



DRAFT SECTION 24G ASSESSMENT REPORT



PROPOSED AGRICULTURAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON REMAINDER OF KAKAMAS NORTH SETTLEMENT 355, FARM TIERKOP, AUGRABIES.

DENC Reference: 02/03/2019

December 2019

Rooipad Boerdery (Pty) Ltd

Mr. Izak Nel

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QUALITY CONTROL

Revision	Date	Author	Checked	Status	Approved
00	October 2019	Elanie Kühn		Application	
01	November 2019	Lia Labuschagne	Yes		Checked
02	December 2019	Elanie Kühn		Assessment Report	
03					

TABLE OF CONTENTS

SECTION A: APPLICATION INFORMATION	7
SECTION B: ACTIVITY INFORMATION	11
SECTION C: DESCRIPTION OF RECEIVING ENVIRONMENT	28
SECTION D: PRELIMINARY IMPACT ASSESSMENT	38
SECTION E: LANDFILL PARAMETERS (Where application relates to a waste management activity)	52
SECTION F: PROPOSED PUBLIC PARTICIPATION	55
SECTION G: ALTERNATIVES	57
SECTION H: APPENDICES.....	59
SECTION I: DECLARATIONS.....	65
Appendix A: Locality Map	69
Appendix B: Site Plans	70
Appendix C: Consent Use.....	72
Appendix D1: Historical Photographic Image.....	73
Appendix D2: Site Photographs	79
Appendix D3: CBA 1 and CBA 2 located on Remainder of Kakamas North Settlement 355	81
Appendix E1: Irrigation rights from Kakamas Water Users Association	83
Appendix E2: Water Use License from Department of water affairs	84
Appendix F: Public Participation Process	93
Appendix H1: Attendance register of meeting held.....	103
Appendix H2: Environmental Management Programme	104
Appendix H3: Water Use License Application	199
Appendix H4: Botanical Assessment.....	259
Appendix H5: Archaeological Assessment	279
Appendix H6: Palaeontology Assessment	301

TABLE OF FIGURES

Figure 1. Locality map of the proposed site on Remainder of Kakamas North Settlement No. 355 as demarcated in red.	17
Figure 2: Landsat Image of site in 2001, showing development.	18
Figure 3: Landsat Image of site in 1990, showing no development.	18
Figure 4: Google Image of the site in 2010.	19
Figure 5: Google Image 2013, showing the 30ha (purple) development.	19
Figure 6: Google Image of 2016.	20
Figure 7: Google Image 2017, showing the development of 9ha (pink).....	20
Figure 8: Proposed Development Layout.....	21
Figure 9: Pipelines.....	22
Figure 10: Ephemeral streams/drainage areas	23
Figure 11: Winegrowing areas of South Africa (sourced from www.wosa.co.za)	24
Figure 12: Access Roads.....	25
Figure 13: The vegetation types (Mucina & Rutherford, 2006) of the Tierkop study site (on a <i>DigitalGlobe</i> image of 26 June 2017).	30
Figure 14: The planned protected areas for the Northern Cape Province of South Africa (Department of Environmental Affairs, 2016).	31
Figure 15: The Critical Biodiversity Areas of the Tierkop study site and surrounds (Oosthuysen & Holness, 2016).....	32
Figure 16: Development Layout Plan – Alternative 1.....	58



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Department:
Environment & Nature Conservation
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

Application form for the regularisation of unlawful commencement or continuation of a listed activity or waste management ; terms of section 24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

2016

Kindly note that:

1. This application form must be completed for all applications in terms of S24G of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.
2. It is the responsibility of the Applicant/Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the application form have been published or produced by the relevant competent authority.
3. This application form is structured as follows:

PART 1

- Section A: Application Information
- Section B: Activity Information
- Section C: Description of Receiving Environment
- Section D: Preliminary Impact Assessment
- Section E: Landfill Parameters
- Section F: Proposed Public Participation Process
- Section G: Alternatives
- Section H: Appendices

PART 2

- Section A: Directive
- Section B: Deferral
- Section C: Quantum of the fine

PART 3

- Section A: Declarations
Annexures

4. An independent EAP must be appointed to complete Part 1 as well as Part 2 Section C Part I of the application form on behalf of the applicant. The applicant must complete the remainder of Part 2 (i.e. excluding Section C part I. Both the EAP and Applicant must sign Part 3.
5. The declaration of independence must be completed by the independent EAP and submitted with the application.
6. The required information must be typed within the spaces provided. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. The space provided extends as each space is filled with typing. A legible font type and size must be used when completing the form. The font size should not be smaller than 10pt (e.g. Arial 10).
7. The use of "**not applicable**" in the application form must be done with circumspection.
8. No faxed or e-mailed applications will be accepted. This application form must be submitted by hand or mailed to the relevant competent authority.
9. Unless protected by law, all information contained in and attached to this application form may become public information on receipt by the competent authority. Upon request, any interested and affected party must be provided with the information contained in and attached to this application form.
10. This application form constitutes the initiation of the S24G application process.

Kindly note further that:

11. Section 24G of the NEMA, without affecting any criminal liability of a person who has acted in contravention of the above, makes provision for that person to submit an application to the relevant MEC/Minister, which, if successful, will enable that person lawfully to continue with the listed activity and/or legalise an otherwise unlawful structure.

12. Before the Minister/MEC may take a decision in respect of the application, the applicant is required to pay an appropriate administrative fine, determined by the competent authority, which fine may not exceed five million Rand (R 5 000 000.00) per listed activity unlawfully commenced or per application where the activities are interrelated.

13. It is the responsibility of the applicant to familiarise himself/herself/itself with all the possible consequences associated with the submission of this application including, but not limited to, the following:

- This application (including a positive decision in respect hereof) in no way affects any criminal liability that the applicant may have incurred in respect of the activities which were commenced, undertaken and/or conducted unlawfully as listed in paragraph 1 above, and in respect of which this application relates.
- The processing of this application may be deferred pending the outcome of criminal proceedings, should criminal proceedings be instituted against the applicant in respect of the abovementioned activities; or where criminal proceedings are pending against the applicant in respect of a similar contravention of section 24F of NEMA or section 20(b) of NEM:WA.
- Before the competent authority may take a decision on the application, an administrative fine determined by the competent authority must be paid, in full, by the applicant.
- That neither the submission of this application, nor the payment of the administrative fine implies that authorisation will be issued for the continuation of an activity/activities that commenced, undertaken and/or conducted unlawfully. This decision will depend on the merits of the application itself.

14. Activities which result in detrimental impacts to the environment are considered in a serious light by the competent authority and accordingly applicants must understand that by lodging an application for the continuation of an activity/ activities that commenced/ was undertaken or conducted unlawfully does not necessarily imply that the activity will be authorised. In terms of the NEMA the Minister/MEC may either refuse to issue an environmental authorisation/waste management licence; conditionally authorise the activity or direct you, the applicant, to provide further information or take further steps prior to making a decision.

DEPARTMENTAL DETAILS

Department of Environment and Nature Conservation
Compliance and Enforcement
90 Long Street
Private Bag X6102
Kimberley
8300

Tel. 053-807 7300
Fax: 053-807 7328

SECTION A: APPLICATION INFORMATION

1. APPLICANT PROFILE INDEX

Cross out the appropriate box "☒".

1.1	The applicant is an individual	YES	NO
1.2	The applicant is a company	YES	NO
1.3	The applicant is a state-owned enterprise or municipality	YES	NO
1.4	Other (specify)	YES	NO
1.5	There is more than one individual/company responsible for the unlawful commencement of listed activities/listed waste management activities.	YES	NO

Name of Project applicant:	Rooipad Boerdery (Pty) Ltd												
RSA Identity number:													
Contact person:	Mr Izak Nel												
Position in company	CEO												
Registered Name of Company/ Closed Corporation	Rooipad Boerdery (Pty) Ltd												
Trading name (if any):	Newgro Farming (Pty) Ltd												
Registration number	1995/003444/07												
Postal address:	PO Box 26												
	Augrabies						Postal code:	8874					
Telephone:	(054) 451 7007						Cell:	(082) 584 9489					
E-mail:	admin@rooipad.co.za						Fax:						
Please Note: In instances where there is more than one individual/company responsible for the unlawful commencement of listed activities / waste management activities, please attach a list of with all contact details to the back of this page.													

Environmental Assessment Practitioner (EAP):	Pieter Badenhorst Professional Services												
Contact person:	Elanie Kuhn												
Postal address:	PO Box 1058												
	Wellington						Postal code:	8870					
Telephone:	(021) 873 7228						Cell:	(076) 584 0822					
E-mail:	elaniem@iafrica.com						Fax:	(086) 672 1916					
EAP Qualifications	Pieter Badenhorst - 44 years' experience (16 at the CSIR) in environmental management; report writing; project management; facilitation												
	Elanie Kuhn – 13 years' experience, environmental management, report writing, project management												
EAP Registrations/Associations	Pieter Badenhorst - IAIAAsa, Pr Eng, SAICE												
	Elanie Kühn - IAIAAsa												

Name of Landowner(s):	Same as applicant											
Contact person(s):												
Postal address:												

Telephone: E-mail:		Postal code: Cell: Fax:	
			()

Please Note: In instances where there is more than one landowner, please attach a list of landowners with their contact details to the back of this page.

Municipality in whose area of jurisdiction the activity falls: Contact person: Postal address: Telephone E-mail:	Kai! Garib Municipality		
	Municipal Manager		
	Private Bag X6		
	Kakamas	Postal code:	8870
	(054) 461 6700	Cell:	
		Fax:	(054) 461 6300

Please Note: In instances where there is more than one Municipality involved, please attach a list of Municipalities with their contact details to the back of this page.

Project title:	Tierkop/Roopad S24G Rectification of cultivation vineyards across small streams and construction of associated infrastructure on the remainder of Kakamas North Settlement 355, Augrabies.
Property location:	Tierkop Farm - Augrabies
Farm/Erf name & number (incl. portion):	Remainder of Kakamas North Settlement 355
SG21 Digit code:	C02800110000033500000

Co-ordinates:	Latitude (S):			Longitude (E):		
Cultivated areas:	28°	38'	29.49 "	20°	28'	03.25"
	28°	38'	57.80 "	20°	27'	54.07"
	28°	39'	01.43 "	20°	28'	09.47"
	28°	38'	39.64 "	20°	28'	43.79"
New cultivation areas:	28°	37'	41.33 "	20°	28'	03.55"
	28°	38'	02.75 "	20°	28'	43.94"
	28°	37'	20.70 "	20°	28'	17.50"
	28°	37'	18.57 "	20°	27'	52.25"

Please Note: Where a large number of properties are involved (e.g. linear activities), attach a list of property descriptions to the back of this page. 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 must be in degrees, minutes and seconds. The minutes must be given to at least three decimals to ensure adequate accuracy. The EAP is required to contact the relevant competent authority with regards to the projection that must be used.

Street address:	Kai! Garib Municipality
Magisterial District or Town:	Augrabies

Please Note: In instances where there is more than one town or district involved, please attach a list of towns or districts as well as complete physical address information for the entire area to the back of this page.

Closest City/Town:	Augrabies	Distance	2 Km
Zoning of Property:	Agricultural Zone 1		

Please Note: In instances where there is more than one zoning, please attach a map clearly indicating the zoning of the different portions.

Was a rezoning application required?	YES	NO
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Was a consent use application required?	YES	NO
Please Note: Where planning approvals have been granted please attach the relevant approvals.		
Owners consent:	NOT REQUIRED AS PROJECT IS ON APPLICANT'S PROPERTY	
	Letters of consent from all landowners or a detailed explanation by the applicant explaining why such letters of consent are not furnished must be attached to the application form.	

2. APPLICATION HISTORY

(Cross out the appropriate box "☒" and provide a description where required).

Has any national, provincial or local authority considered any development/waste management applications on the property previously?	Yes	NO
If so, please give a brief description of the type and/or nature of the application/s: (In instances where there was more than one application, please attach a list of these applications)		
Which authority considered the application(s):		
Has any one of the previous application/s on the property been approved or rejected? If so, provide a list of the successful and unsuccessful application/s and the reasons for decision/s.	Yes	NO
Provide detail on the period of validity of decision(s) and expiry dates of the above applications / licences etc.		

I hereby apply in terms of Section 24G of the National Environmental Management Act (Act no 107 of 1998 as amended) for the regularisation of the unlawful commencement or continuation of the listed activity(ies) in Section B of the application form:

Applicant (Full names) _____ Signature: _____

Place: _____ Date: _____

EAP (Full names) _ Pieter Badenhorst _____ Signature:

Place: _Wellington_____ Date:

SECTION B: ACTIVITY INFORMATION

1. ACTIVITIES APPLIED FOR:

Separate applications are required for one site where more than one listed activity has commenced and where these unlawfully commenced activities constitute offences in terms of different EIA regulations and/or the listed waste management activities.

Applicants and EAPS are strongly advised to discuss the merits of a combined application (*if deemed applicable*) with the relevant competent authority prior to the completion of this application form and submission thereof.

The relevant competent authority will use its discretion in deciding to allow the submission of a single application for more than one NEMA section 24F (1) and/or NEM: WA section 20(b) contravention on one site.

All potential listed activities/waste management activities associated with the site must be indicated below. Only those activities for which the applicant applies will be considered. The onus is on the applicant to ensure that all the applicable listed activities are included in the application.

PLEASE NOTE THIS APPLICATION IS FOR THE ILLEGAL CONSTRUCTION AND CLEARANCE OF LAND OF APPROXIMATELY 84ha, AND THE FUTURE DEVELOPMENT OF AN ADDITIONAL 85.5HA, RESULTING WITH A TOTAL DEVELOPMENT OF 169.5HA.

Listed activities applied for. Identify the relevant listed activities applied for below:

ECA EIA Contraventions: Between 08 September 1997 end of day 09 May 2002		
Activities unlawfully commenced with on or after 08 September 1997 and before end 09 May 2002: EIA Regulations promulgated in terms of the ECA, Act No 73 of 1989, as amended		
Listed Activity(ies)	Details of Activity(ies)	Details of Activity(ies) requiring Basic Assessment
Activity 1(i)	The construction or upgrading of canals and channels, including diversions of the normal flow of water in a riverbed and water transfer schemes between water catchments and impoundments.	The construction during the period from 1990 to 2001 for the infrastructure development associated with the cultivation of the vineyards within water courses of 45 ha.
Activity 2 (d)	The change of land use for grazing to any other form of agricultural use.	Changing the land use from grazing to cultivation of vineyards.

ECA EIA Contraventions: Between 10 May 2002 and before end of day 02 July 2006		
Activities unlawfully commenced with on or after 10 May 2002 and before end 02 July 2006: EIA Regulations promulgated in terms of the ECA, Act No 73 of 1989, as amended		
Listed Activity(ies)	Details of Activity(ies)	Details of Activity(ies) requiring Basic Assessment

Activity 1 (j)	The construction, erection or upgrading of canals and channels, including structures causing disturbances to the flow of water in a riverbed, and water transfer schemes between water catchments and impoundments.	Not applicable, as the 45-ha development took place between 1990 and 2001.
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NEMA EIA Contraventions: Between 03 July 2006 and before end of day 01 August 2010	
Activities unlawfully commenced with in terms of the EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998, as amended on or after 03 July 2006 and before end of day 01 August 2010	
Government Notice No. R386 Activity No(s):	Details of Activity(ies) requiring Basic Assessment
	NOT APPLICABLE
Government Notice No. R387 Activity No(s):	Details of Activity(ies) requiring a Scoping Report and EIA
	NOT APPLICABLE

NEMA EIA Contraventions: On or after 02 August 2010 until 7 December 2014	
Activities unlawfully commenced with in terms of the EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998, as amended on or after 02 August 2010 until 7 December 2014	
Government Notice No. R544 Activity No(s):	Details of Activity(ies) requiring Basic Assessment
Activity 11: The construction of: (xi) infrastructure or structures covering 50 square metres or more, where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of the watercourses, excluding where such construction will occur behind the development setback line.	The construction during the period from 2010 to 2014 for the infrastructure development across 30 ha associated with the cultivation of the vineyards within water courses.
Activity 18: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from: (i) watercourse	Approximately 30 hectares of land were cleared prior to 30 September 2013 (refer to Appendix B), within watercourses.
Government Notice No. R545 Activity No(s):	Details of Activity(ies) requiring a Scoping Report and EIA
Not applicable	
Government Notice No. R546 Activity No(s):	Details of Activity(ies) requiring S&EIR
Activity 12:	Approximately 30 hectares of land were cultivated in July 2010 to September 2013, resulting in the clearance of an

<p>The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation. (b) within critical biodiversity areas identified in bioregional plans.</p>	<p>area of more than 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, within a CBA (Refer to Figure 8).</p>
<p>Activity 13: The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation: (a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority (c) In Northern Cape (ii) Outside urban areas, the following: (ff) Areas within 10 kilometres from national parks.</p>	<p>Approximately 30 hectares of land were cultivated from July 2010 to September 2013, resulting in the clearance of an area of 1 ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, located within a CBA (Refer to Figure 8).</p>
<p>Activity 14: The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: (1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes; (2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list; the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010. (a) In Eastern Cape, Free State, KwaZulu-Natal, Gauteng, Limpopo, Mpumalanga, Northern Cape, Northwest and Western Cape: All areas outside urban areas.</p>	<p>Approximately 30 hectares of land were cultivated from July 2010 to September 2013, resulting in the clearance of an area of more than 5 ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, located within a CBA (Refer to Figure 8).</p>

<p>NEMA EIA Contraventions: On or after 8 December 2014</p>	
<p>Activities unlawfully commenced with in terms of the EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998, as amended on or after 8 December 2014</p>	
<p>Government Notice No. R983 Appendix 1 Activity No(s):</p>	<p>Details of Activity(ies) requiring Basic Assessment</p>
<p>Activity 12: The development of— (vi) bulk stormwater outlet structures exceeding 100 square metres in size;</p>	<p>For the construction of agricultural areas of 9 ha within a watercourse.</p>

<p>(xii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p>	
<p>Activity 19: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from—</p> <p>(i) a watercourse;</p>	<p>The infilling and depositing of more than 5 cubic meters of material within a watercourse, for the construction of 9 ha of agricultural areas.</p>
<p>Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</p> <p>(i) the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>The clearance of 9 ha of indigenous vegetation for the agricultural development.</p>
<p>Government Notice No. R985 Appendix 2 Activity No(s):</p>	<p>Details of Activity(ies) requiring a Scoping Report</p>
<p>Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(a) In Northern Cape:</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p>	<p>For the construction of 9 ha of agricultural areas within Critical Biodiversity Areas 1 and 2.</p>
<p>Activity 14: The development of—</p> <p>(iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size;</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>Northern Cape:</p> <p>ii) Outside urban areas</p>	<p>For the construction of 9 ha of agricultural areas across small streams within Critical Biodiversity Areas 1 and 2.</p>

(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	
Government Notice No. R984 Appendix 3 Activity No(s):	Details of Activity(ies) requiring Environmental Impact Assessment Report
Not Applicable	

NEMA EIA Contraventions: On or after 7 April 2017/Corrected 13 July 2018	
Activities unlawfully commenced with in terms of the EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998, as amended on or after 7 April 2017/Corrected 13 July 2018.	
Government Notice No. R327 Appendix 1 Activity No(s):	Details of Activity(ies) requiring Basic Assessment
Activity 12: The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	For the construction of agricultural areas (structures) of 81 ha within a watercourse.
Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The infilling and depositing of more than 10 cubic meters of material within a watercourse, for the construction of 85.5 ha of agricultural areas.
Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (ii) the undertaking of a linear activity; (iii) or maintenance purposes undertaken in accordance with a maintenance management plan.	The clearance of 85.5 ha of indigenous vegetation for the agricultural development.
Government Notice No. R324 Appendix 2 Activity No(s):	Details of Activity(ies) requiring a Scoping Report
Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (b) In Northern Cape:	For the construction of 85.5 ha of agricultural areas within Critical Biodiversity Areas 1 and 2.

<p>ii. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p>	
<p>Activity 14: The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; Northern Cape: li Outside urban areas (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	<p>For the construction of 85.5 ha of agricultural areas (infrastructure) across small streams within Critical Biodiversity Areas 1 and 2.</p>
<p>Government Notice No. R325 Appendix 3 Activity No(s):</p>	<p>Details of Activity(ies) requiring Environmental Impact Assessment Report</p>
<p>Not Applicable</p>	

<p>Waste Management Activities Contraventions: On or after 3 July 2007 up to end of day 28 November 2013</p>	
<p>Activities unlawfully commenced with in terms of GNR 718 of 3 July 2009 published under the National Environmental Management Waste Act 59 of 2008</p>	
<p>Listed Activity(ies)</p>	<p>Details of Activity(ies)</p>
<p>Not Applicable</p>	

<p>Waste Management Activities Contraventions: On or after 29 November 2013</p>	
<p>Activities unlawfully commenced with in terms of GNR 921 of 29 November 2013 published under the National Environmental Management Waste Act 59 of 2008</p>	
<p>Listed Activity(ies)</p>	<p>Details of Activity(ies)</p>
<p>Not Applicable</p>	

2. ACTIVITY DESCRIPTION

(Cross out the appropriate box “” and provide a description where required).

(a) Is/was the project a new development or an upgrade of an existing development.	New – agricultural development.	Upgrade
------------------------------------------------------------------------------------	---------------------------------	---------

Clearly describe the activity and associated infrastructure commenced with, indicating what has been completed, what still has to be completed and applicable commencement dates.

Locality:

The proposed property on which the construction of the agricultural development (vineyards) has and will take place is situated on the remainder of Kakamas North Settlement No. 355 on the farm Tierkop/Rooipad just outside of the small town of Augrabies (referred to as Remainder of Kakamas North Settlement 355 in this document). The farm is situated approximately 4.5 km north-east of the small town of Augrabies in the Northern Cape, and gains access off gravel road off the N14 towards Riemvasmaak (see Figure 1). The site lies north of the Orange River. Small ephemeral streams cross the site. The site is currently zoned Agriculture Zone I. The owner of the properties is Rooipad Boerdery (Pty) Ltd, who has appointed PBPS as the independent environmental consultant to determine if an environmental authorisation is necessary.



Figure 1. Locality map of the proposed site on Remainder of Kakamas North Settlement No. 355 as demarcated in red.

Project Description:

The proposed development consisted out of various listed activities that triggered from ECA 1990 until NEMA 2017, outlined below:

Refer to the Historical Google Earth images attached at Appendix D1: Figures 2 to 9.

1. ECA Act 1998:

- Construction took place during 1990 to 2001 for the infrastructure development associated with the cultivation of the vineyards of 45 ha across small streams. (Refer to Figure 2: Landsat Image of 2001 and Figure 3: Landsat Image 1990).
- The changing of land use of 45ha of land from grazing to agricultural development.
- Note: the construction of the dam took place. However, this did not affect the flow of a river.

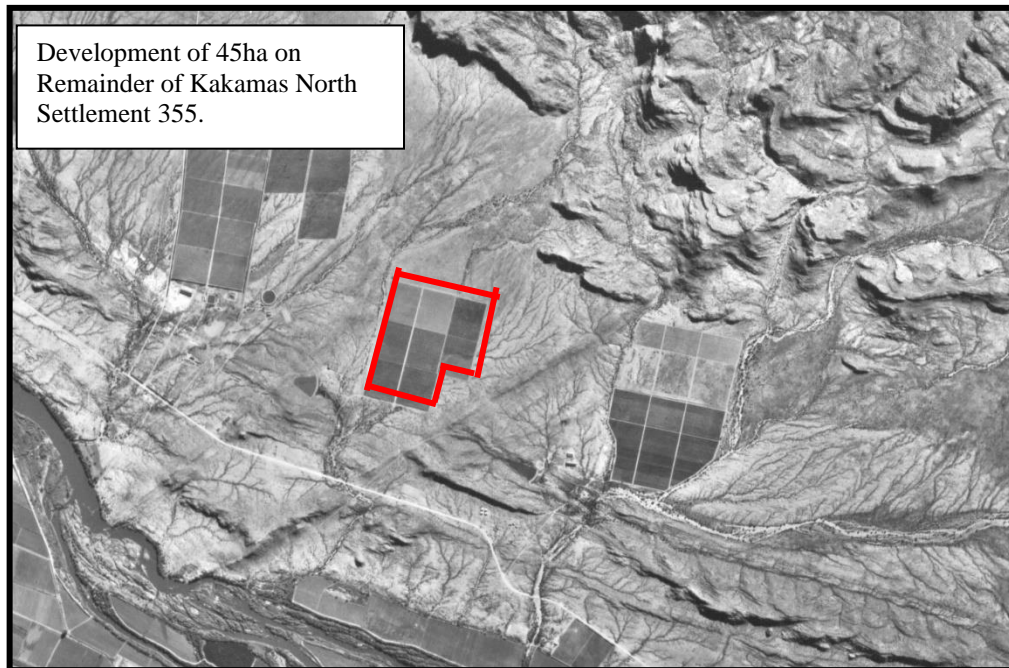


Figure 2: Landsat Image of site in 2001, showing development.

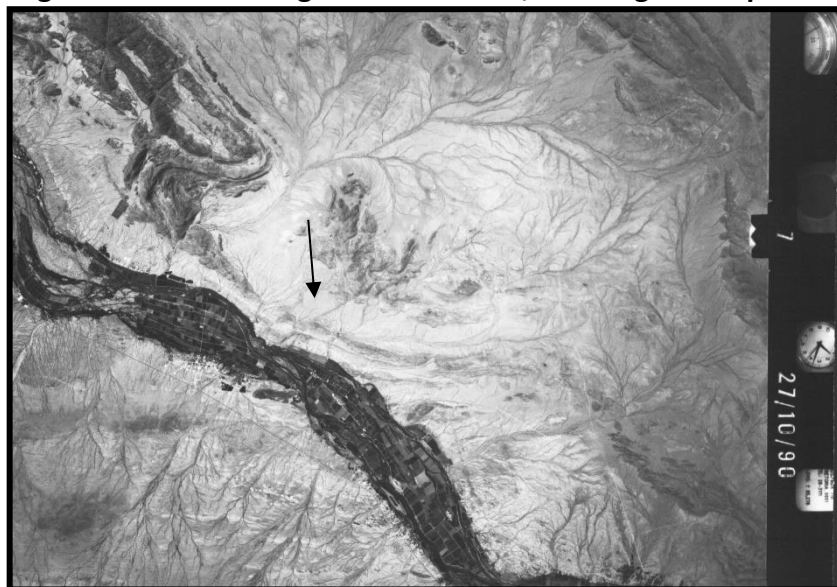


Figure 3: Landsat Image of site in 1990, showing no development.

2. NEMA ACT 2010:
 - Construction of 30 ha agricultural development across small ephemeral streams.
 - Removal of 30 ha of indigenous vegetation for the construction of the agricultural development. (Refer to Figure 4: Google Image of 2010 and Figure 5: Google Image of 2013.)

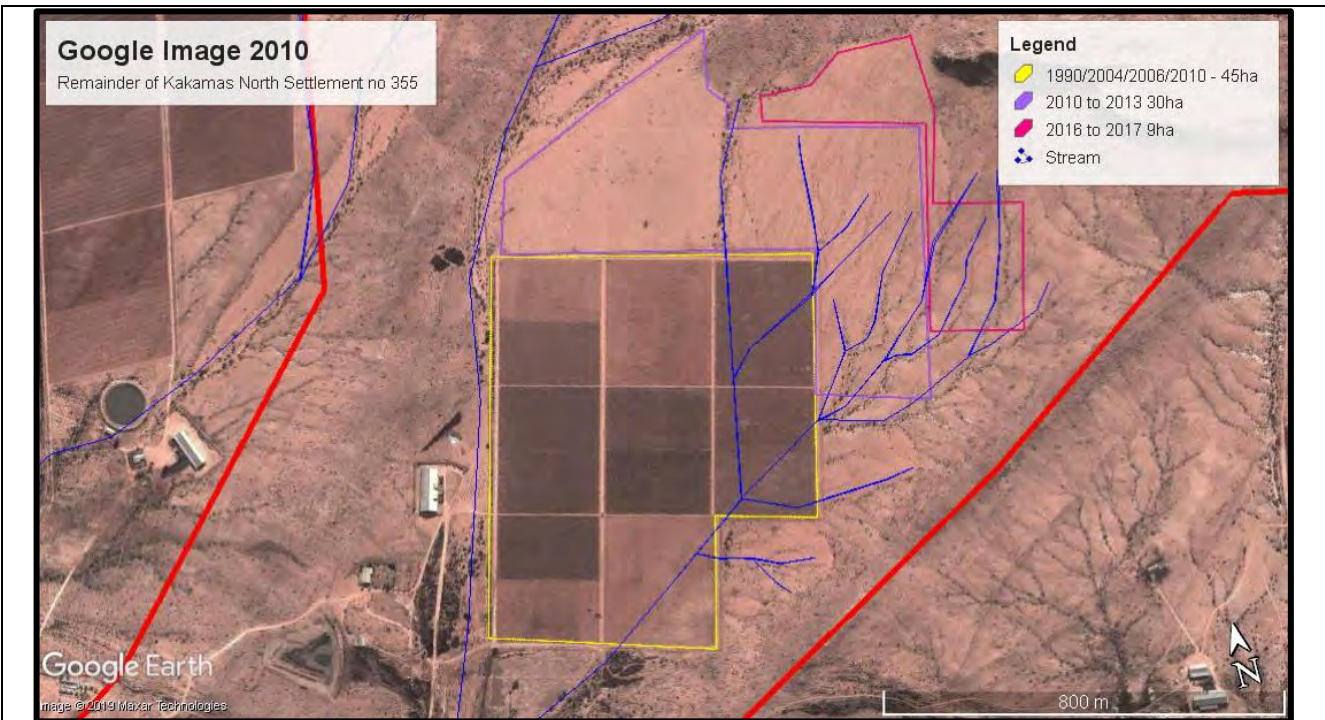


Figure 4: Google Image of the site in 2010.

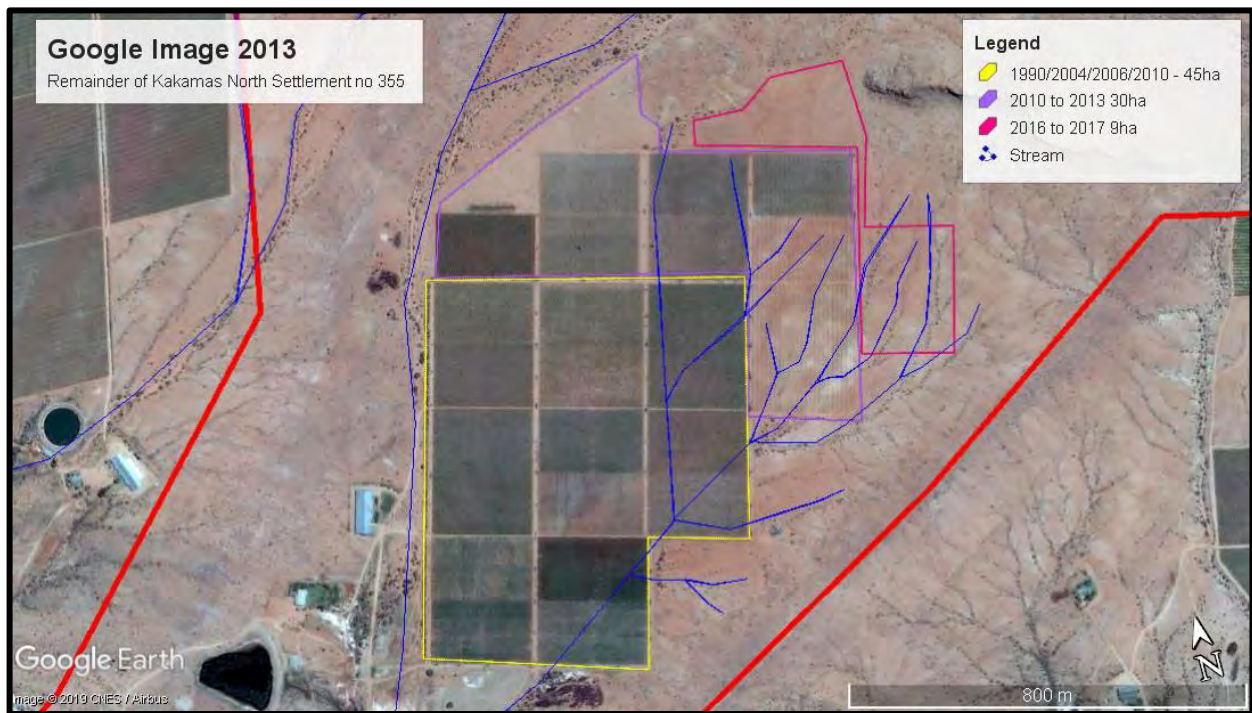


Figure 5: Google Image 2013, showing the 30ha (purple) development.

3. NEMA 2014:

- Construction of 9 ha agricultural development across small ephemeral streams.
- Removal of 9 ha of indigenous vegetation for the construction of the agricultural development. (Refer to Figure 6: Google Image 2016 and Figure 7: Google Image 2017.)

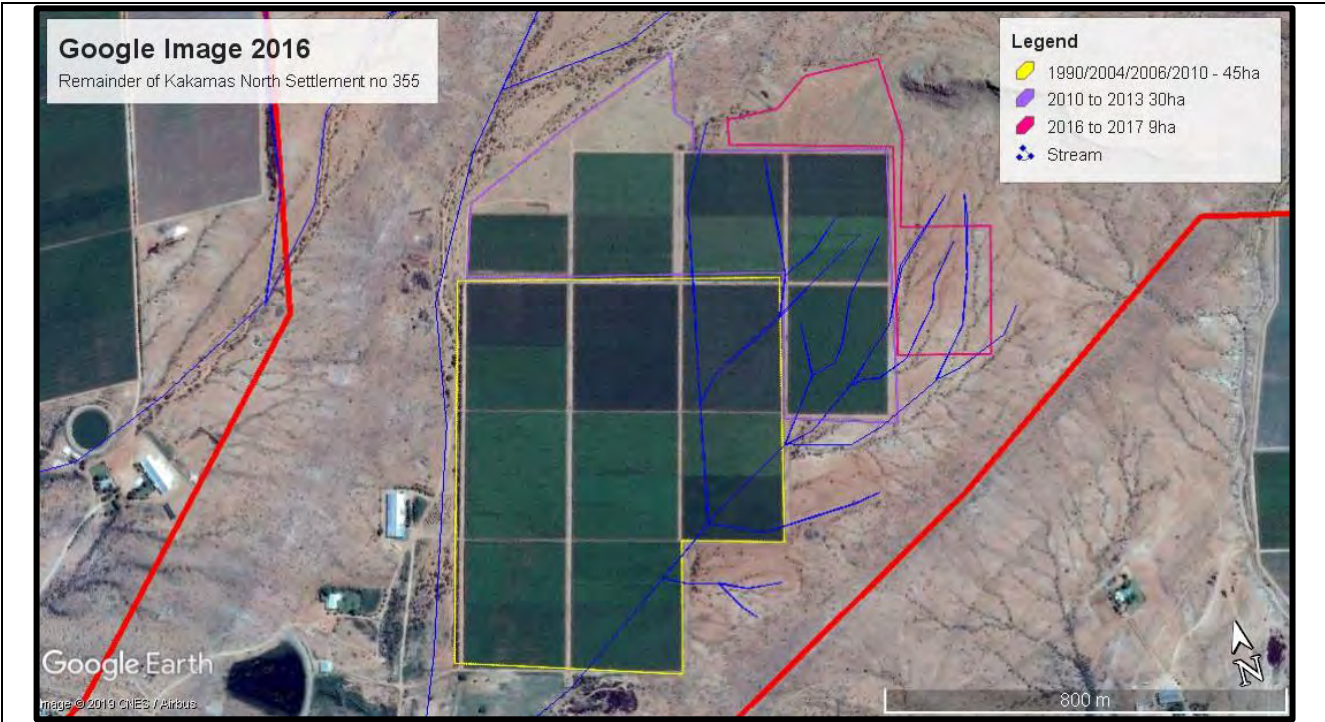


Figure 6: Google Image of 2016.

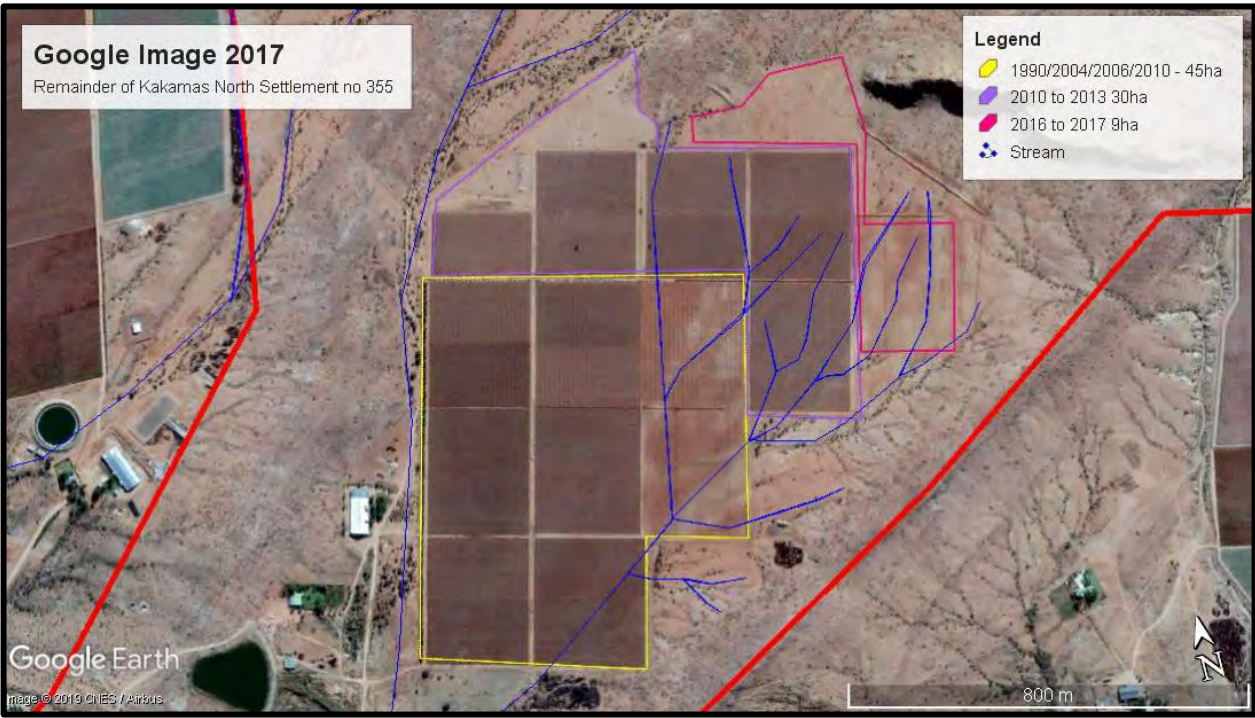


Figure 7: Google Image 2017, showing the development of 9ha (pink).

- 4. NEMA 2018:
 - Construction of 85.5 ha agricultural development across small ephemeral streams (Block 1 to 4). See Figure 8 showing the streams in relation to the developments.
 - Removal of 85.5 ha of indigenous vegetation for the construction of the agricultural development. See Figure 8: Proposed Development Layout.

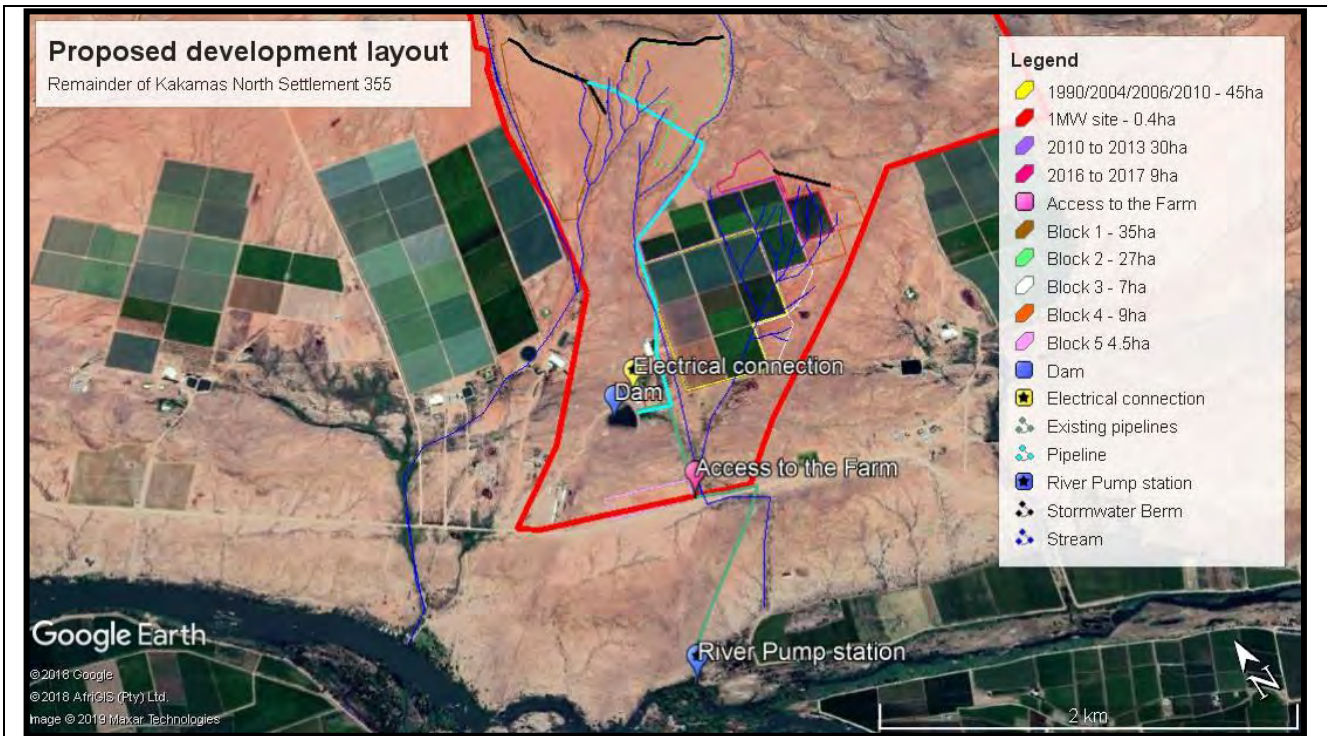


Figure 8: Proposed Development Layout

Provide details of all components of the activity and attach diagrams (e.g. architectural drawings or perspectives, engineering drawings, process flow charts etc.).

Buildings	YES	NO
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Provide brief description:

No buildings were constructed as part of the new agricultural areas that triggered an environmental authorisation.

Infrastructure (e.g. roads, power and water supply/ storage)	YES	NO
--------------------------------------------------------------	-----	---------------

Provide brief description:

Roads:

Access is gained via a gravel road that gains access via the N14. The internal farm tracks are not surfaced and are compacted earth with no formal stormwater management control structures in place. The low rainfall characteristic of the area negates the need to provide for formal stormwater control.

Pipelines:

Water is required for the drip irrigation of the established vineyards and is supplied via pipelines from the booster pump station and pump lines (turquoise) as shown in Figure 9. The other existing pipelines (green) established come from the pump station at the Orange River (See Figure 9) towards the existing dam, and from there distributed to the irrigation areas.



Figure 9: Pipelines

Water:

Remainder of Kakamas North Settlement No. 355 has existing rights for 50 ha (750 000 m³/a) (see Appendix E1, the letter from the Kakamas Water Users Association). The applicant recently obtained additional rights to 145 ha (2 176 782 m³/a), as per the license included in Appendix E1. Therefore, according to the existing license dated 22 March 2019 (Amended in 31 July 2019) and existing rights, the applicant has a total of 195 ha (2 926 782m³/a).

As part of this application, there will be a Water Use License Application for Section 21(c), and (i) of the National Water Act for the streams that were diverted and crossed as part of the illegal establishment of vineyards. The establishment of the vineyards on Remainder of Kakamas North Settlement 355 took place across small sections of the unnamed drainage system that is located on site (see Figure 10). The site falls within the Catchment Region D81A. The drainage channel system is located in an unnamed sub-catchment, D81A-03245. The unnamed sub-catchment is not really a river but fits rather the description of a mostly dry drainage line.

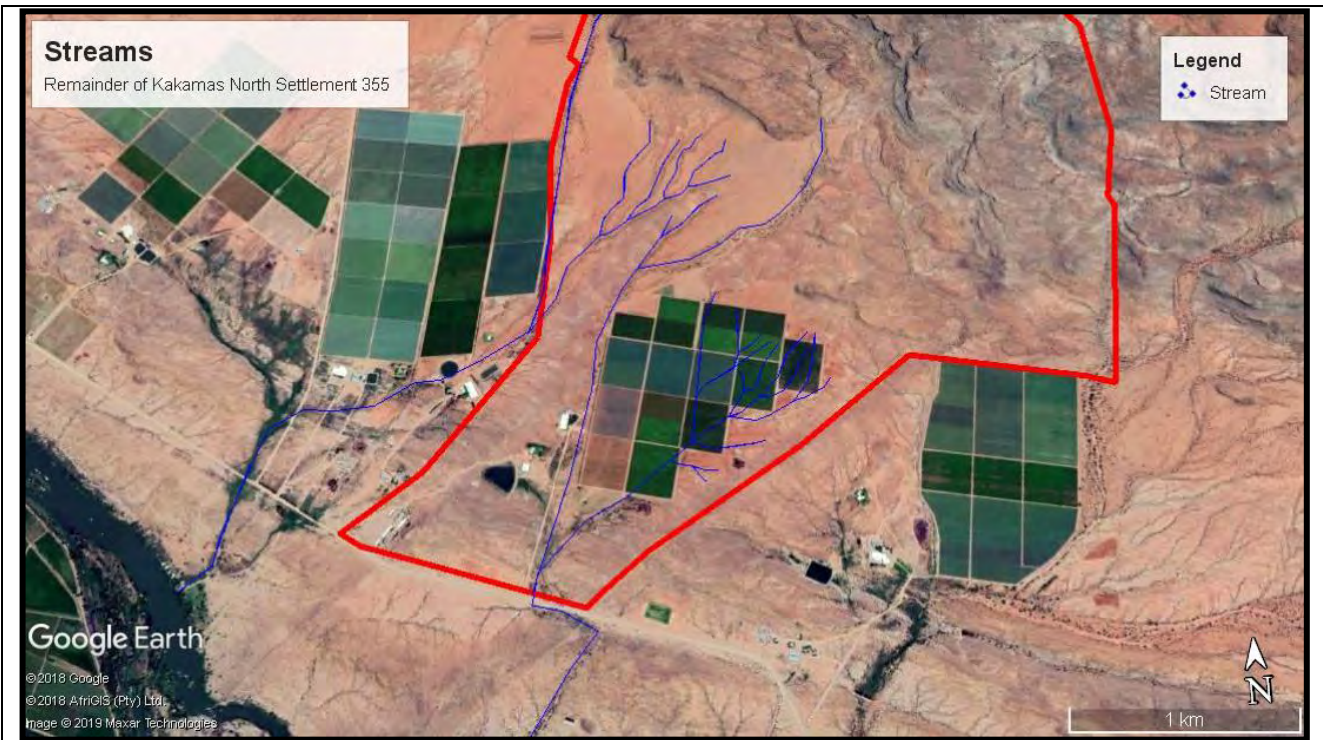


Figure 10: Ephemeral streams/drainage areas

The WULA application is summarised in the table below for the following water usages:

(c) impeding or diverting flow of water in a watercourse	For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas.
(i) altering the bed, banks, course or characteristics of a watercourse	For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas.

Electricity:

There is existing electricity available for the development. The applicant also intends to construct a 1MW PV Plant. The process to determine if environmental authorisation is necessary, is underway.

Processing activities (e.g. manufacturing, storage, distribution)	YES	NO
Provide brief description:		
Storage facilities for raw materials and products (e.g. volume and substances to be stored)		
Provide brief description	YES	NO
Storage and treatment facilities for solid waste and effluent generated by the project		
Provide brief description	YES	NO
The site has an existing conservancy tank that is removed by the municipality on a regular basis.		
Other activities (e.g. water abstraction activities, crop planting activities)	YES	NO
Provide brief description		

Crop Planting:

Table grapes are being cultivated as indicated in the project area. See Figure 8.

3. ACTIVITY NEED AND DESIRABILITY

Describe the need and desirability of the activity:

According to the report prepared by DAFF (2012), South African table grape exports totalled 2 708 767 metric tons. Europe is the most important market. Most table grapes were exported to the Netherlands (40%), followed by Great Britain (21%), Belgium (7,4%), Germany (5,5%), Hong Kong (3,1%) and other African countries (0,3%). During the summer season, India, Chile, South Africa and Israel are the major competing countries.

Major production areas in South Africa

The Hex River Valley is the country's main table grape production area. More than half of all grape exports come from this district, which has the longest harvesting period in the country. The Northern Cape is a very dry province, so most of the grapes in this province are cultivated in the Orange River region and they are harvested very early.

The project area is located within the Lower Orange River wine region (refer to Figure 11 below.)

Remainder of Kakamas North Settlement No. 355 contributes to the production of table grapes that are harvested early for the export market, and in time for the Christmas festive season overseas. This particular characteristic of growing table grapes in this region gives the growers a highly competitive advantage in the global market.

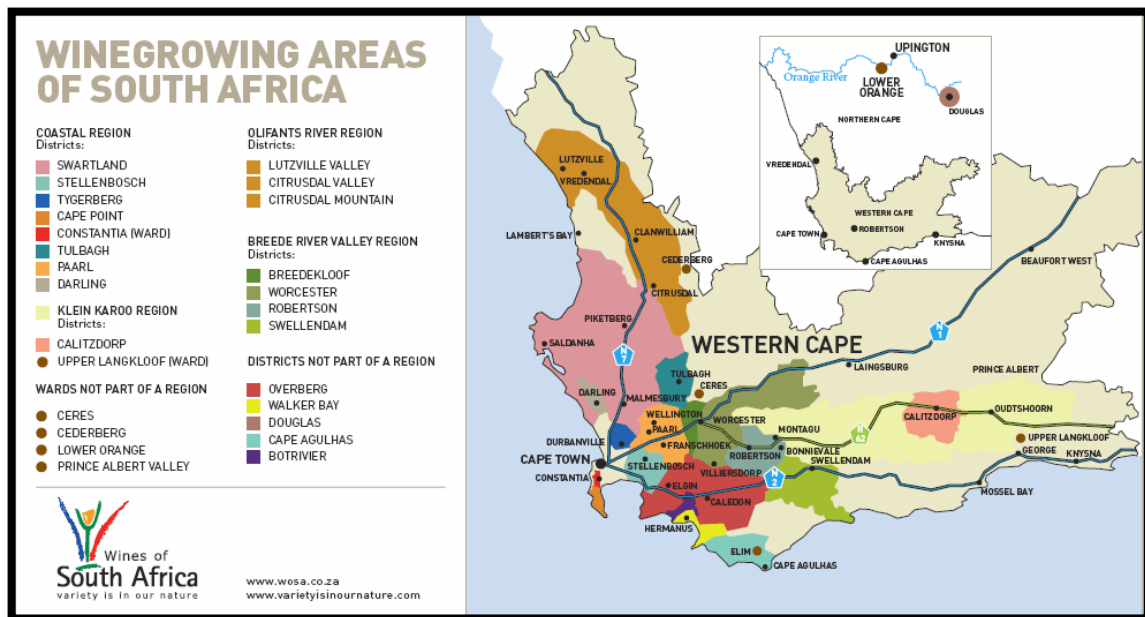


Figure 11: Winegrowing areas of South Africa (sourced from www.wosa.co.za)

Indicate the benefits that the activity has/had for society in general and also indicate what benefits the activity has/had for the local communities where it is located:

The cultivation of table grapes created short-term employment during the construction phase, and long-term employment during the operational phase. The grower (Rooipad Boerdery Pty Ltd) has to employ a large number of workers to harvest the grapes by hand and to sort them during harvest time, and there is a team to ensure the maintenance of the vineyards in general.

Local employment has a positive economic spin-off for the local economy and results in community upliftment through providing for basic needs such as housing and the education of the children of the employed staff.

The export of grapes contributes to the national gross domestic product (GDP).

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical spatial size of the activity as well as associated infrastructure (footprints):	169.5 ha for vineyards; 0.5ha for pipelines.
Indicate the area that has been transformed / cleared to allow for the activity as well as associated infrastructure	169.5 ha for vineyards; 0.5ha for pipelines.
Total area (sum of the footprint area and transformed area)	169.5 ha for vineyards; 0.5ha for pipelines.

5. SITE ACCESS

Was there an existing access road?	YES	NO
If no, what was the distance over which the new access road was built?	<i>m</i>	
Describe the type of access road constructed: [indicate the position of the access road on the site plan.		

The access road is an existing road as shown below in the Google Earth photograph below (refer to Figure 12) and is just under 4 metres wide.

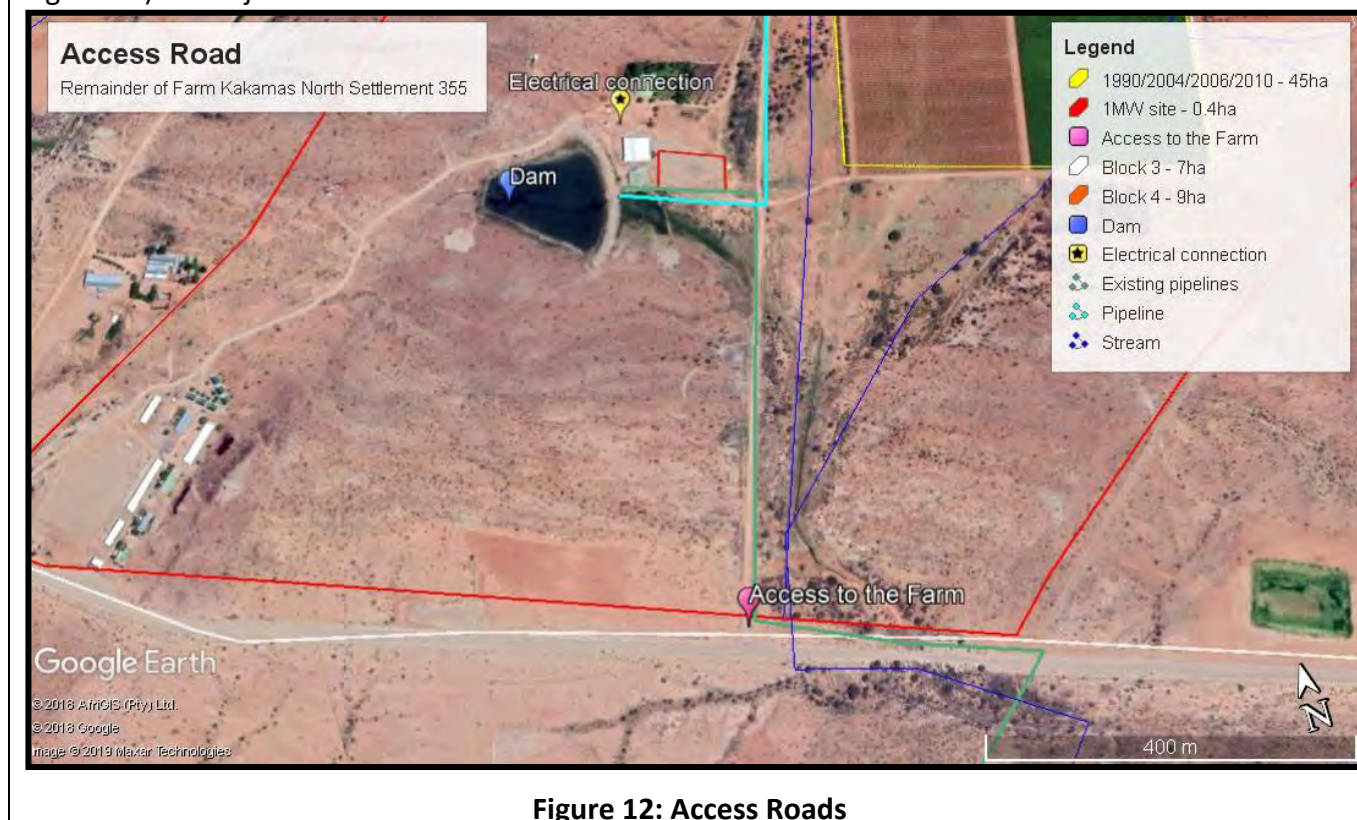


Figure 12: Access Roads

6. SITE PHOTOGRAPHS

Colour photographs of the site and its surroundings (taken of the site and from the site), both before (if available) and after the activity commenced, with a description of each photograph must be attached to this application. The vantage points from which the photographs were taken must be indicated on the site plan, or locality plan as applicable. If available, please also provide past and recent aerial photographs. It should be supplemented with additional photographs of relevant features on the site. Date of photographs must be included. Photographs must be attached under Appendix D to this form.

Historical Aerial photographs dated back to 1990 are provided as Figures 2 to 9, attached at Appendix D1.
Site photographs taken are attached as Appendix D2.

7. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

Please list all legislation, policies and/or guidelines that were or are relevant to this activity.

LEGISLATION	ADMINISTERING AUTHORITY	TYPE Permit/ license/ authorization/comment	DATE (if already obtained):
National Environmental Management Act	Department Environment and Nature Conservation (DENC)	Authorisation	In progress
National Heritage Resources Act	SAHRA	Comment.	In progress
National Water Act	Department of Water and Sanitation	Water Use Licence or General Authorisation	In progress
Conservation of Agricultural Resources Act	Department of Agriculture	Plough Certificate for Water Use Licence; Comment on EIA.	In progress

POLICY/ GUIDELINES	ADMINISTERING AUTHORITY
Guidelines published in terms of NEMA Regulations	Department of Environmental Affairs
Guidelines published in terms of the National Water Act	Department of Water and Sanitation

8. WASTE QUANTITIES (WHERE THE ACTIVITY IS A LISTED WASTE MANAGEMENT ACTIVITY)

THIS SECTION NOT APPLICABLE

Indicate or specify types of waste and list the estimated quantities (expected to be) managed daily (should you need more columns; you are advised to add more)

Hazardous waste	Non-hazardous waste	Total waste handled (tonnes per day)

Source of information supplied in the table above Mark with an "X"

Determined from volumes

Determined with weighbridge/scale

Estimated

Recovery, Reuse, Recycling, treatment and disposal quantities:

Indicate the applicable waste types and quantities expected to be disposed of and salvaged annually:

TYPES OF WASTE	MAIN SOURCE (NAME OF COMPANY)	QUANTITIES		ON-SITE RECOVERY REUSE RECYCLING TREATMENT OR DISPOSAL	OFFSITE RECOVERY REUSE RECYCLING TREATMENT OR DISPOSAL	OFFSITE DISPOSAL
		TONS/MONTH	M ³ /MONTH	method & location	method location and contractor details	

9. GENERAL (WHERE THE ACTIVITY IS A LISTED WASTE MANAGEMENT ACTIVITY)

Prevailing wind direction (e.g. NWW)

November – April	
May - October	

The size of population to be served by the facility

	Mark with "X"	Comment
0-499		
500-9,999		
10,000-199,999		
200,000 upwards		

SECTION C: DESCRIPTION OF RECEIVING ENVIRONMENT

SITE/AREA DESCRIPTION

For linear activities (pipelines etc) as well as activities that cover very large sites, it may be necessary to complete copies of 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. 1, 2, or 3):

1. GRADIENT OF THE SITE

Indicate the general gradient of the site(s) (cross out the appropriate box).

Flat	Flatter than 1:10	1:10 – 1:5	Steeper than 1:5
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2. LOCATION IN THE LANDSCAPE

Indicate the landform(s) that best describes the site (cross out ("☒") the appropriate box(es)).

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front	Other
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3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on or near any of the following [cross out ("☒") the appropriate boxes]?

Shallow water table (less than 1.5m deep)	YES	NO	UNSURE
Seasonally wet soils (often close to water bodies)	YES	NO	UNSURE
Unstable rocky slopes or steep slopes with loose soil	YES	NO	UNSURE
Dispersive soils (soils that dissolve in water)	YES	NO	UNSURE
Soils with high clay content	YES	NO	UNSURE
Any other unstable soil or geological feature	YES	NO	UNSURE
An area sensitive to erosion	YES	NO	UNSURE
Specialist input may be requested by the Department. Information in respect of the above will often be available at the planning Sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used.			

4. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites (cross out ("☒") the appropriate boxes)?

Perennial River	YES	NO	UNSURE
Non-Perennial River (mainly drainage areas and a small stream)	YES	NO	UNSURE
Permanent Wetland	YES	NO	UNSURE
Seasonal Wetland	YES	NO	UNSURE
Artificial Wetland	YES	NO	UNSURE
Estuarine/Lagoonal wetland	YES	NO	UNSURE

The drainage system is classified as an ephemeral course, as it will only flow sporadically after rain. These watercourses are not considered to be seasonal rivers that will regularly contain water in a seasonal pattern.

5. VEGETATION AND GROUNDWATER

5.1 VEGETATION / GROUND COVER (PRE-COMMENCEMENT)

Cross out ("~~☒~~") the block or describe (where required) the vegetation types / groundcover present on the site before commencement of the activity.

Indigenous Vegetation – good condition		Indigenous Vegetation with scattered aliens	X	Indigenous Vegetation with heavy alien infestation	
Describe the vegetation type above: N/A		Describe the vegetation type above: Most of the study site showed Kalahari Karroid Shrubland with some Bushmanland Arid Grassland in the southern parts.		Describe the vegetation type above: N/A	
Provide ecosystem status for above: N/A		Provide ecosystem status for above: Both Kalahari Karroid Shrubland and Bushmanland Arid Grassland are listed as vegetation types of Least Concern (Rouget et al., 2004). The study site also lies in a Critical Biodiversity Area (Oosthuysen & Holness, 2016) with the bulk of the site in a Critical Biodiversity Area 1 (highest priority) and the balance in a Critical Biodiversity Area 2 (moderate priority). (Refer to Appendix F1 showing the CBA status as sourced from bgis.sanbi.org)		Provide Ecosystem status for above: N/A	
Indigenous Vegetation in an ecological corridor or along a soil boundary / interface		Veld dominated by alien species		Distinctive soil conditions (e.g. Sand over shale, quartz patches, limestone, alluvial deposits, termitaria etc.) describe:	
Bare soil		Building or other structure		Sport field	
Other (describe below)		Cultivated land		Paved surface	
<p><u>Vegetation types:</u> Four vegetation types (Mucina & Rutherford, 2006) are found in the Tierkop area:</p> <ul style="list-style-type: none"> • Lower Gariep Broken Veld (NKb 1); • Bushmanland Arid Grassland (NKb 3); • Kalahari Karroid Shrubland (NKb 5); and • Lower Gariep Alluvial (AZa 3). 					

Most of the study site was Kalahari Karroid Shrubland with some Bushmanland Arid Grassland in the southern parts (Figure 13). Only these two vegetation types are described below.

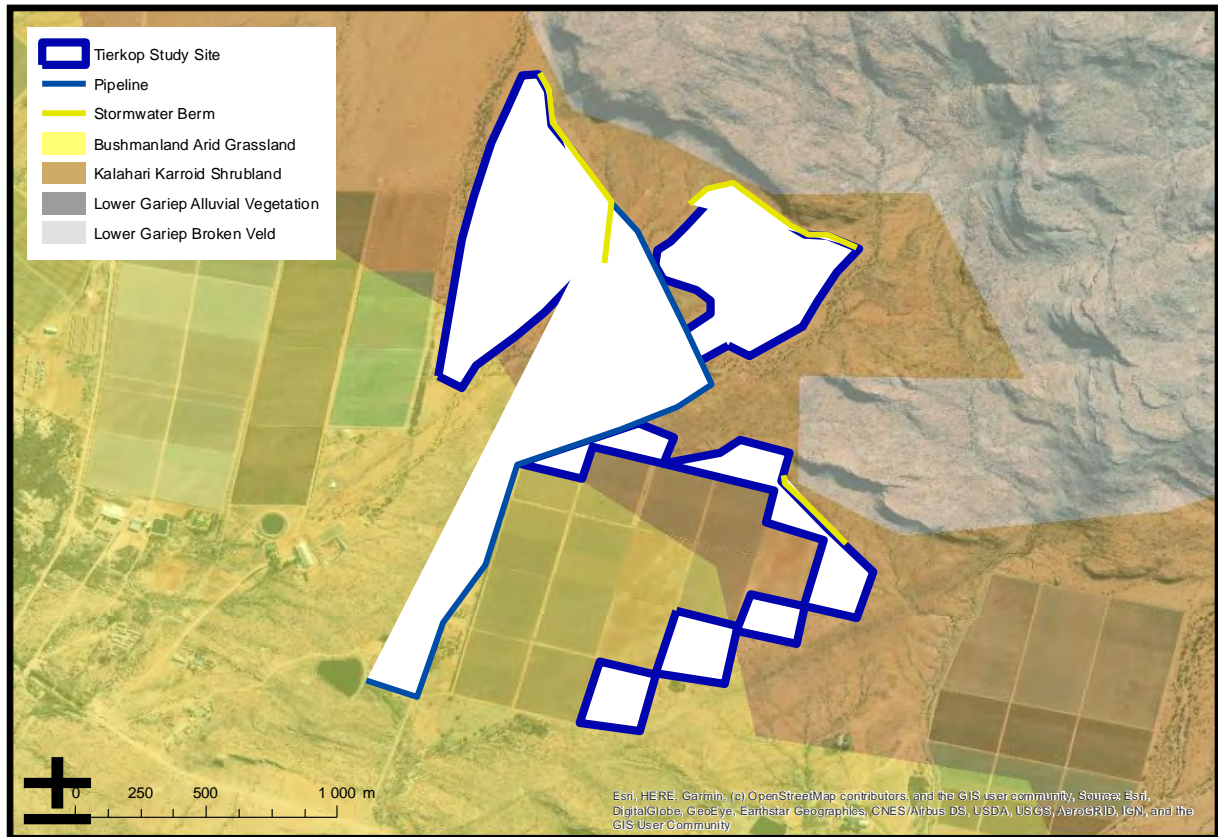


Figure 13: The vegetation types (Mucina & Rutherford, 2006) of the Tierkop study site (on a *DigitalGlobe* image of 26 June 2017).

Both Kalahari Karroid Shrubland and Bushmanland Arid Grassland are listed as vegetation types of Least Concern (Rouget et al., 2004). The study site is some distance from the Augrabies Falls National Park (Figure 14) and is also well outside the latest National Protected Area Expansion Strategy for

South Africa (NPAES of Figure 14; Department of Environmental Affairs, 2016).

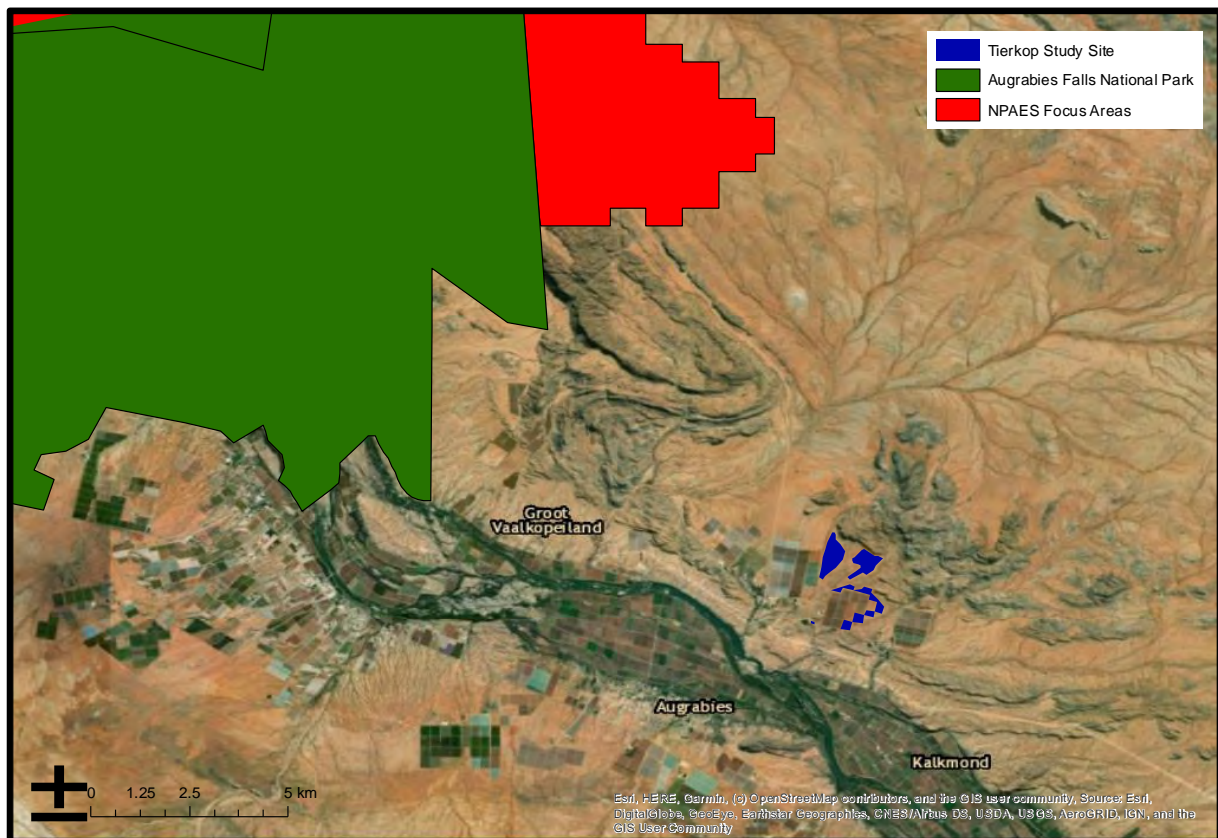


Figure 14: The planned protected areas for the Northern Cape Province of South Africa (Department of Environmental Affairs, 2016).

Critical Biodiversity area:

The study site falls partly within a Critical Biodiversity Area (Figure 15; Oosthuysen & Holness, 2016). The bulk of the proposed development area and the pipeline path falls in a Critical Biodiversity Area 1 (highest priority). The balance of Tierkop is a Critical Biodiversity Area 2 (moderate priority). The high priority Critical Biodiversity Areas in this region are mapped to cover all remaining natural vegetation associated with the Orange River. The positioning of the high priority CBA1 hexagon that includes the vineyards of Tierkop and its neighbours is not ideal, considering the current development situation. It is important that some of the vegetation adjacent to the flood plains of the Orange River should be conserved as a high priority. However, based on this survey, the placement of the particular CBA1 hexagon does not constitute a species-rich patch of vegetation. Tierkop only has 48% of the dominant and important taxa of the two vegetation types found on the site (Appendix). More suitable CBA1 placement would be either west or, preferably, east of the vineyards of Tierkop and its neighbours.

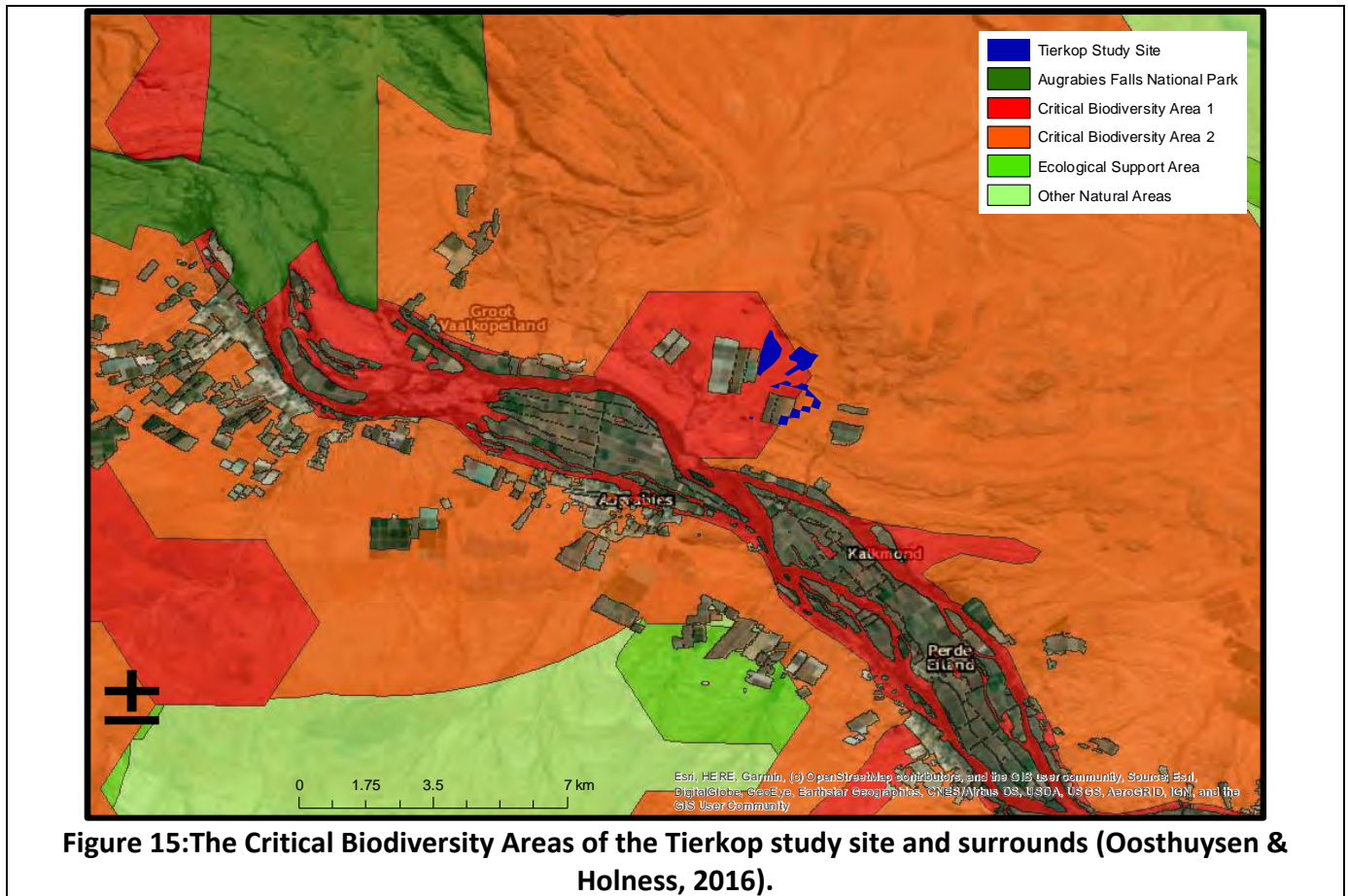


Figure 15: The Critical Biodiversity Areas of the Tierkop study site and surrounds (Oosthuysen & Holness, 2016).

5.2. VEGETATION / GROUND COVER (POST-COMMENCEMENT)

Cross out ("X") the block or describe (where required) the vegetation types / ground cover present on the site after commencement of the activity.

Indigenous Vegetation - good condition		Indigenous Vegetation with scattered aliens		Indigenous Vegetation with heavy alien infestation	
Describe the vegetation type above:		Describe the vegetation type above:		Describe the vegetation type above:	
Provide ecosystem status for above:		Provide ecosystem status for above:		Provide Ecosystem status for above:	
Indigenous Vegetation in an ecological corridor or along a soil boundary / interface		Void dominated by alien species		Distinctive soil conditions (e.g. Sand over shale, quartz patches, limestone, alluvial deposits, termitaria etc.) describe	
Bare soil		Building or other structure		Sport field	
Other (describe below) Pipelines towards cultivated areas.		Cultivated land		Paved surface	

Please note: The Department may request specialist input/studies depending on the nature of the vegetation type / ground cover and impact(s) of the activity/ies. To assist with the identification of the vegetation type and ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (CD) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the **applicant/ EAP's responsibility to ensure that the latest version is used.**

5.3 VEGETATION / GROUND COVER MANAGEMENT

Describe any mitigation/management measures that were adopted and the adequacy of these:

The vegetation was removed, and the brush-cut has been removed. No further mitigation necessary. The area is cultivated with vineyards. Areas around buildings have been cleared, not enough water to landscape around buildings and vineyards. Mitigation measures associated with Stormwater Management is included in the WULA in Appendix H3.

6. THE GEOLOGICAL FORMATIONS UNDERLYING THE SITE

GRANITE
SHALE
SANDSTONE

X

QUARTZITE
DOLOMITE
DOLERITE

OTHER _____

7. LAND USE CHARACTER OF SURROUNDING AREA (PRE-COMMENCEMENT)

Cross out ("X") the block that reflects the past land uses and/or prominent features that occur/red within +/- 500m radius of the site and neighbouring properties if these are located beyond 500m of the site. Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and impact(s) of the activity/ies.

Untransformed area	Low density residential	Medium density residential	High density residential	Informal residential
Retail	Commercial & warehousing	Light industrial	Medium industrial	Heavy industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Tourism & Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical centre	School	Tertiary education facility	Church	Old age home
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)	Airport
Harbour	Sport facilities	Golf course	Polo fields	Filling station
Landfill or waste treatment site	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archaeological site
Other land uses (describe):				

8. REGIONAL PLANNING CONTEXT

Is/was the activity permitted in terms of the property's existing land use rights? Please explain

Yes, Remainder of Kakamas North Settlement No. 355 is zoned as Agriculture.

Is/was the activity in line with the following?

Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
Remainder of Kakamas North Settlement No. 355 is zoned for Agricultural use, and the agricultural activities are in line with the PSDF.			
Urban edge/Edge of Built environment for the area	YES	NO	Please explain
The agricultural activities have taken place outside the urban edge/urban area on land for agricultural use.			
Integrated Development Plan (IDP) of the Local Municipality	YES	NO	Please explain
Remainder of Kakamas North Settlement No. 355 is zoned for Agricultural use, and the agricultural activities are in line with the IDP.			
Spatial Development Framework of the Local Municipality	YES	NO	Please explain
Remainder of Kakamas North Settlement No. 355 is zoned for Agricultural use, and the agricultural activities are in line with the SDF.			
Approved Structure Plan of the Municipality	YES	NO	Please explain
Remainder of Kakamas North Settlement No. 355 is zoned for Agricultural use, and the agricultural activities are in line with the Structure Plan.			
Any other Plans	YES	NO	Please explain

9. SOCIO-ECONOMIC CONTEXT

9.1 SOCIO-ECONOMIC CONTEXT (PRE-COMMENCEMENT)

Describe the pre-commencement social and economic characteristics of the community in order to provide baseline information.

The following information was extracted from the Integrated Development Plan (IDP) of 2014 and summarises the agricultural sector at the time:

The agricultural sector is still the main economic sector making the biggest contribution (51.8 %) to the economy of Kai! Garib in 2010. The agricultural sector is also a major employer in the municipal area, providing 66.5% of all formal employment, and the sector with the largest potential for economic growth. The commercial farmers farm mainly with grapes for export, raisins and wine, while citrus is also becoming more prevalent in the area.

There are three wine cellars in the area at Keimoes, Kakamas and Kanoneiland. High quality table wine is produced at these wine cellars, as well as quality grape juice. Several permanent jobs are created through these wine cellars. Two major raisin export companies (Frut da Sud & Red Sun Raisin) are also established in Kai! Garib Area.

Lucerne, cotton, corn, and nuts are cultivated under irrigation from the Orange River.

The emerging farmers focus more on small stock farming. The Kenhardt area is known for small stock farming, especially dorper sheep. Abattoirs are available at Kenhardt and Kakamas.

Major constraints for agricultural development include poor quality of access roads to and from farms, farming skills amongst the youth and finance for emerging farmers.

Opportunities in the agricultural sector include the expansion of the production of lucerne and citrus, as well as the possible establishment of ostrich farming. Another sector that shows potential within the sector is agritourism, which has not been investigated or explored as yet.

The municipality embarked on a process to become an active facilitator of local economic development when it established a local economic development (LED) strategy with assistance from the Department of Economic Development and Tourism. This strategy was adopted by Council in December 2012.

9.2 SOCIO-ECONOMIC CONTEXT (POST-COMMENCEMENT)

Describe the post commencement social and economic characteristics of the community in order to determine any change.

The following information was extracted from the IDP of 2018/2019 and summarises the agricultural sector currently:

The agricultural sector is still the main economic sector making the biggest contribution to the economy of Kai! Garib in 2010. The agricultural sector is also a major employer in the municipal area in terms of all formal employment. According to Statistics South Africa (Census 2011), about 399 of the households work on crops only; 1382 on livestock only; 222 on mixed farming and 69 on other farming methods. It is also the sector with the largest potential for economic growth. The commercial farmers farm mainly with grapes for export, raisins and wine, while citrus is also becoming more prevalent in the area.

There are three wine cellars in the area at Keimoes, Kakamas and Kanoneiland. High quality table grapes are produced at these cellars, as well as quality grape juice. Several permanent jobs are created through these wine cellars. Two major raisin export companies (Fruit da Sud & Red Sun Raisin) are also established in Kai! Garib area.

Lucerne, cotton, corn, and nuts are cultivated under irrigation from the Orange River.

The emerging farmers focus more on small stock farming. The Kenhardt area is more known for small stock farming, especially the dorper sheep. Abattoirs are available in Kenhardt and Kakamas.

Major constraints for agricultural development include poor quality of access roads to and from farms, farming skills amongst the youth and finance for emerging farmers.

Opportunities in the agricultural sector include the expansion of the production of lucerne and citrus, as well as the possible establishment of ostrich farming. Another sector that shows potential within the sector is agritourism, which has not been investigated or explored as yet.

Rooipad Boerdery (Pty) Ltd Empowerment within the company:

The Rooipad Boerdery (Pty) Ltd strives to remain the frontrunners of the industry through continued focus on the competitive edge, diversification, strategic management and optimal use of water and other resources.

The Rooipad Boerdery (Pty) Ltd firmly believes in the empowerment of its employees: not only by means of financial and land ownership, and senior management positions, but also through promotion, wider responsibilities given to people on the lowest possible level, and a sense of ownership for what you do in any position you might occupy.

The Rooipad Boerdery (Pty) Ltd provides seasonal and permanent employment for a large community of people in one of South Africa's poorest regions. All workers share in benefits such as training and development programmes which are offered in association with various institutions. Development programmes and projects are directed towards all workers and their families, including seasonal workers irrespective of their worker status.

Training and career planning are both initiated for each permanent worker, ensuring that workers have a clear vision of their future and are able to plan their future in the company. Vacancies are always advertised internally, and continuous training and development are undertaken to ensure that workers are equipped with the basic skills for the next level for which they might qualify.

Social and other benefits are offered to the large community of people working within the group. This includes preschool care, bursary and study schemes for children of workers, health care and housing for both permanent staff and temporary workers.

Community involvement projects facilitated include crèche facilities on all farms; social skills training workshops to enhance family and social life; leadership training; low interest student loans to parents; housing for employees staying on farms; a comprehensive healthcare plan through clinics on the various farms; recreation facilities and transport that allow staff to attend sport and other social activities; and spiritual counselling.

Rooipad Boerdery (Pty) Ltd realises the importance of ensuring that the basic needs of the people who work for the company are met, with specific focus on clean water, decent housing, medical services and bonuses for top performers.

The importance of a balance between career and social development is continuously emphasised and the company spends ample resources to facilitate and develop both.

Relationships are built with workers in order to create trust and security. This applies especially to seasonal workers and is executed in practice through new developments relating to different fruit, different regions and different seasons in order to ensure longer working periods for seasonal workers who are in need of prolonged contracts to supply them with a more stable source of income.

The training department plays a major role in achieving productivity and sound human relations by ensuring that a full-scale training programme takes place throughout the year. Learnerships are an important part of the programme to aid workers in getting a formal national qualification combined with their practical skills.

The HIV/AIDS programme includes regular training and is supported by a full-time co-ordinator, health workers and production managers. Counselling, vitamins, and medication are provided to workers to improve their quality of life.

10. CULTURAL/HISTORICAL FEATURES

		YES	NO
Were there any signs or evidence (unearthed during construction) of culturally or historically significant elements including archaeological or palaeontological sites, on or in close proximity to the site?		UNCERTAIN	
If YES, explain:	<p>Sections of the site has entirely been transformed with agricultural activities and therefore possibility of any further finds is scarce.</p> <p>A Palaeontological Impact Assessment (PIA), see Appendix H5: Archaeological Assessment desktop study has been conducted by consulting palaeontologist Dr John Almond of Natura Viva cc. (see Appendix H6: Palaeontology Assessment).</p> <p>In terms of Section 38 (1) (c) (iii) of the National Heritage Resources Act 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) of the proposed project is required if the footprint area of the development is more than 5000 m² in extent.</p> <p>The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance included artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.</p>		
If uncertain, the Department may request that specialist input be provided to establish whether such possibilities occurred on or close to the site.			
Briefly explain the findings of the specialist if one was already appointed:	<p><u>Archaeological findings:</u> One or two marginal scatters (outside the proposed development footprint area), and a limited number of Later Stone Age and Middle Stone Age tools were recorded during a field assessment which took place in June 2019. The very small numbers and transformed context in which they were found means that the archaeological resources have been graded as having low (Grade 3C) significance.</p> <p><u>Built environment/historical structures:</u> In terms of the built environment, no old buildings, historical structures or features, or any old equipment were found in the proposed footprint area.</p> <p><u>Graves:</u> No graves or typical grave features were encountered during the study.</p> <p><u>Impact statement:</u> Overall, the results of the study indicate that the proposed activity (i. e. a new vineyard development), including construction of a small PV package plant, will not have an impact of great significance on the archaeological heritage.</p> <p><u>Conclusion:</u> Indications are that, in terms of archaeological heritage, the receiving environment is not a sensitive or threatened landscape.</p> <p>The impact significance of the proposed development on archaeological heritage is assessed as LOW and therefore there are no objections to the authorization of the proposed development.</p> <p><u>Recommendations:</u> No mitigation is required prior to proposed development activities commencing.</p>		

No archaeological monitoring is required.		
Palaeontology findings: In view of the negligible palaeontological sensitivity of the ancient Precambrian bedrocks as well as the low sensitivity of the geologically recent superficial sediments along the Orange River in the Augrabies-Kakamas North region, the proposed agricultural development – including new vineyards and small PV plant – is not considered to pose a significant threat to palaeontological heritage. Substantial, potentially fossiliferous older alluvial deposits of the Orange River are not mapped here.		
Were any buildings or structures older than 60 years affected in any way?	YES	NO
Was it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO
If yes, please submit or, make sure that the applicant or a specialist submit the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application.		

SECTION D: PRELIMINARY IMPACT ASSESSMENT

Please note, the impacts identified below refer to general impacts commonly associated with development activities. The list below is not exhaustive and may need to be supplemented. Where required, please append the information on any additional impacts to this application.

1. WASTE, EFFLUENT AND EMISSION MANAGEMENT

(a) Solid waste management

Did/does the activity produce any general waste (e.g. domestic-, commercial-, certain industrial waste, including building rubble also known as solid waste) during the construction phase <u>and/or</u> the operational phase?	YES	NO
If yes, briefly describe what type of waste was produced (i.e. green waste, building rubble, etc.) in which phase.		
Construction phase: A small amount of construction related waste associated with vineyards would have been generated, such as cement bags, paint tins, etc.		
Operational phase: Operational waste is limited to broken materials associated with the farming activities, and with solid waste associated with food eaten by the farm workers.		
What quantity was/is produced during the construction period?	App. 2	m ³
What was/is the estimated quantity that will be produced per month during the operational phase?	Negligible	m ³

Did/does the activity produce any <u>hazardous</u> waste (e.g. chemical, medical waste, infectious, nuclear etc.) during the construction <u>and/or</u> the operational phase?	YES	NO
If yes, briefly describe what type of waste was produced (i.e. infectious waste, medical waste, etc.) in which phase.		
What quantity was/is produced during the construction period?		m ³
What was/is the estimated quantity that will be produced per month during the operational phase?		m ³

Where and how was/is waste treated / disposed of (describe each waste stream)?		
Very little solid waste is produced by farm workers and general farming activities.		
General solid waste collection and disposal by the municipality will be confirmed during the public consultation process.		

Has the municipality or relevant authority confirmed that sufficient capacity exists for treating / disposing of the solid waste to be generated by this activity(ies)? If yes, provide written confirmation from municipality or relevant authority	YES	NO
Does/did the activity produce solid waste that was/will be treated and/or disposed of at another facility other than into a municipal waste stream?	YES	NO
If yes, did/has this facility confirmed that sufficient capacity exists for treating / disposing of the solid waste to be generated by this activity(ies)? Provide written confirmation from the facility and provide the following particulars of the facility:	YES	NO
Did/does the facility have an operating license? (If yes, please attach a copy of the license.)	YES	NO
Facility name:		
Contact person:		
Postal address:		
	Postal code:	
Telephone:	Cell:	
E-mail:	Fax:	

(b) Effluent

Did/does the activity produce sewage and or any other effluent?	YES	NO
What was/is the estimated quantity produced per month?	870 m ³ /month	
Was/is the effluent treated and/or disposed of in a municipal system?	YES	NO
If Yes, did/has the Municipality or relevant authority confirmed that sufficient unallocated capacity exists for treating/disposing of the sewage or any other effluent generated by this activity(ies)? Provide written confirmation from the Municipality or relevant authority.	N/A	
Was/is any effluent produced be treated and/or disposed of onsite?	YES	NO
If yes, briefly describe the nature of the effluent and how it was/will be disposed of:	All sewerage is collected via a conservancy tank.	
Did/does the activity produce effluent that was/will be treated and/or disposed of at another facility?	YES	NO
If yes, did/has this facility confirmed that sufficient capacity exists(ed) for treating / disposing of the liquid effluent generated by this activity(ies)? Provide written confirmation from the facility and provide the following particulars of the facility:	YES	NO
Does the facility have an operating license? (If yes, please attach a copy of the license.)	YES	NO
Facility name:		
Contact person:		
Postal address:		
	Postal code:	
Telephone:	Cell:	
E-mail:	Fax:	

Describe the measures that was/will be taken to ensure the optimal reuse or recycling of wastewater, if any:

(c) Emissions into the atmosphere

Did/does the activity produce emissions that will be disposed of into the atmosphere?	YES	NO
If yes, did/does it require approval in terms of relevant legislation? If yes, attach a copy to this application	YES	NO
Describe the emissions in terms of type and concentration and how it was/will be treated/mitigated:		

(d) Describe any mitigation/management measures that were adopted and the adequacy of these:

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2. WATER USE

(a) Please indicate the source(s) of water for the activity by crossing out ("X") the appropriate box(es)

Municipal	Water Board –	Groundwater	River, Stream, Dam or Lake	Other	The activity did/does not use water
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	Kakamas WUA				
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If water was/is extracted from a groundwater source, river, stream, dam, lake or any other natural feature, please indicate the volume that was/is extracted per month: m³

Please provide proof of assurance of water supply, e.g. letter of confirmation from Municipality/water user associations, yield of borehole etc. **Remainder of Kakamas North Settlement No. 355, has existing rights for 50 ha (750 000m³/a), see Appendix E1 the letter from the Kakamas Water Users Association. The applicant recently obtained and additional rights of 145 ha (2 176 782 m³/a), as per the license included in Appendix E1. Therefore, according to the existing license, dated 22 March 2019 (Amended in 31 July 2019) and existing rights the applicant has 195 ha (2 926 782 m³/a).**

As part of this application there will be a Water Use License Application for Section 21(c) and (i) of the National Water Act for the streams that were diverted and crossed as part of the illegal establishment of vineyards. The establishment of the vineyards on Remainder of Kakamas North Settlement 355 took place across small sections of the unnamed drainage system that is located on site. The site falls within the Catchment Region D81A. The drainage channel system is located in a sub-catchment that is unnamed, D81A-03245. The unnamed sub-catchment is not really a river but fits more the description of a mostly dry drainage line.

The WULA application is summarised in the table below for the following water usages:

(c) impeding or diverting flow of water in a watercourse	For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas.
(i) altering the bed, banks, course or characteristics of a watercourse	For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas.

Did/does the activity require a water use permit/license from DWAF? If yes, attach a copy to this application	YES	NO
If yes, please submit the necessary application to Department of Water Affairs and Forestry and attach proof thereof to this application.		

(b) Describe any mitigation/management measures that were adopted and the adequacy of these:

The pumps are selected to provide optimum delivery at minimum demand where water use is managed by applying drip irrigation. This is good agricultural practice.

3. POWER SUPPLY

(a) Please indicate the source of power supply e.g. municipality/Eskom/renewable energy source.

There is an existing Eskom power supply on Remainder of Kakamas North Settlement 355. However, the applicant is applying for the construction of a 1MW PV Plant.

Has the Municipality or relevant service provider confirmed that sufficient electricity capacity (i.e. generation, supply and transmission) exist for activity(ies)? This will be included in the S24G Assessment Report. If yes, provide written confirmation from Municipality or relevant service provider.	YES	NO
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If power supply was/is not available, where was/is it sourced from?

Electricity is supplied by powerline to the cultivated areas from the existing grid.

(b) Describe any mitigation/management measures that were adopted and the adequacy of these:

The pumps utilised are selected based on their optimum delivery at minimum demand, and there are no other types of pumps available for this type of irrigation.

4. ENERGY EFFICIENCY

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

The pumps utilised are selected based on their optimum delivery at minimum demand, and there are no other types of pumps available for this type of irrigation.

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

Drip irrigation utilises less energy (and water) than spray irrigation.

5. NOISE IMPACTS

(a) Did/does the activity result in any noise impacts?	YES	NO
If yes, please describe and indicate the measures implemented to mitigate and manage these impacts?		

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential noise impact(s) of the activity/ies.

6. VISUAL IMPACTS

(a) Did/does the activity result in any visual impacts?	YES	NO
If yes, please describe and indicate the measures implemented to mitigate and manage these impacts?		
The site is not situated close to a road or adjacent homesteads.		
(b) Did/does the activity result in potential lighting impacts at night?	YES	NO
If yes, please describe and indicate the measures implemented to mitigate and manage these impacts?		
No, this is an agricultural development.		
(c) Were/are there any alternatives available to address this impact?	YES	NO
If yes, please describe these alternatives?		
N/A		

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential visual impact(s) of the activity/ies.

7. SOCIO-ECONOMIC IMPLICATIONS OF THE ACTIVITY

(a) What was/is the expected capital value of the activity on completion?	R15 000 000
(b) What was/is the expected yearly income or contribution to the economy that will be generated by or as a result of the activity?	R55 000 000
(c) Did/does the activity contribute to service infrastructure?	YES NO
(d) How many permanent new employment opportunities were created?	10 permanent workers and 800 seasonal from Sept to March, when in full production
(e) What was/is the expected current value of the employment opportunities to date?	R3 984 935

(f) What percentage of this accrued to previously disadvantaged individuals?	95%
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How was(is) this (to be) ensured and monitored (please explain):
As far as possible selecting contractors using local labour.

8. PRELIMINARY IMPACT ASSESSMENT

Briefly describe the impacts (as appropriate), significance rating of impacts and significance rating of impacts after mitigation. This must include an assessment of the significance of all impacts. Please note: This is a preliminary impact statement. The Department may request specialist input/studies depending on the type and nature of the impact(s) of the activity/ies.

Possible Impacts	Significance rating of impacts after mitigation (Low, Medium, Medium-High, High, Very High):
Loss of indigenous vegetation	Low negative
Loss of non-perennial drainage lines	Medium negative
Water required for irrigation	Medium negative
Visual	Low negative
Noise	Low negative
Cultural	None
Employment creation	Medium to high positive
Production of table grapes for export market	Medium to high positive

Refer to the preliminary impact rating tables below.

Preliminary impacts that resulted from the construction phase:

Impacts on geographical and physical aspects:	
Nature of impact:	Removal of 169.5 ha of disturbed indigenous vegetation on Remainder of Kakamas North Settlement 355 located within a CBA2 area and CBA1 area.
Extent and duration of impact:	Local extent and long-term duration
Probability of occurrence:	High
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	The conclusions made here have been made after the clearing of the vegetation. This presents significant limitations. With those limitations in mind, the general conclusions reached are that given the location of the site within a terrestrial Critical Biodiversity Area 2 and ESA, and considering available information and evidence (disturbance regime, least threatened vegetation type etc.) the impact of the clearing for the vineyards is low negative. The rating would have been medium negative if the area was completely undisturbed prior to clearing.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative
Degree to which the impact can be mitigated:	None
Proposed mitigation:	No mitigation is available for the activity that has already taken place.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative

Impacts on geographical and physical aspects:	
Nature of impact:	Loss of non-perennial drainage lines: impeding the flow of water in a watercourse and altering the beds, banks, course and characteristics of the watercourses within the project area through cultivation of vineyards.
Extent and duration of impact:	Local extent and long-term duration
Probability of occurrence:	High
Degree to which the impact can be reversed:	Impact cannot be reversed
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	Medium
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium negative
Degree to which the impact can be mitigated:	None
Proposed mitigation:	No mitigation is available for the activity that has already taken place. An application will be lodged with DWS for Sections 21 (c) and (i) for the new areas.
Cumulative impact post mitigation:	Medium
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium negative

Impacts on geographical and physical aspects:	
Nature of impact:	Loss of non-perennial drainage lines: impeding the flow of water in a watercourse and altering the beds, banks, course and characteristics of the watercourses within the project area for the development of pipelines.
Extent and duration of impact:	Local extent and long-term duration
Probability of occurrence:	High
Degree to which the impact can be reversed:	Impact cannot be reversed
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	Medium
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium negative
Degree to which the impact can be mitigated:	None
Proposed mitigation:	<ul style="list-style-type: none"> • The mitigation is the construction of pipelines through the streams via manual labour. • Construction during dry periods.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative

Impacts on socio-economic aspects:	
Nature of impact:	Job creation
Extent and duration of impact:	Local extent and short-term duration are dependent on the lifespan of the agricultural activities (some will be long term and others will be seasonally linked).
Probability of occurrence:	High
Degree to which the impact can be reversed:	The impact is positive
Degree to which the impact may cause irreplaceable loss of resources:	None
Cumulative impact prior to mitigation:	Job creation to local communities
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium negative prior to job creation
Degree to which the impact can be mitigated:	The activity is mitigation
Proposed mitigation:	The activity is mitigation
Cumulative impact post mitigation:	Job creation to local communities
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium positive with job creation

Impacts on cultural-historical aspects:	
Nature of impact:	In the case of a proposed Tierkop/Rooipad vineyard and PV development on Farm Tierkop/Rooipad (belonging to Rooipad Boerdery Pty Ltd), it is expected that impacts on pre-colonial archaeological heritage and historical heritage resources will be low.
Extent and duration of impact:	Permanent site-specific impact.
Probability of occurrence:	Probable
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	None

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> • No mitigation is required prior to proposed development activities commencing. • No archaeological monitoring is required.
Cumulative impact post mitigation:	Low negative
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Impacts on cultural-historical aspects:	
Nature of impact:	In view of the negligible palaeontological sensitivity of the ancient Precambrian bedrocks, as well as the low sensitivity of the geologically recent superficial sediments along the Orange River in the Augrabies – Kakamas North region, the proposed agricultural development – including new vineyards and small PV plant - is not considered to pose a significant threat to palaeontological heritage. Substantial, potentially fossiliferous older alluvial deposits of the Orange River are not mapped here.
Extent and duration of impact:	Permanent site-specific impact
Probability of occurrence:	Probable
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	None
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> • All South African fossil heritage is protected by law (South African Heritage Resources Act, 1999) and fossils cannot be collected, damaged or disturbed without a permit from SAHRA or the relevant Provincial Heritage Resources Agency; • The palaeontologist concerned with potential mitigation work will need a valid fossil collection permit from SAHRA, and any material collected would have to be curated in an approved depository (e.g. museum or university collection); • All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (e.g. data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies developed by SAHRA (2013).
Cumulative impact post mitigation:	Low negative
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Noise impacts:	
Nature of impact:	General noise associated with clearing of land

Extent and duration of impact:	Local extent, long-term duration
Probability of occurrence:	High
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	None
Cumulative impact prior to mitigation:	Noise pollution of low impact, as area is agricultural with no adjacent neighbours in close proximity. The area falls within an active agricultural area, and the impact will not be very big.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium negative
Degree to which the impact can be mitigated:	Low
Proposed mitigation:	Restrict working hours from 06:00 to 20:00. The area falls within an active agricultural area and the impact will not low due to lack of receptors (people).
Cumulative impact post mitigation:	Noise of short-term duration during construction phase with negligible cumulative impact.
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative

Visual impacts / Sense of Place:	
Nature of impact:	The removal of vegetation for the establishing of the vineyards.
Extent and duration of impact:	Local extent, long-term duration.
Probability of occurrence:	High
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	None, the cleared areas although visible to passing traffic from the main road would be temporary during construction phase.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative
Degree to which the impact can be mitigated:	Low: the activity already took place
Proposed mitigation:	None: the activity already took place
Cumulative impact post mitigation:	None. The cleared areas, although visible to passing traffic from the main road, would be temporary during construction phase.
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative

Preliminary Impacts that result from the Operational Phase:

Impacts on the geographical and physical aspects:	
Nature of impact:	Vegetation has been cleared for the vineyards, and drainage lines cultivated. Therefore this impact is not further rated.
Extent and duration of impact:	
Probability of occurrence:	
Degree to which the impact can be reversed:	
Degree to which the impact may cause irreplaceable loss of resources:	
Cumulative impact prior to mitigation:	

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	
Degree to which the impact can be mitigated:	
Proposed mitigation:	
Cumulative impact post mitigation:	
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	

Impacts on the socio-economic aspects:	
Nature of impact:	Job creation
Extent and duration of impact:	Local extent and duration are dependent on the lifespan of the agricultural activities (some will be long term and other will be seasonally linked).
Probability of occurrence:	High
Degree to which the impact can be reversed:	The activity is positive
Degree to which the impact may cause irreplaceable loss of resources:	None
Cumulative impact prior to mitigation:	Additional job opportunities created for new agricultural activity.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	None
Degree to which the impact can be mitigated:	None
Proposed mitigation:	None: the activity is positive
Cumulative impact post mitigation:	None
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	None

Impacts on socio-economic aspects:	
Nature of impact:	Financial income to Rooipad Boerdery Pty Ltd and region.
Extent and duration of impact:	Region
Probability of occurrence:	High
Degree to which the impact can be reversed:	None, the impact is positive.
Degree to which the impact may cause irreplaceable loss of resources:	None, the impact is positive.
Cumulative impact prior to mitigation:	Financial income to the company and the country by selling of produce nationally and internationally.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	None
Degree to which the impact can be mitigated:	None, the impact is positive.
Proposed mitigation:	None
Cumulative impact post mitigation:	Financial income to the company and the country by selling of produce nationally and internationally.
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	None

Nature of impact:	In the case of a proposed Tierkop/Rooipad vineyard and PV development on Farm Tierkop/Rooipad (belonging to Rooipad Boerdery Pty Ltd), it is expected that impacts on pre-colonial archaeological heritage and historical heritage resources, will be low.
Extent and duration of impact:	Permanent site-specific impact
Probability of occurrence:	Probable
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low

Cumulative impact prior to mitigation:	None
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative
Degree to which the impact can be mitigated:	High
Proposed mitigation:	
Cumulative impact post mitigation:	Low negative
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Impacts on cultural-historical aspects:	
Nature of impact:	In view of the negligible palaeontological sensitivity of the ancient Precambrian bedrocks as well as the low sensitivity of the geologically recent superficial sediments along the Orange River in the Augrabies-Kakamas North region, the proposed agricultural development – including new vineyards and small PV plant – is not considered to pose a significant threat to palaeontological heritage. Substantial, potentially fossiliferous older alluvial deposits of the Orange River are not mapped here.
Extent and duration of impact:	Permanent site-specific impact
Probability of occurrence:	Probable
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	None
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Should substantial fossil remain - such as vertebrate bones and teeth, or petrified logs of fossil wood - be encountered at surface or exposed during construction, the ECO should safeguard these, preferably <i>in situ</i> . They should then alert the relevant provincial heritage management authority as soon as possible - i.e. SAHRA (contact details: Dr Ragna Redelstorff, SAHRA, P.O. Box 4637, Cape Town 8000. Tel: 021 202 8651; e-mail: rredelstorff@sahra.org.za). This is to ensure that appropriate action (i.e. recording, sampling or collection of fossils, recording of relevant geological data) can be taken by a professional palaeontologist at the developer's expense. A tabulated Chance Fossil Finds Procedure is appended to this report.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Noise impacts:	
Nature of impact:	General noise associated with agricultural activities
Extent and duration of impact:	Local extent, long-term duration
Probability of occurrence:	High
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	None

Cumulative impact prior to mitigation:	Localised noise pollution. The area falls within an agricultural active area and any noise generation is generally seasonal when the entire area is busy with harvesting.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium negative
Degree to which the impact can be mitigated:	Low
Proposed mitigation:	The area falls within an agricultural active area and any noise generation is generally seasonal when the entire area is busy with harvesting. No mitigation necessary.
Cumulative impact post mitigation:	The area falls within an agricultural active area and any noise generation is generally seasonal when the entire area is busy with harvesting.
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative

Visual impacts / Sense of Place:	
Nature of impact:	The new vineyards have changed the sense of place, but the nature of impact is limited within the existing established agricultural landscape of the region.
Extent and duration of impact:	Local extent, long-term duration
Probability of occurrence:	High
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	The new vineyards have changed the sense of place, but the nature of impact is limited within the existing established agricultural landscape of the region.
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative
Degree to which the impact can be mitigated:	Low: the activity already took place.
Proposed mitigation:	None: the activity already took place.
Cumulative impact post mitigation:	The new vineyards have changed the sense of place, but the nature of impact is limited within the existing established agricultural landscape of the region.
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low negative

Impacts that may result from the decommissioning and closure phase:

The agricultural activities will not be decommissioned in the near future and impacts associated with this phase have not been assessed.

Rehabilitation of the site would include the removal of all newly planted orchards to make way for the rehabilitation of the 55ha with indigenous vegetation present at surrounding areas. This would result in a major financial loss for the applicant as well as the loss of employment opportunities for employees currently working for the applicant. Water that would have been used for the vineyards would now have to be used to water the rehabilitated vegetation until the area is self-sustainable. The water rights are for irrigation only.

Not applicable

ASSESSMENT CRITERIA:

The criteria for the description and assessment of environmental impacts were drawn from the National Environmental Management Act, 1998 (Act No.107 of 1998).

The level of detail was somewhat fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed it is necessary to establish a rating system, which is consistent throughout all criteria. For such purposes each aspect was assigned a value, ranging from 1-5, depending on its definition.

H-2.1 Potential Impact

This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. Its description should include what is being affected and how it is being affected.

H-2.2 Extent

The physical and spatial scale of the impact is classified as:

Local

The impacted area extends only as far as the activity, e.g. a footprint.

Site

The impact could affect the whole, or a measurable portion of the site.

Regional

The impact could affect the area including the neighbouring erven, the transport routes and the adjoining towns.

H-2.3 Duration

The lifetime of the impact, which is measured in relation to the lifetime of the proposed base?

Short term

The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than any of the phases.

Medium term

The impact will last up to the end of the phases, where after it will be entirely negated.

Long term

The impact will continue or last for the entire operational lifetime of the Development, but will be mitigated by direct human action or by natural processes thereafter.

Permanent

This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

H-2.4 Intensity

The intensity of the impact is considered here by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. These are rated as:

Low

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

Medium

The affected environment is altered, but functions and processes continue, albeit in a modified way.

High

Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

H-2.5 Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

Improbable

The possibility of the impact occurring is none, due either to the circumstances, design or experience.

Possible

The possibility of the impact occurring is very low, due either to the circumstances, design or experience.

Likely

There is a possibility that the impact will occur to the extent that provisions must therefore be made.

Highly Likely

It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity.

Definite

The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on.

H-2.7 Determination of Significance – With Mitigation

Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. In this case the prediction refers to the foreseeable significance of the impact after the successful implementation of the suggested mitigation measures. Significance with mitigation is rated on the following scale:

No significance

The impact will be mitigated to the point where it is regarded to be insubstantial.

Low

The impact will be mitigated to the point where it is of limited importance.

Low to medium

The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

Medium

Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

Medium to high

The impact is of great importance. Through implementing the correct mitigation measures the negative impacts will be reduced to acceptable levels.

High

The impact is of great importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.

SECTION E: LANDFILL PARAMETERS (WHERE APPLICATION RELATES TO A WASTE MANAGEMENT ACTIVITY)

THIS SECTION IS NOT APPLICABLE TO THIS APPLICATION

1. THE METHOD OF DISPOSAL OF WASTE:

Land-building Landfilling Both

2. THE DIMENSIONS OF THE DISPOSAL SITE IN METRES

	At commencement	After rehabilitation
Height/Depth		
Length		
Breadth		

3. THE TOTAL VOLUME AVAILABLE FOR THE DISPOSAL OF WASTE ON THE SITE:

Volume Available	Mark with "X"	Source of information (Determined by surveyor/ Estimated)
Up to 99		
100-34 999		
35 000- 3,5 million		
>3,5 million		

4. THE TOTAL VOLUME ALREADY USED FOR WASTE DISPOSAL:

(a) Will the waste body be covered daily	<table border="1"><tr><td>YES</td><td>NO</td></tr></table>	YES	NO
YES	NO		
(b) Is sufficient cover material available	<table border="1"><tr><td>YES</td><td>NO</td></tr></table>	YES	NO
YES	NO		
(c) Will waste be compacted daily	<table border="1"><tr><td>YES</td><td>NO</td></tr></table>	YES	NO
YES	NO		

If the answers (a) and/or (b) are No, what measures will be employed to prevent the problems of burning or smouldering of waste and the generation of nuisance?

5. THE SALVAGE METHOD

Mark with an "X" the method to be used.

At source	<input type="checkbox"/>
Recycling installation	<input type="checkbox"/>
Formal salvaging	<input type="checkbox"/>
Contractor	<input type="checkbox"/>
No salvaging planned	<input type="checkbox"/>

6. FATAL FLAWS FOR THE SITE:

Indicate which of the following apply to the facility for a waste management activity:

Within a 3000m radius of the end of an airport landing strip	<table border="1"><tr><td>YES</td><td>NO</td></tr></table>	YES	NO
YES	NO		
Within the 1 in 50-year flood line of any watercourse	<table border="1"><tr><td>YES</td><td>NO</td></tr></table>	YES	NO
YES	NO		

Within an unstable area (fault zone, seismic zone, dolomitic area, sinkholes)	YES	NO
Within the drainage area or within 5 km of water source	YES	NO
Within an area with shallow and/or visible water table	YES	NO
Within an area adjacent to or above an aquifer	YES	NO
Within an area with shallow bedrock and limited available cover material	YES	NO
Within 100 m of the source of surface water	YES	NO
Within 1 km from the wetland	YES	NO
Indicate the distance to the boundary of the nearest residential area	_____metres	
Indicate the distance to the boundary of the industrial area	_____metres	

Wettest six months of the year

November–April	
May–October	

For the wettest six-month period indicated above, indicate the following for the preceding 30 years

	Total rainfall for 6 months	Total A-pan evaporation for 6 months	Climatic water balance
For the 1 st wettest year			
For the 2 nd wettest year			
For the 3 rd wettest year			
For the 4 th wettest year			
For the 5 th wettest year			
For the 6 th wettest year			
For the 7 th wettest year			
For the 8 th wettest year			
For the 9 th wettest year			
For the 10 th wettest year			

7. LOCATION AND DEPTH OF GROUND WATER MONITORING BOREHOLES:

Codes of boreholes	Borehole locality	Depth (m)	Latitude	Longitude
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SECTION F: PROPOSED PUBLIC PARTICIPATION

7.1. PUBLIC PARTICIPATION PROCESS

The person conducting the public participation process must fulfil the requirements outlined in Chapter 6 of the 2014 NEMA EIA Regulations and must take into account any applicable guidelines published in terms of Section 24J of NEMA, as well as any other guidance provided by the Department.

Please highlight the appropriate box below to indicate the public participation process that has been or is proposed to be undertaken, including exemptions that have been/will be applied for:

1. In terms of regulation 41 of the EIA Regulations, 2014 -			
(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of -			
(i) the site where the activity to which the application relates is or is to be undertaken; and	YES	EXEMPTION	
(ii) any alternative site	YES	EXEMPTION	
(b) giving written notice, in any manner provided for in section 47D of the NEMA, to -			
(i) the occupiers of the site and, if the applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	YES	EXEMPTION	N/A
(ii) owners, persons in control of, 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;	YES	EXEMPTION	
(iii) 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;	YES	EXEMPTION	
(iv) the municipality (Local and District Municipality) which has jurisdiction in the area;	YES	EXEMPTION	
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and	YES	EXEMPTION	
(vi) any other party as required by the Department;	YES	EXEMPTION	N/A
(c) placing an advertisement in -			
(i) one local newspaper; or	YES	EXEMPTION	
(ii) any official <i>Gazette</i> that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	YES	EXEMPTION	N/A
(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 district municipality in which it is or will be undertaken	YES	EXEMPTION	N/A
(e) using reasonable alternative methods, as agreed to by the Department, in those instances where a person is desirous of but unable to participate in the process due to—	YES	EXEMPTION	N/A
(i) illiteracy; (ii) disability; or (iii) any other disadvantage.			

If you have indicated that “EXEMPTION” applies to any of the above, then a separate Application for Exemption must be submitted.		
2. The NEM: AQA and NEM:WA requires that a notice must be placed in at least two newspapers. NOT APPLICABLE		
If applicable, have/will an advertisement be placed in at least two newspapers?	YES	NO
If “NO”, then an application for exemption from the requirement must be applied for.		

Note: It is no longer possible to obtain permission to deviate from the requirements to give notice to potential interested and affected parties. Unless exemption has been granted from a particular requirement, the requirement must be met. If an application for exemption is refused, the requirement in question must be met.

7.2. PUBLIC PARTICIPATION UNDERTAKEN PRIOR TO THE SUBMISSION OF THE NOTICE OF INTENT

Where public participation in terms of Regulations 40(3) and 41 was undertaken prior to submission of this Notice of Intent, please provide a summary of the steps followed to date.
An advertisement was placed in the local newspaper, the <i>Gemsbok</i> , and was advertised for at least 20 days as per the prescribed legislation. See proof included in Appendix F.

7.3. LIST OF STATE DEPARTMENTS CONSULTED/TO BE CONSULTED

Provide a list of all the State departments that will be/have been consulted, including the name and contact details of the relevant official.									
	Surname	Initials	Representing	Tel	Fax	email	Post Box	Town	Code
1	Lategan	J.G.	Kai Garib Municipality: Municipal Manager	054 431 6328	054 461 6401	mm@kaigarib.gov.za	Private Bag X6	Kakamas	8870
2	Snyers	A.C.	Kai Garib Municipality: Ward Councillor Ward 2	054 431 6328	054 461 6401	mm@kaigarib.gov.za	Private Bag X6	Kakamas	8870
3	October	L	Department of Agriculture and Land Reform	054 461 6700	054 461 6401		P. O. Box 18	Springbok	8240
4	White	C	Department of Water Affairs	082 887 8866/ 054 338 5819		SchwartzC@dws.gov.za ThebeE@dws.gov.za	Private Bag X5912	Upington	8800
5	De la Fontaine	S	Nature Conservation	054 338 4800		sdelafontaine@gmail.com	Evelina De Bruin (former Provincial) Building, Corner of Rivier & Nelson Mandela Road	Upington	8800
6	Abrahams	N	Department of Transport: Environmental Coordinator	021 957 4602	021 910 1699	Abrahamsn@nra.co.za	Private Bag X19, Sanlamhof	Belville	7535
7	CEO		Boegoeberg Water Users Association	054 841 0002	054 841 0000	info@boegoebergwater.co.za	P. O. Box 15	Groblershoop	8850
8	Mans	J	Department of Agriculture Forestry and Fisheries	054 338 5909		jacolinema@daff.gov.za	P. O. Box 2782	Upington	8800
9	Tshimakwane	T	DENC: S24G Section	0798744244		LekweneT@ncpg.gov.za	90 Long Street Sasko Building	Kimberley	8301

Note: A State department consulted in terms of Section 240 (2) of NEMA and Regulations 3(4) and 43(2) must within 30 days from the **date of the Department's request for comment, submit such comment in writing to the Department. The applicant/EAP is therefore** required to inform this Department in writing when the Basic Assessment Report/Scoping Report/Environmental Impact Assessment Report is submitted to the relevant State departments. Upon receipt of this confirmation, this Department will in accordance with Section 240 (2) & (3) of the NEMA (as amended), inform the relevant State departments of the commencement date of the 30-day commenting period.

SECTION G: ALTERNATIVES

As part of this report, consideration must be given to alternatives that are/may have been possible had an environmental impact assessment been undertaken prior to the commencement of the activity. Please provide a detailed description of the alternatives (whether location, technology or environmental) that were/are possible in terms of this application.

Alternative 1: Removal of vegetation for cultivation of vineyards on Remainder of Kakamas North Settlement No. 355

The applicant removed 169.5 ha of indigenous vegetation to establish vineyards for table grape cultivation for export, as shown in Appendix B and below as Figure 16:

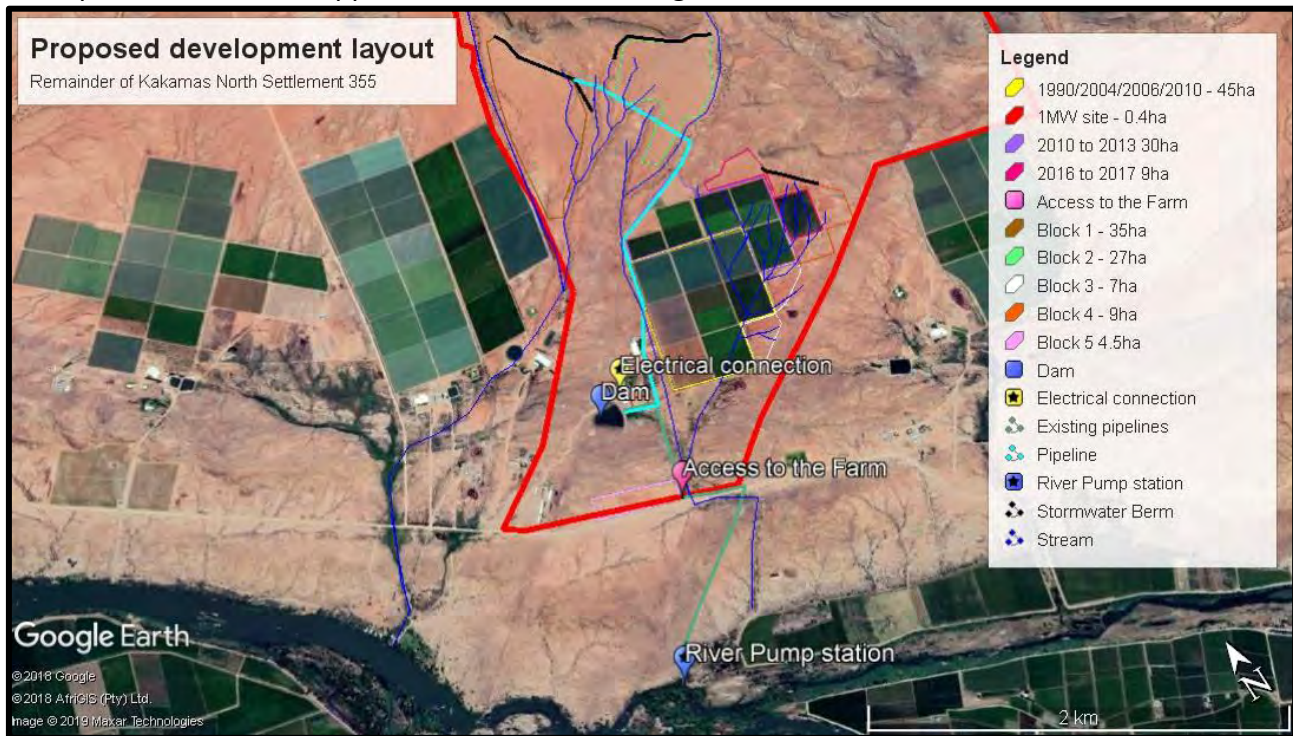


Figure 16: Development Layout Plan – Alternative 1

This alternative took into consideration the following aspects and is therefore considered preferred:

- A development of 84 ha has already taken place and rehabilitation will be too costly. This option is the only feasible and preferred alternative.
- The new development areas fall within an area of low conservation value, with low negative impact on the vegetation. The 1 ha with vulnerable species will be excluded and the additional 4.5 ha of Block 5 will be included as part of the development.
- The small ephemeral streams crossing the site have a low significance and the surrounding bigger streams were excluded. No development will take place within these streams.

Alternative 2: Removal of vegetation for the cultivation of table grapes after obtaining environmental authorisation

Alternative 2 would have been the preferred alternative, by receiving environmental authorisation for the development of the 84 ha before any vegetation was removed.

This would have included comment and input from authorities and I&APs to design the best feasible alternative for the property.

Alternative 3: Removal of vegetation for cultivation of vineyards on Remainder of Kakamas North Settlement No. 355

The applicant removed 165 ha of indigenous vegetation to establish vineyards for table grape cultivation for export, as shown in Appendix B and below as Figure 17:

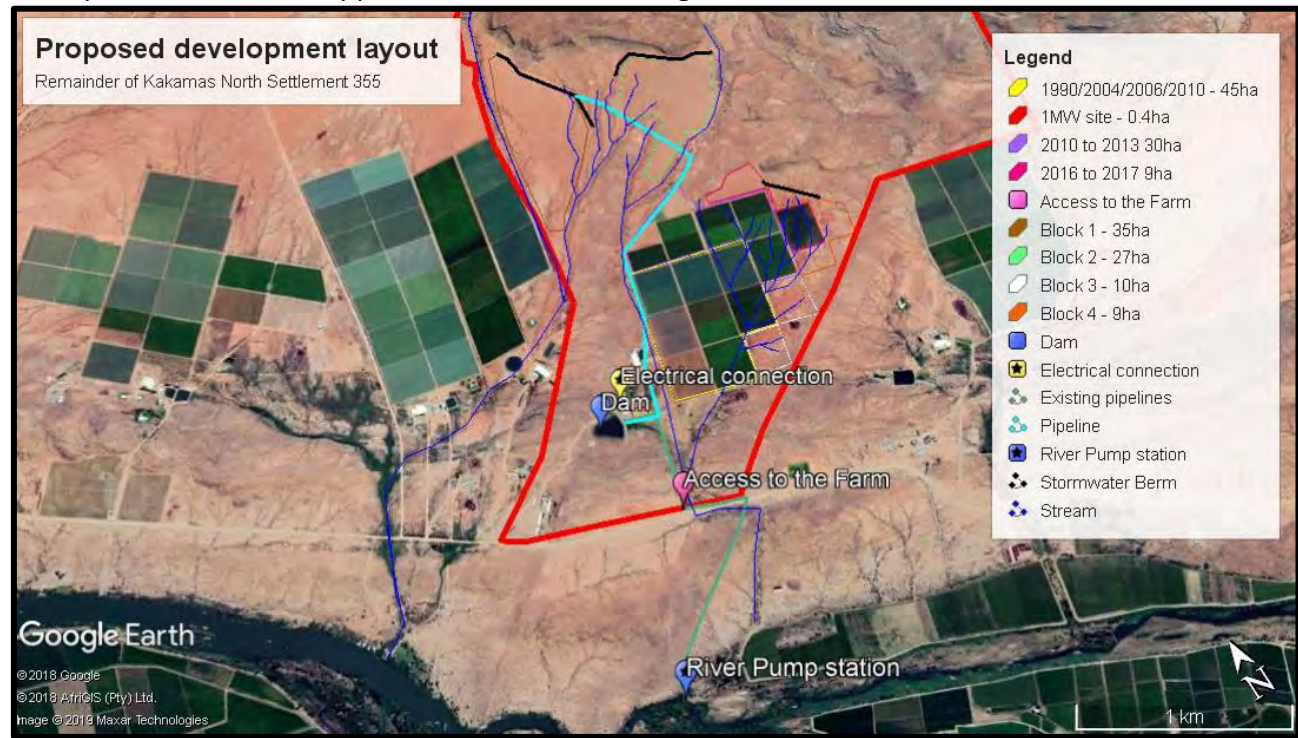


Figure 17: Development layout plan – Alternative 2

This alternative did not take into consideration the following factor and is therefore not considered preferred:

- This alternative included the 1 ha with vulnerable species, therefore resulting in a high negative impact on the botanical aspects of the site.

No-Go Option

The No-Go Option would have meant that vegetation would not have been removed from the property. Not cultivation of the land would have meant that there were no additional table grapes grown for export, with no associated employment creation, and an opportunity cost for the landowners with their land zoned for agricultural use. This would have resulted in no additional job opportunities for local communities and no income to the business and country's economy.

Rehabilitation of the site would include the removal of all newly planted orchards to make way for the rehabilitation of the 85 ha with indigenous vegetation present at surrounding areas. This would result in a major financial loss for the applicant, as well as the loss of employment opportunities for employees currently working for the applicant. Water that would have been used for the vineyards would now have to be used to water the rehabilitated vegetation until the area is self-sustainable.

SECTION H: APPENDICES

The following appendices must be attached where appropriate:

Appendix	Cross out (“☒”) the box if Appendix is attached
Appendix A: Location map	X
Appendix B: Site plan(s)	X
Appendix C: Owner(s) consent(s)	N/A
Appendix D: Photographs <ul style="list-style-type: none"> • Appendix D1: Historic aerial photographs (Figures 1 to 5) • Appendix D2: Site photographs • Appendix D3: CBA 2 and CBA 2 located on Remainder of Kakamas North Settlement No. 355 	X
Appendix E: Permit(s) / license(s) from any other organ of state including service letters from the municipality <ul style="list-style-type: none"> • Appendix E1: Irrigation rights from the Department of Water Affairs 	X
Appendix F: Additional Impact Assessment Information <ul style="list-style-type: none"> • Appendix F: Public Participation 	Not yet completed/ Included in the Assessment Report
Appendix G: Report on alternatives	N/A
Appendix H: Any Other (describe) <ul style="list-style-type: none"> • Appendix H1: Attendance register of meeting held with DENC and DWS. • Appendix H2: EMP • Appendix H3: WULA • Appendix H4: Botanical Assessment • Appendix H4: Archaeological Assessment • Appendix H5: Palaeontology Assessment 	Not yet completed/ Included in the Assessment Report

PART 2

ANNEXURE A TO THE SECTION 24G APPLICATION FORM

SECTION A: DIRECTIVE

Section 24G(1) of the National Environmental Management Act, 1998 (Act 107 of 1998) (“NEMA”) provides that on application by a person who has commenced with a listed or specified activity without an environmental authorisation in contravention of section 24F(1); or a person who has commenced, undertaken or conducted a waste management activity without a waste management licence in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (“NEM:WA”) the Minister, Minister responsible for mineral resources or MEC concerned (or the official to which this power has been delegated), as the case may be, may direct the applicant to-

i	immediately cease the activity pending a decision on the application submitted in terms of this subsection
ii	investigate, evaluate and assess the impact of the activity on the environment
iii	remedy any adverse effects of the activity on the environment
iv	cease, modify or control any act, activity, process or omission causing pollution or environmental degradation
v	contain or prevent the movement of pollution or degradation of the environment
vi	eliminate any source of pollution or degradation
vii	compile a report containing-
aa	a description of the need and desirability of the activity

	bb	an assessment of the nature, extent, duration and significance of the consequences for or impacts on the environment of the activity, including the cumulative effects and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity
	cc	a description of mitigation measures undertaken or to be undertaken in respect of the consequences for or impacts on the environment of the activity
	dd	a description of the public participation process followed during the course of compiling the report, including all comments received from interested and affected parties and an indication of how the issues raised have been addressed
	ee	an environmental management programme
viii		provide such other information or undertake such further studies as the Minister, Minister responsible for mineral resources or MEC, as the case may be, may deem necessary.

You are hereby provided with an opportunity to make representations on any or all of the abovementioned instructions, including where you are of the opinion that any of these instructions are not relevant for the purposes of your application, setting out the reasons for your assertion. Kindly note further that, after taking your representations into account, a final directive may be issued.

SECTION B: DEFERRAL

Section 24G(7) of the NEMA provides that if at any stage after the submission of an application it comes to the attention of the Minister, the Minister responsible for mineral resources or the MEC, that the applicant is under criminal investigation for the contravention of, or failure to comply with, section 24F(1) of the NEMA or section 20(b) of the NEM:WA, the Minister, Minister responsible for mineral resources or MEC may defer a decision to issue an environmental authorisation until such time as the investigation is concluded and-

- (a) the National Prosecuting Authority has decided not to institute prosecution in respect of such contravention or failure;
- (b) the applicant concerned is acquitted or found not guilty after prosecution in respect of which such contravention or failure has been instituted; or
- (c) the applicant concerned has been convicted by a court of law of an offence in respect of such contravention or failure and the applicant has in respect of the conviction exhausted all the recognised legal proceedings pertaining to appeal or review.

Kindly answer the following questions:

Are you, the applicant, being investigated for the contravention of section 24F(1) of the NEMA in respect of a matter that <u>is not subject to this application</u> and in any province in the Republic?	YES	NO	UNCERTAIN
If yes provide details of the offence being investigated and authority conducting the investigation. If uncertain provide details of the activity or activities in relation to which you suspect you may be under investigation.			
Are you, the applicant, being investigated for the contravention of section 20(b) of the NEMWA in respect of a matter that is <u>not subject to this application</u> and in any province in the Republic?	YES	NO	UNCERTAIN
If yes provide details of the offence being investigated and authority conducting the investigation. If uncertain provide details of the activity or activities in relation to which you suspect you may be under investigation.			
Are you, the applicant, being investigated for an offence in terms of section 24F(1) of the NEMA or section 20(b) of the NEMWA <u>in terms of which this application directly relates?</u>	YES	NO	UNCERTAIN
If yes provide details of the offence being investigated and authority conducting the investigation. If uncertain provide details of the activity or activities in relation to which you suspect you may be under investigation.			

If you have answered yes to any of the above questions, you are hereby provided with an opportunity to make representations as to why the Minister, Minister responsible for mineral resources or MEC, as the case may be, should not defer the application as he or she is entitled to do under section 24G(7).

SECTION C: QUANTUM OF THE SECTION 24G FINE

Section 24G(4) of the NEMA makes it mandatory for an applicant to pay an administrative fine as determined by the competent authority before the Minister, Minister responsible for mineral resource or MEC may take a decision on whether or not to grant *ex post facto* environmental authorisation or a waste management licence as the case may be. The quantum of this fine may not exceed R5 million.

Having regard to the factors listed below, you are hereby afforded with an opportunity to make representations in respect of the quantum of the fine and as to why the competent authority should not issue a maximum fine of R5 million.

Please note that Part 1 of this section must be completed by an independent environmental assessment practitioner after conducting the necessary specialist studies.

Please also include in your representations whether or not the activities applied for in this application (if more than 1) are in your view interrelated and provide reasons therefor.

PART 1: THE IMPACTS OR POTENTIAL IMPACTS OF THE ACTIVITY/ACTIVITIES

Index	Socio Economic Impact	Place an "x" in the appropriate box
Description of variable		
	The activity is not giving, has not given and will not give rise to any negative socio-economic impacts	X
	The activity is giving, has given, or could give rise to negative socio-economic impacts, but highly localised	
	The activity is giving, has given, or could give rise to significant negative socio-economic and regionalized impacts	
	The activity is resulting, has resulted or could result in wide-scale socio-economic impacts.	
Motivation:		

Index	Biodiversity Impact	Place an "x" in the appropriate box
Description of variable		
	The activity is not giving, has not given and will not give rise to any impacts on biodiversity	X
	The activity is not giving, has not given and could give rise to localised biodiversity impacts	
	The activity is not giving, has not given and could give rise to significant biodiversity impacts	
	The activity is, has or is likely to permanently/irreversibly transform/destroy a recognised biodiversity 'hot-spot' or threaten the existence of a species or sub-species.	
Motivation:		

Index	Sense of Place Impact and / or Heritage Impact	Place an "x" in the appropriate box
Description of variable		
	The activity is in keeping with the surrounding environment and/or does not negatively impact on the affected area's sense of place and /or heritage	X
	The activity is not in keeping with the surrounding environment and will have a localised impact on the affected area's sense of place and/or heritage	
	The activity is not in keeping with the surrounding environment and will have a significant impact on the affected area's sense of place and/ or heritage	
	The activity is completely out of keeping with the surrounding environment and will have a significant impact on the affected area's sense of place and/ or heritage	
Motivation:		

Index	Pollution Impact	Place an "x" in the appropriate box
Description of variable		
	The activity is not giving, has not given and will not give rise to any pollution	X
	The activity is giving, has given or could give rise to pollution with low impacts.	
	The activity is giving, has given or could give rise to pollution with moderate impacts.	

The activity is giving, has given or could give rise to pollution with high impacts.	
The activity is giving, has given or could give rise to pollution with major impacts.	
Motivation:	

PART 2: COMPLIANCE HISTORY AND KNOWLEDGE OF THE APPLICANT

Index	Previous administrative action (i.e. administrative enforcement notices) issued to the applicant in respect of a contravention of section 24F(1) of the National Environmental Management Act and/or section 20(b) of the National Environmental Management Waste Act	Place an "x" in the appropriate box
Description of variable		
	Administrative action was previously taken against the applicant in respect of the abovementioned provisions.	
	No previous administrative action was taken against the applicant but previous administrative action was taken against a firm(s) on whose board one or more of the applicant's directors sit or sat at the relevant time when the administrative action was taken.	X
	Administrative action was <u>not</u> previously taken against the applicant in respect of the abovementioned provisions.	
Explanation of all previous convictions in respect of the above:		

Index	Previous Convictions in terms of section 24F(1) of the National Environmental Management Act and/or section 20(b) of the National Environmental Management Waste Act	Place an "x" in the appropriate box
Description of variable		
	The applicant was previously convicted in terms of either or both of the abovementioned provisions.	
	No previous convictions have been secured against the applicant but a conviction has been secured against a firm(s) on whose board one or more of the applicant's directors sit or sat; or a conviction was secured against a director of the applicant in his or her personal capacity.	X
	The applicant has not previously been convicted in terms of either or both of the abovementioned provisions.	
Explanation of all previous convictions in respect of the above:		

Index	Number of Section 24G applications previously submitted by the applicant	Place an "x" in the appropriate box
Description of variable		
	Previous applications in terms of section 24G of NEMA were submitted by the applicant.	
	No previous applications have been submitted by the applicant, but a previous application(s) have been submitted by a firm(s) on whose board one or more of the applicant's directors sit or sat at the relevant time.	X
	No previous applications have been submitted by the applicant, but the applicant sat on the board of a firm that previously submitted an application.	
Explanation in respect of all previous applications submitted in terms of section 24G:		

PART 3: APPLICANT'S PERSONAL CIRCUMSTANCES

Index	Applicant's legal persona	Place an "x" in the appropriate box
Description of variable		
	The applicant is a natural person.	
	The applicant is a firm.	X
Describe the firm: Rooipad Boerdery (Pty) Ltd falls under the company Nel Brothers. Rooipad Farms is located in the Northern Cape province of South Africa along the Orange River. The company specializes in the production of high-quality seedless table grapes from its four farms: Rooipad, Alkara, Oranjedal & Tierkop. Each farm has its own pre-cooling and packing facilities.		

Rooipad Farms is owned by Hannes Nel and Izak Nel, who are 4th generation growers. Their focus has always been on producing high-quality fruit with a view to serving discerning clients worldwide. The fruit is marketed under their own brands: Nel Brothers & The Grape Company.

Index	Any other relevant information that the applicant would like to be considered.
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Motivate and explain fully:

NOTE: An explanation as to why the applicant did not obtain an environmental authorisation and/or waste management licence must be attached to this application.

SECTION D: ADVERTISEMENT – SEE APPENDIX F

When submitting this application form, the applicant must submit proof that the application has been advertised in at least one local newspaper in circulation in the area in which the activity was commenced, in the relevant provincial gazette and on the applicant's website, if any.

The advertisement must state that the applicant commenced a listed or specified activity or activities or waste management activity or activities without the necessary environmental authorisation and/or waste management licence and is now applying for *ex post facto* approval. It must include the following:

- the date;
- the location;
- the applicable legislative provision contravened; and
- the activity or activities commenced with without the required authorisation.

Interested and affected parties must be provided with the details of where they can submit their comment and/or register as an interested and affected party.

NOTE: Unless protected by law, all information contained in and attached to this application form may become public information on receipt by the competent authority. This application must be attached to any documentation or information submitted by an applicant further to section 24G(1).

SECTION I: DECLARATIONS

I1: DECLARATIONS OF THE EAP

1. The Independent Environmental Assessment Practitioner

I, _____ do hereby make oath and say that I –

- a. act as the independent environmental assessment practitioner in this application;
- b. do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the S24G of the National Environmental Management Act, read together with the relevant Environmental Impact Assessment Regulations;
- c. do not have, and will not have, a vested interest in the proposed activity proceeding;
- d. have no, and will not engage in, conflicting interests in the undertaking of the activity;
- e. undertake to disclose to the competent authority any material information that has, or may have, the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the S24G of the National Environmental Management Act, read together with the Environmental Impact Assessment Regulations, 2006;
- f. will ensure that all documents contain all relevant facts in respect of the application and that all documentation is timeously distributed or made available to interested and affected parties. I will ensure that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced for this application;
- g. will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- h. will keep a register of all interested and affected parties that participated in a public participation process; and
- i. will provide the competent authority with access to all information at my disposal regarding the application, whether or not such information is favourable to the applicant.

Signature of the environmental assessment practitioner:

Name of company:

Date:

Signature of the Commissioner of Oaths:

Date:

Designation:

Official stamp (below)

I2: DECLARATIONS OF THE APPLICANT

2. The Applicant

I, _____ declares to hereby make oath and say that: -

- a. I am the applicant in this application/duly authorised by the applicant to complete and submit this application.
- b. The information contained in Part 1 and Part 2 of this application form (including annexures thereto) is within my own personal knowledge and is true.
- c. I appointed the environmental assessment practitioner as indicated under A1 above to act as the independent environmental assessment practitioner for this application.
- d. Undertake to provide the environmental assessment practitioner and the competent authority with access to all information at my disposal that is relevant to the application.
- e. Am responsible for complying with the directive or conditions of any environmental authorisation issued by the competent authority.
- f. Understand that I will be required to pay an administration fine in terms of S24G(4) of the Act and that a decision in this regard will only be forthcoming after payment of such a fine and deferral (where applicable); and
- g. Hereby indemnify the government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which the applicant or environmental assessment practitioner is responsible in terms of the Act.

Signature of the applicant:

Name of company:

Date:

Signature of the Commissioner of Oaths:

Date:

Designation:

Official stamp (below):

NOTE: Unless protected by law, all information contained in and attached to this application form may become public information on receipt by the competent authority. Upon request, any interested and affected party must be provided with the information contained in and attached to this application form.

CONTACT DETAILS (NATIONAL AND PROVINCIAL S24G REGULATING DIRECTORATES)

Department	Telephone	Fax	Postal address & e-mail
National Department Environmental Affairs and Tourism	(012) 310 3230	(012) 320-7539	Private Bag X447 Pretoria South Africa 0001
Free State Department of Economic Development, Tourism and Environmental Affairs	(051) 400 9535 0827894468	(051) 400 9538	Private Bag X20801 BLOEMFONTEIN 9300 boing@dtea.fs.gov.za
Eastern Cape Department of Economic Development and Environmental Affairs	0836572465		CNR of Hargeaves & Hockley Close Beacon Hill King Williams Town South Africa bongani.gxilishe@dedia.gov.za
Gauteng Department of Agriculture and Rural Development	(011) 355 1885 (011) 355 1644	(011) 355 1850 (011) 355 1000	P.O. Box 8769 JOHANNESBURG 2000 Green.scorpions@gauteng.gov.za
Kwazulu-Natal Department of Agriculture and Environmental Affairs	(033) 3559427	(033) 355 9614	Private Bag X9059 PIETERMARITZBURG 3200 Christian.Tham@kzndae.gov.za
Limpopo Department of Economic Development, Environment and Tourism	(015) 290 7000 (015) 295 4013	(015) 295 5015	P O Box 55464 POLOKWANE 0700
Mpumalanga Department of Economic Development, Environment and Tourism	(013) 766 6059 082 054 349	(013) 766 8243	Private Bag X 11219 NELSPRUIT 1200
Northern Cape Department of Environment and Nature Conservation	(053) 807 7430	053 831 3530	Private Bag X6102 KIMBERLEY 8300
North West Dept. of Agriculture, Conservation, Environment and Rural Development	(018) 389 5995 (082) 901 8362	(018) 389 5006	Private Bag X2039 MMABATHO 2735 mnkosi@nwpg.gov.za
Western Cape Dept of Environmental Affairs and Development Planning	(021) 483 4093 (021) 483 3722 (044) 805 8781	(021) 483 4372 (021) 483 3633 (044) 874 2423	Private Bag X 9086 CAPE TOWN 8000

CONTACT DETAILS (NATIONAL AND PROVINCIAL ENVIRONMENTAL MANAGEMENT INSPECTORATE)

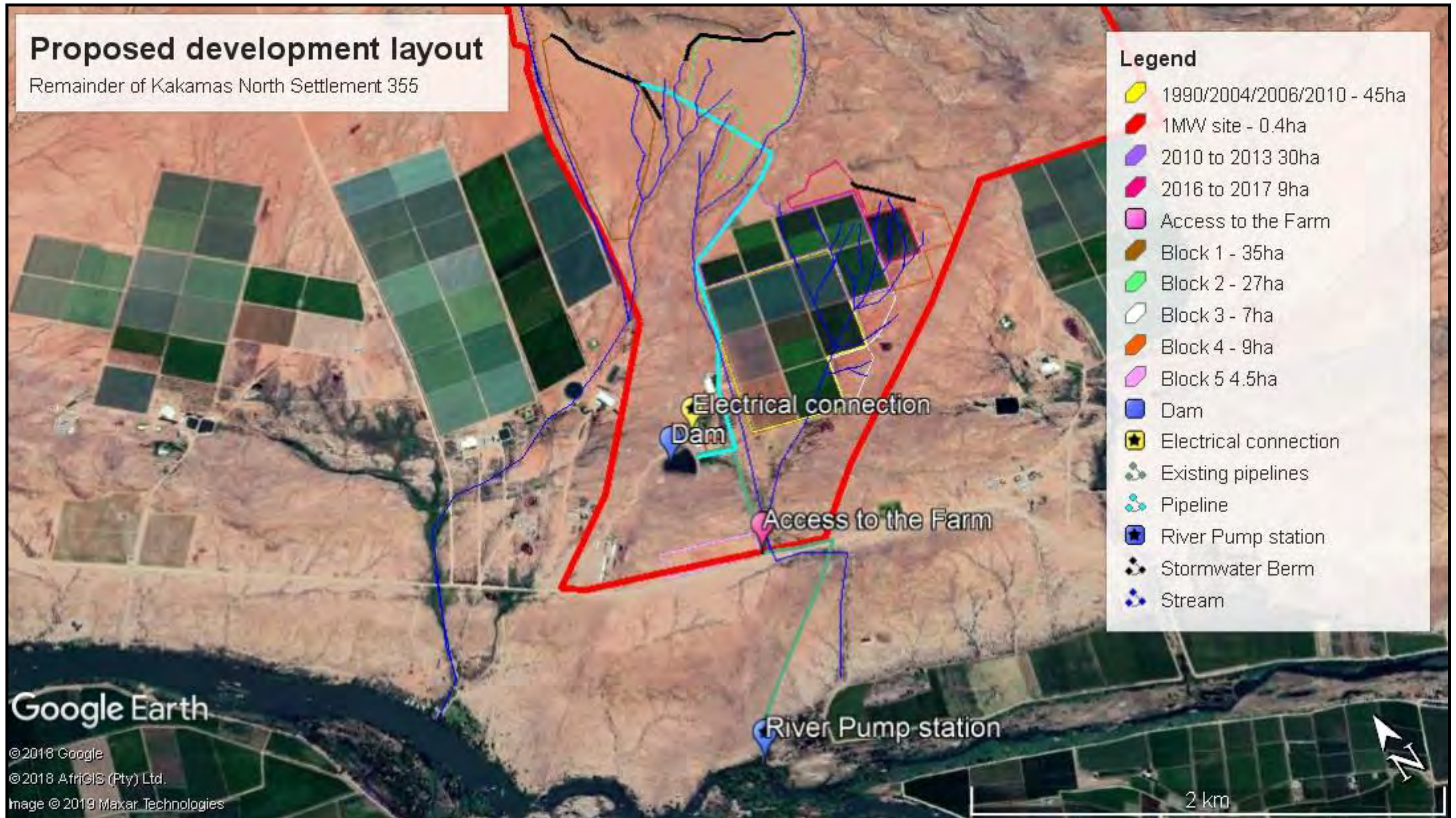
Department	Telephone	Fax	Postal address
National Department Environmental Affairs and Tourism	0800 205 005	(031) 560 7995	Private Bag X447 Pretoria South Africa 0001 pi@toanon.co.za
Eastern Cape Department of Economic Development and Environmental Affairs	0836572465		CNR of Hargeaves & Hockley Close Beacon Hill King Williams Town South Africa bongani.gxilishe@ded ea.gov.za
Free State Department of Tourism, Environmental and Economic Affairs	082 789 4468	(051) 400 4772	Private Bag X20801 BLOEMFONTEIN 9300
Gauteng Department of Agriculture and Rural Development	(011) 355 1440	(011) 355 1850	P.O. Box 8769 JOHANNESBURG 2000 Green.scorpions@ga uteng.gov.za
Kwazulu-Natal Department of Agriculture and Environmental Affairs	(033) 355 9427	(033) 355 9614	Private Bag X9059 PIETERMARITZBURG 3200 Christian.Tham@kznd ae.gov.za
Limpopo Department of Economic Development, Environment and Tourism	015 295 3980	015 295 4869	P O Box 55464 POLOKWANE 0700
Mpumalanga Department of Economic Development, Environment and Tourism	013 766 6077 084 520 3680	(013) 766 8243	Private Bag X 11219 NELSPRUIT 1200
Northern Cape Department of Environment and Nature Conservation	(053) 807 7430 (053) 807 7300		Private Bag 6102 KIMBERLEY 8300
North West Dept. of Agriculture, Conservation, Environment and Rural Development	(018) 389 5995 (018) 389 5698	018 389 5006	Private Bag X2039 MMABATHO 2735 mnkosi@nwpg.gov.za cwessels@nwpg.gov.za
Western Cape Dept of Environmental Affairs and Development Planning	(021) 483 3197 (021) 483 4363	(021) 483 4440	Private Bag X 9086 CAPE TOWN 8000

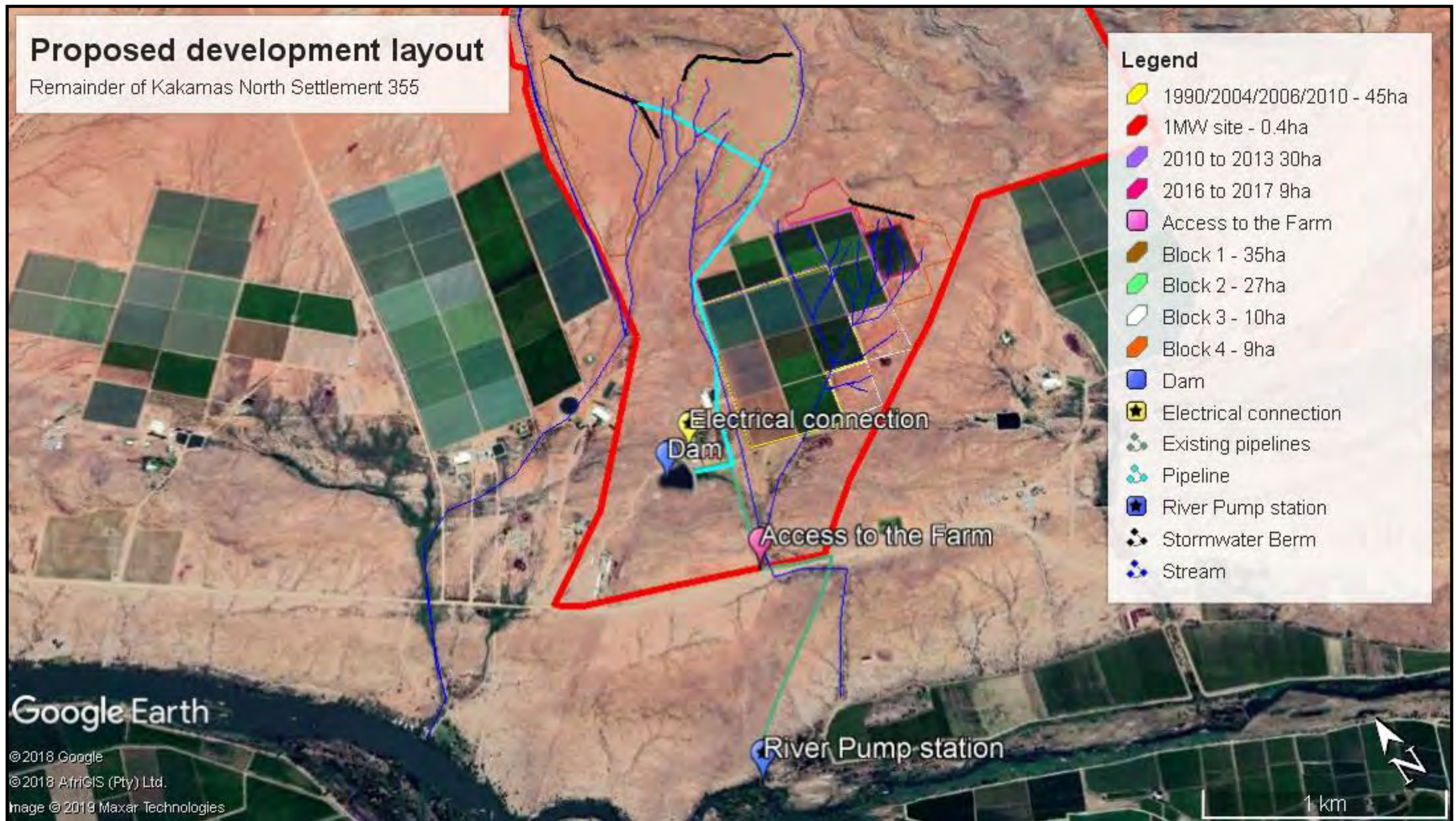
APPENDIX A: LOCALITY MAP



APPENDIX B: SITE PLANS

ALTERNATIVE 1: PREFERRED ALTERNATIVE





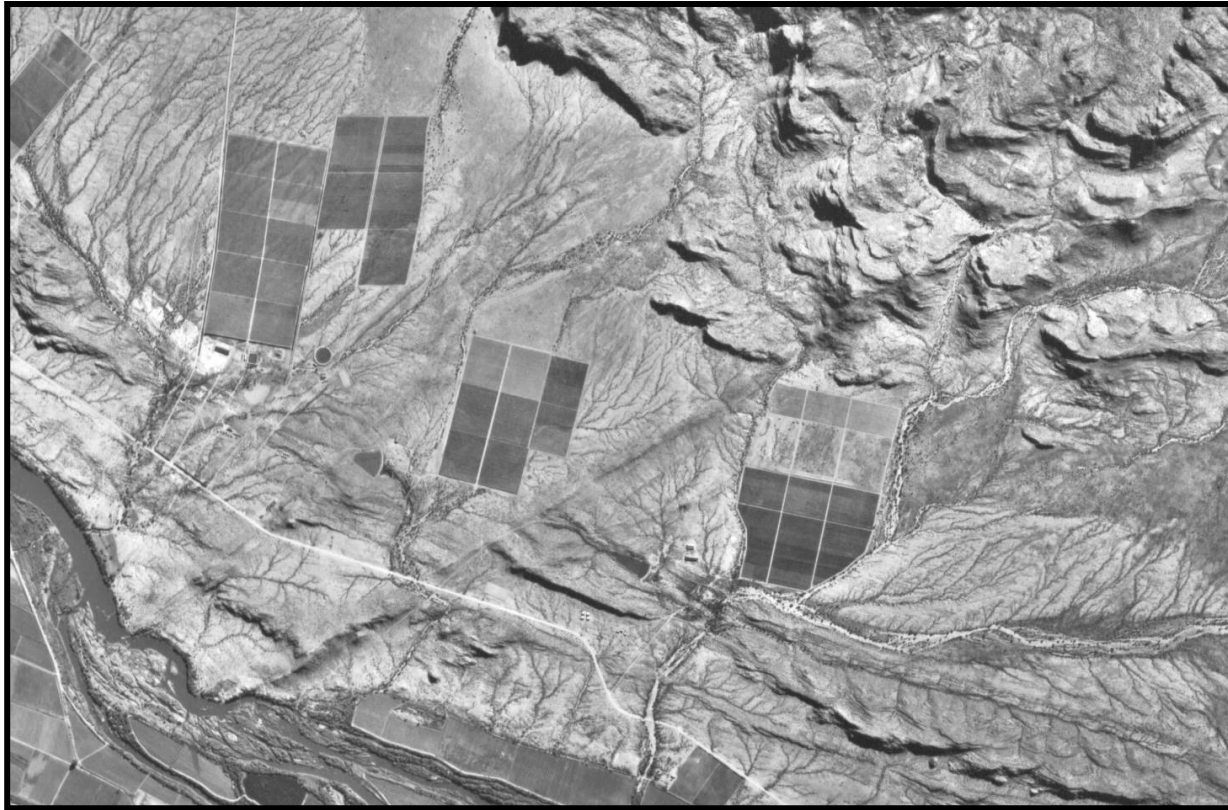
APPENDIX C: CONSENT USE

Not Applicable

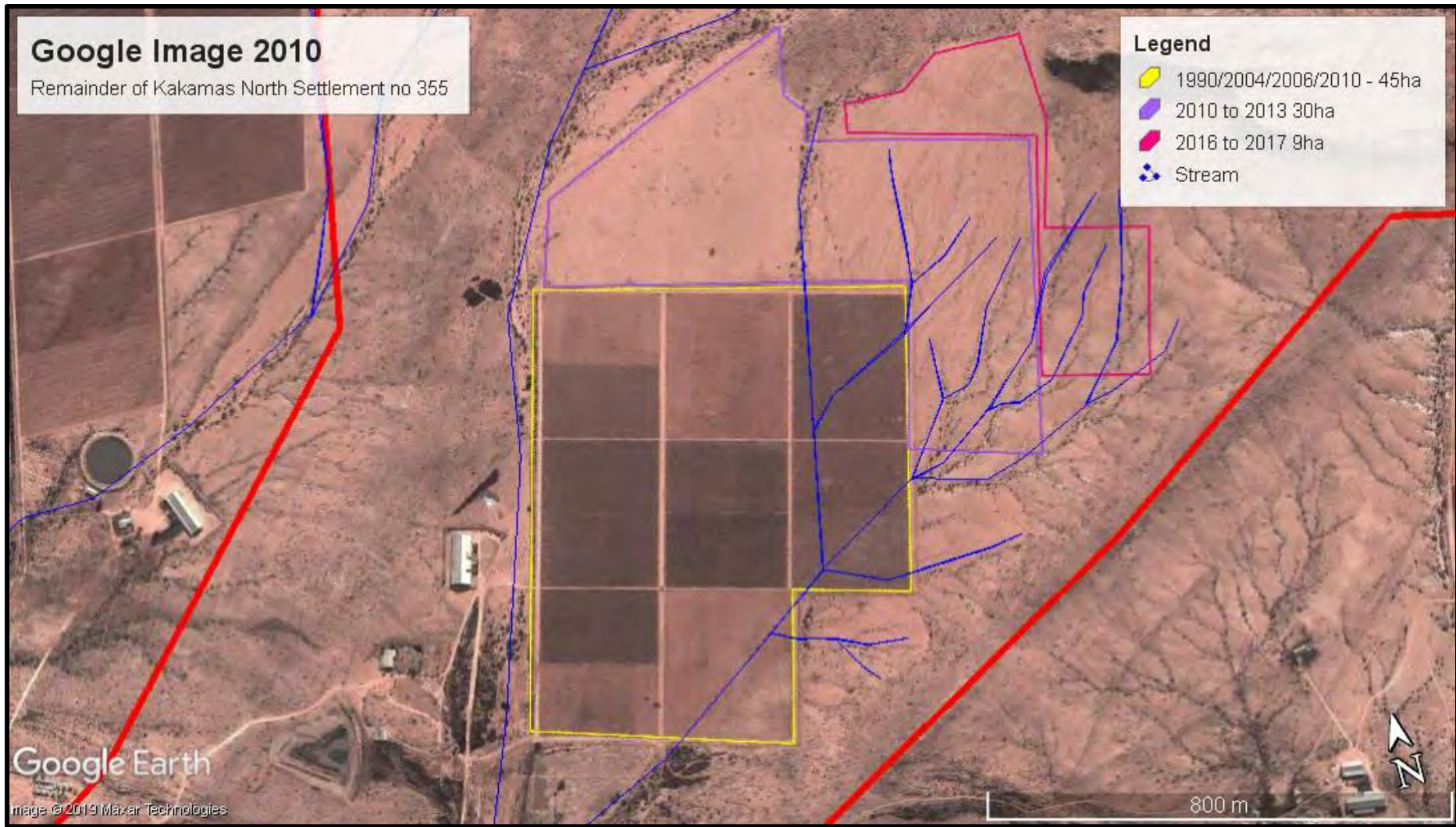
APPENDIX D1: HISTORICAL PHOTOGRAPHIC IMAGE



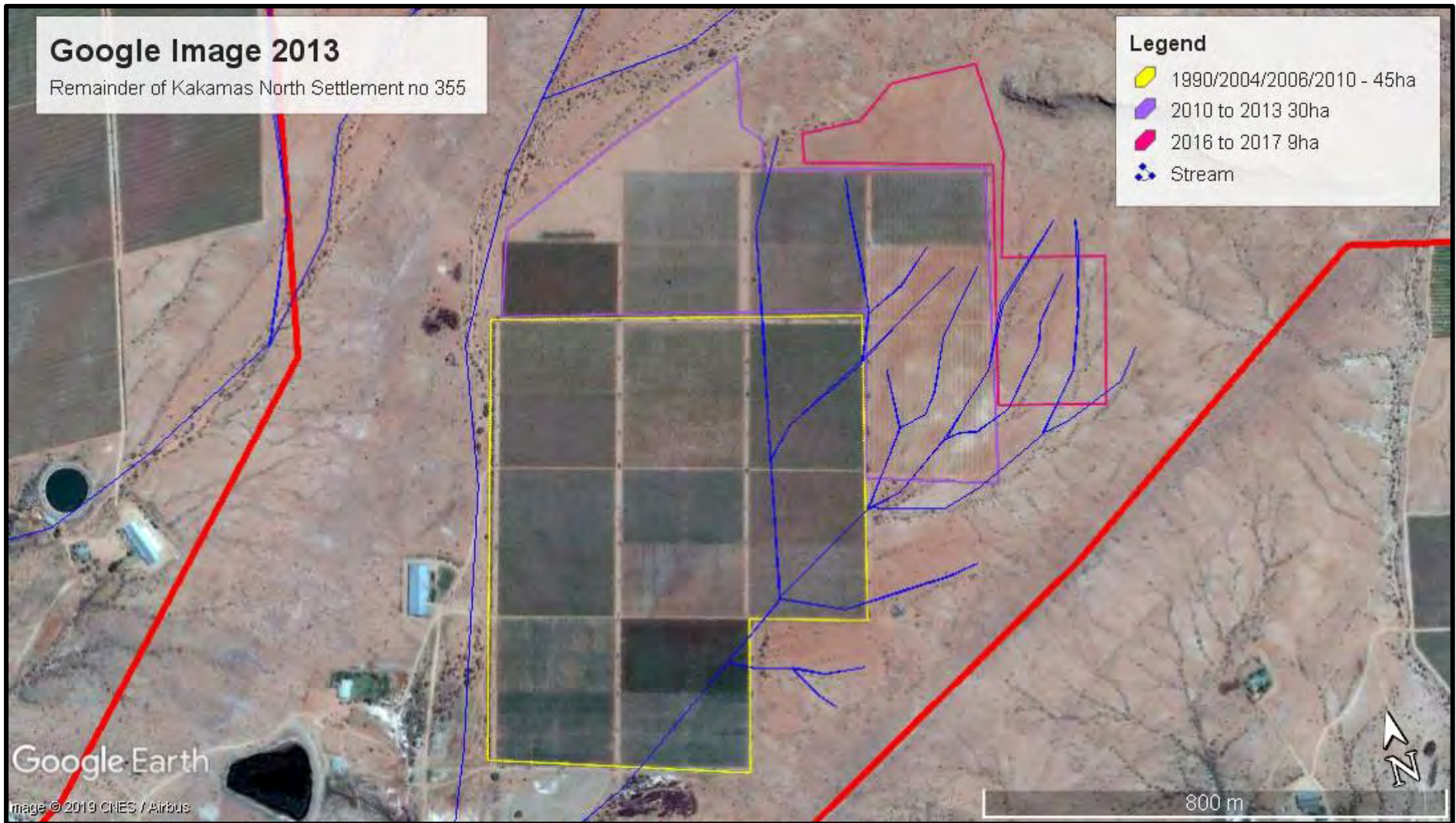
LANDSAT IMAGE 1990



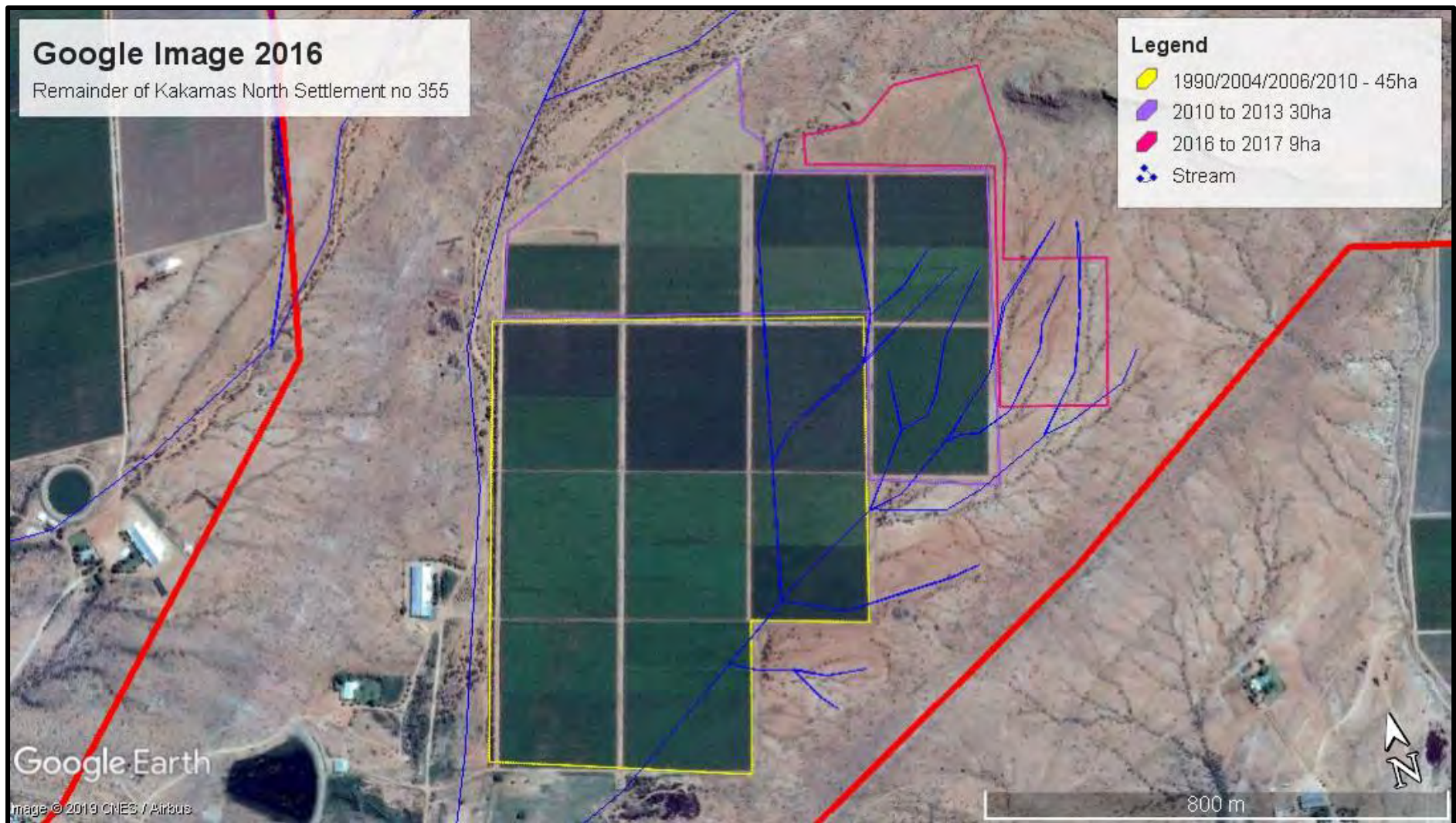
LANDSAT 2002



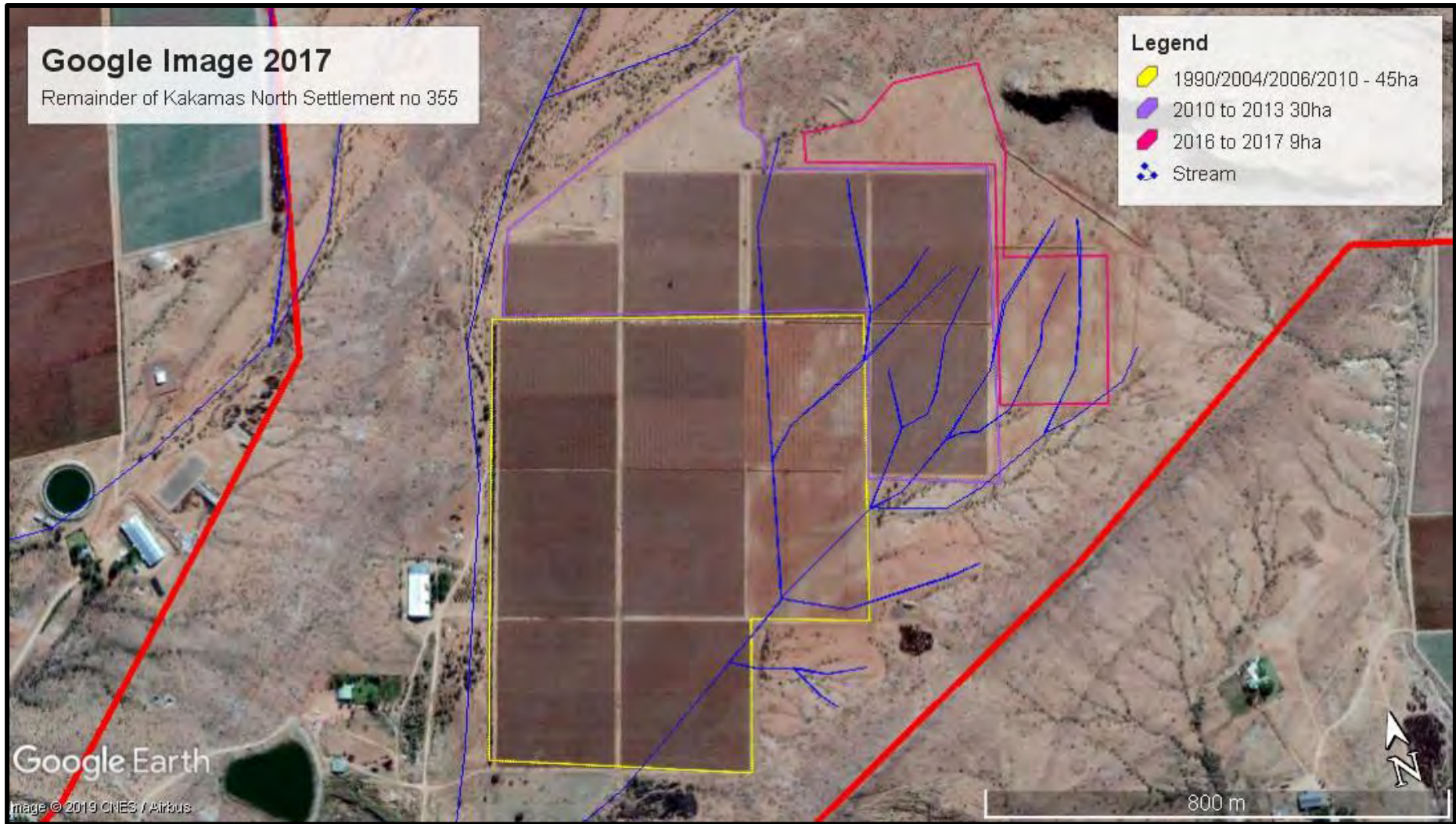
Google Image 2010



Google Image 2013



Google Image 2016



Google Image 2017

APPENDIX D2: SITE PHOTOGRAPHS



New development areas



Existing Development areas

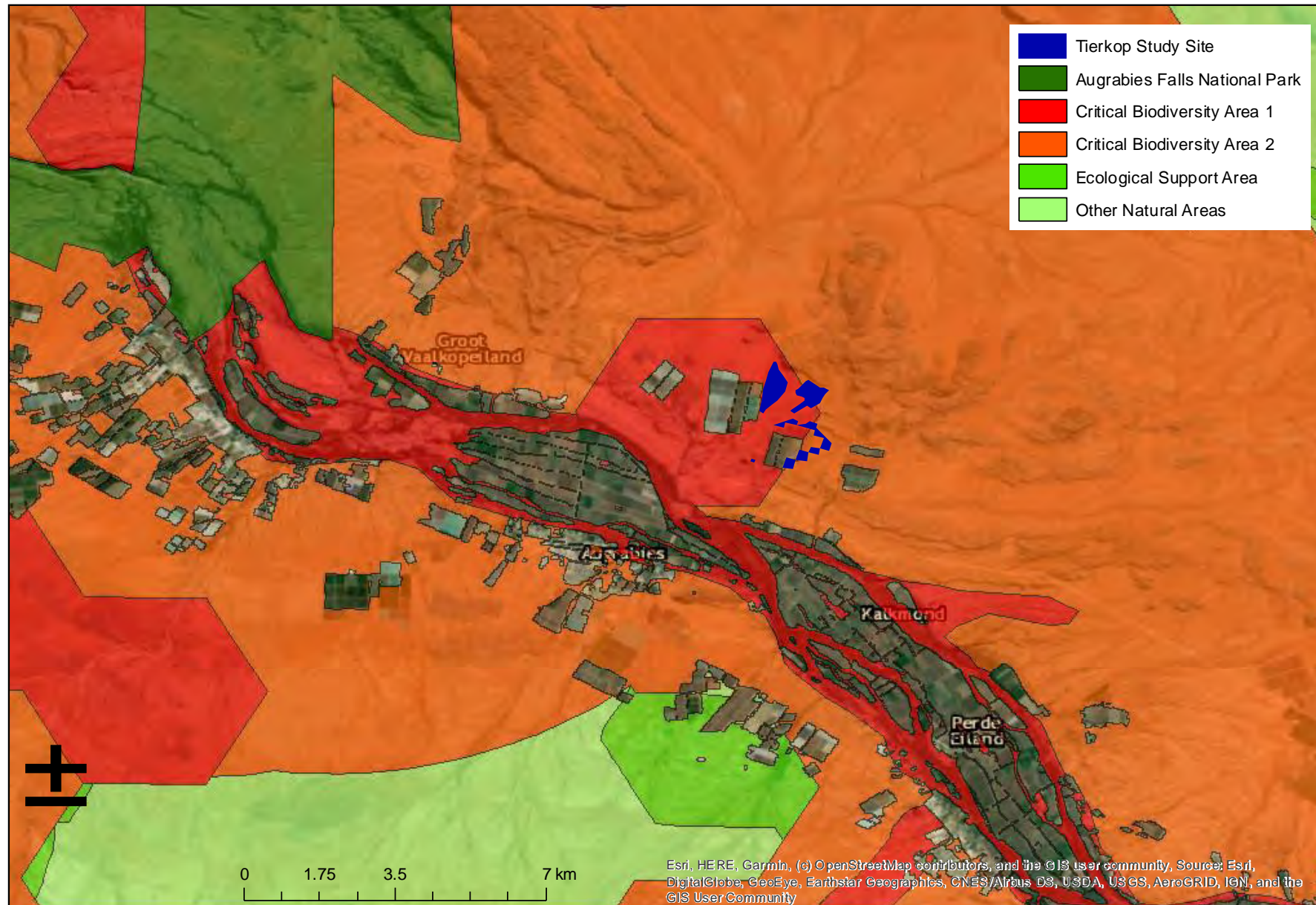


Stormwater drainage berms



Existing dam

APPENDIX D3: CBA 1 AND CBA 2 LOCATED ON REMAINDER OF KAKAMAS NORTH SETTLEMENT 355



APPENDIX E1: IRRIGATION RIGHTS FROM KAKAMAS WATER USERS ASSOCIATION




Watergebruikersvereniging
Water User's Association

Oosthuizenstraat Oosthuizen Street
Privaatsak x4 Private Bag x4
Kakamas 8870 Kakamas 8870

Tel (054) 431 0725/6
Faks/Fax (054) 431 0348
E-Pos/e e Mail ceokwgv@isat.co.za

 Mnr. G. van Niekerk

20 Augustus 2019

 473/D2/2/355

Pieter Badenhorst Profesional Services CC
PO Box 1058
Wellington
7654

KAKAMAS WATERGEBRUIKERSVERENIGING. NAVRAAG MET BETREKKING TOT WATERGEBRUIKSREGTE OP PERSEEL 355. KAKAMAS – NOORD NEDERSETTING

U e-pos gedateer 20 Augustus 2019 het betrekking.

Onderstaande tabel toon gegewens soos deur u versoek. Die gegewens was ten tye van u navraag korrek maar sou u in die onlangse verlede aansoek gedoen het vir wysigings , kan dit wees dat die wysigings nog nie afgehandel is nie en sal dit ook nie as sodanig weergegee wees nie.

Perseelnommer	Maksimum moontlike hektare	Kanaal hektaar	Rivier hektaar
Kakamas – Noord 355	50.00	0.00	50.00 124,318 (Waterlisensie)
TOTAAL	174,318	0.00	174.318

(* Geliewe kennis te neem dat die gebruiksreg van elke individuele eiendom as 'n volume (kubieke meter) teen elke eiendom , soos aangedui in bostaande tabel geregistreer is. Die geregistreerde volume van elke eiendom word dus bereken deur die aantal hectare te vermenigvuldig met die kwota van 15 000 m³ water per jaar.

Registrasie van bogemelde gebruiksregte uit die kanaal sowel as uit die rivier , soos in die tabel hierbo aangedui, is gedurende Oktober 2000 namens u geregistreer in terme van die Nasionale Waterwet (Wet 36 van 1998) soos gewysig. Geen verpligte lisensiering is op hierdie stadium van toepassing nie , en slegs in die geval van permanente oordrag van gebruiksregte van een gedeelte grond na 'n ander gedeelte word die ontvanger eiendom gelisensieër.

Ek vertrou dat u die inligting in orde sal vind en sal graag meer besonderhede verskaf indien dit benodig word.


HOOF UITVOERENDE BEAMPTE

APPENDIX E2: WATER USE LICENSE FROM DEPARTMENT OF WATER AFFAIRS



Private Bag X313, Pretoria, 0001, Sedibeng Building, 185 Francis Baard Street, Pretoria
 Tel: (012) 336-6817 Fax: (012) 326-4472/ (012) 326-2715

AMENDMENT LICENCE IN TERMS OF SECTION 50 OF THE NATIONAL WATER ACT, 1998 (ACT NO 36 OF 1998)

I, **Trevor Balzer**, in my capacity as Deputy Director-General: Special Projects in the Department of Water and Sanitation: and acting under authority of the powers sub-delegated to me by the Acting Director- General of Water and Sanitation, hereby authorizes the amendment of licence dated **22 March 2019**, licence no: **10/D81A/A/8971: Rooipad Boerdery (Pty) Ltd**

SIGNED: Trevor Balzer

DATE: 31/03/2019

The above mentioned licence is amended as follows:

Amendment of condition 1 of Appendix II

1. Condition 1 of the licence is hereby amended-
 - a. by the substitution in condition 1 of the following condition:
 - "1. This licence authorises the abstraction of [**1 864 782**] **2 176 782 m³ /a** of water from Orange River as indicated in Table 1. Wate abstracted shall be used irrigate 170 hectors of grapes using drip irrigation system."
 - b. by the substitution in condition 1 for Table 1 of the following Table:

Table 1: Section 21 (a) water use activity

Water Use	Purpose	Volume (m ³ /a)	Properties	Co-ordinate
Section21(a)				
Abstraction of water from the Orange River	Irrigation of grapes	2 176 782 m ³ /a	Remaining Extent of Lot 355 Kakamas North Settlement Agricultural Holdings	S 28° 39' 17.0" E 20° 26' 49.0"

[END OF LICENCE AMENDMENT] **B 09107** JB



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria 0001, 185 Francis Baard Street, Sedibeng Building, Pretoria,
Tel: 012 336 7500, Fax (012) 323 4472/ (012) 326 2715. www.dws.gov.za

LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

I, **Trevor Balzer**, in my capacity as Deputy Director-General: Special Projects in the Department of Water and Sanitation; and acting under authority of the powers sub-delegated to me by the Acting Director-General of Water and Sanitation, hereby authorizes the following water uses in respect of this licence.

SIGNED: Trevor Balzer

DATE: 22/03/2019

LICENCE NO: 10/D81A/A/8971
FILE NO: 27/2/1/D181/27/1

1. **Licensee:** Rooipad Boerdery Pty Ltd
Postal Address P.O Box 26
Augrabies
8874
2. **Water Uses**
 - 2.2 Section 21(a) of the Act: Taking water from a water resource; subject to the conditions set out in Appendices I and II.
 - 2.3 Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on water Resource; subject to the conditions set out in Appendices I and III.
3. **Properties in respect of which the licence is issued**
 - 3.1. Remaining Extent of Lot 355, Kakamas North Settlement Agricultural Holding
4. **Registered owners of the Property**
 - 4.1 Rooipad Boerdery Pty Ltd
5. **Licence and Review Period.**
 - 5.1 This licence is valid for a period of 20 years from the date of issuance and it may be reviewed at an interval not more than five (5) years. **B08813**

B

6. Definitions

Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998) shall bear the same meaning when used in this licence.

"The Reginal Head"- means the Chief Director : Northern Cape, Department of Water and Sanitation, Private Bag X6101, Kimberley, 8300.

"The Department" means the Department of Water and Sanitation.

"Responsible Authority" means the Department of Water and Sanitation or Catchment Management Agency.

"Report" refers to the reports entitled:

- i) Business Plan for Rooipad Boerdery, compiled by the Rooipad Boerdery (Pty) Ltd, undated; and
- ii) Water use licence Application Reports compiled by Rooipad Boerdery (Pty) Ltd dated 13 August 2018 and as well as all other related documentations and communication (emails, letters, verbal, etc) related thereto.

7. Description of the activity

The propose activity entails taking water from Orange River to irrigate 170 hectors of grapes using drip irrigation system and disposing of wastewater into a septic tank on Remaining Extent of Lot 355, Kakamas North Settlement Agricultural Holding. Water will be pumped directly from the Orange River to irrigation field. The geographical location of the abstraction points is S 28° 39' 17.0" E 20° 26' 49.0". The activity falls within quaternary catchment D81A in the Lower Orange Water Management Area.

8. Licence substituted or replaced

- 8.1 This Licence substitute all previous water uses Licences, Authorisations, Permits, Exemptions granted on Remaining Extent of Lot 355, Kakamas North Settlement Agricultural Holding.

APPENDIX I

Conditions for all Water Uses

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).
2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.
3. The Licensee must immediately inform the Reginal Head or Responsible Authority of any change of name, address, premises and/or legal status.
4. If the property in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Reginal Head or Responsible Authority of the Department within 60 days of the said change taking place.
5. If a water user association is established in the area to manage the resource, membership of the Licensee to this association is compulsory.
6. The Licensee shall be responsible for any water use charges or levies imposed by a responsible authority in terms of the Raw Water Pricing Strategy, Waste Discharge Charges, Water Resource Management Charge of the Department, or any other water charge or levies that might be imposed in terms of the appropriate legislation.
7. While effect must be given to the Reserve as determined in terms of the Act, where a desktop determination of the Reserve has been used in issuance of a licence, when a comprehensive determination of the Reserve has finally been made; it shall be given effect to.
8. The licence shall not be construed as exempting the Licensee from compliance with the provisions any other applicable Act, Ordinance, Regulation or By-law.
9. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other applicable provisions of the Act, as amended from time to time.
10. The Licensee shall conduct an annual internal audit on compliance with the conditions of licence. A report on the audit shall be submitted to the Reginal Head or Responsible Authority within one month of the finalisation of the audit.
11. The Licensee shall appoint an independent external auditor to conduct a biennial external audit on compliance with the conditions of this licence. The audit shall be conducted within 6 (six) months after the submission of internal audit, and a report of the audit shall be submitted to the Reginal Head or Responsible Authority within one month of finalisation of the audit report.
12. Any incident that causes or may cause water pollution shall be reported to the Reginal Head or Responsible Authority or his/her designated representative within 24 hours.
13. The Licensee must inform the Department at least 300 days before the expiry date of the licence whether the licence must be considered for another term.

14. Licensee shall use water efficiently to minimise total water intake, void usage of water where possible, implement "good" housekeeping and operating practices, and maximise the reuse /recycle of contaminated water.
15. All measuring, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals as specified and required according to the device specifications.
16. The licensee must calibrate the inflow and outflow meters and these calibration certificates shall be available for inspection by the Regional Head or Responsible Authority or his/her representative upon request. A relevant maintenance and calibration schedule should be compiled and maintained by the licensee.
17. The conditions of the authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of these activities and the licensee must take such measures that are necessary to bind such persons to the conditions of this licence.
18. Notices prohibiting unauthorised persons from entering the certain areas, as well as acceptable signs indicating the risks involved in case of an unauthorised entry must be displayed along the boundary fence of these areas.
19. If the Licensee is not the end user/beneficiary of the water use related infrastructure and will not be responsible for long term maintenance and management of the infrastructure, the Licensee must provide a programme for hand over to the successor-in-title including a brief management/maintenance plan and the agreement for infrastructure along with allocation of responsibilities, within three (3) months before handover.
20. The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of-
 - 20.1 shortage of water;
 - 20.2 inundations or flood;
 - 20.3 siltation of the resource; and
 - 20.4 required reserve releases.

APPENDIX II

Section 21 (a) of the Act: Taking water from a water resource

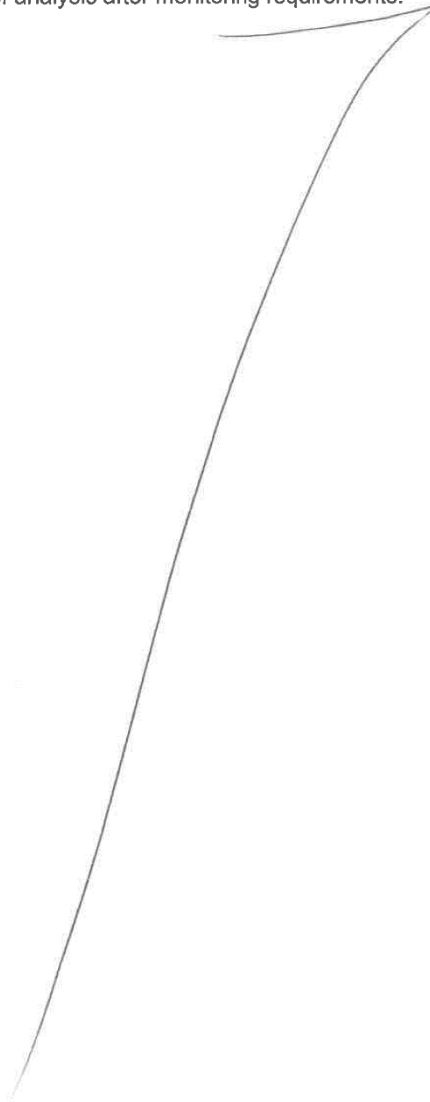
1. This licence authorises the abstraction of 1 864 782 m³ /a of water from Orange River as indicated in Table 1. Wate abstracted shall be used irrigate 170 hectors of grapes using drip irrigation system.

Table 1: Section 21 (a) water use activity

Water Use	Purpose	Volume (m ³ /a)	Properties	Co-ordinate
Section21(a)				
Abstraction of water from the Orange River	Irrigation of grapes	1 864 782 m ³ /a	Remaining Extent of Lot 355 Kakamas North Settlement Agricultural Holdings	S 28° 39' 17.0" E 20° 26' 49.0"

2. The quantity of water authorised to be taken in terms of this licence may not be exceeded without prior authorisation by the Responsible authority.
3. This licence does not imply any guarantee that the said quantities and qualities of water will be available at present or at any time in the future.
4. The abovementioned volume may be reduced when the licence is reviewed.
5. The Licensee shall continually investigate new and emerging technologies and put into practice water efficient devices or apply technique for the efficient use of water containing waste, in an endeavour to conserve water at all times.
6. All water taken from the resource shall be measured as follows:
 - 6.1 The daily quantity of water taken must be metered or gauged and the total recorded at the last day of each month; and
 - 6.2 The Licensee shall keep record of all water taken and a copy of the records shall be forwarded to the Reginal Head or Responsible Authority each year with the annual monitoring report.
7. No water taken may be pumped, stored, diverted, or alienated for purposes other than intended in this licence, without written approval by the Reginal Head or Responsible Authority.
8. The Licensee shall install and monitor appropriate water measuring devices to measure the amount of water abstracted, received and/or consumed, as applicable to the infrastructure.
9. The licensee shall establish and implement a continual process of raising awareness amongst itself, its workers and stakeholders with respect to Water Conservation and Water Demand Management initiatives.
10. The licensee shall as part of annual monitoring report submit:-
 - 10.1 Details of crops
 - 10.2 Irrigation system types

11. The licensee shall appoint and make use of suitable qualified irrigation system designers for the design and installation of irrigation systems which shall be registered with South African Irrigation Institute.
12. The Licensee shall compile an Annual Monitoring Report and submit to the Regional Head or Responsible Authority within eighteen (18) months after issuance of this licence and annually thereafter under Reference number 27/2/1/D181/27/1. This must be accompanied by the results of analysis after monitoring requirements.



APPENDIX III

Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource

1. QUANTITY OF WASTEWATER TO BE DISPOSED

1.1 The Licensee is authorised to dispose wastewater in the waste disposal facilities as set out in Table 2.

Table 2: Waste water management facility

Water use(s)	Purpose	Capacity, (m ³)	Property Description	Co-ordinates
Section 21 (g)				
Disposing of sewage into Septic tank	Sewage treatment	120	Remaining Extent of Lot 355 Kakamas North Settlement Agricultural Holdings	S 28° 38' 59.0" E 20° 27' 23.0"

1.2 The quantity of treated wastewater authorised to be disposed in terms of this licence must not be exceeded.

2. OPERATION AND MAINTENANCE OF THE WASTEWATER SYSTEM

2.1 Potential impact of the septic tank shall be managed according to "A PROTOCOL TO MANAGE THE POTENTIAL OF GROUNDWATER CONTAMINATION FROM ON SITE SANITATION" (Edition 2, March 2003) by the Department of Water Affairs and Forestry.

2.2 No intractable or toxic waste must be allowed to find its way into the wastewater system and /or be discharged with the final effluent. The licensee must take all steps possible to prevent discharge of any substance into the wastewater system, which could have a deleterious effect on the operation of system and/or final waste.

2.3 All non-organic or foreign matter such as cigarette butts, condoms, sanitary wear, ear buds, etc. must not be introduced to septic tank systems as these will cause blockages, damage to the pumps and ultimately create unnecessary service requirements as per the Operation Description.

2.4 The septic tank systems shall be monitored for leaks and these shall be closed / blocked immediately.

2.5 Any foreign chemicals or substances which could retard the growth of the bacteria within the system must be avoided.

2.6 The licensee must ensure effluent disposed septic tank systems shall not overflow.

3. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS

3.1 Pollution incidents must be dealt with in accordance with Section 19 and 20 of the Act.

3.2 Any incident that may cause pollution of any water resource must immediately be reported to the Reginal Head or Responsible Authority.

3.3 If surface and/or groundwater pollution has occurred or may possibly occur, the licensee must conduct, and/or appoint specialists to conduct the necessary investigations and implement additional monitoring, pollution prevention and remediation measures to the satisfaction of the Regional Head or Responsible Authority.

4. SLUDGE MANAGEMENT

4.1 Waste water sludge emanating from the treatment process must be quantified, analysed, dealt with according to the requirements of chapter 5 of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and the Guideline for the Utilisation and Disposal of wastewater sludge (volume 1-5), dated March 2006 and any updates thereafter, to the satisfaction of the Regional Head.

[END OF LICENCE]

B

APPENDIX F: PUBLIC PARTICIPATION PROCESS

APPENDIX F2.1: I&AP DATABASE

AUTHORITIES

	Erf no	Surname	Initials	Representing	Tel	Fax	email	Post Box	Town	Code	Reg
1		Lategan	J.G.	Kai Garib Municipality: Municipal Manager	054 431 6328	054 461 6401	mm@kaigarib.gov.za	Private Bag X6	Kakamas	8870	L
2		Snyers	A.C.	Kai Garib Municipality: Ward Councillor Ward 2	054 431 6328	054 461 6401	mm@kaigarib.gov.za	Private Bag X6	Kakamas	8870	L
3		October	L	Department of Agriculture and Land Reform	054 461 6700	054 461 6401		P. O. Box 18	Springbok	8240	L
4		White	C	Department of Water Affairs	082 887 8866/ 054 338 5819		TowellJ@dws.gov.za	Private Bag X5912	Upington	8800	L
5		De la Fontaine	S	Nature Conservation	054 338 4800		sdelafontaine@gmail.com	Evelina De Bruin (former Provincial) Building, Corner of Rivier & Nelson Mandela Road	Upington	8800	L
6		CEO		Kakamas Water Users Association	054 431 0725/6	054 431 0348	kakamaswgv@isat.co.za	Private Bag X4	Kakamas	8870	L
7		Mans	J	Department of Agriculture Forestry and Fisheries	054 338 5909		jacolinema@daff.gov.za	P. O. Box 2782	Upington	8800	L
8		Tshimakwane	T	DENC: S24G Section	0798744224		LekweneT@ncpg.gov.za	90 Long Street ,Sasko Building	Kimberley	8301	L

I&AP's

	Erf no	Surname	Initials	Representing	Tel	Fax	email	Post Box	Town	Code	Reg
1	Remainder of Farm 299	Engels	Dr LG	Trollope Familie Trust			lgengels@mweb.co.za				L
2	Erf 359	van Niekerk	Henco	Harmonie Boerdery Trust	076 843 2104		henkovn@nexusag.net				L
3	Erf 341 & 343	Dege	Dawid	Cape Span – Oorkant & Omdraai			dawid@capspanfarms.co.za				L
4	Erf 337	du Plessis	Willie	Omdraai Landgoed Trust	054 451 8003 082 558 6973			Posbus 442	Kakamas	8870	L
5	Portion A of Erf 355	Nel	Hannes	Rooipad Boerdery (Pty) Ltd	082 494 9658		admin@rooipad.co.za				L
6	Erf 298	Koortzen	Eric	Zwaardraai Landgoed CC	082 689 5224		zwaardraai@gmail.com				L

Appendix F2.2.2: Advertisement

APPENDIX F2.3: NOTICE BOARDS

Will be included in the final Assessment Report.

APPENDIX F2.4: PROOF OF NOTICES SENT

Will be included in the final Assessment Report.

APPENDIX F2.5: NOTICES SENT

Appendix F2.5.1: Notices

Will be included in the final Assessment Report.

APPENDIX F2.6: COMMENTS RECEIVED
Appendix F2.6.1 Comments from DENC

Will be included in the final Assessment Report.

Appendix F2.6.2 Comments received

Will be included in the final Assessment Report.

APPENDIX F2.7: COMMENTS AND RESPONSES SHEET

COMMENTS ON DRAFT ASSESSMENT REPORT				
Date	Comments from	Comments received	Response from	Response received

APPENDIX H1: ATTENDANCE REGISTER OF MEETING HELD

Will be included in the final Assessment Report.

APPENDIX H2: ENVIRONMENTAL MANAGEMENT PROGRAMME



DRAFT CONSTRUCTION, OPERATIONAL & MAINTENANCE MANAGEMENT PROGRAMME



PROPOSED AGRICULTURAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON REMAINDER OF KAKAMAS NORTH SETTLEMENT 355, FARM TIERKOP, AUGRABIES.

DENC Reference nr: 02/03/2019

December 2019

Rooipad Boerdery (Pty) Ltd

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CONTENTS

1	Introduction.....	1
2	Environmental issues.....	9
2.1	Vegetation.....	9
2.2	Aquatic habitat.....	12
3	Aim and Objectives of the EMPr.....	14
4	Compliance with Applicable Laws.....	14
5	Roles and Responsibilities.....	15
6	Monitoring & Auditing.....	19
6.1	ECO Monitoring.....	19
6.2	Auditing.....	21
7	Environmental auditing and monitoring schedule.....	22
8	Management Programme – Pre-construction & Construction & Operational.....	24
8.1	Specific conditions as stated in EA.....	24
8.2	Contractual obligations.....	24
8.3	Penalties.....	24
8.4	Methodology statement.....	25
8.5	Proposed Impact Management Actions.....	28
	Appendix A: Additional Reports.....	73
	Appendix B: Tracking Table.....	74
	Appendix C: Schedule of Fines.....	75
	Appendix D: Method Statement Proforma.....	77
	Appendix E: Method Statement Control Sheet.....	80
	Appendix F: Project map.....	82
	Appendix G: EAP Curriculum Vitae.....	83

List of Figures

Figure 1. Locality map of the proposed site on Remainder of Kakamas North Settlement No. 355 as demarcated in red.	1
Figure 2: Landsat Image of site in 2001, showing development.	2
Figure 3: Landsat Image of site in 1990, showing no development.	2
Figure 4: Google Image of the site in 2010.....	3
Figure 5: Google Image 2013, showing the 30ha (purple) development.	3

Figure 6: Google Image of 2016.	4
Figure 7: Google Image 2017, showing the development of 9ha (pink).....	4
Figure 8: Proposed Development Layout.....	5
Figure 9: Pipelines	6
Figure 10: Ephemeral streams/drainage areas	7
Figure 11: The vegetation types (Mucina & Rutherford, 2006) of the Tierkop study site (on a DigitalGlobe image of 26 June 2017).....	9
Figure 12: The planned protected areas for the Northern Cape Province of South Africa (Department of Environmental Affairs, 2016).	10
Figure 13: The Critical Biodiversity Areas of the Tierkop study site and surrounds (Oosthuysen & Holness, 2016).	11
Figure 14: Critical Biodiversity Area	11
Figure 15: Location of the canal and streams.....	12
Figure 8: Reporting structure.....	15

List of abbreviations

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DEA	National Department of Environmental Affairs
DENC	Northern Cape: Department of Environment and Nature Conservation
DWS	National Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
ELU	Existing Lawful Use
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ERW	Ecological Release Water
EWR	Existing Water Rights
FEPA	Fresh Water Ecosystem Priority Areas

HWC	Heritage Western Cape
&AP's	Interested and Affected Parties
MAR	Mean Annual Run-off
MMP	Maintenance Management Plan
NFEPA	National Freshwater Ecology Priority Areas
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PA	Protected Area
PES	Present Ecological Status
PPP	Public Participation Process
RE	Resident Engineer
RP	Responsible Person
SANBI	South African National Biodiversity Institute
V&V	Validation and Verification
WCBSP	Western Cape Biodiversity Spatial Plan
WMA	Water Management Area
WULA	Water Use Licence Application
WUL	Water Use License

Definitions

Alien species - Plants and animals which do not arrive naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area. Rooikrans is a good example of alien species in the Cape.

Alternative - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.

Aspect – Element of an organisation's activities, products or services that can interact with the environment.

Auditing - A systematic, documented, periodic and objective evaluation of how well the environmental management programme is performing with the aim of helping to safeguard the environment by facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

Biodiversity - The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.

Built environment - Physical surroundings created by human activity, e.g. buildings, houses, roads, bridges and harbours.

Conservation - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

Construction site, working area or Site - means any area within the boundaries of the property(ies) where construction is taking place.

Contamination - Polluting or making something impure.

Corrective (or remedial) action - Response required to address an environmental problem that is in conflict with the requirements of the EMP. The need for corrective action shall be determined through monitoring, audits or management review.

Degradation - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

Ecology - The scientific study of the relationship between living things (animals, plants and humans) and their environment.

Ecosystem - The relationship and interaction between plants, animals and the non-living environment.

Environment - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

Environmental Impact Assessment (EIA) - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

Environmental Management System (EMS) - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

Environmental policy - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

For the purposes of this Specification the following definitions shall apply (please note some definitions may not apply to this EMP):

Fynbos - Low-growing and evergreen vegetation found only in the south Western Cape. Fynbos is known for its rich biodiversity.

Habitat - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.

Hazardous waste – Waste, even in small amounts, that can cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, etc.

Impact - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Indigenous species - Plants and animals that are naturally found in an area.

Infrastructure - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

Integrated - Mixing or combining all useful information and factors into a joint or unified whole.

Integrated Environmental Management (IEM) - A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".

Land use - The use of land for human activities, e.g. residential, commercial, industrial use.

Mitigation - Measures designed to avoid, reduce or remedy adverse impacts

Natural environment - Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

No-Go area- means any area where no access is allowed.

Over-utilisation - Over-using resources - this affects their future use and the environment.

Policy - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

Process - Development usually happens through a process - a number of planned steps or stages.

Proponent – Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMPr.

Recycling - Collecting, cleaning and re-using materials.

Refuse- refers to all solid waste, including construction debris (cement bags, wrapping materials), waste and surplus food, food packaging, organic waste etc.

Resources - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

Scoping Report - A report presenting the findings of the scoping phase of the EIA. This report is primarily aimed at reaching closure on the issues and alternatives to be addressed in the EIA (in the case of a full EIA process).

See Integrated Environmental Management.

Stakeholders - A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

Storm water management – Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

Sustainability - Being able to meet the needs of present and future resources.

Sustainable development - Development that is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

Waste Management – Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

Wetlands - An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vleis, swamps.

Zoning - The control of land use by only allowing specific type development in fixed areas or zones.

Requirements as stated in GN 982 Environmental Impact Assessment Regulations, 2014, Appendix 4 and corresponding section

Requirement	Section
1. (1) An EMPr must comply with section 24N of the Act and include-	
(a) details of (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Details of EAP, page 10 Appendix G: EAP Curriculum Vitae, page 83
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Environmental auditing and monitoring schedule included on page 22
(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 any areas that should be avoided, including buffers;	Appendix F: Project map, page 82
d) a description of the impact management objectives, 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- (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;	Aim and Objectives of the EMPr, page 14 Mitigation measures and management actions included in page 24.
e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Proposed Impact Management Actions refers to the outcomes in the table on page 28.
(f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Mitigation measures and management actions included in page 28. Further detail with regards to the Compliance with Applicable Laws on page 14.

(ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) 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);	Mitigation measures and management actions included in page 28. Monitoring & Auditing on page 19.
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Monitoring & Auditing on page 19. Frequency etc included in table in Proposed Impact Management Actions on page 28.
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Aim and Objectives of the EMPr, page 14 Compliance with Applicable Laws, page 14. Roles and Responsibilities on page 15.
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Proposed Impact Management Actions includes the expected time management on page 28.
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Proposed Impact Management Actions includes the mechanism for monitoring and compliance on page 28. The Monitoring & Auditing on page 19.
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Monitoring & Auditing refers to reporting on compliance on page 19 This is also outlined in section Management Programme – Pre-construction & Construction & Operational on page 24.
m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	This is included under page 22.
(n) any specific information that may be required by the competent authority	Appendix G.

Details of EAP

Company of Environmental Assessment Practitioner (EAP):	Pieter Badenhorst Professional Service cc	
EAP name:	Elanie Kühn	
Postal address:	P. O. Box 1058	
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E-mail:	elaniem@iafrica.com	Fax: 086 672 1946
EAP Qualifications:	<p>Pieter Badenhorst - 43 years' experience (16 @ CSIR) in environmental management; report writing; project management; facilitation also including preparing of EMPr's</p> <p>Elanie Kühn – BSc Hons. in Environmental Management, 13 years' experience in environmental management and water use license applications etc.</p>	
EAP Registrations/Associations:	<p>Pieter -IAIAsa, Pr Eng, SAICE</p> <p>Elanie - IAIAsa</p>	

1 Introduction

Locality:

The proposed property on which the construction of the agricultural development (vineyards) has and will take place is situated on the remainder of Kakamas North Settlement No. 355 on the farm Tierkop/Rooipad just outside of the small town of Augrabies (referred to as Remainder of Kakamas North Settlement 355 in this document). The farm is situated approximately 4.5 km north-east of the small town of Augrabies in the Northern Cape, and gains access off gravel road off the N14 towards Riemvasmaak (see Figure 1). The site lies north of the Orange River. Small ephemeral streams cross the site. The site is currently zoned Agriculture Zone I. The owner of the properties is Rooipad Boerdery (Pty) Ltd, who has appointed PBPS as the independent environmental consultant to determine if an environmental authorisation is necessary.



Figure 1. Locality map of the proposed site on Remainder of Kakamas North Settlement No. 355 as demarcated in red.

Project Description:

The proposed development consisted out of various listed activities that triggered from ECA 1990 until NEMA 2017, outlined below:

Refer to the Historical Google Earth images attached at Appendix D1: Figures 2 to 9.

1. ECA Act 1998:

- Construction took place during 1990 to 2001 for the infrastructure development associated with the cultivation of the vineyards of 45 ha across small streams. (Refer to Figure 2: Landsat Image of 2001 and Figure 3: Landsat Image 1990).

- The changing of land use of 45ha of land from grazing to agricultural development.
- Note: the construction of the dam took place. However, this did not affect the flow of a river.

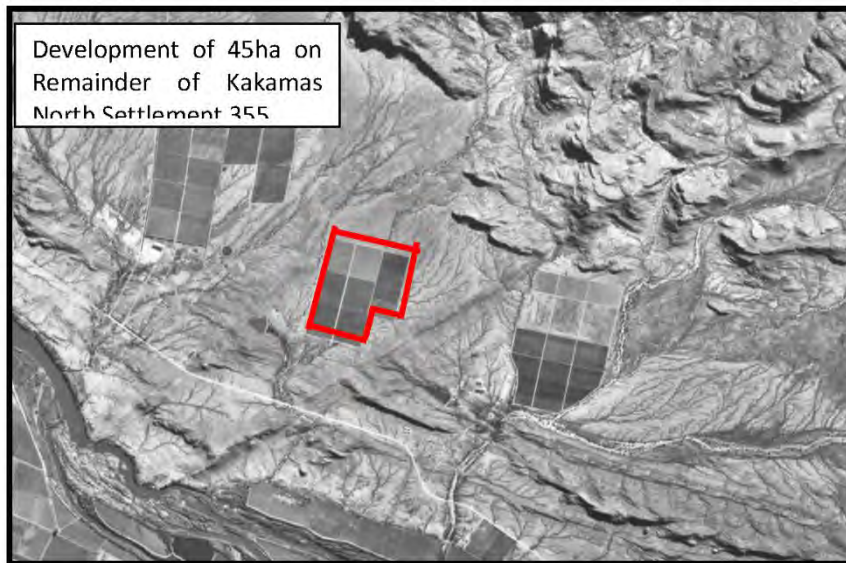


Figure 2: Landsat Image of site in 2001, showing development.

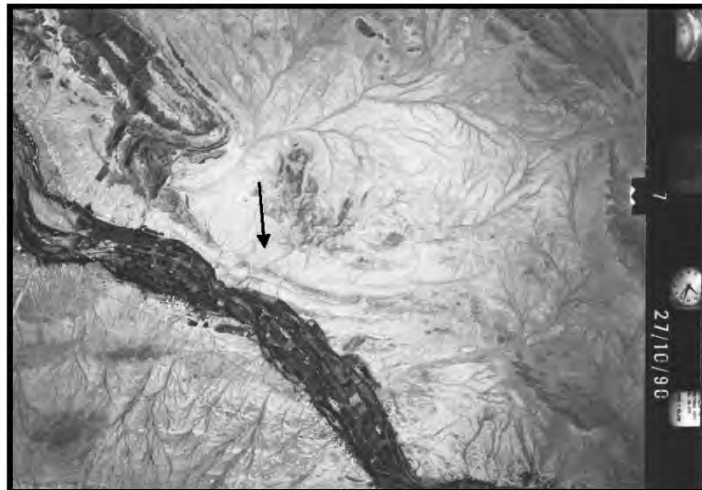


Figure 3: Landsat Image of site in 1990, showing no development.

2. NEMA ACT 2010:

- Construction of 30 ha agricultural development across small ephemeral streams.
- Removal of 30 ha of indigenous vegetation for the construction of the agricultural development. (Refer to Figure 4: Google Image of 2010 and Figure 5: Google Image of 2013.)

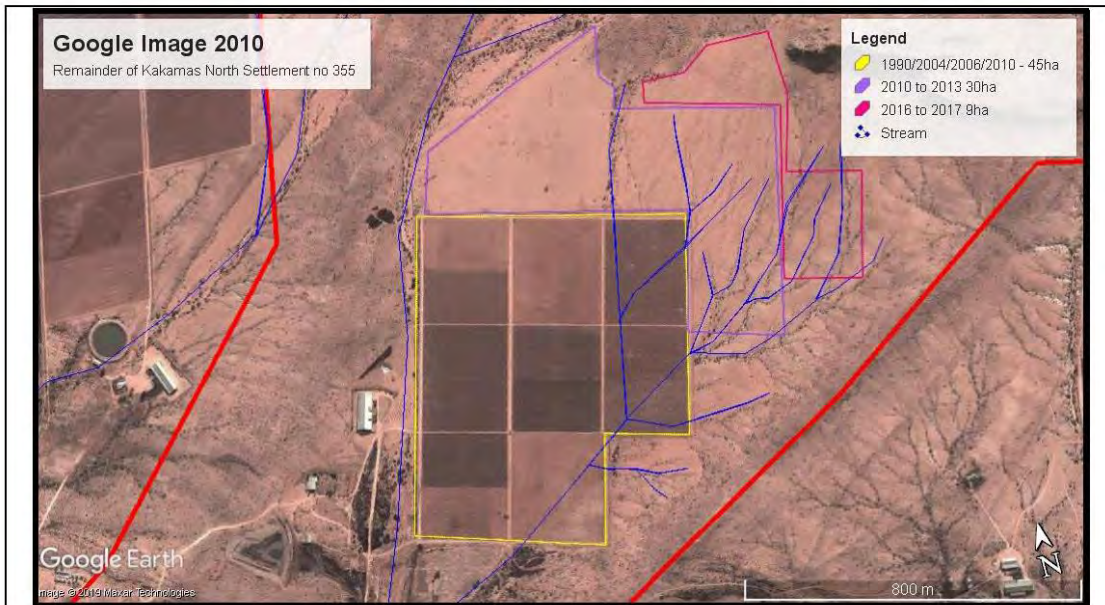


Figure 4: Google Image of the site in 2010.

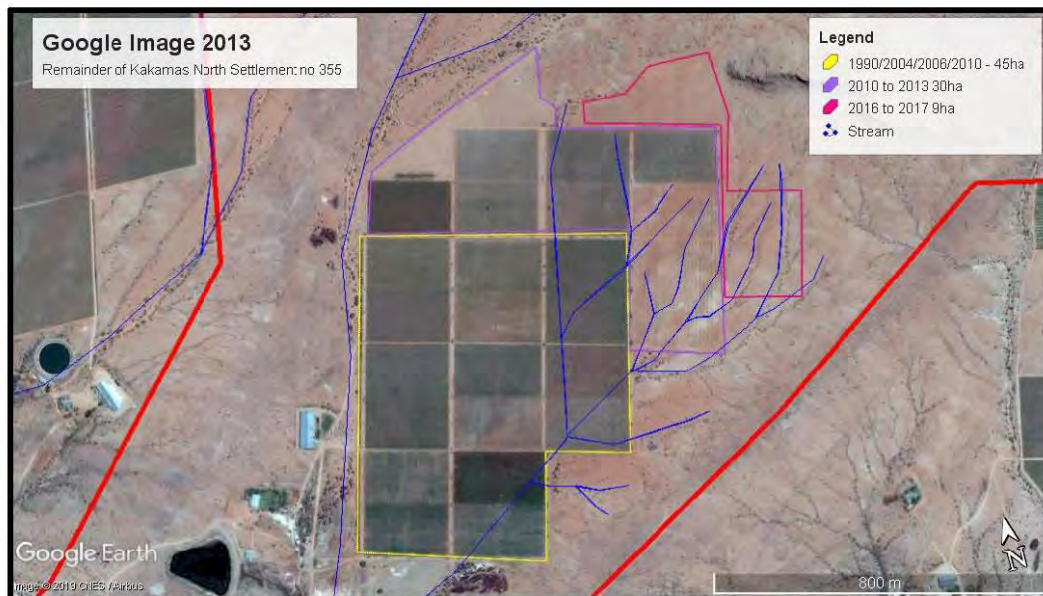


Figure 5: Google Image 2013, showing the 30ha (purple) development.

3. NEMA 2014:

- Construction of 9 ha agricultural development across small ephemeral streams.
- Removal of 9 ha of indigenous vegetation for the construction of the agricultural development. (Refer to Figure 6: Google Image 2016 and Figure 7: Google Image 2017.)



Figure 6: Google Image of 2016.

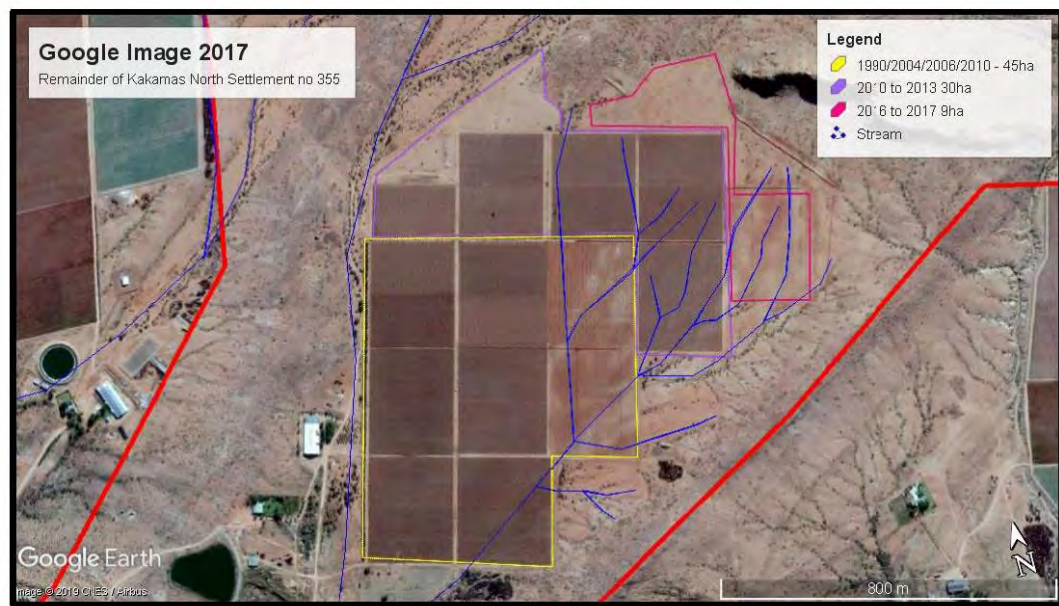


Figure 7: Google Image 2017, showing the development of 9ha (pink).

4. NEMA 2018:

- Construction of 85.5 ha agricultural development across small ephemeral streams (Block 1 to 4). See Figure 8 showing the streams in relation to the developments.
- Removal of 85.5 ha of indigenous vegetation for the construction of the agricultural development. See Figure 8: Proposed Development Layout.

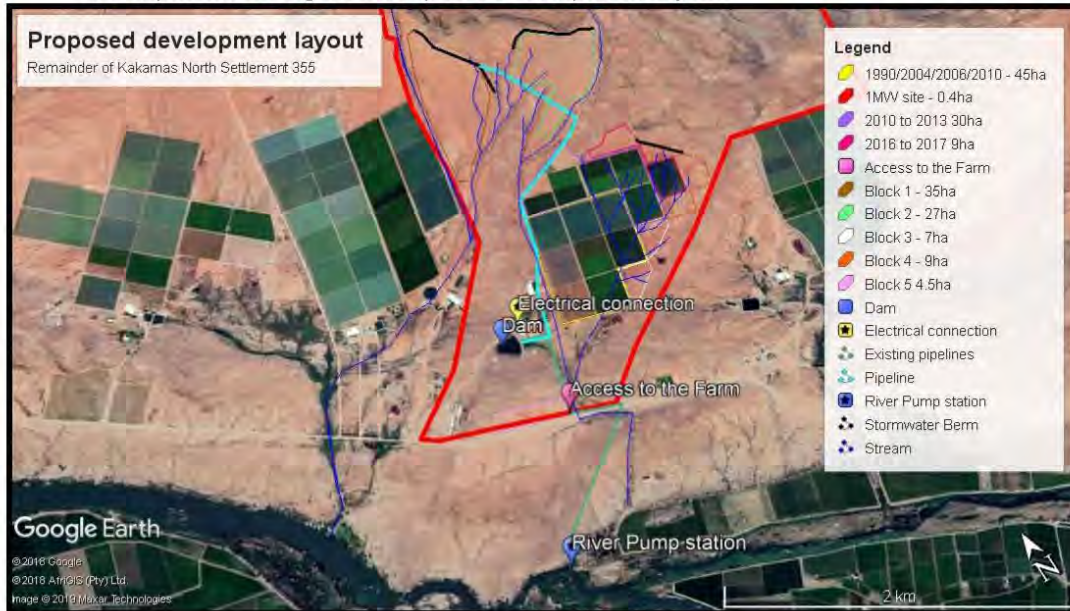


Figure 8: Proposed Development Layout

Roads:

Access is gained via a gravel road that gains access via the N14. The internal farm tracks are not surfaced and are compacted earth with no formal stormwater management control structures in place. The low rainfall characteristic of the area negates the need to provide for formal stormwater control.

Pipelines:

Water is required for the drip irrigation of the established vineyards and is supplied via pipelines from the booster pump station and pump lines (turquoise) as shown in Figure 9. The other existing pipelines (green) established come from the pump station at the Orange River (See Figure 9) towards the existing dam, and from there distributed to the irrigation areas.

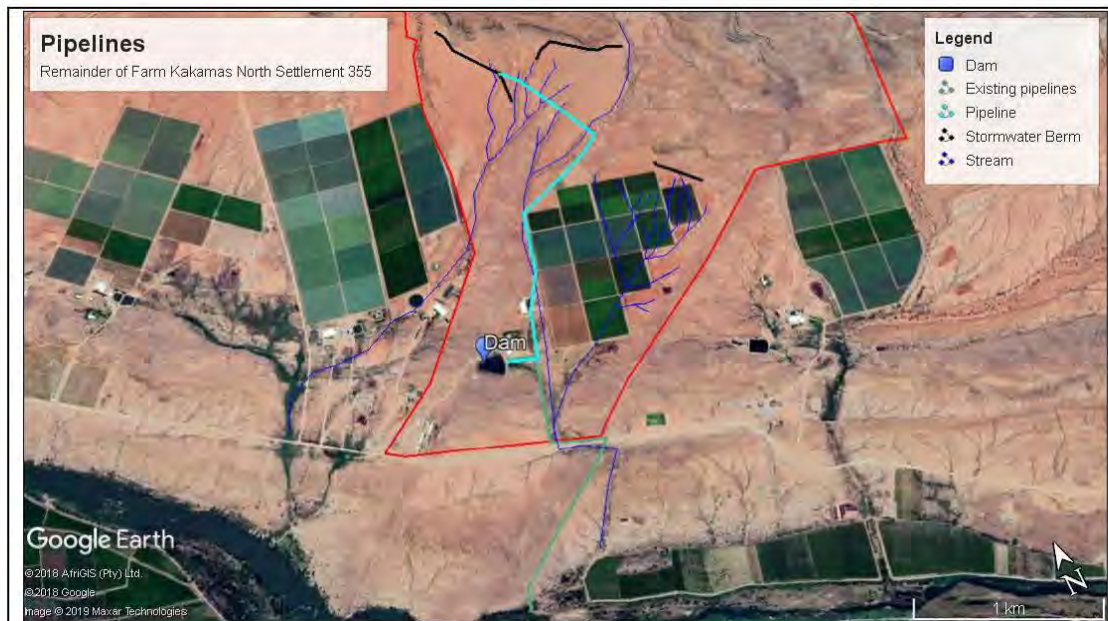


Figure 9: Pipelines

Water:

Remainder of Kakamas North Settlement No. 355 has existing rights for 50 ha (750 000 m³/a) (see Appendix E1, the letter from the Kakamas Water Users Association). The applicant recently obtained additional rights to 145 ha (2 176 782 m³/a), as per the license included in Appendix E1. Therefore, according to the existing license dated 22 March 2019 (Amended in 31 July 2019) and existing rights, the applicant has a total of 195 ha (2 926 782m³/a).

As part of this application, there will be a Water Use License Application for Section 21(c), and (i) of the National Water Act for the streams that were diverted and crossed as part of the illegal establishment of vineyards. The establishment of the vineyards on Remainder of Kakamas North Settlement 355 took place across small sections of the unnamed drainage system that is located on site (see Figure 10). The site falls within the Catchment Region D81A. The drainage channel system is located in an unnamed sub-catchment, D81A-03245. The unnamed sub-catchment is not really a river but fits rather the description of a mostly dry drainage line.

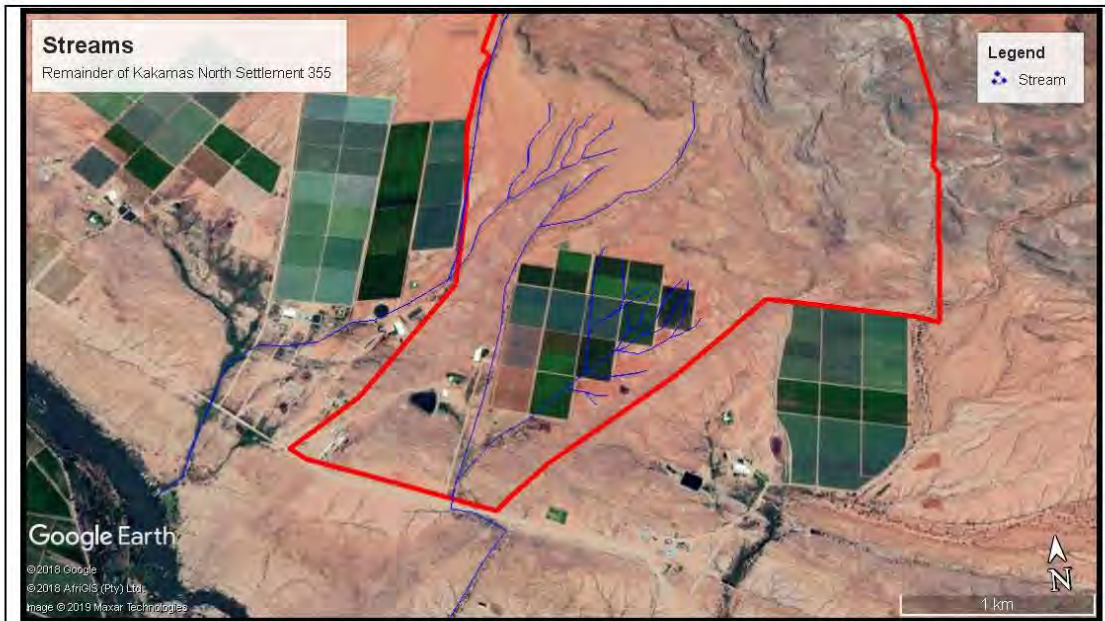


Figure 10: Ephemeral streams/drainage areas

The WULA application is summarised in the table below for the following water usages:

(c) impeding or diverting flow of water in a watercourse	For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas.
(i) altering the bed, banks, course or characteristics of a watercourse	For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas.

Electricity:

There is existing electricity available for the development. The applicant also intends to construct a 1MW PV Plant. The process to determine if environmental authorisation is necessary, is underway.

This document is a requirement for environmental authorization (EA) to be attached at Appendix A. All mitigation measures included in the EA will be inserted into Appendix C. On approval by DEA&DP the developer must ensure that its conditions are implemented by making the document available to the contractor and also ensure that an ECO or the Resident Engineer are appointed,

and systems are in place to evaluate compliance. The contractor(s) is expected to familiarise himself with the contents of this document and to implement its conditions.

Overall the EMPr will aim to:

- Control the construction and operational activities in such a way that negative impacts on the physical environment, sensitive areas and surrounding residential areas are prevented or minimised.
- Ensure that mitigation and rehabilitation measures are implemented where required.

Please note that this document does not replace any other regulations, laws and bylaws that the contractor must adhere to. It specifically does not replace the regulations of the Occupational Health and Safety act of 1993 (Act No. 85 of 1993).

Funding for the implementation of the Construction EMPr is the financial responsibility of the developer.

The project environmental issues are shown in section 2 with the construction EMPr in section 3 and the operational EMPr in section 4.

2 Environmental issues

No significant biophysical impacts are anticipated as the environment has been degraded due to agricultural activities in the surrounding area.

2.1 Vegetation

VEGETATION AND FAUNA (AS PER THE BOTANICAL OPINION, INCLUDED IN DBAR)

Vegetation types:

Four vegetation types (Mucina & Rutherford, 2006) are found in the Tierkop area:

- Lower Gariep Broken Veld (NKb 1);
- Bushmanland Arid Grassland (NKb 3);
- Kalahari Karroid Shrubland (NKb 5); and
- Lower Gariep Alluvial (AZa 3).

Most of the study site was Kalahari Karroid Shrubland with some Bushmanland Arid Grassland in the southern parts (Figure 11). Only these two vegetation types are described below.

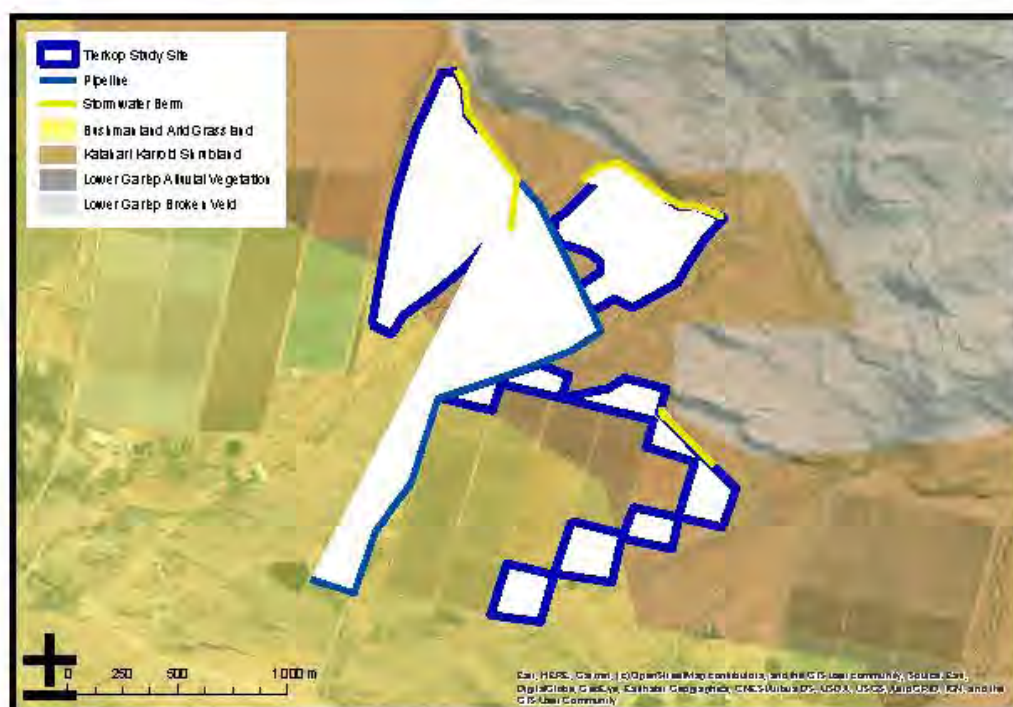


Figure 11: The vegetation types (Mucina & Rutherford, 2006) of the Tierkop study site (on a DigitalGlobe image of 26 June 2017).

Both Kalahari Karroid Shrubland and Bushmanland Arid Grassland are listed as vegetation types

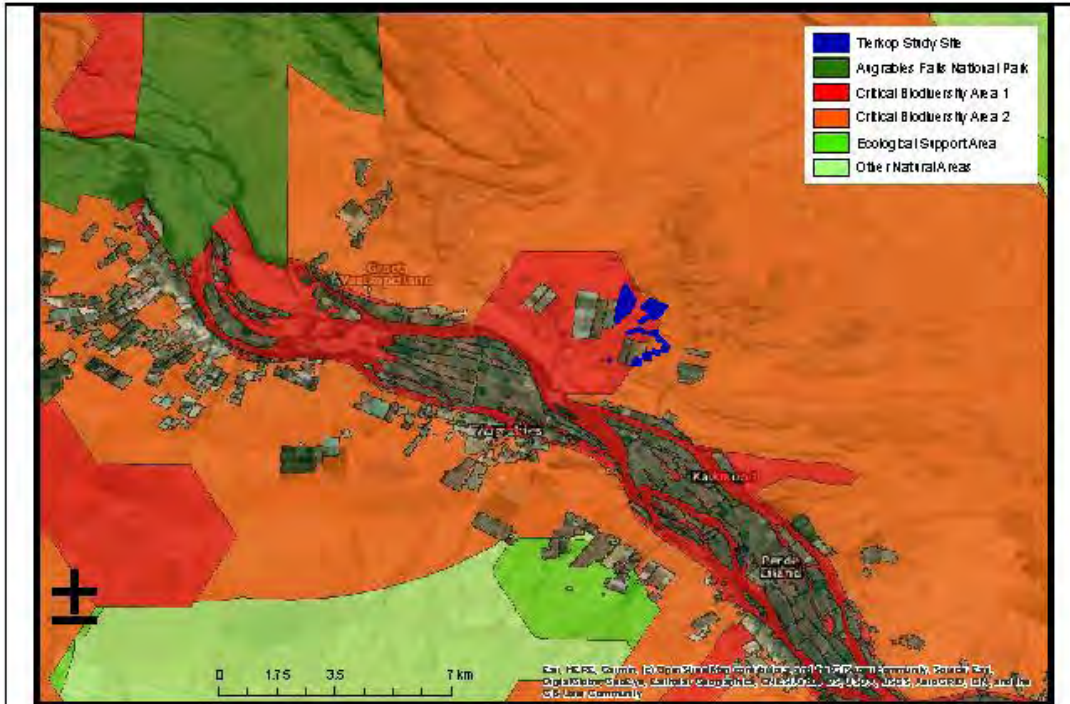


Figure 13: The Critical Biodiversity Areas of the Tierkop study site and surrounds (Oosthuizen & Holness, 2016).



Figure 14: Critical Biodiversity Area

2.2 Aquatic habitat

AQUATIC FEATURES

The establishment of the vineyards on Remainder of Kakamas North Settlement 355 took place across small sections of the unnamed drainage system that is located on site. The site falls within the Catchment Region D81A. The drainage channel system is located in an unnamed sub-catchment, D81A-03245, see Figure 15. The unnamed sub-catchment is not really a river but fits rather the description of a mostly dry drainage line.

The proposed agricultural development areas fall within the Lower Orange River catchment area. It however does not fall within any NEFPA catchment priority areas and is not considered as critically endangered and development of this area will not result in any detrimentally impact on the regional or local catchment area. The site is already cut off from the Orange River via roads and agricultural development.

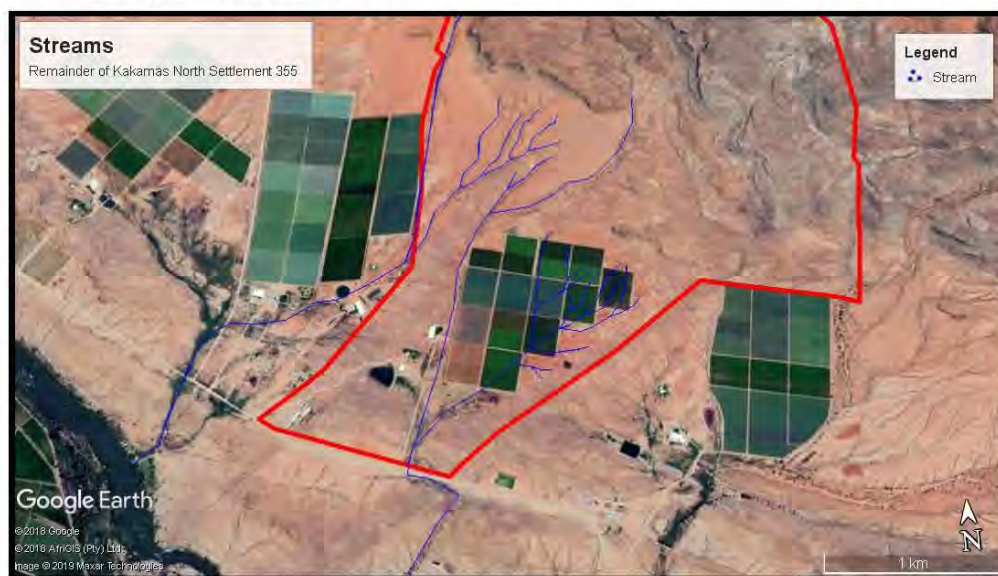


Figure 15: Location of the canal and streams.

ARCHAEOLOGY AND PALAEOLOGY

Sections of the site has entirely been transformed with agricultural activities and therefore possibility of any further finds is scarce.

A Palaeontological Impact Assessment (PIA), see desktop study has been conducted by consulting palaeontologist Dr John Almond of Natura Viva cc.

In terms of Section 38 (1) (c) (iii) of the National Heritage Resources Act 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) of the proposed project is required if the footprint area of the development is more than 5000 m² in extent.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance included artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

Archaeological findings:

One or two marginal scatters (outside the proposed development footprint area), and a limited number of Later Stone Age and Middle Stone Age tools were recorded during a field assessment which took place in June 2019.

The very small numbers and transformed context in which they were found means that the archaeological resources have been graded as having low (Grade 3C) significance.

Built environment/historical structures:

In terms of the built environment, no old buildings, historical structures or features, or any old equipment were found in the proposed footprint area.

Graves:

No graves or typical grave features were encountered during the study.

Impact statement:

Overall, the results of the study indicate that the proposed activity (i. e. a new vineyard development), including construction of a small PV package plant, will not have an impact of great significance on the archaeological heritage.

Conclusion:

Indications are that, in terms of archaeological heritage, the receiving environment is not a sensitive or threatened landscape.

The impact significance of the proposed development on archaeological heritage is assessed as LOW and therefore there are no objections to the authorization of the proposed development.

Recommendations:

No mitigation is required prior to proposed development activities commencing.

No archaeological monitoring is required.

Palaeontology findings:

In view of the negligible palaeontological sensitivity of the ancient Precambrian bedrocks as well as the low sensitivity of the geologically recent superficial sediments along the Orange River in

the Augrabies-Kakamas North region, the proposed agricultural development – including new vineyards and small PV plant – is not considered to pose a significant threat to palaeontological heritage. Substantial, potentially fossiliferous older alluvial deposits of the Orange River are not mapped here.

3 Aim and Objectives of the EMPr

The aim of the EMPr is to:

- Identify those construction activities identified for the proposed project that may have a negative impact on the environment;
- Outline the mitigation measures that will need to be taken and the steps necessary for their implementation; and,
- Describe the reporting system to be undertaken during construction.

The objectives of the EMPr are to:

- Identify a range of mitigation measures which shall reduce and mitigate the potential adverse impacts to minimal or insignificant levels;
- Provide a pro-active and practical working mechanism to enable the measurement and monitoring of environmental performance on site; and,
- Ensure that the environmental specifications are identified, effective and contractually binding to enable compliance on site.

4 Compliance with Applicable Laws

The supreme law of the land is “The Constitution of the Republic of South Africa”, which states: *“Every person shall have the right to an environment which is not detrimental to his or her health or well-being”*.

Laws applicable to protection of the environment in terms of Environmental Management (and relating to construction activities) include but are not restricted to:

- National Environmental Management Act, No. 107 of 1998
- National Environmental Management: Air Quality Act (AQA), No. 39 of 2004
- National Environmental Management: Biodiversity Act, No. 10 of 2004
- National Environmental Management: Waste Act, No. 59 of 2008
- National Heritage Resources Act, No. 25 of 1999
- National Water Act, No 36 of 1998 and amendments
- National Veld and Forest Fire Act, No 101 of 1998
- Occupational Health and Safety Act, No 85 of 1993
- Soil Conservation Act, Act No 76 of 1969
- Sub-division of Agricultural Land Act Repeal Act 64 of 1998 (re: soil conservation) and all regulations framed there under and amendments there to.

Of particular importance is Section 28 (1) of the National Environmental Management Act (NEMA

– Act 107 of 1998) which places an obligation on all individuals to take due care of the environment and to ensure remedial action is instituted to minimise and mitigate environmental impact.

The EMPr forms part of the Contract Documentation and is thus a legally binding document. In terms of this Act an individual responsible for environmental damage must pay costs both to environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle.

5 Roles and Responsibilities

The key role players during maintenance work are anticipated to be as follows:

- Applicant (Holder of the EA) – Rooipad Boerdery (PTY) Ltd
- Engineer / Responsible Person (RP), who will oversee the activities of the contractors on site;
- Environmental Control Officer (ECO);
- Contractors responsible for the maintenance and repair activities; and
- Any sub-contractors hired by the contractor.

The anticipated management structure (organogram) is presented in Figure 8 below and shows the proposed lines of communication for maintenance activities. The applicant retains overall responsibility for maintenance and the implementation of the EMPr.

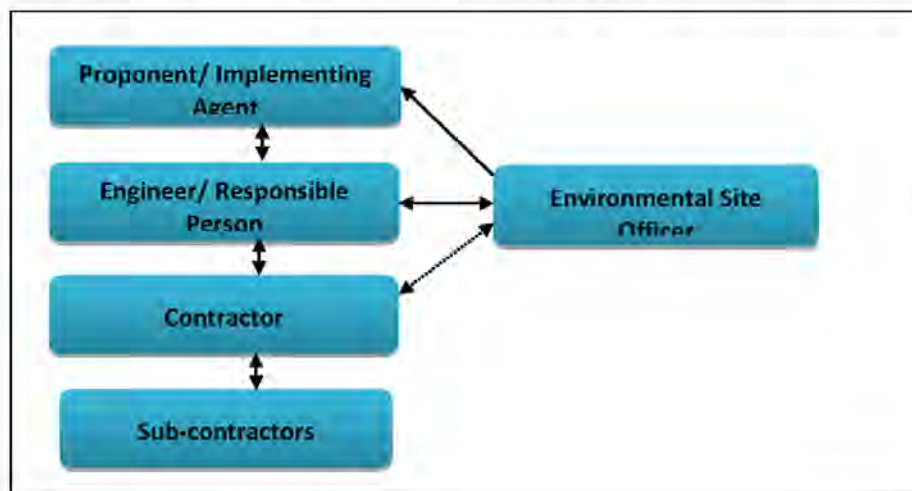


Figure 16: Reporting structure

Key roles and responsibilities with respect to the implementation of the EMPr is outlined below.

Applicant – Rooipad Boerdery (PTY) Ltd:

The applicant (through their Implementing Agent if applicable) has overall responsibility for management of maintenance activities. In terms of environmental management, the proponent will:

- Appoint suitably experienced Engineers, if required, who will be responsible for the overall management of activities on site;
- Identify any activities not covered by the scope of this EMPr, and determine the need for, and where required, obtain relevant authorisations;
- Ensure that the Engineers are aware of the requirements of the EMPr, implement the EMPr and monitor the Contractor's activities on site;
- Ensure that the Contractor is aware of and contractually bound to the provisions of this EMPr by including the relevant environmental management requirements in tender and contract documents, as appropriate;
- Appoint a suitably qualified and experienced ECO to oversee environmental management of the required works;
- Ensure that the Contractor remedies environmental problems timeously and to the satisfaction of the Engineer and authorities (when necessary); and

Responsible Person:

The applicant will appoint suitably qualified Engineers (if necessary), who in turn will designate a responsible person (RP) to oversee activities of the Contractor. This role will be fulfilled either by the Resident Engineer or a suitably qualified representative of the applicant, if applicable. The RP shall:

- Ensure that the Contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr prior to commencement of construction and maintenance activities;
- Identify the need for, and request/provide Method Statements for future maintenance and repair works;
- Monitor the Contractor's activities regarding the requirements outlined in the EMPr;
- Report any environmental emergencies/concerns to the applicant immediately; and

Environmental Control Officer:

The ECO shall be a suitably qualified/experienced environmental professional or professional firm, appointed by the proponent, for the duration of repair or maintenance works. The ECO shall:

- Request Method Statements from the Contractor prior to the start of relevant activities, where required, and approve these (as appropriate) without causing undue delay;
- Monitor, review and verify compliance with the EMPr by the main Contractor, as well as any sub-contractors and specialist contractors;
- Undertake site inspections at least twice a month to determine compliance with the EMPr;
- Identify areas of non-compliance and recommend corrective actions (measures) to rectify them in consultation with the applicant, the RP and the Contractor, as required;
- Compile a checklist highlighting areas of non-compliance following each ECO inspection;
- Ensure follow-up and resolution of all non-compliances;
- Provide feedback for continual improvement in environmental performance;
- Respond to changes in project implementation or unanticipated activities which are not addressed in the EMP, and which could potentially have environmental impacts, and advise the applicant, the RP and Contractor as required; and
- Act as a point of contact for local residents and community members.

Contractor:

The Contractor will be required to appoint or designate a Contractor's Environmental Representative (CER) who will assume responsibility for the Contractor's environmental management requirements on site and be the point of contact between the Contractor, the ECO and the RP. The CER shall:

- Ensure that all activities on site are undertaken in accordance with the EMPr and /or an approved Method Statement which applicable;
- Monitor the Contractor's activities with regard to the requirements outlined in the EMPr;
- Ensure that all employees and Sub-contractors comply with the EMPr;
- Immediately notify the RP and ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the RP and ECO.

The Contractor has a duty to demonstrate respect and care for the environment. The Contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

Sub-contractors:

All Sub-contractors will be required to:

- Ensure that all employees are duly informed of the EMPr and associated responsibilities and implications of this EMPr prior to maintenance activities;
- Ensure that all activities on site are undertaken in accordance with the EMPr;
- Monitor employees' activities with regard to the requirements outlined in the EMPr;
- Immediately notify the RP and ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the RP and ECO.

The Sub-contractor has a duty to demonstrate respect and care for the environment. The Sub-contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation, resulting from their presence on site.

6 Monitoring & Auditing

6.1 ECO Monitoring

The holder of the E.A. must appoint a suitably experienced environmental control officer ("ECO"), for the duration of the construction and rehabilitation phases of implementation.

The ECO must-

- be appointed prior to commencement of any vegetation clearing or construction activities commencing;
- ensure compliance with the EMPr and the conditions contained herein;
- keep record of all activities on site; problems identified; transgressions noted and task schedule of tasks undertaken by the ECO;
- Remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.

An Environmental Control Officer (ECO) will implement and monitor environmental control of the development. The ECO duties will be as follows:

- Ensure implementation and monitoring of the EMPr.
- Make changes to the EMPr as required.

- Visit the site prior to the commencement of activities, to ensure that the correct method statements are prepared. The site must be visited within 10 days after the commencement of activities, and once a month thereafter.
- Prepare ECO site visit reports as required by mitigation measures or by the EA.
- Maintain a photographic record of the work and environmental issues.
- The ECO visits must take place: 1) prior to construction and site clearing, 2) monthly after construction has commenced and 3) 6 months after completion of construction.
- Site visit reports must be compiled which includes photographic evidence and recommendations. The report must be made available to the contractor, applicant and applicable authorities.
- An Audit report must be compiled within 6 months after completion of construction.

A copy of the Environmental Authorisation, EMPr, any independent assessments of financial provision for rehabilitation and environmental liability, closure plans, audit reports and compliance monitoring reports must be kept at the site of the authorised activities.

Access to the site referred to in Section C must be granted, and the environmental reports mentioned above must be produced, to any authorised official representing the Competent Authority who requests to see it for the purposes of assessing and/or monitoring compliance with the conditions contained herein.

The ECO will maintain a file containing the following:

- 1) Copy of the EMPr
- 2) Methodology statement(s) by the contractor(s)
- 3) Site establishment plan
- 4) Letter from contractor(s) indicating that he has familiarised himself with the contents of the EMPr.
- 5) Letter from contractor(s) on environmental awareness training
- 6) The applicant must ensure that complaints received by the farm are documented.
- 7) The contractor shall maintain a copy of the following documents on-site:
 - Operational Plan;
 - Emergency response and remedial action plan;
 - Environmental Management Programme (EMPr) and other documents related to the operation on file.
- 8) Tracking table (see Appendix B).
- 9) Method Statements (See Appendix E and F).

6.2 Auditing

The holder must, for the period during which the environmental authorisation and EMPr remain valid-

- ensure the compliance with the conditions of the environmental authorisation and the EMPr, is audited;
- An Audit report must be compiled within 6 months after completion of construction.
- During the operational phase, the holder must ensure that environmental audit(s) are performed and submitted as outlined in the Environmental Authorisation. During the operational phase the frequency of the auditing of compliance with the conditions of the environmental authorisation and of compliance with the EMPr shall not exceed intervals of 5 years;
- the environmental audit report must be prepared and submitted to the Competent Authority, by an independent person with the relevant environmental auditing expertise;
- The Environmental Audit Report, must-
 - a. provide verifiable findings, in a structured and systematic manner, on-
 - i. the level of compliance with the conditions of the environmental authorisation and the EMPr and whether this is sufficient or not; and
 - ii. The ability of the measures contained in the EMPr to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity.
 - b. identify and assess any new impacts and risks as a result of undertaking the activity;
 - c. evaluate the effectiveness of the EMPr;
 - d. identify shortcomings in the EMPr;
 - e. identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr;
 - f. indicate the date on which the construction work was commenced with and completed or in the case where the development is incomplete, the progress of the development and rehabilitation;
 - g. indicate the date on which the operational phase was commenced with and the progress of the rehabilitation;
 - h. include a photographic record of the site applicable to the audit; and
 - i. Be informed by the ECO reports (where applicable to the construction phase).
- The holder must, within 7 days of the submission of the environmental audit report to the Competent Authority, notify all registered I&AP's of the submission and make the report available to anyone on request and where the holder has such a facility, be placed on a publicly accessible website.

7 Environmental auditing and monitoring schedule

Environmental auditing and monitoring schedule			
Non-operational phases			
	Frequency	Record & duties to be fulfilled	Report
ECO site visits	Once Monthly	<ul style="list-style-type: none"> • Ensure compliance with the EMPR and the conditions contained herein; • Keep record of all activities on site; problems identified; transgressions noted, and a task schedule of tasks undertaken by the ECO; • Remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation. 	Site visit report to holder of EA.
Auditing	Completion of project	Ensure the compliance with the conditions of the environmental authorisation and The EMPR	Submit the Environmental Audit Report(s) to the Competent Authority.
Final construction phase Environmental Audit Report	Within six (6) months of completion of construction.	Ensure the compliance with the conditions of the environmental authorisation and The EMPR	Submit these Environmental Audit Report(s) to the Competent Authority.
Operational phases			
Environmental audit(s)	The frequency of the auditing of compliance with the Conditions of the environmental	<ul style="list-style-type: none"> • The holder must ensure that environmental audit(s) are performed regularly. • The Report must comply with the conditions of the Environmental Authorisation. 	<ul style="list-style-type: none"> • Submit these Environmental Audit Report(s) to the Competent Authority, • The environmental audit

	<p>authorisation and of compliance with the EMPR shall not exceed intervals of 5 years.</p>		<p>report must be prepared and submitted to the Competent Authority, by an independent person with the relevant environmental auditing expertise.</p>
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8 Management Programme – Pre-construction & Construction & Operational

Please note that the EMPr must be included in any tender documentation and all sub-contractors on the site must be made aware of this EMPr and they must at all times adhere to the procedures specified.

Only those sections applicable to the specific construction activity are relevant and to be implemented.

8.1 Specific conditions as stated in EA

- 1) To be included after issue of EA

8.2 Contractual obligations

1. The Contractor shall acknowledge receipt of copies of the EMPr and confirm in writing that he has familiarised himself with the contents thereof;
2. The Contractor shall comply with all environmental obligations imposed by the RE/ECO/EO.
3. The Contractor shall co-operate fully with the RE/ECO/EO and use his best endeavours to ensure that the objectives of the EMPr are fulfilled in the course of the Contractor's execution of the works or the relevant part thereof.
4. The Contractor shall erect an information board containing background information for the construction activity and listing the relevant contact details for complaint.
5. The Contractor must ensure that all workers are given environmental awareness training on the requirements of the EMPr. This must form part of the Contractor's contract agreement. The RE/ECO/EO must be informed in writing of implementation.
6. Working hours will be from 7:00pm to 18:00pm Monday to Saturday. No work will be allowed on Sundays or public holidays.
7. Deliveries will only be allowed between 8:00am and 5pm.
8. Preference must be given to local labour.
9. Workers (except security guards) shall not be housed on site.

8.3 Penalties

Penalties must be instituted for non-compliance. The penalty is over and above the cost of rectifying the problem and/or damage. Penalties vary on a sliding scale from R 1 000 to R 5 000 for non-serious to serious issues as determined by the RE/ECO/EO/EO.

These penalties must be paid into a separate account to be administered by the developer. The RE/ECO/EO/EO will decide how the penalties, if any, are to be spent.

Refer to Appendix D for the Schedule of Fines.

8.4 Methodology statement

Method Statements must be compiled by the contractor(s) before any construction or activity shall commence. The statement must include a site establishment plan indicating all relevant areas. The RE/ECO/EO must approve the Method Statement. Refer to Appendix E.

The ECO must identify Method Statements that will be required as part of the project implementation. The list provided below is generic, and only that which is applicable to the proposed development of the dams and associated infrastructure will be required (underlined).

Access routes

- Upgrading and construction of access routes.
- Rehabilitation of temporary access routes.
- Location of proposed access routes.

Alien plant clearing

- Method of control to be used for the eradication or control of alien vegetation.

Blasting

- Details of all methods and logistics associated with blasting.

Bunding

- Method of bunding for static plant.

Camp establishment

- Layout and preparation of the construction camp.
- Method of installing fences required for “no go” areas, working areas and construction camp areas.
- Preparation of the working area.

Cement /concrete batching

- Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete including the management of runoff water from such areas.

Contaminated water

- Contaminated water management plan, including the containment of runoff and polluted water.

Demolition

- Proposed method(s) of demolition.

Dredging

- Proposed methods and compounds to treat spills.
- Methods of refuelling dredger.

Drilling and jack hammering

- Method of drill coring with water or coolant lubricants.
- Methods to prevent pollution during drilling operations.

Dust

- Dust control.

Earthworks

- Method for the control of erosion during bulk earthwork operations.
- Method of undertaking earthworks, including hand excavation and spoil management.

Emergency

- Emergency construction method statements.

Environmental awareness course

- Logistics for the environmental awareness course for all the Contractors employees.
- Logistics for the environmental awareness course for the Contractors management staff.

Erosion control

- Method of erosion control, including erosion of spoil material.

Exposed aggregate finishes

- The method of control, treatment and disposal with respect to exposed aggregate finishes.

Fire, hazardous and poisonous substances

- Handling and storage of hazardous wastes.
- Emergency spillage procedures and compounds to be used.
- Emergency procedures for fire.
- Use of herbicides, pesticides and other poisonous substances.
- Methods for the disposal of hazardous building materials including asbestos, fibre claddings, refrigerants and coolants.

Fuels and fuel spills

- Methods of refuelling vehicles.
- Details of methods for fuel spills and clean-up operations.
- Refuelling of construction vehicles in high flow areas [or in the 1 in 50-year floodplain].
- Method of refuelling dredger during dredging operations.

Piling, jacking and thrust boring

- The method of piling operation (e.g. driven or bored) or in situ casting or pre-cast pile structures.

Rehabilitation

- Rehabilitation of disturbed areas and revegetation after construction is complete.
- Rehabilitation of street or hardened surfaces after construction is complete.
- Retaining walls and gabions.
- Method for construction and installation of retaining walls/ gabion baskets.

Riverine corridors

- Method for all construction activities within the 1 in 50-year floodplain.

Rock breaking

- Details of chemical applications to be used for rock breaking.

Settlement ponds and sumps

- Layout and preparation of settlement ponds and sumps.

Solid waste management

- Solid waste control and removal of waste from Site.
- Methods for the disposal of vegetation cuttings, building materials or rubble generated by construction.

Sources of materials

- Details of materials imported to the site (where applicable).

Sensitive environments

- Proposed construction methods within any sensitive environments. These can include but are not limited to wetlands, dams and rivers.

Traffic

- Traffic safety measure for entry/ exit onto/ off public roads.
- Traffic control when crossing roads or pedestrian routes with construction activities.

Vegetation clearing

- Method of vegetation clearing during site establishment.

Wash areas

- Location, layout, preparation and operation of all wash areas, including vehicle wash, workshop washing and paint washing and clearing.

Wastewater treatment works

- Emergency procedures for accidental leaks, spillage or overflow of raw wastewater, semi treated wastewater, sludge or final effluent. The Method Statement shall include the following:
 - a. a comprehensive list of available equipment (*e.g.* pipes and pumps) in the event of a spill
 - b. the location of all emergency equipment
 - c. the individual(s) responsible for the upkeep and maintenance of the emergency equipment
 - d. an indication of how regularly the emergency equipment will be checked to ensure that it is working properly
 - e. the location of any and all temporary emergency sumps, including old sludge ponds, clarifiers, low lying areas *etc.*
 - f. the size of spillage which the emergency procedures shall contain
 - g. where and how any spilled material will be returned to the wastewater works system
 - h. who shall be notified in the event of an emergency, including contact numbers for the relevant local authority
- Methods to isolate any section of the wastewater infrastructure for construction or maintenance purposes.
- Methods to connect new structures or reconnect old structures to the wastewater treatment infrastructure.

8.5 Proposed Impact Management Actions

The environmental management and mitigation measures that must be implemented during all construction and operational activities, as well as responsibilities and timelines for the implementation of these measures are presented in Table 4-2. Monitoring thereof, is discussed in section 6.1 above.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
1. Environmental awareness training	<ol style="list-style-type: none"> 1. All the Contractors employees and Sub-Contractors employees and any suppliers' employees that spend more than 1 day a week or four days in a month on site, must attend an Environmental Awareness Training course presented by the Contractor the first of which shall be held within one week of the Commencement Date. Subsequent courses shall be held as and when required. 2. The Engineer/ECO will provide the Contractor with the course content for the environmental awareness training course, and the Contractor shall communicate this information to his employees on the site, to any new employees coming onto site, to his subcontractors and to his suppliers. 3. The Contractor shall supply the Engineer/ECO with a monthly report indicating the number of employees that 	Contractor	<p>Within one week of the Commencement Date/or of new appointments. Subsequent courses shall be held as and when required.</p>	<ul style="list-style-type: none"> • Understanding of the EMPr. • Compliance of Contractor with the EMPr.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>will be present on site during the following month and any changes in this number that may occur during the month.</p> <p>4. The Contractor shall submit a Method Statement detailing the logistics of the environmental awareness training course.</p>			
2. Buffer area	<p>1. A buffer area of 32m of the streams should be kept during construction activities, and the stream area beyond that strictly treated as a No-Go area.</p> <p>2. A buffer zone of 32m from all streams, accept those affected by the development.</p>	Holder of EA or representative	Before construction commences and maintained throughout development.	<ul style="list-style-type: none"> • Ensure no illegal entries. • Ensuring no further degradation of the natural environment. • Ensure no vegetation cleared or disturbed. • Ensuring no degradation to freshwater ecology/environment downstream of the activity.
3. Demarcation and protection	<p>1. The property must be fenced prior to start of construction to determine the construction/work area. Proper access control must be implemented to ensure that only authorised people obtain access to the site.</p> <p>2. The 30m building boundary must be marked and all construction must take</p>	Holder of EA or representative/contractor.	Before construction commences and maintained throughout.	<ul style="list-style-type: none"> • Ensure no illegal entries. • Ensuring no further degradation of the natural environment. • Ensure no vegetation cleared or disturbed. • Ensuring no degradation

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>place within this area.</p> <ol style="list-style-type: none"> 3. No-Go which include sensitive areas, such as the stream, wetland and dams, must be clearly demarcated prior to commencing of demolition and/or earthworks/building operations. 4. The contractor must ensure that fencing and/or demarcations are maintained for the duration of the project. 5. Although not limited to, No-Go areas include the residential areas, dams, stream/river and wetland. 6. No work outside of the property boundary will be allowed. 7. Special features shall be marked on a site layout plan prior to any works commencing on site. These areas shall be designated “No go” areas. 8. Outcrops, rock faces, trees and natural vegetation or any other natural or special features inside and outside the Site, shall not be defaced, painted for benchmarks for survey or any other purposes or otherwise damaged in any way without the prior approval of the Engineer/ECO. These features shall be demarcated as “no 			<p>to fresh water ecology/environment downstream of the activity.</p>

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	go” areas and shall be fenced or similarly protected, as determined by the Engineer/ECO.			
4. Stream &Wetland Sensitive - Environments	<p>1. A buffer zone of 32m from all streams, accept those affected by the development.</p> <p>2. A vegetation and flora survey done in spring yielded 65 plant species in the natural areas of Tierkop, although the region was extremely dry at the time. Two Red Data List plant species were recorded in the Bushmanland Arid Grassland: the Data Deficient <i>Acanthopsis hoffmannseggiana</i> occurs on two quartzite stony slopes of the proposed development area, while the Vulnerable <i>Aloidendron dichotomum</i> trees (also specially protected, Schedule 1 of the Northern Cape Nature Conservation act No. 9 of 2009) are adjacent to (outside) this same area. Two of the four Protected species (Schedule 2 of the Northern Cape Nature Conservation act No. 9 of 2009) were also recorded in this proposed exclusion area (<i>Euphorbia braunsii</i> and <i>E. gariepina</i>). All the protected <i>Pergularia daemia</i> plants (found next to a road) and most of the</p>	Holder of EA or representative/ contractor/ freshwater ecologist	Before construction commences and maintained throughout	<ul style="list-style-type: none"> • Ensure no illegal entries. • Ensuring no further degradation of the natural environment. • Ensure no vegetation cleared or disturbed. • Ensuring no degradation to freshwater ecology/environment downstream of the activity. • Enhancing the downstream wetlands and water quality. • Only enlisted water will be used. • Monitoring as outlined is adhered to.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<i>Boscia albitruncata</i> trees (in the drainage lines) were recorded adjacent to the proposed development area. These areas should not be disturbed.			
3. Aesthetics	<p>The aesthetics measures indicated below must be implemented as required by the specific site and situated and as agreed with the RE/ECO/EO/EO.</p> <ol style="list-style-type: none"> 1. The Contractor shall be required to visually screen the site. 2. Visual screening shall be aesthetically pleasing and shall be erected by the Contractor prior to commencing any activities. 3. Visual screening shall be maintained by the Contractor for the duration of the Contract. 4. Visual screening must be of the following types: <ul style="list-style-type: none"> • Shade cloth • Hessian • Berms 	Holder of EA or representative	Before construction commences and maintained throughout	<ul style="list-style-type: none"> • The construction site is aesthetically pleasing and to reduce the possible visual impact.
4. Camp	<ol style="list-style-type: none"> 1. The Contractor's camp, offices, and storage facilities shall not be located within an environmentally sensitive area or the No-Go areas. The camp's position 	Holder of EA or representative/ Contractor	Before construction commences and maintained throughout	<ul style="list-style-type: none"> • All construction infrastructure etc. is located within a demarcated camp, within

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>must be approved by RE/ECO.</p> <ol style="list-style-type: none"> 2. The camp must be fenced as agreed with the RE/ECO. 3. Water from the kitchens, showers, sinks etc., shall be discharged in a manner approved by the RE/ECO. 4. The contractor must ensure that all temporary structures, equipment, materials, and facilities used or created on-site during the construction phase are removed and appropriately disposed of. 5. No littering by the contractor’s employees shall be tolerated under any circumstances, anywhere in the demarcated area for construction. <p>Site of construction camp</p> <ol style="list-style-type: none"> 1. Choice of site for the contractor’s camp requires the ECO’s permission and must take into account location of local residents and / or ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the ECO and project manager for approval. 2. The construction camp must not be situated within the 1:100-year flood line or 			<p>which possible impacts on the environment can be mitigated.</p> <ul style="list-style-type: none"> • The site is not located close to any environmentally sensitive areas.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>on slopes greater than 1:3.</p> <ol style="list-style-type: none"> 3. The size of the construction camp must be minimized (especially where natural vegetation or grassland has had to be cleared for its construction). 4. The contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion. 5. Suitable control measures over the contractor’s yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented. 6. No development, or activity of any sort associated with camp, is allowed below the 1:50 year flood line of any water system. 7. Storage of materials (including hazardous materials) at site camp 8. Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general on-site topography and water erosion potential of the soil. 9. Storage areas must be designated, demarcated and fenced. 			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>10. Storage areas must be secure to minimize the risk of crime. They must also be safe from access by unauthorised persons.</p> <p>11. Fire prevention facilities must be present at all storage facilities.</p> <p>12. Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any stored volume, and this must be sited away from drainage lines in a site with the approval of the ECO.</p> <p>13. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.</p> <p>14. Clear signage must be placed at all storage areas containing hazardous substances / materials. Staff dealing with these</p>			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>materials / substances must be aware of their potential impacts and follow the appropriate safety measures.</p> <p>15. A Waste Disposal Contractor must be employed to remove waste oil. These wastes must only be disposed of at a licensed landfill sites designed to handle hazardous wastes. A disposal certificate must be obtained from the Waste Disposal Contractor.</p> <p>16. The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.</p> <p>17. All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site.</p> <p>18. Any spillage, which may occur, shall be investigated and immediate action must be taken. This must also be reported to the ECO and DEA&DP, as well as local authorities if so required.</p> <p>19. Drainage of construction camp</p>			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>20. Run-off from the camp site must not discharge into neighbours' properties.</p> <p>End of construction</p> <ol style="list-style-type: none"> Once construction has been completed on site and all excess material has been removed, the storage area shall be rehabilitated. If the area was badly damaged, reseeding shall be done. Such areas shall be rehabilitated to their natural state. Any spilled concrete shall be removed, and soil compacted during construction shall be ripped, levelled and re-vegetated. 			
5. Tree protection	<ol style="list-style-type: none"> All trees, which are to be retained, are to be clearly indicated on a site plan and demarcated. Trees to be demarcated shall be clearly marked under the supervision of the Engineer/ECO. Marking techniques include danger tape, paint (be aware of long-term aesthetics), strapping and pegs. Tagging by exclusion shall be considered, i.e. where the number of trees to be cleared is fewer than those to be retained then marked trees for felling and all other trees shall automatically be retained. 	Holder of EA or representative	If and when required. Before construction commences and maintained throughout. Note possible application to DAFF.	<ul style="list-style-type: none"> Protect the various protected trees, note possible application to DAFF.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	3. Demarcation shall remain in place for the duration of works on site. If damaged, demarcation shall be repaired or replaced immediately.			
6. Sensitive environments	<p>Additional</p> <ol style="list-style-type: none"> 1. Ablution facilities must be located as far away as possible from the river and wetland. Safe and effective sewage treatment will require one of the following sewage handling methods: 2. The use of chemical toilets which are supplied and maintained by the subcontractor 3. The establishment of ablution facilities for all staff and construction workers. A minimum of one toilet must be provided per 15 persons at each working area. 4. Effluent and wastewater – All effluent water from the camp/office must be disposed of in a properly designed and constructed system (ablution facilities), situated so as not to adversely affect the river and wetland. No construction fluids must be allowed to enter the river and wetland. These must be disposed of via the solid waste stream. No wastewater must 	Holder of EA or representative/ Contractor	Before construction commences and maintained throughout. If and when required.	<ul style="list-style-type: none"> • No further impacts on the fauna and flora other than outlined and approved.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>be disposed of onto soil. This does not include clean groundwater from excavations or rainwater.</p> <p>5. Hazardous waste and spillage – Petrochemicals, oils and identified hazardous substances must only be stored under controlled conditions. All hazardous materials must be stored in a secured, appointed area that is fenced and has restricted entry. The site must be protected from direct or indirect spillage of pollutants such as cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products. Responsibility for spill treatments lies with the contractor. Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed.</p> <p>6. Construction vehicles and equipment must be kept in a good working condition. Storage and re-fuelling areas must be clearly demarcated, bunded and lined.</p>			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>7. Spillage of any fuels directly onto bare soil or into a watercourse must be prevented at all times.</p> <p>8. Litter and solid waste – No littering by construction workers must be allowed. Measures must be taken by the contractor to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. The contractor must provide litter bins at all places of work. Solid waste must be stored in an appointed area in covered, tip proof metal drums for collection and disposal.</p> <p>Animals</p> <p>1. The site is within a rural area that has been extensively cultivated and it is therefore unlikely that any animal life would be present. However, should any animal life be encountered it must be carefully removed and none must be harmed or killed. Most animals will move away naturally except possibly snakes. Any problems must be reported to the ECO.</p>			
7. Cement mixing/batching plant	1. The cement mixing or batching plant area(s) must be indicated on the Site Establishment Plan.	Holder of EA or representative/ Contractor	Continuously Throughout the construction phase. If	•Mixing of cement will be done in an environmentally sensitive

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	<ol style="list-style-type: none"> 2. All wastewater resulting from batching of concrete shall be disposed of via the wastewater management system where available. 3. The cement/ concrete batching works shall be kept neat and clean at all times. No batching activities shall occur on unprotected substratum of any kind. 4. All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at a site approved by the Engineer/ECO/EO. Dagga boards, mixing trays and impermeable sumps shall be used at all mixing and supply points. Contaminated water shall be disposed at a waste disposal site approved by the Engineer/ECO/EO. 5. Contaminated water storage facilities shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented. 6. Contaminated water treatment on Site shall require a method statement approved by Engineer/ECO/EO. 7. Unused cement bags are to be stored so as 		and when required.	<p>manner.</p> <ul style="list-style-type: none"> • No cement spillage takes place.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>not to be affected by rain or runoff events.</p> <p>8. Used bags shall be stored in weatherproof containers to prevent wind-blown cement dust and water contamination. Used bags shall be disposed of on a regular basis via the solid waste management system and shall not be used for any other purpose.</p> <p>9. Concrete transportation shall not result in spillage.</p> <p>10. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment: Care shall be taken to collect contaminated wash water from cleaning activities and dispose of it in a manner approved by the Engineer/ECO/EO. To prevent spillage onto roads, ready mix trucks shall rinse off the delivery shoot into a suitable sump prior to leaving Site.</p> <p>11. Suitable screening and containment shall be in place to prevent wind-blown contamination associated with bulk cement silos, loading and batching.</p> <p>12. With respect to exposed aggregate finishes, the Contractor shall collect all contaminated water & fines and store it in</p>			

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	<p>sumps for disposal at an approved waste site.</p> <p>13. All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete pour section and disposed. Washing the remains into the ground is not acceptable. All excess aggregate shall also be removed. Any mixed cement (for building or plastering) at the work area must be placed on boards or container to prevent spillage or contamination of the soil.</p> <p>14. During cement delivery boards or other protection material must be used to prevent spilling on the ground.</p> <p>15. No mixed concrete/dagga must be placed or stored on bare surfaces. Dagga boards must be use at all times to prevent contamination of surfaces.</p>			
8. Surface and groundwater pollution	<p>1. The Contractor shall take all reasonable steps to prevent pollution of surface and groundwater as a result of his activities. Such pollution could result from release (accidental or otherwise) of chemicals, oils, fuels, paint, and sewage, water from excavations, construction water, water</p>	Holder of EA or representative/ Contractor	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> •No further degradation or deterioration of ground and surface water due to construction activities.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>carrying soil particles or waste products.</p> <ol style="list-style-type: none"> 2. Cement or concrete mixing must take place in such a way as to prevent any cement water runoff. All pieces of cement or related material are to be stored and dumped at the approved Municipal site. 3. Bulk cement silos and storage areas must be properly lined/screened/contained to prevent windblown cement dust or pollution of water during rain events. 4. On completion, storm water catch pits must be closed with geotextile (biddim) or similar material to prevent sand or other contaminants from entering the system. 5. Ready-mix trucks are not permitted to clean chutes at the work site. 6. Adequate plastic or concrete lined cleaning pits are to be installed to facilitate washing of all cement and painting equipment. A functional, non-leaking, water point must be installed at each pit. The top 75% of the water in the pit must be disposed down the sewerage system, with approval from the Engineer. The remaining water and sludge must be disposed of at a Municipal approved site or removed by a 			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	chemical contractor. 7. The Contractor shall provide water and/or washing facilities at the construction camp for personnel. 8. In the event of any pollution entering any water body, the Contractor shall inform the RE/ECO/EO immediately. 9. The contractor will be responsible for any clean-up costs involved should pollution, erosion or sedimentation have taken place.			
9. Air pollution	Air Pollution 1. During the construction phase, and due to the nature of the project, a small amount of smoke (from machines) and dust could be generated. Dust pollution may have an impact on the operational workers. 2. In order to minimize the effect of dust pollution, the construction area must be kept wet as far as possible and the workers must wear the necessary safety clothing. The applicant is referred to section 19 of the National Water Act No. 36 of 1998 with regard to the prevention of, and remedies for, the effects of pollution. In terms of this section of the Act, the person who owns controls, occupies or uses the	Holder of EA or representative/ Contractor	Continuously Throughout the construction phase. If and when required.	Ensuring dust etc associated with construction activities are mitigated and managed to prevent any degradation to the natural environment.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	land in question is responsible for taking measures to prevent pollution of water resources and property.			
10. Noise control	<ol style="list-style-type: none"> 1. Working hours will be restricted to daily normal working hours. 2. Limit the use of heavy vehicle machinery and construction activities associated with high level noise to 07h00 to 18h00 from Mondays to Saturdays, particularly to where residential areas or sensitive institutions are situated close to the site. 3. All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels for residential areas. 4. All plant and machinery are to be fitted with adequate silencers. 5. No sound amplification equipment such as sirens, loud hailers or hooters shall be used on site, after normal working hours, except in emergencies. 6. If work is to be undertaken outside of normal work hours, permission must be obtained from the Local Authority. Prior to commencing any such activity, the 	Holder of EA or representative	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> • Ensuring no noise levels above Standard and mitigating possible noise in the receiving environment.

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	<p>Contractor is also to advise the potentially affected neighbouring residents. Dates, times and the nature of the work to be undertaken are to be provided. Notification may include letter-drops.</p> <p>7. The acceptable noise level according to SABS 10103 Code of Practice is 45dBA in rural district during the day and 35dBA at night. The applicant must comply/adhere to this requirement.</p> <p>8. The Contractor shall make adequate provision to prevent or minimize the possible effects of air and noise pollution. Should the noise from the construction work be found to cause problems, (which is not anticipated to be the case) work hours in these areas must be restricted between 06:00 and 18:00, or as otherwise agreed between the parties involved. Strict measures shall therefore be enforced, especially in terms of the contract specifications, to prevent any negative impacts in this regard.</p>			
11. Pipe testing and cleaning	1. Cleaning/flushing of pipelines shall not impair (down grade) downstream baseline water quality.	Holder of EA or representative/ Contractor	Continuously Throughout the construction phase. If	<ul style="list-style-type: none"> • No blockages and damage to pipes.

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	<ol style="list-style-type: none"> 2. Materials used in the sterilisation of pipelines, viz. chlorine solutions shall be treated as hazardous substances and disposed of at an approved landfill site. 3. Litter traps shall be installed and maintained at the outflow of all pipelines. 		and when required.	
12. Erosion control	<p>The Contractor must take all reasonable precautions to prevent soil erosion resulting from a diversion, restriction or increase in the flow of storm water or water resulting from its operations and activities, to the satisfaction of the RE/ECO/EO. Possible measures that can be considered include the following:</p> <ol style="list-style-type: none"> 1. Brush cut packing 2. Mulch or chip cover 3. Straw stabilising (at the rate of one bale/m² and rotated into the top 100mm of the Completed earthworks) 4. Watering 5. Planting / sodding 6. Hand seeding sowing 7. Hydroseeding 8. Soil binders and anti-erosion compounds 9. Mechanical cover or packing structures 10. Gabions & mattresses 11. Geofabric 	Holder of EA or representative/ Contractor	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> • Ensuring no further degradation of the natural environment. • Ensure no more vegetation cleared or Disturbed due to erosion. • No erosion downstream of the newly constructed dams.

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	12. Hessian cover 13. Armourflex 14. Log / pole fencing 15. Retaining walls 16. The Contractor shall take reasonable measures to control the erosive effects of storm water runoff. 17. The Contractor shall use silt screens to prevent overland flowing water from causing erosion. 18. The use of straw bales as filters, which are placed across the flow of overland storm water flows, shall be used as an erosion protection measure. 19. The ploughing-in of straw offers limited protection against storm water runoff induced erosion and shall be used as an erosion protection measure. 20. The Contractor shall be liable for any damage to downstream property caused by the diversion of overland storm water flows.			
13. Dust control	DUST - generated by works 1. Sand stockpiles are to be covered with hessian, shade cloth or DPC plastic. 2. Stockpiles are to be located in sheltered	Contractor	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> • Ensuring proper dust suppression. • Minimizing the potential dust impacts during

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	<p>areas and the usable/cut face orientated away from the direction of the prevailing wind for that season.</p> <p>3. Excavating, handling or transporting erodible materials in high wind or when dust plumes visible shall be avoided.</p> <p>4. If high winds prevail the Engineer shall decide whether water dampening measures or cessation of activities is required, and if necessary, they shall have the authority to temporarily stop certain of the works until wind conditions become more favourable.</p> <p>Dust – generated by roads and vehicle movement</p> <p>1) Vehicle speeds shall not exceed 40km/h along gravel roads or 20km/h on unconsolidated or non-vegetated areas. Dust plumes created by vehicle movement are to be monitored.</p> <p>2) If access roads are generating dust beyond acceptable levels dust suppression measures must be initiated. These include, but are not limited to the following:</p> <p>2.1 Reduction of travelling speeds along the road.</p> <p>2.2 Restriction of vehicle or plant usage.</p> <p>2.3 Application of chemical soil binders.</p> <p>2.4 Application of a suitable sacrificial road surfacing.</p>			<p>construction.</p>

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>2.5 If water is to be used for dust suppression, then only the critical areas shall be watered. The use of water carts or hand watering is preferable. Overhead sprayers shall not be permitted in windy conditions, as the evaporation loss is too high. Watering is to be supervised to prevent unnecessary water wastage, and runoff into potentially sensitive areas. Preferable watering times are early morning and late afternoon/ evening. Water restrictions are to be observed if in place.</p>			
14. Fire management	<p>1) No open fires or naked flames for heating or cooking shall be allowed on Site. Stoves and other electrical equipment shall only be permitted in the Contractor’s camp and never be left unattended.</p> <p>1.1. The Contractor shall take all reasonable and active steps to avoid increasing the risk of fire through their activities on Site. No fires shall be lit except at places approved by the Engineer/ECO/EO.</p> <p>1.2. The Contractor shall ensure that the basic fire-fighting equipment is to the satisfaction of the Municipal Fire Chief (where applicable).</p> <p>1.3. The Contractor shall supply all living</p>	Contractor	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> • Prevent any open fires from taking place. • Prevention measures in place if any accidental fires do take place.

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	<p>quarters, site offices, kitchen areas, workshop areas, materials, stores and any other areas identified by the Engineer/ECO/EO with tested and approved firefighting equipment.</p> <p>1.4. Fire and “hot work” shall be restricted to a site approved by the Engineer/ECO/EO</p> <p>1.5. A braai facility shall be considered at the discretion of the Engineer/ECO/EO. The area shall be away from flammable stores. All events shall be under management supervision and a fire extinguisher shall be immediately available. “Low smoke” fuels shall be used. Smoke free zoning regulations shall be considered.</p> <p>1.6. Fires within National Parks, Nature Reserves and natural areas are prohibited.</p> <p>1.7. Cooking shall be restricted to bottled gas facilities under strict control and supervision. The sensitivity of the surrounding land uses and occurrence of natural indigenous vegetation must be considered when assessing the risk of fires.</p> <p>1.8. The Contractor shall take precautions when working with welding or grinding equipment near potential sources of</p>			

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	<p>combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains.</p> <p>1.9. The Contractor shall identify the authorities responsible for fighting fires in the area and shall liaise with them regarding procedures should a fire start. The Contractor shall ensure that his staff are aware of the fire danger at all times and are aware of the procedure to be followed in the event of a fire. The Contractor shall also ensure that all the necessary telephone numbers etc. are posted at conspicuous and relevant locations in the event of an emergency. The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it.</p> <p>1.10. Should a contractor be found responsible for the outbreak of a fire, he shall be liable for any associated costs.</p>			
15. Water management	1. The Contractor shall provide water for drinking and construction purposes until such time as it is available from the local	Holder of EA or representative	Continuously Throughout the construction phase. If	•Management of water for drinking, construction activities and dust

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>system. Water from the local system must be used carefully and sparingly with the view of not wasting water.</p> <ol style="list-style-type: none"> 2. Taps are to be attached to secure supports and leaking taps and hosepipes are to be repaired immediately. 3. Watering as dust suppression must be undertaken as a last resort. It is preferable that sand stockpiles be covered rather than watered. 4. Any abstraction from natural water sources such as a stream or groundwater will require a Method Statement for approval by the RE/ECO/EO. 5. An adequate supply of potable water that complies with bacteriological and chemical quality must be available at all times. 6. Water samples of the potable water must be taken at regular intervals and the results kept on record. 7. The aforementioned records must be made available to a competent authority upon request. 		and when required.	suppression.
16. Waste management	<ol style="list-style-type: none"> 1. A waste minimisation approach must be followed. This requires recycling wherever possible. All waste therefore to be suitably 	Holder of EA or representative/ Contractor.	Continuously Throughout the construction phase. If	<ul style="list-style-type: none"> •Ensure the site is kept free of litter. •Ensuring proper waste

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	<p>contained and removed regularly from site in accordance with the municipal waste management procedures. Other examples shall include the use of rubble as fill, minimisation of waste concrete and the use of brush cuttings for mulching on rehabilitated areas.</p> <p>2. The Contractor shall be responsible for the establishment of a refuse control and removal system that prevents the spread of refuse within and beyond the construction sites.</p> <p>3. The Contractor shall ensure that all refuse is deposited in refuse bins, which he shall supply and arrange to be emptied on a weekly basis. Refuse bins shall be of such a design that the refuse cannot be blown out and that animals or birds are not attracted to the waste and spread it around. Refuse bins shall be water tight, wind-proof and scavenger-proof and shall be appropriately placed throughout the site. Refuse must also be protected from rain, which may cause pollutants to leach out. Refuse bins shall be appropriately placed throughout the Site and shall be conspicuous (e.g.</p>		<p>and when required.</p>	<p>management and removal takes place.</p> <ul style="list-style-type: none"> •Ensuring legal waste removal takes place.

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	<p>painted bright yellow).</p> <p>4. Refuse shall be disposed of at an approved waste site (site and method to be agreed with Local Authority). Refuse shall not be burnt or buried on or near the Site.</p> <p>5. The Contractor shall provide labourers to clean up the Contractor's camp and Site on a weekly basis.</p> <p>6. The Contractor shall also clean the Contractor's camp and Site of all structures, equipment, residual litter and building materials at the end of the contract.</p> <p>7. No waste, specifically rubble and "building rubble" shall be utilised for fill material, except where such actions are approved or licenced</p>			
17. Toilets	<p>1. The Contractor shall be responsible for providing all sanitary arrangements for construction and supervisory staff on the site. A minimum of one chemical toilet shall be provided per 15 persons. Toilets provided by the Contractor must be easily accessible and within a practical distance from the workers. Toilets shall be located within areas of low environmental</p>	Holder of EA or representative	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> •Appropriate sewerage management will take place. •Sufficient ablution facilities provided.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>importance. The toilets shall be of a neat construction and shall be provided with doors and locks and shall be secured to prevent them blowing over. Toilets shall be placed outside areas susceptible to flooding.</p> <ol style="list-style-type: none"> 2. The Contractor shall keep the toilets in a clean, neat and hygienic condition. The Contractor shall supply toilet paper at all toilets. 3. The Contractor shall be responsible for the cleaning, maintenance, servicing and emptying of the toilets on a regular basis (by chemical contractor). No waste to be dumped in the bush or wetland. 4. The Contractor shall ensure that the toilets are emptied before the builders' or other holidays and the waste be stored and disposed of at an appropriate place off site. 5. The Contractor shall ensure that no spillage occurs when chemical toilets are cleaned and emptied. 6. The Contractor shall supply a contingency plan for spills from toilets. 7. Performing ablutions in any other area is 			

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	<p>strictly prohibited.</p> <p>8. The location for construction camps and toilets must be approved by the ECO.</p>			
<p>18. Fuel and chemical management</p>	<ol style="list-style-type: none"> 1. Fuel may be stored on site providing the following is strictly adhered to: 2. All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities. 3. The Municipal Fire Chief (or as applicable) must be informed and consulted into Fire Regulations. 4. The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly shut and under lock and key at all times. 5. The Contractor shall stand any equipment that may leak, and does not have to be transported regularly, on watertight drip trays to catch any pollutants. The drip trays shall be of a size that the equipment can be placed inside it. Drip trays shall be cleaned regularly and shall not be allowed to overflow. 6. All hazardous material (e.g., oils. Petrol or diesel) used on site must be disposed of at an approved hazardous waste facility or 	<p>Holder of EA or representative</p>	<p>Continuously Throughout the construction phase. If and when required.</p>	<ul style="list-style-type: none"> •Ensuring proper use/ storage/ handling and management of fuel on site. •Ensuring minimal to no impact on the natural environment.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>with the services of a licensed waste transportation company. All certificates of disposal and weigh bridge slips need to be signed by all relevant officials and kept as records on the premises.</p> <p>7. The contractor will be responsible for the cleaning up of any spill and associated costs.</p> <p>8. Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and shall require the approval of the Municipal Fire Chief (in urban areas) or RE/ECO/EO.</p> <p>9. Temporary above ground storage tanks may be permitted at the discretion of the Municipal Fire Chief based on the merit of the situation, provided that the following requirements are complied with:</p> <p>10. Written application together with a plan and authority from the Municipality shall be forwarded to the Municipal Fire Chief (in urban areas) or RE/ECO/EO at least fourteen (14) days prior to the installation being erected on site. Written permission shall be obtained from the chief fire officer for the erection of the installation.</p>			

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	<p>11. The drawn plan shall be acceptable to the Municipal Fire Chief (in urban areas) or RE/ECO/EO and to contain the following information:</p> <p>1.11. the scale</p> <p>1.12. the name and address of the premises,</p> <p>1.13. the number and the quantity of the tanks,</p> <p>1.14. the position of the tanks in relation to the boundary, other flammable or combustible materials, etc,</p> <p>1.15. the size and construction materials used for the bund</p> <p>1.16. the product to be kept in the tank, and</p> <p>1.17. any other information relevant to the situation.</p> <p>Location</p> <p>12. The fuel storage area shall be located at one of the following locations: {provide a list of acceptable locations for the fuel storage area}.</p> <p>13. The Engineer/ECO shall be advised of the area that the Contractor intends using for</p>			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>the storage of fuel.</p> <p>14. The location of the fuel storage area will be determined by the Municipal Fire Chief (in urban areas) and be approved by the Engineer/ECO/EO.</p> <p>15. The tank shall be erected at least 3.5 meters from buildings, boundaries and any other combustible or flammable materials.</p> <p>Signs/good practice/safety precautions</p> <p>16. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 are to be prominently displayed in and around the fuel storage area. The volume capacity of the tank shall be displayed.</p> <p>17. No smoking shall be allowed in the vicinity of the stores.</p> <p>18. The capacity of the tank shall be clearly displayed, and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1.</p> <p>19. There shall be adequate fire-fighting equipment at the fuel storage and dispensing area or areas.</p>			

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	<p>20. Fuel shall be kept under lock and key at all times.</p> <p>Tanks</p> <p>21. The storage tank shall be removed on completion of the works.</p> <p>22. The storage tank shall be on the premises only for as long as the contract last.</p> <p>23. All such tanks to be designed and constructed in accordance with a recognised code.</p> <p>24. The rated capacity of tanks shall provide sufficient capacity to permit expansion of the product contained therein by the rise in temperature during storage.</p> <p>Bunds/storage areas</p> <p>25. Tanks shall be situated in a bunded area the volume of which shall be at least 150% of the volume of the largest tank. The floor of bund shall be smooth and impermeable constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The bund walls shall be of concrete or formed of well-packed earth with the impermeable lining extending to the crest. The floor of the bund shall be sloped towards an oil</p>			

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	<p>trap or sump to enable any spilled fuel and/or fuel-soaked water to be removed.</p> <p>26. A bacterial hydrocarbon digestion agent that is effective in water approved by the Engineer/ECO/EO shall be installed in the sump.</p> <p>27. The tanks and bunded areas shall be covered by a roofed structure to prevent the bunded area from filling with rain water. This structure shall be constructed in such a way, and to the approval of the Engineer/ECO/EO, to ensure that it is wind resistant.</p> <p>28. Any water that collects in the bund shall not be allowed to stand and shall be removed within one day and taken off Site to a disposal site approved by the Engineer/ECO/EO, and the bacterial hydrocarbon digestion agent shall be replenished.</p> <p>Empty containers</p> <p>29. Only empty and externally clean tanks shall be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.</p>			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>Filling/dispensing methods</p> <p>30. Any electrical or petrol-driven pump shall be equipped and positioned so as not to cause any danger of ignition of the product.</p> <p>31. If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used. The drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container when not in use.</p> <p>32. Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents.</p> <p>Method statements</p> <p>33. A method statement is required for the filling of and dispensing from storage tanks.</p>			
34. Litter and oil traps	2) Refuse screens and oil traps shall be installed at runoff concentration points from large parking facilities, wash bays, storm water outlets, inlets to detention ponds, workshop forecourt drainage points, ablution and eating areas. These	Holder of EA or representative	Continuously Throughout the construction phase. If and when required.	

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	facilities shall be serviced and monitored at the discretion of the Engineer/ECO			
19. Contaminated water	<p>General</p> <p>3) The Engineer/ECO/EO's approval will be required prior to the discharge of contaminated water to the Municipal sewer system.</p> <p>4) The Contractor shall prevent discharge of any pollutants, such as cements, concrete, lime, chemicals and fuels into any water sources.</p> <p>5) Water from kitchens, showers, laboratories, sinks etc. shall be discharged into a conservancy tank for removal from the site.</p> <p>6) Runoff from fuel depots/workshops/truck washing areas and concrete swills shall be directed into a conservancy tank and disposed of at a site approved by the Engineer/ECO and Local Authority.</p> <p>7) The contaminated water, contaminated run-off, or effluent released into a water body requires analysis in terms of the National Water Act. Contaminated</p>	Holder of EA or representative	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> •Contaminated water will be dealt with as part of the existing infrastructure on the property. •The workshops on the property will be utilised to manage runoff.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>water must not be released into the environment without authorisation from the relevant authority.</p> <p>Washing areas</p> <p>8) Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas, which include groundwater, are not polluted.</p> <p>9) A Method Statement shall be required for all wash areas where hydrocarbon and hazardous materials, and pollutants are expected to be used. This includes, but is not limited to, vehicle washing, workshop wash bays, paint wash and cleaning.</p> <p>10) Wash areas for domestic use shall ensure that the disposal of contaminated “grey” water is sanctioned by the Engineer/ECO.</p>			
20. Vehicles and access roads	<ol style="list-style-type: none"> The movement of any vehicles and/ or personnel outside of the designated working areas shall not be permitted without the written authorisation of the Engineer/ECO. Should the Contractor not exercise 	Holder of EA or representative	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> •Proper vehicle movement on site and surrounding areas. •Management of potential damage to existing roads during

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>sufficient control to restrict all work to the area within the marker boundaries, then these on instruction of the Engineer/ECO/EO shall be replaced by fencing the additional cost of which shall be borne by the Contractor.</p> <p>3. Dust control measures such as dampening with water shall be implemented where necessary, as indicated by the Engineer/ECO.</p> <p>4. Access and haul roads shall be maintained by the Contractor.</p> <p>5. Maintenance includes adequate drainage and side drains, dust control and restriction of edge use.</p> <p>6. All temporary access routes shall be rehabilitated at the end of the contract to the satisfaction of the Engineer/ECO.</p> <p>7. All public roads shall be kept clear of mud and sand. Mud and sand that has been deposited through construction activities shall be cleared regularly.</p> <p>8. Any materials used for layer works shall be approved by the Engineer/ECO prior to the activity commencing.</p> <p>9. Damage to the existing access roads as a</p>			<p>construction.</p> <ul style="list-style-type: none"> •Traffic management to ensure safety on roads.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>result of construction activities shall be repaired to the satisfaction of the Engineer/ECO/EO, using material similar to that originally used. The cost of the repairs shall be borne by the Contractor</p> <p>10. Traffic safety measures, to the satisfaction of the Engineer/ECO, shall be considered in determining entry / exit onto public roads.</p> <p>11. All users of haul roads shall not exceed 45 km/h (cars)/ 15 km/h (trucks) {note that the standard spec places a site speed limit of 45 km/h for all vehicles}</p> <p>12. Appropriate traffic warning signs shall be erected and maintained.</p> <p>13. Trained and equipped flagmen shall be used where the access road intersects with any public roads.</p> <p>14. Attention shall be paid to minimising disruption of the flow of traffic and reducing the danger to other road users and pedestrians.</p> <p>15. Method statements are required for the following: -</p> <ul style="list-style-type: none"> • Traffic safety measures with regard to entry and exit on public roads and the control of construction traffic. 			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<ul style="list-style-type: none"> Proposed route for new access roads, tracks, or haul roads; the proposed construction of new roads, and the method of upgrading existing roads; and the proposed methods of rehabilitation on completion. 			
21. Stockpiling of materials	<ol style="list-style-type: none"> The Contractor shall temporarily stockpile topsoil materials in such a way that the spread of materials is minimised, and thus the impact on the natural vegetation. The stockpiles must be placed within areas demarcated for this purpose. The RE/ECO/EO shall approve stockpile areas. 	Holder of EA or representative/Contractor	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> Appropriate stockpiling, to ensure topsoil can be utilised properly. Re-establish vegetation
22. Heritage remains	<ol style="list-style-type: none"> Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during preparation of the lands for cultivation, , these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt' 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist. It is therefore recommended that, pending the discovery of significant new fossils 	Holder of EA or representative/Contractor If discovered qualified archaeologist and/or palaeontologist.	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> To ensure the proper management of heritage remains are undertaken in the event of a discovery during construction and excavations.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>remains before or during development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Remainder of Kakamas North Settlement no 355 near Augrabies, Northern Cape.</p> <p>3. A qualified archaeologist and/or palaeontologist must be contracted where necessary (at the expense of the holder) to remove any heritage remains.</p> <p>4. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA.</p> <p>5. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves</p>			

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>(BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA.</p> <p>6. The following conditions apply with regards to the appointment of specialists:</p> <p>i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;</p>			
23. Contingency planning	<p>1. In the event of a spill or leak of product into the ground and/or water courses (e.g. that of hazardous substances used for the construction phase), such incidents must be reported (within 14 days) to all the relevant authorities including the Directorate: Pollution Management in</p>	Holder of EA or representative	Continuously Throughout the construction phase. If and when required.	<ul style="list-style-type: none"> •Management tools and emergency contacts available in the event of a spillage or incident.

Action	Proposed impact management action and Procedures / Mitigation measures to achieve it	Responsible person for implementation	Implementation timeframe and frequency	Outcome
	<p>accordance with Section 30(10) of the National Environmental Management Act No. 107 of 1998 (NEMA) and Section 20 (3) of the National Water Act No.36 of 1998 (NWA), that pertains to the control of emergency incidents and the remediation of the affected area. All necessary documentation must be completed and submitted within the prescribed timeframes.</p> <p>2. Containment, clean-up, and remediation must commence immediately.</p>			
24. Energy Efficiency & Waste Minimization Measures	<p>The following design measures will be considered for energy and water saving measures:</p> <ul style="list-style-type: none"> • Household waste to be separated and re-cycled (glass, paper, green/garden waste). • The use of energy saving bulbs in all structures, alternatively use low voltage or compact fluorescent lights are to be used in this project. 	Holder of EA or representative	Continuously Throughout the construction phase. If and when applicable and required.	•Energy and water saving mechanisms implemented.

Appendix A: Additional Reports

No additional reports

Appendix B: Tracking Table

Requirement	Received		Date	Comment
	Yes	No		
Methodology statement				
Site establishment plan				
Letter re contents of EMPr				
Letter re awareness training				

Appendix C: Schedule of Fines

SCHEDULE OF FINES FOR ENVIRONMENTAL DAMAGE OR EMPr TRANSGRESSIONS

(Based on City of Cape Town: Standard Environmental Specifications – Ver. 5 (03/2002))

Note: The maximum fine for any environmental damage will never be less than the cost of applicable environmental rehabilitation.

EMPr TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE	MIN. FINE	MAX. FINE
Failure to comply with prescriptions regarding appointment of an ESO and monitoring of EMPr compliance.	R500	R2000
Failure to comply with prescriptions regarding environmental awareness training.	R500	R5000
Failure to comply with prescriptions regarding method statements.	R500	R5000
Failure to report environmental damage or EMPr transgressions to the ESO.	R500	R1000
Failure to carry out instructions of the ESO regarding the environment or the EMPr.	R500	R1000
Failure to comply with prescriptions posting of emergency numbers.	R500	R5000
Failure to comply with prescriptions regarding a complaint register.	R500	R1000
Failure to comply with prescriptions regarding information boards.	R500	R1000
Failure to comply with prescriptions regarding site demarcation and enforcement of 'no go' areas.	R500	R5000
Failure to comply with prescriptions regarding site clearing.	R500	R5000
Failure to comply with prescriptions for supervision for loading and off-loading of delivery vehicles.	R500	R1000
Failure to comply with prescriptions for securing of loads to ensure safe passage of delivery vehicles.	R500	R1000
Failure to comply with prescriptions for the storage of imported materials within a designated contractor's yard.	R500	R1000
Failure to comply with prescribed administration, storage or handling of hazardous substances.	R500	R1000
Failure to comply with prescriptions regarding equipment maintenance and storage.	R500	R1000
Failure to comply with fuel storage, refuelling, or clean-up prescriptions.	R500	R1000
Failure to comply with prescriptions regarding procedures for emergencies (spillages and fires).	R1000	R5000
Failure to comply with prescriptions regarding construction camp.	R500	R5000
Failure to comply with prescriptions for the use of ablution facilities.	R500	R1000
Failure to comply with prescriptions regarding water provision.	R500	R1000
Failure to comply with prescriptions for the use of designated eating areas, heating source for cooking or presence of fire extinguishers	R500	R1000
Failure to comply with prescriptions regarding fire control.	R500	R5000
Failure to comply with prescriptions for solid waste management.	R500	R5000
Failure to comply with prescriptions regarding road surfacing.	R500	R5000
Failure to comply with prescriptions to prevent water pollution and sedimentation	R500	R5000
Failure to comply with prescriptions to the protection of natural features, flora, fauna and archaeology.	R500	R5000
Failure to comply with prescriptions regarding speed limits.	R500	R1000
Failure to comply with prescriptions regarding noise levels of construction activities.	R500	R5000
Failure to comply with prescriptions regarding working hours.	R500	R5000

Failure to comply with prescriptions regarding aesthetics.	R500	R1000
Failure to comply with prescriptions regarding dust control.	R500	R1000
Failure to comply with prescriptions regarding security and access onto private property	R500	R1000
Failure to comply with prescriptions regarding cement and concrete batching	R500	R5000

For each subsequent similar offence committed by the same individual, the fine shall be doubled in value to a maximum value of R50,000.

Appendix D: Method Statement Proforma

METHOD STATEMENT PROFORMA

METHOD STATEMENT FOR THE:

This method statement is to be completed by the Contractor (in consultation with the Resident Engineer and EO) at least 5 working days prior to the proposed commencement date of the said work and represents a binding agreement to the method statement by all site contractors and sub-contractors involved in the work for which the method statement is submitted.

DATE OF SUBMISSION: _____

LEAD CONTRACTOR: _____

OTHER CONTRACTORS AND/OR SUB-CONTRACTORS: _____

Describe in detail what work is to be undertaken?

Describe in detail where on the site the works are to be undertaken and the extent? Provide a sketch plan and grid block reference.

Lead supervisor/foreman name and contact details: _____

Number of personnel: _____

Construction activities: _____

Plant and machinery to be used: _____

Other: _____

What environmental impacts are anticipated and what precautions are proposed to prevent these impacts? (Refer to the relevant sections of the EMPr for guidance and provide general site camp layout).

Toilet facilities: _____

Litter: _____

Security: _____

Plant/machinery (operation, servicing, management, storage, refuelling, etc.).

Emergencies and fire: _____

Hazardous materials (handling, management, storage):

Have all personnel involved been through an environmental induction course:

Petrochemical spill remediation and containment measures:

Other:

DECLARATION BY PARTIES

Contractor:

I understand the contents of the method statement and the scope of the works required of me. I further understand that the method statement may be amended on application to the above signatories and that the Environmental Officer will audit my compliance with the contents of this method statement.

Print Name

Date

Signed

Environmental Officer (EO):

The work described in this method statement, if carried out according to the methodology described, is satisfactory mitigation to prevent avoidable environmental harm.

Print Name

Date

Signed

Resident Engineer:

The work described in this method statement, if carried out according to the methodology described, is satisfactory mitigation to prevent avoidable environmental harm.

Print Name

Date

Signed

Appendix E: Method Statement Control Sheet

METHOD STATEMENT CONTROL SHEET

CONTRACT NO: _____

METHOD STATEMENT CONTROL SHEET

(This control sheet is to be attached to all methods statements)

MS Number:

THIS SECTION TO BE COMPLETED BY THE CONTRACTOR/METHOD STATEMENT AUTHOR ONLY

TITLE:
DESCRIPTION:
SUBMITTED BY:

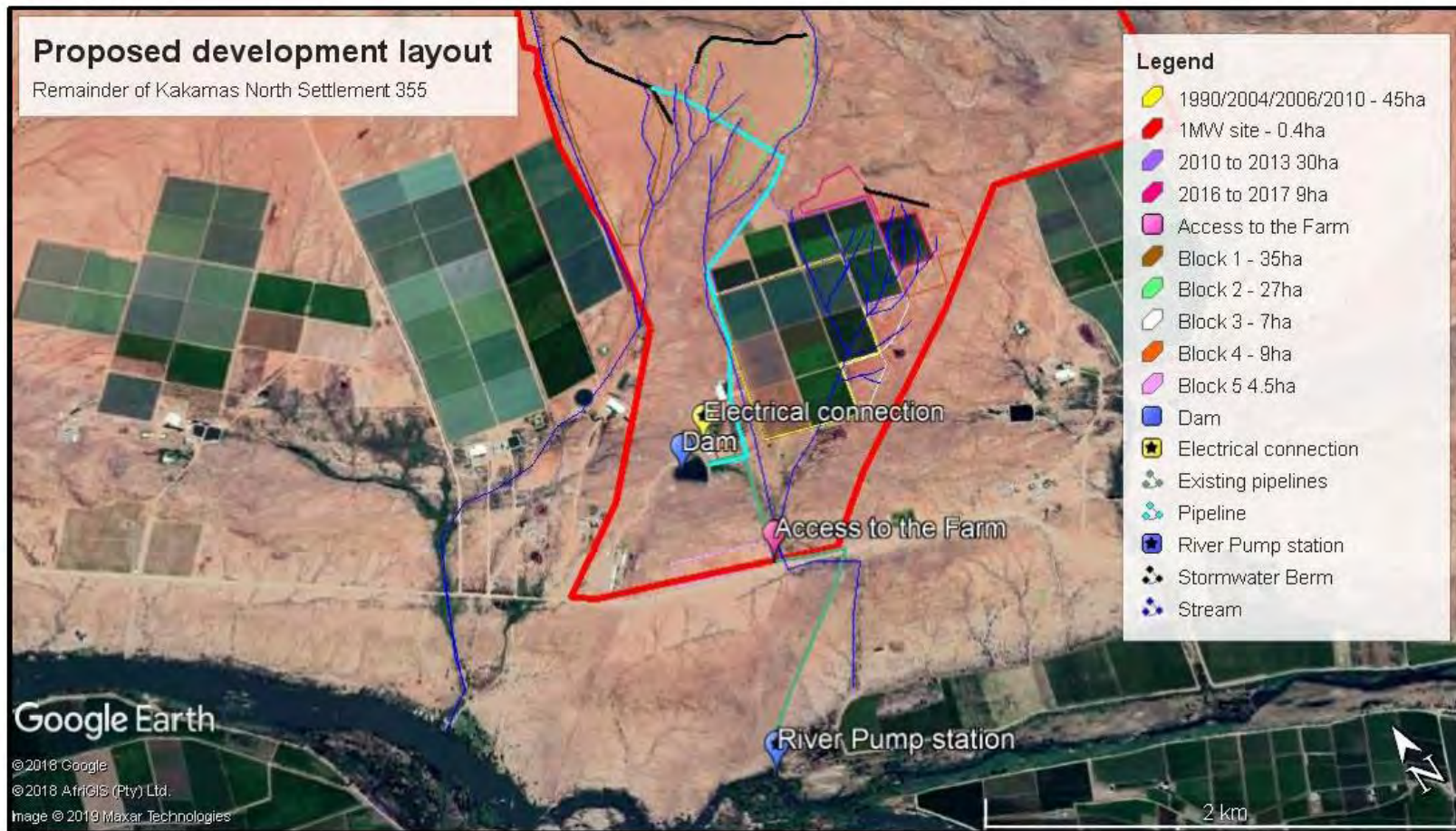
Date requested by: _____ Date submitted: _____

Date response required by: _____ Date work start: _____

REVIEW SCHEDULE		
Date	Authority	Comments

DISTRIBUTION AND AUTHORISATION			
	APPLICANT	EO	CONTRACTOR
Name			
Signature			
Date			

Appendix F: Project map



Appendix G: EAP Curriculum Vitae

PB Professional Services CC
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Wellington 7854

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Cell: 0827783422
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E-mail: pbps@africa.com

Pieter Badenhorst

Nationality	South African		
Date of birth	25 March 1951		
Qualifications	B.Sc. B.Eng. (Civil) M.Eng. (Irrigation) B.Hons. (B&A) MBA	University of Stellenbosch University of Stellenbosch University of Stellenbosch University of Stellenbosch	1973 1977 1992 1993
Special courses	<ul style="list-style-type: none"> ● Project Management (5/1990), GROMAN, Stellenbosch; ● Project Management Diploma (2-7/91), Damelin Management School, Cape Town; ● Time Management (7/91), FSA-Contact group, Cape Town; ● Advanced Project Management, GROMAN (9/91), Stellenbosch; ● Environmental Auditing (11/93), Inst. of Environmental Assessment, Lincoln, England; ● SPIN Complex Selling (2/94), Sales Productivity Associates, Johannesburg; ● Presentation (3/94), Whitehead Morris, Johannesburg; ● Public participation - Participlan (10/94), CSIR/Univ. Cape Town 		
Professional membership	Professional engineer, member of the Engineering Council of South Africa Member of the South African Institute of Civil Engineers Member of International Association for Impact Assessment (South Africa)		
Career	<p>Since 1997 1997 1995 - 1996 1993 - 1994 1992 1982 - 1991 1981 1979 - 1980 1978 1974 - 1977</p>	<p>Own consultancy CSIR, Environmentek; Provincial Business Development Manager Gulf Petrochemical Services LLC, Business Development Engineer (Sultanate of Oman & UAE) and CSIR Marketing Manager Middle East (Sultanate of Oman, UAE & Qatar). CSIR, Ematek, Coastal Development Programme; Marketing Manager Study for MBA CSIR, Ematek, Coastal Development Programme; Project Manager Municipality of Somerset West; Deputy Town Engineer Municipality of Kuils River; Town Engineer Municipality of Klerksdorp; Senior Engineer (water) Department of Water Affairs; Assistant Engineer</p>	
Current position	Owner of Pieter Badenhorst Professional Services CC. As a private consultant now provide consultancy services in Environmental/coastal Management, Environmental Engineering, Public Participation and Project Management.		
Professional experience	<p>39 years experience in civil, municipal and environmental engineering as well as business development. Civil experience in heavy construction with Department of Water Affairs. Municipal experience includes Senior Engineer, Klerksdorp, Town Engineer of Kuils River and Deputy Town Engineer of Somerset West. Nearly 16 years at CSIR in environmental management (estuarine and coastal), business management, coastal engineering and project management. Work and lived two years in Middle East working in business development, project management for CSIR contracts, tender preparation and environmental management advice. Have extensively traveled the coastlines of Australia and USA to study coastal management. Other overseas visits were undertaken to UK, Netherlands and Australia to investigate commercialisation of CSIR products and general business opportunities.</p> <p>Now mainly involved with environmental studies and management. Have produced various technology research reports for CSIR. The following projects were undertaken for DEAT: a Coastal Management Technical Guide; project managed the Adopt A Beach and Interpretive Signage projects as well as public participation components; initiated and implemented the Blue Flag campaign in South Africa. A number of impact studies were/are undertaken for various clients including major developments with/without golf courses and eco estates. Produced various Scoping and Environmental Impact Reports, Environmental Management Plans and an Environmental Management Framework. Act as Environmental Control Officer for many developments including Thesen Islands Canal development (Knysna), Pezula Private Estate development (Knysna), George Mall development, Leisure Isle Boat Club upgrade (Knysna), Breakwater Bay (George), St Helena Bay development and various building sites. Have undertaken a number of asset assessments for Municipalities.</p> <p>Presented a third year course in Coastal Management at Cape Technikon.</p>		
Publications/Contracts (A full list is available on request)	<ul style="list-style-type: none"> ● Scoping and Environmental Impact reports. ● Environmental Management Plans –construction and operation. ● Basic Assessment Reports ● S24G Applications ● Waste License Applications ● Water Use License Applications ● Quarry applications/EMPRs ● Contract reports on coastal and estuarine environmental management, coastal engineering and monitoring (including a beach monitoring project along the KZN coastline) and various reports on implementation of the Blue Flag campaign. ● Contract reports in business management include market research and technology requirements (environment, food and textile/clothing industries). ● Publications include CZM Technical Guide, CZM Guidelines and Coastal Processes. Research publications on sedimentation in estuaries and low-level environmental monitoring techniques. ● Fomed part of the Estuarine and Coastal Unit (ECRU) team that compiled the "Estuaries of the Cape" series. ● Fomed part of the team that compiled the Policy and Principles & Objectives for Coastal Zone Management in the RSA – for Council of the Environment. ● Fomed part of the team that developed Norms and Standards for inclusion into NEMA. ● Feasibility studies for Department of Environment Affairs & Tourism and Department of Water Affairs. ● EIA Review for DEAT on proposed Cape Town Harbour expansion ● Member of team – SA Wetland audit for SANBI 		

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Elanie Kühn

Nationality	South African		
Date of birth	20 February 1983		
Qualifications	B.Sc. Degree (Zoology & Physiology) B.Sc. Hons. (Environmental Management)	North West University – Potchefstroom North West University – Potchefstroom	2004 2005
Special courses	None additional to the above.		
Professional membership	IAIA South Africa		
Career	2010 - current 2006 - 2009 2005	Pieter Badenhorst Professional Services - Wellington Doug Jeffrey Environmental Consultants - Paarl DERA Environmental Consultancy – Klerksdorp (Part time while completing Hons.)	
Current position	Environmental Assessment Practitioner at Pieter Badenhorst Professional Services cc. As a private consultant now provide consultancy services in Environmental Management, Public Participation and Project Management.		
Professional experience	The consultant has 13 years' experience in project management and report writing. She has worked for two other environmental assessment companies prior to the present. She completed her BSc degree and gained an Honours Degree in Environmental Management from the North West University in Potchefstroom. She has been working with Pieter Badenhorst for the last nine years working on Environmental Impact Assessments and Water Use License Applications.		
Publications/ Contracts (A full list is available on request)	Projects and work experience range from: <ul style="list-style-type: none"> ● Project Management ● Basic Assessment Reports ● Scoping and Environmental Impact Assessment reports. ● Environmental Management Programmes –construction/operational/decommissioning. ● S24G Applications ● Waste License Applications ● Water Use License Applications ● Mining EMP's ● Mining Rights and Prospecting Rights applications ● Environmental Control Officer (ECO) ● Auditing Reports 		



WATER USE LICENSE APPLICATION FOR A GENERAL AUTHORISATION



PROPOSED AGRICULTURAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON REMAINDER OF KAKAMAS NORTH SETTLEMENT 355, FARM TIERKOP, AUGRABIES.

December 2019

Rooipad Boerdery (Pty) Ltd

Mr. Izak Nel
P.O. Box 26, Augrabies, 8874
Email: admin@rooipad.co.za
Cell: 082 584 9489

QUALITY CONTROL

Revision	Date	Author	Checked	Status	Approved
00	December 2019.	Elanie Kühn		Draft with draft Assessment Report.	
01					

APPLICATION FOR A LICENSE FOR THE USE OF WATER (CONTROLLED ACTIVITY) IN TERMS OF THE NATIONAL WATER ACT, 1998 (ACT NO 36 OF 1998)

TABLE OF CONTENTS

1. THE APPLICATION AND TECHNICAL DETAIL	8
1.1 The applicant	8
1.2 The property on which the water use is intended	8
1.3 Water Use License Application	8
1.4 Existing lawful water use and development on the property	9
1.5 Details of the water use intended	9
1.5.1 Section 21c –impeding and diverting flow in a watercourse and Section 21i - altering the bed, banks, course or characteristics of a watercourse.	9
1.6 Plough certificate	12
1.7 Storm water Management	12
1.7.1 Introduction	12
1.7.2 Mitigation Measures:	12
2. CONSIDERATIONS AND ASSESSMENT CRITERIA	17
2.1 The reserve	18
2.2 The class and resource quality objectives of the water resource	18
2.3 The strategic importance of the water to be authorized	18
2.4 The existing lawful water use in the catchment under consideration	18
2.5 The likely effect of the water uses to be authorized on the water resource and on other water users in the catchment	18
2.6 The impact on the environment	18
2.6.1 Assessment of the impacts associated with the water use:	20
2.7 The need to redress the results of the past racial and gender discrimination	20
2.8 Efficient and beneficial use of the water in public interest	22
2.9 Socio economic impact of water use to be authorized	22
2.10 Investment already made and to be made by the water user in respect of the water use in question	23
2.11 The period for which the license is to be issued	23
2.12 Failure to authorize the water use	23
3. CONCLUSION	23
4. CONDITIONS	23
5. RECOMMENDATION	24
6. APPENDICES	26

APPENDIX A: COMPLETED LICENSE APPLICATION FORMS	26
APPENDIX B: EXISTING WATER USE CONFIRMATION AND WATER USE LICENSE	27
APPENDIX C: DEED SEARCH AND TITLE DEEDS	38
APPENDIX D: POWER OF ATTORNEY	45
APPENDIX E1: PROPOSED LOCALITY AND DEVELOPMENT LAYOUT	46
APPENDIX F: TECHNICAL DOCUMENTS	48
APPENDIX F.1: ENVIRONMENTAL IMPACT REPORT	48
APPENDIX F.2: STORM WATER MANAGEMENT PLAN	49
APPENDIX F.3: ENVIRONMENTAL AUTHORISATION	50
APPENDIX G: PROOF OF PUBLIC PARTICIPATION	51
APPENDIX H: SECTION 27 REPORT	52
APPENDIX I: CERTIFIED COPY OF ID	53
APPENDIX J: COMPANY REGISTRATION CERTIFICATES	54
APPENDIX K: COPY OF RECEIPT	59
APPENDIX L: SECTION 21 C AND I LIST OF DRAINAGE LINES COORDINATES AND RISK MATRIX	60
APPENDIX M: PLOUGH CERTIFICATE	61

Table of Figures

<i>Figure 1: Locality map of the proposed site on Remainder of Kakamas North Settlement No. 355 as demarcated in red.</i>	8
<i>Figure 2: Ephemeral streams/drainage areas</i>	10
<i>Figure 3: Extract of map that shows the locality of the EWR sites in context of the MRUs (referenced from Figure 3.1 in Report No. RDM/WMA06/00/CON/COMP/2016).</i>	11
<i>Figure 4: Pump stations and pipelines</i>	12
<i>Figure 5: Mulching and planting between rows</i>	13
<i>Figure 6: Storm water management plan layout</i>	14
<i>Figure 7: Scarifying of soil</i>	15
<i>Figure 8: Buffer areas with natural vegetation between blocks and roads</i>	16

List of Tables

<i>Table 1: Water Use Licence activities triggered</i>	9
<i>Table 2: Impacts table</i>	18
<i>Table 3: New employment opportunities</i>	22

List of Abbreviations

BAR	Basic Assessment Report
CBA	Critical biodiversity Area
DEA	Department of Environmental Affairs
DENC	Department of Environment and Nature Conservation
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
ELU	Existing Lawful Use
EMPr	Environmental Management Programme
ESA	Ecological Support Areas
ERW	Ecological Release Water
EWR	Existing Water Rights
FEPA	Fresh Water Ecosystem Priority Areas
HWS	Heritage Western Cape
I&AP's	Interested and Affected Parties
MAR	Mean Annual Runoff
MMP	Maintenance Management Plan
NFEPA	National Fresh Water Ecology Priority Areas
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PA	Protected Areas
PES	Present Ecological Status
PPP	Public Participation Process

RE	Resident Engineer
SANBI	South African National Biodiversity Institute
SAHIRS	South African Heritage Information Resources System
SWMP	Storm Water Management Plan
S24G	Section 24G Process
V&V	Validation and Verification
WMA	Water Management Area
WQMR	Water Quality Management Report
WULA	Water Use Licence Application

SYNOPSIS

Application for a license in terms of the National Water Act, 1998 (NWA) is made by the developer, Rooipad Boerdery Pty Ltd, for the construction of vineyards across small streams and the stream crossings of pipelines on Remainder of Kakamas North Settlement no 355, Augrabies.

Approval, in this case a General Authorisation, is also necessary for the proposed development of agricultural areas across small ephemeral streams/drainage areas for the proposed new agricultural development on Remainder of Kakamas North Settlement no 355.

The application is summarised for the following water usages:

(c) impeding or diverting flow of water in a watercourse	For the construction of agricultural areas across ephemeral streams/natural drainage areas.
(i) altering the bed, banks, course or characteristics of a watercourse	For the construction of agricultural areas across ephemeral streams/natural drainage areas.

Remainder Kakamas North Settlement No. 355 will abstract water from an existing pump station.

The additional water will have little or no effect on the quantity of available water from the water resources within the immediate vicinity.

Remainder of Kakamas North Settlement No. 355 has existing rights for 50 ha (750 000 m³/a) (see Appendix E1, the letter from the Kakamas Water Users Association). The applicant recently obtained additional rights to 145 ha (2 176 782 m³/a), as per the license included in Appendix B. Therefore, according to the existing license dated 22 March 2019 (Amended in 31 July 2019) and existing rights, the applicant has a total of 195 ha (2 926 782m³/a).

The establishment of the vineyards on Remainder of Kakamas North Settlement 355 took place across small sections of the unnamed drainage system that is located on site. The site falls within the Catchment Region D81A. The drainage channel system is located in an unnamed sub-catchment, D81A-03245. The unnamed sub-catchment is not really a river but fits rather the description of a mostly dry drainage line.

The proposed agricultural development areas fall within the Lower Orange River catchment area. It however does not fall within any NEFPA catchment priority areas and is not considered as critically endangered and development of this area will not result in any detrimentally impact on the regional or local catchment area. The site is already cut off from the Orange River via roads and agricultural development.

1. THE APPLICATION AND TECHNICAL DETAIL

1.1 The applicant

The applicant, Rooipad Boerdery Pty Ltd is applying for a section 21 (c) and (i) for the following:

1. Applying for Section 21 (c) and (i) for the construction of orchards/vineyards across small streams.

1.2 The property on which the water use is intended

The proposed property on which the construction of the agricultural development (vineyards) has and will take place is situated on the remainder of Kakamas North Settlement No. 355 on the farm Tierkop/Rooipad just outside of the small town of Augrabies (referred to as Remainder of Kakamas North Settlement 355 in this document). The farm is situated approximately 4.5 km north-east of the small town of Augrabies in the Northern Cape, and gains access off gravel road off the N14 towards Riemvasmaak (see Figure 1). The site lies north of the Orange River. Small ephemeral streams cross the site. The site is currently zoned Agriculture Zone I. The owner of the properties is Rooipad Boerdery (Pty) Ltd, who has appointed PBPS as the independent environmental consultant to determine if an environmental authorisation is necessary.



Figure 1: Locality map of the proposed site on Remainder of Kakamas North Settlement No. 355 as demarcated in red.

1.3 Water Use License Application

Application for a license in terms of the National Water Act, 1998 is made by the developer, Rooipad Boerdery Pty Ltd, for the following water usages:

Table 1: Water Use Licence activities triggered

(c) impeding or diverting flow of water in a watercourse	For the construction of agricultural areas across ephemeral streams/natural drainage areas.
(i) altering the bed, banks, course or characteristics of a watercourse	For the construction of agricultural areas across ephemeral streams/natural drainage areas.

1.4 Existing lawful water use and development on the property

Remainder of Kakamas North Settlement No. 355 has existing rights for 50 ha (750 000 m³/a) (see Appendix E1, the letter from the Kakamas Water Users Association). The applicant recently obtained additional rights to 145 ha (2 176 782 m³/a), as per the license included in Appendix B. Therefore, according to the existing license dated 22 March 2019 (Amended in 31 July 2019) and existing rights, the applicant has a total of 195 ha (2 926 782m³/a).

1.5 Details of the water use intended

1.5.1 Section 21c –impeding and diverting flow in a watercourse and Section 21i - altering the bed, banks, course or characteristics of a watercourse.

1.5.1.1 Remainder of Kakamas North Settlement no 355, Augrabies.

The drainage channel system on site has not been mapped (as a watercourse) on any of the maps that are available of the study area. However, upon request from DENC and DWS, the drainage system is seen as a watercourse, see Figure 2: Ephemeral streams/drainage areas below. Please note: There will be NO planting of vineyards within the **larger drainage channels** as far as possible and a buffer of at least 20m of the larger drainage systems will always be kept. It is also the intension to keep the bigger stream areas open and not to develop so has to minimise impact on the larger streams.

The unnamed drainage system is therefore classified as an ephemeral course as it will only flow sporadically after rain. These watercourses are not considered to be seasonal rivers which will regularly contain water in a seasonal pattern. **However, it does fall within an area outlined as CBA1.**

The proposed agricultural development areas fall within the Lower Orange River catchment area. It however does not fall within any NEFPA catchment priority areas **and is not considered as critically endangered and development of this area will not result in any detrimentally impact on the regional or local catchment area. The site is already cut off from the Orange River via roads and agricultural development.**

The site falls within the Catchment Region D81A. The drainage channel system is located in an unnamed sub-catchment, D81A-03245, see Figure 2. The unnamed sub-catchment is not really a river but fits rather the description of a mostly dry drainage line.

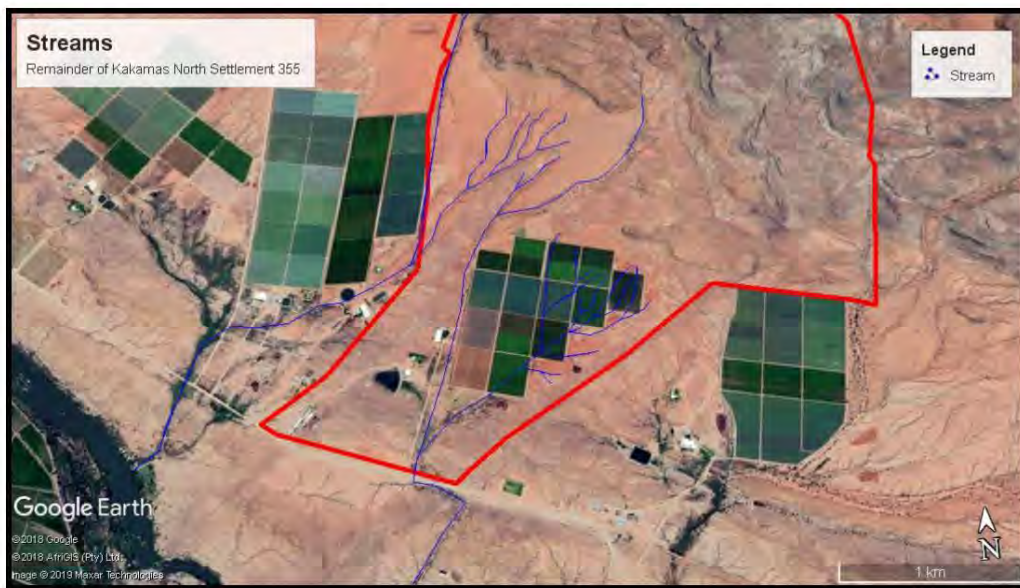


Figure 2: Ephemeral streams/drainage areas

1.5.1.2 Present Ecological Status (PES) & Ecological Importance Sensitivity (EIS)

Reference is made to the Draft Department of Water and Sanitation (DWS) Report (dated August 2016): "Determination of Ecological Water Requirements for Surface Water (rivers, estuaries and wetlands) and groundwater in the Lower Orange WMA; Report No. RDM/WMA06/00/CON/COMP/2016)1.

This Report provides the PES and EIS of the Orange River at EWR 02, located upstream of the confluence of the water courses that flow into the Orange River from the project site, and at EWR 03, downstream of the Augrabies Falls and downstream of the confluence of the watercourses that flow into the Orange River from the project sites.

Refer to Figure 3: Extract of map that shows the locality of the EWR sites in context of the MRUs (referenced from Figure 3.1 in Report No. RDM/WMA06/00/CON/COMP/2016), below for the location of the Project Site (Kakamas South Settlement no 2185, 2092 and 2193,) in relation to EWR 02 and EWR 03.

EWR 02 and EWR 03 both have a:

- PES of C (Moderately Modified); and,
- EIS as High (the river in terms of biota and habitat may be sensitive to flow modifications but in some cases may have a substantial capacity for use.)



Figure 3: Extract of map that shows the locality of the EWR sites in context of the MRUs (referenced from Figure 3.1 in Report No. RDM/WMA06/00/CON/COMP/2016).

The drainage channel system is in a sub-catchment of an unnamed tributary, the tributary is not really a river, but more fits the description of a mostly dry drainage line. The overall all analysis according to DWS: PES & EIS Desktop Assessment is that the site was not assessed, and the ecological importance of the River is very low. Because it was not assessed fall back to the overall assessment for the EWR:02, which refers to moderately modified.

1.5.1.3 Pump stations and Pipelines

Water is required for the drip irrigation of the established vineyards and is supplied via pipelines from the booster pump station and pump lines (turquoise) as shown in Figure 4. The other existing pipelines (green) established come from the pump station at the Orange River (See Figure 4) towards the existing dam, and from there distributed to the irrigation areas.



Figure 4: Pump stations and pipelines

1.6 Plough certificate

There is an existing Plough Certificate for Remainder of Kakamas North Settlement No. 355. Find included in Appendix M the existing Plough certificate.

1.7 Storm water Management

1.7.1 Introduction

This section in the report is intended to provide the Department of Water Affairs with all necessary information to assess the suitability of the measures to be taken by Rooipad Boerdery Pty Ltd regarding the successful storm water management of the proposed irrigation/agricultural development. This section describes the various infrastructure items that are/were to be constructed and the storm water management objectives that the landowner will undertake to ensure sustainable management of the constructed storm water infrastructure. Find attached F2 the Storm Water Management Plan.

1.7.2 Mitigation Measures:

The main issues to be addressed with mitigation measures include

1. Design
2. Irrigation
3. Nutrients (fertilisers)
4. Spraying (pesticides)
5. Storm water channels
6. Pipelines

- 7. Erosion control
- 8. River pump station

1.7.2.1 Design

The design of vineyard blocks considered the natural flows and minimise impacts on the ephemeral streams. A storm water channels divert flow around the planted blocks towards the diversion channel. Flow entering the diversion channel will then flow downstream and naturally enter an existing stream.

1.7.2.2 Irrigation

In order to prevent over irrigation, which might lead to water flows creating erosion and or transporting nutrients to the retained ephemeral streams, good farming practises such as irrigation on demand should be utilised.

In addition, the use of mulching should be used to reduce evaporation losses. The mulch also serves to retain moisture and prevent erosion near the plants at the source of irrigation; microjet or drip.

A typical example with mulching along the planted rows and planting between rows is shown below in Figure 5: Mulching and planting between rows.



Figure 5: Mulching and planting between rows

1.7.2.3 Nutrients

Nutrients are usually applied in the irrigation water. Every effort must be made to only apply as required by the plant and soil.

Should fertiliser powder or pellets be used and applied by hand or machine it must only be placed along the vine plants and no mess or waste between rows should be allowed.

Powder or pellet fertiliser may not be spilled between vine rows or on access roads between the vine blocks. Should this happen it must be picked up and removed immediately.

1.7.2.4 Spraying

Spraying of pesticide is normally applied by machine as a vapour. The main potential source of pollution would be from spillages. Therefore, filling of the spray machine must be done in a safe area where pollution of the soil would not be possible. The best place would be on a concrete area where the pesticide is mixed with water.

1.7.2.5 Storm water channels

As shown in the Storm water management Layout Plan, the black lines indicated are the storm water berms constructed to accumulate the storm water and divert flow to the existing streams that will not form part of the development..

It should be noted that no dissipation/retention structures other than the storm water channels and drainage pipelines are included to prevent erosion and storm water accumulation. However, natural vegetation has over time accumulated within the channels and does reduce flow. The storm water channels are deep enough to prevent overflow and erosion.

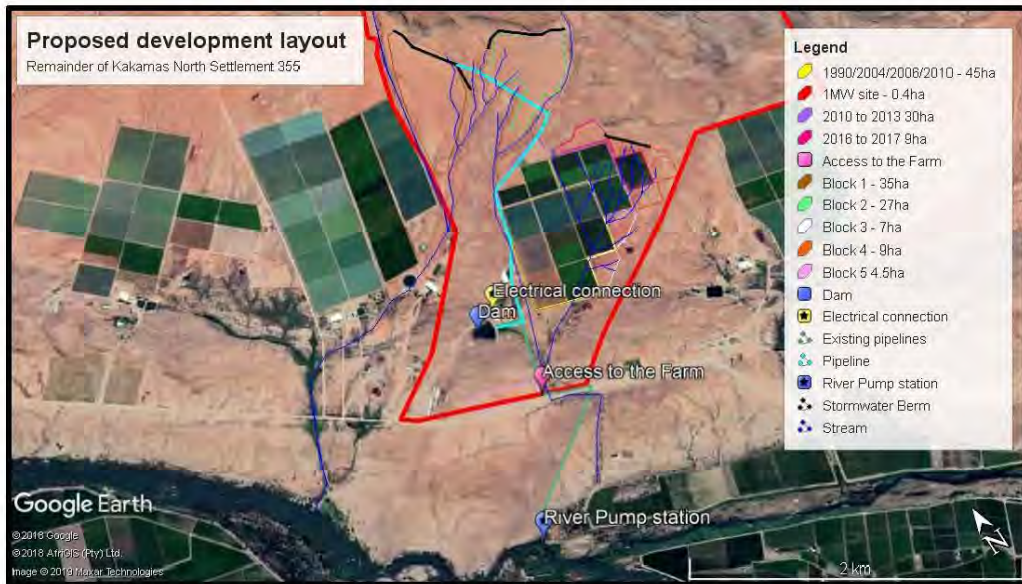


Figure 6: Storm water management plan layout

1.7.2.6 Pipelines

The proposed new pipelines to the irrigation areas will run along road reserve, the only section of the pipeline that will affect one of the streams is shown in Figure 6: Storm water management plan layout, this is within the new proposed development areas. Care will be taken to prevent any future impediment of flow related to these pipes, as the pipes will be constructed below the ground. Find included in Appendix C the pipeline method statement for construction of pipelines (PVC Pipes) below ground. The following mitigation measures should be implemented for work on the pipelines:

- Care will be taken to only construct the pipelines during the dry seasons
- As far as possible the section of the pipeline across/within the stream should be done manually, no machinery, resulting in the lowest possible impact.
- Infilling with original soils (as per method statement)
- Flow meters must be equipped on the pipelines. -protective measurement on water losses. This must be monitored on a regular basis and records kept on site.

1.7.2.7 Erosion control

Erosion would normally occur with the following:

1. Over irrigation which create water flows from the planted rows to the area between the rows and then to roads between the blocks.
 - a. For mitigation see (3) below.
2. Pipe breakages where water will wash from the plants to the area between the rows to the roads between blocks and from where water can flow towards the retained ephemeral streams – thereby causing erosion gulley's.
 - a. For mitigation see (3) below.
3. Rain events where the water will flow down slope to reach the ephemeral streams and along the way cause erosion where development took place; that is – between the planted rows and along the roads between blocks.
 - a. Mitigation include the following:
 - i. Mulching and planting/mulching between rows – see Figure 5 for typical example.
 - ii. Scarifying of soil between planted blocks and roads to create a soft/rough area to retain moisture and prevent erosion – see Figure 7: Scarifying of soil.



Figure 7: Scarifying of soil

- iii. Create a buffer with natural vegetation between the planted blocks and roads as shown in Figure 8: Buffer areas with natural vegetation between blocks and roads.



Figure 8: Buffer areas with natural vegetation between blocks and roads

Overall therefore, the natural approach is preferred whereby mulching, planting and natural buffer areas are used to serve as mitigation to prevent flows that could create erosion. This has the further advantage that it also acts against spreading of nutrients and pesticides.

2. CONSIDERATIONS AND ASSESSMENT CRITERIA

Management actions in the Development of an Integrated Water Quality Management Strategy for the Upper and Lower Orange Water Management Areas for the Lower Orange Water Management Area include the following:

Area 1: Boegoeberg to Kanon Islands

It is the vision of all interested and affected parties within Visioning Area 1:

To contribute towards the integrated management of the surface and groundwater resources in all LOWMA catchments between Douglas and Boegoeberg Dam, to secure sufficient water that is fit for all beneficial uses, specifically including domestic and variable agricultural use, and to support a healthy aquatic ecosystem, particularly for ecological sensitive areas such as the Douglas Conservancy.

Area 2: Boegoeberg to Kanon Islands

It is the vision of all interested and affected parties within Visioning Area 2: (Kakamas/Augrabies/Keimoes falls within this area)

To contribute towards securing suitable water supplies of qualities for all LOWMA catchments between Boegoeberg and Kanon Islands, that will sustain:

- a thriving table grape export market and wine production;
- local agricultural activities via an extensive irrigation canal system;
- a thriving stock farming industry;
- domestic and light industrial water use in all towns, specifically including Upington;
- supplying water to rural communities via both the Kalahari West and Karos- Geelkoppan water supply schemes.

Area 3: Kanon Islands to Pella *It is the vision of all interested and affected parties within Visioning Area 3:* To promote the participatory and integrated management of all water resources pertaining to the LOWMA catchments situated between Kanon Islands and Pella in order to ensure that water supplies are of an acceptable quality to all water users, in particular to sustain a prominent conservation and ecotourism industry, as well as livestock and private game farming, while allowing room for beneficial water use.

Other legislation and guidelines that have been considered includes the following:

- The Constitution of South Africa Act No.108 Of 1996
- The National Environmental Management Act, 1998 (Act No. 107 Of 1998)
- The National Heritage Resources Act, 1999 (Act No. 25 Of 1999)
- Conservation of Agricultural Resources Act No 43 Of 1983
- Subdivision of Agricultural Land Act, 1970 (Act No. 70 Of 1970)
- Urban Structure Plan for the Cape Metropolitan Area, Volume 4: Paarl/Wellington Region
- National Environmental Management: Biodiversity Act (Act 10 Of 2004)
- Planning Legislation and Guideline

2.1 The reserve

The Department of Water Affairs and Forestry have recently completed the reserve determination for the Berg River: Directorate of Scientific Services in Pretoria.

From the reserve determination it could now be ascertained by your department as to the availability of water for the allocation of the water usages requested as per the issue of a license to the applicant. This application is for the transfer of water between within the same water user’s association (Kakamas Water Users Association) and the transfer falls within the WUA jurisdiction, managed by DWS: Upington, will have little effect on the quantity of water available from within the catchment.

2.2 The class and resource quality objectives of the water resource

These aspects could only be addressed and commented on by the Department of Water Affairs.

2.3 The strategic importance of the water to be authorized

This water use has no strategic importance.

2.4 The existing lawful water use in the catchment under consideration

This authorization will have no impact on any existing lawful water use within the investigation area. Please see attached letter from the Kakamas Water Users Associations confirming the existing water allocation (Appendix B).

2.5 The likely effect of the water uses to be authorized on the water resource and on other water users in the catchment

The construction of vineyards across small streams will have little or no effect on the quantity of available water from the water resources within the immediate vicinity.

2.6 The impact on the environment

The transfer of the water between the said properties will not have a negative impact on the existing water use within the catchment region. The water can be accommodated, as confirmed by the Kakamas Water Users Association. The impacts and mitigation measures are summarised in the table below:

Table 2: Impacts table

Water Uses	Potential Impact on	Proposed Measures	Mitigation	Review of the adequacy of suggested mitigation measures
	New irrigation areas.	Low positive	• Measures should be implemented to reduce water use within the	Mitigation measures adequate to ensure positive impact takes place.

		<p>proposed development, such as the use of tension meters to avoid over irrigation of the soils.</p> <ul style="list-style-type: none"> • Environmental education programs for workers will ensure that they will be sensitive to the environment and report incidents such as leaking taps, broken irrigation systems, etc. • The irrigation system to be used is DFM method along with irri-check calibrations and recommendations. • Test pits and data collections from these pits are taken on a regular basis to determine the moisture content for soil etc. • Soil coverage within the vineyards with chaff. • Regular monitoring and checks from specialists in the field to introduce best possible irrigation practices. 	
Section 21 (c&i)	Water Quality	<ul style="list-style-type: none"> • No impact on water quality, as construction will be conducted outside the rainfall season (Replanting). • No flow from agricultural areas as storm water berms will be constructed as far as possible (Replanting). • Measures should be implemented to reduce water use within the proposed development, such as the use of tension meters to avoid 	Mitigation measures adequate to ensure impacts are fully mitigated.

		over irrigation of the soils.	
	Impeding and diverting flow within ephemeral streams.	<p>Low negative</p> <ul style="list-style-type: none"> • The natural drainages areas and small ephemeral stream will be filled in and vineyards established on these areas, therefore a low negative impact on surface water flow. • This will however be mitigated by establishing a storm water management mitigation measures, outlined in the SWMP. 	Mitigation measures adequate to ensure impacts are fully mitigated.

2.6.1 Assessment of the impacts associated with the water use:

The impacts associated with the development (already took place) and that of agricultural areas across stream is low negative, however mitigation measure taken into account can prevent any further negative impacts, see **Table 2** above.

2.7 The need to redress the results of the past racial and gender discrimination

Rooipad Boerdery (Pty) Ltd Empowerment within the company:

The Rooipad Boerdery (Pty) Ltd strives to remain the frontrunners of the industry through continued focus on the competitive edge, diversification, strategic management and optimal use of water and other resources.

The Rooipad Boerdery (Pty) Ltd firmly believes in the empowerment of its employees: not only by means of financial and land ownership, and senior management positions, but also through promotion, wider responsibilities given to people on the lowest possible level, and a sense of ownership for what you do in any position you might occupy.

The Rooipad Boerdery (Pty) Ltd provides seasonal and permanent employment for a large community of people in one of South Africa's poorest regions. All workers share in benefits such as training and development programmes which are offered in association with various institutions. Development programmes and projects are directed towards all workers and their families, including seasonal workers irrespective of their worker status.

Training and career planning are both initiated for each permanent worker, ensuring that workers have a clear vision of their future and are able to plan their future in the company. Vacancies are always advertised internally, and continuous training and development are

undertaken to ensure that workers are equipped with the basic skills for the next level for which they might qualify.

Social and other benefits are offered to the large community of people working within the group. This includes preschool care, bursary and study schemes for children of workers, health care and housing for both permanent staff and temporary workers.

Community involvement projects facilitated include crèche facilities on all farms; social skills training workshops to enhance family and social life; leadership training; low interest student loans to parents; housing for employees staying on farms; a comprehensive healthcare plan through clinics on the various farms; recreation facilities and transport that allow staff to attend sport and other social activities; and spiritual counselling.

Roopad Boerdery (Pty) Ltd realises the importance of ensuring that the basic needs of the people who work for the company are met, with specific focus on clean water, decent housing, medical services and bonuses for top performers.

The importance of a balance between career and social development is continuously emphasised and the company spends ample resources to facilitate and develop both.

Relationships are built with workers in order to create trust and security. This applies especially to seasonal workers and is executed in practice through new developments relating to different fruit, different regions and different seasons in order to ensure longer working periods for seasonal workers who are in need of prolonged contracts to supply them with a more stable source of income.

The training department plays a major role in achieving productivity and sound human relations by ensuring that a full-scale training programme takes place throughout the year. Learnerships are an important part of the programme to aid workers in getting a formal national qualification combined with their practical skills.

The HIV/AIDS programme includes regular training and is supported by a full-time co-ordinator, health workers and production managers. Counselling, vitamins, and medication are provided to workers to improve their quality of life.

The new water use licence will lead to the expansion of the farming operation and will create a demand for new staff and new skills, e.g.

- Skilled agricultural labourers
- Specific knowledge of vineyards and citrus fruit production will be needed
- Specific knowledge of fruit packing will be needed
- Support staff will be needed: Admin, forklift drivers, tractor operators and Code 14 drivers.

Preference will be given to black/coloured people for these positions, and more specific **black/coloured women** where possible.

Existing employees with experience on the farm, plus the potential to be leaders, will in the first place be identified for new supervisory positions.

Table 3: New employment opportunities

No. of persons for employment	No. of persons for accredited training
Semi-skilled: 80 (Spesialis werkers) Unskilled: 520 (Tydelike/Seisoen werkers)	Semi-skilled: 4080 Unskilled: 250
Men: 320 (±55%) Women: 270 (±45%)	Men: 28 Women: 28
Youth: 250 (±70% onder 30 Jaar) Adult: 350 (±30% ouer as 30 Jaar)	Youth: 53 Adult: 23

2.8 Efficient and beneficial use of the water in public interest

The new water use will have the following benefits:

Enough water will directly secure existing and new job opportunities.

- Planting new varieties that can spread the preparation, pruning, harvesting and packing seasons over longer periods. This will support the entity in their efforts to convert as much as possible seasonal job opportunities into permanent job opportunities. Especially black females from the farm and neighbouring towns will benefit here. The positive impact on their lives will even be more as more of them will now also be promoted to supervisor level to help manage the increased production as well as the increase in value-adding volume.
- The increase in production of export produce will bring more foreign capital to South Africa which is much needed to strengthen our economy and as such fully supported by Government.

2.9 Socio economic impact of water use to be authorized

In a rural area such as this with a high unemployment rate, any new employment positions have a huge impact on the immediate and extended families of such new workers. Add then also the impact of more people with proper housing, undergoing skills training and going to church, sport, etc. and children going to school, to understand the positive impact on this rural community. Even seasonal work opportunities have the advantage of extra income plus the opportunity to gain skills that can in future be used to gain permanent employment on the farm or elsewhere.

Not only are the new employment opportunities important, but also the fact that:

- Existing jobs can be secured: Enough water will directly secure existing and new job opportunities.
- Planting new varieties that can spread the preparation, pruning, harvesting and packing seasons over longer periods. This will support the entity in their efforts to convert as much as possible seasonal job opportunities into permanent job opportunities. Especially black females from the farm and neighbouring towns will benefit here. The positive impact on their lives will even be more as more of them will now also be promoted to supervisor level to help manage the increased production as well as the increase in value-adding volume.
- The increase in production of export produce will bring more foreign capital to South Africa which is much needed to strengthen our economy and as such fully supported by Government. See Appendix H for the Section 27 Report.

2.10 Investment already made and to be made by the water user in respect of the water use in question

The following investments have been made:

1. Currently Kakamas North Settlement 355, is owned by Rooipad Boerdery Pty Ltd. Additional water rights were recently acquired.
2. All investments made already for the construction of the existing development areas as this is part of an existing farming unit with existing infrastructure on Kakamas North Settlement 355.

The future investments to be made:

1. New investments to be made for the new pipelines and new agricultural areas on Kakamas North Settlement No. 355.
2. No additional investments, other than mentioned above.

2.11 The period for which the license is to be issued

The license should be issued for the maximum possible period, as the water use will be of a permanent nature.

2.12 Failure to authorize the water use

Failure to authorize the water use will result in the following:

- Financial loss due to existing investments already made, for construction of dams, existing infrastructure for water distribution and existing water use rights lost,
- The design and processes implemented to obtain authorisation also has a high financial implication that will be lost.
- Loss in current and future employment opportunities and skills development and training opportunities.

3. CONCLUSION

The authorisation of the vineyards across streams on the farm, thereby complying with the necessary legislation will have numerous positive socio-economic impacts not only on the farm but also the region and result in job creations, skills development, social upliftment and earning of foreign currency.

4. CONDITIONS

When instructed to do so by the Responsible Authority the user must fit a self- registering meter at the user's expense to measure water use and the user at his expense must maintain the meter in satisfactory working condition.

Officers from the Department of Water Affairs will always have free access to the property and the water works for supervision and control purposes.

The Department's or Responsible Authority's local representative will issue the necessary instructions to the user regarding the keeping of proper registers of water use and quality, and the owner must at all times comply with such instructions.

The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of: shortage of water; inundation or flood; siltation of the river or dam basin; and/or the shifting of water work in the event of a rise or drop in the water level of river or dam.

The quality or suitability of the water for any purpose is not guaranteed.

The water abstracted/used in terms of this license may only be used for the authorized purposes.

This license is not a permanent, lawful right and is not transferable from one user to another or from one property to another.

The user must take every possible precaution to the satisfaction of the Department, to prevent pollution of water resources.

The Department of Water Affairs reserves the right to withdraw this license in the event of failure to comply with any of the said conditions or provisions.

The applicant has a period of 2 (two) years within which to commence/implement this water use, failing which, the license will lapse.

5. RECOMMENDATION

The following recommendations should be adhered to:

- Any further recommendations outlined in the Environmental Authorisation and the Water Use License issued.
- When instructed to do so by the Responsible Authority the user must fit a self- registering meter at the user's expense to measure water use and the user at his expense must maintain the meter in satisfactory working condition.
- Officers from the Department of Water Affairs will at all times have free access to the property and the water works for supervision and control purposes.
- The Department's or Responsible Authority's local representative will issue the necessary instructions to the user with regard to the keeping of proper registers of water use and quality, and the owner must at all times comply with such instructions.
- The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of: shortage of water; inundation or flood; siltation of the river or dam basin; and/or the shifting of water work in the event of a rise or drop in the water level of river or dam.
- The quality or suitability of the water for any purpose is not guaranteed.
- The water abstracted/used in terms of this license may only be used for the authorized purposes.
- This license is not a permanent, lawful right and is not transferable from one user to another or from one property to another.
- The user must take every possible precaution to the satisfaction of the Department, to prevent pollution of water resources.
- The Department of Water Affairs reserves the right to withdraw this license in the event of failure to comply with any of the said conditions or provisions.
- The applicant has a period of 2 (two) years within which to commence/implement this water use, failing which, the license will lapse.

It is recommended that the development across small ephemeral streams on Remainder of Kakamas North Settlement No. 355 be approved.

6. APPENDICES

APPENDIX A: Completed License Application Forms

APPENDIX B: Existing Water Use Confirmation and Water Use License



water & sanitation

Department
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

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**AMENDMENT LICENCE IN TERMS OF SECTION 50 OF THE
NATIONAL WATER ACT, 1998 (ACT NO 36 OF 1998)**

I, **Trevor Balzer**, in my capacity as Deputy Director-General: Special Projects in the Department of Water and Sanitation; and acting under authority of the powers sub-delegated to me by the Acting Director-General of Water and Sanitation, hereby authorizes the amendment of licence dated **22 March 2019**, licence no: **10/D81A/A/8971: Rooipad Boerdery (Pty) Ltd**

SIGNED:

DATE: 31/03/2019

The above mentioned licence is amended as follows:

Amendment of condition 1 of Appendix II

- 1. Condition 1 of the licence is hereby amended-
 - a. by the substitution in condition 1 of the following condition:
 - "1. This licence authorises the abstraction of **[1 864 782] 2 176 782 m³ /a** of water from Orange River as indicated in Table 1. Wate abstracted shall be used irrigate 170 hectors of grapes using drip irrigation system."
 - b. by the substitution in condition 1 for Table 1 of the following Table:

Table 1: Section 21 (a) water use activity

Water Use	Purpose	Volume (m ³ /a)	Properties	Co-ordinate
Section21(a)				
Abstraction of water from the Orange River	Irrigation of grapes	<u>2 176 782 m³ /a</u>	Remaining Extent of Lot 355 Kakamas North Settlement Agricultural Holdings	S 28° 39' 17.0" E 20° 26' 49.0"

[END OF LICENCE AMENDMENT]

B 09107



Watergebruikersvereniging
Water User's Association

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Private Bag x4 Private Bag x4
Kakamas 8870 Kakamas 8870

Tel (054) 431 0725/6
Faks/Fax (054) 431 0348
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Mnr. G. van Niekerk

20 Augustus 2019



473/D2/2/355

Pieter Badenhorst Profesional Services CC
PO Box 1058
Wellington
7654

**KAKAMAS WATERGEBRUIKERSVERENIGING. NAVRAAG MET BETREKKING
TOT WATERGEBRUIKSREGTE OP PERSEEL 355. KAKAMAS – NOORD NEDER-
SETTING**

U e-pos gedateer 20 Augustus 2019 het betrekking.

Onderstaande tabel toon gegewens soos deur u versoek. Die gegewens was ten tye van u navraag korrek maar sou u in die onlangse verlede aansoek gedoen het vir wysigings, kan dit wees dat die wysigings nog nie afgehandel is nie en sal dit ook nie as sodanig weergegee wees nie.

Perseelnommer	Maksimum moontlike hektare	Kanaal hektaar	Rivier hektaar
Kakamas – Noord 355	50.00	0.00	50.00 124,318 (Waterlisensie)
TOTAAL	174,318	0.00	174,318

(*) Geliewe kennis te neem dat die gebruiksreg van elke individuele eiendom as 'n volume (kubieke meter) teen elke eiendom, soos aangedui in bostaande tabel geregistreer is. Die geregistreerde volume van elke eiendom word dus bereken deur die aantal hectare te vermenigvuldig met die kwota van 15 000 m³ water per jaar.

Registrasie van bogemelde gebruiksregte uit die kanaal sowel as uit die rivier, soos in die tabel hierbo aangedui, is gedurende Oktober 2000 namens u geregistreer in terme van die Nasionale Waterwet (Wet 36 van 1998) soos gewysig. Geen verpligte lisensieëring is op hierdie stadium van toepassing nie, en slegs in die geval van permanente oordrag van gebruiksregte van een gedeelte grond na 'n ander gedeelte word die ontvanger eiendom gelisensieër.

Ek vertrou dat u die inligting in orde sal vind en sal graag meer besonderhede verskaf indien dit benodig word.

HOOF UITVOERENDE BEAMPTTE



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria 0001, 185 Francis Beard Street, Sedibeng Building, Pretoria,
Tel: 012 336 7500, Fax (012) 323 4472/ (012) 326 2715. www.dws.gov.za

LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

I, **Trevor Balzer**, in my capacity as Deputy Director-General: Special Projects in the Department of Water and Sanitation: and acting under authority of the powers sub- delegated to me by the Acting Director- General of Water and Sanitation, hereby authorizes the following water uses in respect of this licence.

SIGNED: Trevor Balzer

DATE: 22/03/2019

LICENCE NO: 10/D81A/A/8971
FILE NO: 27/2/1/D181/27/1

1. **Licensee:** Rooipad Boerdery Pty Ltd
Postal Address P.O Box 26
Augrabies
8874
2. **Water Uses**
 - 2.2 Section 21(a) of the Act: Taking water from a water resource; subject to the conditions set out in Appendices I and II.
 - 2.3 Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on water Resource; subject to the conditions set out in Appendices I and III.
3. **Properties in respect of which the licence is issued**
 - 3.1 Remaining Extent of Lot 355, Kakamas North Settlement Agricultural Holding
4. **Registered owners of the Property**
 - 4.1 Rooipad Boerdery Pty Ltd
5. **Licence and Review Period.**
 - 5.1 This licence is valid for a period of 20 years from the date of issuance and it may be reviewed at an interval not more than five (5) years. **B08813**

B

6. Definitions

Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998) shall bear the same meaning when used in this licence.

"The Reginal Head"- means the Chief Director : Northern Cape, Department of Water and Sanitation, Private Bag X6101, Kimberley, 8300.

"The Department" means the Department of Water and Sanitation.

"Responsible Authority" means the Department of Water and Sanitation or Catchment Management Agency.

"Report" refers to the reports entitled:

- i) Business Plan for Rooipad Boerdery, compiled by the Rooipad Boerdery (Pty) Ltd, undated; and
- ii) Water use licence Application Reports compiled by Rooipad Boerdery (Pty) Ltd dated 13 August 2018 and as well as all other related documentations and communication (emails, letters, verbal, etc) related thereto.

7. Description of the activity

The propose activity entails taking water from Orange River to irrigate 170 hectors of grapes using drip irrigation system and disposing of wastewater into a septic tank on Remaining Extent of Lot 355, Kakamas North Settlement Agricultural Holding. Water will be pumped directly from the Orange River to irrigation field. The geographical location of the abstraction points is S 28° 39' 17.0" E 20° 26' 49.0". The activity falls within quaternary catchment D81A in the Lower Orange Water Management Area.

8. Licence substituted or replaced

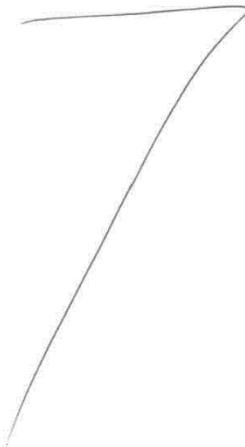
- 8.1 This Licence substitute all previous water uses Licences, Authorisations, Permits, Exemptions granted on Remaining Extent of Lot 355, Kakamas North Settlement Agricultural Holding.

APPENDIX I

Conditions for all Water Uses

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).
2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.
3. The Licensee must immediately inform the Reginal Head or Responsible Authority of any change of name, address, premises and/or legal status.
4. If the property in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Reginal Head or Responsible Authority of the Department within 60 days of the said change taking place.
5. If a water user association is established in the area to manage the resource, membership of the Licensee to this association is compulsory.
6. The Licensee shall be responsible for any water use charges or levies imposed by a responsible authority in terms of the Raw Water Pricing Strategy, Waste Discharge Charges, Water Resource Management Charge of the Department, or any other water charge or levies that might be imposed in terms of the appropriate legislation.
7. While effect must be given to the Reserve as determined in terms of the Act, where a desktop determination of the Reserve has been used in issuance of a licence, when a comprehensive determination of the Reserve has finally been made; it shall be given effect to.
8. The licence shall not be construed as exempting the Licensee from compliance with the provisions any other applicable Act, Ordinance, Regulation or By-law.
9. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other applicable provisions of the Act, as amended from time to time.
10. The Licensee shall conduct an annual internal audit on compliance with the conditions of licence. A report on the audit shall be submitted to the Reginal Head or Responsible Authority within one month of the finalisation of the audit.
11. The Licensee shall appoint an independent external auditor to conduct a biennial external audit on compliance with the conditions of this licence. The audit shall be conducted within 6 (six) months after the submission of internal audit, and a report of the audit shall be submitted to the Reginal Head or Responsible Authority within one month of finalisation of the audit report.
12. Any incident that causes or may cause water pollution shall be reported to the Reginal Head or Responsible Authority or his/her designated representative within 24 hours.
13. The Licensee must inform the Department at least 300 days before the expiry date of the licence whether the licence must be considered for another term.

14. Licensee shall use water efficiently to minimise total water intake, void usage of water where possible, implement "good" housekeeping and operating practices, and maximise the reuse /recycle of contaminated water.
15. All measuring, recording and integrating devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals as specified and required according to the device specifications.
16. The licensee must calibrate the inflow and outflow meters and these calibration certificates shall be available for inspection by the Regional Head or Responsible Authority or his/her representative upon request. A relevant maintenance and calibration schedule should be compiled and maintained by the licensee.
17. The conditions of the authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of these activities and the licensee must take such measures that are necessary to bind such persons to the conditions of this licence.
18. Notices prohibiting unauthorised persons from entering the certain areas, as well as acceptable signs indicating the risks involved in case of an unauthorised entry must be displayed along the boundary fence of these areas.
19. If the Licensee is not the end user/beneficiary of the water use related infrastructure and will not be responsible for long term maintenance and management of the infrastructure, the Licensee must provide a programme for hand over to the successor-in-title including a brief management/maintenance plan and the agreement for infrastructure along with allocation of responsibilities, within three (3) months before handover.
20. The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of-
 - 20.1 shortage of water;
 - 20.2 inundations or flood;
 - 20.3 siltation of the resource; and
 - 20.4 required reserve releases.



APPENDIX II

Section 21 (a) of the Act: Taking water from a water resource

1. This licence authorises the abstraction of 1 864 782 m³ /a of water from Orange River as indicated in Table 1. Water abstracted shall be used irrigate 170 hectares of grapes using drip irrigation system.

Table 1: Section 21 (a) water use activity

Water Use	Purpose	Volume (m ³ /a)	Properties	Co-ordinate
Section21(a)				
Abstraction of water from the Orange River	Irrigation of grapes	1 864 782 m ³ /a	Remaining Extent of Lot 355 Kakamas North Settlement Agricultural Holdings	S 28° 39' 17.0" E 20° 26' 49.0"

2. The quantity of water authorised to be taken in terms of this licence may not be exceeded without prior authorisation by the Responsible authority.
3. This licence does not imply any guarantee that the said quantities and qualities of water will be available at present or at any time in the future.
4. The abovementioned volume may be reduced when the licence is reviewed.
5. The Licensee shall continually investigate new and emerging technologies and put into practice water efficient devices or apply technique for the efficient use of water containing waste, in an endeavour to conserve water at all times.
6. All water taken from the resource shall be measured as follows:
 - 6.1 The daily quantity of water taken must be metered or gauged and the total recorded at the last day of each month; and
 - 6.2 The Licensee shall keep record of all water taken and a copy of the records shall be forwarded to the Regional Head or Responsible Authority each year with the annual monitoring report.
7. No water taken may be pumped, stored, diverted, or alienated for purposes other than intended in this licence, without written approval by the Regional Head or Responsible Authority.
8. The Licensee shall install and monitor appropriate water measuring devices to measure the amount of water abstracted, received and/or consumed, as applicable to the infrastructure.
9. The licensee shall establish and implement a continual process of raising awareness amongst itself, its workers and stakeholders with respect to Water Conservation and Water Demand Management initiatives.
10. The licensee shall as part of annual monitoring report submit:-
 - 10.1 Details of crops
 - 10.2 Irrigation system types

11. The licensee shall appoint and make use of suitable qualified irrigation system designers for the design and installation of irrigation systems which shall be registered with South African Irrigation Institute.
12. The Licensee shall compile an Annual Monitoring Report and submit to the Reginal Head or Responsible Authority within eighteen (18) months after issuance of this licence and annually thereafter under Reference number 27/2/1/D181/27/1. This must be accompanied by the results of analysis after monitoring requirements.

APPENDIX III

Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource

1. QUANTITY OF WASTEWATER TO BE DISPOSED

1.1 The Licensee is authorised to dispose wastewater in the waste disposal facilities as set out in Table 2.

Table 2: Waste water management facility

Water use(s)	Purpose	Capacity, (m ³)	Property Description	Co-ordinates
Section 21 (g)				
Disposing of sewage into Septic tank	Sewage treatment	120	Remaining Extent of Lot 355 Kakamas North Settlement Agricultural Holdings	S 28 ^o 38' 59.0" E 20 ^o 27' 23.0"

1.2 The quantity of treated wastewater authorised to be disposed in terms of this licence must not be exceeded.

2. OPERATION AND MAINTENANCE OF THE WASTEWATER SYSTEM

2.1 Potential impact of the septic tank shall be managed according to "A PROTOCOL TO MANAGE THE POTENTIAL OF GROUNDWATER CONTAMINATION FROM ON SITE SANITATION" (Edition 2, March 2003) by the Department of Water Affairs and Forestry.

2.2 No intractable or toxic waste must be allowed to find its way into the wastewater system and /or be discharged with the final effluent. The licensee must take all steps possible to prevent discharge of any substance into the wastewater system, which could have a deleterious effect on the operation of system and/or final waste.

2.3 All non-organic or foreign matter such as cigarette butts, condoms, sanitary wear, ear buds, etc. must not be introduced to septic tank systems as these will cause blockages, damage to the pumps and ultimately create unnecessary service requirements as per the Operation Description.

2.4 The septic tank systems shall be monitored for leaks and these shall be closed / blocked immediately.

2.5 Any foreign chemicals or substances which could retard the growth of the bacteria within the system must be avoided.

2.6 The licensee must ensure effluent disposed septic tank systems shall not overflow.

3. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS

3.1 Pollution incidents must be dealt with in accordance with Section 19 and 20 of the Act.

3.2 Any incident that may cause pollution of any water resource must immediately be reported to the Regional Head or Responsible Authority.

3.3 If surface and/or groundwater pollution has occurred or may possibly occur, the licensee must conduct, and/or appoint specialists to conduct the necessary investigations and implement additional monitoring, pollution prevention and remediation measures to the satisfaction of the Regional Head or Responsible Authority.

4. SLUDGE MANAGEMENT

4.1 Waste water sludge emanating from the treatment process must be quantified, analysed, dealt with according to the requirements of chapter 5 of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and the Guideline for the Utilisation and Disposal of wastewater sludge (volume 1-5), dated March 2006 and any updates thereafter, to the satisfaction of the Regional Head.

[END OF LICENCE]

B

APPENDIX C: Deed Search and Title Deeds



Berrangé Incorporated
P.O. Box 13446
Cascades, 3202
Tel : (033) 345 5331

SEELRFB
FOU: 4 400.00
FEES R.

Prepared by me

CONVEYANCER
GINETTE LINDA CHUBB

DEED OF TRANSFER

T 2693- 2016

cf

BE IT HEREBY MADE KNOWN THAT

MICHELLE HATTINGH

appeared before me, REGISTRAR OF DEEDS at VRYBURG, the said appearer being duly authorised thereto by a Power of Attorney which said Power of Attorney was signed at Pietermaritzburg on 28 September 2016 granted to him by

**The Liquidator of
VRYSTAAT MIELIES PROPRIETARY LIMITED (IN LIQUIDATION)
Registration Number 1996/017678/07
Number T1135/16/PRETORIA**

[Handwritten mark]

And the appearer declared that his said principal the Liquidator of VRYSTAAT MIELIES PROPRIETARY LIMITED (IN LIQUIDATION) Number T1135/16/PRETORIA had, on 19 September 2016, truly and legally sold by Private Treaty, and that he, the said Appearer, in his capacity aforesaid, did, by virtue of these presents, cede and transfer to and on behalf of:

ROOIPAD BOERDERY (EDMS) BPK
Registration Number 1995/003444/07

or its Successors in Title or assigns, in full and free property

REMAINING EXTENT OF LOT 355 KAKAMAS NORTH SETTLEMENT
SITUATE IN THE KAI IGARIEP MUNICIPALITY
DIVISION GORDONIA
NORTHERN CAPE PROVINCE

IN EXTENT 1086,3821 (ONE THOUSAND AND EIGHTY SIX COMMA
THREE EIGHT TWO ONE) HECTARES

First registered by Certificate of Registered Title Number T 698/2002 with Diagram SG Number 447/2000 annexed thereto and held by Deed of Transfer Number T 2776/2010

THIS PROPERTY IS TRANSFERRED :-

I Wat betref die geheel van die eiendom :

A. Die voorwaardes vervat in Grondbrief FT 971 (GQ 2/57), Grondbrief FT 970 (2/56) en Grondbrief FT 969 (GQ 2/55), Nr VI, waarvan in elke van gemelde Grondbriewe as volg lui :

VI. That the Government or any body corporate or person duly authorised by the State shall at all times have the power without compensation of making riad, railways and railway stations and of conducting telegraphs over and of taking materials for making or repairing roads and railways from any land hereby granted which has not been approved by cultivation, irrigation or otherwise, and shall further have the power of making roads, railways and railway stations and of conducting telegraphs over and of taking materials for making or repairing roads or railways from any land hereby granted which has been improved by cultivation, irrigation or otherwise, and of making aqueducts, dams and drains for the benefit of the public and of establishing convenient outspans for the use of travellers on payment to the Proprietor of such sums of money in compensation as may be mutually agreed upon by the parties concerned, of failing such agreement, as three appraisers, one to be appointed by each side, and a third to be chosen by the two other before proceeding to act, or any two of the, shall award.

B. NOTARIELE AKTES VAN SERWITUUT Nrs. 191, 192, 190 en 189, almal geregistreer op die 11de dag van Februarie 1895, waarvolgens daar toegeken is ann die Staat of sy Opvolgers, die reg om waterweë en afleivore te maak op en om water te lei orr die eiendom, soos meer volledig sal blyk uit die gemelde Aktes van Serwituut.

[Handwritten signatures]

- C. Die volgende voorwaardes opgelê deur die Distrikspadingenieur van Department van Vervoer kragtens Artikel 11(6) van die Wet op Adverteer langs Paaie en toebou van Paaie, Wet 21 van 1940, en die Ordonnansie op Paaie, 19 van 1976, naamlik :
1. In terme van Artikel 9 van die bogenoemde Wet, is die 95 m boubeperkingslyn (gemeet van die middellyn van die pad) langs Hoofpad 859 van toepassing. Die boubepkering geld nie vir bona-fide Boerdery-bedrywighede nie.
 2. In terme van Artikel 17 van bogenoemde Ordonnansie, is die statutêre 5 m boulyn (gemeet van die wetlike padgrens) langs Hoofpad 859 van toepassing.

GEREGTIG OP :

- D. 'n Kanaalgebied Serwituut 7,87 meter wyd iir PERSEEL 52 van die plaas KAKAMAS NOORD, groot 1,2887 hektaar, gehou kragtens Akte van Transport Nr 161/1960, ten gunste van die RESTANT van die plaak KAKAMAS NOORD, Afdeling GORDONIA, Provinsie NOORDKAAP, groot 40,673,6675 hektaar (waarvan hierdie eiendom 'n gedeelte vorm) welke serwituut aangetoon is deur die kom lyn b, middel van voor a, middle van voor g, op Kaart Nr 12516/57 daaraan geheg, soos geskep en meer volledig sal blyk uit genoemde Akte van Transport Nr T161/1960.

ONDERHEWIG AAN :

- II. Wat betref die figuur g B C D E F G H J K e, soos aangedui op gemelde Kaart Nr 447/2000;

E. Notariële Akte van Serwituut Nr 188 geregistreer op 11 Februarie 1895, waarvolgens daar toegeken is aan die Staat of sy Opvolgers, die reg om Waterweë en afeivore te maak op en om water te lei oor die gogemelde figuur, soos meer volledig sal blyk uit die gemelde Akte van Serwituut.

- III. Wat betref die figuur A B C D E F G H J K L M N P Q R a V W X Y Z A1 B1 C1 D1 E1 F1 op gemelde Kaart Nr 447/2000 :

F. 'n Veesuiping op :

PERSEEL	208 van die plaas KAKAMAS NOORD
GELEE	in die Afdeling GORDONIA
	Provinsie NOORDKAAP
GROOT	356,6583 HEKTAAR
GEHOU	kragtens Akte van Transport Nr 647/1970

Kragtens Notariële Akte Nr 24/1970S

- G. 'n Pyplyn Serwituut 3 meter wyd, die middellyn waarvan voorgestel word deur die stippellyn RS op Kaart Nr 2048/85, oor :

PERSEEL	302 gedeelte van perseel 200, KAKAMAS NORTH
	SETTLEMENT
GELEE	in die Afdeling GORDONIA
	Provinsie NOORDKAAP
GROOT	9 116,5025 HEKTAAR

Soos geskep in Akte van Transport Nr 809/1968

H. 'n Reg van Weg vyf (5) meter wyd ten gunste van

PERSEEL	330 Gedeelte van PERSEEL 20 KAKAMAS NORTH SETTLEMENT
GELEE	in die Afdeling GORDONIA
	Provinsie NOORDKAAP
GROOT	141,0144 hektaar

Soos geskep in Akte van Transport Nr T630/1996

I. 'n Reg van Weg vyf (5) meter wyd ten gunste van :

PERSEEL	329, (gedeelte van PERSEEL 200), KAKAMAS NORTH SETTLEMENT
GELEE	in die Afdeling GORDONIA
	Provinsie NOORDKAAP
GROOT	141,1048 hektaar

Soos geskep in Akte van Transport Nr T631/1996.

GEREGTIG OP :

IV. Wat betref die figuur m a R s h n soos aangedui op gemelde Kaart Nr 447/2000:

J. 'n Pad en Pyplynserwituut, 15 meter wyd, die suidoostelike grens voorgestel deur die lyn m n p soos aangetoon op gemelde Kaart Nr. LG447/2000 oor die Resterende Gedeelte van Perseel 208 (Gedeelte van perseel 211) KAKAMAS NORTH SETTLEMENT.

ONDERHEWIG AAN :

V. Wat betref die figuur U m n p regterwal van Oranjerivier t soos aangedui op gemelde Kaart Nr 447/2000:

K. 'n Ewigdurende Serwituut van Veesuijing aangetoon deur die figuur geletter GHj regterwal van Oranjerivier KL op Kaart Nr 7237/69, geheg aan voormelde Serfikaat van Geregistreerde Title Nr 647/1970, geregistreer onder Nr 24/1970/S.

GEREGTIG OP :

L. 'n Kanaalgebied Serwituut 7,87 wyd oor PERSEEL 52 van die plaas KAKAMAS NOORD, groot 1,2888 hektaar, gehou kragtens Akte van Transport Nr 161/1960 ten gunste van die Restrant van die plaas KAKAMAS NOORD, Afdeling GORDONIA, GROOT 34 673,6775 HEKTAAR (WAARVAN HIERDIE EIENDOM 'N GEDEELTE VORM) WELKE Serwituut aangetoon is deur die krom lyn b middle van voor a middle van voor g op Kaart Nr 12516/57 daaraan geheg, soos meer volledig sal blyk uit gemelde Akte van Transport.

ONDERHEWIG AAN :

M. Kragtens Notariële Akte Nr K32/1997S is die hierinvermelde eiendom onderhewig aan 'n Serwituutgebied aangedui as A B C x regterwal van Oranjerivier y, groot 2655 vierkante meter op Serwituutdiagram LG 8654/96

§ ⚡ ω

ten gunste van Gedeelte 3 (Omdraaisville) (Gedeelte van Gedeelte 1) van die plaas OMDRAAI 492, gehou kragtens Akte van Transport Nr T3028/1995.

- N. Binne-gemelde restant is onderhewig aan 'n Pad en pyplyn Serwituut ten gunste van Perseel 338 (Gedeelte van perseel 208) Kakamas North Settlement, soos aangetoon by die lyn A F B op Kaart 8784/97 gely van T1962/1998.
- O. 'n Serwituut van 15 (vyftien) meter wyd oor die volle lengte van die grens van Perseel 354, aangedui deur B C D en d op Diagram 446/2000 en ewewydig met gemelde grens, soos geskep Transportakte Nr T697/2002.
- P. 'n Serwituut 15 (vyftien) meter wyd oor die volle lengte en ewewyding met die Noord-Westelike grens van gemelde perseel 354, aangemerk deur A E en e op Diagram 446/2000 welke serwituut aangeteken word ten gunste van die Restant van perseel 208, KAKAMAS NORTH SETTLEMENT, soos geskep in Akte van Transport Nr T697/2002.
- Q. Die figuur f g h regtewal van Oranjerivier j k stel 'n veesuijing serwituutgebied voor, soos aangetoon op gemelde Kaart Nr. LG 447/2000 en geskep in Sertifikaat van Verenigde Titel Nr T698/2002.



f g h j k

WHEREFORE the said Appearer, renouncing all right and title which the said

Liquidator of VRYSTAAT MIELIES PROPRIETARY LIMITED (IN LIQUIDATION) Number T1135/16/PRETORIA

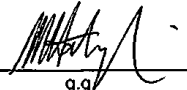
heretofore had to the premises, did in consequence also acknowledge him to be entirely dispossessed of, and disentitled to the same, and that by virtue of these presents, the said

**ROOIPAD BOERDERY (EDMS) BPK
Registration Number 1995/003444/07**

or its Successors in Title or assigns, now is and henceforth shall be entitled thereto, conformably to local custom, the State, however reserving its rights, and finally acknowledging the purchase price to be the sum of R41 140 761,20 (FORTY ONE MILLION ONE HUNDRED AND FORTY THOUSAND SEVEN HUNDRED AND SIXTY ONE RAND AND TWENTY CENTS).

IN WITNESS WHEREOF, I the said Registrar, together with the Appearer, have subscribed to these presents, and have caused the Seal of Office to be affixed thereto.

THUS DONE and EXECUTED at the Office of the REGISTRAR OF DEEDS at VRYBURG on 24 -11- 2016



q.q

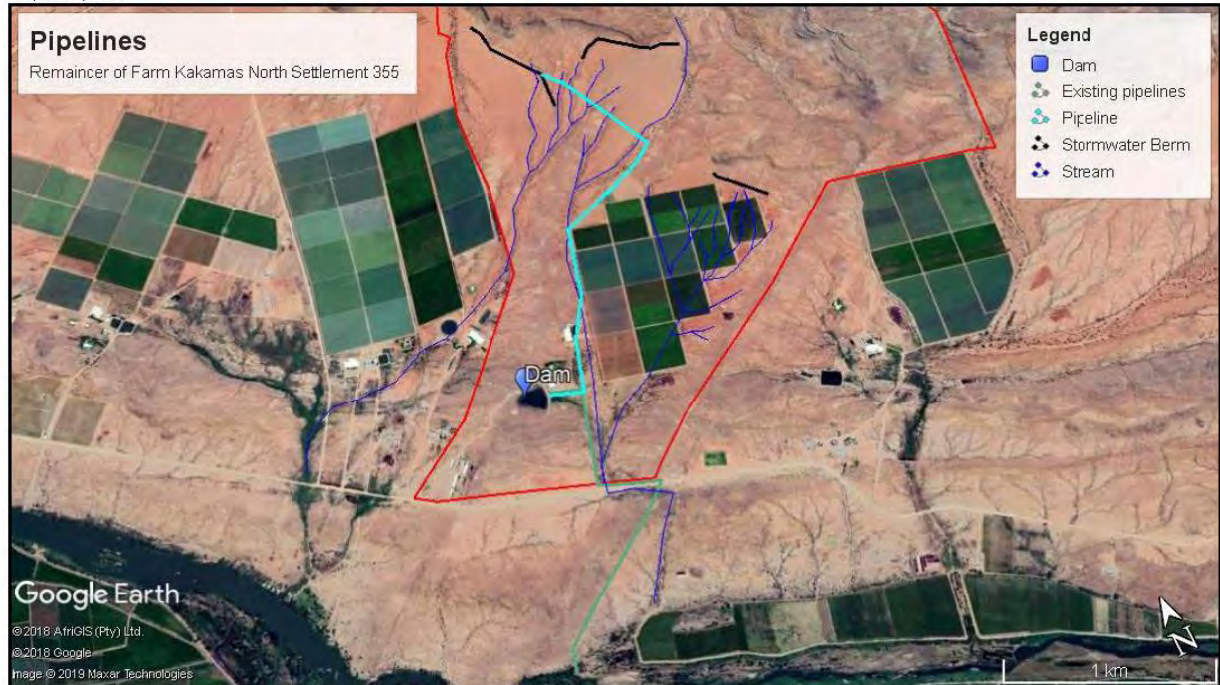
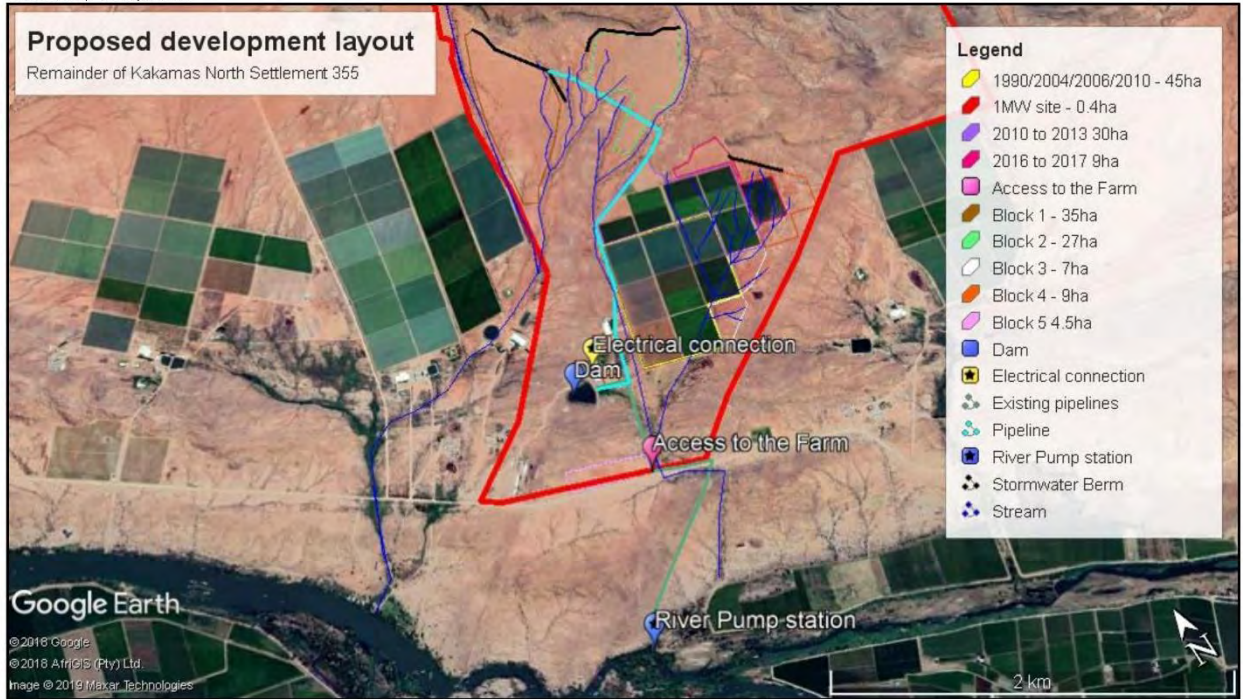
In my presence



REGISTRAR OF DEEDS

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APPENDIX D: Power of Attorney



APPENDIX F: Technical Documents
Appendix F.1: Environmental Impact Report

A S24G process is underway, and this report will be advertised as part of the public participation for the draft Assessment Report.

Appendix F.2: Storm water Management Plan

Appendix F.3: Environmental Authorisation

APPENDIX G: Proof of Public Participation

APPENDIX H: Section 27 Report

APPENDIX I: Certified copy of ID

APPENDIX J: Company Registration certificates

Certificate issued by the Commissioner of Companies & Intellectual Property Commission on Tuesday, October 4, 2016 at 12:20



Disclosure Certificate: Companies and Close Corporations

Companies and Intellectual Property Commission
a member of the **SA** group

Registration Number: 1995 / 003444 / 07
Enterprise Name: ROOIPAD BOERDERY

ENTERPRISE INFORMATION

Registration Number: 1995 / 003444 / 07
Enterprise Name: ROOIPAD BOERDERY (PTY) LTD
Registration Date: 19/04/1995
Business Start Date: 19/04/1995
Enterprise Type: Private Company
Enterprise Status: In Business
Financial Year End: September
TAX Number: 9440068063
Addresses:

POSTAL ADDRESS	ADDRESS OF REGISTERED OFFICE
POSBUS 26 AUGRABIES AUGRABIES NORTHERN CAPE 8874	ROOIPAD NR 13 AUGRABIES AUGRABIES NORTHERN CAPE 8874

ACTIVE MEMBERS / DIRECTORS

Surname and First Names	Type	ID Number / Date of Birth	Contrib. (R)	Interest (%)	Appoint. Date	Address
NEL, JOHANNES IZAK	Director	67091551-42088	0,00	0,00	19/04/1995	Postal: POSBUS 26, AUGRABIES, 8874 Residential: PLAAS ROOIPAD, AUGRABIES, 8874
NEL, JOHANNES JACOBUS	Director	1972-07-25	0,00	0,00	19/04/1995	Postal: POSBUS 26, AUGRABIES, 8874 Residential: PLAAS ROOIPAD, AUGRABIES, 8874
NEL, JOHANNES IZAK	Company Secretary	67091551-42088	0,00	0,00	19/04/1995	Postal: POSBUS 26, AUGRABIES, 8874 Residential: PLAAS ROOIPAD, AUGRABIES, 8874

AUDITOR DETAILS

Auditor Name	Type	Status	Appointment Date	Resignation Date	Email Address
KOEBUS NEL EN KIE	Auditor	Name Change	1995-04-19		

Profession Number:

Physical Address
the **di** Campus - Block F
77 Meintjes Street
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- 1995-04-19 : Registration of CCA/CC on 19/04/1995
- 2002-05-07 : Accounting Officer Change on 28/05/1998
 Change Record
 Name = KOBUS NEL EN KIE
 Status = Name Change
- 2002-05-07 : Accounting Officer Change on 28/05/1998
 Add Record
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 Status = Current
- 2006-02-20 : Member Change on 20/02/2005
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 Status ACTIVE
- 2008-09-11 : Member Change on 11/09/2008

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2011-03-30 · Member Change on 03/02/2011.
Change Record
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First Names = JOHANNES IZAK
Status = Active

2011-07-05 · Status changed to Cancellation of Deregistration Process on 05/07/2011.
Annual Return Non Compliance - Cancellation of Deregistration

2014-05-20 · Annual Return completed on 20/05/2014.
Company / Close Corporation AR Filing - Web Services : Ref No. : 53357430

2015-04-06 · Status changed to Unknown.
No Valid SMS or Email Address for enterprise M1995003444

2015-05-19 · Registered Address Change on 19/05/2015.
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Registration Number: **1996 / 003444 / 07**
Enterprise Name: **ROOIPAD BOERDERY**

2015-05-20 : Annual Return completed on 20/05/2015
Company / Close Corporation AR Filing - Web Services : Ref No. : 526519780
2016-04-02 : Status changed to Unknown.
No Valid SMS or Email Address for enterprise M1995003444
2016-05-17 : Annual Return completed on 17/05/2016.
Company / Close Corporation AR Filing - Web Services : Ref No. : 534660949



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APPENDIX K: Copy of Receipt

APPENDIX L: Section 21 c and i list of drainage lines coordinates and Risk Matrix

APPENDIX M: Plough Certificate



Department of Botany
NELSON MANDELA
UNIVERSITY

**The vegetation and flora of the areas of Tierkop
proposed for vineyard expansion.**



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**Report prepared for Pieter Badenhorst Professional Services
P O Box 1058, Wellington, 7654**

25 October 2019

Executive Summary

Rooipad Boedery has proposed to plant a new vineyard on 72 ha of Farm 355 Tierkop, Kakamas North, Augrabies, Northern Cape. They also propose to install a small (ca. 1 MW) solar power plant. This report contains information on the flora and vegetation to contribute to the Integrated Environmental Management process.

Two vegetation types (Mucina & Rutherford, 2006) are found on the Tierkop study site: most of the property is Kalahari Karroid Shrubland NKb 5), but some Bushmanland Arid Grassland (NKb 3) occurs in the south. Both are listed as vegetation types of **Least Concern** (Rouget et al., 2004) and the site is at least 10 km from Augrabies Falls National Park and areas proposed for its expansion (Department of Environmental Affairs, 2016). However, the site lies in a **Critical Biodiversity Area** (CBA; Oosthuysen & Holness, 2016): mostly a CBA1 (highest priority) with the rest a CBA2 (moderate priority). Only 4% of the proposed development area is transformed.

A vegetation and flora survey done in spring yielded 65 plant species in the natural areas of Tierkop, although the region was extremely dry at the time. Two **Red Data List** plant species were recorded in the Bushmanland Arid Grassland: the Data Deficient *Acanthopsis hoffmannseggiana* occurs on two quartzite stony slopes of the proposed development area, while the Vulnerable *Aloidendron dichotomum* trees (also specially protected, Schedule 1 of the Northern Cape Nature Conservation act No. 9 of 2009) are adjacent to (outside) this same area. This area (ca. 1 ha) should be excluded from development and an alternative for development is recommended west of the Tierkop entrance gate (4.5 ha). Two of the four **Protected** species (Schedule 2 of the Northern Cape Nature Conservation act No. 9 of 2009) were also recorded in this proposed exclusion area (*Euphorbia braunsii* and *E. gariiepina*). All the protected *Pergularia daemia* plants (found next to a road) and most of the *Boscia albitruncata* trees (in the drainage lines) were recorded adjacent to the proposed development area.

Contents

Executive Summary.....	1
Contents.....	2
List of Figures.....	2
List of Plates.....	2
Introduction.....	3
Method.....	3
1. The natural vegetation of the Tierkop area.....	5
1.1 Kalahari Karroid Shrubland.....	5
1.2 Bushmanland Arid Grassland.....	7
2. The flora of Tierkop.....	8
3. Transformation of vegetation at Tierkop.....	11
4. Conservation-based recommendations for Tierkop.....	11
References.....	15
Appendix. Plant species recorded in the proposed development areas at Tierkop, Augrabies.	16

List of Figures

Figure 1. The locality of the Tierkop study site north-east of Augrabies, Northern Cape. The background image is from <i>DigitalGlobe</i> of 26 June 2017.....	4
Figure 2. The areas of the Tierkop study site (on a <i>DigitalGlobe</i> image of 26 June 2017) that were surveyed in this study.....	4
Figure 3. The vegetation types (Mucina & Rutherford, 2006) of the area surrounding the Tierkop study site (on a <i>DigitalGlobe</i> image of 26 June 2017).....	6
Figure 4. The vegetation types (Mucina & Rutherford, 2006) of the Tierkop study site (on a <i>DigitalGlobe</i> image of 26 June 2017).....	6
Figure 5. The quartzitic stony slopes of Bushmanland Arid Grassland (1.2 ha in red) that had all the Species of Conservation Concern found on the study site (on a <i>DigitalGlobe</i> image of 26 June 2017). The <i>Aloidendron dichotomum</i> trees were at the black dots.	9
Figure 6. The transformed part of the Tierkop study site (on a <i>DigitalGlobe</i> image of 26 June 2017) proposed for development of vineyards. The northern triangular area has subsequently been planted to grass to serve as feed for the wildlife of the area.	9
Figure 7. A part of the Tierkop study site (on a <i>DigitalGlobe</i> image of 26 June 2017) that could be used for development of vineyards should other logistics be found to be acceptable.....	13
Figure 8. The current and planned protected areas for the Northern Cape Province of South Africa (Department of Environmental Affairs, 2016) some distance from the Tierkop Study Site (on a <i>DigitalGlobe</i> image of 26 June 2017).....	13
Figure 9. The Critical Biodiversity Areas of the Tierkop study site and surrounds (Oosthuysen & Holness, 2016). Orange River.	14

List of Plates

Plate 1. The quartzitic stony slopes of Bushmanland Arid Grassland on Tierkop that are home to <i>Acanthopsis hoffmannseggiana</i> plants (a dry plant is shown bottom right) in the elevated parts of the two southern-most proposed development blocks (Fig. 5).	10
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Introduction

Pieter Badenhorst Professional Services was appointed to conduct an Environmental Impact Assessment for a proposed new agricultural development on Farm 355 Tierkop, Kakamas North, Augrabies, Northern Cape Province (Fig. 1). Rooipad Boedery (Pty.) Ltd. has proposed to plant new vineyards on ca. 72 ha of the study site (a total of 90 ha, Fig. 2) and install a small (ca. 1 MW) solar power plant.

This report presents a description and assessment of the vegetation and flora of the areas considered for vineyard expansion. Recommendations pertaining to the proposed development are made in the context of Species of Conservation Concern recorded as well as Bioregional Conservation Plans. For the purposes of this report, the study site (Fig. 2) is collectively referred to as “Tierkop”.

Method

A **field survey** was conducted between 24 and 27 September 2019. This time was chosen to represent the spring flowering season. However, it is of particular significance that the region was extremely dry at the time of surveying and the species list recorded at the time should be considered to be extremely conservative. Given the dry conditions, a list of plant Species of Conservation Concern of the broader area was compiled, and in the survey, these were specifically targeted as they would appear in a drought. The list was compiled from species lists published for the Augrabies Falls National Park as compiled by Zietsman & Bezuidenhout (1999) and Werger & Coetzee (1977). This list was annotated for Species of Conservation Concern based on legislation (the Northern Cape Nature Conservation Act No. 9 of 2009) and the Red Data List for plants of South Africa (BODATSA, <http://posa.sanbi.org> accessed in July 2019). In addition the list of vegetation type endemics was extracted from Mucina & Rutherford (2006). Most of the Species of Conservation Concern in this list (Campbell, 2019) could be surveyed, despite the dry conditions (the species are recognisable even if dried out or drought stressed). For those that were not likely to be found in dry periods (the non-emergent species or those that survive dry conditions only as seeds), BODATSA (<http://posa.sanbi.org> accessed in July 2019) records of collections from the area were considered to determine the possibility of their occurrence.

The areas earmarked for vineyard expansion (Fig. 2) were surveyed for **flora** in detail by walking along a grid of lines ca. 10 m apart. The path of the proposed pipeline (Fig. 2) was also surveyed. Areas on the property outside the proposed planting areas were surveyed

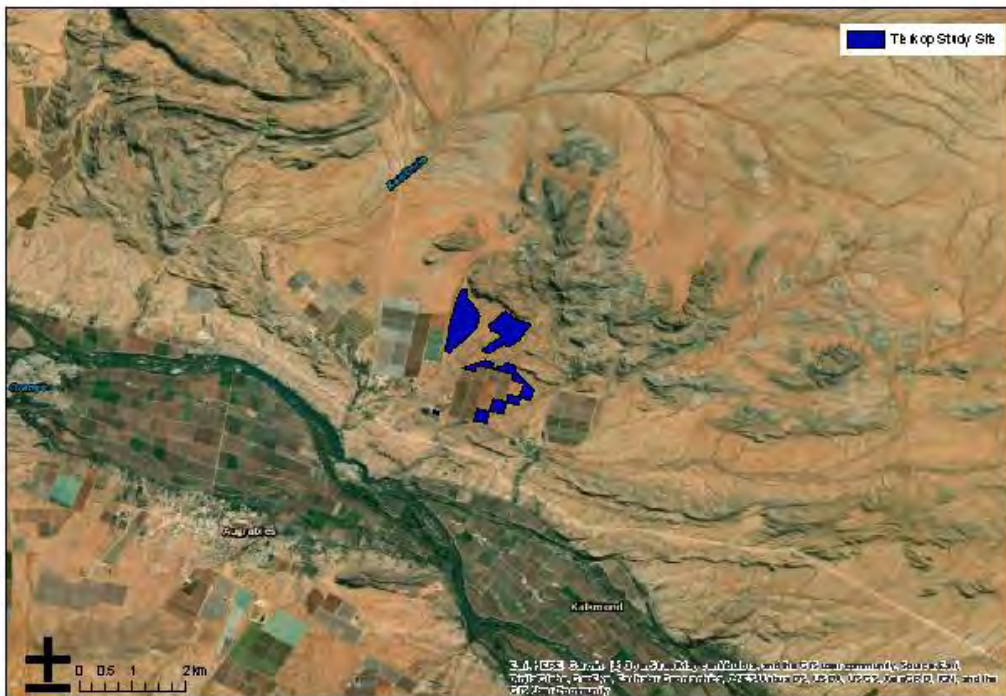


Figure 1. The locality of the Tierkop study site north-east of Augrabies, Northern Cape. The background image is from *DigitalGlobe* of 26 June 2017.

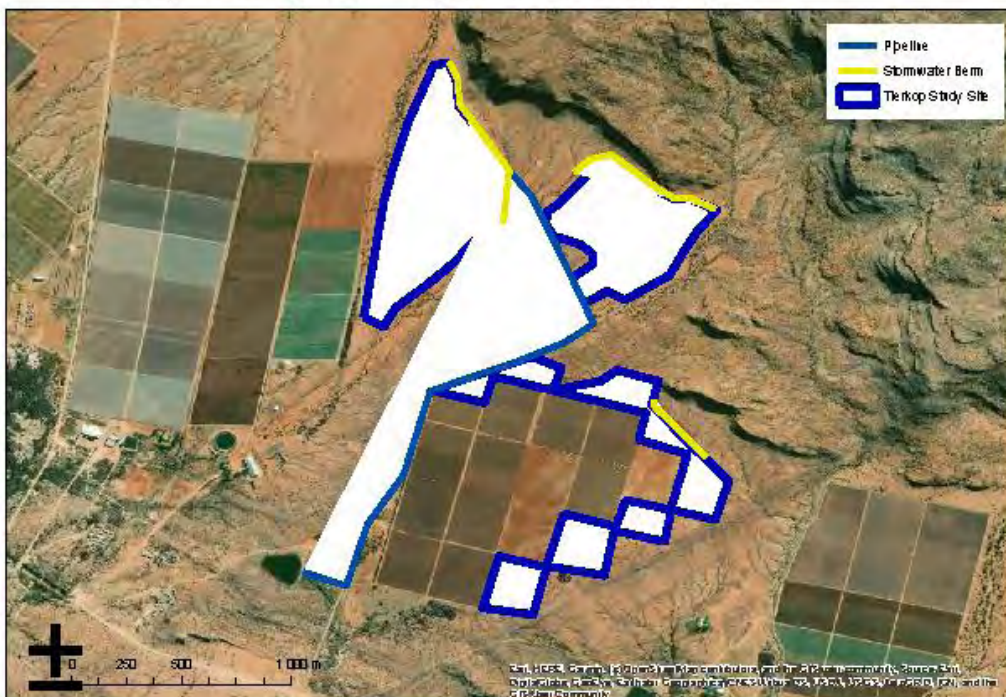


Figure 2. The areas of the Tierkop study site (on a *DigitalGlobe* image of 26 June 2017) that were surveyed in this study.

broadly, considering only representative samples of vegetation that appeared homogeneous in *DigitalGlobe* imagery (Fig. 2). An area west of the Tierkop entrance gate was also surveyed in detail, in strips of ca. 10 m wide.

The classification of the **vegetation** follows that of Mucina & Rutherford (2006). Regional conservation aspects were considered from Oosthuysen & Holness (2016) for Critical Biodiversity and Critical Ecosystem Process Areas as well as the Department of Environmental Affairs (2016) for existing Protected Areas and proposed expansion to the regional network of Protected Areas.

1. The natural vegetation of the Tierkop area

Four vegetation types (Mucina & Rutherford, 2006) are found in the Tierkop area (Fig. 3):

- Lower Gariep Broken Veld (NKb 1);
- Bushmanland Arid Grassland (NKb 3);
- Kalahari Karroid Shrubland (NKb 5); and
- Lower Gariep Alluvial (AZa 3).

Most of the study site was Kalahari Karroid Shrubland with some Bushmanland Arid Grassland in the southern parts (Fig. 4). Only these two vegetation types are described below.

1.1 Kalahari Karroid Shrubland

The dominant vegetation type on the study site is Kalahari Karroid Shrubland (Fig. 4; NKb 5; Mucina & Rutherford, 2006).

Kalahari Karroid Shrubland occurs at altitudes of between 700 and 1 100 m above sea level (Mucina et al., 2006). It is a low shrubland on flat, gravel plains. It occurs on Cenozoic Kalahari Group sands, but there may be also be screes in drainage lines. Soils are deep, red-yellow, apedal, well-drained, of the Ae land type.

The vegetation is dominated by shrubs *Rhigozum trichotomum* Burch., *Hermannia spinosa* E.Mey. ex Harv., *Limeum aethiopicum* Burm.f. and *Phaeoptilum spinosum* Radlk. and grasses *Aristida adscensionis* L., *Enneapogon desvauxii* P.Beauv., *Enneapogon scaber* Lehm. and *Stipagrostis obtusa* (Delile) Nees (Leistner & Werger, 1973; Werger & Coetsee, 1977; Werger et al., 1979). Occasionally, small trees of *Senegalia mellifera* (Vahl) Seigler & Ebinger and *Parkinsonia africana* Sond. may be found.

The most common invaders are *Prosopis glandulosa* Torr. and *Prosopis velutina* Wooton, particularly in drainage lines. *Prosopis chilensis* (Molina) Stuntz and *Prosopis pubescens* Benth. may also be found.

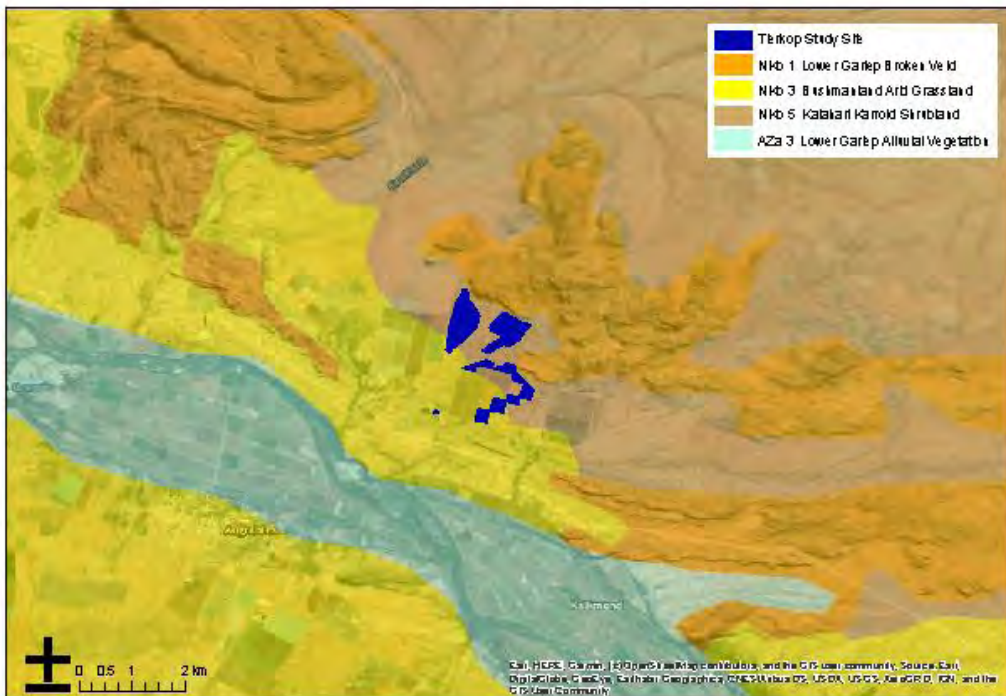


Figure 3. The vegetation types (Mucina & Rutherford, 2006) of the area surrounding the Tierkop study site (on a *DigitalGlobe* image of 26 June 2017).

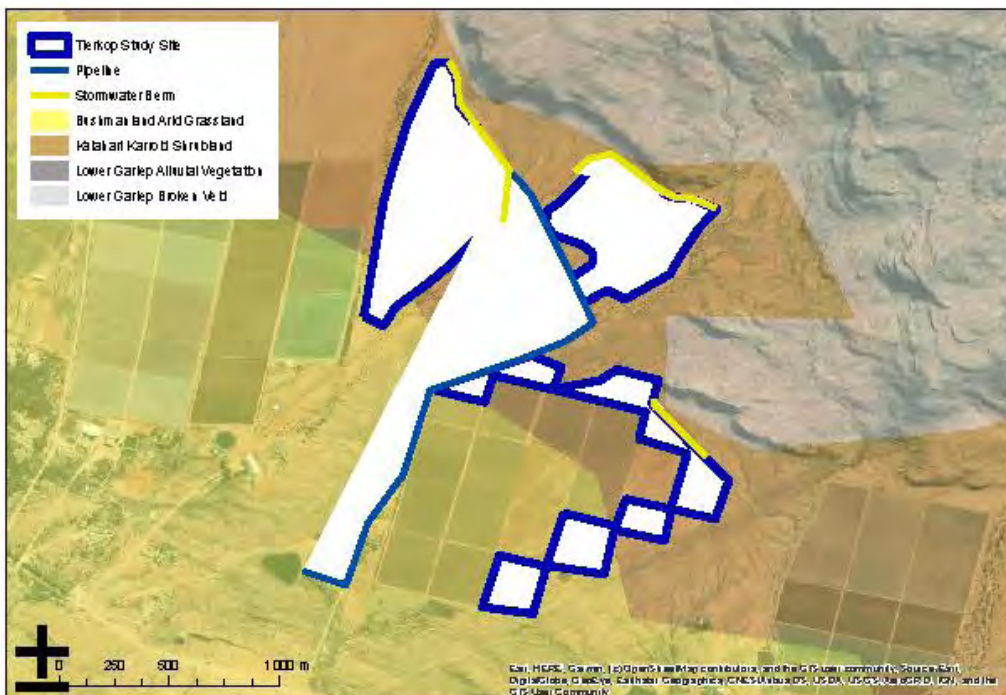


Figure 4. The vegetation types (Mucina & Rutherford, 2006) of the Tierkop study site (on a *DigitalGlobe* image of 26 June 2017).

The vegetation type is considered to be Least Threatened (Rouget et al., 2004) even though very little is formally conserved (in the nearby Augrabies Falls National Park). Not much of this vegetation type has been transformed, with most of the transformed area surrounding the Orange River. Erosion is very low (94%).

1.2 Bushmanland Arid Grassland

On the study site the two southern proposed development blocks as well as the southern tip of the westernmost proposed development area has Bushmanland Arid Grassland (Fig. 4; NKb 3; Mucina & Rutherford, 2006).

Bushmanland Arid Grassland occurs at altitudes of between 600 and 1 200 m above sea level (Mucina et al., 2006). It is a sparsely vegetated grassland dominated by yellow grasses (*Stipagrostis* spp.) giving the vegetation a pale appearance. It occurs on Quaternary alluvial sands interspersed by outcrops of Palaeozoic diamictites (Dwyka Group), gneisses or Mokolian sediments. Soils are deep, red-yellow, apedal, well-drained, of the Ae or Ag land types.

The vegetation is dominated by grasses *Aristida adscensionis*, *Aristida congesta* Roem. & Schult., *Enneapogon desvauxii*, *Eragrostis nindensis* Ficalho & Hiern, *Schmidtia kalahariensis* Stent, *Stipagrostis ciliata* (Desf.) De Winter and *Stipagrostis obtusa* (Mucina et al., 2006). These may be interspersed by the shrubs *Lycium cinereum* Thunb. and *Rhigozum trichotomum* or the dwarf shrubs *Aptosimum spinescens* (Thunb.) Emil Weber, *Hermannia spinosa*, and *Pentzia spinescens* Less.

The vegetation type is considered to be Least Threatened (Rouget et al., 2004) even though very little is formally conserved in the Augrabies Falls National Park and the Goegab Nature Reserve. Not much of this vegetation type has been transformed with most transformation associated with the Orange River. Erosion is very low (60%).

2. The flora of Tierkop

The plant species recorded on Tierkop during the survey, as well as the dominant and important flora of the area (from Mucina & Rutherford, 2006; Zietsman & Bezuidenhout, 1999; Werger & Coetzee, 1977) are listed in the Appendix. This list was annotated for Species of Conservation Concern (Red Data List: BODATSA (<http://posa.sanbi.org> accessed in July 2019; Protected: Northern Cape Nature Conservation Act No. 9 of 2009), Exotics were also annotated from BODATSA (<http://posa.sanbi.org> accessed in July 2019).

A total of 65 plant species were identified from the proposed vineyard development areas and along the proposed pipeline. Of these, a few species were identified only from wetland areas on the property (e.g. *Juncus rigidus* Desf.), but these are well away from the proposed development areas. The area proposed for construction of the solar power plant (Fig. 2) had no plants.

The Kalahari Karroid Shrubland (the vegetation type of most of the study site) has no **Vegetation-Type endemic plant species** (Appendix) nor any **South African endemics** (Mucina & Rutherford, 2006). The only species of concern reported for this vegetation type is *Dinebra retroflexa* (Vahl) Panz. var. *condensata* S.M. Phillips that occurs at its south-western distribution limit (Mucina & Rutherford, 2006). No plants of this grass were found on the site (Appendix). As a result, these areas have no plants species that will constrain development.

All plant Species of Conservation Concern found on Tierkop were found in the Bushmanland Arid Grassland on the site. The first of the two **Red Data List** plant species recorded (Appendix) is the **Vulnerable** *Aloidendron dichotomum* (Masson) Klopper & Gideon F.Sm. although only three trees were found on Tierkop. They were, however, found outside the proposed development footprint. The other species is the **Data Deficient** *Acanthopsis hoffmannseggiana* (Nees) C.B. Clarke. All the *Acanthopsis hoffmannseggiana* plants were limited to the elevated slopes of the two southernmost proposed development blocks (Fig. 5). These plants appear to be confined to the quartzitic stony slopes of Bushmanland Arid Grassland on the study site (Plate 1). They were relatively common in the areas marked in Figure 5. No plants could be found on the quartzitic stony plains (i.e. on flat terrain) of the Bushmanland Arid Grassland in the southern portion of the westernmost proposed development block (Fig. 4) despite a particular effort to find them there.

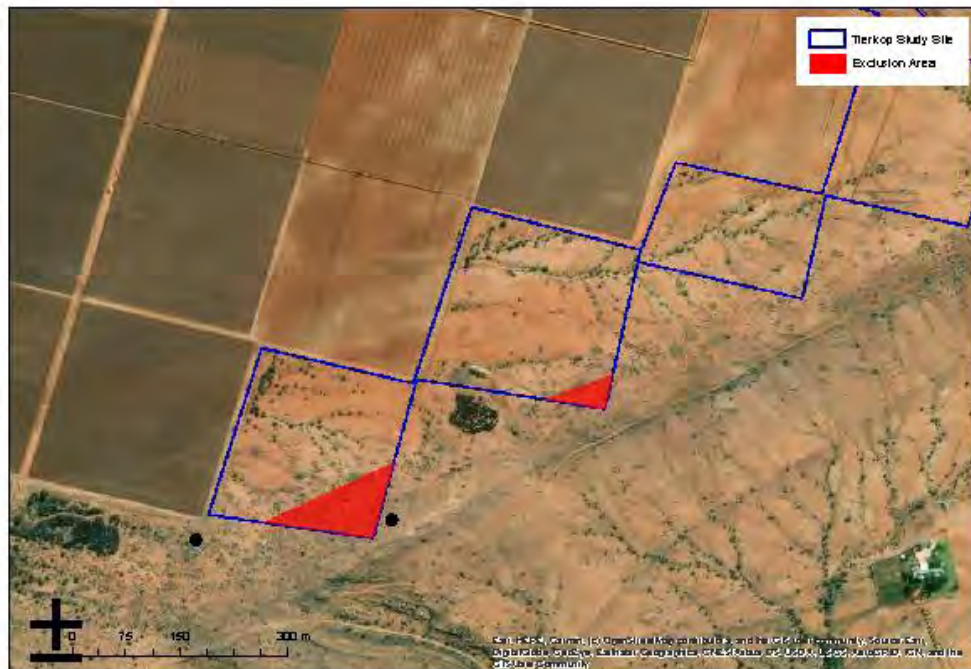


Figure 5. The quartzitic stony slopes of Bushmanland Arid Grassland (1.2 ha in red) that had all the Species of Conservation Concern found on the study site (on a *DigitalGlobe* image of 26 June 2017). The *Aloidendron dichotomum* trees were at the black dots.

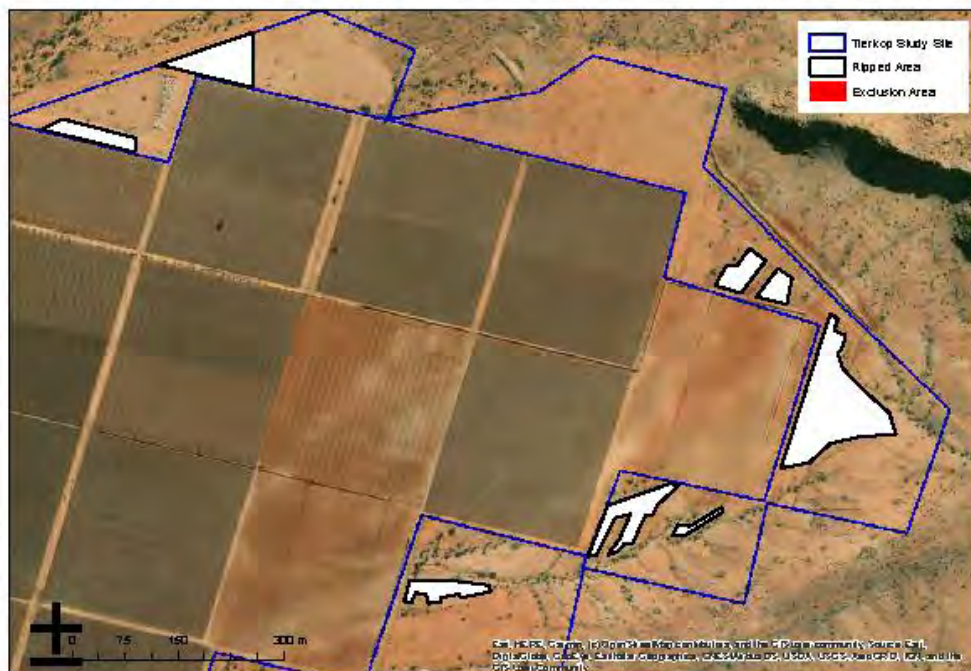


Figure 6. The transformed part of the Tierkop study site (on a *DigitalGlobe* image of 26 June 2017) proposed for development of vineyards. The northern triangular area has subsequently been planted to grass to serve as feed for the wildlife of the area.



Plate 1. The quartzitic stony slopes of Bushmanland Arid Grassland on Tierkop that are home to *Acanthopsis hoffmannseggiana* plants (a dry plant is shown bottom right) in the elevated parts of the two southern-most proposed development blocks (Fig. 5). The species was identified by microscopic inspection of the floral bracts even though the plants were dry.

The two **South African endemic plant species** found at Tierkop are: *Roepera lichtensteiniana* (Cham.) Beier & Thulin and *Searsia tridactyla* (Burch.) Molfett. Both of these were recorded from the Bushmanland Arid Grassland on the site.

Several **protected species** were recorded at Tierkop (Appendix): The specially protected *Aloidendron dichotomum* trees (Schedule 1 of the Northern Cape Nature Conservation Act No. 9 of 2009; also listed as Vulnerable) found on the property are outside the proposed development footprint. The *Pergularia daemia* (Forssk.) Chiov. subsp. *gariensis* (E.Mey.) Goyder is a species protected by Family rather than based on the status of the individual species - a few plants were found growing adjacent to the road (outside the proposed development footprint). Several *Boscia albitruncata* (Burch.) Gilg & Gilg-Ben. trees were recorded in the proposed development footprint – they are widespread in the area and common on the property in the vegetation of the drainage lines that have been excluded from the proposed development footprint. The two *Euphorbia* species recorded were limited to the same areas as *Acanthopsis hoffmannseggiana* (Fig. 5).

3. Transformation of vegetation at Tierkop

The extant vegetation on Tierkop is largely intact. Only one **exotic** species was recorded in the proposed development areas: *Salsola kali* L. is a small herb with only a few plants found on the study site. The plants were recorded along the proposed pipeline path and none were found in the intact vegetation of the site.

In certain areas of the southern blocks of the proposed development area, the soil has been lightly tilled or **ripped** in order to break the flat surface (Fig. 6). These areas were almost completely devoid of vegetation before being tilled (*DigitalGlobe* image dated 2017, Fig. 6). The tilled areas cover 3.5 ha in total, constituting just less than 4% of the 90 ha surveyed in this study.

4. Conservation-based recommendations for Tierkop

The flora-based conservation recommendation for Tierkop is to exclude the elevated parts of the two southern-most proposed development blocks (Fig. 5) where the *Acanthopsis hoffmannseggiana* plants occur on the quartzitic stony slopes (Plate 1). These areas are largely unsuitable for development of vineyards, but the flat areas below the ridges have no Plants of Conservation Concern and can be developed.

A survey of the areas of Tierkop outside the proposed development area (90 ha, Fig. 2) was done to determine if any other areas could be developed. There is only one area that would be suitable for development: the area of, and surrounding an old football field just west of the entrance gate to Tierkop (Fig. 7). This area was surveyed in detail, and no flora or vegetation constraints could be identified.

However, the study site falls partly within a **Critical Biodiversity Area** (Fig. 9; Oosthuysen & Holness, 2016). The bulk of the proposed development area and the pipeline path falls in a Critical Biodiversity Area 1 (highest priority). The balance of Tierkop is a Critical Biodiversity Area 2 (moderate priority). The high priority Critical Biodiversity Areas in this region are mapped to cover all remaining natural vegetation associated with the Orange River. The positioning of the high priority CBA1 hexagon that includes the vineyards of Tierkop and its neighbours is not ideal considering the current development situation. It is important that some of the vegetation adjacent to the Flood Plains of the Orange River should be conserved as a high priority. However, based on this survey, the placement of the particular CBA1 hexagon does not constitute a species-rich patch of vegetation. Tierkop only has 48% of the dominant and important taxa of the two vegetation types found on the site (Appendix). More suitable CBA1 placement would be either west or, preferably, east of the vineyards of Tierkop and its neighbours.

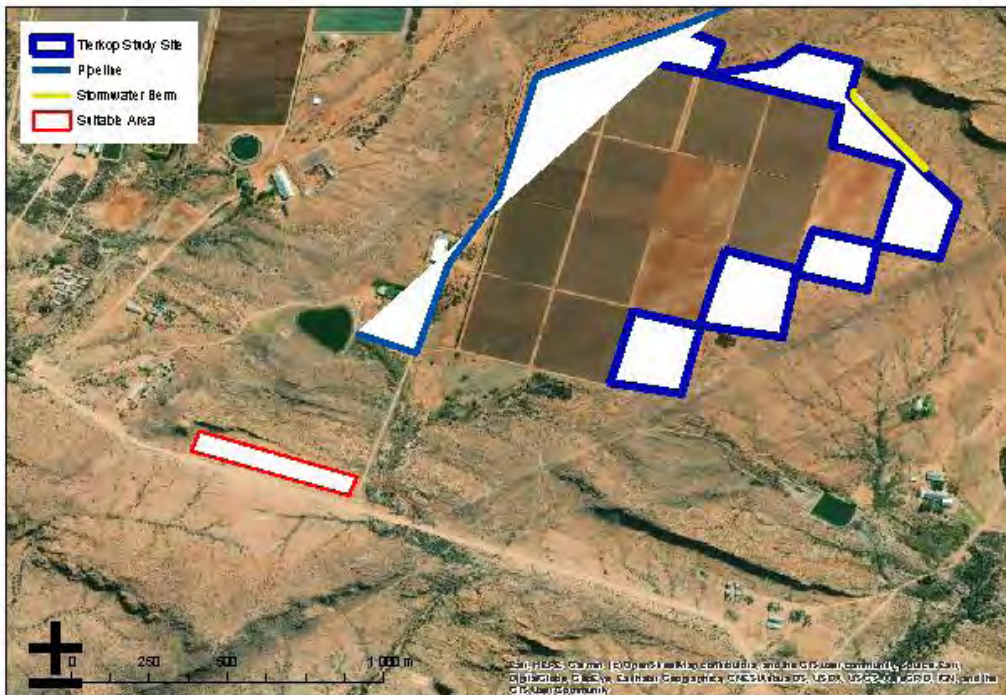


Figure 7. A part of the Tierkop study site (on a *DigitalGlobe* image of 26 June 2017) that could be used for development of vineyards should other logistics be found to be acceptable.

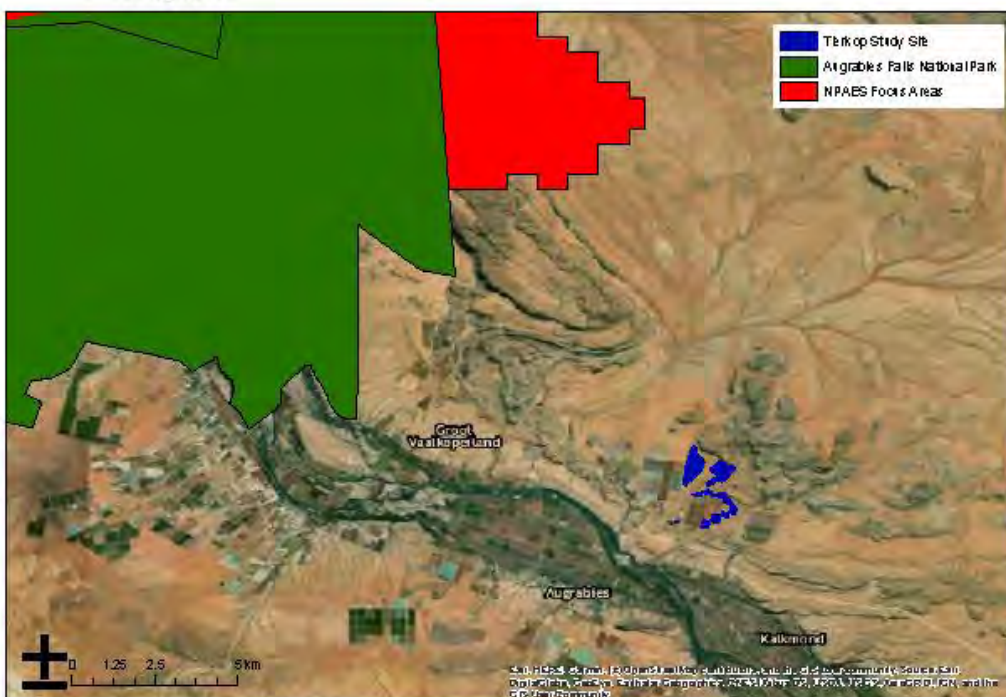


Figure 8. The current and planned protected areas for the Northern Cape Province of South Africa (Department of Environmental Affairs, 2016) shown to be some distance from the Tierkop Study Site (on a *DigitalGlobe* image of 26 June 2017). NPAES - National Protected Area Expansion Strategy.

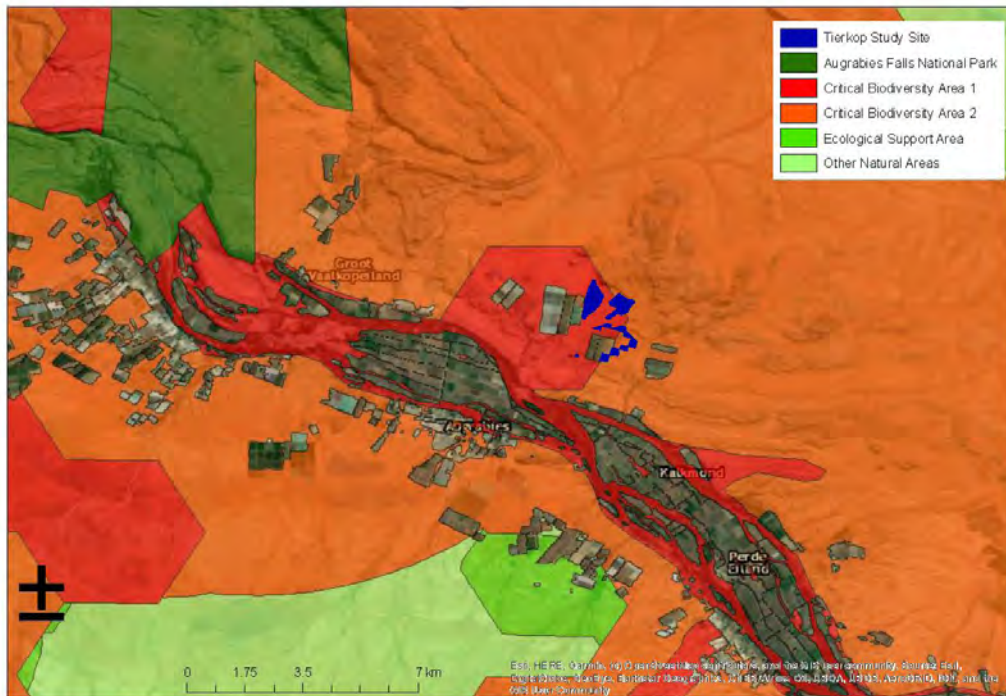


Figure 9. The Critical Biodiversity Areas of the Tierkop study site and surrounds (Oosthuysen & Holness, 2016).

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- Zietsman, P.C. and Bezuidenhout, H. 1999. Flowering plant biodiversity of Augrabies Falls National Park: a comparison between Augrabies Falls National Park, Kalahari Gemsbok National Park, Vaalbos National Park and Goegap Nature Reserve. *Koedoe* 42: 95-112.

This report should be referenced as:

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Disclaimer

The author cannot be held responsible for any damages whatsoever (including without limitation, damages for loss of trade or business profits, business interruption or any other pecuniary loss) arising out of the adoption of any of the scientific advice provided in this report.

Appendix. Plant species recorded in the proposed development areas at Tierkop, Augrabies.

Classification after	South African National Biodiversity Institute. 2016. Botanical Database of Southern Africa (BODATSA) [dataset]. Website http://posa.sanbi.org/ accessed in July 2019.		
Status:			
Protected	P	Protected species found in the area (protected by the Northern Cape Nature Conservation Act No. 9 of 2009).	
	P*	Specially protected species found in the area (protected by the Northern Cape Nature Conservation Act No. 9 of 2009).	
Threatened	CE	Critically endangered	South African National Biodiversity Institute. 2016. Botanical Database of Southern Africa (BODATSA) [dataset]. Website http://posa.sanbi.org/ accessed in July 2019.
	EN	Endangered	
	VU	Vulnerable	
	DD	Data deficient	
	NT	Near-threatened	
Endemic	SA	South African	South African National Biodiversity Institute. 2016. Botanical Database of Southern Africa (BODATSA) [dataset]. Website http://posa.sanbi.org/ accessed in July 2019.
	B	Bushmanland	
Importance	Ve	Vegetation Type	Mucina, L. and Rutherford, M.C. (eds.) 2006. The Vegetation of South Africa, Lesotho and Swaziland. <i>Strelitzia</i> 19, South African National Biodiversity Institute, Pretoria. 807 pp.
	Vd	Vegetation Dominant	
	V	Vegetation important	

Division	Class	Family	Species	Status:	NKb 5	NKb 3	Recorded
Magnoliophyta	Eudicots	Acanthaceae	<i>Acanthopsis hoffmannseggiana</i> (Nees) C.B. Clarke	DD		V	✓
Magnoliophyta	Eudicots	Acanthaceae	<i>Barleria lichtensteiniana</i> Nees	LC	V	V	
Magnoliophyta	Eudicots	Acanthaceae	<i>Barleria rigida</i> Nees	LC	V	V	✓
Magnoliophyta	Eudicots	Acanthaceae	<i>Blepharis mitrata</i> C.B. Clarke	LC		V	✓
Magnoliophyta	Eudicots	Acanthaceae	<i>Justicia australis</i> (P.G. Mey.) Vollesen	LC	V	V	
Magnoliophyta	Eudicots	Acanthaceae	<i>Justicia incana</i> (Nees) T. Anderson	LC	V	V	
Magnoliophyta	Eudicots	Acanthaceae	<i>Justicia spartioides</i> T. Anderson	LC		V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Aizoon asbestinum</i> Schitr.	LC		V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Aizoon canariense</i> L.	LC		V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Aizoon schellenbergii</i> Adamson	LC	V	V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Dinteranthus pole-evansii</i> (N.E. Br.) Schwantes	VU _{b1+2}		Ve	
Magnoliophyta	Eudicots	Aizoaceae	<i>Mesembryanthemum coriarium</i> Burch. ex N.E. Br.	LC		V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Ruschia kenhardtensis</i> L. Bolus	LC, SA		Ve	

Tierkop vegetation and flora, page 16

Magnoliophyta	Eudicots	Aizoaceae	<i>Tetragonia arbuscula</i> Fenzl	LC		V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Trianthena parvifolia</i> E. Mey. ex Sond. var. <i>parvifolia</i>	LC	V	V	
Magnoliophyta	Eudicots	Aizoaceae	<i>Trianthena parvifolia</i> E. Mey. ex Sond. var. <i>rubens</i> (Sond.) Adamson	LC	V	V	
Magnoliophyta	Eudicots	Amaranthaceae	<i>Amaranthus praetermissus</i> Brenan	LC	V	V	
Magnoliophyta	Eudicots	Amaranthaceae	<i>Leucosphaera bainesii</i> (Hook. f.) Gilg	LC	V	V	
Magnoliophyta	Eudicots	Amaranthaceae	<i>Salsola glabrescens</i> Burt. Davy	LC		V	
Magnoliophyta	Eudicots	Amaranthaceae	<i>Salsola kali</i> L.	Exotic		V	
Magnoliophyta	Eudicots	Amaranthaceae	<i>Salsola tuberculata</i> (Moq.) Fenzl	LC		V	✓
Magnoliophyta	Eudicots	Amaranthaceae	<i>Sericocoma avolans</i> Fenzl	LC	V	V	✓
Magnoliophyta	Eudicots	Apocynaceae	<i>Larryleachia marlothii</i> (N.E. Br.) Plowes	P, LC		Ve	
Magnoliophyta	Eudicots	Apocynaceae	<i>Pergularia daemia</i> (Forssk.) Chiov. subsp. <i>garipeensis</i> (E. Mey.) Goyder	P, LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Berkheya amneciens</i> Harv.	LC		V	□
Magnoliophyta	Eudicots	Asteraceae	<i>Dicola capensis</i> Less.	LC	V	V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Eriocephalus ambiguus</i> (DC.) M.A.N. Mull.	LC		V	
Magnoliophyta	Eudicots	Asteraceae	<i>Eriocephalus spinescens</i> Burch.	LC		V	
Magnoliophyta	Eudicots	Asteraceae	<i>Geigeria ornithia</i> O. Hoffm.	LC	V	V	
Magnoliophyta	Eudicots	Asteraceae	<i>Helichrysum garipeinum</i> DC.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Kleinia longiflora</i> DC.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Oedera humilis</i> (Less.) N.G. Bergh	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Pentzia pinnatisecta</i> Hutch.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Pentzia spinescens</i> Less.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Pteronia leucoclada</i> Turcz.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Pteronia mucronata</i> DC.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Pteronia sordida</i> N.E. Br.	LC		V	✓
Magnoliophyta	Eudicots	Asteraceae	<i>Senecio niveus</i> (Thunb.) Willd.	LC		V	✓
Magnoliophyta	Eudicots	Bignoniaceae	<i>Rhigozum trichotomum</i> Burch.	LC	V	V	✓
Magnoliophyta	Eudicots	Boraginaceae	<i>Heliotropium stuedneri</i> Vatke	LC		V	✓
Magnoliophyta	Eudicots	Capparaceae	<i>Boscia albitruncata</i> (Burch.) Gilg & Gilg-Ben.	P, LC		V	✓
Magnoliophyta	Eudicots	Capparaceae	<i>Boscia foetida</i> Schinz subsp. <i>foetida</i>	LC	V	V	✓
Magnoliophyta	Eudicots	Capparaceae	<i>Cadaba aphylla</i> (Thunb.) Willd.	LC		V	✓
Magnoliophyta	Eudicots	Capparaceae	<i>Maerua gilgii</i> Schinz	LC		V	✓
Magnoliophyta	Eudicots	Capparaceae	<i>Searsia tridactyla</i> (Burch.) Moffett	LC, SA		V	✓
Magnoliophyta	Eudicots	Cleomeaceae	<i>Cleome angustifolia</i> Forssk. subsp. <i>diandra</i> (Burch.) Kers	LC		V	
Magnoliophyta	Eudicots	Cucurbitaceae	<i>Cucumis africanus</i> L.f.	LC		V	

Tierkop vegetation and flora, page 17

Magnoliophyta	Eudicots	Euphorbiaceae	<i>Euphorbia braunsii</i> N.E.Br.	P,LC			✓
Magnoliophyta	Eudicots	Euphorbiaceae	<i>Euphorbia gariepina</i> Boiss.	P,LC			✓
Magnoliophyta	Eudicots	Euphorbiaceae	<i>Euphorbia glanduligera</i> Pax	P,LC	Vd		
Magnoliophyta	Eudicots	Euphorbiaceae	<i>Euphorbia inaequalitera</i> Sond.	P,LC	Vd	Vd	
Magnoliophyta	Eudicots	Fabaceae	<i>Indigostrum niveum</i> (Willd. ex Spreng.) Schrire & Callm.	LC	V	V	
Magnoliophyta	Eudicots	Fabaceae	<i>Indigofera alternans</i> DC. var. <i>alternans</i>	LC	V		
Magnoliophyta	Eudicots	Fabaceae	<i>Indigofera auricomia</i> E.Mey.	LD	V		
Magnoliophyta	Eudicots	Fabaceae	<i>Indigofera heterotricha</i> DC.	LC	V		✓
Magnoliophyta	Eudicots	Fabaceae	<i>Leobordea oligocephala</i> (B.-E.van Wyk) B.-E.van Wyk & Boatwr.	DD,SA		Ve	
Magnoliophyta	Eudicots	Fabaceae	<i>Leobordea platycarpa</i> (Viv.) B.-E.van Wyk & Boatwr.	LD		V	✓
Magnoliophyta	Eudicots	Fabaceae	<i>Pytholobium biflorum</i> (E.Mey.) Brummitt subsp. <i>biflorum</i>	LD	V		
Magnoliophyta	Eudicots	Fabaceae	<i>Senegalia mellifera</i> (Vahl) Seigler & Ebinger ubsp. <i>delinens</i> (Burch.) Kyal. & Boatwr.	LC	Vd	V	✓
Magnoliophyta	Eudicots	Fabaceae	<i>Tephrosia dregeana</i> E.Mey. var. <i>dregeana</i>	LD	V		✓
Magnoliophyta	Eudicots	Fabaceae	<i>Vachellia erioloba</i> (E.Mey.) P.J.H.Hürter	LD			✓
Magnoliophyta	Eudicots	Geraniaceae	<i>Monsonia crassicaulis</i> (Rehm) F.Abers	LC			✓
Magnoliophyta	Eudicots	Geraniaceae	<i>Monsonia umbellata</i> Harv.	LD	V		✓
Magnoliophyta	Eudicots	Geraniaceae	<i>Parkinsonia africana</i> Sond.	LC	Vd	V	✓
Magnoliophyta	Eudicots	Gisekiaceae	<i>Gisekia africana</i> (Lour.) Kuntze var. <i>africana</i>	LD	V		✓
Magnoliophyta	Eudicots	Gisekiaceae	<i>Gisekia pharnaceoides</i> L. var. <i>pharnaceoides</i>	LD	V	V	✓
Magnoliophyta	Eudicots	Limeaceae	<i>Limeum aethiopicum</i> Burm.f.	LD	Vd	V	✓
Magnoliophyta	Eudicots	Limeaceae	<i>Limeum argute-carinatum</i> Wawra ex Wawra & Peyr.	LD	V		✓
Magnoliophyta	Eudicots	Lophiocarpaceae	<i>Lophiocarpus polystachyus</i> Turcz.	LC		V	
Magnoliophyta	Eudicots	Loranthaceae	<i>Agelanthus pungu</i> (De Wild.) Polhill & Wiens	LD	V		✓
Magnoliophyta	Eudicots	Loranthaceae	<i>Tapinanthus oleifolius</i> (J.C.Wendl.) Danser	LC			✓
Magnoliophyta	Eudicots	Malvaceae	<i>Hermannia atrotanoides</i> Schrad.	LD	V		✓
Magnoliophyta	Eudicots	Malvaceae	<i>Hermannia coccoarpa</i> (Eckl. & Zeyh.) Kuntze	LD			✓
Magnoliophyta	Eudicots	Malvaceae	<i>Hermannia minutiflora</i> Engl.	LD			✓
Magnoliophyta	Eudicots	Malvaceae	<i>Hermannia modesta</i> (Ehrenb.) Mast.	LD	V		✓
Magnoliophyta	Eudicots	Malvaceae	<i>Hermannia spinosa</i> E.Mey. ex Harv.	LC	Vd	Vd	✓
Magnoliophyta	Eudicots	Malvaceae	<i>Hermannia tomentosa</i> (Turcz.) Schinz ex Engl.	LD			✓
Magnoliophyta	Eudicots	Molluginaceae	<i>Hypertelis cerviana</i> (L.) Thulin	LC	V		✓
Magnoliophyta	Eudicots	Neuradaceae	<i>Grieliu humifusum</i> Thunb. var. <i>humifusum</i>	LD			✓
Magnoliophyta	Eudicots	Nyctaginaceae	<i>Phaeoptilum spinosum</i> Radlk.	LC	Vd	V	✓
Magnoliophyta	Eudicots	Pedaliaceae	<i>Sesamum capense</i> Burm.f.	LC	V	V	✓

Tierkop vegetation and flora, page 18

Magnoliophyta	Eudicots	Phyllanthaceae	<i>Phyllanthus maderaspatensis</i> L.	1.00	V			
Magnoliophyta	Eudicots	Polygalaceae	<i>Polygala seminuda</i> Harv.	0.00	V		V	
Magnoliophyta	Eudicots	Rubiaceae	<i>Kohautia cynanchica</i> DC.	0.00	V			
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Aptosimum albomarginatum</i> Marloth & Engl.	0.00	V			
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Aptosimum elongatum</i> Engl.	1.00	V			✓
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Aptosimum lineare</i> Marloth & Engl.	1.00	V		V	✓
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Aptosimum marlothii</i> (Engl.) Hiem	1.00	V		V	✓
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Aptosimum spinescens</i> (Thunb.) F.E.Weber	1.00	V		Vd	✓
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Nemesia anisocarpa</i> E.Mey. ex Benth.	1.00				✓
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Nemesia maxii</i> Hiem	1.00			Ve	
Magnoliophyta	Eudicots	Scrophulariaceae	<i>Peliosotum leucorrhizum</i> E.Mey. ex Benth.	1.00				✓
Magnoliophyta	Eudicots	Solanaceae	<i>Lycium cinereum</i> Thunb.	1.00			Vd	✓
Magnoliophyta	Eudicots	Solanaceae	<i>Lycium bosciifolium</i> Schinz	1.00			V	✓
Magnoliophyta	Eudicots	Solanaceae	<i>Solanum capense</i> L.	1.00	V		V	
Magnoliophyta	Eudicots	Talinaceae	<i>Talinum arnottii</i> Hook.f.	1.00			V	
Magnoliophyta	Eudicots	Vahliaceae	<i>Vahlia capensis</i> (L.f.) Thunb. subsp. <i>capensis</i>	1.00			V	☐
Magnoliophyta	Eudicots	Vahliaceae	<i>Vahlia capensis</i> (L.f.) Thunb. subsp. <i>vulgaris</i> Bridson	1.00			V	✓
Magnoliophyta	Eudicots	Verbenaceae	<i>Chascanum garipense</i> E.Mey.	1.00	V			
Magnoliophyta	Eudicots	Viscaceae	<i>Viscum rotundifolium</i> L.f.	1.00				✓
Magnoliophyta	Eudicots	Zygophyllaceae	<i>Roepera lichtensteiniana</i> (Cham.) Beier & Thulin	1.00, SA				✓
Magnoliophyta	Eudicots	Zygophyllaceae	<i>Roepera microphyllum</i> (L.f.) Beier & Thulin	1.00			V	✓
Magnoliophyta	Eudicots	Zygophyllaceae	<i>Roepera pubescens</i> (Schinz) Beier & Thulin	1.00				✓
Magnoliophyta	Eudicots	Zygophyllaceae	<i>Tribulus terrestris</i> L.	1.00	V		V	
Magnoliophyta	Eudicots	Zygophyllaceae	<i>Tribulus cristatus</i> C.Presl	1.00	V			
Magnoliophyta	Eudicots	Zygophyllaceae	<i>Tribulus pterophorus</i> C.Presl	1.00	V		V	
Magnoliophyta	Monocots	Asphodelaceae	<i>Aloidendron dichotomum</i> (Masson) Klopper & Gideon F.Sm.	VU A3ce, P ¹				✓
Magnoliophyta	Monocots	Iridaceae	<i>Moraea venerata</i> Dinter	0.00			V	✓
Magnoliophyta	Monocots	Juncaceae	<i>Juncus rigidus</i> Desf.	1.00				✓
Magnoliophyta	Monocots	Poaceae	<i>Aristida adscensionis</i> L.	1.00	Vd		Vd	✓
Magnoliophyta	Monocots	Poaceae	<i>Aristida congesta</i> Roem. & Schult. subsp. <i>congesta</i>	0.00	V		Vd	✓
Magnoliophyta	Monocots	Poaceae	<i>Cenchrus ciliaris</i> L.	0.00			V	
Magnoliophyta	Monocots	Poaceae	<i>Centropodia glauca</i> Cope	1.00				✓

Magnoliophyta	Monocots	Poaceae	<i>Dinebra retroflexa</i> (Vahl) Panz. var. <i>condensata</i> S.M.Phillips		
Magnoliophyta	Monocots	Poaceae	<i>Enneapogon cenchroides</i> (Licht. ex Roem. & Schult.) C.E.Hubb.		V
Magnoliophyta	Monocots	Poaceae	<i>Enneapogon desvauxii</i> P.Beauv.		VII
Magnoliophyta	Monocots	Poaceae	<i>Enneapogon scaber</i> Lehm.		VII
Magnoliophyta	Monocots	Poaceae	<i>Eragrostis annulata</i> Rendle ex Scott-Elliott		V
Magnoliophyta	Monocots	Poaceae	<i>Eragrostis homomalla</i> Nees		V
Magnoliophyta	Monocots	Poaceae	<i>Eragrostis nindensis</i> Ficalho & Hiern		VII
Magnoliophyta	Monocots	Poaceae	<i>Eragrostis parosa</i> Nees		V
Magnoliophyta	Monocots	Poaceae	<i>Eragrostis procumbens</i> Nees		V
Magnoliophyta	Monocots	Poaceae	<i>Panicum lanipes</i> Mez		V
Magnoliophyta	Monocots	Poaceae	<i>Schmidtia kalahariensis</i> Stent		VII
Magnoliophyta	Monocots	Poaceae	<i>Setaria verticillata</i> (L.) P.Beauv.		V
Magnoliophyta	Monocots	Poaceae	<i>Sporobolus nervosus</i> Hochst.		V
Magnoliophyta	Monocots	Poaceae	<i>Stipagrostis anomala</i> De Winter		V
Magnoliophyta	Monocots	Poaceae	<i>Stipagrostis brevifolia</i> (Nees) De Winter		V
Magnoliophyta	Monocots	Poaceae	<i>Stipagrostis ciliata</i> (Desf.) De Winter var. <i>capensis</i> (Trin. & Rupr.) De Winter		VII
Magnoliophyta	Monocots	Poaceae	<i>Stipagrostis hochstetteriana</i> (Beck ex Hack.) De Winter var. <i>secalina</i> (Henrard) De Winter		V
Magnoliophyta	Monocots	Poaceae	<i>Stipagrostis obtusa</i> (Deille) Nees		VII
Magnoliophyta	Monocots	Poaceae	<i>Stipagrostis uniplumis</i> (Licht.) De Winter var. <i>uniplumis</i>		V
Magnoliophyta	Monocots	Poaceae	<i>Tragus berteronianus</i> Schult.		V
Magnoliophyta	Monocots	Poaceae	<i>Tragus racemosus</i> (L.) All.		V

Tierkop vegetation and f

ARCHAEOLOGICAL IMPACT ASSESSMENT

Proposed vineyard development on Farm 355 Tierkop, Kakamas North, near Augrabies Northern Cape

Assessment conducted under Section 38 (3) of the National Heritage Resource Act
(No. 25 of 1999)

Prepared for:

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Rooipad Boerdery (Pty) Ltd

By



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**JUNE
2019**

Executive summary

1. Introduction

ACRM was appointed by Pieter Badenhorst Professional Services (PBPS) to conduct an Archaeological Heritage Impact Assessment (AIA) for a proposed new agricultural development on Farm 355 Tierkop Kakamas North, near Augrabies in the Northern Cape Province.

The study site is located about 4.5kms north east of the town of Augrabies, across the Orange/Gariep River, alongside the gravel road to Riemvasmaak.

The proposed vineyard development will cover a footprint area of about 72ha. A small ±1 Megawatt PV package plant is also envisaged. Water for the new vineyards will be supplied from a pump station located on the banks of the Orange River. The vineyards will be supplied with water via existing pipelines. Existing farm roads will be used, and no new access roads will need to be constructed.

PBPS is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the EIA process.

A Palaeontological Impact Assessment (PIA) desktop study has been conducted by consulting palaeontologist Dr John Almond of Natura Viva cc.

2. Legal requirements

In terms of Section 38 (1) (c) (iii) of the National Heritage Resources Act 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) of the proposed project is required if the footprint area of the development is more than 5000m² in extent.

3. Aim of the AIA

The overall purpose of the AIA is to assess the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur

4. Limitations

There were no limitations associated with the study. Access to the site was easy and archaeological visibility was very good.

5. Findings

One or two marginal scatters (outside the proposed development footprint area), and a limited number of Later Stone Age and Middle Stone Age tools were recorded during a field assessment which took place in June 2019.

5.1 Grading

The very small numbers and transformed context in which they were found means that the archaeological resources have been graded as having *low* (Grade 3C) significance.

6. Built environment/historical structures

In terms of the built environment, no old buildings, historical structures or features, or any old equipment was found in the proposed footprint area.

7. Graves

No graves or typical grave features were encountered during the study.

8. Impact statement

Overall, the results of the study indicate that the proposed activity (i. e. a new vineyard development), including construction of a small PV package plant will not have an impact of great significance on the archaeological heritage.

9. Conclusion

Indications are that, in terms of archaeological heritage, the receiving environment is not a sensitive or threatened landscape.

The impact significance of the proposed development on archaeological heritage is assessed as *LOW* and therefore, there are no objections to the authorization of the proposed development.

10. Recommendations

1. No mitigation is required prior to proposed development activities commencing.
2. No archaeological monitoring is required.

Table of Contents

	Page
Executive summary	1
1. INTRODUCTION	4
2. HERITAGE LEGISLATION	5
3. TERMS OF REFERENCE	6
4. THE STUDY SITE	6
4.1 PV package plant	12
5. STUDY APPROACH	13
5.1 Method of survey	13
5.2 Constraints and limitations	13
5.3 Identification of potential risks	13
5.4 Results of the desk top study	14
6. FINDINGS	15
6.1 PV Package plant	18
6.2 Grading of archaeological resources	18
6.3 Built Environment /historical structures	20
6.4 Graves	20
7. ASSESSMENT OF IMPACTS	20
8. CONCLUSIONS	20
9. RECOMMENDATIONS	20
10. REFERENCES	21

1. INTRODUCTION

ACRM was appointed by Pieter Badenhorst Professional Services (PBPS) on behalf of Rooipad Boerdery (Pty) Ltd to conduct an Archaeological Heritage Impact Assessment (AIA) for a proposed agricultural development on Farm 355 Tierkop Kakamas Noord, near Augrabies in the Northern Cape Province of South Africa (Figures 1 & 2).

The proposed new vineyard development will cover a footprint area of about 72ha. A small ± 1 Megawatt PV off site package plant is also envisaged. Water for the new vineyards will be supplied from a pump station located on the banks of the Gariep/Orange River. The vineyards will be supplied with water via existing underground pipelines. Existing farm roads will be used, and no new access roads will need to be constructed.

PBPS is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Environmental Impact Assessment (EIA) process.

A Palaeontological Impact Assessment (PIA) desktop study has been conducted by consulting palaeontologist Dr John Almond of Natura Viva cc.

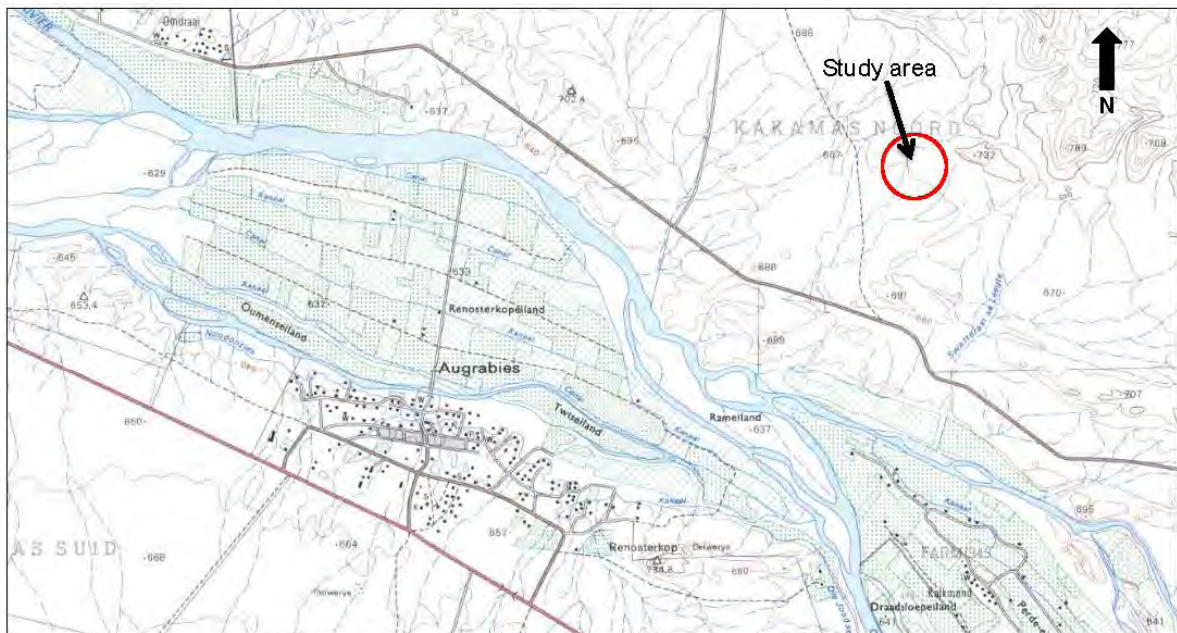


Figure 1. Locality Map (2820CB Augrabies). Red polygon illustrates the location of the study area

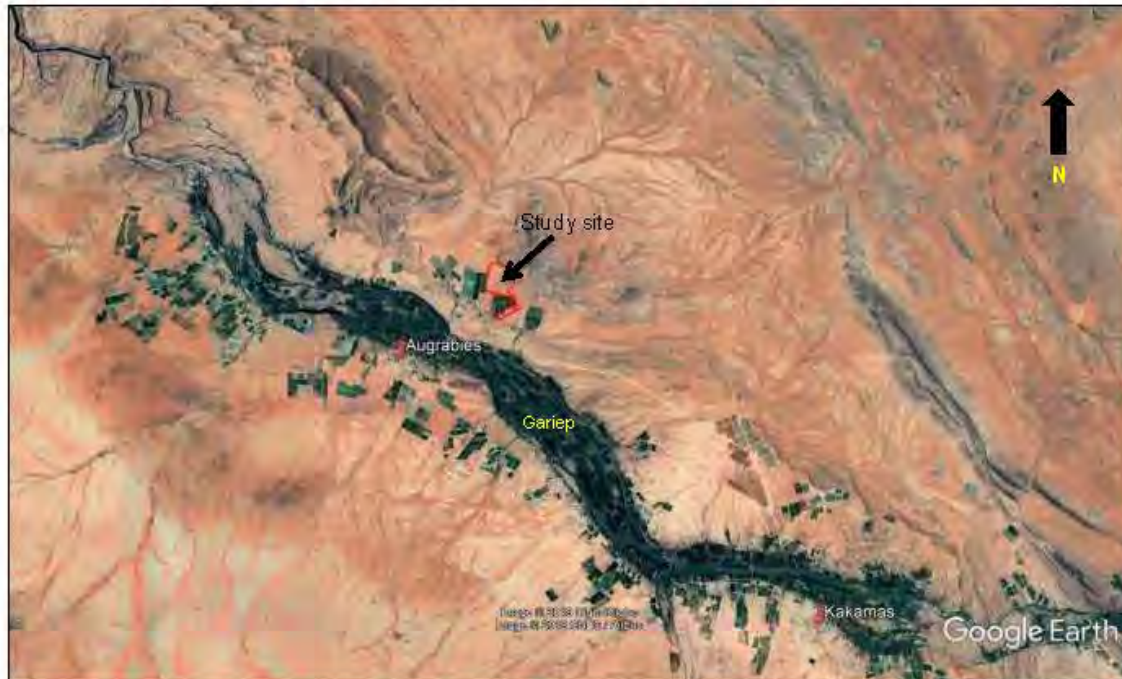


Figure 2. Google satellite map illustrating the location of the proposed development site (red polygon) in relation to the towns of Augrabies and Kakamas.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);

- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

3. TERMS OF REFERENCE

The terms of reference for the archaeological study were to:

- Determine whether there are likely to be any important archaeological resources that may potentially be impacted by the proposed development activities;
- Indicate any constraints that would need to be taken into account in considering the development proposal;
- Identify potentially sensitive archaeological areas, and
- Recommend any mitigation action.

4. THE STUDY SITE

Tierkop is located about 4.5kms north east of Augrabies (across the Gariep River), and about 14kms north west of Kakamas on the gravel road to Riemvasmaak, with the turnoff to the farm on the right hand side of the road (Figure 3). An agricultural potential survey of the study area has identified \pm 72ha of land that is suitable for new vineyard production (Area A, B & C). The receiving environment comprises mostly level lands, sloping slightly to the south, on a substrate of soft, weathered gravelly sands. There is barely any surface stone covering the potential agricultural lands, save for a few isolated pieces of vein and pink quartz. The affected lands are mostly bare, covered in small tufts of yellow grass, with a few sporadic trees and bushes occurring in places (Figures 4-11). Dense vegetation is associated with several dry drainage channels that intersect the site, particularly along the western and south eastern boundary of the proposed development site. There are no significant landscape features on the proposed site. Hard dorbank surfaces of gravel, and outcroppings of quartz occur, but these areas are not suitable for vineyard production. Surrounding land use is agriculture (mostly vineyards/table grapes), grazing (eland, kudu, and wildebeest), mountain biking and Wilderness.

Additional, contiguous, smaller landholdings (Areas D-H), measuring about 10-12ha in extent, have also been identified for potential future vineyard production, but according to the farm manager Mr Daniel Nel (pers. comm.), these are unlikely to be developed due to a constrained water rights supply. The proposed vineyards sites are located directly adjacent to existing, established vineyards, below rocky gravelly slopes, and have already been cleared of natural vegetation (Figures 12-19). About 80% of the proposed lands have also been ripped, and therefore constitute a transformed landscape. Thick patches of Euphorbia (Areas D & F & G) and dense stands of Acacia (Site H) occur in places, while sporadic Acacias, Euphorbias and bushes also occur. Numerous deep pits have been excavated in Area F, while small drainage channels in Area G have been filled with rocks. Apart from a few isolated scatters of pink and white vein quartz, and some gravelly patches mainly alongside drainage channels, there is

Archaeological Impact Assessment, proposed agricultural development on Farm Tierkop, near Augrabies, Northern Cape

barely any surface stone covering these areas. A mountain bike trail has been built across the upper portions of the proposed vineyard sites.

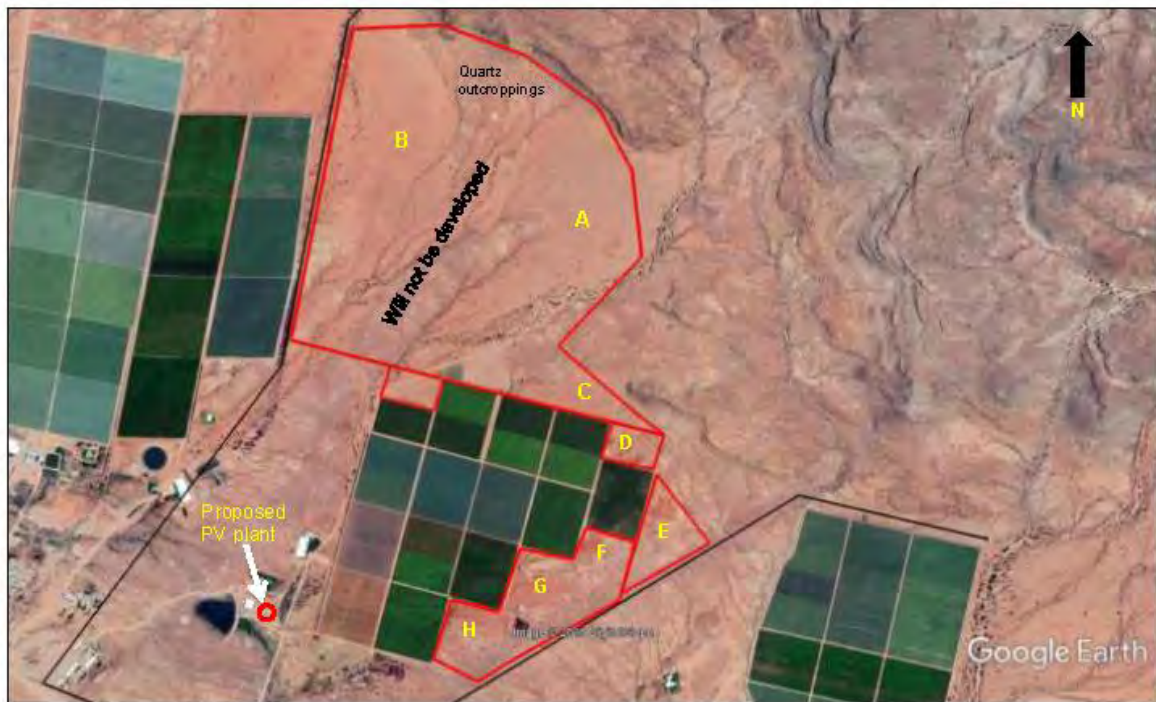


Figure 3. Google satellite map of the proposed study area, including the location of the proposed PV package plant



Figure 4. Area A. View facing south west



Figure 5. Area A. View facing south/south west



Figure 6. Area A. View facing south east



Figure 7. Area A. View facing north

Archaeological Impact Assessment, proposed agricultural development on Farm Tierkop, near
Aurgrabies, Northern Cape



Figure 8. Area A. View facing north



Figure 9. Area B. View facing south



Figure 10. Area B. View facing north.

Archaeological Impact Assessment, proposed agricultural development on Farm Tierkop, near Augrabies, Northern Cape



Figure 11. Area C. View facing south/south west



Figure 12. Area D. View facing south east

Archaeological Impact Assessment, proposed agricultural development on Farm Tierkop, near Augrabies, Northern Cape



Figure 13. Area E. View facing north



Figure 14. Area F. View facing north east



Figure 15. Area F. View facing south west



Figure 16. Area G. View facing north east



Figure 17. Area G. View facing south west



Figure 18. Area H. View facing north east



Figure 19. Area H. View facing north west

4.1 PV package plant

The proposed 1.0 Mega Watt PV package plant, previously located about 250m south west of the packing shed, will now be located in a severely degraded, level patch of scraped ground about 50m south of the packing shed, in front of the dam (Figure 20). The proposed PV development site is about 0.3ha in extent.



Figure 20. Google image indicating the proposed new location site for the PV plant (red polygon)

5. STUDY APPROACH

5.1 Method of survey

The overall purpose of the HIA is to assess the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

Survey track paths were captured and the position of identified archaeological occurrences was fixed by a hand held GPS unit set on the map datum WGS 84. A literature survey was also carried out to assess the archaeological context surrounding the proposed development site

5.2 Constraints and limitations

There were no constraints or limitations associated with the study. Access to the site was easy and archaeological visibility was very good.

5.3 Identification of potential risks

The results of the study indicate that there are no potential archaeological or heritage risks associated with the proposed vineyard development on Tierkop near Augrabies.

5.4 Results of the desk top study

More and more contract archaeological surveys are being conducted in the Augrabies and Kakamas area. One of the earliest studies was done by Morris and Beaumont (1991) who undertook a combined impact assessment, and mitigation of sites on Renosterkop Peak, known historically to pre-colonial local Namneiqua pastoralists as !Nawabdanas. Several, low-density surface scatters of Middle Stone Age (MSA) and Later Stone Age (LSA) material were identified on and around the hill, which is also the site of the historic Renosterkop Tin Mine (circa 1940). Archaeological investigation of a Ceramic LSA surface scatter (Renosterkop 1) and a small LSA rock shelter (Renosterkop 2) were undertaken by Morris and Beaumont (1991), who showed that the two sites likely pre-date the late 18th Century. Morris and Beaumont (1991) were also able to show, based on extensive historical research, a rapidly changing cultural and linguistic landscape from as early as the mid 1700's, up until the violent Northern Border (frontier) War of 1869/9.

Morris and Beaumont (1991) also note that many indigenous skeletons, most dating to the 18th and 19th Centuries were exhumed from the area, along the banks of the Orange River near Augrabies in the late 1930s. A pre-colonial grave was also recorded at the base of the Renosterkop Hill, during an HIA for a proposed new vineyard development on the farm (Kaplan 2016).

More recently, large numbers of LSA, MSA and some older Early Stone Age (ESA) implements were recorded on the flatlands below the prominent Koppie on the farm Renosterkop during an archaeological impact assessment for a proposed new vineyard development (Kaplan 2016), while limited numbers of tools were recorded on the farm Renosterkop extension, south of the R359 near the entrance to the town (Kaplan 2017).

Orton (2012) also recorded low density scatters of LSA, MSA and ESA tools during a survey for a proposed solar energy farm near the Augrabies Falls National Park about 12kms from Renosterkop. Orton (2012) also describes a Stone Age sequence in the Augrabies Falls area where much of the information has been generated by excavations of open scatters containing stone tools, pottery and ostrich eggshell, as well as excavations of several small shelters near the falls, and the town of Augrabies (Morris & Beaumont 1991).

Small numbers of MSA tools were documented by Van Schalkwyk (2013) during a HIA for a township development near Augrabies, while Pelsler (2012) recorded small numbers of LSA as well as ESA implements during an AIA for a solar energy farm near the National Park. Kaplan (2018) also documented relatively large numbers of LSA and MSA lithics, including activity areas, on the farm Orange Falls, just outside the urban edge of the town. Several other impact assessment reports were not available on the SAHRIS website at the time of writing (e.g. Van Schalkwyk 2011, & Beaumont 2008).

Morris (2014) notes that there are substantial herder encampments along the floodplain of the Orange River, but these tend to be short duration visits by small groups of hunter-gatherers. Most of these camps have, however, been destroyed by intensive farming alongside the river, and would no longer be archaeologically visible in the landscape.

6. FINDINGS

A detailed foot survey of the proposed new vineyard development site, including an assessment of the footprint area for the (then) proposed 1.0 MW PV package plant was undertaken on 4th & 5th June 2019. A track path of the survey was created (Figure 21). A spreadsheet of waypoints and a description of archaeological finds are presented in Table 1.

A small number of isolated, MSA and LSA lithics were recorded during the study. These comprised mostly a few round quartz cores, flakes and chunks in quartz, quartzite, indurated shale, silcrete, and banded ironstone. Several weathered flake tools were also noted. No formal tools such as scrapers or adzes were found, and no organic remains such as pottery or ostrich eggshell were encountered. A very small number of tools were recorded in Areas A, B and C. Ironically, most of the lithics were recorded in Area E on washed gravels above the ripped lands, while a small handful of tools were recorded in Area H. A, low density scatter of tools, comprising a few weathered indurated shale flakes and chunks were recorded on an extensive scatter of quartz pebbles and washed gravels in the south western portion of Area B (Points 034-037), alongside the drainage channel, *outside* the proposed development site. A, low density scatter of lithics including a lump of silcrete and a weathered quartz MSA flake were also recorded on an extensive scatter of quartz gravels in the northern boundary of Area A (Points 091-011).

A collection of tools recorded during the study, and the context in which they were found are illustrated in Figures 22-30.

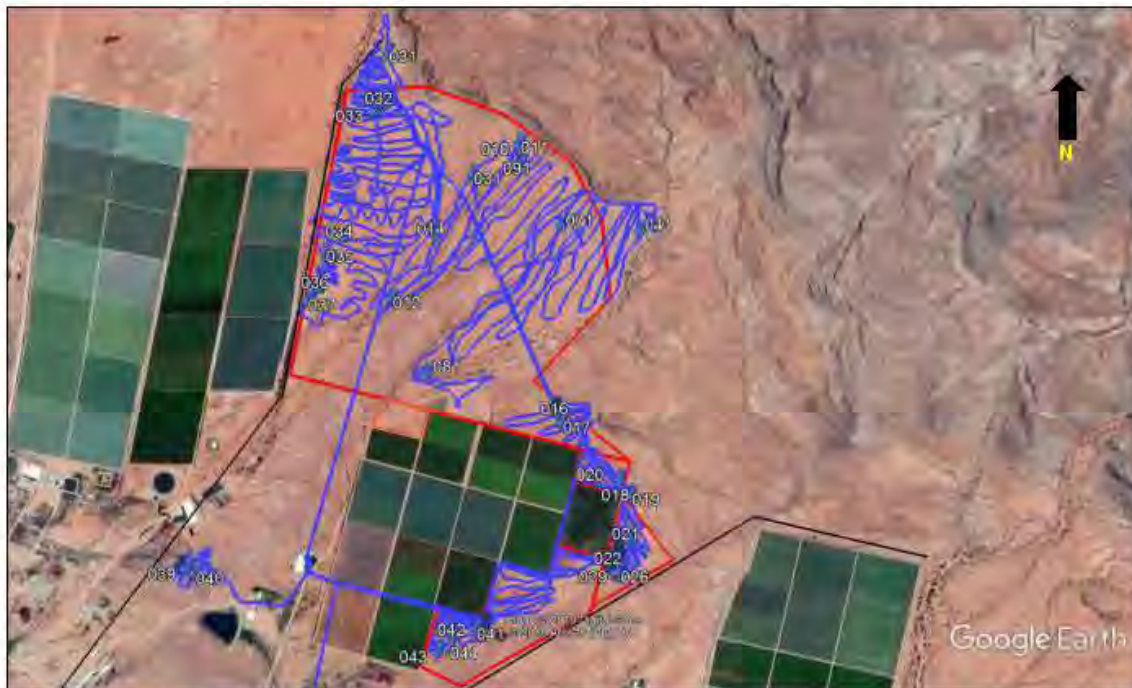


Figure 21. Trackpaths in blue and waypoints of archaeological finds



Figure 22. Area A, Site 916. Context in which the remains were found



Figure 23. Flake tools from Area A. Scale is in cm



Figure 24. Lithics from Site 916. Scale is in cm



Figure 25. Flake tools from Area C & D. Scale is in cm



Figure 26. Area B. Site 034-037. Context in which the remains were found. View facing south west



Figure 27. Building foundations (Site 017) in Area C.



Figure 28. Lithics from Area C & D. Scale is in cm



Figure 29. Tools from Area E. Scale is in cm



Figure 30. Tools from Area E & H. Scale is in cm

6.1 PV Package plant

The proposed new site for the PV package plant (refer to Figure 20) was not searched for archaeological resources, but it is clear from the Google image that the preferred site constitutes a severely transformed landscape. Three implements (Points 038-040) were found in the original proposed site (refer to trackpaths in Figure 21), including a combined hammerstone/grindstone/anvil (Figure 31).



Figure 31. Tools from original proposed PV site. Scale in cm

6.2 Grading of archaeological resources

Overall, the very small numbers and transformed context in which they were found means that the archaeological remains have been graded as having *low* (Grade 3C) significance.

Site	Farm name	Lat/long	Description of finds	Grading	Mitigation
	Farm No. 355 Tierkop			NCW = not conservation worthy	
Site A					
041		S28° 38.106' E20° 28.632'	Weathered quartzite MSA flake	NCW	None required
071		S28° 38.084' E20° 28.501'	Vein quartz flake	NCW	None required
081		S28° 38.400' E20° 28.170'	Possible quartz core/chunk	NCW	None required
091		S28° 37.924' E20° 28.419'	Low density scatter of a few flake tools, chunks, core, outcropping of quartz and large scatter of quartz pebbles & gravels	NCW	None required
010		S28° 37.884' E20° 28.413'	Lump of silcrete on quartz gravels	NCW	None required
011		S28° 37.880' E20° 28.414'	Weathered MSA quartz flake/MRP on quartz gravels	NCW	None required
012		S28° 38.219' E20° 28.097'	Silcrete chunk/flake on gravel patch	NCW	None required
013		S28° 37.949' E20° 28.297'	Pink quartz core on gravel patch	NCW	None required
014		S28° 38.079' E20° 28.205'	Pink quartz core	NCW	None required

Archaeological Impact Assessment, proposed agricultural development on Farm Tierkop, near Augrabies, Northern Cape

Site C				
015		S28° 38.455' E20° 28.500'	Indurated shale flake	NCW None required
016		S28° 38.472' E20° 28.512'	Indurated shale chunk	NCW None required
017		S28° 38.491' E20° 28.519'	Concrete building foundations	NCW None required
Site D				
018		S28° 38.614' E20° 28.664'	Quartz core	NCW None required
019		S28° 38.646' E20° 28.691'	Banded ironstone chunk/core	NCW None required
020		S28° 38.616' E20° 28.600'	Indurated shale broken cobble.	NCW None required
Site E				
021		S28° 38.745' E20° 28.689'	Silcrete core on gravel patch	NCW None required
022		S28° 38.798' E20° 28.645'	Banded ironstone retouched/utilised flake on gravels	NCW None required
023		S28° 38.767' E20° 28.652'	Weathered quartz flake on gravel	NCW None required
024		S28° 38.771' E20° 28.655'	Quartzite chunk/core on gravels	NCW None required
025		S28° 38.783' E20° 28.662'	Chunky quartzite MSA flake on gravels	NCW None required
026		S28° 38.815' E20° 28.663'	Quartzite chunk on gravels	NCW None required
027		S28° 38.815' E20° 28.663'	Banded ironstone cortex cobble flake/chunk on gravels	NCW None required
028		S28° 38.812' E20° 28.651'	Quartz core/chunk on gravels	NCW None required
029		S28° 38.817' E20° 28.657'	Weathered banded ironstone chunk/broken flake	NCW None required
030		S28° 38.796' E20° 28.636'	Small banded ironstone flake	NCW None required
Site B				
031		S28° 37.682' E20° 28.088'	Quartz flake on fence line	NCW None required
032		S28° 37.795' E20° 28.075'	Pink quartz core	NCW None required
033		S28° 37.812' E20° 28.051'	Indurated shale cortex flake/MRP	NCW None required
034		S28° 38.085' E20° 27.978'	Low density scatter of tools on quartz pebbles and washed gravels alongside drainage channel & below	Low (Grade 3C) None required
035		S28° 38.118' E20° 27.931'	Indurated shale cobble/flake	Low (Grade 3C) None required
036		S28° 38.197' E20° 27.917'	Indurated shale cobble/chunk, quartzite chunk	Low (Grade 3C) None required
037		S28° 38.224' E20° 27.887'	Broken quartzite MSA flake, weathered indurated shale chunk & weathered indurated shale flake	Low (Grade 3C). None required
PV plant				
038		S28° 38.800' E20° 27.577'	Quartz flake	NCW None required
039		S28° 38.810' E20° 27.589'	Banded ironstone cortex flake	NCW None required
040		S28° 38.821' E20° 27.611'	Combined hammerstone/anvil/grindstone	NCW None required
Site H				
041		S28° 38.939' E20° 28.305'	Broken quartzite cobble/chunk/core	NCW None required
042		S28° 38.954' E20° 28.256'	Quartzite broken chunk	NCW None required
043		S28° 38.991' E20° 28.210'	Weathered banded ironstone utilized/retouched flake	NCW None required
044		S28° 38.981' E20° 28.239'	Banded ironstone utilized chunk	NCW None required
045		S28° 38.928' E20° 28.327'	Banded ironstone core/chunk on the fence line	NCW None required

Table 1. Spreadsheet of waypoints and description of archaeological finds

6.3 Built environment

No old buildings, structures, features or old equipment were recorded in the study area. The concrete foundations of a modern building, and a few isolated coarse concrete bricks, and some glass and rusted metal bits were recorded in Site C (Point 017 & Figure 27). A number of these bricks line the gravel farm road that crosses the site, leading to Sites A and B.

6.4 Graves

No graves or typical grave features were encountered during the study.

7. ASSESSMENT OF IMPACTS

In the case of a proposed Tierkop vineyard and PV development on Farm Tierkop 355, it is expected that impacts on pre-colonial archaeological heritage and historical heritage resources, will be *LOW* (Table 2).

Potential impacts on archaeological heritage	
Extent of impact:	Site specific
Duration of impact;	Permanent
Intensity	Low
Probability of occurrence:	Probable
Significance without mitigation	Low
Significance with mitigation	Negative
Confidence:	High

Table 2. Assessment of archaeological impacts.

8. CONCLUSION

Indications are that, in terms of archaeological heritage, the proposed development site (i. e. Areas A-C & Areas D-H), including the proposed new site for the PV package plant is not a sensitive or threatened landscape.

The impact significance of the proposed development on archaeological heritage is assessed as *LOW*, and therefore, there are no objections to the authorization of the proposed vineyard and PV development.

9. RECOMMENDATIONS

With regard to the proposed vineyard and PV development on Farm Tierkop 355 Kakamas North, the following recommendations are made:

1. No mitigation is required prior to proposed development activities commencing.
2. No archaeological monitoring is required

10. REFERENCES

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Van Schalkwyk, J. A. 2013. Cultural Heritage Impact Assessment for the proposed township development on a section of the Farm Kakamas Suid 28 Augrabies, Kai !Garib Municipality, Northern Cape Province. Report prepared for MEG Environmental Consultants.

APPENDIX H6: PALAEOLOGY ASSESSMENT

PALAEOLOGICAL ASSESSMENT: RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES

Proposed vineyard development on Farm 355 Tierkop, Kakamas North, near Augrabies, Kai! Garib Municipality, Northern Cape

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August 2019

Executive summary

The proposed agricultural development (c. 72 ha) comprises new vineyards and a small 1 MW PV solar plant on the Farm 355 Tierkop, Kakamas North, situated c. 4 km NE of Augrabies in the Kai! Garib Municipality of the Northern Cape Province. The development footprint is underlain by (1) ancient Precambrian igneous and metamorphic bedrocks that do not contain fossils as well as (2) sparsely fossiliferous or unfossiliferous superficial sediments (alluvium, aeolian sands, surface gravels) of probable Quaternary to Recent age. Ancient alluvial terraces (potentially fossiliferous "High Level Gravels") are not mapped in the study area. In view of the small, in part disturbed development footprint and the generally low palaeontological sensitivity of the study region, no further specialist studies or mitigation are considered necessary for this project, as far as fossil heritage is concerned. However, should significant fossil remains (e.g. vertebrate bones and teeth) be encountered during construction, the responsible ECO should inform SAHRA at the earliest opportunity to consider possible mitigation measures. A tabulated Chance Fossil Finds Procedure is appended to this report.

1. Project description

The proponent Rooipad Boerdery (Pty) Ltd is proposing to establish a new agricultural development (c. 72 ha in area) on the Farm 355 Tierkop, Kakamas North, situated on the northern side of the Orange River (Gariep) some 4 km NE of Augrabies in the Kai! Garib Municipality of the Northern Cape Province (Fig. 1). The gravel road to Riemvasmaak runs along the southern edge of the study area. The proposed vineyard development will cover a footprint area of about 72 ha. A small (± 1 Megawatt) PV package plant is also envisaged (Small red triangle in Fig. 1). Water for the new vineyards will be supplied from a pump station located on the banks of the Orange River. The vineyards will be supplied with water *via* existing pipelines. Existing farm roads will be used, and no new access roads will need to be constructed.

An EIA for this agricultural development proposal is being co-ordinated by Pieter Badenhorst Professional Services (PO Box 1058, Wellington, 7654. Cell: 0827763422. Fax: 0866721916. E-mail: pbps@iafrica.com). The present report contributes to the HIA component of the EIA that is being compiled by Jonathan Kaplan of ACRM (5 Stuart Road, Rondebosch, 7700. Ph/Fax: 021 685 7589. Cell: 082 321 0172. E-mail: acrm@waccess.co.za).

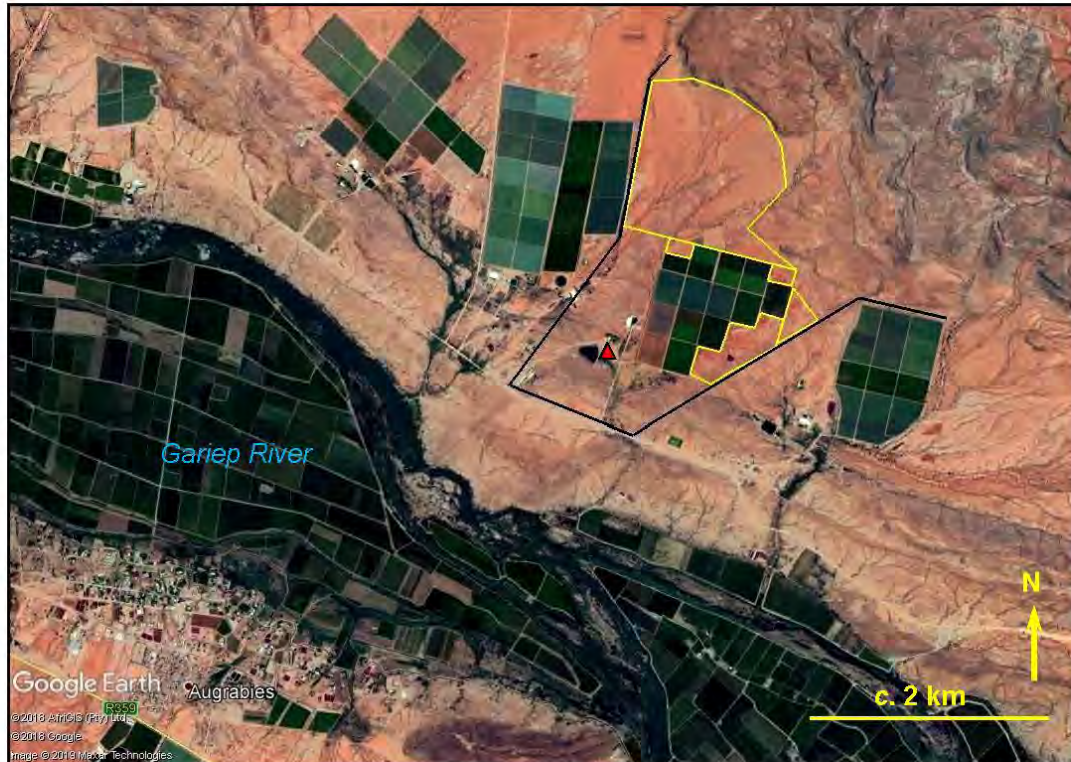


Figure 1. Google earth© satellite image showing the study site for new vineyards (yellow polygons) as well as a small 1 MW PV plant (red triangle) on the Farm 355 Tierkop, Kakamas North, situated on the northern side of the Orange River (Gariep) some 4 km NE of Augrabies, Kai! Garib Municipality of the Northern Cape Province. The PV plant site is highly disturbed.

2. Geological and palaeontological context

The agricultural project study area on Farm 355 Tierkop comprises gently sloping arid terrain between c. 660 and 715 m amsl. which stretches from about 1.0 to 3.6 km NE of the present banks of the Gariep up to the edge of a range of low basement *koppies* (Fig. 1). The area is largely mantled by orange-hues aeolian sands and sparse gravels (vein quartz, gneiss *etc*) with no extensive areas of bedrock exposure. Shallow, dendritic, ephemeral stream drainage lines feeding into the Gariep traverse the area which is also extensively disturbed by previous agricultural activities. Kaplan (2019) reports “Hard *dorbank* surfaces of gravel, and outcroppings of quartz” but these lie outside the new vineyard footprint. The proposed PV plant site is already highly disturbed.

The geological context of the study area is shown on the 1: 250 000 geology sheet 2820 Upington (Fig. 2; Council for Geoscience, Pretoria) (Moen 2007). The underlying bedrocks are ancient Precambrian granite-gneisses assigned to the **Riemvasmaak Gneiss** and **Omdraai Gneiss** of the **Namaqua-Natal Province** that are some 1.5 billion years old and entirely unfossiliferous (Cornell *et al.* 2006, Almond & Pether 2008).

The study area lies only shortly (< 4 km) north and < 70 m above the present course of the River Orange, so ancient (Tertiary - Quaternary), consolidated alluvial gravels of the Orange River system – which are known to be highly fossiliferous elsewhere along the Orange (e.g. Partridge *et al.* 2006) – might be present here. However, neither “High Level Gravels” nor the commonly associated diamond prospecting symbols are mapped on the Farm 355 Tierkop region on the 1:

250 000 geological sheet (Fig. 2). Superficial sediments away from the main drainage courses largely comprise surface gravels (mainly alluvial, sheetwash and deflation deposits) and reddish-hued aeolian and locally-derived sands (*cf* Kaplan 2019). The red sands may in part be assigned to the upper part of the **Kalahari Group (Gordonia Formation)** of late Caenozoic (Neogene / Quaternary) age and the remaining alluvial sediments are probably of a similar, geological youthful age. Although fossil remains are occasionally encountered in these younger fluvial and terrestrial units – for example reworked mammalian bones and teeth, freshwater molluscs, calcretised root casts, termitaria, ostrich egg shells, land snail shells (Almond 2008, Almond & Pether 2008 and refs. therein) - they are sparsely distributed and occur over a very wide area, so the chances of serious impacts on unique fossil heritage resources here are only slight.

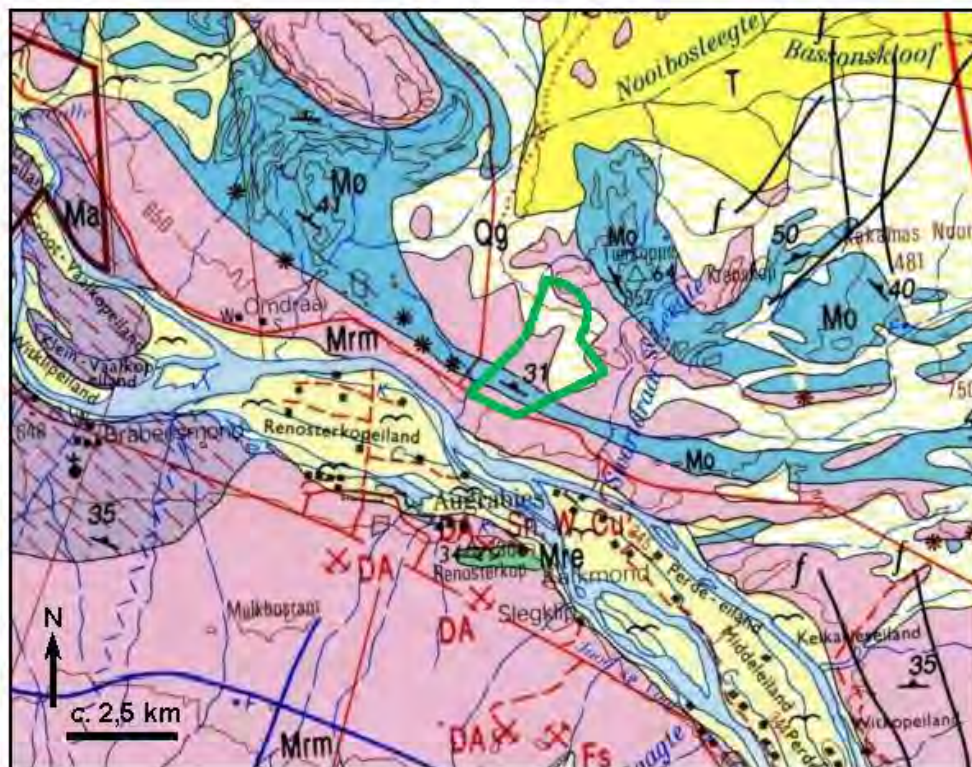


Figure 2. Extract from 1: 250 000 sheet 2820 Upington (Council for Geoscience, Pretoria) showing the geology of the Tierkop agricultural project study area (green polygon) on the northern side of the Orange River and c. 4 km NE of Augrabies, Northern Cape. Bedrocks beneath the study area comprise Riemvasmaak Gneiss (Mrm, pink) and Omdraai Gneiss (Mo, blue) forming part of the Precambrian (Proterozoic) Namaqua-Natal Metamorphic Province. Parts of the project area are mantled by orange-hued aeolian sands of the Gordonia Formation (Kalahari Group) of Quaternary to Recent age. Older alluvial gravels (“High Level Gravels”) are not mapped in this area. Prospecting for alluvial diamonds (red DA symbols) occurs south of the Orange at Augrabies but is not mapped to the north of the river in this region.

3. Conclusions & recommendations

In view of the negligible palaeontological sensitivity of the ancient Precambrian bedrocks as well as the low sensitivity of the geologically recent superficial sediments along the Orange River in the Augrabies – Kakamas North region, the proposed agricultural development – including new vineyards and small PV plant - is not considered to pose a significant threat to palaeontological heritage. Substantial, potentially-fossiliferous older alluvial deposits of the Orange River are not mapped here.

Pending any significant new fossil discoveries in the area, no further specialist studies or mitigation are considered necessary for this agricultural project.

All South African fossil heritage is protected by the National Heritage Resources Act, 1999. Should substantial fossil remains - such as vertebrate bones and teeth, or petrified logs of fossil wood - be encountered at surface or exposed during construction, the ECO should safeguard these, preferably *in situ*. They should then alert the relevant provincial heritage management authority as soon as possible - *i.e.* SAHRA (Contact details: Dr Ragna Redelstorff, SAHRA, P.O. Box 4637, Cape Town 8000. Tel: 021 202 8651. Email: rredelstorff@sahra.org.za). This is to ensure that appropriate action (*i.e.* recording, sampling or collection of fossils, recording of relevant geological data) can be taken by a professional palaeontologist at the developer's expense. A tabulated Chance Fossil Finds Procedure is appended to this report.

These mitigation recommendations should be incorporated into the Environmental Management Programme (EMPr) for this agricultural project. Please note that:

- All South African fossil heritage is protected by law (South African Heritage Resources Act, 1999) and fossils cannot be collected, damaged or disturbed without a permit from SAHRA or the relevant Provincial Heritage Resources Agency;
- The palaeontologist concerned with potential mitigation work will need a valid fossil collection permit from SAHRA and any material collected would have to be curated in an approved depository (*e.g.* museum or university collection);
- All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies developed by SAHRA (2013).

4. References

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5. Qualifications & experience of the author

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Limpopo, Mpumalanga, Northwest, Free State and KwaZulu-Natal under the aegis of his Cape Town-based company *Natura Viva cc*. He was a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Assessment Practitioners – Western Cape).

Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



Dr John E. Almond
Palaeontologist (*Natura Viva cc*)

CHANCE FOSSIL FINDS PROCEDURE: Proposed vineyard & PV plant developments on Farm 355 Tierkop, Kakamas North, near Augrabies		
Province & region:	NORTHERN CAPE, Kai! Garib Municipality	
Responsible Heritage Resources Authority	SAHRA (Contact details: P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502)	
Rock unit(s)	Late Caenozoic alluvium, aeolian sands	
Potential fossils	Mammalian bones and teeth, freshwater molluscs, calcretised root casts, termitaria, ostrich egg shells, land snail shells	
ECO protocol	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (<i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.	
	2. Record key data while fossil remains are still <i>in situ</i> : Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo Context – describe position of fossils within stratigraphy (rock layering), depth below surface Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (e.g. rock layering)	
	3. If feasible to leave fossils <i>in situ</i> : Alert Heritage Resources Authority and project palaeontologist (if any) who will advise on any necessary mitigation Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Authority for work to resume	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock) Photograph fossils against a plain, level background, with scale Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist Alert Heritage Resources Authority and project palaeontologist (if any) who will advise on any necessary mitigation
	4. If required by Heritage Resources Authority, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.	
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Authority	
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Authority. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Authority minimum standards.	