morgan Griffiths (Office Manager & Enviro-Governance Programme Manager)		WESSA – Port Elizabeth	morgan@wessaep.co.za	041 585 9606	2(b) Lawrence Street, Central, Port Elizabeth, 6001
Cllr Khunjuzwa Eunice Kekana (Executive Mayor)		Sarah Baartman District Municipality	cpaul@cacadu.co.za	041 508 7111/ 041 508 7116	PO Box 318, PORT ELIZABETH, 6000
Ted Pillay (Municipal Manager)			t.pillay@sbdm.co.za		

		mmolefe@sbdm.co.za	041 508 7111	
Cllr MW Kebe (Executive Mayor)	Sundays River Valley Local Municipality	malizolen@srvm.gov.za	042 230 7700/ 073 598 5001	PO Box 47, KIRKWOOD, 6120
Lonwabo Ngoqo (Municipal Manager)		renneb@srvm.gov.za	042 230 7700/ 083 490 0341	
Cllr AM Ndwawo (Ward 7 Councillor)		amndwawo@gmail.com / anelemn@gmail.com	042 230 7730	
Mpumelelo Nzuzo (Director: Infrastructure Planning & Development)		mpumelelon@srvm.gov.za	042 230 7767	32, Middle Street, Kirkwood
CONTACT	OTHER STAKEHOLDERS	EMAIL	CONTACT NO.	POSTAL
Greg Jones	Kirkwood Ratepayers Association	gjones@srcc.co.za	082 971 2804	
Mike Bridgeford	Eden to Addo Corridor Initiative	mikebridgeford@telkomsa.net	044 533 1623	
Mzwandile Mjadu	SANParks	mzwandile.mjadu@sanparks.org	042 233 8602	R335, Addo, 6105

PROOF OF NOTIFICATION OF AUTHORITIES AND KEY STAKEHOLDERS

Notification sent on the 24th of October 2019

Proof of email notification

From: Nicole Wienand
Sent: Thursday, 24 October 2019 08:54
To: hlehl@srvalley.co.za; daniell@srvalley.co.za; edaniell@srvalley.co.za; imnande@gmail.com; roets@igen.co.za; tanleyt@environment.gov.za; rmasela@environment.gov.za; slekota@environment.gov.za; NokoyoD@daff.gov.za; DorothyJ@daff.gov.za; john.geeringh@eskom.co.za; GeerinJH@eskom.co.za; vbaduza@sahra.org.za; phine@sahra.org.za; andries.Struwig@dedea.gov.za; Charmaine.Mostert@dedea.gov.za; Dayalan.Govender@dedea.gov.za; bloemm@dws.gov.za; Randall.Moore@dpw.ecape.gov.za; zukile.pityi@drdlr.gov.za; smokhanya@ecphra.org.za; info@ecphra.org.za; Malaika.Koali-Lebona@ecpta.co.za; ceo@sundaysriverwater.co.za; info@sundaysriverwater.co.za; sizulesilinta@gmail.com; morgan@wessaep.co.za; cpaul@cacadu.co.za; t.pillay@sbdm.co.za; mmolefe@sbdm.co.za; malizolen@srvm.gov.za; renneb@srvm.gov.za; amndwawo@gmail.com; anelemn@gmail.com; mpumelelon@srvm.gov.za; gjones@srcc.co.za; mikebridgeford@telkomsa.net; mzwandile.mjadu@sanparks.org
Cc: Rosalie Evans <r.evans@cesnet.co.za>; Caroline Evans <c.evans@cesnet.co.za>
Subject: Proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

Dear Stakeholders and Interested and/or Affected Parties (I&APs),

NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR KIRKWOOD, EASTERN CAPE PROVINCE.

Notice is hereby given, in terms of Regulation 41 (2) of the National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), of the intention to submit an Application for the proposed Sitrusrand Dwarsleegte Farm Citrus Development, to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT). The project entails the clearance of 19.8 ha of vegetation for the cultivation of citrus orchards on Portion 472 of Farm 42, and triggers activities which are stipulated under Listing Notice 1 (GN R. 983/GN R. 327) and Listing Notice 3 (GN R. 985/GN R. 324) of the NEMA EIA Regulations. CES has been appointed by Sitrusrand Boerdery (Pty) Ltd (the "Applicant") to undertake the Basic Assessment (BA) Process for Environmental Authorisation.

Please find the Background Information Document (BID) attached for more information on the proposed Sitrusrand Dwarsleegte Farm Citrus Development. If you have received this e-mail and the attached BID, you are already a registered I&AP on the I&AP Database. Please kindly acknowledge receipt of this notification and provide us with the details of any other individuals who are likely to be interested in- or affected by the proposed Citrus Development.

Should you require any further information, please do not hesitate to contact me.

Kind regards,
Nicole Wienand




Nicole Wienand
Environmental Consultant
CES - Environmental and Social Advisory Services
36 Pickering Street, Newton Park
Port Elizabeth | Eastern Cape | South Africa
Office: +27 (41) 393 0700 Cell: +27 (81) 044 1925
n.wienand@cesnet.co.za | www.cesnet.co.za

























Screenshot of email notification



Reply Reply All Forward


Thu 2019/10/24 08:54


 **Nicole Wienand**

Proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

To  hlehlers@srvalley.co.za;  daniell@srvalley.co.za;  edaniell@srvalley.co.za;  imnande@gmail.com;  roets@igen.co.za;  tanleyt@environment.gov.za;  rmasela@environment.gov.za;  slekota@environment.gov.za;  NokoyoD@daff.gov.za;  DorothyJ@daff.gov.za;  john.geeringh@eskom.co.za;  GeerinJH@eskom.co.za;  vbaduza@sahra.org.za;  phine@sahra.org.za;  andries.Struwig@dedea.gov.za;  Charmaine.Mostert@dedea.gov.za;  Dayalan.Govender@dedea.gov.za;  bloemm@dws.gov.za;  Randall.Moore@dpw.ecape.gov.za;  zukile.pityi@drdlr.gov.za;  smokhanya@ecphra.org.za;  info@ecphra.org.za;  Malaiika.Koali-Lebona@ecpta.co.za;  ceo@sundaysriverwater.co.za;

Cc  Rosalie Evans;  Caroline Evans

 You forwarded this message on 2019/10/24 10:15.

 **Background Information Document (BID).pdf**
509 KB

Dear Stakeholders and Interested and/or Affected Parties (I&APs),


NOTIFICATION OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR KIRKWOOD, EASTERN CAPE PROVINCE.

Notice is hereby given, in terms of Regulation 41 (2) of the National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), of the intention to submit an Application for the proposed Sitrusrand Dwarsleegte Farm Citrus Development, to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT). The project entails the clearance of 19.8 ha of vegetation for the cultivation of citrus orchards on Portion 472 of Farm 42, and triggers activities which are stipulated under Listing Notice 1 (GN R. 983/GN R. 327) and Listing Notice 3 (GN R. 985/GN R. 324) of the NEMA EIA Regulations. CES has been appointed by Sitrusrand Boerdery (Pty) Ltd (the "Applicant") to undertake the Basic Assessment (BA) Process for Environmental Authorisation.

Please find the Background Information Document (BID) attached for more information on the proposed Sitrusrand Dwarsleegte Farm Citrus Development. If you have received this e-mail and the attached BID, you are already a registered I&AP on the I&AP Database. Please kindly acknowledge receipt of this notification and provide us with the details of any other individuals who are likely to be interested in- or affected by the proposed Citrus Development.

Should you require any further information, please do not hesitate to contact me.

Kind regards,
Nicole Wienand

 **Nicole Wienand**
Environmental Consultant
CES - Environmental and Social Advisory Services
36 Pickering Street, Newton Park
Port Elizabeth | Eastern Cape | South Africa



BACKGROUND INFORMATION DOCUMENT (BID) & INVITATION TO COMMENT

APPLICATION FOR ENVIRONMENTAL AUTHORISATION: PROPOSED SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR KIRKWOOD, EASTERN CAPE PROVINCE.

AIM OF THIS DOCUMENT

The purpose of this document is to ensure that people that are interested in or affected by the proposed Citrus Development are provided with the information about the project, the process being followed and provided with an opportunity to be involved in the Basic Assessment Process for the Proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

Registering as an Interested and/or Affected Party (I&AP) allows individuals or groups the opportunity to contribute ideas, issues, and concerns relating to the project. I&APs also have an opportunity to review all the reports and submit their comments on those reports. All the comments which are received during this process will be included in the Final Basic Assessment Report (BAR), which will be submitted to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT).

THE BASIC ASSESSMENT PROCESS

According to the National Environmental Management Act (NEMA, Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), the potential impacts on the environment will have to be assessed in terms of the listed activities. These environmental listed activities, initially published on 21st of April 2006, were amended in 2010, 2014 and again on the 7th of April 2017, as Government Notice (GN) Numbers R. 983 (GN R. 327), R. 984 (GN R. 325), and R. 985 (GN R. 324) which define the activities which require, respectively, a Basic Assessment (GN R. 983 and GN R. 985 listed activities which apply to activities with limited environmental impacts), or a Scoping and Environmental Impact Assessment (GN R. 984 listed activities which apply to activities which are significant in extent and duration).

As part of the Basic Assessment Process and in terms of Regulation 41 (2) of the NEMA EIA Regulations (2014 and subsequent 2017 amendments), CES (on behalf of the Applicant) must consult with the landowners, occupiers, abutting landowners and the public and submit the results of such consultation to the Competent Authority.

Table 1: NEMA Listed Activities Triggered by the Proposed Citrus Development.

LISTING NOTICE	ACTIVITY NO.	DESCRIPTION	Comment
Listing Notice 1 (GN R. 983/GN R. 327)	12(ii)(c)	<i>The development of – (ii) infrastructure or structures with a physical footprint of 100 square meters or more Where such development occurs – (c) if no development setback exists, within 32 meters of a watercourse, measured from the edge of a watercourse.</i>	The proposed development entails the establishment of infrastructure associated with the proposed citrus development which will have physical footprint exceeding 100 square meters, within 32 meters of a watercourse.
	19	<i>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 a watercourse.</i>	The proposed development is likely to result in the infilling of material of more than 10 cubic metres into the watercourse which traverses the north-western corner of the development site.
	27	<i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.</i>	The proposed development requires the clearance of approximately 19.8 hectares of indigenous vegetation for the cultivation of citrus orchards and the construction of associated farm infrastructure.
	56(ii)	<i>The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometre – (ii) where no reserve exists, where the existing road is wider than 8 meters.</i>	The proposed development entails the lengthening of existing farm access roads by more than 1 kilometre in an area where no reserve exists, but where the existing farm access roads are wider than 8 meters.
Listing Notice 3 (GN R. 985/GN R. 324)	12(a)(ii)(v)	<i>The clearance of an area of 300 square metres or more of indigenous vegetation – a. Eastern Cape ii. Within critical biodiversity areas identified in bioregional plans; and v. On land, where, at the time of the coming into effect of this notice or thereafter such land was zoned open space, conservation, or had an equivalent zoning</i>	The proposed development requires the clearance of more than 300 square metres of indigenous vegetation within a terrestrial CBA 1 and an aquatic CBA 2 (ECBCP, 2007), an Addo BSP CBA (SANParks, 2012), as well as an area classified as a Private Nature Reserve, the Voetpadskloof Game Farm.
	14(ii)(c)(a)(i)(aa)(ff)(hh)	<i>The development of – (ii) infrastructure or structures with a physical footprint of 10 square meters or more; Where such development occurs – (c) if no development setback has been adapted, within 32 meters of a watercourse, measured from the edge of a water course; a. Eastern Cape</i>	The proposed development entails the establishment of citrus orchards and associated farm infrastructure, with a physical footprint exceeding 10 square meters, within 32 meters of a watercourse in an area classified as a terrestrial CBA 1, an Aquatic CBA 2 (ECBCP, 2007) and an Addo BSP CBA (SANParks, 2012).

LISTING NOTICE	ACTIVITY NO.	DESCRIPTION	Comment
		<p><i>(i) Outside urban areas:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies</i></p> <p><i>(ff) Critical Biodiversity Areas or ecosystem services areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p> <p><i>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</i></p>	<p>The proposed development is located within a Private Nature Reserve, the Voetpadskloof Game Farm, and it is situated approximately 8.2 kilometres from Addo Elephant National Park (NEMPAA, 2007).</p>
	<p>1B(a)(i) (aa)(ee) (SE)(ii)</p>	<p><i>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre:</i></p> <p><i>a. Eastern Cape</i></p> <p><i>(i) Outside urban areas:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p><i>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; and</i></p> <p><i>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined;</i></p>	<p>The proposed development entails the lengthening of existing farm access roads within an area classified as a Private Nature Reserve (the Voetpadskloof Game Farm), a terrestrial CBA 1 and an aquatic CBA 2 (ECBCP, 2007), and an Addo BSP CBA (SANParks, 2012).</p> <p>The proposed development is located approximately 8.2 kilometres from the Addo Elephant National Park (NEMPAA, 2007) and is situated within 100 m of a watercourse.</p>

PROJECT DESCRIPTION

Sitrusrand Boerdery (Pty) Ltd (the "Applicant") is proposing the development of 19.8 hectares (ha) of citrus on a section of Portion 472 of Farm 42 (SG-Code: C07600000000004200472), which is situated approximately 7.8 kilometres (km) southwest of Kirkwood, within the Eastern Cape Province (Figure 1). This area falls under the jurisdiction of the Sundays River Valley Local Municipality, seated under the Sarah Baartman District Municipality.

The proposed Citrus Development entails the clearance of a total of 19.8 ha of indigenous vegetation for the following:

- The cultivation of citrus orchards;
- Upgrade and extension of existing farm access roads; and
- The construction of fences and a loading area/shed (Figure 1).



Figure 1: Locality Map of the Proposed Citrus Development.

APPROACH TO THE BASIC ASSESSMENT

The proposed Citrus Development triggers activities contained in Listing Notice 1 (GN R. 983/GN R. 327) and Listing Notice 3 (GN R. 985/GN R. 324) of the of the NEMA EIA Regulations (2014 and subsequent 2017 amendments) and therefore requires a **Basic Assessment Process**. The relevant Competent Authority is the Eastern Cape DEDEAT.

Table 2: Simplified Basic Assessment Process Diagram.

SIMPLIFIED BASIC ASSESSMENT PROCESS	
PRE-APPLICATION CONSULTATION WITH THE COMPETENT AUTHORITY	
PRE-APPLICATION PUBLIC PARTICIPATION PROCESS: IDENTIFICATION AND REGISTRATION OF INTERESTED AND/OR AFFECTED PARTIES	
COMPILE & SUBMIT APPLICATION FOR ENVIRONMENTAL AUTHORISATION TO THE EASTERN CAPE DEPARTMENT OF ECONOMIC DEVELOPMENT, ENVIRONMENTAL AFFAIRS AND TOURISM (DEDEAT).	90 DAYS
DRAFT A BASIC ASSESSMENT REPORT IN ACCORDANCE WITH THE NEMA EIA REGULATIONS	
DRAFT AN ENVIRONMENTAL MANAGEMENT PROGRAMME IN ACCORDANCE WITH THE NEMA EIA REGULATIONS	
SUBMIT THE DRAFT REPORTS TO THE DEDEAT	
PUBLIC REVIEW OF THE DRAFT BASIC ASSESSMENT REPORT	30 DAYS
FINALISE THE DRAFTS AND SUBMIT TO DEDEAT	

DEDEAT DECISION	10 DAYS
NOTIFY I&APS OF THE DEDEAT DECISION AND THE APPEALS PROCESS	24 DAYS
APPEALS PERIOD	10 DAYS

POTENTIAL IMPACTS AND BENEFITS

The potential impacts will be assessed in the Basic Assessment Report (BAR) and include, *but are not limited to*:

- Loss of vegetation;
- Degradation of surface water features;
- Loss of faunal habitats;
- Creation of employment opportunities;
- Increase in exports and foreign exchange; and
- Erosion potential due to vegetation clearance.

HOW CAN YOU BE INVOLVED?

A Public Participation Process (PPP) is being conducted as part of the Basic Assessment Process for the proposed Citrus Development. The aim of the PPP is to allow everyone who is interested in, or likely to be affected by the proposed development to provide input into the process. The PPP includes, but is not limited to, the placement of advertisements, onsite signage, and circulation of the BID (this document) to all registered I&APs, comments periods, a public meeting (if required) and the review of the Draft BAR, specialist reports (if required) and Environmental Management Programme (EMPr) by all registered I&APs.

If you consider yourself an interested and/or affected person/party, it is important that you become and remain involved in the PPP. To do so, please follow the steps below:

1. **STEP 1:** Please register by responding to our notification and invitation, with your name and contact details (details provided below). As a registered I&AP, you will be informed of all report review periods and project developments throughout the Basic Assessment Process of the proposed Citrus Development.
2. **STEP 2:** Register by contacting Ms Nicole Wienand with your name and contact details via post, phone or e-mail.

CES is required to engage with all private and public parties that could be interested and/or affected by the proposed development in order to distribute information for review and comment in a transparent manner.

In the same light, it is important for I&APs to note the following:

1. For CES to continue engaging with you, please ENSURE that you register on our database by contacting Ms Nicole Wienand.
2. As the Basic Assessment Process is regulated by specific review and comment timeframes, it is your responsibility to submit your comments within these timeframes.

Please contact Ms Nicole Wienand to register as an IB&AP for the proposed Citrus Development, for enquiries and/or for the submission of your written comments.

CONTACT DETAILS	
Environmental Company:	CES
Contact Person:	Ms Nicole Wienand
Address:	36 Pickering Street, Newton Park, Port Elizabeth
Telephone Number:	+27 (0)41 393 0700 / +27 (0)41 043 0496
E-mail Address:	n.wienand@cesnet.co.za
Website:	www.cesnet.co.za

ISSUES AND RESPONSE TRAIL

I&AP Comment: Chris Roets, 24 October 2019

Reply Reply All Forward
Thu 2019/10/24 14:08


RB Roets Boerdery <roets@igen.co.za>
RE: Proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

To: Nicole Wienand
You replied to this message on 2019/10/24 14:10.

Good afternoon Nicole

Thank you for the email and information. I am not sure if we are supposed to comment now or not, but please note that we have no objections, nor any concerns about this proposed development.

Kind regards
Chris Roets



Roets Boerdery • Friede & Angora Farms
P.O. Box 162 • Kirkwood • 6120

Chris Cell: 072 636 4704
Mandy Cell: 072 525 4615
Danny Cell: 076 531 2425
Email: roets@igen.co.za

EAP Response, 24 October 2019.

Reply Reply All Forward
Thu 2019/10/24 14:11


NW Nicole Wienand
RE: Proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

To: Roets Boerdery

Dear Mr Roets,

Thank you for your email. Your comments will be noted and included in the Draft Basic Assessment Report (BAR) for the proposed Sitrusrand Dwarsleegte Farm Citrus Development.

Kind regards,
Nicole Wienand



Nicole Wienand
Environmental Consultant
CES - Environmental and Social Advisory Services
36 Pickering Street, Newton Park
Port Elizabeth | Eastern Cape | South Africa
Office: +27 (41) 393 0700 Cell: +27 (81) 044 1925
n.wienand@cesnet.co.za | www.cesnet.co.za

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

Please find the EMPr attached on the pages that follow.



DRAFT
**ENVIRONMENTAL
MANAGEMENT PROGRAMME**



ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

**SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT NEAR
KIRKWOOD, EASTERN CAPE PROVINCE.**

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

DEDEAT Reference: EC06/C/LN1&3/M/09-2020

Prepared for:

Sitrusrand Boerdery



Prepared by:



ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

PORT ELIZABETH

36 PICKERING STREET
NEWTON PARK
041 393 0700

*Also in Cape Town, East London, Johannesburg,
Grahamstown, Maputo (Mozambique) and Romsey (UK)*

www.cesnet.co.za

MARCH 2020



REVISIONS TRACKING TABLE

CES Report Revision and Tracking Schedule

Document Title:	Draft Environmental Management Programme (EMPr) for THE proposed Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.		
Client Name & Address:	Sitrusrand Boerdery (Pty) Ltd.		
Status:	Draft Environmental Management Programme		
Issue Date:	MARCH 2020		
Lead Author:	Ms Nicole Wienand		
Reviewer:	Ms Caroline Evans		
Study Leader/ Registered Environmental Assessment Practitioner – Approval:	Dr Alan Carter Ms Caroline Evans		
Report Distribution	<i>Circulated to</i>	<i>No. of hard copies</i>	<i>No. electronic copies</i>
Report Version	<i>DECEMBER 2019</i>		
	DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME		

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www.cesnet.co.za



DETAILS OF THE EAP

Details of the EAP

Coastal & Environmental Services (Pty) Ltd, trading as CES

Physical Address (Head Office): 67 African Street, Grahamstown 6139

Physical Address (Branch): 36 Pickering Street, Newton Park, Port Elizabeth, 6045

Postal Address: 36 Pickering Street, Newton Park, Port Elizabeth, 6045

Telephone: +27 41 393 0700 (Branch)

Website: www.cesnet.co.za

Consultant Name	E-mail	Position	Role on Project
Dr Alan Carter	a.carter@cesnet.co.za	Executive	EAP & Project Leader
Ms Caroline Evans	c.evans@cesnet.co.za	Senior Consultant	Project Manager
Ms Rosalie Evans	r.evans@cesnet.co.za	Senior Consultant	Report Reviewer
Ms Nicole Wienand	n.wienand@cesnet.co.za	Environmental Consultant	Lead Report Writer

Company Overview

CES has its head office in Grahamstown, where it was founded in 1990, to service a then fledgling market in the fields of Environmental Management and Impact Assessment. CES now has offices in South Africa (Cape Town, Port Elizabeth, East London and Johannesburg), the United Kingdom (Romsey) as well as a wholly owned subsidiary in Maputo, Mozambique (Coastal & Environmental Services LDa., registered as an Environmental Practitioner with the Mozambican authorities).

The Company has grown apace with the increased market demand for environmental and social advisory services in Southern Africa and further afield. Our principal area of expertise lies in assessing the risks and impacts of the development process on the natural, social and economic environments through, among other instruments, the environmental impact assessment (EIA) process. We believe that by offering these services we contribute meaningfully towards sustainable development.

We adopt a scientific approach to our studies, underpinned by an informed and holistic view of the environment and a pragmatic approach to sustainable development. This results in deliverables that are robust, defensible and credible. This is important for both the development and EIA processes, and as a result the outputs of our studies demonstrate objectivity, sincerity and professionalism. We believe that a balance between development and environmental protection can be achieved by skilful and careful planning, and that our outputs reflect this. Our track record across 20 African countries as well as in the Middle East and Asia is evidence of the value added we bring to the environmental and social advisory services we provide and has contributed to our deep understanding of the environmental and social challenges associated with establishing and operating facilities and infrastructure in emerging markets.



CES Project Team

Dr Alan Carter (*Role: EAP & Project Leader*)

Dr Alan Carter is an Executive and the East London Branch Manager at CES. He has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also certified ISO14001 EMS Auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 25 years. He is a registered professional with the South African Council for Natural Scientific Professionals (SACNASP) and through Environmental Assessment Practitioners Association of South Africa (EAPASA).

Caroline Evans (*Role: Project Manager and Report Review*)

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LIST OF ABBREVIATIONS

AIS	Alien Invasive Species
BA	Basic Assessment
BAR	Basic Assessment Report
CARA	Conservation of Agricultural Resources Act
CITES	Convention of International Trade in Endangered Species
DEDEAT	Department of Economic Development, Environmental Affairs & Tourism
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EMS	Environmental Management System
GN	Government Notice
IEC	Independent Environmental Consultant
I&AP	Interested and/or Affected Party
KPI	Key Performance Indicator
MSDS	Material Safety Data Sheets
NEMA	National Environment Management Act
NEM:AQA	National Environmental Management: Air Quality Act
NEM:BA	National Environmental Management: Biodiversity Act
NEM:WA	National Environmental Management: Waste Act
NFA	National Forest Act
NHRA	National Heritage Resources Act
NWA	National Water Act
OHSA	Occupational Health and Safety Act
RoD	Record of Decision
SBDM	Sarah Baartman District Municipality
SCC	Species of Conservation Concern
SRVLM	Sundays River Valley Local Municipality



CONTENTS OF AN EMPr

The contents of the EMPr, as it is defined in the Environmental Impact Assessment (EIA) Regulations 2014 (as amended) published as Government Notice (GN) R. 326 of 7 April 2017 in terms of Chapter 5 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended), must be consistent with requirements included in Appendix 4 of the Regulations.

EMPr REQUIREMENTS ACCORDING TO APPENDIX 4 OF GNR 982 OF 2014, AS AMENDED IN GNR 326 OF 2017		SECTION OF REPORT
1	An EMPr must comply with Section 24N of the Act and include-	Page i, ii, and iv of this report
	a. Details of:	
	i. the EAP who prepared the EMPr; and	Annexure 2
	ii. the expertise of that EAP to prepare an EMPr, including a curriculum vitae.	
	b. a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Chapter 3
	c. a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Annexure 3
	d. a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Chapter 4
	i. Planning and design	
	ii. Pre-construction activities	
	iii. Construction activities	
	iv. rehabilitation of the environment after construction and where applicable post closure; and	
	v. where relevant, operation activities;	
	f. description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -	Section 3.2 – 3.4; Chapter 4 and Chapter 5
	a. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	b. comply with any prescribed environmental management standards or practices;	
	c. comply with any applicable provisions of the Act regarding closure, where applicable; and	
d. comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;		
g. the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 5.4	
h. the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);		
i. an indication of the persons who will be responsible for the implementation of the impact management actions;		
j. the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;		
k. the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);		
l. a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;		
m. an environmental awareness plan describing the manner in which-		Chapter 6



	a. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
	b. risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
	n. any specific information that may be required by the competent authority.	None to date.



1. INTRODUCTION

An Environmental Management Programme (EMPr) must consist of a set of mitigation, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The programme also includes the actions needed to implement these measures.

1.1 ENVIRONMENTAL MANAGEMENT PROGRAMME

An EMPr can be defined as, “*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced*”.

An EMPr is a very important tool in the sound environmental management of a project, provided the specifications are implemented and the user understands the contents of the report and the reasons for the implementation of certain specifications.

The EMPr has the following objectives:

- To state standards and guidelines which are required to be achieved in terms of environmental legislation;
- To set out the mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts and where possible to improve the condition of the environment;
- To provide guidance regarding Method Statements which could be required to achieve the environmental specifications (refer to **Annexure 1** for an example of the Method Statement);
- To define corrective actions, these must be taken in the event of non-compliance with the specifications; and
- To prevent long-term or permanent environmental degradation.

This EMPr aims to achieve the following:

- Compliance with relevant legislation, standards, codes, and practices in the application of safe technologies;
- Minimisation of impacts on the surrounding natural and social environment;
- Performance of all activities in a safe and effective manner and maintenance of all equipment in good operating condition for the protection of the health and safety of all persons and to conserve the environment and property;
- Focus on environment risk prevention;
- Focus on occupational and public health, safety; and
- The undertaking of all necessary precautions to control, remove, or otherwise correct any leaks and/or spills of hazardous materials, or other health and safety hazards.

There are essentially four (4) broad categories of EMPr's: Design EMPr, Construction EMPr, Operational EMPr and Decommissioning EMPr. The objectives of these EMPr's are all the same and include; identifying the possible environmental impacts of the proposed activity, and



developing measures to minimise, mitigate and manage the negative impacts while enhancing the positive ones. The difference between these EMPr's is related to the different mitigation measures required for the different stages of the project life cycle. Each category of EMPr is discussed in more detail below.

As it is unlikely that the proposed citrus orchards will be decommissioned in the near future, a Decommissioning EMPr is not discussed further in this report. However, should the citrus orchards be decommissioned, a suitable EMPr (including specific rehabilitation guidelines) should be compiled and implemented throughout the decommissioning phase.

1.1.1 DESIGN EMPR

The Design EMPr is an integral component of the project life cycle and ensures that the Developer is aware of the environmental constraints that must be considered and incorporated into the final design/layout of the project.

The format of this design EMPr is checklist in nature to ensure that all specifications are included in the design phase. The design EMPr phase requires ongoing discussions between the Developer and the Environmental Control Officer (ECO).

1.1.2 CONSTRUCTION EMPR

The Construction EMPr details the Environmental Management System (EMS)/framework within which construction activities will be governed for the Construction Phase. The Construction EMPr consists of various actions, initiatives and systems that the Developer will have to ensure are in place and are undertaken. The Construction EMPr consists of both a management system and environmental specifications which contain detailed specifications that will need to be undertaken or adhered to by the Developer.

The Construction EMPr must be developed in parallel with the Final Design Stages, and constructive input should be invited from the Developer. Sound environmental management is orientated around a pragmatic, unambiguous but enforceable set of guidelines and specifications, and for this reason it is imperative that the Developer, while being bound by the EMPr, fully understands it and has had input into its final development. For this reason, the final Construction EMPr will need to be signed off prior to the initiation of construction activities.

1.1.3 OPERATIONAL AND MAINTENANCE EMPR

The Operational EMPr provides specific guidance related to operational activities associated with a particular development. Operational EMPr's are sometimes referred to as EMS.

Impacts during the operational phase of a development of this nature could be few in number and low in intensity. By taking pro-active measures during the construction phase, potential environmental impacts emanating during the operational phase will be minimised. Monitoring of certain issues such as the success of vegetation re-establishment and erosion control will be required to continue during operation.



The final Operational EMPr should be developed in conjunction with any other relevant stakeholders prior to the adoption thereof.



2. DEFINITIONS

For the purposes of this EMPr, the following definitions and abbreviations shall apply:

Alien Vegetation: Alien vegetation is defined as undesirable plant growth which shall include, but is not limited to, all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable. This includes plant species identified as Alien and invasive species in the National environmental Management Biodiversity Act of 2004, Alien and Invasive Species Regulations, 2014.

Environment: Environment means the surroundings within which humans exist and that could be made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Authorisation (EA) (formerly known as RoD, Record of Decision): A written statement from the relevant environmental authority, with or without conditions, that records its approval of a planned undertaking to construct the proposed development and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Environmental Control Officer (ECO): A suitably qualified and experienced person or entity appointed for the construction works, to perform the obligations specified in the EA.

Environmental Impact: An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct, indirect or cumulative consequence of a construction activity.

Environmental Management Programme (EMPr): An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced.

Environmental Management System (EMS): The internationally accepted and recognized EMS which enables companies, organisations and operations to systematically manage, prevent and reduce environmental problems and associated costs. In terms of ISO 14001 an EMS is defined as, *“that part of the overall management system that includes organizational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy.”*

Environmental Policy: A statement by the organisation of its intentions and principles in



relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets.

External Auditor: A suitably qualified and experienced independent expert as per the required auditor qualifications (ISO 14012).

Independent Environmental Consultant (IEC): A suitably qualified and experienced IEC appointed by the Developer or the Engineer to perform the obligations specified in the Contract. The IEC should provide reports to the regulatory authority, the Engineer and any other parties as specified by the regulatory authority.

Interested and/or Affected Party (I&AP): Refers to an I&AP contemplated in section 24(4)(d) of the NEMA (1998, Act No. 107) and which, in terms of that section, includes –

- a) *Any person, groups of persons, organisation interested in or affected by an activity, and;*
- b) *Any organ of state that may have jurisdiction over any aspect of the activity.*

ISO 14001 Environmental Management System (ISO 14001): The internationally accepted and recognised EMS as reflected in the document SABS ISO 14001: 1996.

Method Statement: Is a written submission by the Contractor to the ECO in response to the EMPr or to a request by the ECO, setting out the plant (construction equipment), materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the ECO when requesting the Method Statement. The Method Statement must be in such detail that the ECO is able to assess whether the Contractor's proposal is in accordance with the EMPr and/or will produce results in accordance with the EMPr.

Mitigate: The implementation of practical measures to reduce the adverse impacts, or to enhance beneficial impacts, of a particular action.

No-Go Area: Areas where construction activities are prohibited.

Pollution: According to the NEMA (Act No. 107 of 1998 and subsequent amendments), pollution can be defined as, “*Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future*”.

Potentially hazardous substance: Is a substance, which, in the reasonable opinion of the ECO, can have a deleterious effect on the environment. Hazardous Chemical Substances are defined in the Regulations for Hazardous Chemical Substances published in terms of the Occupational Health and Safety Act.



Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the ECO.

Rehabilitation: To re-establish or restore to a healthy, sustainable capacity or state.

Site: The area in which the development is proposed or in which construction is taking place.

Solid waste: Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Species of Conservation Concern (SCC): Those species listed in the rare, indeterminate, or monitoring categories of the South African Red Data Books, and/or species listed in globally near threatened, nationally threatened or nationally near threatened categories (Barnes, 1998).

Threatened species: Threatened species are defined as: a) species listed in the endangered or vulnerable categories in the revised South African Red Data Books or listed in the globally threatened category; b) species of special conservation concern (i.e. taxa described since the relevant South African Red Data Books, or whose conservation status has been highlighted subsequent to 1984); c) species which are included in other international lists; or d) species included in Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).

Topsoil: The top 100 mm of soil which could include top material, such as vegetation and leaf litter.



3. BACKGROUND INFORMATION

3.1 PROJECT DESCRIPTION

CES has been appointed by Sitrusrand Boerdery (the Proponent) to apply for Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), for the clearance of approximately 19.8 hectares (ha) of indigenous vegetation for the cultivation of citrus orchards and the construction of associated farm infrastructure. The study area is located on Portion 472 of Farm 42, approximately eight (8) km southwest of Kirkwood, within Ward 7 of the Sundays River Valley Local Municipality (SRVLM), seated in the Sarah Baartman District Municipality (SBDM) of the Eastern Cape Province (Figure 1). The total extent of Portion 472 of Farm 42 is 603.22 ha (Figure 2). Water for the proposed development will be supplied by the Sundays-Fish Transfer Scheme (Figure 3).

The proposed Sitrusrand Dwarsleegte Farm Citrus Development entails the clearance of a total of 19.8 ha of indigenous vegetation for the following:

- The cultivation of citrus orchards;
- Upgrade and extension of existing farm access roads; and
- The construction of fences and a loading area/shed (Figure 2).



Figure 1: Proposed project area in relation to Kirkwood and Port Elizabeth, Eastern Cape Province (Google Earth, 2018).

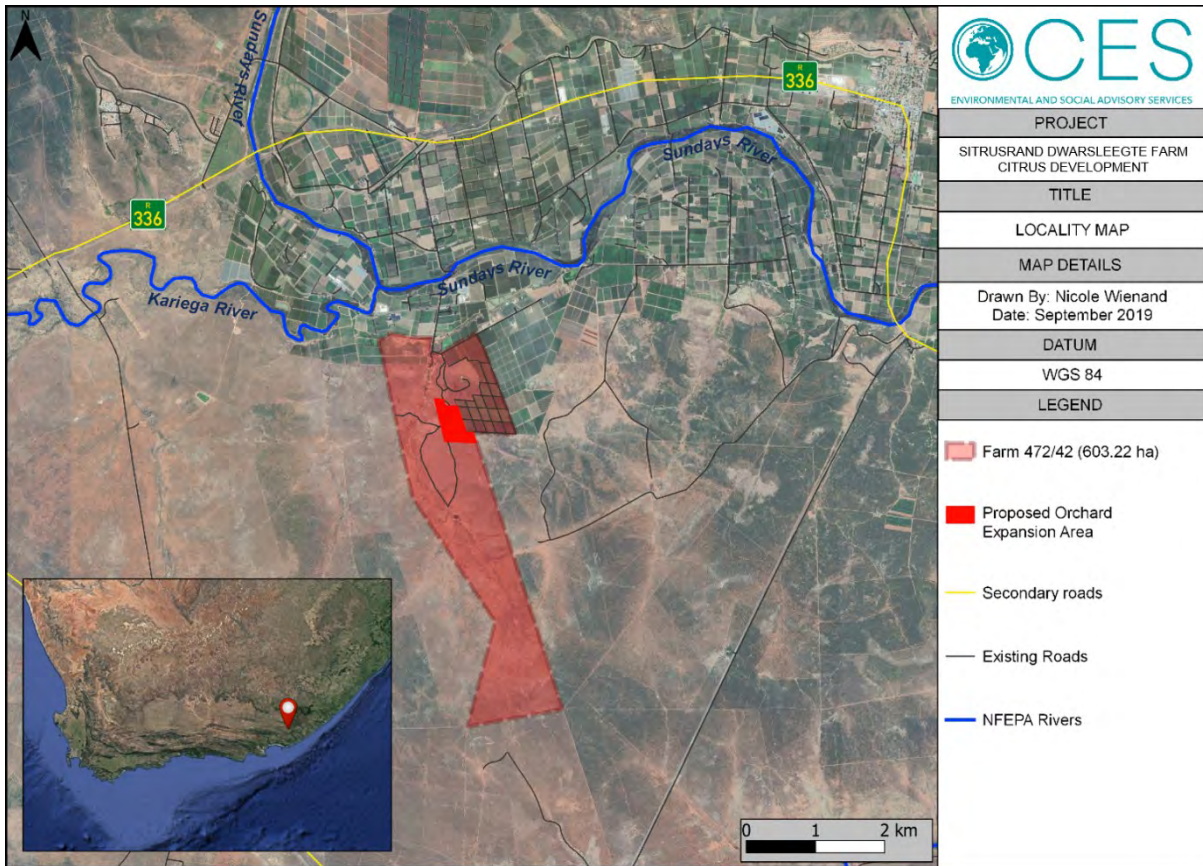


Figure 2: Locality map of the proposed Citrus Development.

Water Supply

Water for the proposed citrus development will be supplied by the Fish-Sundays Transfer Scheme which supplies Orange River water from the Great Fish River Valley to the Sundays River Valley, thereby supplementing the existing water supply in the Eastern Cape Province.

Water from the Orange River is diverted via the Elandsdrift Weir from the Great Fish River and flows by gravity along a sixty-five kilometre (65 km) long aqueduct, which cuts through the Bosberg Chain between Cookhouse and Somerset East. This water is diverted into the 13.1 km Cookhouse tunnel which discharges into the Little Fish River near Somerset East, via a multi-stepped chute. From here, the water flows 40 km down the Little Fish to the De Mistkraal Weir which transfers water to the Darlington Dam, down the Sundays River supplying water to the citrus farms in the lower Sundays River Valley (Figure 3).

Water for the proposed citrus development will be extracted from a gravity-fed canal system containing water from the Sundays River, via an existing pump station which is located on Portion 472 of Farm 42.

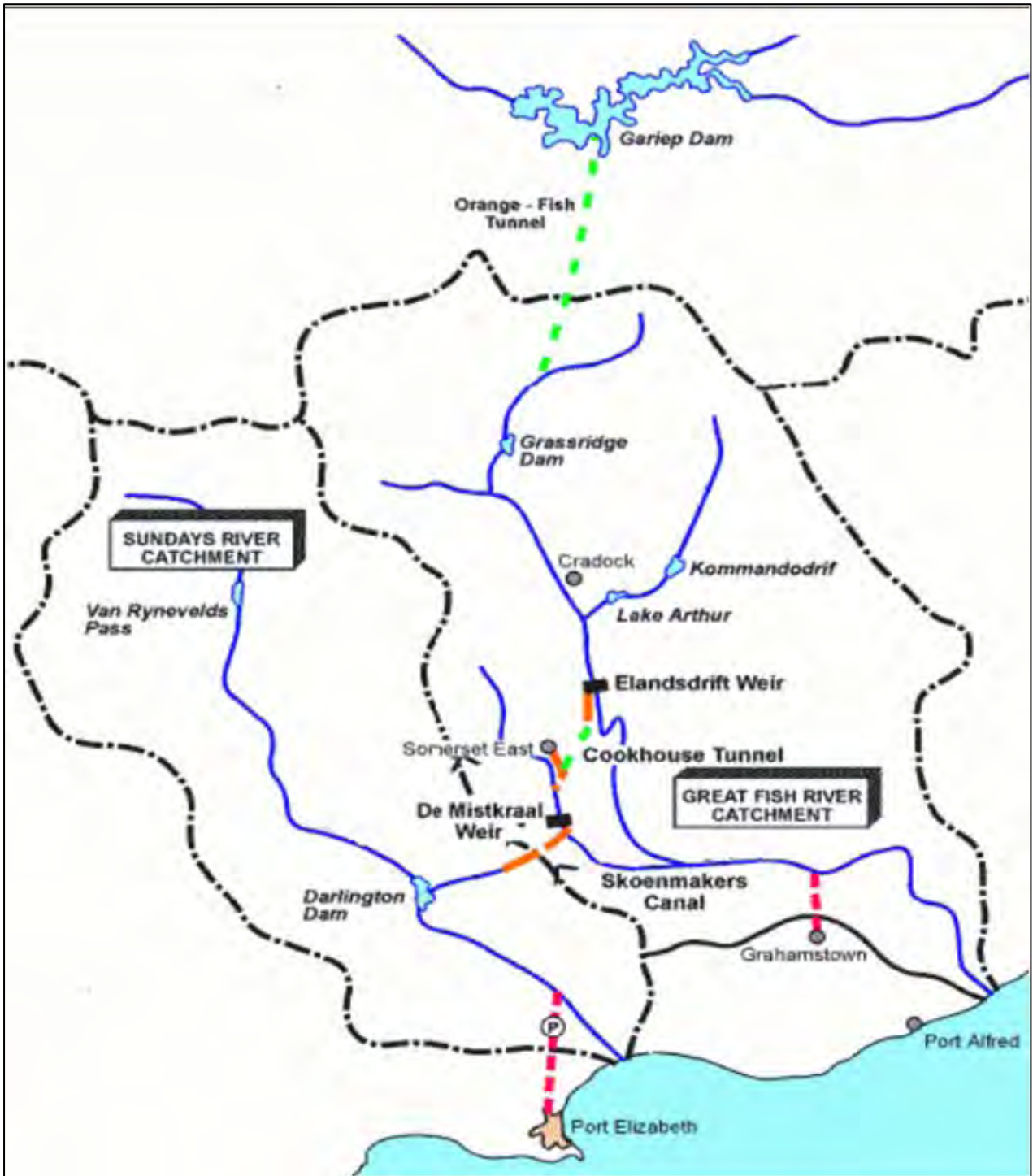


Figure 3: Fish-Sundays Transfer Scheme (Pedersen et al., 2007).

Listed Activities

In terms of the NEMA (Act No. 107 of 1998 and subsequent amendments) Environmental Impact Assessment (EIA) Regulations (2014 and subsequent 2017 amendments), the following relevant Listed activities are triggered by the proposed development:



Table 1: NEMA Listed Activities triggered by the proposed Citrus Development.

LISTING NOTICE	ACTIVITY NO.	DESCRIPTION	COMMENTS
Listing Notice 1 (GN R. 983/ GN R. 327)	12(ii)(c)	<i>The development of – (ii) infrastructure or structures with a physical footprint of 100 square meters or more; (c) if no development setback exists, within 32 meters of a watercourse, measured from the edge of a watercourse.</i>	The proposed development entails the establishment of citrus orchards and associated farm infrastructure, with a physical footprint exceeding 100 m ² , within 32 m of a watercourse.
	19	<i>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 a watercourse.</i>	The proposed development requires the infilling of material of more than 10 m ³ into the watercourse which traverses the north-western corner of the development site.
	27	<i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.</i>	The proposed development requires the clearance of 19.8 hectares of indigenous vegetation for the cultivation of citrus orchards and the construction of associated farm infrastructure.
	56(ii)	<i>The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometer – (ii) where no reserve exists, where the existing road is wider than 8 meters;</i>	The proposed development entails the lengthening of existing farm access roads by more than 1 km in an area where no reserve exists, but where the existing farm access roads are wider than 8 m.
Listing Notice 3 (GN R. 985/ GN R. 324)	12(a)(ii)(v)	<i>The clearance of an area of 300 square meters or more of indigenous vegetation – a. Eastern Cape ii. Within critical biodiversity areas identified in bioregional plans. v. On land, where, at the time of the coming into effect of this notice or thereafter such land was zoned open space, conservation, or had an equivalent zoning.</i>	The proposed development requires the clearance of more than 300 m ² of indigenous vegetation within a terrestrial CBA 1 and an aquatic CBA 2 (ECBCP, 2007), an Addo BSP CBA (SANParks, 2012), as well as an area classified as a Private Nature Reserve, the Voetpadskloof Game Farm.
	14(ii)(c)(i)(aa)(ff)(hh)	<i>The development of – (ii) infrastructure or structures with a physical footprint of 10 square meters or more; Where such development occurs – (c) if no development setback has been adopted, within 32 meters of a watercourse, measured from the edge of a water course; a. Eastern Cape (i) Outside urban areas:</i>	The proposed development entails the establishment of citrus orchards and associated farm infrastructure, with a physical footprint exceeding 10 m ² , within 32 m of a watercourse in an area classified as a terrestrial CBA 1, an Aquatic CBA 2 (ECBCP, 2007) and an Addo BSP CBA (SANParks, 2012). The proposed development is located within a Private Nature Reserve, the Voetpadskloof Game Farm, and it is situated approximately 8.2 km from



LISTING NOTICE	ACTIVITY NO.	DESCRIPTION	COMMENTS
		<p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies</i></p> <p><i>(ff) Critical Biodiversity Areas or ecosystem services areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p> <p><i>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</i></p>	<p>Addo Elephant National Park (National Environmental Management Protected Areas Act (NEMPAA), 2007).</p>
	<p>18(a)(i) (aa)(ee) (gg)(ii)</p>	<p><i>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</i></p> <p><i>a. Eastern Cape</i></p> <p><i>(i) Outside urban areas:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p><i>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; and</i></p> <p><i>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</i></p>	<p>The proposed development entails the lengthening of existing farm access roads within an area classified as a Private Nature Reserve (the Voetpadskloof Game Farm), a terrestrial CBA 1 and an aquatic CBA 2 (ECBCP, 2007), and an Addo BSP CBA (SANParks, 2012).</p> <p>The proposed development is located approximately 8.2 km from the Addo Elephant National Park (NEMPAA, 2007) and is situated within 100 m of a watercourse.</p>

3.2 THE ENVIRONMENTAL POLICY

The Developer is required to be familiar with the environmental policy (to be developed by himself) and all that it implies, and to adopt and implement the policy throughout the course of construction. The policy must be communicated to all employees and must be made available to the public, if requested.



3.3 ENVIRONMENTAL OBJECTIVES AND TARGETS

In order to meet the commitments included within the environmental specifications of this EMP, the Developer should establish environmental objectives and targets. The objectives and targets must conform to, and comply with, the following criteria:

- The objectives and targets shall constitute the overall goals for environmental performance identified in the environmental policy and strategy;
- When establishing objectives and targets, the Developer should take into account the identified environmental aspects and associated environmental impacts, as well as the relevant findings from environmental reviews and audits;
- The targets must be set to achieve objectives within a specified timeframe;
- Targets should be specific and measurable;
- When the objectives and targets are set, the Developer should establish measurable Key Performance Indicators (KPIs). The latter will be used by the Developer as the basis for an Environmental Performance Evaluation System, and can provide information on both the environmental management and the operational systems; and
- Objectives and targets need to apply broadly across the Developer's operations, as well as to site-specific and individual activities.

Objectives and targets must be reviewed from time to time in view of changed operational circumstances and/or changes in environmental legal requirements and need to take into consideration the views of the I&APs.

3.4 ENVIRONMENTAL LEGISLATION AND GUIDELINES

The Developer must ensure that all South African legislation concerning the natural environment, pollution and the built environment is strictly enforced. Such legislation must include, but is not limited to the:

- The Constitution of the Republic of South Africa (Act No. 108 of 1996).
- National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended).
- National Heritage Resources Act (NHRA) (Act No. 25 of 1999).
- National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004).
- National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004, as amended).
- National Environmental Management: Waste Act (NEM:WA) (Act No.59 of 2008, as amended).
- The Environment Conservation Act (Act No. 73 of 1989).
- National Water Act (NWA) (Act No. 36 of 1998).
- National Forest Act (NFA) (Act No. 84 of 1998).
- Occupational Health and Safety Act (OHSA) (Act No. 85 of 1993, as amended).
- Cape Nature and Environmental Conservation Ordinance (Ordinance No. 19 of 1974).
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) – Alien and Invasive Species (AIS) Regulations.
- All relevant provincial legislation, municipal by-laws and ordinances.



4. IMPACT ASSESSMENT AND MITIGATION SUMMARY

This section provides an assessment of the pre-mitigation significance as well as the post-mitigation significance of the social and environmental impacts that could result from the primary activities associated with the development.

4.1 IMPACT MANAGEMENT OUTCOMES

In order to identify the appropriate methods required to manage and mitigate environmental disturbance during the proposed development, the impacts and risks that need to be avoided must first be identified. This has been determined by the undertaking of a Basic Assessment (BA) process and the details of the impacts and risks associated with the proposed development are included in the Basic Assessment Report (BAR). The aim of this EMP is to ensure that the impacts which have been identified are properly mitigated to ensure that their significance is reduced (in the case of negative impacts) in order to protect the environment. The table below illustrates the significance of the impacts before and after mitigation is taken into account:

Table 2: Significance of impacts associated with the proposed development before and after mitigation.

IMPACT	WITHOUT MITIGATION	WITH MITIGATION	NO-GO OPTION
PLANNING AND DESIGN PHASE			
Legal and Policy Compliance	HIGH -	LOW -	N/A
CONSTRUCTION PHASE			
Storage of Hazardous Substances	MODERATE -	LOW -	N/A
Waste Management	MODERATE -	LOW -	N/A
Noise Impacts	LOW -	LOW -	N/A
Air Quality and Dust Control	LOW -	LOW -	N/A
Cultural Heritage	MODERATE -	LOW -	N/A
Traffic Impacts	LOW -	LOW -	N/A
Health and Safety	HIGH -	MODERATE -	N/A
Visual and Aesthetic Impacts	LOW -	LOW -	N/A
Creation of Employment Opportunities	MODERATE +	HIGH +	MODERATE -
Erosion	MODERATE -	LOW -	N/A
Loss of Indigenous Vegetation (Sundays Arid Thicket)	MODERATE -	MODERATE -	N/A
Loss of Biodiversity	MODERATE -	LOW -	N/A
Habitat Loss/Fragmentation	MODERATE -	LOW -	N/A
Loss of Species of Conservation Concern	HIGH -	MODERATE -	N/A
Establishment of Alien Plant Species	MODERATE -	LOW -	MODERATE -
Damage to Surface Water Features	MODERATE -	LOW -	N/A



Wildlife Mortalities	MODERATE -	LOW -	N/A
Loss of Critical Biodiversity Areas	MODERATE -	MODERATE -	N/A
Inadequate rehabilitation and Maintenance of Disturbed Areas	MODERATE -	LOW -	N/A
OPERATIONAL PHASE			
General Waste Management	MODERATE -	LOW -	N/A
Use of Hazardous Substances	MODERATE -	LOW -	N/A
Creation of Employment Opportunities	MODERATE +	HIGH +	HIGH -
Erosion	MODERATE -	LOW -	N/A
Loss of Soil Quality	MODERATE -	LOW -	N/A
Loss of Indigenous Vegetation	MODERATE -	LOW -	N/A
Establishment of Alien Plant Species	MODERATE -	LOW -	MODERATE -
Damage to Surface Water Features	MODERATE -	LOW -	N/A
Wildlife Mortalities	MODERATE -	LOW -	N/A
Inadequate Rehabilitation and Maintenance of Disturbed Areas	MODERATE -	LOW -	N/A
Air Quality and Dust Control	LOW -	LOW -	N/A
Fire Risk	MODERATE -	LOW -	N/A

4.2 IMPACT MANAGEMENT ACTIONS

The table below lists the impact management actions which need to be implemented in order to correctly mitigate the significance of the abovementioned impacts.

Table 3: Impact Management Actions.

PLANNING AND DESIGN PHASE		
Impact	Description	Mitigation Measures
Legal and Policy Compliance	During the Planning and Design Phase, failure to obtain the necessary permits and/or authorisations, as well as failure to adhere to existing policies and legal obligations, could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in a lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	<ul style="list-style-type: none"> ➤ All necessary permitting and authorisations must be obtained prior to the commencement of any vegetation clearance and/or construction activities; ➤ If necessary, a suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase; ➤ Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and ➤ Planning for the construction and operation of the proposed development should consider available best practice guidelines.



CONSTRUCTION PHASE		
Storage of Hazardous Substances	Spillage or leaching of hazardous substances (such as diesel, fertilisers, pesticides, etc), could result in the contamination of soils, surface and ground water, as well as pose a health and safety risk to staff.	<ul style="list-style-type: none"> ➤ Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) and the SABS Code of Practice must be adhered to; ➤ The individual(s) that will be handling hazardous materials must be trained to do so; ➤ All hazardous substances such as diesel, pesticides and fertilisers must be stored in a bunded area with an impermeable surface beneath them; ➤ Maintenance of any vehicles or machinery should not take place within 50 m of any watercourse and drip trays must be used; ➤ Spill kits must be kept on-site and maintained; and ➤ The appointed ECO must determine and/or approve the precise method for the treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestives.
Waste Management	During the construction phase, long-term and inappropriate storage and disposal of general waste could potentially result in ground water contamination or pollution of the surrounding environment.	<ul style="list-style-type: none"> ➤ Littering must be avoided, and sufficient waste bins must be provided on site; ➤ All general waste must be disposed of in bins or waste skips labelled general waste; ➤ All waste collected on site must be disposed of at the nearest registered landfill; and ➤ Waste must not be buried or burned on site.
Noise Impacts	During the construction phase, construction activities could result in an increase in ambient noise levels on site and surrounding properties.	<ul style="list-style-type: none"> ➤ Applicable municipal by-laws relating to noise control must be adhered to; ➤ Activities which include the movement of construction vehicles and the operation of machinery should be restricted to normal working hours (06:00am – 18:00pm); and ➤ There must be a complaints register on site to register and record any complaints received from the public. The appointed ECO must be made aware of any



		complaints relating to the citrus development.
Air Quality and Dust Control	During the construction phase, the moving of construction vehicles and other construction activities, such as vegetation clearing, could result in air pollution in the form of dust, especially during windy conditions.	<ul style="list-style-type: none"> ➤ During windy periods, exposed soil should be dampened down if necessary; ➤ Vegetation should be retained, where possible, to reduce dust travel; ➤ Excavations and other clearing activities must only take place during agreed working times and permitting weather conditions to avoid the drifting of dust into neighbouring areas; ➤ Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register; ➤ Construction vehicles should adhere to the recommended speed limit of 30 km/h; and ➤ Vehicles and construction plant must be serviced regularly to reduce excessive vehicle emissions.
Cultural Heritage	During the construction phase, the clearance of vegetation and the disturbance of the soil profile could adversely impact possible heritage and paleontological artefacts on the site.	<ul style="list-style-type: none"> ➤ All recommendations and mitigation measures made by the Archaeological Specialist and relating to the cultural heritage within the site must be implemented/adhered to; and ➤ Should any archaeological or cultural sites or objects be located during the construction of the proposed development, they must be reported to the archaeologist at the Albany Museum (Tel.: 046 6222312) or to the ECPHRA (Tel.: 043 7450888) immediately in accordance with the National Heritage Act (Act No. 25 of 1999).
Traffic Impacts	During the construction phase, construction or delivery vehicles traveling to and from the citrus development site could increase traffic volumes on the existing gravel access roads and/or adversely affect the traffic flow in the area.	<ul style="list-style-type: none"> ➤ Construction activities must be restricted to normal working hours (06:00 am to 18:00 pm); ➤ All surrounding landowners must be notified once construction activities commence; and ➤ Vehicles must adhere to the recommended speed restrictions (preferably 30 km/hr along gravel roads).
Health and Safety	During the construction phase, inadequate attention to fire	<ul style="list-style-type: none"> ➤ Operational firefighting equipment must be present on site at all times



	<p>safety awareness and fire safety equipment could result in runaway fires, an unsafe working environment, and the potential loss of property.</p>	<p>as per the Occupational Health and Safety Act;</p> <ul style="list-style-type: none"> ➤ Employees should be trained in basic fire hazard control and firefighting techniques; ➤ The Proponent should provide the employees with all relevant emergency contact details; and ➤ Burning of construction waste or debris must not occur onsite.
<p>Visual and Aesthetic Impacts</p>	<p>During the construction phase, construction activities and the presence and use of machinery on site and along access roads, could result in a visual disturbance to nearby visual receptors. The transformation of the current, indigenous vegetation, to citrus orchards is likely to alter the aesthetic quality of the area. However, this impact is unlikely to be significant because the proposed citrus orchards are in line with the surrounding land uses.</p>	<ul style="list-style-type: none"> ➤ Vegetation clearance must be restricted to the demarcated development footprints; and ➤ Any disturbed areas should be rehabilitated as soon as possible.
<p>Creation of Employment Opportunities</p>	<p>During the construction phase, both permanent and temporary employment opportunities will be created by the proposed citrus development.</p>	<ul style="list-style-type: none"> ➤ Where possible, individuals residing in nearby communities should be contracted for unskilled and semi-unskilled employment opportunities.
<p>Erosion</p>	<p>During the construction phase, the clearance of vegetation and associated construction activities could result in erosion and the loss of topsoil within the development site and surrounds.</p>	<ul style="list-style-type: none"> ➤ An Erosion Management Plan or method statement must be compiled indicating what measures will be implemented during the construction phase; ➤ Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion; ➤ Disturbed areas must be rehabilitated as soon as possible after construction; and ➤ The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.
<p>Loss of Indigenous Vegetation (Sundays Arid Thicket)</p>	<p>Vegetation clearance for the cultivation of the proposed citrus orchards will result in the direct loss of Vulnerable Sundays Arid Thicket Vegetation. It must be noted that, although it is still in a natural state, the ecosystem has</p>	<ul style="list-style-type: none"> ➤ A comprehensive Plant Search and Rescue should be conducted prior to vegetation clearance; ➤ Any Species of Conservation Concern (SCC) should be translocated to the nearest appropriate habitat;



	<p>been transformed from Sunday Arid Thicket to a low scrub/grassland by suspected over-grazing by large game species, and the recovery of this ecosystem to its former state is unlikely.</p>	<ul style="list-style-type: none"> ➤ The clearance of vegetation at any given time should be kept to a minimum; ➤ Employees must not make fires and/or harvest plants within the Citrus Development site; ➤ Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase; ➤ Only indigenous species must be used for rehabilitation purposes; ➤ As far as practically possible, existing roads should be utilised; and ➤ An Alien Vegetation Management Plan must be compiled (for implementation during the phases that follow).
<p>Loss of Biodiversity</p>	<p>During the construction phase, uncontrolled construction activities, such as vegetation clearing and soil ripping, beyond the footprint of the development, could lead to unnecessary damage to and removal of natural vegetation, loss of faunal habitat, and SCC within the proposed site boundaries.</p>	<ul style="list-style-type: none"> ➤ A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance; ➤ The clearance of vegetation at any given time must be kept to a minimum and restricted to demarcated development areas; ➤ Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas; ➤ Employees must not make fires and/or harvest plants within the Citrus Development site; ➤ Any alien vegetation, which establishes during the construction phase, must be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings must take place throughout the construction phase; ➤ Only indigenous species must be used for rehabilitation purposes; and ➤ As far as practically possible, existing roads must be utilised.
<p>Habitat Loss/Fragmentation</p>	<p>During the construction phase, the loss of vegetation coincides with the loss of faunal habitat,</p>	<ul style="list-style-type: none"> ➤ A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;



	<p>reducing feeding, breeding and rearing locales. Faunal populations could become locally extinct or diminish in size. However, faunal species are mobile and it is likely that some of the species will move away during the construction phase and return once the citrus development has been established.</p>	<ul style="list-style-type: none"> ➤ The clearance of vegetation at any given time should be kept to a minimum; ➤ Vegetation clearance and trampling should be avoided in areas demarcated as no-go areas; ➤ Employees must not trap, hunt, handle or remove any faunal species from the site; and ➤ As far as practically possible, existing roads must be utilized.
Loss of Species of Conservation Concern (SCC)	<p>During the construction phase, construction activities, including the clearance of vegetation, could permanently damage or destroy plant SCC which are present on site, contributing to the cumulative loss of plant SCC in the region.</p>	<ul style="list-style-type: none"> ➤ A comprehensive Plant Search and Rescue must be conducted prior to vegetation clearance; ➤ A qualified botanical specialist must be present on-site during the clearance of vegetation; and ➤ Any SCC should be relocated to the nearest appropriate habitat.
Establishment of Alien Plant Species	<p>The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems.</p>	<ul style="list-style-type: none"> ➤ An Alien Vegetation Management Plan must be developed and implemented to prevent the establishment and spread of undesirable alien plant species during all phases of development; and ➤ Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase.
Damage to Surface Water Features	<p>Construction works, including vegetation clearing, levelling and earthworks for the cultivation of the proposed citrus orchards will result in the loss and damage of a section of the drainage line which traverses the northwest corner of the citrus development site.</p>	<ul style="list-style-type: none"> ➤ The construction site must be managed in a manner that prevents the contamination or sedimentation of the main tributary into which the drainage line flows; and ➤ If necessary, silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further loss and degradation of the main tributary.
Wildlife Mortalities	<p>During the construction phase, construction activities could result in faunal fatalities through collisions with moving vehicles, accidents during vegetation clearance, or the baiting and trapping of fauna by construction workers.</p>	<ul style="list-style-type: none"> ➤ A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance; ➤ Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality; ➤ Train all staff on site regarding the proper management and response should animals be encountered;



		<ul style="list-style-type: none"> ➤ Search and clear the construction region prior to work commencing, relocating animals where found; ➤ No hunting, baiting and trapping will be allowed; and ➤ Animals must not be injured or killed by construction activities.
Loss of Critical Biodiversity Areas	<p>The proposed citrus development will result in the loss of a portion of an area classified as a CBA 1 in terms of both the ECBCP and the Addo BSP. This classification was driven by the vegetation type, threat status and the established national conservation target. Even though a site is considered degraded, the systematic biodiversity planning algorithm will still select sites to ensure that the target is satisfied, recommending that degraded areas of CBAs are rehabilitated. The planning process, however, does not take the capability of the ecosystem to recover once disturbed into account. In this case, Sundays Arid Thicket has been significantly degraded and it is unlikely that any future efforts to restore the ecosystem will be successful.</p>	<ul style="list-style-type: none"> ➤ If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented.
Inadequate Rehabilitation and Maintenance of Disturbed Areas	<p>During the construction phase, failure to implement rehabilitation measures could lead to the erosion of- and permanent loss of valuable soil, the unnecessary loss of indigenous vegetation and the establishment of alien invasive vegetation.</p>	<ul style="list-style-type: none"> ➤ A Rehabilitation Plan must be developed and implemented during and post-construction; ➤ All temporary disturbed areas that do not form part of the citrus orchards, must be rehabilitated using only indigenous vegetation; and ➤ All impacted areas must be restored as per the EMP requirements.
OPERATIONAL PHASE		
General Waste Management	<p>During the operational phase, the long-term and inappropriate storage of general waste onsite could result in pollution of the surrounding environment and/or contamination of surface water features (i.e. the non-perennial</p>	<ul style="list-style-type: none"> ➤ All waste generated on site must be stored in a designated waste area in lidded bins; ➤ Any hazardous chemicals must be stored in a designated hazardous waste area which is bunded and clearly labelled; ➤ Any hazardous waste must be removed in an appropriate manner



	water course in the northwest corner of the project site).	<p>and disposed of at a suitably registered waste site; and</p> <ul style="list-style-type: none"> ➤ General waste must be disposed of at the nearest registered landfill.
Use of Hazardous Substances	During the operational phase, the inappropriate handling, application, storage and disposal of hazardous substances such as pesticides, fertilisers and chemicals commonly utilised in the agricultural industry, could lead to the contamination of soil, and surface and/or ground water features, as well as pose a health and safety risk to staff.	<ul style="list-style-type: none"> ➤ Only plant protection products, including pesticides, fungicides and herbicides, which are registered with the Department of Agriculture for specific uses must be used during the operation of the citrus development; ➤ Herbicides should not be sprayed during very windy conditions; and ➤ The application of plant protection products must adhere to the information displayed on the product label to avoid the misuse of these products
Creation of Employment Opportunities	Forty (40) permanent and forty (40) temporary employment opportunities will be created during the operational phase of the development.	<ul style="list-style-type: none"> ➤ Where possible, individuals residing in the nearby communities should be contracted for unskilled and semi-unskilled employment.
Erosion	During the operational phase, failure to install erosion control and stormwater management measures could result in increased run-off and further erosion within the boundaries of Portion 472 of Farm 42. Additionally, failure to rehabilitate temporary areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable topsoil.	<ul style="list-style-type: none"> ➤ Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms; ➤ All erosion control mechanisms, such as silt traps, must be regularly maintained; ➤ Natural vegetation must be retained where possible to avoid soil erosion; ➤ Any cleared areas, which are not used for the cultivation of the citrus orchards, should be rehabilitated post-construction using only indigenous plant species; ➤ Irrigation methods must ensure minimal runoff; ➤ All pipelines associated with the irrigation system(s) must be monitored for leaks throughout the operational phase; and ➤ The quality and health status of surrounding soils should be monitored throughout the operational phase.
Loss of Soil Quality	During the operational phase, soil leaching caused by poor irrigation methods and/or	<ul style="list-style-type: none"> ➤ Disturbed areas must be rehabilitated as soon as possible after construction;



	<p>stormwater management, coupled with the application of fertilisers, pesticides, and/or herbicides, could lead to the loss/alteration of soil quality and structure within the study area.</p>	<ul style="list-style-type: none"> ➤ The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion; ➤ If necessary, any negative alterations in the soil quality should be remediated in line with best practices; and ➤ The application of fertilisers, pesticides, and/or herbicides to cultivated areas must be carefully managed.
<p>Loss of Indigenous Vegetation</p>	<p>During the operational phase, unsustainable and irresponsible farming practises could result in the loss or damage of the surrounding indigenous vegetation, beyond the orchard development footprint.</p>	<ul style="list-style-type: none"> ➤ The proposed vegetation clearing and ripping of soil required for cultivation must be restricted to the citrus orchards; ➤ Sustainable farming methods must be practiced during the operational phase, such as application of pesticides using nozzles which will assist in preventing wind-drift; and ➤ Vehicles should make use of existing farm roads and must refrain from driving through surrounding indigenous vegetation.
<p>Establishment of Alien Plant Species</p>	<p>During the operational phase, failure to remove and manage alien vegetation could result in the establishment of alien vegetation in the study area and the potential spreading of alien vegetation. In addition, the poor rehabilitation of disturbed areas could lead to the permanent degradation of ecosystems which will permit alien vegetation species to establish and spread.</p>	<ul style="list-style-type: none"> ➤ An Alien Vegetation Management Plan must be implemented to prevent the establishment and prevent the spread of undesirable alien plant species during the operational phase; and ➤ Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide.
<p>Damage to Surface Water Features</p>	<p>During the operational phase, runoff from the proposed citrus orchards could result in the subsequent sedimentation and/or contamination of downstream water features.</p>	<ul style="list-style-type: none"> ➤ The citrus orchards must be managed in a manner that prevents the contamination or sedimentation of the main tributary to which the drainage line is connected to; ➤ Irrigation methods must ensure that the correct rates of agricultural application, which could potentially contaminate water course (such as fertilisers, herbicides and pesticides), are applied and ensure the minimal runoff of water; and ➤ If necessary, silt traps should be erected in the drainage line at the



		boundary of the development footprint to prevent further degradation of the main tributary.
Wildlife Mortalities	Operational activities could result in faunal fatalities through collisions with moving vehicles, accidents during harvesting of the citrus orchards, or the baiting and trapping of fauna by farm workers.	<ul style="list-style-type: none"> ➤ Vehicle speed must be limited to 30 km/hr to reduce faunal collision mortality; ➤ Train all staff on site regarding the proper management and response should animals be encountered within the citrus development; ➤ No animal shall be killed or hurt; and ➤ No hunting, baiting or trapping shall be allowed.
Inadequate Rehabilitation and Maintenance of Disturbed Areas	During the operational phase, failure to rehabilitate temporary disturbed areas, which were impacted during the construction phase, could lead to the erosion of- and permanent loss of valuable soil, the degradation of the surrounding indigenous vegetation, and the establishment of alien invasive vegetation.	<ul style="list-style-type: none"> ➤ Stormwater control must be undertaken to prevent soil loss from the site; ➤ All erosion control mechanisms must be regularly maintained; ➤ Vegetation must be retained where possible to avoid soil erosion; ➤ Any cleared/disturbed areas, which are not used for the cultivation of citrus, should be rehabilitated post-construction using only indigenous plant species; ➤ Irrigation methods must ensure minimal runoff; ➤ The quality and health status of surrounding soils should be monitored throughout the operational phase; and ➤ If necessary, any negative alterations in the soil quality should be remediated in line with best practice.
Air Quality and Dust Control	During the operational phase, the moving of transportation or delivery vehicles and other operational activities could result in air pollution in the form of dust, especially during windy conditions.	<ul style="list-style-type: none"> ➤ Fugitive/nuisance dust could be reduced by implementing the following: <ul style="list-style-type: none"> ➤ The use of commercial dust binders such as Hydropam or Dustex; ➤ Rotovating straw bales; ➤ Retention of vegetation where possible; ➤ Planting of open cleared space; ➤ A speed limit of 30km/h must not be exceeded on gravel roads; and ➤ Any complaints or claims emanating from the lack of dust control should be attended to immediately by the Proponent.



Fire Risk	Inadequate attention to fire safety awareness and the lack of fire safety equipment could result in runaway fires, an unsafe working environment and the loss of property.	<ul style="list-style-type: none"> ➤ The Proponent must ensure that operational firefighting equipment is present on site at all times as per the Occupational Health and Safety Act; ➤ All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances; ➤ No open fires are to be permitted; and ➤ There should be no burning of general waste or debris onsite.
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4.3 BASIC ASSESSMENT ISSUES AND MITIGATION MEASURES

The identification and significance of project related impacts (before and after mitigation) are presented in the BAR. The BAR identified potential impacts and risks associated with the proposed development and these, contained in this EMPr, present the preliminary actions, specifications and management commitments that need to be adhered to in order to mitigate or enhance the impacts of significance. These are detailed in the sections that follow.

4.4 SPECIALIST'S MITIGATION MEASURES

The following recommendations of the specialists, which are detailed in the specialist's studies appended to the BAR, must also be adhered to:

Planning and Design Phase:

- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities;
- A suitably qualified Environmental Control Officer (ECO) must be appointed prior to the commencement of the construction phase;
- Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy; and
- Planning for the construction and operation of the proposed development should consider available best practice guidelines.

Construction Phase

- An Erosion Management method statement must be compiled indicating what measures will be implemented during the Construction Phase;
- Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion;
- Disturbed areas must be rehabilitated as soon as possible after construction;
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;
- The construction site must be managed in a manner that prevents the contamination or sedimentation of the main tributary into which the drainage line flows;



- Silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further loss and degradation of the main tributary;
- A comprehensive Plant Search and Rescue should be conducted prior to vegetation clearance;
- Any SCC should be translocated to the nearest appropriate habitat;
- The clearance of vegetation at any given time should be kept to a minimum;
- Employees must be prohibited from making fires and harvesting plants;
- Any alien vegetation which establishes during the construction phase should be removed from site and disposed of at a registered waste disposal site. Continuous monitoring for alien plant seedlings should take place throughout the construction phase;
- Only indigenous species must be used for rehabilitation purposes;
- As far as practically possible, existing roads should be utilised;
- An alien vegetation management plan must be compiled (for implementation during the phases that follow);
- Vegetation clearance and trampling must be avoided in areas outside of the demarcated development areas;
- A qualified botanical specialist must be present on-site during the clearance of vegetation;
- If there is an opportunity for the consideration of a “set-aside” this should be investigated and implemented;
- A comprehensive Faunal Search and Rescue should be conducted prior to vegetation clearance;
- Employees must not trap, hunt, handle or remove any faunal species from the site;
- Vehicle speed must be limited to 30km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- Search and clear the construction region prior to work commencing, relocating animals where found;
- No animal shall be killed or hurt;
- No hunting, baiting or trapping shall be allowed.
- A Rehabilitation Plan must be developed and implemented during and post-construction;
- All temporary disturbed areas that do not form part of the citrus orchards, must be rehabilitated using only indigenous vegetation; and
- All impacted areas must be restored as per the EMP requirements.

Operational Phase

- Stormwater control must be undertaken to prevent soil loss from the site, potentially by contour ridging and storm water attenuation berms;
- All erosion control mechanisms, such as silt traps, must be regularly maintained;
- Natural vegetation must be retained where possible to avoid soil erosion;
- Any cleared areas, which are not used for the cultivation of the citrus orchards, should be rehabilitated post-construction using only indigenous plant species;
- Irrigation methods must ensure minimal runoff;
- The quality and health status of surrounding soils should be monitored throughout the operational phase;
- Disturbed areas must be rehabilitated as soon as possible after construction;
- The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion;
- Any alteration of soil quality should be remediated in line with best practices;



- The application of fertilisers, pesticides, and/or herbicides to cultivated areas must be carefully managed;
- The citrus orchards must be managed in a manner that prevents the contamination or sedimentation of the main tributary to which the drainage line is connected to;
- Irrigation methods must ensure that the correct rates of agricultural application which could potentially contaminate water course (such as fertilisers, herbicides and pesticides) are applied and ensure the minimal runoff of water;
- Silt traps should be erected in the drainage line at the boundary of the development footprint to prevent further degradation of the main tributary;
- The proposed vegetation clearing and ripping of soil required for cultivation must be restricted to the citrus orchards;
- Sustainable farming methods must be practiced during the operational phase, such as application of pesticides using nozzles which will assist in preventing wind-drift;
- An Alien Vegetation Management Plan must be implemented to prevent the establishment and prevent the spread of undesirable alien plant species during the Operational Phase;
- Monitoring of the establishment of alien plant seedlings should continue throughout the operational phase. Any alien seedlings should be removed and disposed of at a registered landfill or treated with an appropriate herbicide;
- Vehicle speed must be limited to 30km/hr to reduce faunal collision mortality;
- Train all staff on site regarding the proper management and response should animals be encountered;
- No animal shall be killed or hurt where possible; and
- No hunting, baiting or trapping shall be allowed.



5. ENVIRONMENTAL MANAGEMENT SYSTEM

5.1 REPORTING

5.1.1 Administration

Prior to the commencement of the Construction Phase, the Developer should submit a written Method Statement to the ECO detailing the following:

- The activities to be undertaken;
- The locality of the activities to be undertaken;
- The identification of impacts that might result from the activities;
- Identification of activities or aspects that could cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specific actions for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and
- Treatment and continued maintenance of the impacted environment.

The Developer should inform the ECO whenever there is a change or variation to the original documentation.

The ECO may provide comment on the methodology and procedures proposed by the Developer, but the ECO will not be responsible for the Developer's chosen measures of impact mitigation and emergency/disaster management systems. However, the Developer should demonstrate at inception that the approved measures and procedures function properly.

5.1.2 Good Housekeeping

The Developer should undertake "good housekeeping" practices during both the Construction and Operational Phase of the development. This will help avoid disputes on responsibility and allow for the smooth-running of development. Good housekeeping extends beyond the wise practice of construction methods and includes the care for and preservation of the environment within which the site is situated.

5.1.3 Record Keeping

Should monitoring and/or reporting by an independent ECO be required by the Competent Authority, as recommended in the BAR, this will be done as per the requirements specified in EA. The appointed ECO will monitor the Developer's adherence to the approved impact prevention procedures and a notice of non-compliance will be issued to the Developer whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. These reports must be made available to the authorities when requested.



The Developer should ensure that an electronic filing system identifying all documentation related to the EMP is established.

A list of reports likely to be generated during all phases of the development is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index. This includes the following (if necessary):

- Environmental Management Programme;
- Final design/site layout;
- All communications detailing changes of design/scope that could have environmental implications;
- Complaints register;
- Medical reports;
- Incident and accident reports;
- Emergency preparedness protocol;
- Copies of all relevant environmental legislation;
- All relevant permits; and
- All method statements from the Developer for all phases of the project.

5.1.4 Document control

The Developer will be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person;
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution; and
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five-year period.

The Developer should ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available on the farm. All documents must be made available to independent external auditors (if required).

5.2 CONSTRUCTION PHASE

5.2.1 Site Clearing

In all areas where the Developer intends to, or is required to, clear the natural vegetation and soil, either within the construction area, or at designated areas outside the construction area, a plan of action should first be submitted to the ECO for his/her approval. A qualified botanical specialist must be present during vegetation clearance.



The EMPr should contain a photographic record and change/land reference of the areas to be disturbed. This should be submitted to the ECO for his/her records before any disturbance/stockpiling occurs. The record should be comprehensive and clear, allowing for easy identification during subsequent inspections.

The Developer will be responsible for the re-establishment of natural vegetation within the development boundaries, for all areas disturbed during construction. This responsibility extends until expiry of the defect's notification period.

5.2.2 Site Access and Demarcation

The location, layout and method of establishing the citrus orchards, including the following, must be clearly indicated and demarcated prior to the commencement of construction activity:

- The position or location of the shed/loading area;
- The width and length of the gravel access roads;
- Laydown/stockpile areas;
- Wash down areas (if required);
- Fuel storage areas (including refuelling areas, if any); and
- Other infrastructure required for the running of the project.

Details of the access points and routes must be submitted to the ECO and supported by the following management requirements:

- On the site and within such distance of the site as may be stated, the Developer will control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes and that all relevant laws are complied with;
- On gravel or earth roads on site and within 500 m of the site, the vehicles of the Developer and his suppliers should not exceed a speed of 30 km/h or as directed by the ECO; and
- The Developer should supply the ECO with a Method Statement detailing the location and management of all access points and roads.

The Developer must ensure that, insofar as he has the authority, no person, machinery, equipment or materials enter any areas outside of the approved development boundaries which do not form part of the neighbouring existing citrus orchards.

5.2.3 Materials handling, use and storage

- The Developer must ensure that any delivery drivers are informed of all procedures and restrictions (including any identified "no go" areas) required to comply with the EMPr;
- The Developer should ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the EMPr;
- Materials must be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and/or fertilizers, amongst others, should have appropriate cover to prevent them spilling from the vehicle during transit;



- The Developer should be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials;
- All manufactured and/or imported material should be stored within a designated area as specified by the ECO and, if required by the EMP, out of the rain;
- All lay down areas should be subject to the ECO's approval; and
- Any imported gravel, fill, soil and sand materials (if required) should be free of weeds, alien invasive seed matter, plant material, litter and contaminants and should be obtained from sources approved by the ECO.

5.2.4 Stockpiling

- Any stockpiling (if required) of gravel, cut, fill or any other material including spoil should be in areas approved by the ECO within the defined working area;
- The Developer should ensure that the material does not blow or wash away. If the stockpiled material is in danger of being washed or blown away, the Developer should spray it with Dustex or cover it with a suitable material, such as hessian or plastic. Stockpiles of topsoil should not be covered with plastic; and
- No stockpiling of any material is allowed within 20 m of any “no go” area.

5.2.5 Solid Waste Management

- No on-site burning, burying or dumping of any waste materials, litter or refuse may occur;
- The waste from bins on the farm may be temporarily stored on Site in a designated waste area, which is weatherproof and scavenger-proof, and which the ECO has approved;
- Recyclable waste should be disposed of into separate skips/bins and removed off-site for recycling; and
- All solid waste must be disposed of off-site at the closest approved registered landfill site.

5.2.6 Water Use

- All sources of water for the development should be approved by the ECO in writing before any such sources can be used to obtain water;
- Water may not be sourced from a river, natural watercourse or from a borehole without the appropriate authorisation from the Department of Water and Sanitation (DWS); and
- Where possible, all grey water should be recycled for use, as grey water again or for dust suppression, where applicable.



5.2.7 Contaminated Water

- Potential pollutants of any kind and in any form should be kept, stored, and used in such a manner that any escape can be contained and that the water table and surface water is not endangered. Water containing pollutants such as fuel, fertilizers, chemicals, pesticides, herbicides and/or irrigation return flows, should be contained and discharged into an impermeable storage facility for removal from the site or for recycling; and
- Wash down areas (if required) should be placed and/or constructed in such a manner so as to ensure that the surrounding areas are not polluted. The Developer must notify the ECO immediately of any pollution incidents on Site.

5.2.8 Hazardous Substances

- The transportation and handling of hazardous substances must comply with the provisions of the Hazardous Substances Act (Act No.187 of 1993) and associated regulations as well as SABS 0228 and SABS 0229;
- The Developer must also comply with all other applicable regional and local legislation and regulations with regard to the transport, use and disposal of hazardous substances. Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction/operation must be stored in secondary containers;
- The relevant Material Safety Data Sheets (MSDS) should be available on site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation;
- The Developer will be responsible for the training and education of all personnel on site who will be handling hazardous materials about their proper use, handling and disposal; and
- If potentially hazardous substances are to be stored or used on site, the Developer should submit a Method Statement to the ECO detailing the substances/materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

5.2.9 Cement and Mixing of Concrete

Should any mixing of concrete or cement take place of site, the following will apply:

- The proposed location of cement mixing areas (including the location of cement stores and sand and aggregate stockpiles) should be indicated on the site layout plan and approved by the ECO;
- All wastewater generated from the operation and cleaning of concrete mixing equipment and other sources of concrete should be passed through a concrete wastewater settlement system. The water from this system must not be allowed to flow into any “no go” area or watercourse but must permeate through the ground before it reaches any such water course. The accumulated sludge in the settlement system must be regularly cleaned out and appropriately disposed of as solid waste;
- The Developer should ensure that minimal water is used for washing of concrete and cement mixing equipment;



- Used cement bags should be temporarily stored in separate weatherproof bins on site to prevent the generation of wind-blown cement dust and the bags from blowing away. These used cement bags must then be correctly disposed of as hazardous waste; and
- The Developer must ensure that any concrete is mixed on mortar boards, all visible remains of concrete are removed and disposed of as waste, and that all surplus aggregate is removed.

5.2.10 Fuel (petrol and diesel) and Oil

Should any fuel storage and/or refuelling take place on site, the following will apply:

Fuel Storage

- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms/bunds to avoid spread of any contamination into the nearby drainage line. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. These sites must be re-vegetated after construction has been completed. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to the drainage line;
- The location of the fuel storage area should be approved by the ECO and must be situated at least 20 m away from any “no go” areas. All necessary approvals with respect to fuel storage and dispensing must be obtained from the appropriate authorities. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 should be prominently displayed in and around the fuel storage area (if any). There must be adequate fire-fighting equipment at the fuel storage area;
- The Developer should ensure that all liquid fuels and oils are stored in tanks with lids, which are always kept firmly shut and under lock and key. The capacity of the tank must be clearly displayed, and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1. Fuel storage tanks should have a capacity not exceeding 9 000 litres and should be kept on site only for as long as fuel is needed;
- Tanks on site must not be linked or joined via any pipe work but must remain as separate entities. The tanks should be situated on a smooth impermeable base with a bund. The volume inside the bund must be 110% of the total capacity of the largest storage tank. The base may be constructed of concrete, or of plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The impermeable lining should extend to the crest of the bund. The floor of the bund should be sloped to enable any spilled fuel and/or fuel-contaminated water to be removed. Appropriate material approved by the ECO that absorbs, breaks-down or encapsulates minor hydrocarbon spillage and which is effective in water should be installed in the sump;
- The tanks and bunded areas should be covered by a roofed structure and the material that absorbs, breaks-down or encapsulates minor hydrocarbon spillage should be replenished;
- Only empty and externally clean tanks may be stored on the bare ground. Empty and externally dirty tanks should be sealed and stored on an area where the ground has been protected;
- Adequate precautions must be undertaken to prevent spillage during the filling of any tank and during the dispensing of the contents. The dispensing mechanism for the fuel storage tanks should be stored in a waterproof container when not in use; and



- A plan should be submitted to the ECO detailing the design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks and for the type of absorbing, breaking-down or encapsulating material to be used.

Refuelling

- Where reasonably practical, the plant should be refuelled at a designated re-fuelling area/depot or at a workshop, as applicable. If this is not reasonably practical, then the surface under the refuelling area must be protected and appropriately bunded against pollution to the reasonable satisfaction of the ECO prior to any refuelling activities;
- If fuel is dispensed from 200 litre (ℓ) drums, the proper dispensing equipment must be used, and the drum should not be tipped in order to dispense fuel. The Developer should ensure that the appropriate fire-fighting equipment is present during refuelling operations; and
- The Developer should ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials should be able to handle a minimum of 200 ℓ of hydrocarbon liquid spill. Prior to any refuelling or maintenance activities, the ECO must approve this material.

Used oil and hydrocarbon contaminated materials

- Used oil should be stored at a central location on site prior to removal off site for disposal at an approved disposal or recycling site; and
- Old oil filters and oil, petrol and diesel-soaked material must be treated as hazardous waste. The Developer should remove all oil, petrol, and diesel-soaked sand immediately and must dispose of it as hazardous waste or treat it on site with material that breaks-down or encapsulates such spillages as approved by the ECO.

5.2.11 Workshop, equipment maintenance and storage

Should equipment maintenance and/or storage be required on site, the following will apply:

- All maintenance of equipment and vehicles on site must be performed in a designated area as identified by the appointed ECO. If it is necessary to do maintenance outside of the designated area, the Developer should obtain the approval of the ECO prior to commencing such activities. No maintenance, including emergency maintenance, of plant may take place within 20 m of any “no go” areas;
- The Developer should ensure that in this designated area and other plant maintenance facilities, including those areas where, after obtaining the ECO's approval, the Developer carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The designated area should have a smooth impermeable (concrete or thick plastic covered with sand) floor;



- The floor should be bunded and sloped towards an oil trap or sump to contain any spillages. When servicing equipment, drip trays must be used to collect the waste oil and other lubricants. Drip trays should also be provided for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders and/or vehicles);
- All vehicles and equipment should be kept in good working order and serviced regularly. Leaking equipment should be repaired immediately or removed from the site;
- The washing of equipment must be restricted to urgent or preventative maintenance requirements only. All washing should be undertaken in the designated area or maintenance areas, and these areas must be equipped with a suitable impermeable floor and sump/oil trap. The use of detergents for washing should be restricted to low phosphate and nitrate containing and low sudsing-type detergent; and
- As part of the site layouts, a plan must be submitted to the ECO detailing the design of the bunding of the designated area and how run-off from this area will be managed as well as how drip trays used under plant will be managed.

5.2.12 Site structures

- Any site establishment components (as well as equipment) should be positioned to limit visual intrusion on neighbours and the size of the land area disturbed. Should any temporary structures be required, the type and colour of roofing and cladding materials should be selected to reduce reflection; and
- The Developer should supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that could deteriorate or corrode if exposed to the weather should be weatherproof, adequately ventilated and provided with raised floors.

5.2.13 Noise

- The Developer should take precautions to minimise noise generated on site; and
- The Developer must comply with the Noise Induced Hearing Loss Regulations published under the OHSA.

5.2.14 Dust Control

- The Developer will be responsible for the continued control of dust arising from his operations. The Developer must take all reasonable measures to minimize the generation of dust as a result of construction activities to the satisfaction of the ECO. Appropriate dust suppression measures include: spraying or dampening with water, using a commercial dust binder (such as Hydropam or Dustex), rotovating straw bales, planting of open cleared space and the scheduling of dust-generating activities. If the conditions are such that the Developer cannot satisfactorily dampen the dust, then the ECO may halt operations until such time as the conditions are more suitable for lower dust generating construction;
- Should dust be a problem on any specific road, the allowable speed should be reduced to 20 km/h. If dust is still a problem the road should be treated with a commercial dust binder, as required, to form a cohesive layer that will control the dust on the road;



- Areas that are to have the topsoil stripped for construction purposes must be limited and only stripped when work is about to take place;
- Other activities and situations that could result in a dust nuisance include: site clearance and other earth moving operations, open cleared space, stockpiles of topsoil or sand and activities associated with concrete mixing (if any);
- If required, health and safety equipment (e.g. dust masks) should be worn by workers during dust-producing activities; and
- During periods of strong winds, construction work which tends to produce large amounts of dust should be paused until such a time that the wind subsides.

5.2.15 Environmental Awareness Training

- All staff must receive environmental awareness training prior to the commencement of activities. Environmental awareness training must include as a minimum, the following:
 - A description of significant environmental impacts, actual or potential, related to their work activities;
 - Mitigation measures to be implemented when carrying out specific activities;
 - Emergency preparedness and response procedures;
 - Procedures to be followed when working near or within sensitive areas;
 - Wastewater management procedures;
 - Water usage and conservation;
 - Solid waste management procedures (including litter prevention);
 - Sanitation procedures;
 - Fire prevention; and
 - Disease prevention.
- All staff must be made aware of the conditions and controls linked to the EA within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr.

5.2.16 Fire Control

- The Developer should take all the necessary precautions to ensure that fires are not started as a result of his activities on site;
- No open fires should be permitted on the site;
- Smoking should not be permitted in those areas where there is a fire hazard. Such areas include fuel storage areas and any areas where the vegetation or other material is such as to support the rapid spreading of an initial flame;
- The Developer must ensure that basic fire-fighting equipment is available on site at all times. This should include at least rubber beaters when working in natural areas, and at least one fire extinguisher of the appropriate type; and
- The Developer will be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.



5.2.17 Emergency Procedures

- Emergency procedures, including the names and contact details of responsible personnel and emergency services should be made available to all staff on the site. The Developer must inform the ECO of any emergencies on site, together with a record of action taken, within 24 hours of the emergency occurring;
- The Developer should submit a Method Statement covering the procedures for the following emergencies:

Fire

- The Developer should advise the relevant authority of a fire as soon as one starts and must not wait until he can no longer control it; and
- The Developer must ensure that his employees are aware of the procedures to be followed in the event of a fire.

Accidental leaks and spillages

- The Developer must ensure that his employees are aware of the procedures to be followed for dealing with spills and leaks, which include notifying the ECO and the relevant authorities. The Developer must ensure that all the necessary materials and equipment for dealing with spills and leaks are available on site at all times. Treatment and remediation of the spill areas should be undertaken to the reasonable satisfaction of the ECO;
- In the event of a hydrocarbon spill, the source of the spillage must be isolated, and the spillage contained. The area should be cordoned off and secured. The Developer should ensure that there is always a supply of absorbent material readily available to absorb/ breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials should be able to handle a minimum of 200 l of hydrocarbon liquid spill; and
- Any spills must be cleared, and the contaminated soil/sludge disposed of in an appropriate manner, approved by the ECO, or at a licensed hazardous waste disposal site.

5.2.18 Protection of natural features

- The Developer should not deface, paint, damage or mark any natural features (e.g. rock formations or trees) situated in or around the site for survey or other purposes unless agreed upon beforehand by the ECO. Any features affected by the Developer in contravention of this clause must be restored/rehabilitated to the satisfaction of the ECO; and
- The Developer should not permit his employees to make use of any natural water courses for the purposes of swimming, personal washing and the washing of machinery or clothes.

5.2.19 Topsoil

- Topsoil can only be stripped from the areas as indicated below:
 - Within the development footprint of the proposed citrus orchards;
 - Any area which is to be used for temporary storage of materials;



- Areas which could be polluted by any aspect of the construction activity; and
 - Areas designated for the dumping of soil.
- Stripping of topsoil must be undertaken in such a manner as to minimise erosion by wind or runoff;
 - Outside of the development footprint, topsoil must be stripped to a depth not exceeding 150 mm from the original ground level;
 - Areas from which the topsoil is to be removed should be cleared of any foreign material which could come to form part of the topsoil during removal including any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil;
 - The Developer should ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost;
 - Soils should be exposed for the minimum time possible once cleared;
 - Topsoil should be temporarily stockpiled, separately from subsoil and rocky materials;
 - Topsoil should be stockpiled in areas designated by the ECO;
 - Stockpiles should either be vegetated with indigenous grasses or covered by a suitable fabric to prevent erosion and invasion of weeds; and
 - Stockpiled topsoil must not be compacted.

5.2.20 Stormwater Management

- Vegetation clearing must be kept to a minimum in order to prevent erosion caused by increased stormwater runoff;
- Natural stormwater that is not contaminated can be discharged directly into the nearby drainage line, subject to approval and support by the ECO; and
- Water that has been contaminated with suspended solids, such as soils and silt, may be released into the nearby drainage line only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the approval and support of the ECO.

5.2.21 Erosion and Sedimentation Control

- The Developer should take all reasonable measures to limit erosion and sedimentation due to construction activities and must comply with such detailed measures as may be required by the EMPr;
- Areas that have been disturbed should be revegetated as soon as possible; and
- Where erosion and/or sedimentation, whether on or off the site, occurs despite the Developer complying with the foregoing, rectification should be carried out in accordance with details specified by the ECO. Where erosion and/or sedimentation occur due to the fault of the Developer, rectification must be carried out to the reasonable requirements of the ECO and at the expense of the Developer.

5.2.22 Aesthetics



- The Developer must take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

5.2.23 Community Relations

- The Developer should keep a "Complaints Register" on site. The Register should contain the contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was received and resolved;
- The Developer will be responsible for responding to queries and/or complaints and may request the assistance of the ECO; and
- Construction materials and other purchases relating to the project should be done, where possible, within the nearby community and at local shops.

5.2.24 Construction Activities and Equipment

- Vegetation clearance must be restricted to normal daytime working hours (06:00 – 18:00);
- All noise-making equipment should be turned off when not in use;
- All equipment should be kept in good working order;
- All equipment should be operated within specifications and capacity (i.e. do not overload machines);
- Compliance with the appropriate legislation with respect to noise is mandatory;
- The Developer must familiarise himself with, and adhere to, any local by-laws and regulations regarding the generation of noise;
- The Developer should endeavour to keep noise generating activities associated with construction activities to a minimum;
- Modern low noise emission vehicles and equipment should be favoured on site. The details of all construction machinery and vehicles must be determined prior to construction in order to identify potentially noisy machinery and to seek possible alternatives. These details will include the manufacturer, type and noise emission data of each machinery/vehicle and how many will be used at any time; and
- A well planned and co-ordinated "fast track" procedure should be implemented to complete the total construction process in the area in the shortest possible time.

5.3 OPERATIONAL PHASE

5.3.1 Health and Safety

- All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the OHSA (Act No. 85 of 1993);
- All necessary occupational certificates and inspections must be complied with; and
- The Developer or persons in control of the facility must train safety representatives, managers and workers in workplace safety.



5.3.2 Emergency Protocol

- An emergency response protocol (for construction and operation) should be drawn up, to the approval of the ECO, prior to construction and operation taking place;
- All pollution incidents must be reported immediately to the ECO and/or the relevant authorities; and
- Record(s) of environmental related incidents should be maintained and communicated to the ECO.

Accidental leaks and spillages

- The Developer should ensure that his employees are aware of the procedures to be followed for dealing with spills and leaks, which must include notifying the ECO and the relevant authorities. The Developer should ensure that all the necessary materials and equipment for dealing with spills and leaks are available on site at all times. Treatment and remediation of the spill areas must be undertaken to the reasonable satisfaction of the ECO;
- In the event of a hydrocarbon spill, the source of the spillage must be isolated, and the spillage contained. The area should be cordoned off and secured. The Developer should ensure that there is always a supply of absorbent material readily available to absorb/ breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials must be able to handle a minimum of 200 l of hydrocarbon liquid spill; and
- Any spills must be cleared, and the contaminated soil/sludge disposed of in an appropriate manner, approved by the ECO, or at a licensed hazardous waste disposal site.

Fire control

- The Developer must take all the necessary precautions to ensure that fires are not started as a result of his activities on site.
- Smoking should not be permitted in those areas where there is a fire hazard;
- The Developer should ensure that there is basic fire-fighting equipment available on site at all times; and
- The Developer will be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

5.3.3 Safeguarding of the environment, local community and employees against fire risk

- Smoking should be prohibited in the vicinity of flammable substances;
- Ensure the availability of sufficient firewater tie-in points;
- Basic training should be provided in the use of the appropriate fire-fighting equipment;
- Ensure availability of fire extinguishers and fire-fighting equipment (SABS 089-1-1987); and
- All employees must be aware of emergency/contingency protocol to ensure an understanding of the hazards and procedures required during an emergency situation.



5.3.4 Effluent handling

- All waste oils, greases, fuels, chemicals etc. should be collected and disposed of in an appropriate manner off site. The contents of grease traps or other waste oil, grease and/or fuel disposal or storage containers should under no circumstances be emptied and dumped to the surrounding area.

5.3.5 Site structures

- All site components (as well as equipment) should be positioned to limit visual intrusion on neighbours and the size of the land area disturbed; and
- The Developer should supply and maintain adequate and suitable areas for the storage of materials. The areas that could deteriorate or corrode, if exposed to the weather, should be weatherproof, adequately ventilated and provided with raised floors.

5.3.6 Noise

- The Developer should take precautions to minimise noise generated on site; and
- The Developer should comply with the Noise Induced Hearing Loss Regulations published under the OHSA.



5.4 MONITORING AND AUDITING

The key to a successful EMP is appropriate monitoring and review to ensure effective functioning of the EMP and to identify and implement corrective measures in a timely manner. The overall monitoring and auditing of the site will be the responsibility of the ECO, however the Developer must provide the necessary environmental control and audit measures and integrate these through their EMS. The monitoring protocol, which should be adhered to for the proposed development, is included in the table below.

Impact Management Action	Monitoring Method	Monitoring Frequency	Responsible Entity	Time Period for Monitoring	Mechanism and Reporting of Monitoring Compliance
PLANNING AND DESIGN PHASE					
LEGAL AND POLICY COMPLIANCE	Ensuring that all necessary authorisations are obtained prior to the commencement of construction activities.	As required.	Developer	Pre-construction	As specified by the Competent Authority in the conditions of the EA.
			Authorities		
			Independent Environmental Consultant		
CONSTRUCTION PHASE					
MONITORING THE STORAGE OF HAZARDOUS SUBSTANCES	Visual Inspections	As specified in the conditions of the EA	ECO	Construction phase	As specified by the Competent Authority in the conditions of the EA.
			Developer		
			Developer		
WASTE MANAGEMENT	Visual inspections and waste inventory	As specified in the conditions of the EA	ECO	Throughout the construction phase	As specified by the Competent Authority in the conditions of the EA.
			Developer		
MITIGATING EROSION	Visual Inspections	As specified in the conditions of the EA	ECO	Throughout the construction phase	As specified by the Competent Authority in the conditions of the EA.
			Developer		
NOISE MITIGATION			ECO		



Impact Management Action	Monitoring Method	Monitoring Frequency	Responsible Entity	Time Period for Monitoring	Mechanism and Reporting of Monitoring Compliance
	Maintain a record of complaints	As specified in the conditions of the EA	Developer	Throughout the construction phase	
MITIGATING AIR QUALITY AND DUST CONTROL	Maintain a record of complaints	As specified in the conditions of the EA	ECO	Throughout the construction phase	
			Developer		
CULTURAL HERITAGE	As specified in the Archaeological Assessment Report and conditions of the EA	As specified in the conditions of the EA	ECO	Pre-construction and throughout the construction phase	
			Developer		
MITIGATING DAMAGE TO SURFACE WATER FEATURES	Visual inspections	As specified in the conditions of the EA	ECO	Throughout the construction phase	
			Developer		
MITIGATING LOSS OF INDIGENOUS VEGETATION (SUNDAYS ARID THICKET)	Visual Inspections	As specified in the conditions of the EA	ECO	Throughout the construction phase	
			Developer		
MITIGATING LOSS OF BIODIVERSITY	Visual Inspections	As specified in the conditions of the EA	ECO	Throughout the construction phase	
			Developer		
MITIGATING HABITAT LOSS/FRAGMENTATION	Visual Inspections	As specified in the conditions of the EA	ECO	Throughout the construction phase	
			Developer		
MITIGATING LOSS OF SPECIES OF CONSERVATION CONCERN (SCC)	Visual Inspections	As specified in the conditions of the EA	ECO Developer	Pre-construction and throughout construction	As specified by the Competent Authority in the conditions of the EA.
MITIGATING WILDLIFE MORTALITIES	Visual Inspections	As specified in the conditions of the EA	ECO Developer	Pre-construction and throughout construction	
MITIGATING THE ESTABLISHMENT OF ALIEN PLANT SPECIES	Visual Inspections	As specified in the conditions of the EA	ECO Developer	Throughout the construction phase	
MITIGATING INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	Visual Inspections	As specified in the conditions of the EA	ECO Developer	Throughout the construction phase	
TRAFFIC MITIGATION			ECO		



Impact Management Action	Monitoring Method	Monitoring Frequency	Responsible Entity	Time Period for Monitoring	Mechanism and Reporting of Monitoring Compliance	
	Maintain a record of complaints	As specified in the conditions of the EA	Developer	Throughout the construction phase		
HEALTH AND SAFETY MITIGATION	Safety file and visual inspections	As specified in the conditions of the EA	ECO Developer	Throughout the construction phase		
VISUAL AND AESTHETIC MITIGATION	Maintain a record of complaints and visual inspections	As specified in the conditions of the EA	ECO Developer	Throughout the construction phase		
OPERATIONAL PHASE						
GENERAL WASTE MANAGEMENT	Visual Inspections and waste inventory slips (if required)	As specified in the conditions of the EA	Developer	Throughout the operational phase		
MITIGATING THE USE OF HAZARDOUS SUBSTANCES	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase		
EROSION MITIGATION	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase		
MITIGATING THE LOSS OF SOIL QUALITY	Visual inspections and/or soil sample tests (if required)	As specified in the conditions of the EA	Developer	Throughout the operational phase	As specified by the Competent Authority in the conditions of the EA.	
DAMAGE TO SURFACE WATER FEATURES	Visual inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase		
MITIGATING LOSS OF INDIGENOUS VEGETATION	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase		
MITIGATING THE ESTABLISHMENT OF ALIEN PLANT SPECIES	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase		
MITIGATING WILDLIFE MORTALITIES	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase		



Impact Management Action	Monitoring Method	Monitoring Frequency	Responsible Entity	Time Period for Monitoring	Mechanism and Reporting of Monitoring Compliance
MITIGATING INADEQUATE REHABILITATION AND MAINTENANCE OF DISTURBED AREAS	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase	
Air Quality and Dust Control Mitigation	Maintain a record of complaints and visual inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase	
Mitigating Visual and Aesthetic Impacts	Maintain a record of complaints and visual inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase	
Mitigating Traffic Impacts	Maintain a record of complaints	As specified in the conditions of the EA	Developer	Throughout the operational phase	
Noise Mitigation	Maintain a record of complaints	As specified in the conditions of the EA	Developer	Throughout the operational phase	
Mitigating Fire Risk	Visual Inspections	As specified in the conditions of the EA	Developer	Throughout the operational phase	



6. ENVIRONMENTAL AWARENESS TRAINING

The Developer should ensure that his employees, and any third party who is responsible for all or part of the proposed development, are adequately trained with regards to the implementation of the EMP, as well as regarding environmental legal requirements and obligations.

Environmental training should, as a minimum include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- Details regarding floral/faunal SCC and protected species, and the procedures to be followed should these be encountered during vegetation clearance;
- The importance of not littering;
- The need to use water sparingly;
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible; and
- Details regarding archaeological and/or palaeontological artefacts which may be unearthed during construction and the procedures to be followed should these be encountered.

The Developer must monitor the performance of construction and/or farm workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, a translator should be called to the site to further explain environmental and/or social obligations which are unclear.



7. CONCLUSION

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental standards that are required to minimise the negative impacts and maximise the positive benefits of the proposed development. This EMPr is a “live document”, and if continuously reviewed and managed correctly, can result in successful construction and operation of the proposed development.

Further guidance should also be taken on any conditions contained in the EA, if the project is granted approval, and that these conditions must be incorporated into the final EMPr.



ANNEXURE 1: METHOD STATEMENTS

Method Statements need to be compiled by the Developer for approval by the ECO. For the purposes of the environmental specification, a Method Statement is defined as a written submission by the Developer to the ECO setting out the plant, materials, labour and method the Developer proposes using to carry out an activity, in such detail that the ECO is enabled to assess whether the proposal is in accordance with the EMPr and/or will produce results in accordance with EMPr.

Method Statements can be used to cover applicable details with regards to:

- Construction procedures;
- Materials and equipment to be used;
- Getting the equipment to and from site;
- How the equipment/material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that could occur;
- Timing and location of activities;
- Compliance/non-compliance with the specifications/conditions, and
- Any other information deemed necessary by the DWS regarding the abstraction of water and/or development near a drainage line.

The Developer should abide by these approved Method Statements (if any), and any activity covered by a Method Statement must not commence until the ECO has approved it. Any Method Statements, which are required, should be submitted to the ECO not less than twenty (20) days prior to the intended date of commencement of the activity, or as directed by the ECO.



METHOD STATEMENT

CONTRACT:..... **DATE:**.....

PROPOSED ACTIVITY (give title of method statement and reference number from the EMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

Start Date:	End Date:

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated sketches and plans where possible):

* Note: please attach extra pages if more space is required



DECLARATIONS

1) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(Signed)

(Print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

(Signed)

(Print name)

Dated: _____



ANNEXURE 2: CVS OF THE PROJECT TEAM

Please refer to the CVs included in the Draft Basic Assessment Report.



ANNEXURE 3: SENSITIVITY MAPS

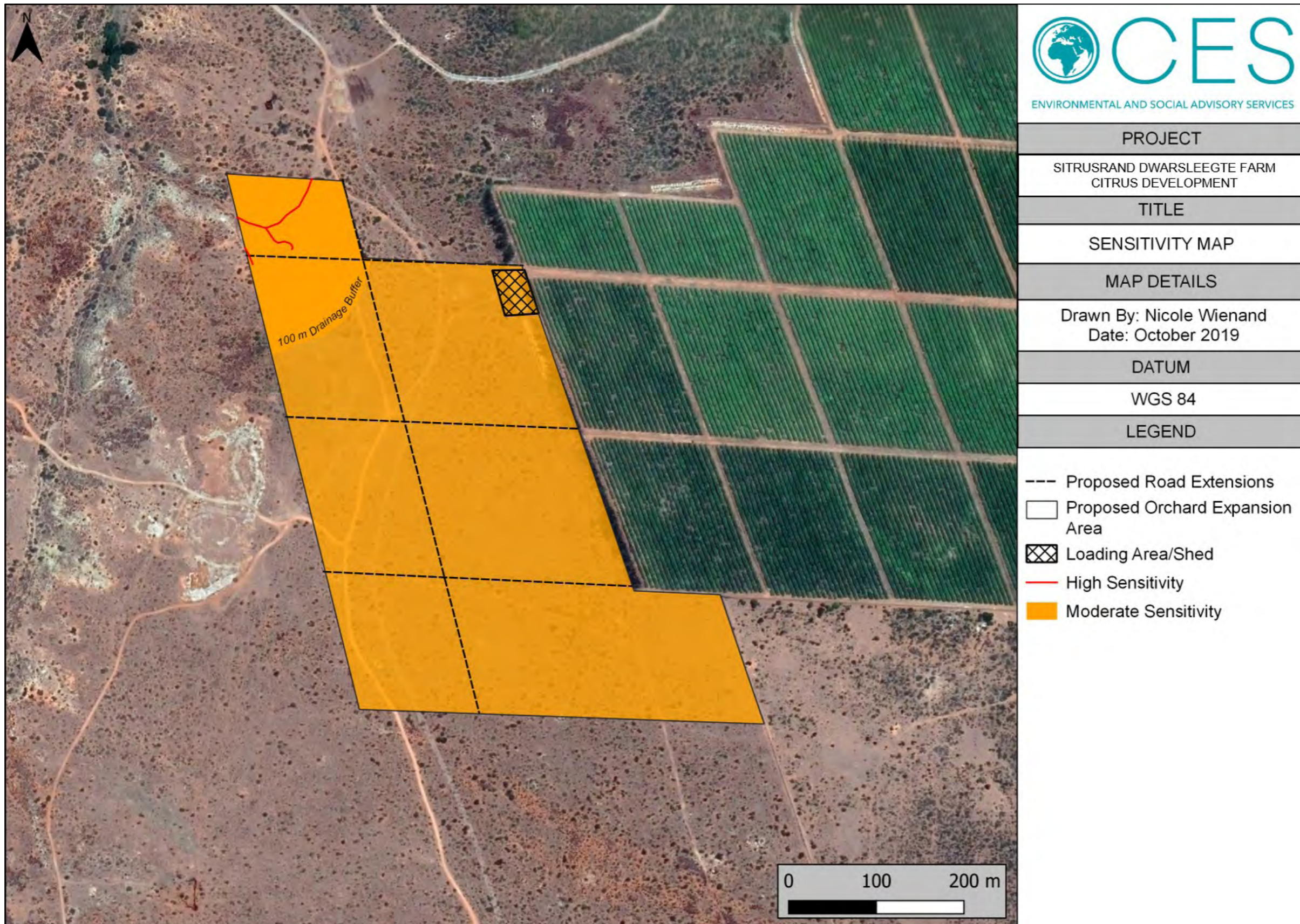


Figure A1: Sensitivity map of the proposed project area.

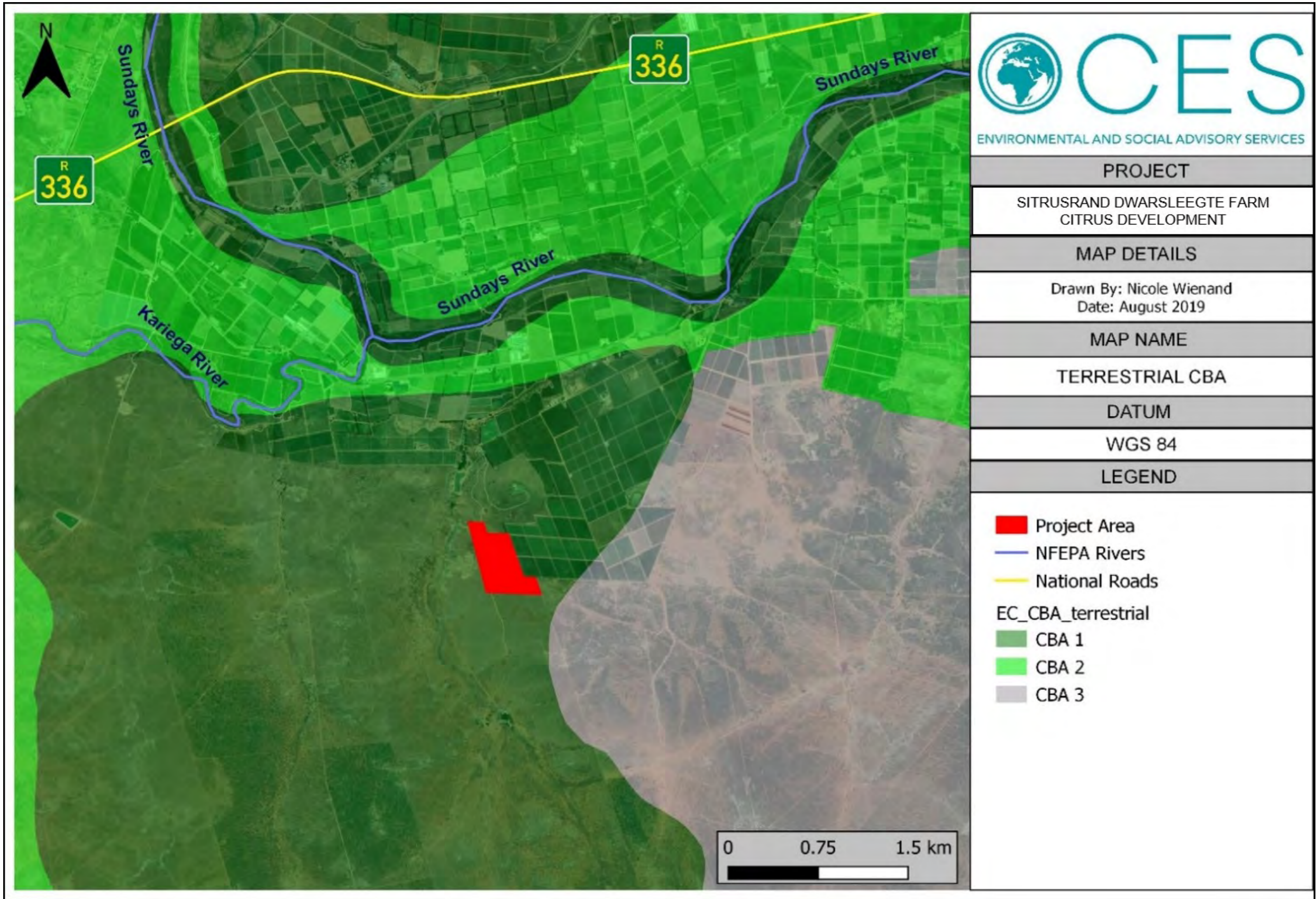


Figure A2: ECBCP Terrestrial CBAs.

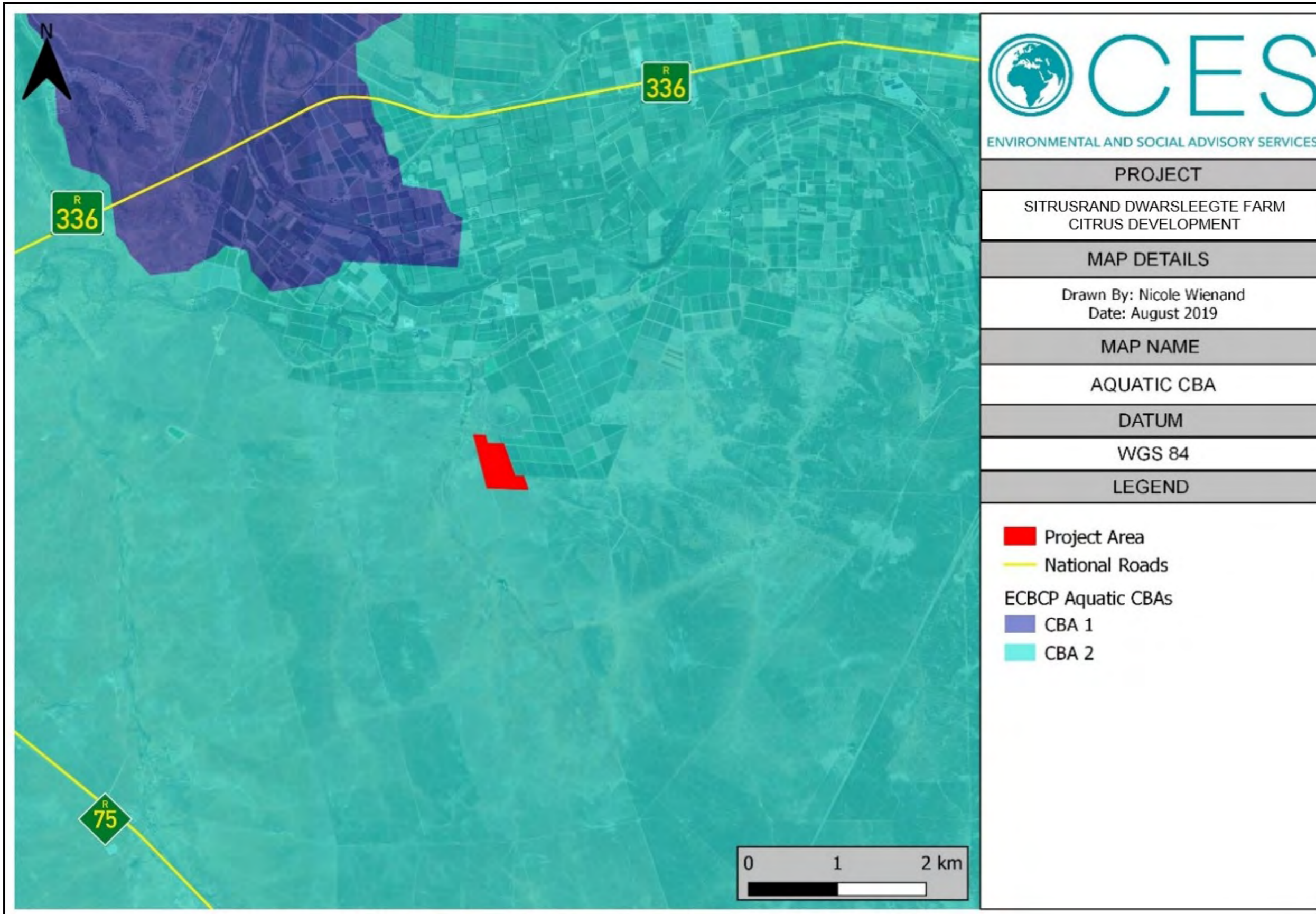


Figure A3: ECBCP Aquatic CBAs.

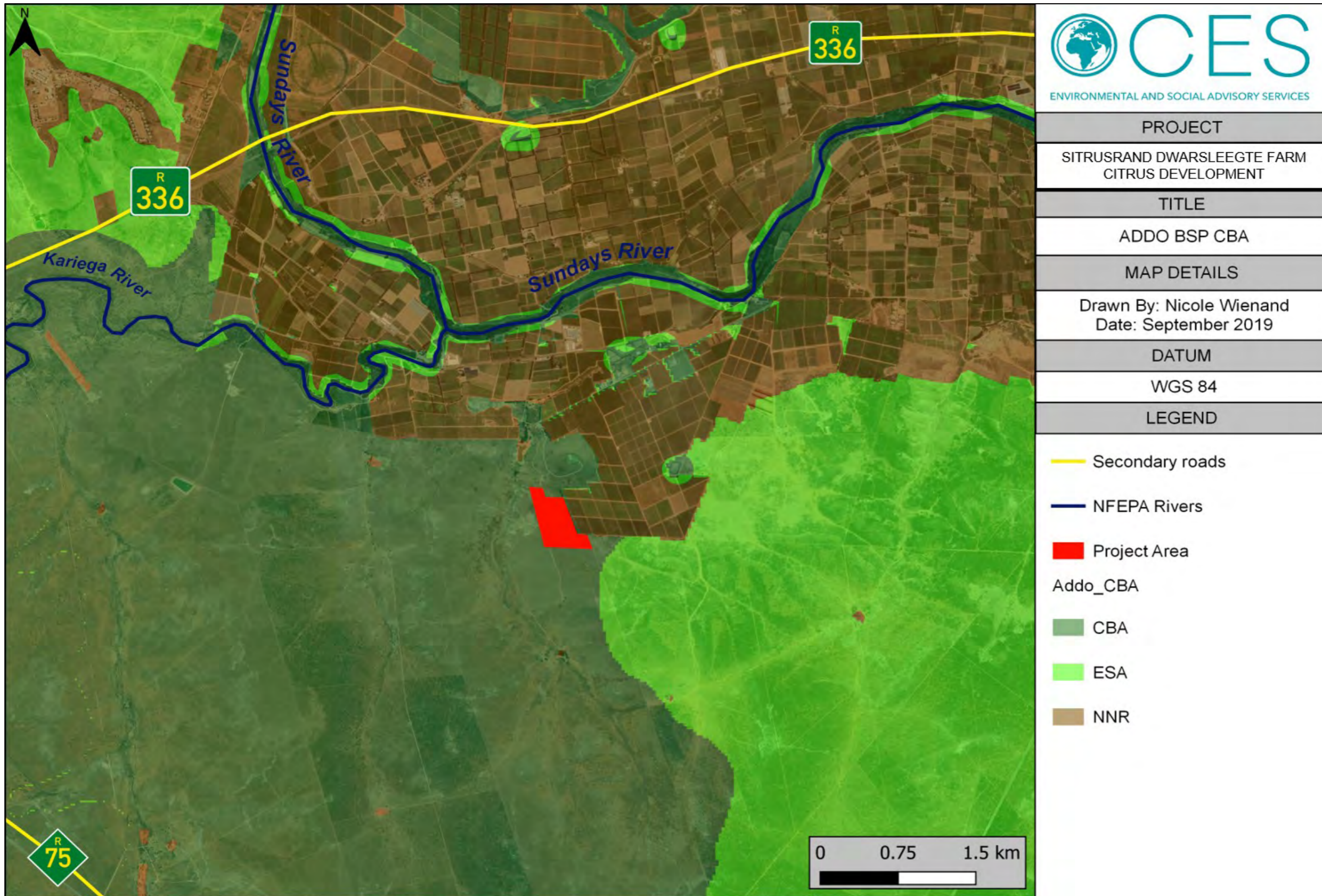


Figure A4: Addo CBAs.

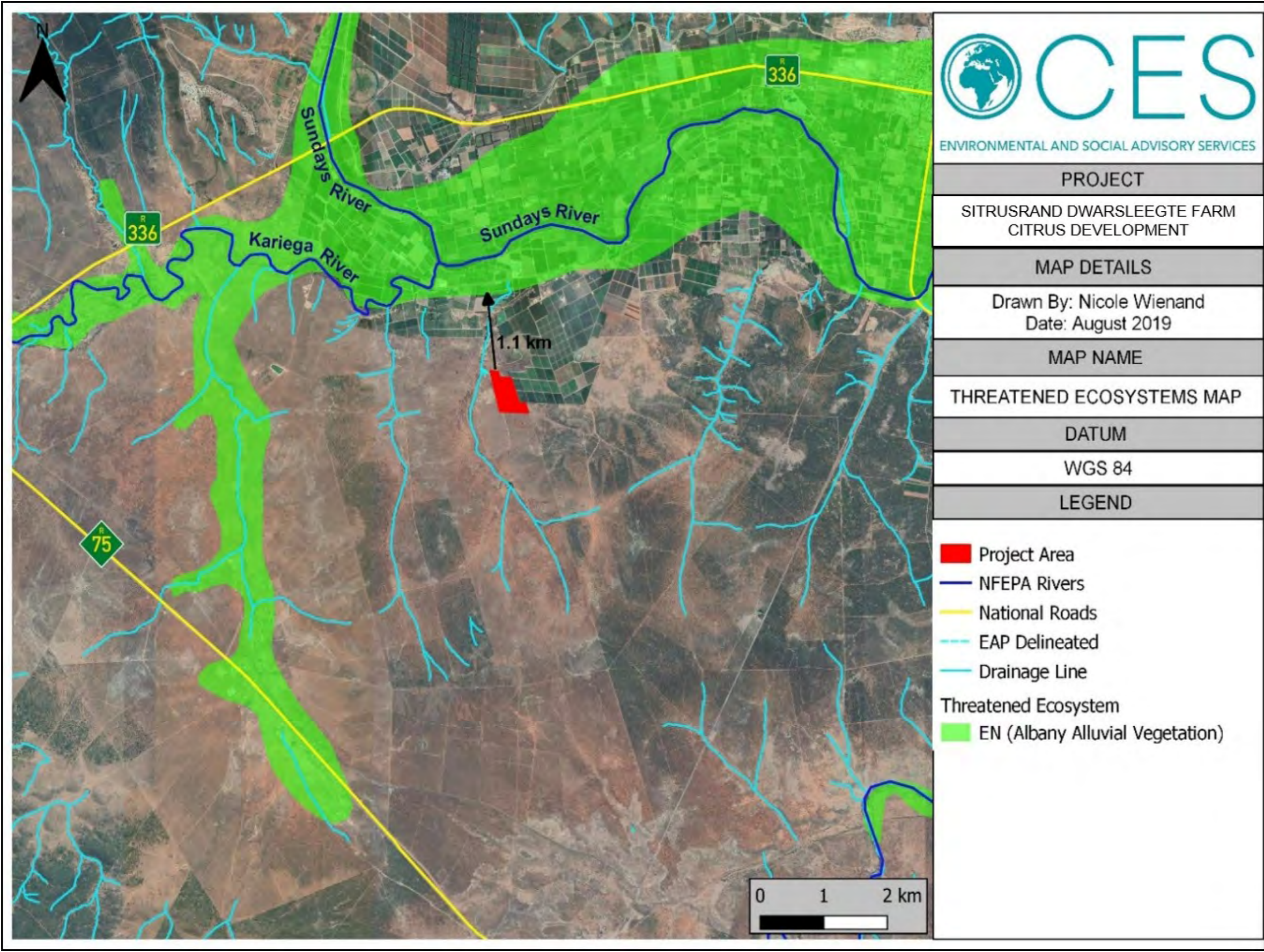


Figure A5: Threatened Ecosystems.



PROJECT
SITRUSRAND DWARSLEEGTE FARM CITRUS DEVELOPMENT
TITLE
PROTECTED AREAS
MAP DETAILS
Drawn By: Nicole Wienand Date: September 2019
DATUM
WGS 84
LEGEND

- Secondary roads
- Project Area
- NFEPA Rivers
- National Parks
- Informal Protected Areas
- NPAES Focus Areas (Baviaans-Addo)

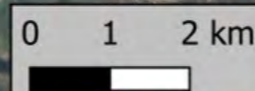


Figure A6: Protected areas map.

APPENDIX G: OTHER INFORMATION

Please find attached copies of the water right on the pages that follow.

SITRUSRAND BOERDERY BK



Tel: 042 232 0132
Fax: 042 232 9081
Epos: sitrusrand@ruvalley.co.za

REG NR. 2004/093590/73
RTW NR 402 022 8006

Posbus 240
Wesbank
Kirkwood
6120

5 AUGUSTUS 2016.

LAER SONDAGSRIVIER
WATERGEBRUIKERSVERENIGING
POSBUS 10
SUNLAND
6115

I/S: TOEKENNING VAN ADDISIONELE KANAALKAPASITEIT - WESBANK GROEP

Mnr. JHH du Plessis

U skrywe van 29 Julie 2016 verwys/vorderingsverslag.

- Op 4 September 2012 is 'n addisionele 44ha Kapasiteit op Wesbank 1 en 2 toegeken.
- Daar is reeds 32ha sitrus geplant en kon tot dusver met waterbesparings en goeie bestuur besproei word uit bestaande kwota.
- 'n Verdere 25ha grond is voorberei vir verdere aanplantings.
- Ons is in die proses van permanente oordrag van verdere waterregte, maar sal op korttermyn water jaarliks oorplaas van my eiendom in Visrivier skema. Daardie grond is bekom met die doel om water jaarliks/tydelik oor te plaas op grond van hierdie kapasiteit op Wesbank.
- Die 44ha kapasiteit sal beslis opgeneem word.
- Ons as gebruikers op Wesbank kanaal het in jare negentig finansieël bygedra om twee ekstra sluisse en strome op Wesbank kanaal te bou. Sal hierdie kapasiteit hiervoor gebruik word?

Indien daar enige vrae is, sal ek graag beantwoord.

By voorbaat dank.

PJ NORTJE



Lower Sundays River
Water User Association

Laer Sondagsrivier
Watergebruikersvereniging

PO Box / Posbus 10, Belmont Road, Sunland, 6115
Tel: 042 234 0038 Fax / Faks: 042 234 0022 • E-mail / E-pos: info@sundayriverwater.co.za
VRT No. 4630100087

Wesbank Groep

Meneer

29 Julie 2016

TOEKENNING VAN ADDISIONELE KANAAL KAPASITEIT VIR WESBANK GROEP

Met verwysing na die goedkeurings van kanaal kapasiteit wat gedurende 2012 toegestaan was, was daar sekere voorwaardes geplaas op die goedkeurings.

Ons het geen vorderings verslae ontvang nie en gevolglik as verwys word na item 3 van die aanhangsels, sal dit waardeer word dat u vir ons sal inlig oor vordering en of u nog die goedkeuring wil laat voortduur en wat se aksies u beplan om die goedkeurings kapasiteit op te neem.

Dit sal waardeer word indien u nie later as 31 Augustus 2016 vir ons die nodige terugvoering sal laat kry sodat verdere oorwegings gemaak kan word.

Die uwe

JHH DU PLESSIS
HOOF UITVOERENDE KOMITEE
HDP/IF



Lower Sundays River
Water User Association

Laer Sondagsrivier
Watergebruikersvereniging

PO Box / Posbus 10, Belmont Road, Sunland, 6115

Tel: 042 234 0038 Fax / Faks: 042 234 0022 • E-mail / E-pos: info@sundaysriverwater.co.za

VAT No. 4630120287

Kobus: 082 782 6053

Sitrusrand Boerdery
Posbus 240
Kirkwood
6120

4 September 2012

Meneer

TOEKENNING VAN ADDISIONELE KANAAL KAPASITEIT – WESBANK GROEP

As gevolg van baie hoë aanvraag en soos ons aangedui het in ons skrywe van 6 Julie 2012, sal daar wel 'n prorate toekenning gemaak moet word.

Gevolglik is die kapasiteit van 20 ha (Wesbank 2) en 24 ha (Wesbank 1) aan jou toegeken en wanneer u aansoek doen vir oorplasing van waterregte, sal die kapasiteit toegeken word aan die betrokke eiendom.

Bogenoemde toekenning van kapasiteit is onderworpe aan die Voorwaardes hierby aangeheg.

Die wyle


J.H. DU PLESSIS
HOOF UITVOERENDE BEAMPTÉ
NDP/II



Lower Sundays River
Water User Association

Laer Sondagsrivier
Watergebruikersvereniging

PO Box / Posbus 10, Belmont Road, Sunland, 6115
Tel: 042 234 0038 Fax / Faks: 042 234 0022 • E-mail / E-pos: info@sundaysriverwater.co.za
VAT No. 463012087

Sitrusrand Boerdery
Posbus 240
Kirkwood
6120

"New permanent situation"

5 September 2012

Meneer

KANAAL KAPASITEIT

Met verwysing na u aansoek vir kanaal kapasiteit is die volgende toekennings aan jou toegeken:

113/327	25 ha	} in bridge
113/5	25 ha	
113/330	60 ha	} Buit. kas
650/2	50ha	- Simge

Bogenoemde toekennings van kapasiteit is onderworpe aan die Voorwaardes hierby aangeheg.

Die uwe


JHM DU PLESSIS
HOOF UITVOERENDE BEAMPTE
HDP/II

1. Stroom = 64 ha op 102h

Curriculum Vitae of Project Team

CONTACT DETAILS

Name of Company	Coastal and Environmental Services (Pty) Ltd. t/a CES
Designation	East London Branch – Executive
Profession	Executive
Years with firm	18 (Eighteen) Years
E-mail	a.carter@cesnet.co.za
Office number	+27 (0) 43 – 7267809 / 8313
Nationality	South African
Professional Affiliations	SACNASP: South African Council for Natural Scientific Profession EAPSA: Environmental Assessment Practitioners Southern Africa IWMSA: Institute Waste Management Southern Africa TSBPA: Texas State Board of Public Accountancy (USA)
Key areas of expertise	<ul style="list-style-type: none">• Marine Ecology• Environmental and coastal management• Waste management• Financial accounting and project feasibility studies• Environmental management systems, auditing and due-diligence

PROFILE

Dr Alan Carter

Alan has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also a certified ISO14001 EMS auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 25 years.

**EMPLOYMENT
EXPERIENCE**

- October 2013 – Present: Executive (EOH Coastal & Environmental Services, East London, South Africa)
- January 2002 – September 2013: Director (Coastal & Environmental Services, East London, South Africa)
- January 1999 – December 2001: Manager (Arthur Andersen LLP, Public Accounting Firm, Chicago, Illinois USA)
- December 1996 – December 1998: Senior Accountant/Auditor (Ernst & Young LLP, Public Accounting Firm, Austin, Texas, USA.)
- January 1994 – December 1996: Senior Accountant/Auditor (Ernst & Young, Charteris & Barnes, Chartered Accountants, East London, South Africa)
- July 1991 – December 1994: Associate Consultant (Coastal & Environmental Services, East London, South Africa)
- March 1989 – June 1990: Data Investigator (London Stock Exchange, London, England, United Kingdom)

**ACADEMIC
QUALIFICATIONS**

- Ph.D. Plant Science (Marine) Rhodes University 1987
- B. Compt. Hons. Accounting Science University of South Africa 1997
- B. Com. Financial Accounting Rhodes University 1995
- B.Sc. Hons. Plant Science Rhodes University 1983
- B.Sc. Plant Science & Zoology Rhodes University 1982

**CONTINUING
PROFESSIONAL
DEVELOPMENT**

- Environmental Management Systems Lead Auditor Training Course - American National Standards Institute and British Standards Institute (2000)
- ISO 14001:2015 Implementing Changes - British Standards Institute (2015)
- Numerous other workshops and training courses

**PROFESSIONAL
EXPERIENCE**

Environmental Impact Assessment, Feasibility and Pre-feasibility Assessments:-

- Managed numerous projects and prepared environmental impact assessment (EIA) reports in terms of relevant EIA legislation and regulations for development proposals including: Infrastructure projects: bulk water and waste water, roads, electrical, mining, ports, aquaculture, renewable energy (solar and wind), industrial processes, housing developments, golf estates and resorts, etc. (2002 – present).
- Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications.
- Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, infrastructure projects, etc.
- Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009).
- Managed pre-feasibility study to establish a Mariculture Zone within the Coega Industrial Development Zone (2014).
- Assisted City of Johannesburg in the process to proclaim four nature reserves in terms of relevant legislation (2015-2016).
- Acted as Environmental Control Officer (ECO) for numerous projects including solar and wind farms, roads, industrial processes, etc.

Strategic Environmental Assessment:-

- Managed Strategic Environmental Assessment (SEA) project toward the development of a Biofuel Industry in the Eastern Cape Province of South Africa (2014-2016)
- Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007).
- Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005).
- Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006).

Climate change, emissions trading and renewable energy:-

- Provided specialist peer review services for National Department of Environmental Affairs relating to climate change impact assessments for large infrastructure projects (2017-2018).
- Conducted climate change impact assessment for a proposed coal-fired power station in Africa (2017-2018).

- Participated in the development of a web-based Monitoring & Evaluation (M&E) system for climate change Mitigation and Adaptation in South Africa for National Department of Environmental Affairs (DEA) (2015-2016).
- Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013).
- Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).
- Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).
- Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).
- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009)
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).
- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.
- Participated in the preparation of CDM applications for two solar PV projects in the Eastern Cape.

Waste Management:-

- Managed project to develop Integrated Waste Management Plans for six local municipalities on behalf of the Sarah Baartman District Municipality in the Eastern Cape Province (2016).
- Managed project to develop Integrated Waste Management Plans for four local municipalities on behalf of Alfred Nzo District Municipality in the Eastern Cape Province (2015).
- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of Chris Hani District Municipality in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and

CERCLA environmental regulations.

- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

Environmental Due Diligence and Business Risk:-

- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011)
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).
- Conducted sustainability and cost/benefit analysis of various waste water treatment options (including a marine pipeline at Hood Point) for the West Bank of East London (2004).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).
- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

Policy and Guidelines:-

- Development of Administration / Application Fee Structure for the Reclamation of Land, Coastal Use Permits, Coastal Waters
- Discharge Permits, Dumping Of Waste at Sea, Off-Road Vehicle Regulations Promulgated in Terms of the National Environmental Management Act: Integrated Coastal Management Act (Act No. 24 Of 2008) (2017).
- Managed project to develop an Estuarine Management Plan for the Buffalo River Estuary for the National Department of Environmental Affairs (2017).
- Managed project to develop a Coastal Management Programme for Amathole District Municipality, Eastern Cape (2015 – 2016).
- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013).
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated

with the implementation of the Integrated Coastal Management Act (2007).

- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007)
- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

Environmental auditing and compliance:-

- Conducted environmental legal compliance audit for various large Transnet Freight Rail facilities (2018).
- Managed projects to develop Environmental & Social Management Systems (ESMS) in line with IFC Performance Standards for three (3) wind farms in South Africa (2015-2018).
- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013)
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).
- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation

Public financial accounting:-

- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and private companies, mostly in the technology business segment of up to \$200 million in annual sales. Client experience included assistance in a \$100 million debt offering, a \$100 million IPO and SEC annual and quarterly reporting requirements.
- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered

Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.

Refereed Publications:-

- Carter, A.R. 1985. Reproductive morphology and phenology, and culture studies of *Gelidium pristoides* (Rhodophyta) from Port Alfred in South Africa. *Botanica Marina* 28: 303-311.
- Carter, A.R. 1993. Chromosome observations relating to bispore production in *Gelidium pristoides* (Gelidiales, Rhodophyta). *Botanica Marina* 36: 253-256.
- Carter, A.R. and R.J. Anderson. 1985. Regrowth after experimental harvesting of the agarophyte *Gelidium pristoides* (Gelidiales: Rhodophyta) in the eastern Cape Province. *South African Journal of Marine Science* 3: 111-118.
- Carter, A.R. and R.J. Anderson. 1986. Seasonal growth and agar contents in *Gelidium pristoides* (Gelidiales, Rhodophyta) from Port Alfred, South Africa. *Botanica Marina* 29: 117-123.
- Carter, A.R. and R.H. Simons. 1987. Regrowth and production capacity of *Gelidium pristoides* (Gelidiales, Rhodophyta) under various harvesting regimes at Port Alfred, South Africa. *Botanica Marina* 30: 227-231.
- Carter, A.R. and R.J. Anderson. 1991. Biological and physical factors controlling the spatial distribution of the intertidal alga *Gelidium pristoides* in the eastern Cape Province, South Africa. *Journal of the Marine Biological Association of the United Kingdom* 71: 555-568.

Published reports:-

- Water Research Commission. 2006. Profiling Estuary Management in Integrated Development Planning in South Africa with Particular Reference to the Eastern Cape. Project No. K5/1485.
- Turpie J., N. Sihlophe, A. Carter, T. Maswime and S. Hosking. 2006. Maximising the socio-economic benefits of estuaries through integrated planning and management: A rationale and protocol for incorporating and enhancing estuary values in planning and management. Un-published Water Research Commission Report No. K5/1485

Conference Proceedings:-

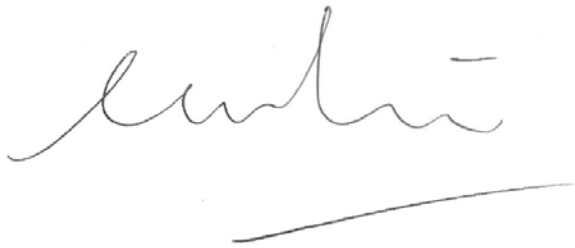
- Carter, A.R. 2002. Climate change and emission inventories in South Africa. Invited plenary paper at the 5th International System Auditors Convention, Pretoria. Held under the auspices of the South African Auditor & Training Certification Association Conference (SAATCA).
- Carter, A.R. 2003. Accounting for environmental closure costs and remediation liabilities in the South African mining industry. Proceedings of the Mining and Sustainable Development Conference. Chamber of Mines of South Africa, Vol. 2: 6B1-5
- Carter, A.R. and S. Fergus. 2004. Sustainability analysis of wastewater treatment options on the West Bank of East London, Buffalo City. Proceedings of the Annual National Conference of the International Association for Impact

Assessment, South African Affiliate: Pages 295-301.

- Carter, A., L. Greyling, M. Parramon and K. Whittington-Jones. 2007. A methodology for assessing the risk of incurring environmental costs associated with port activities. Proceedings of the 1st Global Conference of the Environmental Management Accounting Network.
- Hawley, GL, McMaster AR and Carter AR. 2009, Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate.
- Hawley, GL, McMaster AR and Carter AR. 2010. The Environmental and Social Impact Assessment and associated issues and challenges. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.
- Carter, A.R. 2011. A case study in the use of Life Cycle Assessment (LCA) in the assessment of greenhouse gas impacts and emissions in biofuel projects. 2nd Environmental Management Accounting Network- Africa Conference on Sustainability Accounting for Emerging Economies. Abstracts: Pages 69-70.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Alan Robert Carter

Date: 22 January 2020

CONTACT DETAILS

Name of Company	CES – Environmental and Social Advisory Services
Designation	Grahamstown Branch
Profession	Senior Environmental Consultant
Years with firm	6 Years
E-mail	c.evans@cesnet.co.za
Office number	+27 (0)46 622 2364
Nationality	South African
Professional Body	SACNASP, South African Council for Natural Scientific Profession, Professional 2017 IAIA
Key areas of expertise	<ul style="list-style-type: none">➤ Project Management➤ Renewable Energy

PROFILE

Ms Caroline Evans

Ms Caroline Evans is a Senior Environmental Consultant based in the Grahamstown branch. She holds a BSc degree in Zoology and Environmental Science (with distinction) and a BSc Honours degree in Environmental Science (with distinction), both from Rhodes University. Caroline has completed accredited courses in environmental impact assessments and wetland assessments.

Caroline's primary focuses include Project Management, the general Environmental Impact Assessment Process, Visual Impact Assessments and Wetland Impact Assessments. Examples of fields in which Caroline was the project manager and lead report writer include Wind Energy Facilities and the associated infrastructure (including powerlines), Solar PV, Waste Water Treatment Works, Housing Developments and Agricultural Developments. Her experience with wind energy facilities and associated infrastructure includes the project management and report writing for the Umsobomvu WEF, Dassiesridge WEF, Scarlet Ibis WEF, Albany WEF, Waaihoek WEF and the Great Kei WEF.

Caroline is well versed in South African policy and legislation relating to development, particularly in the Eastern Cape Province. In addition, Caroline's project management experience has helped her gain knowledge and experience in the technical and financial management and coordination of large specialist teams, competent authority and stakeholder engagement, and client liaison.

**EMPLOYMENT
EXPERIENCE**

EOH Coastal & Environmental Services, Senior Environmental Consultant
August 2016 - present

- Project Management
- Renewable Energy Consultant
- Wetland Specialist

EOH Coastal & Environmental Services, Environmental Consultant
November 2013 – July 2016

Rhodes University, Department of Environmental Science, Graduate Assistant
January 2010 – January 2012

**ACADEMIC
QUALIFICATIONS**

Rhodes University, Eastern Cape, South Africa
B.Sc. Honours Environmental Science (with distinction)
2011

Rhodes University, Eastern Cape, South Africa
B.Sc. Zoology & Environmental Science (with distinction)
2007-2010

COURSES

- Rhodes University, Eastern Cape
“Tools for Wetland Assessment” 2010. (with distinction)
- Rhodes University, Eastern Cape
“Urban Ecology” 2010. (with distinction)
- Rhodes University, Eastern Cape
“Post Graduate Statistics” 2010. (with distinction)
- Rhodes University, Eastern Cape
“Environmental Impact Assessment” 2013. (with distinction)

**CONSULTING
EXPERIENCE**

ENVIRONMENTAL IMPACT ASSESSMENTS:

- Project: Albany Wind Energy Facility (Grahamstown, EC)
Role: Project Manager and Report Production
- Project: Umsobomvu Wind Energy Facility (Middelburg, EC / Noupoort, NC)
Role: Project Manager and Report Production
- Project: Waainek Wind Energy Facility Post-Construction Bird and Bat Monitoring (Grahamstown, EC)
Role: Project Manager and Report Production
- Project: Dassiesridge Wind Energy Facility (Uitenhage, EC)
Role: Project Manager and Report Production

- Project: Waaihoek Wind Energy Facility (Utrecht, KZN)
Role: Project Manager and Report Production
- Project: Waaihoek Wind Energy Facility (Utrecht, KZN)
Role: Project Manager and Report Production
- Project: Great Kei Wind Energy Facility (Komga, EC)
Role: Assistant Project Manager and Report Production
- Project: Doorndraai Citrus Plantation (Cookhouse, EC)
Role: Project Manager and Report Production
- Project: Fishwater Flats WWTW Biogas (Port Elizabeth, EC)
Role: Report Production
- Project: Olivewood Golf and Residential Estate (Chintsa, EC)
Role: Report Production

BASIC ASSESSMENTS:

- Project: Albany Powerline (Grahamstown, EC)
Role: Project Manager and Report Production
- Project: Scarlet Ibis Wind Energy Facility (NMBM, EC)
Role: Project Manager and Report Production
- Project: Grey Jade Waterfall Feedlot Biogas (Berlin, EC)
Role: Project Manager and Report Production
- Project: Black Lite Solar 5MW PV (Berlin, EC)
Role: Project Manager and Report Production
- Project: Sitrusrand Kirkwood Citrus (Kirkwood, EC)
Role: Project Manager
- Project: Kareekrans Middleton Pivot (Middleton, EC)
Role: Project Manager
- Project: Uitsig Boerdery Kirkwood Citrus (Kirkwood, EC)
Role: Project Manager

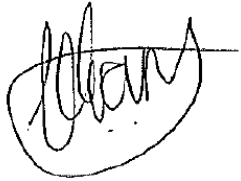
OTHER REPORTS:

- Project: Eastern Cape Biofuels Strategic Environmental Assessment (EC)
Role: Report Production
- Project: Coega Industrial Development Zone (EC)
Role: Report Production
- Project: Umsobomvu WEF EA Amendments (EC & NC)
Role: Project Manager and Report Production

- Project: Dassiesridge WEF EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Great Kei WEF EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Ukomeleza WEF EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Motherwell WEF EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Golden Valley II WEF EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Peddie WEF and PV EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Nqamakwe WEF and PV EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Thomas River Renewable Energy Facility EA Amendments (EC)
Role: Project Manager and Report Production
 - Project: Qunu WEF and PV EA Amendments (EC)
Role: Project Manager and Report Production
- SPECIALIST REPORTS:**
- Project: Umsobomvu Wind Energy Facility (Middelburg, EC / Noupoot, NC)
Role: Visual Impact Assessment
 - Project: Dassiesridge Wind Energy Facility (Uitenhage, EC)
Role: Visual Impact Assessment
 - Project: Great Kei Wind Energy Facility (Komga, EC)
Role: Visual Impact Assessment
 - Project: Waaihoek Wind Energy Facility (Utrecht, KZN)
Role: Visual Impact Assessment & Wetland Impact Assessment
 - Project: Olivewood Golf and Residential Estate (Chintsa, EC)
Role: Visual Impact Assessment
 - Project: Oyster Bay Wind Energy Facility (Oyster Bay, EC)
Role: Wetland Impact Assessment

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



CAROLINE ANN EVANS

Date: June 2019

CONTACT DETAILS

Legal Name of Company	Coastal and Environmental Services (Pty) Ltd
Trading Name of Company	CES
Designation	Port Elizabeth Branch
Profession	Senior Environmental Consultant
Years with firm	Five (5) Years & six (6) months
E-mail	r.evans@cesnet.co.za
Office number	+27 (0)41 393 0700 +27 (0)41 045 0494
Nationality	South African
Professional Body	International Association for Impact Assessment (IAIA) Member No. 5809 Land Rehabilitation Society of Southern Africa (LaRSSA) Member No. 52119
Key areas of expertise	<ul style="list-style-type: none">➤ Basic Assessments & Environmental Impact Assessments➤ GIS Mapping➤ Project Management➤ Public Participation Process➤ NEMA Section 24 (G) Applications➤ MPRDA Section 53 Applications➤ Agriculture & Soils Assessments

PROFILE

Ms Rosalie Evans

Rosalie is a Senior Environmental Consultant with five (5) and a half years' experience and she is based in the Port Elizabeth branch. She holds a BA degree in Social Dynamics with majors in Geography and Psychology as well as a BA Honours degree in Geography and Environmental Studies, both from Stellenbosch University. Rosalie's honours dissertation analysed the role of small grains in soil carbon sequestration in the agricultural sector of the Western Cape.

Rosalie completed the Introduction to Environmental Impact Assessment Procedure Short Course by Coastal & Environmental Services and the Department of Environmental Science Rhodes University as well as the Estuary Management Short Course by Nelson Mandela University (NMU). In addition, Rosalie is a member of the Land Rehabilitation Society of Southern Africa (LaRSSA) and a member of the International Association for Impact Assessment (IAIA).

Her main focuses include the general Environmental Impact Assessment (EIA) process, project management, the Public Participation Process, NEMA Section 24 (G) Applications and associated reports, GIS Mapping, and Agriculture and Soils Assessments.

**EMPLOYMENT
EXPERIENCE**

Senior Environmental Consultant, CES

1 August 2018 - present

Project Management, Report Reviewing, GIS Mapping, BA and EIA Report Writing, NEMA Section 24 (G) Applications, Sub-consultant Management, MPRDA Section 53 Applications, Specialist Report Writing, Water Use Licensing Process & Public Participation Process.

Environmental Consultant, CES

1 August 2014 – 31 July 2018

GIS Mapping, BA and EIA Report Writing, NEMA Section 24 (G) Applications, MPRDA Section 53 Applications, Specialist Report Writing, Water Use Licensing Process & Public Participation Process.

Online Tutor (2nd year Geography, GGH2602), University of South Africa (UNISA)

1 August 2014 – present

Responding to/resolving e-tutor group student queries, maintaining the myUnisa GGH2602 e-tutor module site & preparing online activities for GGH2602.

Geography Junior Lecturer (1st year Geography, GGH1501), University of South Africa (UNISA)

1 June 2013 – 31 July 2014

Marking undergraduate and post-graduate assignments and examinations, responding to/resolving student queries and maintaining the myUnisa GGH1501 module site, assisting with writing study material for GGH1501 & Assisting with setting up assignments for GGH1501.

**ACADEMIC
QUALIFICATIONS**

Stellenbosch University, Stellenbosch

BA Honours in Geography & Environmental Studies
2012

Stellenbosch University, Stellenbosch

BA in Social Dynamics (Geography & Psychology)
2011

COURSES

1. Coastal & Environmental Services and the Department of Environmental Science Rhodes University, Grahamstown.
"Introduction to Environmental Impact Assessment Procedure Short Course." 2016.
2. Nelson Mandela Metropolitan University, Port Elizabeth.
"Estuary Management Short Course." 2016.

**CONSULTING
EXPERIENCE**

1. Potsdam Housing Development EIA, Potsdam, EC. 2016.
DEDEAT Application & DEDEAT Scoping Report.
2. Waaihoek Wind Energy Facility EIA, Utrecht, KZN. 2015/2016.
Amended DEA Applications (WEF & Powerline), Amended DEA Powerline, Environmental Impact Report, Appeals Process Public Participation Process & Tourism Assessment Report.
3. National Route N2 Bypass Road EIA, King William's Town, EC. 2016.
DEA Application & DEA Scoping Report
4. Umsobomvu Wind Energy Facility EIA, Middelburg, EC / Noupoot, NC. 2015.
Assisting DEA Environmental Impact Report, Visual Assessment Report & DMR Section 53 Application.
5. Matatiele to KZN Border Road Upgrade & Borrow Pits BA, Matatiele, EC. 2016.
Baseline Sensitivity Report, DEA Application, DEA Basic Assessment Report, Environmental Management Programme, Public Participation Process, DMR Application, DMR Scoping Report & PPP on the Environmental Authorisation.
6. Upington SEZ & PV Solar EIA, Upington, NC. 2017.
Assisting DEA Scoping Report & Tourism Assessment Report.
7. Molteno Sewer & Sewage Pump Stations BA, Molteno, EC. 2015/2016.
Project Management, DEDEAT Application, DEDEAT Basic Assessment Report, Environmental Management Programme, DWS Water Use Applications, Public Participation Process, Rehabilitation, Erosion Management & Alien Invasive Management Plan & PPP on the Environmental Authorisation.

8. Green River to Zwelitsha and the new Breidbach Interchange Road Upgrade BA, King William's Town, EC. 2016.
Baseline Sensitivity Report, DEA Application, DEA Basic Assessment Report, Environmental Management Programme, DWS Water Use Applications, Public Participation Process & PPP on the Environmental Authorisation.
9. Olivewood Golf & Country Estate BA, Chintsa, EC. 2015/2016.
DEDEAT Basic Assessment Report & Public Participation Process.
10. Lizmore to Heidelberg Road Upgrade & Borrow Pits BA, Heidelberg, WC. 2017.
Baseline Sensitivity Report, DEA Application, DEA Basic Assessment Report, Environmental Management Programme, DMR Regulation 2.2 Maps & Specialist Mapping.
11. Phase 4 Housing Development BA, East London, EC. 2016.
Assisting DEDEAT Basic Assessment Report.
12. Dassiesridge Wind Energy Facility EIA, Uitenhage, EC. 2015.
DMR Section 53 Application & Visual Assessment Report.
13. Lusikisiki Regional Water Supply Scheme EIA: Zalu Dam, Lusikisiki, EC. 2015.
Visual Assessment Report & Environmental Management Programme.
14. Tyityaba Game Reserve Conservation Management Plan, Komga, EC. 2016.
Assisting Conservation Management Plan.
15. Port St Johns Beach Infrastructure EIA, Port St Johns, EC. 2017.
Estuarine Assessment Report.
16. Scarlet Ibis Wind Energy Facility BA, Motherwell, EC. 2017.
Agriculture & Soils Assessment Report, DMR Section 53 Application, DMR Regulation 2.2 Map, Public Participation Process Material, Biophysical Mapping & PPP on the Environmental Authorisation.
17. Albany Wind Energy Facility EIA, Grahamstown, EC. 2018/2019.
Agriculture & Soils Assessment Report, DMR Regulation 2.2 Map, Updating Ecological Assessment Report, Assisting DEA Scoping Report, Biophysical Mapping & Public Participation Process Material.
18. Bodeux Fuel Station EMP, East London, EC. 2015.
Assisting Environmental Management Programme.
19. Specialist Input for the Route Location of possible Bypasses at Butterworth on National Route N2 Section 17 and 18, Butterworth, EC. 2016.
Project Management & Biophysical Mapping.
20. Specialist Input for the Route Location of possible Bypasses at Dutywa on National Route N2 Section 17 and 18, Dutywa, EC. 2016.
Project Management & Biophysical Mapping.
21. Eastern Cape Biodiversity Conservation Strategy and Action Plan, EC. 2016.
Assisting Mapping Specialist Data.
22. Gonubie Boardwalk NEMA Section 24G Application, Gonubie, EC. 2014.
Assisting NEMA Section 24G Application.
23. Great Kei Wind Energy Facility Section 53 Application, Komga, EC. 2015.
DMR Section 53 Application.
24. Environmental Screening for a Pumped Storage Scheme, Hogsback, EC. 2016.
Biophysical Mapping.
25. Ndlambe Bulk Water Supply Project BA, Ndlambe Municipality, EC. 2016/2017.
Route Assessment & DWS Consultation & DWS Water Use Applications.
26. Justin Le Roux NEMA Section 24G Application, EC. 2017.
NEMA Section 24G Application, Basic Assessment Report (for rectification), Environmental Management Programme & Public Participation Process Material.

27. Thriftwood NEMA Section 24G Application, EC. 2017.
Project Management & Biophysical Mapping.
28. Kurlandbrik Mine Social and Labour Plan, WC. 2017.
Updated Social & Labour Plan.
29. Brickvest NEMA Section 24G Application, EC. 2017.
Project Management, Biophysical Mapping, Public Participation Process Material, NEMA Section 24G Application, DWS Water Use Applications & DWS Risk Assessment.
30. Wells Estate Social Housing Development BA, Port Elizabeth, EC. 2017.
Project Management, DEDEAT Basic Assessment Report, Environmental Management Programme & ELC Meeting Presentation.
31. St Christopher's Private School BA, Port Elizabeth, EC. 2017.
Project Management, DEDEAT Application, Biophysical Mapping & DEDEAT Basic Assessment Report.
32. Pofadder Prospecting Right, NC. 2017.
Biophysical Mapping.
33. Kenmare Moma Titanium Minerals Mine ESIA, Mozambique. 2018.
Biophysical Mapping, Assisting Estuarine Assessment Report, Assisting PPP Posters & Presentation.
34. Toliara Sand Heavy Minerals Mine ESHIA, Madagascar. 2017.
PPP Presentation & Posters & Infrastructure Mapping.
35. Subdivision & Mixed-Use Development on Erf 1 Parsonsvlei EIA, EC.2017.
Project Management, DEDEAT Scoping Report & Public Participation Process.
36. Bayview Wind Energy Facility EIA, EC. 2017.
Agriculture & Soils Assessment Report, Biophysical Mapping, Public Participation Process Material, Chapters of the DEA Scoping Report, Chapters of the DEA Environmental Impact Report, Environmental Management Programme & PPP on the Environmental Authorisation.
37. General Motors NEMA Section 24G, EC. 2017.
Project Management, NEMA Section 24G Application, Public Participation Process Material, Biophysical Mapping, DWS Water Use Applications & DWS Risk Assessment.
38. Grahamstown to Fish River Pass: Phase 2 Road Upgrade ECO, EC. 2017-2019.
Project Management & Review of Monthly Audit Reports.
39. Joubert Dorndraai Citrus Farm EIA, EC. 2018.
DEDEAT Application, Public Participation Process Material, DEDEAT Scoping Report & Biophysical Mapping.
40. Part 2 Amendment of the Makana Residential Development EA, Grahamstown, EC. 2018.
DEDEAT Application for Amendment of Environmental Authorisation, Part 2 Amendment Report, Public Participation Process Material & PPP on the Amended Environmental Authorisation.
41. Roode Heuwel Prospecting Right, Garies, NC. 2018.
Biophysical Mapping.
42. Citrus Development Section 24(G), Cookhouse, EC. 2018.
DEDEAT Basic Assessment Report (for rectification), Environmental Management Programme, Public Participation Process & Biophysical Mapping.
43. Phase 1 & Phase 2 West End Student Residence Development BA, Port Elizabeth, EC. 2018.
Project Management, Public Participation Process Material, Biophysical Mapping, DEDEAT Basic Assessment Report, Environmental Management Programme & PPP on the Environmental Authorisation.
44. Phase 3 & Phase 4 West End Student Residence Development BA, Port Elizabeth, EC. 2018.

Project Management, Public Participation Process Material, Biophysical Mapping, DEDEAT Basic Assessment Report, Environmental Management Programme & PPP on the Environmental Authorisation.

45. Central Balama Graphite Mine ESIA, Balama, Mozambique. 2018.

Land & Natural Resource Use Report.

46. Waainek Post-Construction Bird and Bat Monitoring, Grahamstown, EC. 2018.

Assisting Bat Data Analysis.

47. Victoria Drive ECO, Port Elizabeth, EC. 2019.

Review of Monthly Audit Reports & Quarterly Report Review.

48. Part 2 Amendment of the Umsobomvu Wind Energy Facility Environmental Authorisation, Middelburg, EC/Noupoort, NC. 2019.

DEA Application for Part 2 Amendment, Part 2 Amendment Report, Public Participation Material, DEA Environmental Impact Report for the Umsobomvu I WEF, DEA Environmental Impact Report for the Coleskop WEF, DEA Environmental Impact Report for the Eskom Infrastructure MTS, Agriculture & Soils Assessment Report for the Umsobomvu I WEF, Agriculture & Soils Assessment Report for the Coleskop WEF, Agriculture & Soils Assessment Report for the Eskom MTS, Agriculture & Soils Opinion Letter & Biophysical Mapping.

49. The Refurbishment of the Kwanobuhle Wastewater Treatment Plant ECO, Nelson Mandela Bay Municipality, EC. 2019.

Review of Monthly Audit Reports.

50. Fishwater Flats Wastewater Treatment Works ECO, Nelson Mandela Bay Municipality, EC. 2019.

Review of Monthly Audit Reports.

51. Residential Development on a Portion of Erf 1226 in Fairview ECO, Port Elizabeth, EC. 2019.

Review of Monthly Audit Reports.

52. Eskom Substation and Powerlines EIA, Heidelberg, GP. 2019.

Visual Assessment Report.

53. Impofu Wind Farms (North, East and West) Section 53 Applications, Oyster Bay, EC. 2019.

Project Management & Three (3) Separate DMR Section 53 Applications.

54. Coleskop Infrastructure Development BA, Middelburg, EC / Noupoort, NC. 2019.

Project Management, DEA Application, DEA Draft Basic Assessment Report, DEA Environmental Management Programme Template (March 2019) & Public Participation Process Material.

55. Umsobomvu Infrastructure Development BA, Middelburg, EC / Noupoort, NC. 2019.

Project Management, DEA Application, DEA Draft Basic Assessment Report, DEA Environmental Management Programme Template (March 2019) & Public Participation Process Material.

56. Khayamnandi Extension on Erven 114, 609, 590 and 24337 ECO, Bethelsdorp, EC. 2019.

Review of Monthly Audit Reports & Quarterly Report Review.

57. Development of Agricultural Lands Section 24(G), Cookhouse, EC. 2019.

Section 24(G) Application and Reporting, Environmental Management Programme, Public Participation Process & Biophysical Mapping.

58. Development of Agricultural Lands Section 24(G), Klipfontein, EC. 2019.

Section 24(G) Application and Reporting, Environmental Management Programme, Public Participation Process & Biophysical Mapping.

59. Development of Citrus and Associated Infrastructure on Nomzamo Farm EIA, Kirkwood, EC. 2019.

Project Management, Specialist Coordination & the review of the Application.

60. Development of Citrus and Associated Infrastructure on Siyahluma Farm EIA, Addo, EC. 2019.
Project Management, Specialist Coordination & the review of the Application.
61. Development of 19.8 ha of Citrus BA, Kirkwood, EC. 2019.
Project Management, DEDEAT Application, DEDEAT Basic Assessment Report, Environmental Management Programme & Public Participation Process.
62. Development of a Facility for the Recycling & Smelter of Non-ferrous Metals in the Coega SEZ, Port Elizabeth, EC. 2019.
Project Management & Specialist Coordination.
63. Water Use for 7 Wind Farms, EC & NC. 2019.
Project Management & DWS Liaison.
64. Part 2 Amendment of the Ukomeleza Wind Energy Facility EA, Uitenhage, EC. 2019.
Biophysical Mapping.
65. Part 2 Amendment of the Motherwell Wind Energy Facility EA, Uitenhage, EC. 2019.
Biophysical Mapping.
66. Part 2 Amendment of the Dassiesridge Wind Energy Facility EA, Uitenhage, EC. 2019.
Biophysical Mapping & Assisting Report Writing.
67. Part 2 Amendment of the Great Kei Wind Energy Facility EA, Komga, EC. 2019.
Biophysical Mapping & Assisting Report Writing.
68. Driftsands Sewer Collector Augmentation (Phase II) ECO, Port Elizabeth, EC. 2019.
Review of Monthly Audit Reports.
69. Dwarsleegte Farm Citrus Development BA, Kirkwood, EC. 2019.
Report Review.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

ROSALIE ANN EVANS

Date: January 2020

CONTACT DETAILS

Name of Company	Coastal and Environmental Services (Pty) Ltd. t/a CES
Designation	East London Branch – Principal Consultant
Profession	Environmental Consultant
Years with firm	12 (twelve) Years
E-mail	g.hawley@cesnet.co.za
Office number	+27 (0) 43 – 7267809 / 8313
Nationality	South African
Professional Affiliations	SACNASP: South African Council for Natural Scientific Profession
Key areas of expertise	<ul style="list-style-type: none">• Environmental Impact Assessment (Aquaculture, renewable energy, waste water treatment, agriculture)• Environmental Management and Planning• Biodiversity/Conservation Management• Biodiversity/Ecological Assessments

PROFILE

Dr Greer Hawley-McMaster

Dr Greer Hawley has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She completed her PhD thesis (Microbiology) at Rhodes University. Greer has been involved in a number of diverse activities. The core academic focus has been in the field of taxonomy both in the plant and fungal kingdom. Greer's research ranges from fresh water and marine algae, estuarine diatoms, plant species classification in the fynbos and forest vegetation and fungal species identification and ecology. Greer has been involved in environmental and biodiversity impact assessments and environmental and biodiversity management projects both in South Africa and other African countries. Greer has recently assisted with the completion of the Eastern Cape Biodiversity Conservation Plan (2019), the Eastern Cape Biodiversity Strategy and Action Plan and assisted with the generation of the Western Cape State of the Coast Report. She is currently involved with developing the Environmental Management Framework for the King Cetshwayo District Municipality.

**EMPLOYMENT
EXPERIENCE**

- 1998 : Botanical consultant: University of Cape Town
- Laboratory assistant: University of Cape Town
- 1999 : Undergraduate Tutor: University of Cape Town
- 2000- 2001 : Temporary administrative positions:
- Robert Half International, London
- Assistant Office Manager: Warwick House, London
- Office administration: West London Magistrates Court, London
- 2002: Laboratory Assistant: Amphigro
- 2002- 2007: Undergraduate Tutor: Botany and Microbiology, Rhodes University
- 2006- 2007: Laboratory researcher: Abalone Probiotic isolation and testing, Rhodes University
- 2007: Laboratory assistant and product quality control: Mycoroot (Pty) Ltd, Grahamstown
- 2007- present : Principal Environmental Consultant - Coastal & Environmental Services

POST GRADUATE STUDENT SUPERVISION

- 2005 – 2007: 3 Honours students in the Mycology Unit, Rhodes University
- 2006: MSc student in the Mycology Unit, Rhodes University.
- 2016-2018: Co-supervisor of a PhD student in the Mycology Unit, Rhodes University

**ACADEMIC
QUALIFICATIONS**

- PhD Microbiology Rhodes University 2008
- BSc Hons Botany University of Cape Town 1999
- BSc Natural Science (Botany and Zoology) University of Cape Town 1998

**CONTINUING
PROFESSIONAL
DEVELOPMENT**

- Rhodes University-Coastal & Environmental Services: Environmental Impact Assessment Course 2008
- Training in Greenhouse Gas Accounting for Forest Inventories Greenhouse Gas Management Institute 2009

**PROFESSIONAL
EXPERIENCE**

ENVIRONMENTAL MANAGEMENT EXPERIENCE

Specialist studies

- Eastern Cape Biodiversity Conservation Plan review and Biodiversity Strategy and Action Plan (2016-2019). I am currently responsible for a number of roles on this project, including the following:
 - Project manager
 - Biodiversity data collection and analysis
 - Part of planning team
 - One of the report writing authors
 - Client and stakeholder liaison

- Waaihoek Wind Energy Facility (2013-2015): EIA and Ecological Sensitivity Assessment
- This assessment, located just east of Utrecht in KZN, involved two elements: an EIA and a detailed vegetation survey of Grassland and Thornveld (Savanna) culminating in an ecological sensitivity map.
- Olivewood Golf Estate (2014): EIA and Ecological Sensitivity Assessment
- This assessment, located 25km north of East London in the Eastern Cape, involved two elements: an EIA and a detailed vegetation survey of Thicket, Thornveld (Savanna) and Forest vegetation culminating in an ecological sensitivity map.
- Eastern Cape Biofuel Strategic Environmental Assessment (2014-2016)
- This assessment involved the detailed assessment of optimal grow areas against environmental constraints. The product was aimed at selecting the best clustered areas of growth potential, outlining the respective environmental constraints within these clusters, in order to guide investor interests. Detailed mapping analysis was undertaken.
- Balama Graphite Mine and Tete Iron Mine, Mozambique (2013): Biodiversity Survey and Ecological Sensitivity Assessment
- These assessments were both located in Mozambique. Detailed biodiversity surveying and assessment of ecological sensitivity (identify NO-GO areas) were undertaken.
- Addax BioEnergy (2009/2010), Biodiversity and Ecological Impact Assessment AND Carbon Stock Impact Assessment, Sierra Leone.
- The above specialist studies were submitted as separate deliverables and are described separately.
- Biodiversity and Ecological Impact Assessment: This study involved the survey of a 60 000 ha site in Sierra Leone. The vegetation types were described and assessed in terms of biodiversity and overall ecological sensitivity. In addition, the area was surveyed by local experts for the presence of rare and endangered faunal species, for inclusion into the report. All vegetation types were mapped using GIS. The assessment was compiled for international review in accordance with World Bank standards.
- Carbon Stock Impact Assessment: In accordance with the EU directive, Biofuel production needs to demonstrate a 30% reduction in carbon emissions compared to fossil fuels. For this reason, a Carbon Stock study was carried out to determine site specific carbon stocks. This study included field calculations,

vegetation and soil sampling and carbon stock calculations according to internationally accepted standards and using best practice guidelines. Using the detailed GIS vegetation maps, total carbon stocks could be calculated. Sample collection included local academic soil scientists. This study and associated methodology was compiled according to the International Panel on Climate Change (IPCC) standards.

- Wild Coast Forest Survey: (2009-2010) Department of Water and Forestry / Eastern Cape Parks Board initiative
- The forest survey included substantial field work and data collection of the following: plant species identification, GPS mapping of forest boundaries, forest-typing and identifying and quantifying disturbance impacts.
- Mncwasa Water Scheme (2009): Ecological Sensitivity Assessment
- This assessment involved a detailed vegetation survey of forest vegetation and wetlands along anticipated and alternative pipeline routes. The survey included an assessment of the environmental sensitivity along the route and recommendations for mitigation and environmentally acceptable alternatives.
- Peregrine Dunes Golf Estate (2009): Vegetation Rehabilitation Plan and Ecological Impact Assessment
- The Ecological Impact Assessment and Rehabilitation Plan were represented as two reports for the same project. The work carried out on the Ecological Impact Assessment included report revision writing.
- The Rehabilitation Plan was submitted as part of the Environmental Management Plan and incorporated elements of re-vegetation, alien plant removal and rehabilitation, landscape restoration, based on widely accepted concepts of soil ecology and plant succession ecology.

Feasibility studies

- Coega IDZ Aquaculture Feasibility Study:
- Aspects of this study included the consideration of the environmental sustainability, economic and financial viability of the proposed project as well as an assessment of environmental risks and alternative project designs.
- Ndakana Wind farm Feasibility Study
- Nkanya Lodge Feasibility Study: Eastern Cape Development Corporation (ECDC) initiative
- Aspects of this study included the consideration of the economic and financial viability of the proposed project as well as the environmental risks and alternative technologies.

Full Scoping and Environmental Impact Assessments (South African National Environmental Management: EIA regulations)

- Buffalo City Municipality R72 national road re-alignment (2007-2008): Sleeper site
- Responsibilities included: Project Management, budget management, written report, public participation and engagement with key stakeholders throughout the EIA process. Environmental approval obtained.
- Wild Coast Abalone expansion and processing plant (2008)
- Responsibilities included: Project management, budget management, written

reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- Qolora Aquaculture Development Zone (2011)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- All Saints Hospital Waste Water Treatment Works (2012)
- written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- Jamestown Waste Water Treatment Works (2012)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- Ntabankulu Waste Water Treatment Works (2012)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- Qamata: No-gate Waste Water Treatment Works (2012)
- Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.
- St Patricks Hospital Waste Water Treatment Works (2014)
- Responsibilities included: Project management and report review.

State of Environment (SoER), Environmental Management Plans (EMP) and Environmental Management Frameworks (EMF) for:

- OR Tambo District Municipality SoER and EMP, Eastern Cape Province, South Africa (2009-2010). Accepted by council.
- Joe Gqabi District Municipality SoER and EMP, Eastern Cape Province, South Africa. (2011)
- Mnquma Local Municipality SoER and EMP, Eastern Cape Province, South Africa (2012)
- Western Cape Province, State of the Coast Report, South Africa (2018)
- King Cetswayo District Municipality Environmental Management Framework, KwaZulu-Natal Province, 2017-2019.

Activities:

- o Field survey of district municipality through aerial surveying and field work reporting of whole district municipality (incorporating 4-7 local municipalities).
- o Continued interaction with municipal representatives and key stakeholders
- o Workshops held with key role-players and decision-makers
- o Review of planning documents and integrated development programs.
- o Identification of key environmental issues
- o Selection of priority environmental issues
- o Development of Environmental Management Action Plans directly aimed at mitigating priority issues.
- o Collection and analysis of data

- o Reporting on selected indicators
- o Collection and analysis of spatial data

Responsibilities:

- o Project manager,
- o Project lead,
- o Budget management,
- o Report writing,
- o Team delegation and management and
- o Client liaison.

Additional Specialist studies

- o Sensitive Ecology Assessment: Mncwasa Water Scheme (2009)
- o Vegetation Rehabilitation Plan: Peregrine Dunes Golf Estate (2009)
- o Ecological Impact Assessment: Peregrine Dunes Golf Estate (2009)
- o Vegetation Assessment: Atterbury Development (2008)
- o Wild Coast Forest Survey: (current) DWAF/EC Parks initiative (2009-2010)
- o Biodiversity and Ecological Impact Assessment, Sierra Leone, Addax Biofuels (2009-2010)
- o Land use Impact Assessment, Sierra Leone, Addax Biofuels (2009-2010)
- o Thyspunt – Melkhout Eskom Power line, Ecological Impact Assessment
- o Ecological Impact Assessment: Chaba WEF
- o Ecological Impact Assessment: Thomas River WEF
- o Ecological Impact Assessment: Qunu Renewable Energy Facility
- o Ecological Impact Assessment: Ncora Renewable Energy Facility
- o Ecological Impact Assessment: Ngqamakwe Renewable Energy Facility
- o Ecological Impact Assessment: Qumbu Wind Energy Facility
- o Terrestrial Ecology Impact Assessment: Qolora Aquaculture Zone
- o Toboshane Valley Estate: Ecological Impact Assessment
- o Toboshane Valley Estate: Conservation Management Plan
- o Biodiversity and Impact Assessment: Niassa Green Resource, Mozambique
- o Biodiversity and Impact Assessment: Balama Graphite Mine
- o Biodiversity and Impact Assessment: Tete Iron Ore Mine

Alien Invasive Monitoring, Control and Eradication Plans

- ACSA East London Alien Invasive Plant assessment and eradication programme (2009 and 2016)
- Rehabilitation and Restoration (including alien plant removal) Plan: Peregrine Dunes Golf Estate (2010)
- Alien Invasive Plant Monitoring and Control Plan for the following Wind Energy Facilities:
 - o Chaba WEF (2011)
 - o Komga WEF (2016)
- 2018 (June): Hawley G and Desmet P. Eastern Cape Biodiversity Conservation Plan (Draft 3) and the Strategy and Action Plan. Thicket Forum
- 2017 (June): Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity

Sector Plan and Biodiversity Strategy and Action Plan. Biodiversity Planning Forum.

- 2017: Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. Thicket Forum
- 2016 (June): Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. Biodiversity Planning Forum.
- 2016: Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. Thicket Forum
- 2016: Hawley, G, Berliner, D and Desmet P. Eastern Cape Biodiversity Sector Plan and Biodiversity Strategy and Action Plan. International Association of Impact Assessment, South Africa.
- 2010: Hawley, GL, McMaster AR and Carter AR. The Environmental and Social Impact Assessment, and associated issues and challenges associated with Biofuels. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.
- 2009: Hawley, GL, McMaster AR and Carter AR. Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. International Association of Impact Assessors.
- 2008: Hawley GL and Dames JF. Ectomycorrhizal species diversity above- and below ground comparison in *Pinus patula* (Schlecht et Cham) plantations, South Africa. South African Society for Microbiology (Poster).
- 2006: Hawley, GL and Dames, JF. Morphological and molecular identification of ectomycorrhizal fungi in *Pinus* plantations. South African Society of Microbiology.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Greer Hawley-McMaster

Date: 22 January 2020

CONTACT DETAILS

Name of Company	Coastal and Environmental Services (Pty) Ltd trading as CES
Designation	Port Elizabeth Branch
Profession	Environmental Consultant / Junior Ecological Specialist
Years with firm	One (1) Year
E-mail	n.wienand@cesnet.co.za nicole.wienand@eoh.com
Office number	+27 (0)41 045 0496 +27 (0)41 393 0700
Nationality	South African
Key areas of expertise	<ul style="list-style-type: none">➤ Environmental and Ecological Impact Assessments➤ Botanical Specialist Studies➤ Environmental Auditing/Compliance Monitoring➤ GIS Mapping

PROFILE

Ms Nicole Wienand

Ms Nicole Wienand is an Environmental Consultant based in the Port Elizabeth branch. Nicole obtained her BSc Honours in Botany (Environmental Management) from Nelson Mandela University (NMU) in December 2018. She also holds a BSc Degree in Environmental Management (Cum Laude) from NMU. Nicole's honours project focused on the composition of subtidal marine benthic communities on warm temperate reefs off the coast of Port Elizabeth and for her undergraduate project she investigated dune movement in Sardinia Bay. Nicole's key interests include marine ecology, botanical specialist assessments, GIS Mapping, the general EIA process, Public Participation Process (PPP) and Ecological Impact Assessments. Since her appointment with CES in January 2019, Nicole has undertaken a number of Ecological Impact Assessments under the guidance of Dr Greer Hawley and Tarryn Martin.

**EMPLOYMENT
EXPERIENCE**

Environmental Consultant, CES
07 January 2019 – Present

- Basic Assessment Reports
- Ecological Impact Assessments
- Environmental Audit/Compliance Monitoring
- GIS Mapping
- Public Participation

**ACADEMIC
QUALIFICATIONS**

Nelson Mandela University, Port Elizabeth
BSc Honours Botany (Environmental Management)
2018

Nelson Mandela Metropolitan University, Port Elizabeth
BSc Environmental Sciences
2015-2017

**CONSULTING
EXPERIENCE**

Basic Assessments

- Duyker Island Prospecting Right, North West Province – Assisting Report Writing
- ZMY Steel Traders (Pty) Ltd. Steel Recycling Plant, Zone 5 of the Coega SEZ, Eastern Cape Province – Basic Assessment Report;
- Fairview Sand Mine near Port Alfred, Eastern Cape Province – Basic Assessment Report;
- Kareekrans Boerdery Agricultural Development near Kirkwood, Eastern Cape Province – Report Writing; and
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province – Report Writing.

Ecological Assessments

- ZMY Steel Traders (Pty) Ltd., Steel Recycling Plant, Zone 5 of the Coega SEZ, Eastern Cape Province;
- Kareekrans Boerdery Agricultural Development near Kirkwood Eastern Cape Province, Ecological Impact Assessment and Report Writing;
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing;
- Uitsig Boerdery Trust Citrus Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing;
- Mosselbankfontein Coastal Dune and Ecological Impact Assessment near Witsand, Western Cape Province – Ecological Impact Assessment and Report Writing;
- Nomzamo Citrus Farm Development near Kirkwood, Eastern Cape Province – Ecological Impact Assessment and Report Writing; and
- Mangrove Forest Survey for the Kenmare Biodiversity Management Plan, Topuito, Mozambique.

Environmental Auditing

- Khayamnandi Extension on Erven 114, 609, 590 and 24337, Bethelsdorp, within the Nelson Mandela Bay Municipality;

- Aberdeen Bulk Water Supply Phase 2, Dr Beyers Naude Local Municipality, Eastern Cape Province, South Africa;
- The Milkwoods Integrated Residential Development, Remainder Erf 1953, Victoria Drive, Walmer, Nelson Mandela Bay Municipality, Eastern Cape Province;
- Fishwater Flats Wastewater Treatment Works Refurbishment, Nelson Mandela Bay Municipality, Eastern Cape Province;
- The Refurbishment of the Kwanobuhle Wastewater Treatment Plant, Nelson Mandela Bay Municipality, Eastern Cape Province, South Africa; and
- Driftsands Sewer Collector Augmentation (Phase II), Within the Nelson Mandela Bay Municipality, Eastern Cape Province.

Geographical Information Systems (GIS)

- ZMY Steel Traders – Basic Assessment Report and Biophysical Mapping;
- Duyker Island – Prospecting Area Mapping & Biophysical Mapping;
- Fairview Sand Mine near Port Alfred, Eastern Cape Province – Biophysical and Layout Mapping;
- St Francis Coastal Protection Scheme – Kromme Estuary Functional Zone Mapping; Biophysical Mapping; and Sand Source Area Mapping;
- Kareekrans Boerdery Agricultural Development – Biophysical and Layout Mapping;
- Nomzamo Citrus Farm Development near Kirkwood, Eastern Cape Province - Biophysical and Layout Mapping;
- Siyahluma Citrus Farm Development near Addo, Eastern Cape Province – Biophysical and Layout Mapping; and
- Sitrusrand Dwarsleegte Farm Citrus Development – Biophysical and Layout Mapping.

Public Participation process

- Duyker Island Prospecting Right, North West Province St Francis Coastal Protection Scheme;
- Fairview Sand Mine near Port Alfred, Eastern Cape Province;
- Kareekrans Boerdery Agricultural Development near Kirkwood Eastern Cape Province;
- Proposed Coastal Protection Scheme, St Francis Bay, Kouga Local Municipality, Eastern Cape Province; and
- Sitrusrand Dwarsleegte Farm Citrus Development near Kirkwood, Eastern Cape Province.

Social Auditing

- Malawi Millennium Development Trust – Resettlement Action Plan Implementation Auditing.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Nicole Wienand

Date: January 2020