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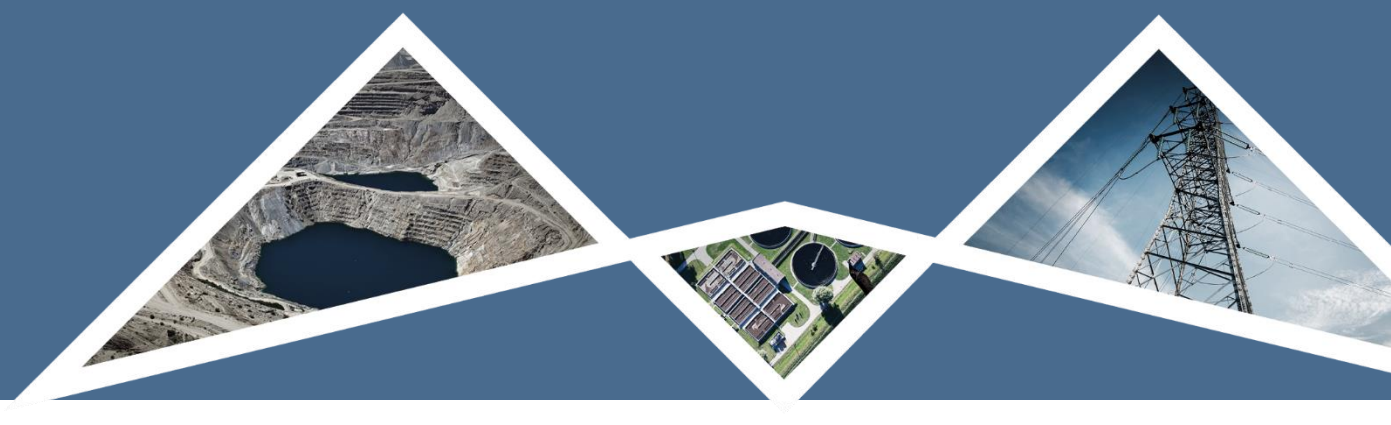
SCOPING REPORT

WILLIET BOERDERY OLIE RIVIER FARM PIVOT EXPANSION EIA



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List of Abbreviations

BA	:	Basic Assessment
BPG	:	Best Practice Guidelines
CARA	:	Conservation of Agricultural Resources Act
CBA	:	Critical Biodiversity Area
DALRRD	:	Northern Cape Department of Agriculture, Land Reform and Rural Development
DEA	:	Department of Environmental Affairs
DEFF	:	Department of Environment, Forestry and Fisheries
DHSWS	:	Department of Human Settlements, Water and Sanitation
DWAF	:	Department of Water Affairs and Forestry
EA	:	Environmental Authorisation
EAP	:	Environmental Assessment Practitioner
ECA	:	Environmental Conservation Act
EIA	:	Environmental Impact Assessment
EMPr	:	Environmental Management Programme Report
GIS	:	Geographical Information System
GLADA	:	Global Assessment of Land Degradation
IDP	:	Integrated Development Plan
IEM	:	Integrated Environmental Management
ISRIC	:	International Soil Reference and Information System
HIA	:	Heritage Impact Assessment
I&APs	:	Interested and Affected Parties
KPI	:	Key Performance Indicator
LED	:	Local Economic Development
LUS	:	Land Use Scheme
SAHRA	:	South African Heritage Resources Agency
SDF	:	Spatial Development Framework
NDP	:	National Development Plan
NEMA	:	National Environmental Management Act
NEM:AQA	:	National Environmental Management: Air Quality Act
NEM:BA	:	National Environmental Management: Biodiversity Act
NEM:PAA	:	National Environmental Management: Protected Areas Act
NFA	:	National Forests Act
NHRA	:	National Heritage Resources Act
NWA	:	National Water Act
PDA	:	Palaeontological Desktop Assessment

PPP	:	Public Participation Process
RLE	:	Red List of Ecosystems
SAHRIS	:	South African Heritage Resources Information System
SANLC	:	South African National Land-Cover
SAPAD	:	South Africa Protected Areas Data
SDF	:	Spatial Development Framework
SEMAs	:	Specific Environmental Management Acts
SEMA	:	Specific Environmental Management Act
SPLUMA	:	Spatial Planning and Land Use Management Act
VTU	:	Vegetation Type Units

1 EXECUTIVE SUMMARY

Williet Boerdery (Pty) Ltd (the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required Environmental Authorisation (EA) application processes (including the statutory public participation) for the proposed expansion of farming activities, in the form of additional pivots, on the remaining extent of the farm Olie Rivier 170 (registration division: Kimberley), near Douglas in the Northern Cape. This Scoping Phase Report is prepared in accordance with the requirements of Appendix 2 of the Environmental Impact Assessment Regulations, 2014, as part of the National Environmental Management Act (NEMA- Act 107 of 1998).

PURPOSE OF THE SCOPING REPORT

The purpose of the scoping process is to:

- Identify the policies and legislation that are relevant to the activity;
- To motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- To identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking;
- Where appropriate, to identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process including cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- To identify the key issues to be addressed in the assessment phase;
- To agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required, as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- To identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

PUBLIC PARTICIPATION PROCESS

A Public Participation (PP) Plan has been prepared in accordance with the requirements of the National Environmental Management Act (Act 107 of 1998-NEMA), and the Directions issued by the Department of Environment, Forestry and Fisheries (GN 650 of 5 June 2020) in terms of the Disaster Management Act (Act 57 of 2002). The purpose of this PP Plan is to obtain agreement from the relevant Competent Authority on the public engagement and participation for the abovementioned project. A copy of the plan can be made available upon request.

The Public Participation Process (PPP) for the proposed project has been undertaken in accordance with the requirements the National Environmental Management Act (NEMA) in line with the principles of Integrated Environmental Management (IEM). The PPP commenced on the 19th of November 2020 with an initial notification and call to register to interested and affected parties (I&APs). The comments received from I&APs during the initial call to register and commenting period to date have been captured in the Public Participation Report in Appendix C, and a summary of the issues raised and section of this report where issues are addressed is presented in Table 7 Section 8.6 respectively.

Comments received during this Scoping Report review period will be included in the finalised Scoping Report to be submitted to the Northern Cape Department of Agriculture Land Reform and Rural Development (DALRRD). Should the DALRRD accept the Scoping Report, an EIA Report including an Environmental Management

Programme Report (EMPr), will also be compiled and presented for public comment as part of this EIA phase during which time further stakeholder engagement will take place.

This Scoping Report has been made available for public review and comment for a period of 30 days from the 1st of April 2021 until the 5th of May 2021. Contact details are provided below:

- Environmental Impact Management Services (Pty) Ltd (EIMS)
- P.O. Box 2083 Pinegowrie 2123
- Phone: 011 789 7170 / Fax: 086 571 9047
- Contact: Cheyenne Muthukarapan
- Email: olierivier@eims.co.za

PROJECT ALTERNATIVES AND ENVIRONMENTAL IMPACT ASSESSMENT

A scoping assessment was undertaken to identify all the potential risks and impacts associated with each phase of the proposed pivot expansion activities as well as potentially feasible alternatives. After considering the broad range of alternative types that exist (i.e. location, process, technology, and activity options), no other feasible alternatives other than the preferred and No-Go alternatives could be identified. Certain incremental alternatives such as power sourcing to the proposed centre pivot system will be further considered during the EIA phase.

Background information review on the surrounding areas, the biodiversity and heritage/ palaeontological specialist assessment reports (Appendix D) as well as the Department of Environment, Forestry and Fisheries (DEFF) Screening Tool Report (Appendix F) helped to guide the identification of potential impacts. Each of the identified risks and impacts at the various project phases were assessed. The assessment criteria (See Section 10.1 for the EIMS Impact Assessment Methodology) include the nature, extent, duration, magnitude / intensity, reversibility, probability, cumulative impact, and irreplaceable loss of resources.

The most significant risks and impacts identified were those that remain high in terms of significance even post mitigation measures being considered. The visual impact of the proposed project was rated as having a medium negative significance and the socio-economic benefit was rated as having a medium positive impact. Additional impacts identified are listed below. All these impacts were rated as having low significance if mitigation measures are adhered to (See Section 10.2 for full list of identified impacts and the significance of each):

- Negative Impacts:
    - Habitat fragmentation, loss of natural vegetation and alien invasion in a CBA 2
    - Loss of species of conservation concern
    - Anthropogenic disturbances, intentional and/or accidental killing of fauna
    - Loss of fossil heritage
    - Noise nuisance
    - Fire damage
    - Dust nuisance
    - Oil/ fuel spillages causing soil and groundwater contamination
    - Littering
    - Erosion
    - Impact on heritage resources
- Positive Impacts:

- Gain of fossil heritage (this is a positive impact if the mitigation measures are adhered to, as it will result in the preservation of fossils if any are found during construction)

The identified potential impacts, where required, will be further assessed during the EIA phase of the project. Potential mitigation measures have been identified and will be refined based on input from the EAP, competent authority and public consultation. The associated EMPr, drafted during the EIA phase, will identify appropriate mitigation mechanisms for avoidance, minimisation and / or management of the negative impacts and enhancement of the positive impacts.

2 INTRODUCTION

Williet Boerdery (Pty) Ltd (the applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the EAP to assist with undertaking the required authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of application for:

- EA in accordance with the NEMA- Listed activity/ies:
    - GNR 984: Activity 15: "the clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-
        - (i) The undertaking of a linear activity; or
        - (ii) Maintenance purposed undertaken in accordance with a maintenance management plan."

The project will involve the expansion of agricultural activities on the farm Olie Rivier by introducing 3 new pivots that will require the clearance of approximately 70 ha of indigenous vegetation, primarily for the growing of potatoes. The 3 pivots will be 40 ha (pivot 1), 20 ha (pivot 2) and 10 ha (pivot 3) in size. In year 1, potato seeds will be planted on 20 ha of pivot 1 and in year 2 potato seeds will be planted on the other 20 ha of pivot 1. Thereafter potato seeds will be planted on pivot 2 and 3 in years 3 and 4, respectively. Crop rotation will be done thereafter by planting either corn, wheat, lucerne or peanuts on the pivots.

The proposed project is located on the Remaining Extent of the Farm Olie Rivier 170 (registration division: Kimberly), located along the R357 from Kimberly to Douglas, in the Siyancuma Local Municipality, Pixley Ka Seme District Municipality in the Northern Cape. The site is located approximately 26 km north-east of the town Douglas and 77 km south-west of the town Kimberly. The centre point of the site is: 28°57'26.5"S and 24°0'32.731"E.

2.1 REPORT STRUCTURE

This report has been compiled in accordance with the 2014 NEMA EIA Regulations, as amended. A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in Table 1 below.

Table 1: Report Structure

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 2(2)(a):	Details of – i. The Environmental Assessment Practitioner (EAP) who prepared the report; and ii. The expertise of the EAP, including a curriculum vitae;	Section 2.2; Section 2.3
Appendix 2(2)(b):	The location of the activity. Including – i. The 21-digit Surveyor General code of each cadastral land parcel; ii. Where available, the physical address and farm name; iii. Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 3
Appendix 2(2)(c):	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. On a land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Figure 1; Figure 3
Appendix 2(2)(d):	A description of the scope of the proposed activity, including – i. All listed and specified activities triggered; ii. A description of the activities to be undertaken, including associated structures and infrastructure;	Table 5; Section 4.1; Section 4.2
Appendix 2(2)(e):	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 5
Appendix 2(2)(f):	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 6
Appendix 2(2)(g):	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including – i. Details of all alternatives considered;	Section 7; Section 8;

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – aa. Can be reversed; bb. May cause irreplaceable loss or resources; and cc. Can be avoided, managed or mitigated; vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. The possible mitigation measures that could be applied and level of residual risk; ix. The outcome of the site selection matrix; x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 9; Section 10 Appendix C
Appendix 2(2)(h):	A plan of study for undertaking the environmental impact assessment process to be undertaken, including – i. A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; ii. A description of the aspects to be assessed as part of the environmental impact assessment process; iii. Aspects to be assessed by specialists; iv. A description of the proposed method of assessing the environmental aspects, including a description of the proposed method assessing the environmental aspects to be assessed by specialists; v. A description of the proposed method of assessing duration and significance; vi. An indication of the stages at which the competent authority will be consulted; vii. Particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Section 11

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	viii. A description of the tasks that will be undertaken as part of the environmental impact assessment process; ix. Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored;	
Appendix 2(2)(i)	An undertaking under oath or affirmation by the EAP in relation to – i. The correctness of the information provided in the report; ii. The inclusion of comments and inputs from stakeholders and interested and affected parties; and iii. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Section 13
Appendix 2(2)(j):	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Section 13
Appendix 2(2)(k):	Where applicable, any specific information required by the competent authority; and	No additional requirements have been received from the competent authority to date.
Appendix 2(2)(l):	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	No additional required matters were identified in terms of these sections of the Act.

2.2 DETAILS OF THE EAP

The contact details of the EIMS consultant who compiled this Scoping Report are as follows:

- Name of the consultant: Pieter Holtzhausen
- Tel No.: 011 789 7170
- Fax No.: 086 571 9047
- E-mail address: olierivier@eims.co.za

2.3 EXPERTISE OF THE EAP

2.3.1 EAP QUALIFICATIONS

In terms of Regulation 13 of the EIA Regulations (GN R. 982) as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS has been appointed by the Applicant as the EAP to assist with compiling the necessary reports and undertaking the statutory consultation processes, in support of the proposed farming expansion project. EIMS is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, *inter alia*, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

The Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultant that is involved in the EIA process and the compilation of this Scoping Report is presented in Appendix A.

2.3.2 SUMMARY OF THE EAP'S PAST EXPERIENCE

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 25 years' experience in conducting EIA's, including many EIA's for mines and mining related projects. Please refer to the EIMS website (www.eims.co.za) for examples of EIA documentation currently available. Pieter Holtzhausen is a consultant at EIMS and has been involved in core aspects of numerous environmental impact assessment projects the past 3 years that he has been with the firm. His main expertise relate to the areas of spatial analysis and sensitivity mapping on Geographical Information Systems (GIS) for a wide array of projects ranging from risk assessments, audits, EIAs and Basic Assessments (BAs) for mining, gas extraction, wetland rehabilitation, road upgrades, etc. He has taken part in numerous PPP, water use license applications, water monitoring, soil sampling and risk assessment report writing. He also compiled numerous BA reports.

2.3.3 SPECIALIST CONSULTANTS

Biodiversity and Heritage/ Palaeontology were the only pre-identified specialist studies that were deemed essential by the EAP and that were conducted during the scoping phase of this project. Additional specialist studies that were identified through use of the DEFF Screening Tool were:

- Agricultural Impact Assessment
- Landscape/ Visual Impact Assessment
- Aquatic Biodiversity Impact Assessment
- Hydrology Assessment

- Socio-Economic Assessment

In terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended, the required DEFF Screening Report is provided as part of Appendix F. The above-mentioned specialist studies as identified through the tool were deemed unnecessary by the EAP because of the proposed location and type of activities which form part of the farm expansion project. A desktop study and an on-site investigation was conducted on the 19th of November 2020, which confirmed the redundance of these studies as identified by the tool.

No aquatic areas exist within or closely surround the proposed footprint area. Most of the footprint will fall on old lands (previously cultivated land that was allowed to reform into a semi-natural state) and the proposed activity, pivot irrigation, will visually fit in with the surrounding area, as it mostly consists of pivots.

The biodiversity and heritage/ palaeontological specialist studies involved the gathering of desktop data and an on-site inspection to identify and assess any environmental impacts that may occur because of the proposed farming expansion project. These impacts were assessed according to the EIMS pre-defined impact significance rating methodology (Section 10). These specialists also recommended appropriate mitigation/ management or optimisation measures to minimise potential negative impacts or enhance potential benefits, respectively. The specialist's declaration of independence is included in the specialist reports presented in Appendix D.

3 DESCRIPTION OF THE PROPERTY

Table 2 provides a description of the property details and size of the proposed pivot footprints as well as the distance to the nearest towns. See Figure 1 for the locality of the proposed pivots.

Table 2: Locality details

Property	Remaining Extent of Farm Olie Rivier 170 (Registration Division: Kimberley)
21-digit Surveyor General Code	C03700000000017000000
Application Area (Ha)	The development footprint of the 3 pivots covers a total extent of approximately 70 ha. The directly affected portion (RE of Farm Olie Rivier 170, Kimberley) comprises an area of 1291.61 ha.
Magisterial District	Pixley Ka Seme District Municipality, Siyancuma Local Municipality, Ward 6.
Distance and direction from nearest towns	The proposed project is located on the Remaining Extent of the Farm Olie Rivier 170 (registration division: Kimberly), located along the R357 from Kimberly to Douglas. The site is located approximately 26 km north-east of the town Douglas and 77 km south-west of the town Kimberly. The centre point of the site is: 28°57'26.5"S and 24°0'32.731"E.

3.1 SURROUNDING LAND USES

According to the South African National Land-Cover (SANLC) dataset (GTI, 2018), the proposed pivots are mostly surrounded by natural grassland and low shrubland, with patches of dense thicket and woodland and bare non-vegetated areas. Agricultural activities dominate the land use type in the local area, mostly located north and west of the proposed development footprint in the form of existing pivots and cultivated land. A secondary gravel road cuts through between pivots 1 and 2 and pivot 3, where it connects with the R357 directly south of the proposed pivots. The Vaal River is located approximately 2.5 km to the northwest of the proposed footprint and the Riet River approximately 5.5 km to the south. See Figure 2 for a map of the landcover surrounding the proposed development.

On a more regional scale, the town of Douglas is the closest town located 26 km to the southwest. According to the South African Protected Areas Database (DEA, 2019) and the National Protected Areas Expansion Strategy (SANBI, 2010) the Mokala National Park and Eastern Kalahari Bushveld Focus Area are located approximately 25 km to the southeast of the proposed development. Both the National Park and the Focus Area fall within a central power corridor.

3.2 PROPERTY OWNERSHIP

As stated above, the proposed pivot expansion will be located on the remaining extent of the farm Olie Rivier 170 (registration division: Kimberley). This property is currently owned by Williet Boerdery (Pty) Ltd.

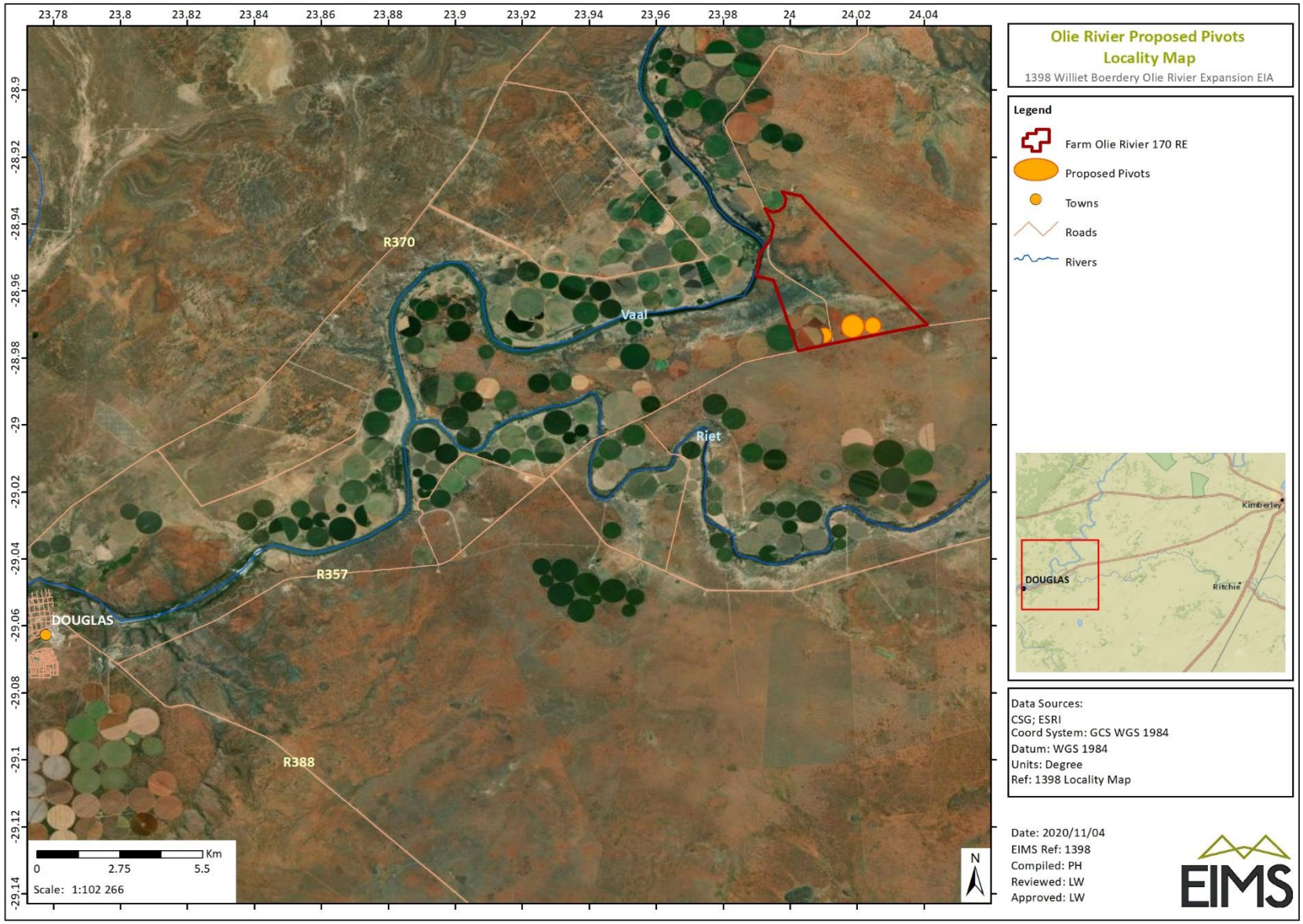


Figure 1: Aerial imagery indicating the locality of the proposed pivots.

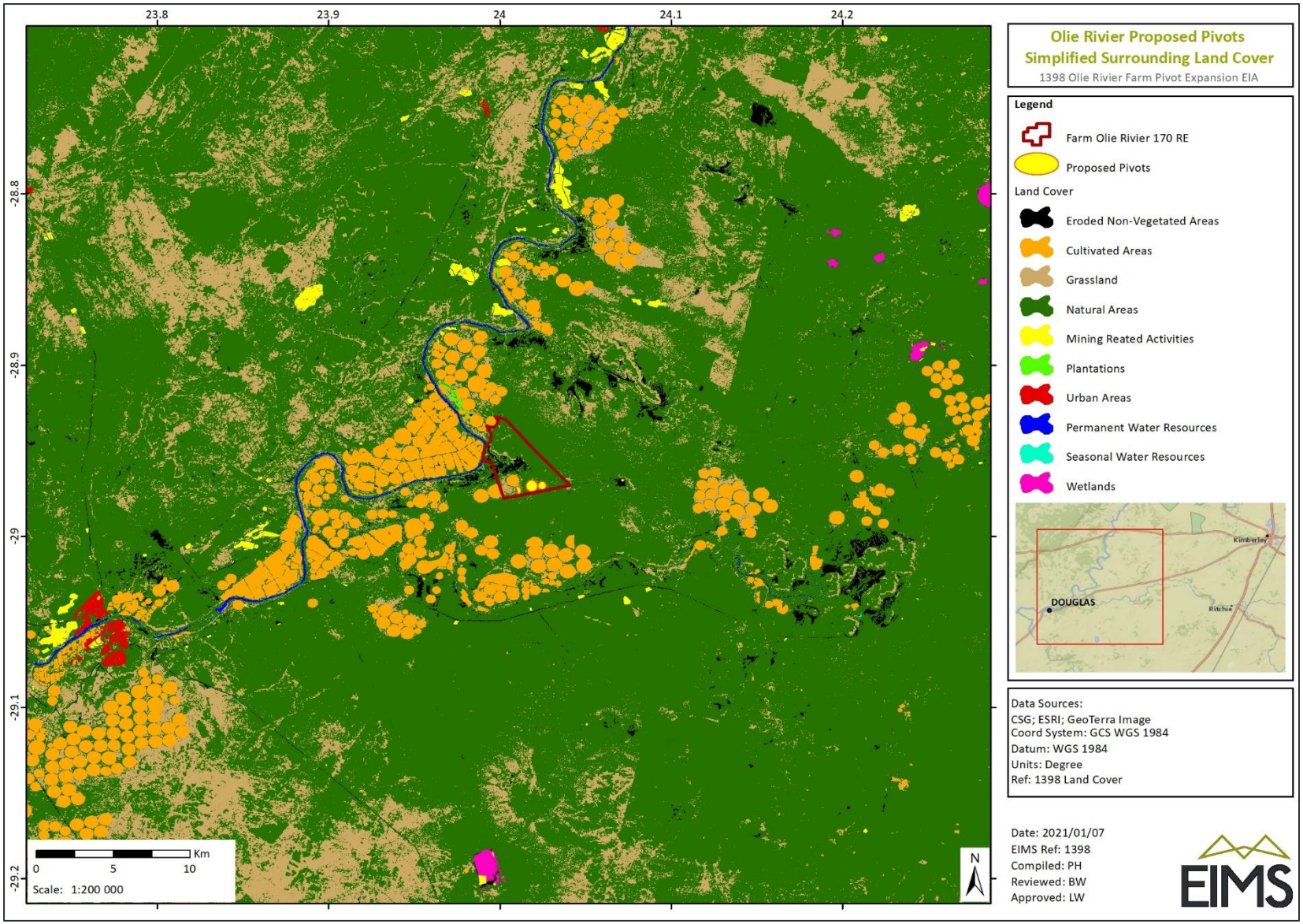


Figure 2: Land cover and land use surrounding the proposed site footprint.

4 DESCRIPTION AND SCOPE OF THE PROPOSED PROJECT

The section below provides a detailed description for the proposed agriculture expansion activities. Most of the key information presented in this chapter was obtained from the applicant. The aim of the project description is to describe in detail the proposed activities planned to take place on the affected property. Furthermore, the project description is designed to facilitate the understanding of the proposed project related activities, which are anticipated to lead to the identification of possible impacts that will be assessed in this Scoping Report, and for which management measures will be designed.

4.1 PROJECT DESCRIPTION

The project will involve the expansion of agricultural activities on the property remaining extent of farm Olie Rivier 170 (registration division: Kimberley) by introducing 3 new pivots that will require the clearance of approximately 70 ha of vegetation, primarily for the growing of potatoes. The 3 pivots will be 40 ha (pivot 1), 20 ha (pivot 2) and 10 ha (pivot 3) in size. In year 1, potato seeds will be planted on 20 ha of pivot 1 and in year 2 potato seeds will be planted on the other 20 ha of pivot 1. Thereafter potato seeds will be planted on pivot 2 and 3 in years 3 and 4, respectively. Crop rotation will be done after each harvest by planting either corn, wheat, lucerne or peanuts on the pivots.

Crop rotation is the growing of different crops in succession on a specific field. This practise, if implemented correctly, can among other positive impacts improve soil health and fertility, maintain soil structure and integrity, and help combat pests and weeds. Crop rotation is important, especially when planting potatoes, as potatoes are known heavy feeders, meaning they can easily deplete soils of nutrients. If rotations are not done, it could lead to a low harvest yield the following year or heavy reliance on fertilisers. Crop rotation will also help prevent disease such as blight, which is commonly caused by repeatedly planting potatoes on the same land. Blight is caused by a fungus-like organism which spreads in the foliage of potatoes, causing a collapse and decay of foliage and infection of the potatoes.

Water for the pivots will be sourced from an existing borehole and pumped through an existing underground PVC pipe (315 mm in diameter), which will be extended toward the 40 ha pivot. The existing pipe is approximately 1200 m in length and is used to water pecan nut trees. The pipe will be extended by a further 500 m to reach the 40 ha pivot. The pipe is not a listed activity under the NEMA, however it will only be extended if Environmental Authorisation for the proposed pivots is granted. See Figure 3 for a layout of the planned expansion activities. Water abstraction to be used on the farm was already listed with the Oranje Vaal Water Users Association on 17 August 2020 for 19 140 m^3/ha. See Appendix G for the certificate of enrolment.

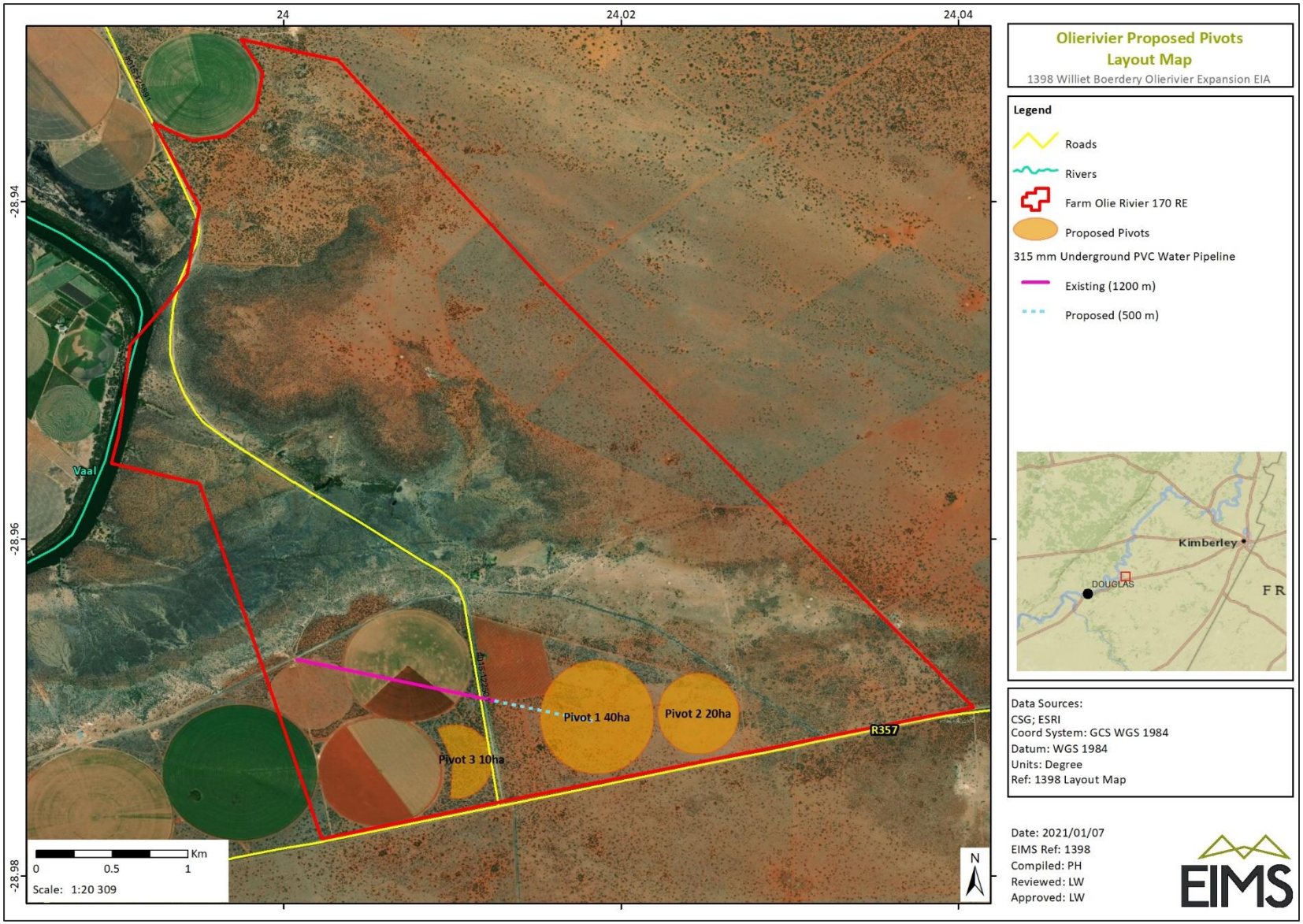


Figure 3: Layout map of the proposed expansion activities.

4.2 PROJECT INFRASTRUCTURE AND ASSOCIATED ACTIVITIES

Table 3: Proposed farming expansion infrastructure and purpose.

Infrastructure	Purpose
315 mm PVC pipeline	Water for the pivots will be sourced from an existing borehole and pumped through an existing 1200 m underground 315 mm PVC pipe, which will be extended by a further 500 m to reach the pivots. The water abstraction is approved by the Oranje Vaal Water Users Association.
Centre Pivot Irrigation System	The underground PVC pipeline will provide water to a centre pivot irrigation system. A centre pivot irrigation system is a moveable pipe structure which usually spans the length of a field and rotates around a pivot in the centre of the field. As the irrigation system rotates around its central pivot, it supplies water to crops through sprinklers along its length.

5 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which may relate to the proposed project. A summary of the applicable legislation is provided in Table 4 below. The primary legal requirement for this project stems from the need for an EA to be granted by the competent authority, the DALRRD in accordance with the requirements of the NEMA. In addition, there are numerous other pieces of legislation governed by many acts, regulations, standards, guidelines and treaties on an international, national, provincial and local level, which should be considered in order to assess the potential applicability of these for the proposed project. More detail on the legislative framework is presented below.

Table 4: Applicable legislation and guidelines overview

Applicable Legislation, Policies and Guidelines	Description of Legislation, Policy or Guideline	Relevance to the Proposed Project
Constitution of the Republic of South Africa (Act 108 of 1996)	The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act 108 of 1996) makes provisions for environmental issues and declares that: "Everyone has the right - a) to an environment that is not harmful to their health or well-being; and b) to have the environment protected, for the benefit of present and future c) generations, through reasonable legislative and other measures that: i. prevent pollution and ecological degradation; ii. promote conservation; and iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".	This EIA is conducted to align with the requirement of the Bill of Rights.
National Environmental Management Act (Act 107 of 1998 – NEMA); and the EIA Regulations (2014, as amended)	The NEMA (1998) requires that a project of this nature must undergo a Scoping and Environmental Impact Assessment (EIA); an Environmental Management Programme (EMPr) must also be compiled. The EIA Regulations GN R. 984 (2014, as amended) in terms of the NEMA is applicable to this project.	The only activity that triggered the need for an EIA process to be followed is GN R. 984, Listing Notice 2, Activity 15
National Water Act (Act 36 of 1998 – NWA)	The NWA recognises that water is a scarce and unevenly distributed national resource which must be managed encompassing all aspects of water resources.	Water to be used on the farm was already listed with the Oranje Vaal Water Users Association on 17 August 2020 for 19 140 m^3/ha. See Appendix G for the certificate.
Specific Environmental Management Acts (SEMAs)	The SEMAs refer to specific portions of the environment where additional legislation over and above the NEMA (1998) as amended, is applicable.	SEMAs likely to be relevant to this application include the following: • National Environmental Management: Protected Areas Act (NEM:PAA, Act 57 of 2003. • National Environmental Management: Biodiversity Act (NEM:BA, Act 10 of 2004);

Applicable Legislation, Policies and Guidelines	Description of Legislation, Policy or Guideline	Relevance to the Proposed Project
Integrated Environmental Management Information Guidelines Series:	This series of guidelines was published by the Department of Environmental Affairs (DEA) and refers to various environmental aspects. Applicable guidelines in the series for the proposed farm expansion activities include: • Guideline 5: Companion to NEMA EIA Regulations, 2010; • Guideline 7: Public participation; and • Guideline 9: Need and desirability. Additional guidelines published in terms of the NEMA EIA Regulations, 2014 (as amended), in particular: • Guideline 3: General Guide to EIA Regulations, 2006; • Guideline 4: Public Participation in support of the EIA Regulations, 2006; and • Guideline 5: Assessment of alternatives and impacts in support of the EIA Regulations, 2006.	These guidelines will assist in conducting the EIA.
Best Practise Guideline (BPG)	The BPG series refers to publications by the then Department of Water Affairs and Forestry (DWAF), now the Department of Human Settlements, Water and Sanitation (DHSWS), providing best practice principles and guidelines relevant to certain aspects of water management.	Best practice guidelines relevant to the proposed farming expansion activities will be considered during this EIA.
Conservation of Agricultural Resources Act (Act 43 of 1983- CARA)	The CARA controls the exploitation of natural agricultural resources to promote conservation of soils, water resources and vegetation. In addition, the CARA also provides for the control of invader plant species and weeds.	This EIA is conducted to align with the CARA to promote sustainable utilisation of the natural agricultural resources. Precautionary measures will be included in the EMPr in order to conserve the soils and vegetation and to protect the proposed footprint area against weeds and invader species.
National Heritage Resources Act (Act 25 of 1999- NHRA)	The National Heritage Resources Act aims to promote good management of cultural heritage resources and encourages the nurturing and conservation of cultural legacy so that it may be bestowed to future generations.	It is possible that some heritage resources and palaeontological features could occur within the project boundary area.
National Forests Act (Act 84 of 1998- NFA)	The National Forests Act provides for the protection of forests as well as specific tree species.	A permit will be required should a protected tree species be required to be destroyed, transported, or transplanted.
National Development Plan (NDP)	The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting	This project aligns with the aims of the NDP. Approximately 5 skilled and 110 unskilled opportunities will be made available during operational phase of the project. 92 % of these will accrue to previously disadvantaged individuals.

Applicable Legislation, Policies and Guidelines	Description of Legislation, Policy or Guideline	Relevance to the Proposed Project
	leadership and partnerships throughout society.	
Northern Cape Nature Conservation Act (Act 9 of 2009)	This act provides for, among other, the sustainable utilisation of wild animals and plants and the protection of protected species.	The proposed project area is situated amongst natural indigenous vegetation and cultivated land. A permit may be required for site clearing and/ or for the destruction of any nationally or provincially listed protected species.
Northern Cape Provincial Spatial Development Framework (SDF) and Pixley Ka Seme District Municipality SDF	Spatial land-use directive which aims to promote environmental, economic, and social sustainability through sustainable development.	The proposed project aligns with the Northern Cape and Pixley Ka Seme District Municipality SDF. The Siyancuma Local Municipality does not have a SDF as of yet.
Spatial Planning and Land Use management Act (Act 16 of 2013- SPLUMA)	SPLUMA aims to develop a new framework to govern planning permissions and approvals, sets parameters for new developments and provides for different lawful land uses in South Africa. SPLUMA is a framework law, which means that the law provides broad principles for a set of provincial laws that will regulate planning.	The SPLUMA was considered as part of the EIA process.
Noise Control Regulations, 1992 (GN R.154)	The Noise Control Regulations provide a means for regulating noise emissions which may cause harm or nuisance.	These regulations were considered in the activities that will take place as part of the proposed project.
The Environment Conservation Act (Act 73 of 1989- ECA)	To provide for the effective protection and controlled utilization of the environment and for matters incidental thereto.	This EIA will align with the Environmental Conservation Act.
National Veld and Forest Fire Act (Act 101 of 1998)	The purpose of this Act is to prevent and combat veld, forest and mountain fires.	The proposed project area is situated in the amongst natural indigenous vegetation and cultivated land. It is important to ensure that the necessary precautionary measures are included in EMPr in case of fires.
The National Heritage Resources Act (Act 25 of 1999- NHRA)	The act stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority.	Heritage and palaeontological specialist studies were conducted to identify any heritage or palaeontological resources that may be impacted on by the proposed project.

5.1 APPLICABLE NATIONAL LEGISLATION

The legal framework within which the proposed agricultural expansion activities operates is governed by many Acts, Regulations, Standards and Guidelines on an international, national, provincial and local level. Legislation applicable to the project includes (but is not limited to) those discussed below.

5.1.1 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA. In South Africa, EIA's became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA).

Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now DEA) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended in June 2010 and again in December 2014 as well as April 2017. The 2014 NEMA EIA Regulations (as amended) are applicable to this project.

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that have been identified to be triggered by the proposed development. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting EIA's in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the EIA process to be followed when applying for EA for any listed activity. The Regulations differentiate between a simpler Basic Assessment Process (required for activities listed in GN R. 983 and GN R. 985) and a more complete EIA process (activities listed in GN R. 984). In the case of the proposed farm expansion activities, there are activities triggered under GN R. 984 and as such a full EIA process is necessary. Table 5 presents all the anticipated listed activities under the NEMA 2014 EIA Regulations (as amended) that are applicable to this project.

Table 5: Listed activities in terms of the NEMA EIA Regulations (2014) as amended

Name of activity	Aerial extent of the activity	Applicable listing notice
Clearance of indigenous vegetation to construct pivots for cultivation of potatoes	70 ha	NEMA GN R. 984, Listing Notice 2, Activity 15

An environmental Scoping and Impact Assessment process is reserved for activities which have the potential to result in significant impacts which are complex to assess. Scoping and Impact Assessment studies accordingly provide a mechanism for the comprehensive assessment of activities that are likely to have more significant environmental impacts. Figure 4 below provides a graphic representation of all the components of a full EIA process.

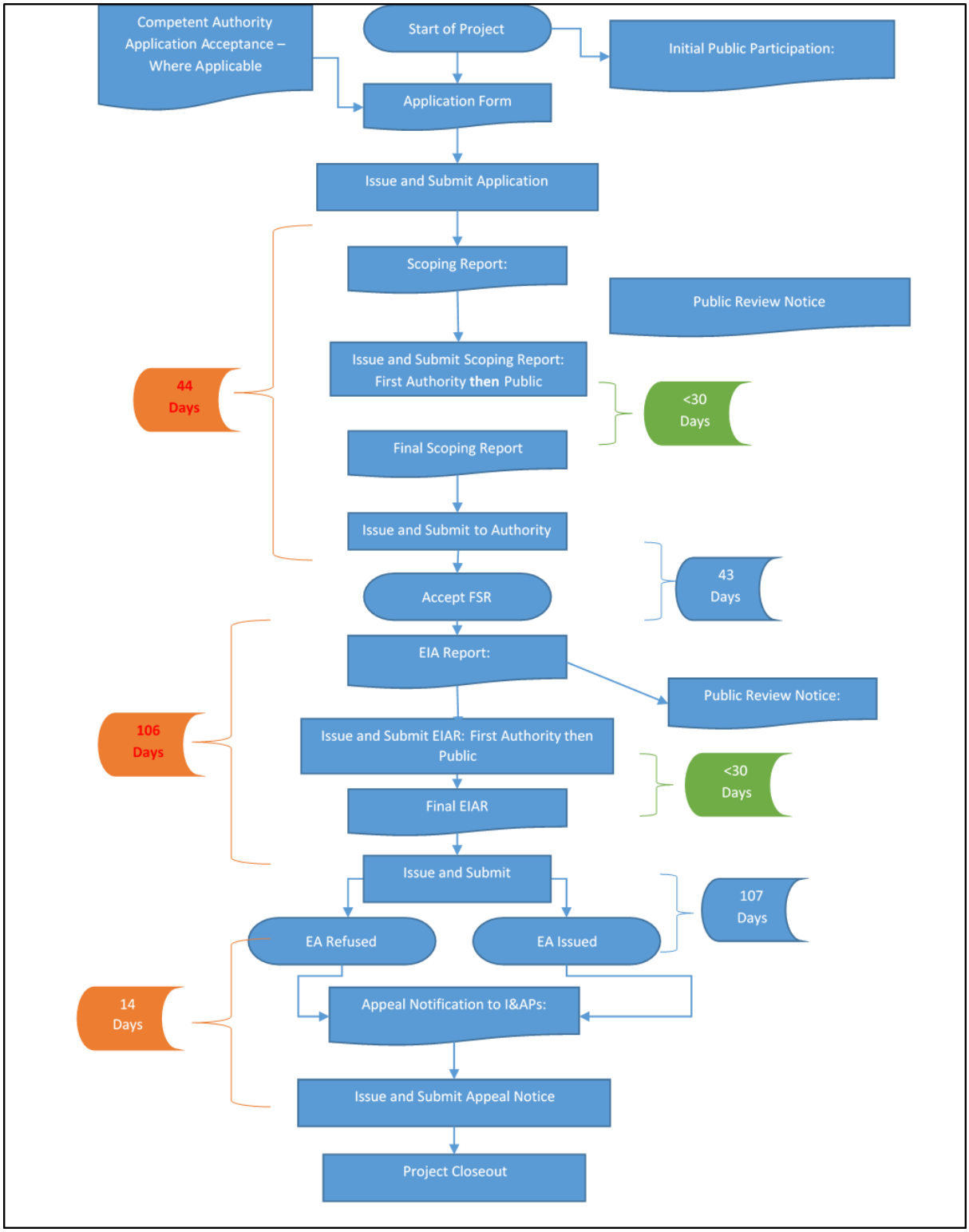


Figure 4: EIA process diagram

5.1.2 THE NATIONAL WATER ACT (NWA)

The National Water Act, 1998 (Act 36 of 1998 – NWA) makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the NEMA EIA Regulations. A person may use water if the use is:

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

These water use processes are described in Figure 5 below.

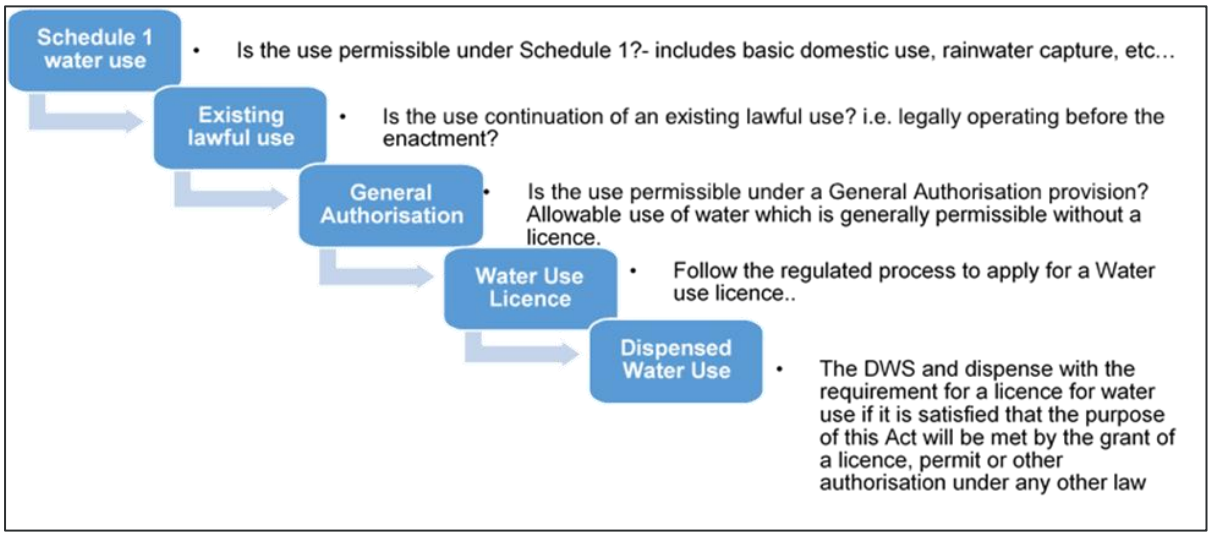


Figure 5: Authorisation processes for new water uses

The NWA defines 11 water uses. A water use may only be undertaken if authorised by the DHSWS. Water users are required to register certain water uses that took place on the date of registration, irrespective of whether the use was lawful or not. The water uses for which an authorisation or licence can be issued include:

- Taking water from a water resource;
- Storing water;
- Impeding or diverting the flow of water in a watercourse;
- Engaging in a stream flow reduction activity contemplated in section 36;
- Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;
- Disposing of waste in a manner which may detrimentally impact on a water resource;
- Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- Altering the bed, banks, course or characteristics of a watercourse;
- Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

- Using water for recreational purposes.

No further water use authorisation should be required for the proposed project as water to be used on the farm was already listed with the Oranje Vaal Water Users Association on 17 August 2020 for 19 140 m^3/ha (See Appendix G for the certificate of enrolment).

5.1.3 THE SPATIAL PLANNING AND LAND USE MANAGEMENT ACT (SPLUMA)

The Spatial Planning and Land Use Management (Act 16 of 2013 – SPLUMA) is set to aid effective and efficient planning and land use management, as well as to promote optimal exploitation of minerals and mineral resources. The SPLUMA was developed to legislate for a single, integrated planning system for the entire country. Therefore, the Act provides a framework for a planning system for the country and introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals. The proposed project aligns with the SPLUMA and the Pixley Ka Seme District Municipality SDF as the proposed pivots will be constructed within a potential intensive irrigation agricultural area (see Figure 6).

5.1.4 NOISE CONTROL REGULATIONS, 1992 (GN R.154)

In terms of section 25 of the ECA, the National Noise Control Regulations (GN R. 154 – NCRs) published in Government Gazette No. 13717 dated 10 January 1992, were promulgated. The NCRs were revised under GN R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations.

The NCRs will need to be considered in relation to the potential noise that may be generated mainly during the construction and decommissioning phases of the proposed project. The two key aspects of the NCRs relate to disturbing noise and noise nuisance.

Section 4 of the Regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the Regulations as "*a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more*."

Section 5 of the NCRs in essence prohibits the creation of a noise nuisance. A noise nuisance is defined as "*any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person.*" Noise nuisance is not anticipated as part of the proposed farming activities as there are no nearby noise receptors.

5.1.5 ENVIRONMENT CONSERVATION ACT (ECA)

The Environment Conservation Act (Act 73 of 1989 – ECA) was, prior to the promulgation of the NEMA, the backbone of environmental legislation in South Africa. To date the majority of the ECA has been repealed by various other Acts, however Section 25 of the Act and the Noise Regulations (GN R. 154 of 1992) promulgated under this section are still in effect. These Regulations serve to control noise and general prohibitions relating to noise impact and nuisance. Noise nuisance is not anticipated as part of the proposed farming activities.

5.1.6 THE NATIONAL HERITAGE RESOURCES ACT

The National Heritage Resources Act (NHRA) (Act 25 of 1999) stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…". The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA. This change requires us to evaluate the Section of these Acts relevant to heritage.

The NEMA 23(2)(b) states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage".

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be considered of the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 (Fourie, 2008b).

5.2 PERIOD FOR WHICH AUTHORIZATION IS REQUIRED

The authorisation will be required for the duration of the agricultural activities on-site.

6 NEED AND DESIRABILITY OF THE PROPOSED PROJECT

This section will examine the need and desirability of the proposed pivots and the importance of the project for the applicants continued operations and as a local economic stimulus. The proposed pivots will allow for favourable economic impacts on both the local and regional economy. The proposed pivots are consistent with the surrounding land use activities which is largely agricultural. Should the project proceed additional jobs are anticipated to be created and the project will contribute to food security.

6.1 NEED AND DESIRABILITY ANALYSIS

The needs and desirability analysis component of the "*Guideline on need and desirability in terms of the Environmental Impact EIA Regulations (Notice 819 of 2014*)" includes, but is not limited to, describing the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question, and how the proposed development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage sites, opportunity costs, etc.). Table 6 below presents the needs and desirability analysis undertaken for the proposed pivot development.

Table 6: Needs and desirability analysis for the proposed project.

Ref No.	Question	Answer
1	**Securing ecological sustainable development and use of natural resources**	
1.1	How were the ecological integrity considerations taken into account in terms of: Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets, Ecological drivers of the ecosystem, Environmental Management Framework, Spatial Development Framework (SDF) and global and international responsibilities.	After running the DEA screening tool (Appendix F), specialist studies that were identified included: • Heritage Impact Assessment • Palaeontological Impact Assessment • Biodiversity Impact Assessment • Agricultural Impact Assessment • Landscape/ Visual Impact Assessment • Aquatic Biodiversity Impact Assessment • Hydrology Assessment • Socio-Economic Assessment In terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended, the required DEFF Screening Report is provided as part of Appendix F. Only the Heritage, Palaeontological and Biodiversity specialist assessments were deemed necessary by the EAP and were conducted by the relevant specialists. These were the only specialist studies considered because of the proposed location and type of activities which form part of the pivot expansion project. A desktop study and an on-site investigation was conducted on the 19th of November 2020, which confirmed the redundance of additional specialists' studies to be done. No aquatic areas exist within or closely surround the proposed footprint area. Most of the footprint will fall on old lands (previously cultivated land that was allowed to reform into a semi-natural state) and the proposed activity, pivot irrigation, will visually fit in with the surrounding area because of the presence of other pivots in the project's vicinity.

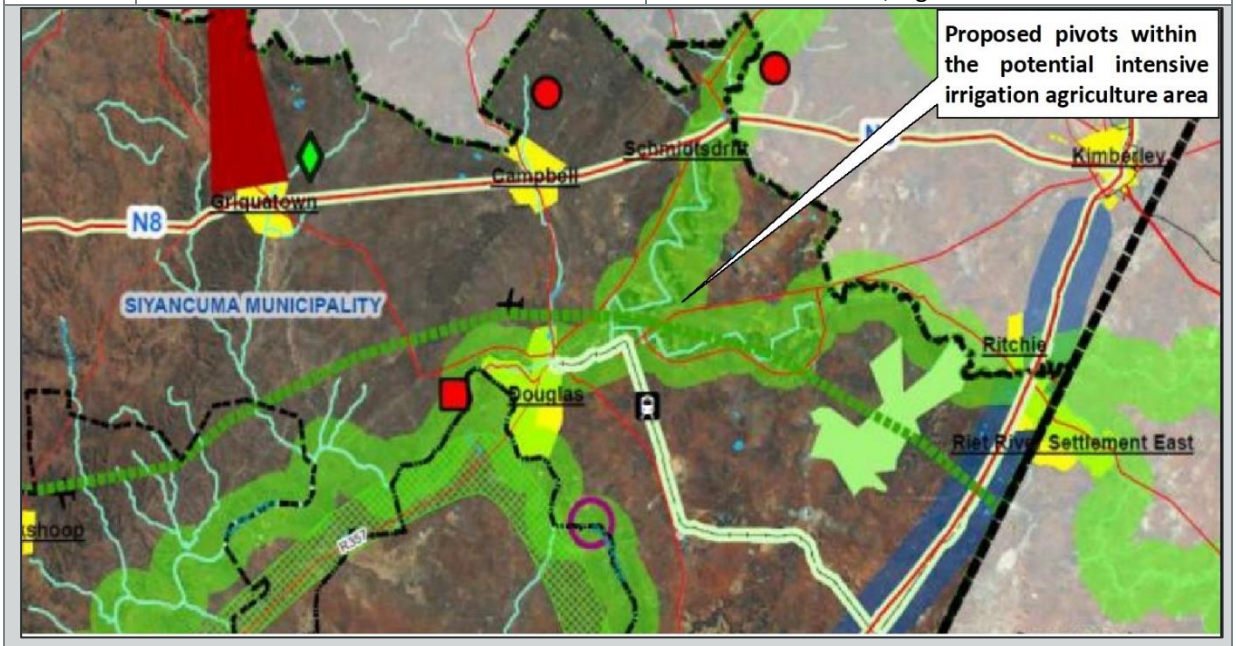
Ref No.	Question	Answer
		The biodiversity and heritage/ palaeontological specialist studies involved the gathering of desktop data and an on-site inspection to identify and assess any environmental impacts that may occur because of the proposed farming expansion project. These impacts were assessed according to the EIMS pre-defined impact significance rating methodology (Section 10). The specialists have also recommended appropriate mitigation/ management or optimisation measures to minimise potential negative impacts or enhance potential benefits, respectively. The proposed development aligns with the Siyancuma Local Municipality Local Economic Development Plan (LED), which highlights agriculture and geoprocessing as an opportunity for economic growth in the municipality.
1.2	How will this project disturb or enhance ecosystems and / or result in the loss or protection of biological diversity? What measures were explored to avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	Refer to the baseline ecological information in Section 9, and the impact assessment and mitigation measures in Section 10 of this Scoping Report. Efforts will be made to avoid any identified impacts/ disturbance to sensitive environmental constraints.
1.3	How will this development pollute and / or degrade the biophysical environment? What measures were explored to either avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	Refer to the alternatives considered for this project in Section 7, the baseline ecological information in Section 9, and the impact assessment and mitigation measures in Section 10 of this Scoping Report.
1.4	What waste will be generated by this development? What measures were explored to avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and / or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste generated will consist mainly of plant material while clearing the proposed footprint area. Refer to Section 7 for alternatives considered and Section 10 for possible impact and mitigation measures relating to waste.
1.5	How will this project disturb or enhance landscapes and / or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	Heritage and Palaeontological specialist assessments were conducted to identify any possible impacts from the proposed activities and mitigation measures. Refer to Appendix D for the specialist report. The possible impacts and associated mitigation measures as identified by the specialist was also included as part of Section 9.
1.6	How will this project use and / or impact on non-renewable natural resources? What measures were explored to ensure	It is anticipated that no non-renewable natural resources will be impacted on. However, potatoes are known heavy feeders, meaning they can easily

Ref No.	Question	Answer
	responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	deplete soils of nutrients. Therefore, crop rotations will be done. Crop rotation is the growing of different crops in succession on a specific field. This practise, if implemented correctly, can among other positive impacts, improve soil health and fertility, maintain soil structure and integrity, and help combat pests and weeds. In year 1, potato seeds will be planted on 20 ha of pivot 1 and in year 2 potato seeds will be planted on the other 20 ha of pivot 1. Thereafter potato seeds will be planted on pivot 2 and 3 in years 3 and 4, respectively. Crop rotation will be done after each harvest by planting either corn, wheat, lucerne or peanuts on the pivots. Soils will only be supplemented, after testing, with the necessary chemicals to ensure a good yield.
1.7	How will this project use and / or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and / or impacts on the ecosystem jeopardise the integrity of the resource and / or system considering carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	No renewable resources are anticipated to be used and no impacts on renewable resources are expected as a part of the proposed activities.
1.7.1	Does the proposed project exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?	For the foreseeable future, the proposed pivots will only cover an area of 70 ha on which crops will be planted. The main natural resource required is the initial soil area on which the crops will be planted as well as additional chemicals from time-to-time, when needed, to supplement the soil. An increase of resources will not be required to maintain economic growth as the crops planted over the 70 ha area should not depreciate in value over time. If the applicant wants to expand his pivot operations in the future, it will consume more resources, in the form of additional soil area.
1.7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used?	The area for development of the proposed pivots mostly consists of old land, which has over time developed into a semi-natural state. The proposed area for development is currently uneconomical and not used. For this reason and considering that the major surrounding land-use is agriculture, the proposed pivots do constitute the best use of the natural resources/ area. The alternative will be for the area to remain undeveloped.
1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	The proposed pivots will mostly be located on old lands (previously cultivated area) within the property of the applicant. While the proposed

Ref No.	Question	Answer
		project will not reduce the dependency on natural resource, the output of the proposed pivots will result in an increase in employment and food security.
1.8	**How were a risk-averse and cautious approach applied in terms of ecological impacts**	
1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The exact number and location of protected plant species within the proposed development footprint is not known. The EMPr will include a requirement for a specialist walkthrough to identify any protected species within the development footprint and to oversee the relocation of these plants, if required, prior to any developments. Additionally, chance finds with regards to cultural heritage and palaeontology is a possibility. A chance find protocol was developed by the heritage/ palaeontology specialist. Another gap in knowledge is the exact soil composition. It will be required as part of the EMPr that soil testing be done prior to development to identify and add any substances that is required to ensure a good crop yield.
1.8.2	What is the level of risk associated with the limits of current knowledge?	In terms of location the level of risk with regards to soil composition is low due to the proposed project being within the vicinity of other successful pivot operations. The uncertainties mentioned in 1.8.1 above will be mitigated in the EMPr, which if followed, will attribute a low risk to any uncertainties.
1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Sufficient information was gathered prior to the onset of this process to indicate that positive impacts will outweigh low risk for the proposed project. The proposed project will positively influence the local economy through job creation and food security.
1.9	**How will the ecological impacts resulting from this development impact on people's environmental right in terms following?**	
1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. In summary, because of the preferred location alternative, the proposed project will not negatively affect public amenity or have any high negative visual impacts, as the proposed pivots are within the applicant's property and aligns with surrounding land-use. Water quality won't be affected as there are no water sources within the vicinity of the proposed development.
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. In summary, positive impacts will be to the local economy as a result of job creation and contribution to food security.

Ref No.	Question	Answer
1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Refer to baseline ecological information in Section 9, and the impact assessment and mitigation measures in Section 10 of this Scoping Report. No dependencies are expected to be negatively impacted on because the proposed development will be on the applicant's property. The pivots will not negatively impact on any water sources that might be used by the surrounding communities. If any cultural or heritage resources are identified during development, a chance find procedure as described by the heritage specialist will be implemented to mitigate any negative impacts.
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. Overall, the proposed project will result in the loss of natural vegetation, however the impact is anticipated to be low.
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Refer to Section 7 for details of the alternatives considered, as well as this section of the Scoping Report for the advantages and disadvantages of the proposed activity. The only viable alternative assessed for the proposed pivots is the no-go option.
1.13	Describe the positive and negative cumulative ecological / biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. The proposed project will contribute to the loss of natural vegetation and could potentially impact on cultural resources if a chance find occurs. The proposed pivot development is consistent with the surrounding land use activities in the area. Because of this and the small scale no significant negative cumulative impacts are expected.
2	**Promoting justifiable economic and social development**	
2.1	**What is the socio-economic context of the area, based on, amongst other considerations, the following?**	
2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area,	Siyancuma LM, part of the Pixley Ka Seme DM, has three major urban settlements: Douglas, Griekwastad and Campbell and a few rural areas. The rest of the municipality consists of mainly commercial and small farming areas (which aligns with the proposed project) as well as small private game parks. This municipality was classified as a financially distressed municipality, mainly due to the strain that Eskom is putting on its cash flow. The LM's Integrated Development Plan (IDP, 2020) states that the main themes to focus on are increasing economic growth, improving community self-reliance, achieving service excellence and sustainability.

Ref No.	Question	Answer
		According to StatsSA (2001 and 2011) the total population for Siyancuma Local Municipality showed a negative growth rate of -5.6 % with the population decreasing from 39 275 to 37 076. The 2016 Community Survey showed a further negative population growth rate of -3.1 % from 2011 to 2016 during which the population decreased from 37 067 to 35 938. The age group between 20 and 34 (characterised as the economically active group) forms 27.7 % of the total population in this LM. The LM's population can be broken down into the following (Community Survey, 2016): • Coloured – 67,80 % • African – 25,30 % • White – 6,69 % • Asian – 0,21 % Irrigated agriculture is among the major contributing factors to the Northern Cape provincial GDP, with a total area of 140 000 ha that is under irrigation. This sector uses approximately 80% of the total water used in the province to produce nearly 50% of the gross agricultural product. Agriculture forms the key economic activity within the Pixley Ka Seme District Municipality. According to the Pixley Ka Seme District Municipality IDP (2017) the agricultural sector provides around 39% of the employment opportunities in the district, which represent a significant and important economic sector, especially in this area that has limited job opportunities. The mechanisation by farmers has however resulted in declining job opportunities in this sector. According to the Pixley Ka Seme District Growth and Development Strategy (2006) the Municipalities of Ubuntu, Siyathemba and Siyacuma contribute the most to this sector, with a total of 28,49 % contributed to the provincial Gross Geografic Product. Agriculture and agro-processing is one of the six critical sectors which was identified in the Growth and Development Strategy for unlocking economical potential. Douglas, 26 km southwest of the proposed project, is the economic hub of the municipality. This town has seen an influx of unskilled people from farms which is continuous. The agriculture, community, social and personal services sectors are the strongest economic sectors and biggest job providers in and around this town. The major employment agencies in the area include agricultural entities like GWK, the SLM and provincial government departments (IDP, 2020)
2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	The LM has no Spatial Development Framework (SDF) or Land Use Scheme (LUS) to date. However, even though a small project, the proposed pivots align with the municipalities ideals as set out in the IDP as it will contribute to sustainable economic

Ref No.	Question	Answer
		growth and job creation of unskilled people, which is much needed in the municipality. This is further exacerbated by the municipality's Key Performance Area 3- Local Economic Development and Tourism. Additionally, the project promotes self-reliance and fits in with one of the municipalities main themes, and Douglas's main job providing economic sectors, which is farming. The municipalities mission, among others, is to optimize all available resources and human skills to create an economically enabling environment. According to the Pixley Ka Seme DM SDF (2013-2018) The proposed project falls within a potential intensive irrigation agricultural area. See below extract from the SDF, Figure 6.
		 **Figure 6: Extract from the Pixley Ka Seme DM SDF (2013-2018).**
2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	The preferred location for proposed pivots falls within a potential intensive irrigation agricultural area according to the Pixley Ka Seme DM SDF (2013-2018). The proposed project aligns with the surrounding land uses.
2.1.4	Municipal Economic Development Strategy ("LED Strategy").	The LED strategy for Siyancuma LM focuses on 4 LED Pillars, each with supporting programmes, project and accompanying Key performance indicators (KPIs). Pillar 1 of the LED strategy focuses on Agriculture and Agro-Processing Development The proposed pivot project aligns with the programmes and projects identified under Pillar 1 of the LED. The project will support agricultural growth and will create job opportunities for the local community as far as reasonably possible. Should the project proceed.
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate	Job creation for local residents as far as reasonably possible. Refer to the identified impacts, their assessment and recommended mitigation measures in Section

Ref No.	Question	Answer
	elements/aspects), and specifically also on the socio-economic objectives of the area?	10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr
2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	The proposed development aligns and compliments the LED Pillar 1: local economic development, which includes various projects that focuses on agriculture and agro-processing development, including potato processing and packaging. The proposed pivot plant project will support the LED pillar 1 through the creation of job opportunities for the local community as far as reasonably possible.
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	Refer to the public participation process undertaken to date in Section 8 of this Scoping Report. Public participation and consultation will continue during the EIA phase as described in Section 11. Furthermore, refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. The impacts will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The need for additional pivots will support the need for short-term and long-term food security through the provision of potato seeds The proposed pivots will allow for favourable economic impacts on both the local and regional economy. Should the project proceed, additional jobs are anticipated to be created for the foreseeable future. Furthermore, as per pillar 1 of the LED strategy, the proposed pivots will support the emerging potato farmers through the provision of seedlings and in turn will help increase the portion of crops that are beneficiated locally.
2.5	**In terms of location, describe how the placement of the proposed development will:**	
2.5.1	Result in the creation of residential and employment opportunities in close proximity to or integrated with each other.	The proposed project site is located in the middle of agricultural land which is located approximately 27 km north-east of the town Douglas and 77 km south-west of the town Kimberly. Should the project proceed, additional jobs are anticipated to be created for the foreseeable future for the nearbysurrounding farming communities.
2.5.2	Reduce the need for transport of people and goods.	The proposed project will not have an increase or reduction on the need for transportation of goods and people as the proposed project will allow for the continuation of farming practices for the applicant.
2.5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	The proposed project will not have an increase in the use of public transport as the proposed project will allow for the continuation of farming practices for the applicant.
2.5.4	Compliment other uses in the area,	The proposed project is consistent with the other land uses in the area, which is agricultural farming.

Ref No.	Question	Answer
2.5.5	Be in line with the planning for the area.	Refer to item 2.1.2 of this table (above).
2.5.6	For urban related development, make use of underutilised land available with the urban edge.	Not applicable. The proposed pivots will be situated outside an urban area within an area classified as agricultural land.
2.5.7	Optimise the use of existing resources and infrastructure.	No existing infrastructure exist on the proposed site location.
2.5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement).	Refer to Section 4 of this Scoping Report.
2.5.9	Discourage "urban sprawl" and contribute to compaction / densification.	The proposed project will not have an impact on urban sprawl and compaction/densification as the project location is situated 26km north-east of the town Douglas and 77km south-west of the town Kimberly in an area zoned as agricultural land.
2.5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs.	Refer to items 2.5.7 to 2.5.9 of this table (above).
2.5.11	Encourage environmentally sustainable land development practices and processes.	The proposed land use is agricultural, which aligns with the surroundings. The pivot areas will be subject to crop rotations, a well-known agricultural best practice, to ensure sustainability.
2.5.12	Consider special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.).	See item 1.7.3 of this table (above).
2.5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	The proposed project will allow for contribution to the local, regional and national Gross Domestic Product (GDPs), and also to the local communities through employment of workers and local. Surrounding the proposed development footprint are other successful pivot operations, suggesting that the area has potential to succeed economically.
2.5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area.	The proposed locality is natural semi-vegetated and in the middle of agricultural land. Therefore, no sense of history or heritage will be lost. The proposed pivots will fit in with the surroundings, having no negative impacts on the sense of place.
2.5.15	In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The proposed locality is natural semi-vegetated and in the middle of agricultural land. The proposed pivots will fit in with the surroundings, having no negative impacts on the sense of place.
2.6	**How was a risk-averse and cautious approach applied in terms of socio-economic impacts**	
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The following gaps/ uncertainties are noted: • The scoping process and report is based on the technical information and process description provided by the client; and

Ref No.	Question	Answer
		• The description of the baseline environment has been obtained from specialist studies and a desktop analysis.
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	The level of risk is low as the project is not expected to have far reaching negative impacts on socio-economic conditions should the recommended mitigation and management measures be implemented and adhered to.
2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	As the proposed project is a new development a cautious approach has been applied. An extensive public participation process was undertaken to ensure that the local community and relevant authorities were notified of the proposed project.
2.7	**How will the socio-economic impacts resulting from this development, impact on people's environmental right in terms following:**	
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr. In summary the only negative effects identified will be that on the loss of natural vegetation.
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr. In summary, local employment will be prioritised.
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 9 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr. The proposed development will have a minimal impact on human-wellbeing and ecosystem services due to the location. Human livelihoods could however be positively impacted because of employment opportunities. There will be a negative impact on the ecology of the area as natural vegetation will need to be cleared in order to develop the pivots. These impacts could be minimised if the proposed mitigation measures are carried out.
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr. Additionally, see item 2.8 of this table (above).
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.

Ref No.	Question	Answer
	vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	The preferred alternative is considered the best practicable environmental option as it is located in an area zoned as agricultural land and is adjacent to the existing pivots.
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	By conducting a Scoping and EIA process, with an adequate public participation process, the applicant ensures that equitable access to the environment has been considered. Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.13	**What measures were taken to:**	
2.13.1	Ensure the participation of all interested and affected parties.	Refer to the public participation process undertaken to date in Section 8 of this Scoping Report. Public participation and consultation will continue during the EIA phase as described in Section 11. Advertisements as well as site notices were distributed in and around the project area in English and Afrikaans to assist in understanding the project. The notices and advertisements included contact details for easy access to the public participation specialist if any additional information is required by anyone from the public. The public is encouraged to participate and provide input which will then be recorded and submitted with the relevant reports to the competent authority. The scoping report will be made available on the at a local public place (Public Library) and the EIMS website after completion, and all registered I&APs will be notified of the report availability.
2.13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	
2.13.3	Ensure participation by vulnerable and disadvantaged persons,	
2.13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5	Ensure openness and transparency, and access to information in terms of the process,	
2.13.6	Ensure that the interests, needs and values of all interested and affected parties were considered, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein will be promoted?	
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that	Refer to the public participation process undertaken to date in Section 8 of this Scoping Report. Public participation and consultation will continue during the EIA phase as described in Section 11.

Ref No.	Question	Answer
	is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	Furthermore, refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. The impacts will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.15	What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Workers at the farm will be educated on a regular basis through toolbox talks on the environmental and health risks that may occur within their work environment, and adequate measures will be taken to ensure that the appropriate personal protective equipment is issued to workers based on the areas that they work in as well as the requirements of their job.
2.16	**Describe how the development will impact on job creation in terms of, amongst other aspects:**	
2.16.1	The number of temporary versus permanent jobs that will be created.	The project pivots are located approximately 27 km north-east of the town Douglas and 77 km south-west of the town Kimberly. It is anticipated that workers currently employed or to be employed will travel from the surrounding towns and farming communities. During construction 5 temporary skilled job opportunities and 20 unskilled job opportunities will be made available. These opportunities are temporary as they are only applicable to the construction phase. During operation, 5 skilled opportunities and 110 un-skilled opportunities will be created. These are more permanent in nature as the workforce will be required during each harvest for the duration of the project. The anticipated expected value of the employment opportunities during the first year (construction and operation) is R1 751 000.00 of which 92% of this value will accrue to previously disadvantaged individuals. The expected current value of employment opportunities amounts to R18 849 000.00 during the first 10 years.
2.16.2	Whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area).	
2.16.3	The distance from where labourers will have to travel.	
2.16.4	The location of jobs opportunities versus the location of impacts.	
2.16.5	The opportunity costs in terms of job creation.	
2.17	**What measures were taken to ensure:**	
2.17.1	That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	The Scoping and EIA process requires governmental departments to communicate regarding any application. In addition, all relevant Departments and key stakeholders have been notified about the project by the EAP and registered as Interested and Affected Parties who will continue to be notified and engaged with regarding the project throughout the EIA process.
2.17.2	That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures.	The Scoping and EIA process requires governmental departments to communicate regarding any application. In addition, all relevant Departments and key stakeholders have been notified about the project by the EAP and registered as Interested and Affected Parties who will continue to be notified and engaged with regarding the project throughout the EIA process.

Ref No.	Question	Answer
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Refer to the public participation process undertaken to date in Section 8 of this Scoping Report. Public participation and consultation will continue during the EIA phase as described in Section 11. Furthermore, refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. The impacts will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr. Potato seedlings are sought in the agricultural industry and will contribute to food security on a national scale.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. The impacts will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to Section 7 for details of alternatives considered in this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this Scoping Report. The impacts will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.

7 PROJECT ALTERNATIVES

The identification of alternatives is a key aspect of the success of the environmental scoping phase. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess in the EIA phase. There are, however, some significant constraints that have to be considered when identifying alternatives for a project with this scope. Such constraints include social, financial and environmental issues, which will be discussed as part of the evaluation of the alternatives for this project. Alternatives can typically be identified according to:

- Location alternatives (including design and layout);
- Process alternatives;
- Technology alternatives; and
- Activity alternatives (including the No-Go option).

For any alternative to be considered feasible such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. As mentioned in Section 6 of this Scoping Report, the need for the proposed project includes the following key drivers:

- The need for employment opportunities, which the project will create.
- The project will contribute to food security (crops will be sold locally).
- The need for integrated and zoned land-uses.

Essentially, alternatives represent different means of meeting the general purpose and need of the proposed project through the identification of the most appropriate and feasible methods of development/ production, all of which are discussed below. Alternatives can further be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and or scoping phases of the EIA process (DEAT, 2004). Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation and management measures and are not specifically identified as distinct alternatives. Incremental alternatives to be considered by the applicant include the type of irrigation system to be used and the method of sourcing power to the pivot to turn around its centre. These will be investigated further during the EIA phase and will form part of the EMPr.

In this section the only discrete alternatives considered, as described in the sections that follow, was the **Preferred Alternative** and the **No-Go Alternative**, as no other feasible alternatives could be identified with regards to location, process, technology or the type of activity owing to the nature of the existing farming activities being undertaken by Williet Boerdery.

7.1 PREFERRED ALTERNATIVE

The preferred alternative will involve the expansion of agricultural activities on the farm Olie Rivier 170 (registration division: Kimberley) by introducing 3 new pivots that will require the clearance of approximately 70 ha of vegetation, primarily for the growing of potatoes. The 3 pivots will be 40 ha (pivot 1), 20 ha (pivot 2) and 10 ha (pivot 3) in size. In year 1, potato seeds will be planted on 20 ha of pivot 1 and in year 2 potato seeds will be planted on the other 20 ha of pivot 1. Thereafter potato seeds will be planted on pivot 2 and 3 in years 3 and 4, respectively. Crop rotation will be done after each potato harvest, by planting either corn, wheat, lucerne or peanuts on the pivots. See Figure 3 for a layout map of the proposed pivots.

Water for the pivots will be sourced from an existing borehole and pumped through an existing underground PVC pipe (315 mm in diameter), which will be extended toward the proposed 40 ha pivot. The existing pipe is approximately 1200 m in length and is being used to water pecan nut trees. The pipe will be extended by a further 500 m to reach the 40 ha centre pivot irrigation system. Water to be used for the proposed pivots were already listed with the Oranje Vaal Water Users Association on 17 August 2020 for pivot 1 (40 ha at 10 000 m^3/ha) and for pivot 2 (21.1 ha at 9140 m^3/ha). See Appendix G for the certificate of enrolment.

No other feasible alternatives other than the No-Go alternative could be identified. The proposed project is located on the applicant's property close to other pivots, mostly on previously cultivated lands. This makes it the ideal location as the area has been used previously for cultivation, and it fits in with the surrounding land uses. No significant negative environmental impacts are expected as because of the proposed project. No other land-uses seem more feasible within the proposed project area.

7.2 NO-GO ALTERNATIVE

The **no-go alternative** option means 'do nothing' or the option of not undertaking the proposed preferred activities, consequently leading to the continuation of the current land-use, which is leaving the location as a semi-vegetated area. As such, the 'do nothing' alternative or keeping the current status quo of a with no activities occurring on-site also provides the baseline against which the impacts of other alternatives should be compared.

8 STAKEHOLDER ENGAGEMENT

The Public Participation Process (PPP) is a requirement of several pieces of South African legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their opinions are taken into account, and a record included in the reports submitted to relevant authorities. The process aims to ensure that all stakeholders are provided an opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the proposed project needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with international best practise options;
- Compliance with national legislation;
- Establish and manage relationships with key stakeholder groups; and
- Encourage involvement and participation in the environmental study and authorisation / approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Provide an opportunity for I&APs to obtain clear, accurate and comprehensible information about the proposed activity, its alternatives or the decision and the environmental impacts thereof;
- Provide I&APs with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and / or the decision;
- Provide I&APs with the opportunity to suggest ways of avoiding, reducing or mitigating negative impacts of an activity and enhancing positive impacts;
- Enable the applicant to incorporate the needs, preferences and values of I&APs into the activity;
- Provide opportunities to avoid and resolve disputes and reconcile conflicting interests;
- Enhance transparency and accountability in decision-making;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and / or prevent environmental impacts associated with the project.

The PPP for this project has been undertaken in accordance with the requirements of the NEMA, as well as in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project.

8.1 LEGAL COMPLIANCE

The PPP must comply with several important sets of legislation that require public participation as part of an application for authorisation or approval. For this project, the National Environmental Management Act (Act No. 107 of 1998 – NEMA) applies. Adherence to the requirements of the above-mentioned Act will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation referenced in the Act. The details of the Integrated PPP followed are provided below.

8.2 GENERAL APPROACH TO PUBLIC PARTICIPATION

The PPP for the proposed project has been undertaken in accordance with the requirements of the NEMA as well as in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project.

8.3 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

The I&AP databases compiled for various past environmental authorisation processes in the vicinity of the proposed project have been utilised towards compiling a pre-notification register of key I&APs to be notified of the Environmental Authorisation Application. The I&AP database includes amongst others: landowners, communities, regulatory authorities and other specialist interest groups. Additional I&APs have been registered during the initial notification and call to register period. The I&APs database will continue to be updated throughout the duration of the EIA process. A full list of I&APs is attached in Appendix C.

8.3.1 LIST OF AUTHORITIES IDENTIFIED AND NOTIFIED

The following Government Authorities were notified of the proposed project

- Pixley Ka Seme District Municipality
- Siyancuma Local Municipality
- Commission on Restitution of Land Rights: Northern Cape and Free State Regional Office
- Department of Agriculture
- Department of Roads Transport and Public Works
- Department of Rural Development and Land Reform
- Department of Water Affairs
- Northern Cape Department of Agriculture & Land Reform
- Regional Land Claims Commission Free State and Northern Cape
- South African National Roads Agency Limited (SANRAL)
- South African Civil Aviation Authority
- South African Heritage Resources Agency (SAHRA)
- South African Radio Astronomy Observatory (SARAO)
- Northern Cape Department of Environment and Nature Conservation (DENC)

8.3.2 OTHER KEY STAKEHOLDERS IDENTIFIED AND NOTIFIED

The following key stakeholders have been identified and notified of the proposed project:

- Cilliers Blaauwkrantz Trust
- CJ Mulke Trust
- Faveur Boerdery Pty Ltd
- Genade Plase Pty Ltd
- Kaaldraai Trust
- Vickie Trust
- Youngberg Investments Pty Ltd
- Williet Boerdery Pty Ltd
- Botanical Society
- Conservation South Africa (CSA)
- Endangered Wildlife Trust (EWT)
- Oranje Vaal Water Users Association
- Succulent Society of South Africa (SSSA)
- WESSA

8.4 INITIAL NOTIFICATION OF I&APS

The PPP commenced on the 19th of November 2020 with an initial notification and call to register for a period of 14 days, ending on the 3rd of December 2020. Initial call to register notifications were conducted as presented below.

8.4.1 REGISTERED LETTERS, FAXES AND EMAILS

Registered letters, emails and facsimiles (faxes) were prepared and distributed to the identified relevant authorities, affected and adjacent landowners and legal occupiers, ward councillors and other pre-identified key stakeholders. The notification documents included the following information:

- The purpose of the proposed project;
- Details of the NEMA Regulations that are anticipated to be applicable and must be adhered to;
- List of anticipated activities to be authorised;
- Location and extent of activities to be authorised;
- Details of the affected properties (including a locality map or an indication of where the locality map may be viewed or obtained);
- Brief but sufficient detail of the intended operation to enable I&APs to assess/ surmise what impact the project will have on them or on the use of their land (if any);
- Initial call to register duration; and
- Contact details of the EAP.

In addition, a registration form was included in the registered letters, emails and facsimiles distributed to I&APs and it included a request for the following information from I&APs:

- Provide information on how they consider that the proposed project will impact on them or their socio-economic conditions;
- Make proposals as to how the potential impacts on identified environmental features, their infrastructure, and socio-economic concerns may be managed, avoided or mitigated;
- Details of the landowner and information on lawful occupiers;
- Details of any communities existing within the area;
- Details of any Tribal Authorities within the area;
- Details of any other I&APs that need to be notified;
- Details on any land developments proposed; and
- Any specific comments or concerns regarding the proposed project for environmental authorisation.

Proof of the registered letters, emails and facsimiles that were distributed during the initial notification and call to register period are attached in Appendix C.

8.4.2 SITE NOTICES AND POSTERS

4 Site notices were placed along, within and surrounding the perimeter of the proposed project area and its surroundings on 19 November 2020 . The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location;
- Description of the environmental authorisation application process;
- Legislative requirements; and
- Relevant EAP contact person details for the project.

Please refer Appendix C for proof of site notice and poster placement.

8.4.3 NEWSPAPER ADVERTISEMENTS

One advertisement (English and Afrikaans) was placed on the 19th of November 2020 in the Noordkaap Bulletin newspaper with circulation in the vicinity of the project area. The details of the advertisements are presented below:

- Project name;
- Applicant name;
- Project location;
- Description of the environmental authorisation application process;
- Legislative requirements; and
- Relevant EAP contact person details for the project.

As stated in sections above, I&APs were provided a period from the 19th of November 2020 to the 3rd of December 2020, to register for the proposed project. It is important to note however, that I&AP registration is on-going and will continue through the EIA process.

8.5 NOTIFICATION OF AVAILABILITY OF SCOPING REPORT

Notification regarding the availability of this Scoping Report for public review has been given in the following manner:

- Registered letters with details on where the Scoping Report is available from, as well as the duration of the public review comment period, were distributed to all registered I&APs (which includes key stakeholders, affected and surrounding landowners, and registered occupiers);
- Facsimile notifications with information similar to that in the registered letter described above, were distributed to all registered I&APs; and
- Email notifications with a letter attachment containing the information described above were also distributed to all registered I&APs.

The Scoping Report was made available for public review at the Kimberley Public Library from the 1st of April 2021 to the 5th of May 2021, for a period of 30 days as well as on the EIMS website (www.eims.co.za).

8.6 ISSUES AND REPONSES

Issues raised to date have been addressed in a transparent manner and the full details (such as the comment received, the name of the I&AP who commented, the issue raised and the main aspect of the raised issue, as well as the response provided to the I&AP) included in the Public Participation Report (Appendix C). A summary of the key issues/ comments raised and an indication of where these issues are addressed in this Scoping Report, is presented in Table 7 below.

Table 7: Summary of issues raised by I&APs

Issue/ Comment Raised	Aspect Affected	EAP Response/ Relevant Section in Scoping Report
Good afternoon, Please note that all development applications are processed via our online portal, the South African Heritage Resources Information System (SAHRIS) found at the following link: http://sahra.org.za/sahris/. We do not accept emailed, posted, hardcopy, faxed, website links or DropBox links as official submissions. Please create an application on SAHRIS and upload all documents pertaining to the Environmental Authorisation Application Process. As per section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA), an assessment of heritage resources must form part of the process and the assessment must comply with section 38(3) of the NHRA. Once all documents including all appendices are uploaded to the case application, please ensure that the status of the case is changed from DRAFT to SUBMITTED. Please ensure that all documents produced as part of the EA process are submitted as part of the application.	Heritage	No response required. EIMS will load the necessary documentation onto the SAHRIS website for comments from the SAHRA during the Scoping and EIA phase.

9 ENVIRONMENTAL ATTRIBUTES AND BASELINE

This section of the Scoping Report provides a description of the environment that may be affected by the proposed pivots. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the proposed project have been described. Baseline information sourced from various spatial datasets and the biodiversity and heritage/ palaeontological specialist studies have been utilised to prepare the environmental attributes baseline below.

9.1 CLIMATE

9.1.1 TEMPERATURE

The average monthly temperature was obtained from weatherbase.com (2021) for Kimberley, approximately 77 km northeast from the proposed project area, and is presented in According to the Siyancuma LM IDP (2020), temperatures during the day can vary between 1.7°C in winter and 34.8 °C in summer.

Table 8 and Figure 7 below. The average monthly temperatures were calculated based on 18 years on record. Average temperatures ranged between 11°C during winter months in June and July to 25°C in the summer during January. According to the Siyancuma LM IDP (2020), temperatures during the day can vary between 1.7°C in winter and 34.8 °C in summer.

Table 8: Monthly average temperature in Kimberley (weatherbase.com, 2021).

Monthly Average Temperatures (°C) in Kimberley												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
25	24	22	18	14	11	11	13	17	20	22	24	18

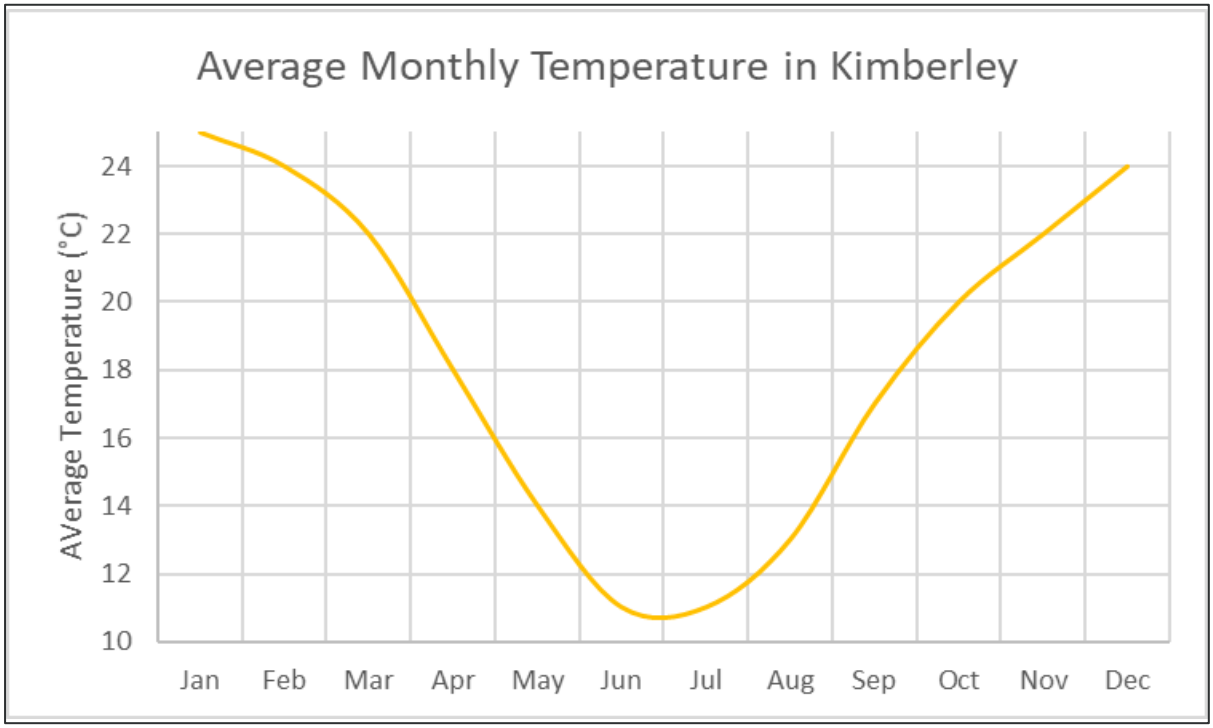


Figure 7: Monthly average temperature in Kimberley (weatherbase.com, 2021).

9.1.2 RAINFALL AND EVAPORATION

Rainfall data was collected from weatherbase.com (2021) and evaporation data was extracted from the Water Resources of South Africa 2005 Study (WR, 2005).

Average monthly precipitation values for Kimberly were extracted from weatherbase.com (2021) (see Table 9 and Figure 8). According to the site, these averages were derived from 114 years on record. The study area falls

within quaternary catchments C51M and C92B, and according to the Water Resources of South Africa Study (WR2005) the study area has an average annual evaporation of more than 2600 mm.

Table 9: Average monthly precipitation in Kimberley (weatherbase.com, 2021).

Average Monthly Precipitation (mm) in Kimberley												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
60	60	70	40	10	-	-	-	10	20	40	50	420

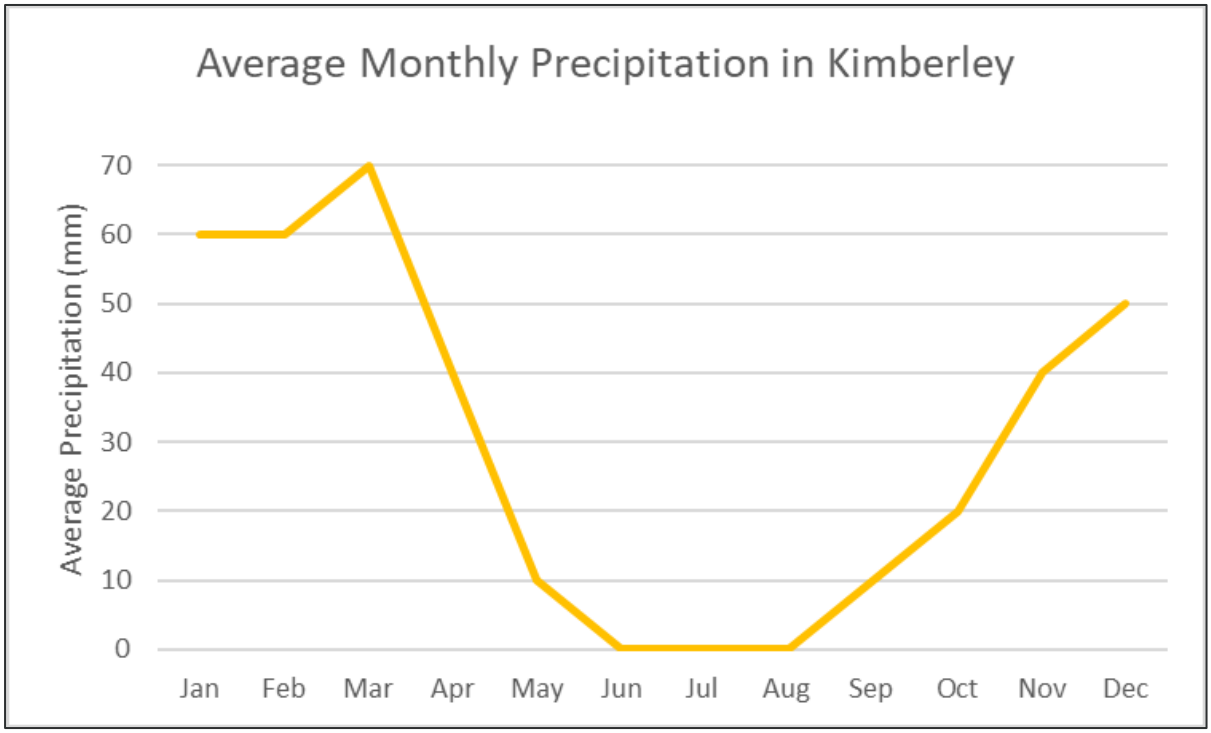


Figure 8: Average monthly precipitation in Kimberley (weatherbase.com, 2021).

9.2 TOPOGRAPHY

On a regional scale (50 km radius) the elevation ranges between approximately 980 and 1350 masl (Figure 9). The topography within the project area can be described as fairly flat (less than 10 % slope) with an elevation of 1050 masl. Some hills are located approximately 5 km northeast of the proposed project at 1140 masl and the Vaal river 2.4 km to the northwest of the proposed site at 1000 masl.

9.3 GEOLOGY AND PALAEONTOLOGY

Banzai Environmental was appointed as the specialists to conduct a Palaeontological Desktop Assessment (PDA) for the proposed pivot irrigation expansion project. The PDA was conducted to identify if fossils could be present within the area of the planned development and to evaluate the possible effect that construction can have on any palaeontological resources.

According to the specialist assessment done, the proposed pivot irrigation expansion is mantled by Late Caenozoic Superficial Sediments (see Figure 10 for a simplified geology map and for an extract of the 2824 Kimberley Geological Map). The Superficial deposits in the Douglas area consists of alluvial gravels, aeolan sands, calcretes of the Quaternary Gordonia Formation that overlies the older sediments. The Cenozoic Kalahari Group is the most widespread body of terrestrial sediments in southern Africa. The sands and calcretes of the Kalahari Group range in thickness from a few metres to more than 180m (Partridge et al., 2006). The pan sediments of the area originated from the Gordonia Formation and contains white to brown fine-grained silts, sands and clays. Some of the pans consist of clayey material mixed with evaporates that shows seasonal effects of shallow saline groundwaters.

The Gordonia dune sands are dated as Late Pliocene/Early Pleistocene to Recent times by the Middle to Later Stone Age stone tools recovered from them (Dingle et al, 1983). The boundary of the Pliocene-Pleistocene has been extended back from 1.8 Ma to 2.588 Ma placing the Gordonia Formation almost entirely within the Pleistocene Epoch.

The fossil assemblages of the Kalahari are generally low in diversity and occur over a wide range but has a high Paleontologically Sensitivity. These fossils represent terrestrial plants and animals with a close resemblance to living forms. Fossil assemblages include bivalves, diatoms, gastropod shells, ostracods and trace fossils. The palaeontology of the Quaternary superficial deposits has been relatively neglected in the past. Late Cenozoic calcrete may comprise of bones, horn corns as well as mammalian teeth. Tortoise remains have also been uncovered as well as trace fossils which includes termite and insect's burrows and mammalian trackways. Amphibian and crocodile skeletons have been uncovered where the depositional settings in the past were wetter.

According to the South African Heritage Resources Information System (SAHRIS), the Palaeontological Sensitivity of the Late Caenozoic Superficial Sediments is low, but locally high (see Figure 12 for Palaeontological sensitivity). The extension of the pivot irrigation on Olie Rivier 170 farm was deemed appropriate and feasible by the specialist and will not lead to detrimental impacts on the palaeontological resources of the area. The specialist stated that construction and operation of the pivots may be authorised as the whole extent of the development footprint is not considered sensitive in terms of palaeontological resources. It was consequently recommended by the specialist that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils. If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol (see Section 10.2.2.4) must be implemented by the farm manager in charge of these developments. These discoveries ought to be protected (if possible, in situ) and the farm manager must report to the South African Heritage Resources Agency (SAHRA).

9.4 HERITAGE

PGS Heritage (Pty) Ltd was appointed as the specialists to conduct a Heritage Impact Assessment (HIA) for the proposed pivot irrigation expansion project. Intensive field surveys of the study area were undertaken on foot, comprising one field archaeologist and a technician on 28 November 2020. No archaeological sites or heritage sites such as burial grounds and graves were identified during the fieldwork. The specialist concluded that, with no impacts expected with regards to heritage, that no further mitigation is required other than a chance find procedure be implemented if any cultural material is unearthed (See Section 10.2.2.14).

9.5 SOIL

The proposed project area is underlain by the CMx- Chromic Cambisols soil type according to the International Soil Reference and Information System (ISRIC 2008/06) and Global Assessment of Land Degradation (GLADA 2008/03) reports and spatial data (Figure 13). This soil type within the project area is characterised by a mean gradient of less than 10% and a relief intensity of less than 50 m/km^2. According to ISRIC, Cambisols are mostly found in temperate and boreal regions, where the soil's parent material is still young or where low temperatures slow down processes of soil formation. Britannica (2021) explains that because of the favourable aggregate structure and high content of weatherable minerals in Cambisols, they can be exploited for agriculture. See Figure 13 for a soil map of the project area. The DEA Screening Tool spatial data identified the proposed project as having a medium agricultural sensitivity (moderate land capability).

According to the biodiversity specialist's assessment report, the study area falls within the land types Ia and Ae, a land-type being an area that is uniform with respect to terrain form, soil patterns and climate. The soils within the Ae landtype are AC soils, which are red-yellow well drained soils lacking a strong texture contrast, with a high base status. They are eutrophic soils >= 750 mm deep with < 15 % clay. The soils within the Ia landtype are classified as EE soils which are soils with a negligible to weak profile development, usually occurring on recent flood plains. They are >= 750 mm deep with < 15 % clay.

9.6 VEGETATION

Ecological Management Services were appointed as the specialists to conduct a biodiversity assessment for the proposed pivot expansion project. The specialist conducted both a desktop and field investigation.

According to spatial data from Mucina and Rutherford, 2006, the project area falls within SVk 4, Kimberley Thornveld (Figure 14). According to the National Biodiversity Assessment (SANBI, 2018) this vegetation type is poorly protected and is listed as least concern on the Red List of Ecosystems (RLE). The specialist assessment report describes Kimberley Thornveld as having a well-developed tree layer with *Vachellia erioloba*, *V. tortilis* and *V. karroo* and *Boscia albitrunca*. The shrub layer is also described as well-developed with occasional dense stands of *T. camphoratus* and *S. mellifera*. The grass layer is open with a lot of uncovered soil.

The biodiversity specialist assessment identified numerous Vegetation Type Units (VTU) within the property of the proposed development (Figure 15). These are riparian vegetation (VTU 1), *Senegalia mellifera* scrub (VTU 2), mixed *Vachellia* Savannah (VTU 3), dams (VTU 4), old lands/ secondary vegetation (VTU 5) and existing pivots and irrigation land (VTU 6). The two proposed large pivots will intersect on VTU 5, old lands/ secondary vegetation, and the smaller pivot will intersect on VTU 3, the mixed *Vachellia Savannah*. These are further discussed below.

VTU 3: mixed *Vachellia Savannah*

This vegetation community contains a tree layer which is mainly comprised of *Vachellia erioloba* and *Vachellia tortilis*. Three vegetation strata are evident within this vegetation unit. There is a prominent tree layer between 2.5m – 5m, a shrub layer, between 1.5m – 2.5m and a grass layer with an average height of 50cm. *Vachellia erioloba*, and *Vachellia tortilis* are prominent within this vegetation type. The density of the trees varies across the landscape, with some areas forming a more open savannah, while other areas have dense pockets of trees and shrubs. Other species recorded included, Asparagus glaucus, Zygophyllum lichtensteinianum, *Lycium hirsutum*, *Helichrysum arenicola*, *Selago multispicata*, and *Melhania rehmannii*. Grass species within this vegetation community included, *Eragrostis lehmanniana*, *Schmidtia pappophoroides*, *Aristida congesta*, *Centropodia glauca*, *Enneapogon scoparius*, *Stipagrostis hirtigluma Stipagrostis uniplumis*, and *Tricholaena monachne*.

VTU 5: old lands/ secondary vegetation

These are areas that have been utilized as irrigation lands in the past. The land has not been under irrigation for about 25 years. Remnants of the old pipeline that supplied the lands with water is still evident as well as some ridging from ploughing activity. The area consists mostly of an open grassland savannah, where the *Vachellia erioloba* and *Vachellia tortillis* have re-colonised. The grass layer is fairly well developed and consists predominantly of *Eragrostis lehmanniana*, and *Schmidtia pappophoroide*.

The biodiversity specialist consulted historical records of Red List plant species in order to determine the likelihood of any such species occurring in the study area and these were searched for in the field. Plant species observed as well as a list of threatened plant species previously recorded in the quarter degree grids in which the study area is situated which was obtained from the South African National Biodiversity Institute, are listed in Table 10 below.

Table 10: Protected species that possibly occur on-site.

Species	Legislation	Conservation Status	Potential of occurrence on-site
Vachellia erioloba	National Forests Act 1998	Protected	Recorded on property and within development footprint
Vachellia haematoxylon	National Forests Act 1998	Protected	Recorded on property but NOT recorded with development footprint
Bosica albitrunca	National Forests Act 1998; NCNA	Protected; Schedule 2	Recorded on property but NOT recorded with development footprint
Titanopsis calcarea	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint

Plinthus karooicus	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint
Ruschia ruralis	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint
Bulbine abyssinica	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint
Aloe claviflora	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint
Ornithogalum nanodes	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint
Nemesia pubescens	NCNCA	Schedule 2	Not recorded during field survey, Low potential of occurrence within development footprint

In order to remove species listed in Schedule 1 & 2 of the NCNCA, during site clearing activities, an integrated permit application will have to be made to the DENC to obtain the required permission to remove and/or translocate these species from site. In order to remove the protected trees a license application will have to be made to the Department of Environment Forestry and Fisheries. The specialist further recommended that prior to clearing an additional walk through should be conducted.

The biodiversity specialist also identified certain alien invasive plant species. These are divided in categories in accordance with the Government Gazette Notice No. 40166 of July 2016. The specialist specifically identified category 1b and category 3 species (see Table 11), which are defined below.

Table 11:Alien invasive species that occur in or around the property.

Species	Common Name	Category
Argemone mexicana	Yellow flowered Mexican Poppy	1b
Prosopis cf. glandulosa	Mesquite	3
Opuntia humifusa	Prickly pear	1b
Argemone ochroleuca	White flowered Mexican poppy	1b

Category 1b (prohibited / exempted if in possession or under control): Listed Invasive Species

A person in control of a Category 1 b Listed Invasive Species must control the listed invasive species in compliance with sections 75(1), (2) and (3) of the Act. A person contemplated in sub-regulation (2) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the control of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in section 75(4) of the Act.

Category 3 (prohibited): Listed Invasive Species

Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of the Act, as specified in the Notice. Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3.

9.7 FAUNAL SPECIES

Because of a limited time-frame the biodiversity specialist could not identify all faunal species that might exist on or surrounding the proposed development site. The specialist thus placed emphasis on the habitat in order to determine potential occurrence of species. The potential of occurrence was also assessed for the immediate surrounding area as to establish the possibility of ecological linking corridors for certain species.

No red data reptile or amphibian species of conservation concern were identified occurring in the quarter degree square, based on the distribution maps available in the South African Red Data Book for reptiles (Bates et. al. 2014), The Southern African Reptile Conservation Assessment (SARCA) and the South African Red Data Book for amphibians.

Eight red data bird species have been recorded for the quarter degree square, five have a high potential to occur on site. Most of these species will utilise the site for foraging purposes but they may not be totally dependent on the site. Table 12 lists these species and there potential for occurrence on-site.

Table 12: Bird species of conservation concern identified as occurring in and around the quarter degree squares and the potential for occurrence on-site.

Common Name	Scientific Name	Potential for occurrence on-site and surrounding area
Blue Crane	*Anthropoides paradiseus*	Very Low: Edge of distribution range, vegetation too dense.
Kori Bustard	*Ardeotis kori*	High: Recorded in the area Suitable habitat occurs on site.
Greater Flamingo	*Phoenicopterus ruber*	Very Low: No large bodies of open water occur on the proposed development site.
Lanner Falcon	*Falco biarmicus*	High: Suitable foraging habitat occurs on site.
Lesser Flamingo	*Phoenicopterus minor*	Very Low: No large bodies of open water occur on the proposed development site.
Secretary Bird	*Asagittarius serpentarius*	High: Suitable habitat occurs on site.
African White Backed Vulture	*Gyps africanus*	High: Suitable habitat on the property, however no nests were recorded within the planned development area. The fact that the site is located near operating pivots reduces its suitability but does not exclude it as potential habitat.
Cape Vulture	*Gyps coprotheres*	High: Suitable habitat on the property. The fact that the site is located near operating pivots reduces its suitability but does not exclude it as potential habitat.

The biodiversity specialist extrapolated a list of all red data mammal species occurring in the quarter degree squares from the Red Data Book for Mammals (EWT, 2004) and the MammalMAP, the Mammal Atlas of Africa database. Based on an evaluation of the habitat requirements for these red data species (EWT, 2004; Skinner and Chimimba, 2005), the potential of these species occurring either on-site or within 500m of the property boundary is provided in Table 13.

Table 13: Mammal species of conservation concern identified as occurring in and around the quarter degree squares and the potential for occurrence on-site.

Common Name	Scientific Name	Potential for occurrence on-site and surrounding area
South African Hedgehog	*Atelerix frontalis*	High: Area has sufficient grassland and bushes thus suitable habitat is present.
Brown Hyena	*Hyaena brunnea*	Low: For the most part, the vegetation cover of the proposed development site is suitable however the substantial amount of agricultural activity and its promiximity to human habitation make it unlikely that this animal will occur in the area.
Spotted-Necked Otter	*Lutra maculicollis*	Low: Although it is likely that it occurs around the river the proposed development site of the pivots is situated too far from the water margin.

9.8 BIODIVERSITY SITE SENSITIVITY

The biodiversity specialist classified areas on-site into different sensitivity classes based on information collected at various levels (in-field and desktop). The criteria used to inform the biodiversity sensitivity map include current status of degradation, slope and drainage, potential for erosion, presence of red data species, suitable habitat for red data species, potential habitat fragmentation and importance to biodiversity and ecosystem functioning. See

9.9 SURFACE WATER FEATURES

The National Freshwater Ecosystem Priority Areas (NFEPA) wetlands (SANBI, 2011) as well as the National Wetland Map (2018) spatial layers were inspected to identify wetlands within the study area. Spatial data from a 1:50 000 topographical map was used to identify any rivers or streams within the study area. See Figure 17 for

a surface water features map. After inspection it was noted that the Vaal River is approximately 2.4 km northwest, and the Riet River is approximately 5.4 km to the south of the proposed development footprint. The proposed development footprint falls outside of the 500 m regulated area for watercourses, and no negative impacts are expected on water resources as a result of the proposed pivot expansion project. This was also verified during the on-site investigation by the biodiversity specialist.

9.10 IMPORTANT AREAS

Focus areas for land-based protected area expansion are large, intact and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation or expansion of large, protected areas. The focus areas were identified through a systematic biodiversity planning process undertaken as part of the development of the National Protected Area Expansion Strategy 2008 (NPAES). They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for freshwater ecosystems. The project area does not fall within a NPAES focus area and is located approximately 25km northwest of the Mokala National Park and its proposed expansion area for the eastern Kalahari bushveld. The study area does not fall within any of the Square Kilometre Array (SKA) Karoo Central Astronomy Advantage areas and is approximately 170 km northeast of these areas. The study site and surrounding area does not fall within an Important Bird and Biodiversity Area (IBA). IBAs are sites of international significance for the conservation of the world's birds and other biodiversity (see Figure 19 for protected areas surrounding the proposed development site).

The study site falls with a Critical Biodiversity Area 2 (CBA2)(Figure 18). CBA2 are areas that have been selected as the best option for meeting biodiversity targets, based on complementarity, efficiency, connectivity and/or avoidance of conflict with other land or resources uses.

9.11 SURROUNDING LAND USES AND DEMOGRAPHICS

9.11.1 LAND USES

The current land use of the proposed pivot development area can be described as semi-natural, which is mostly made up of old lands where natural vegetation has re-established over the years. The proposed development is directly surrounded by natural areas to the north and east (semi-vegetated with bare patches in between), existing pivots. The R357 is adjacent to the proposed development to the south which connects Kimberley and Douglas. Just to the north of the proposed project is the Vaal River and to the south the Riet River. These rivers are surrounded by what is known as potential intensive irrigation agricultural areas, which comprises of mostly irrigation pivots.

On a regional scale, the town of Douglas is the closest major town located 26 km to the southeast of the proposed development. According to the South African Protected Areas Data (SAPAD, 2021) the Mokala National Park is located approximately 25 km to the southeast of the proposed project area along with the proposed Eastern Kalahari Bushveld expansion area. Both of these areas fall within a power corridor.

9.11.2 DEMOGRAPHICS AND EMPLOYMENT STATISTICS

Pixley Ka Seme DM is one of five district municipalities in the Northern Cape Province. Pixley Ka Seme is composed of eight local municipalities, of which Siyancuma LM is the one where the project is located. Siyancuma has three major urban settlements which Douglas, Griekwastad and Campbell and a few rural areas. The rest of the LM consists of mainly commercial and small farming areas (which aligns with the proposed project) as well as small private game parks. Siyancuma is situated to the southeastern regions of the Northern Cape and borders onto the Free State Province to the east, the ZF Mgcawu and Frances Baard Districts to the north, Siyathemba and Thembelihle Districts to the south and the ZF Mgcawu to the West. This LM covers an area of 16 753 km^2, accounting for 16 % of the Pixley Ka Seme DM geographical area. The main economic sectors for Siyancuma are agriculture and mining (municipalities.co.za, 2021).

According to StatsSA (2001 and 2011) the total population for Siyancuma Local Municipality showed a negative growth rate of -5.6 % with the population decreasing from 39 275 to 37 076. The 2016 Community Survey

showed a further negative population growth rate of -3.1 % from 2011 to 2016 during which the population decreased from 37 067 to 35 938.

Douglas, 26 km southwest of the proposed project, is the economic hub of the LM. This town has seen a continuous influx of unskilled people from farms. According to the 2011 Census, the official unemployment rate in the Siyancuma LM was 28.2 %, and for youth (between the ages of 15 and 34) it was 35.2 %. The agriculture, community, social and personal services sectors are the strongest economic sectors and biggest job providers in and around this town. The major employment agencies in the area include agricultural entities like GWK, the SLM and provincial government departments (IDP, 2020)

According to the Stats SA community Survey (2016), the Coloured population group account for the largest portion of the population at 67.8 % of the LM total, with the remaining made up of Black African (25.3 %), Indian/ Asian (0.21 %) and White (6.7 %). The total population within the LM is 35 941. The most prominent language spoken at home (Census, 2011) is Afrikaans (88.9 %) followed by Setswana (5.1 %) and then English (1.3 %). The sex ratio in the municipality was calculated at 100.4 during the 2011 Census.

During 2011 (Census, 2011) in the Siyancuma LM there were 11 064 economically active people (those who are either employed or looking for work) of which 28.2 % were unemployed.5 800 people in the area could be described as economically active youth (15- 34 years) of which 35.2 % were unemployed.

Agriculture forms the key economic activity within the Pixley Ka Seme District Municipality. According to the Pixley Ka Seme District Municipality IDP (2017) the agricultural sector provides around 39% of the employment opportunities in the district, which represent a significant and important economic sector, especially in this area that has limited job opportunities. The mechanisation by farmers has however resulted in declining job opportunities in this sector. According to the Pixley Ka Seme District Growth and Development Strategy (2006) the Municipalities of Ubuntu, Siyathemba and Siyacuma contribute the most to this sector, with a total of 28,49 % contributed to the provincial Gross Geografic Product. Agriculture and agro-processing is one of the six critical sectors which was identified in the Growth and Development Strategy for unlocking economical potential. Irrigated agriculture is among the major contributing factors to the Northern Cape provincial GDP, with a total area of 140 000 ha that is under irrigation.

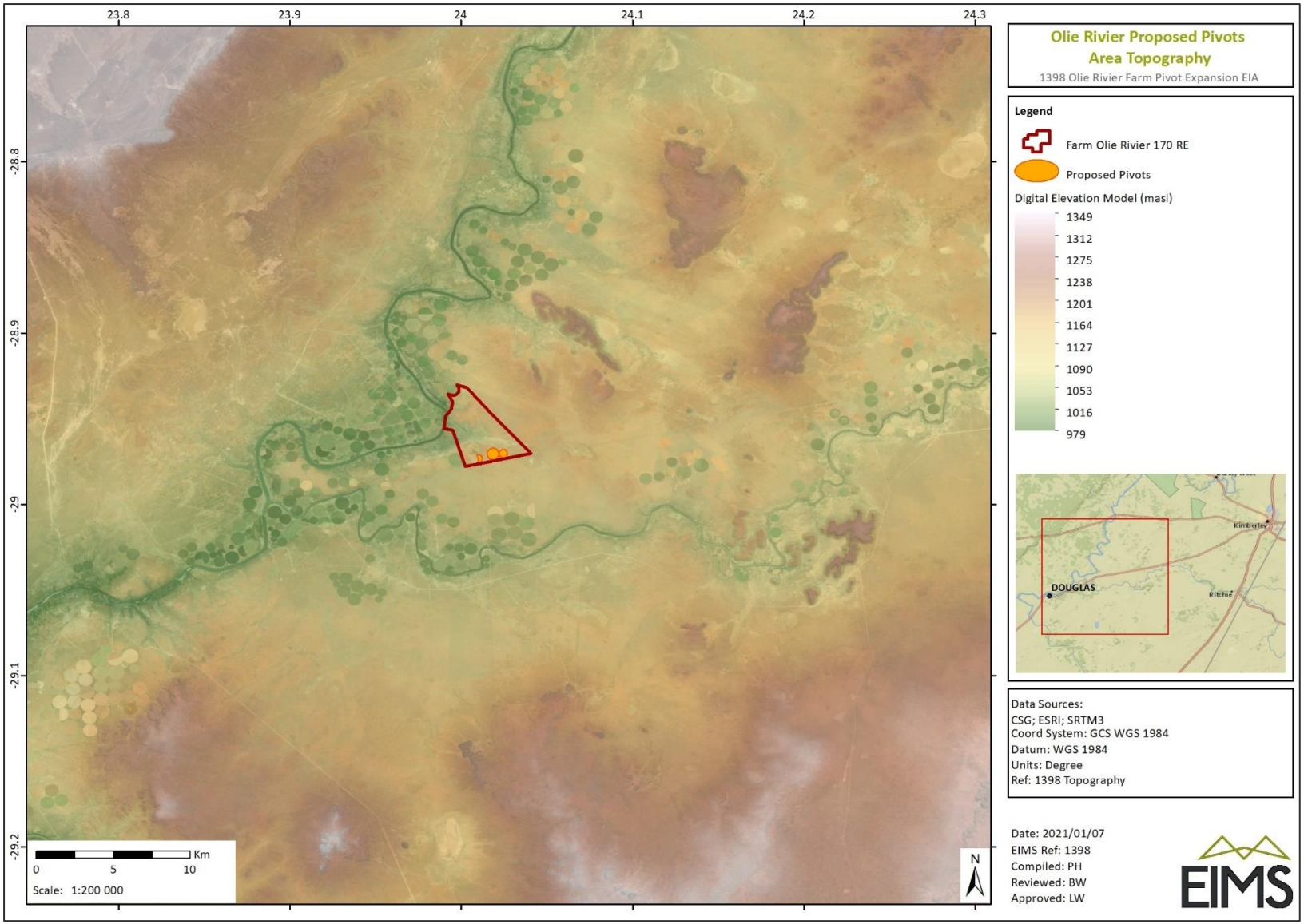


Figure 9: Regional topography.

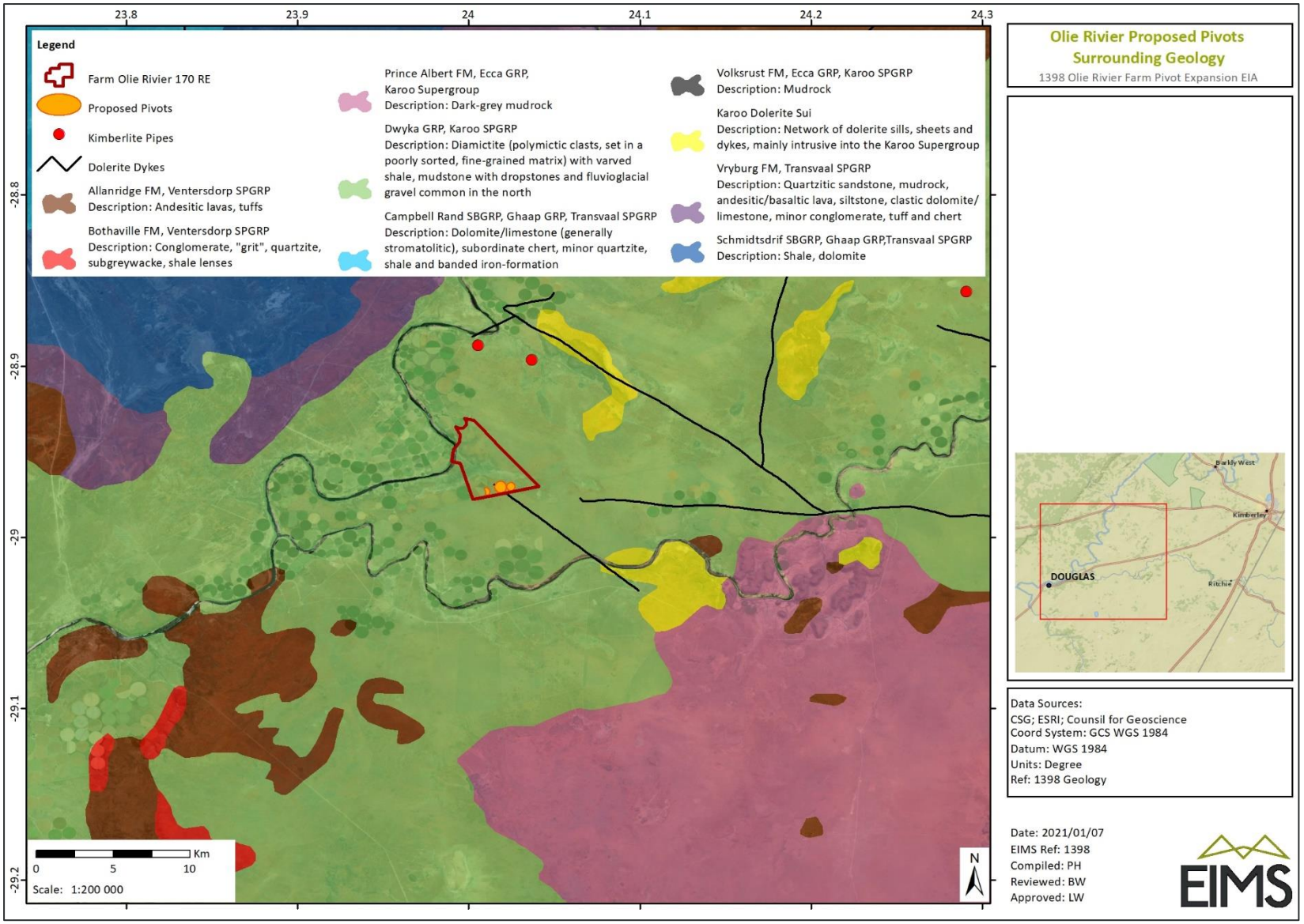


Figure 10: Project area simplified geology.

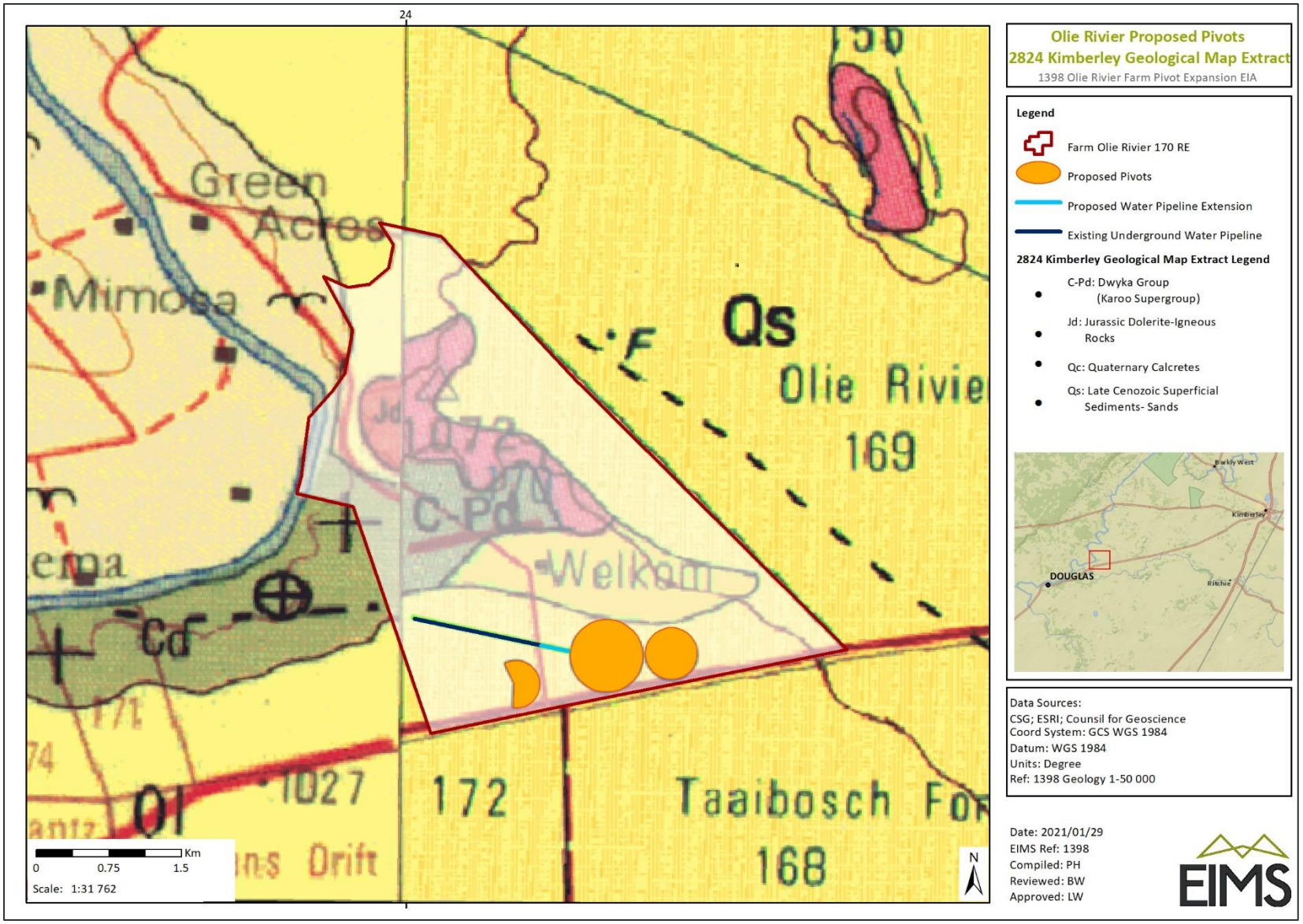


Figure 11: extract of the 2824 Kimberley Geological Map.

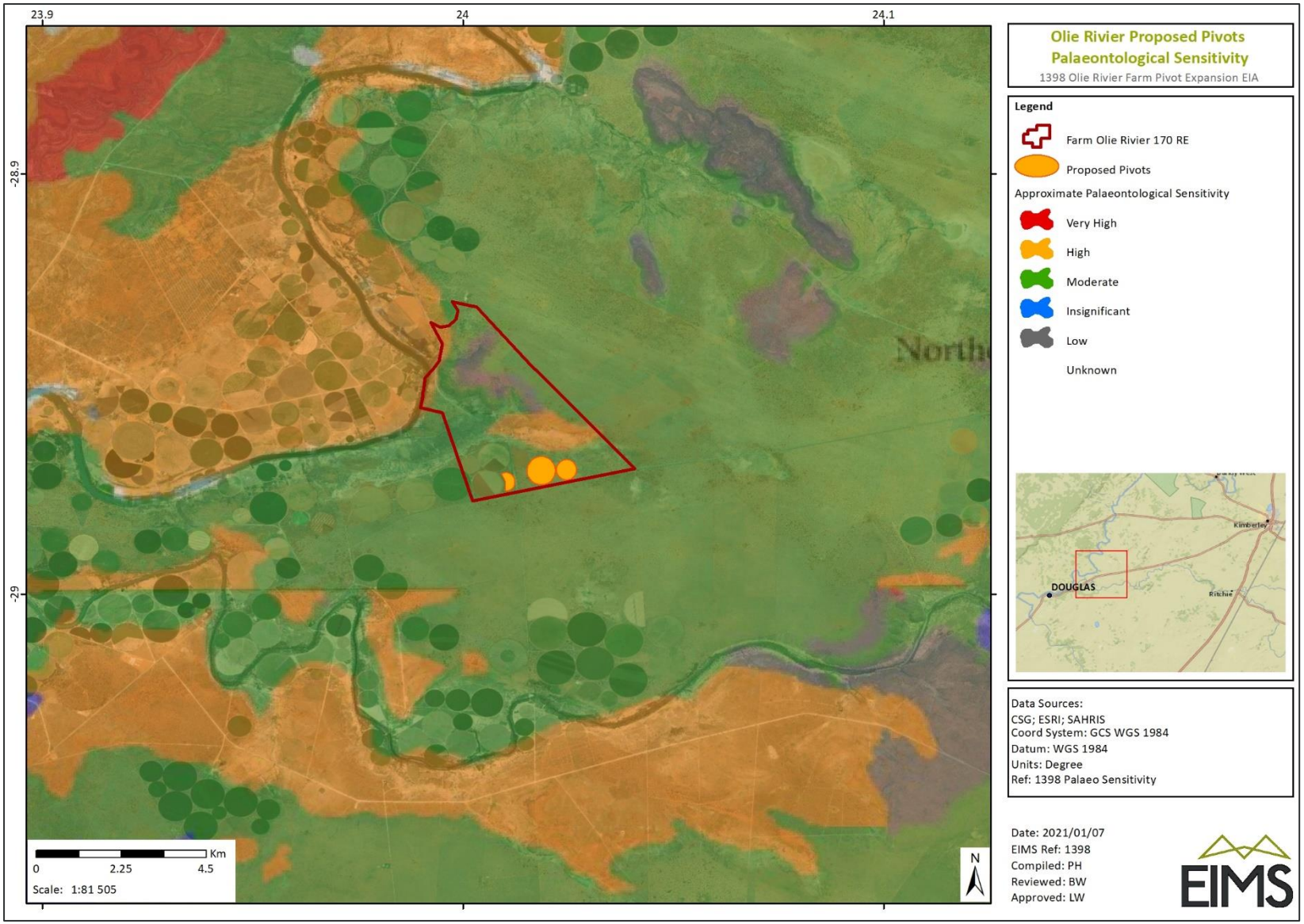


Figure 12: Palaeontological sensitivity of the project area.

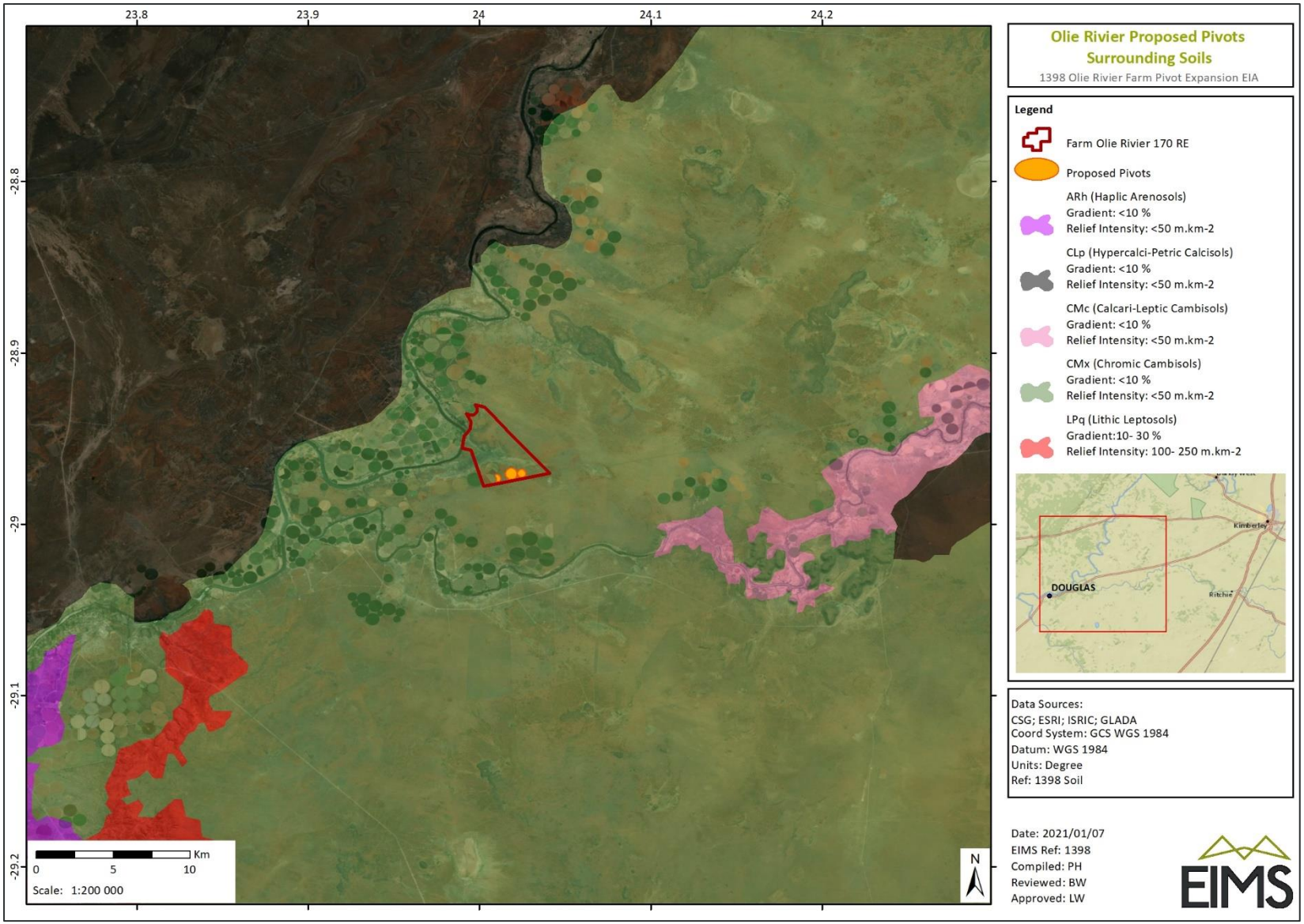


Figure 13: Soil types covering the study area.

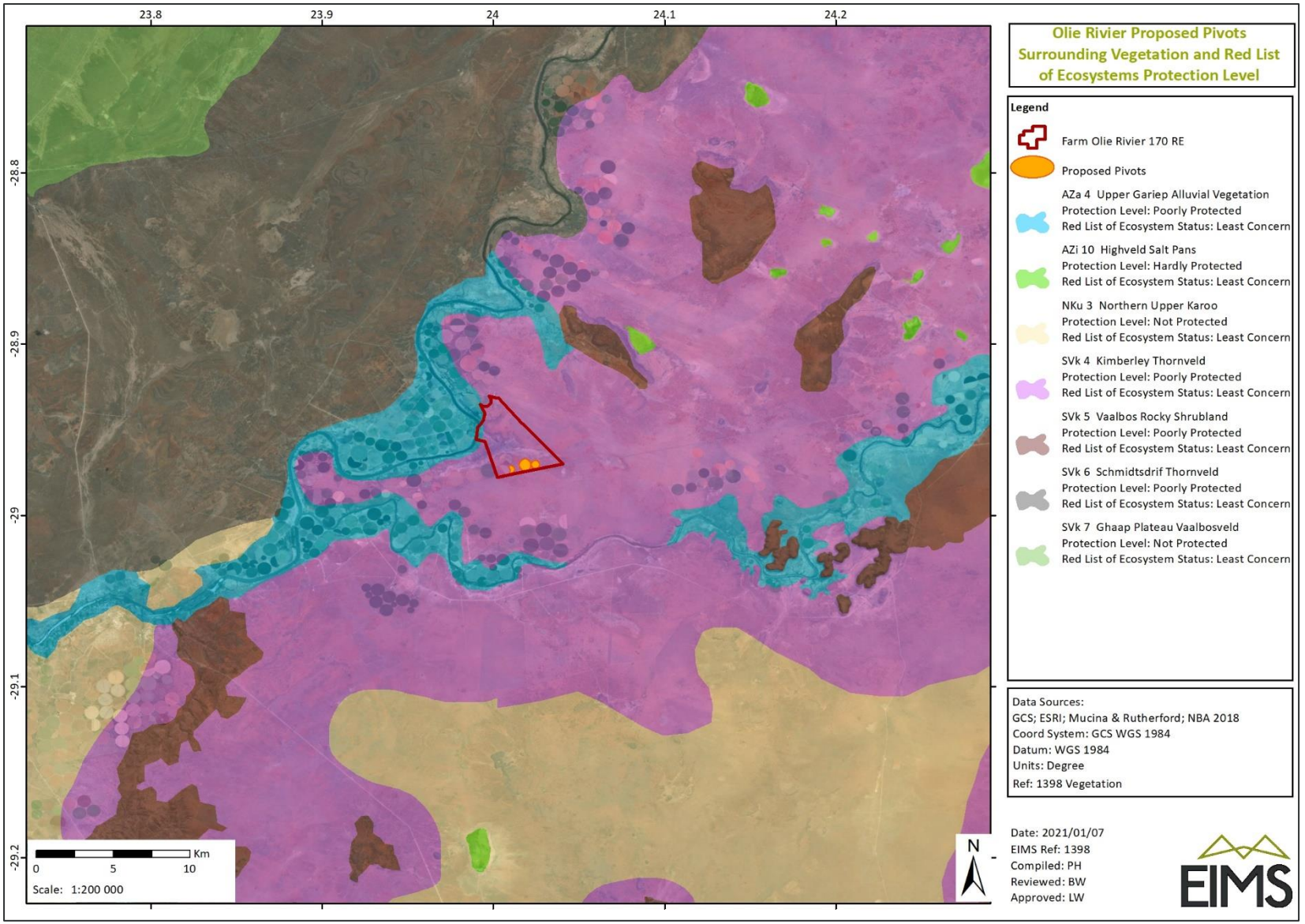


Figure 14: Study area vegetation.

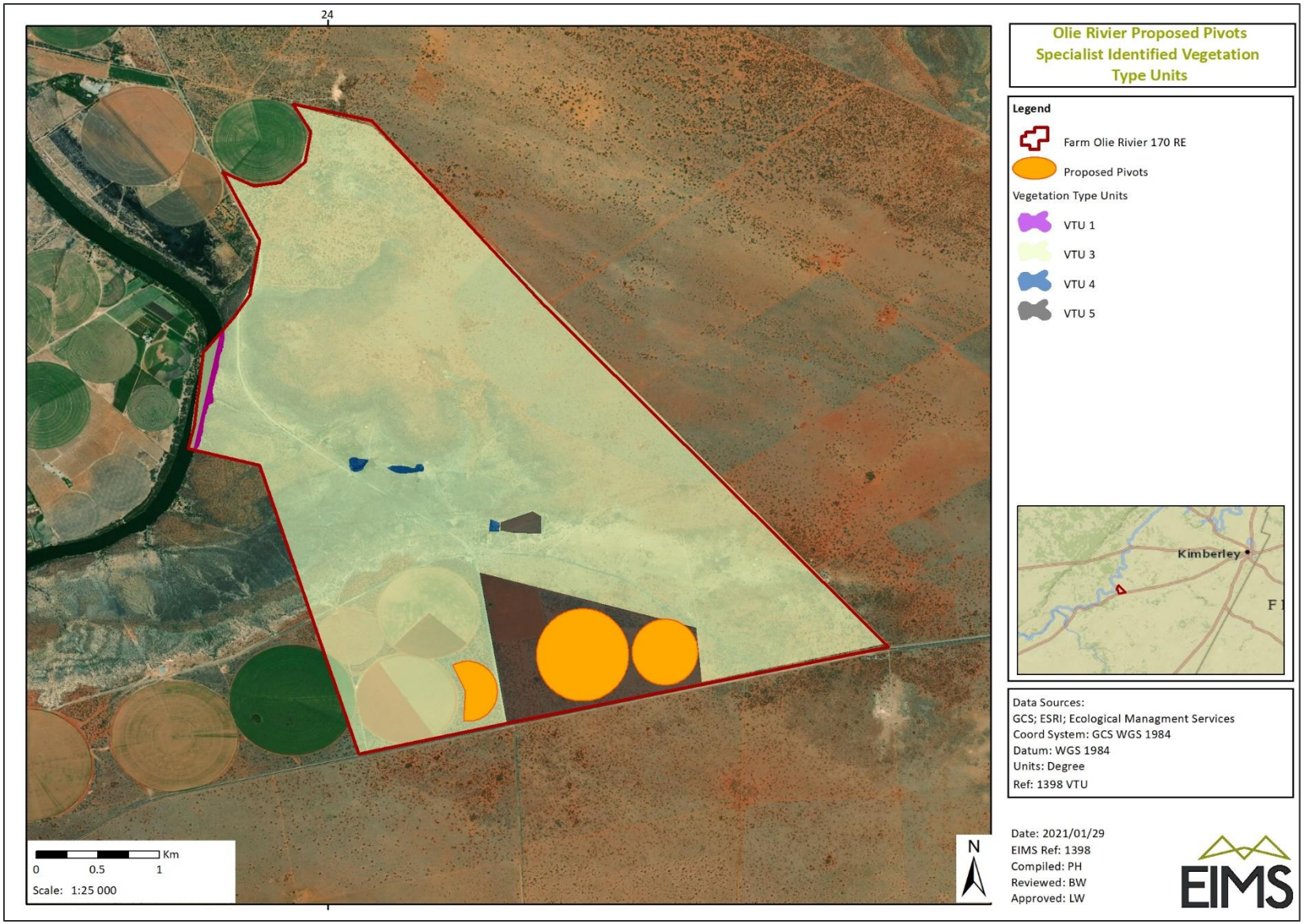


Figure 15: Specialist identified vegetation type units.

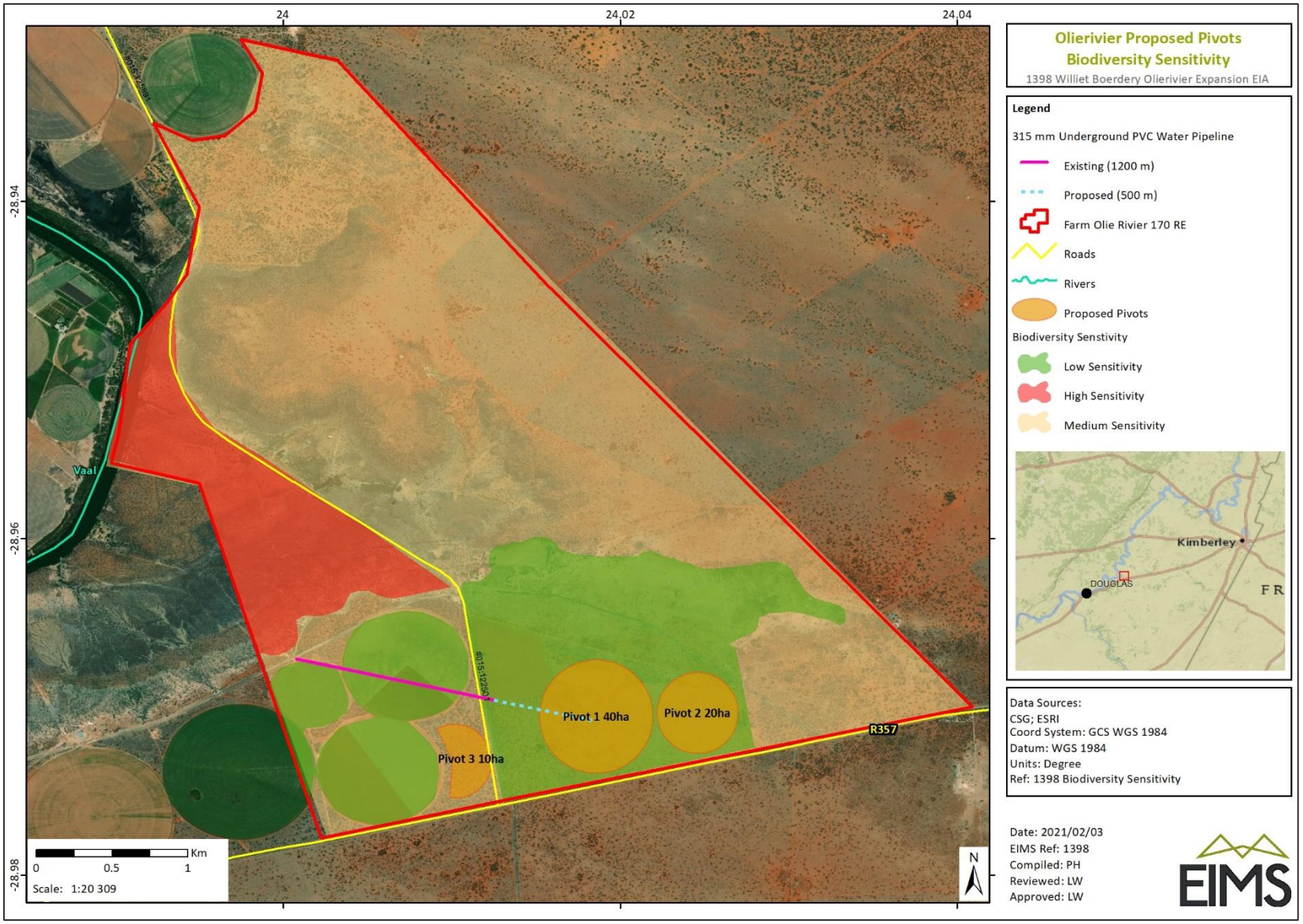


Figure 16: Biodiversity Site Sensitivity.

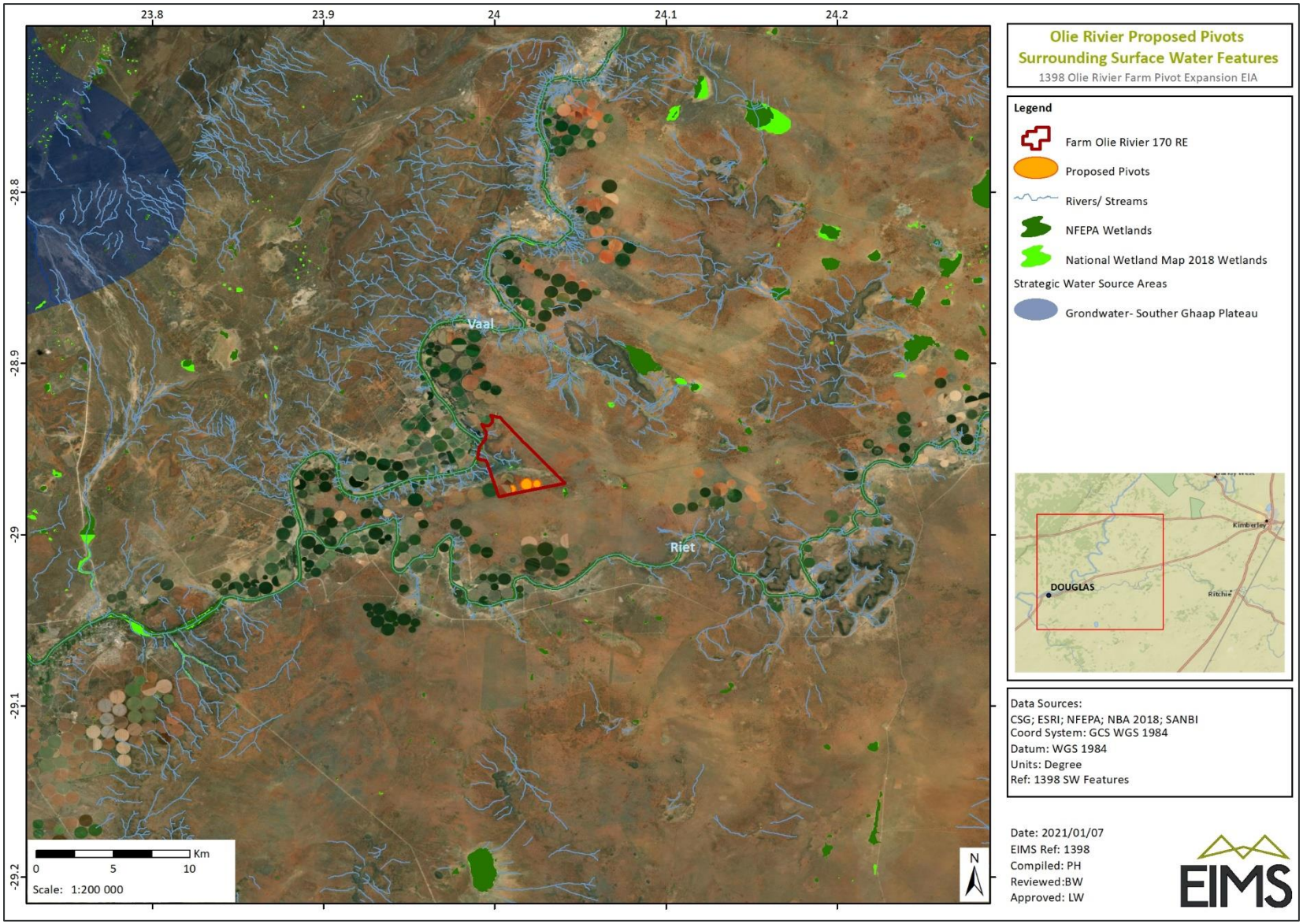


Figure 17: Surface Water Features Surrounding the proposed project area.

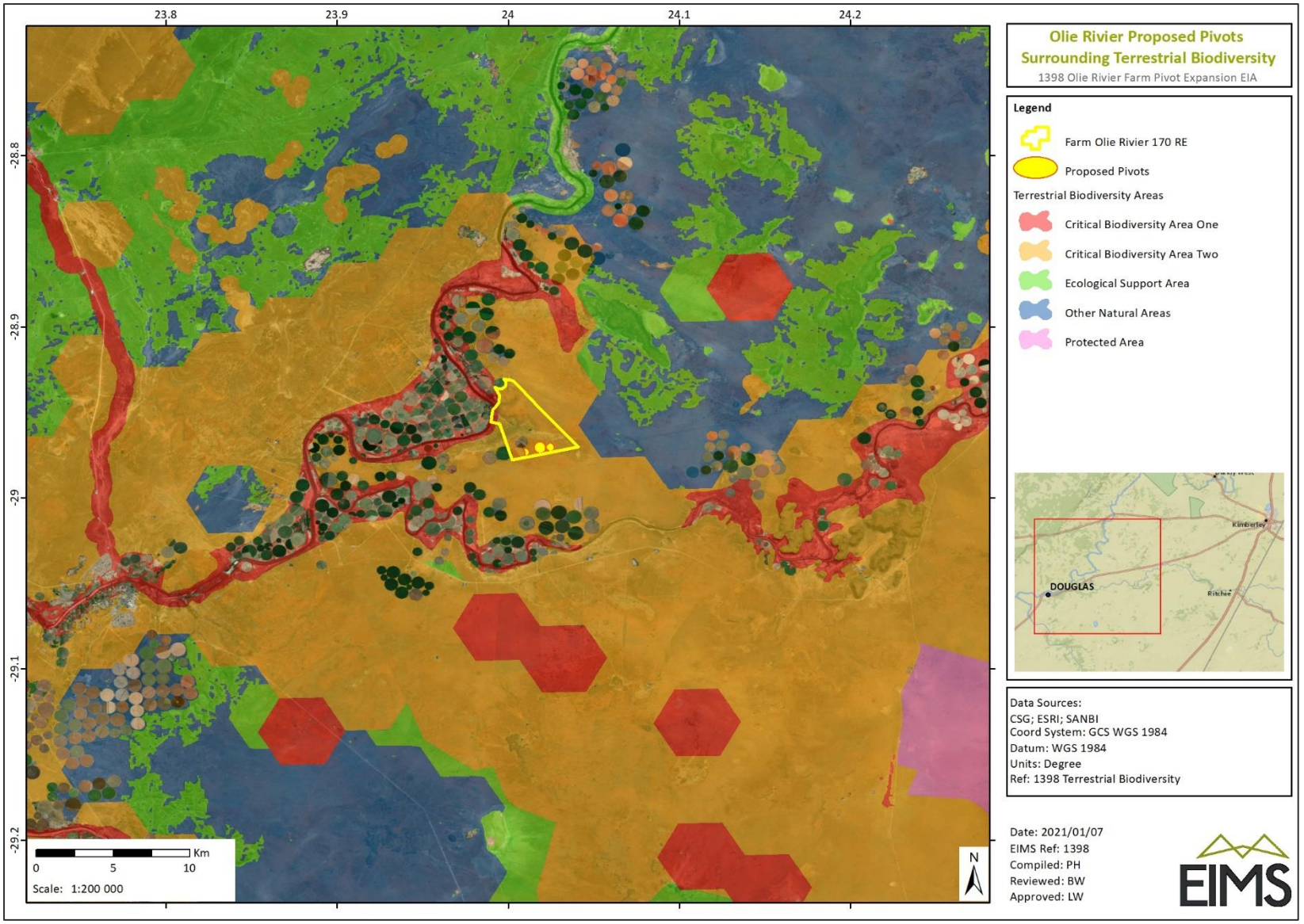


Figure 18: Terrestrial Biodiversity Areas.

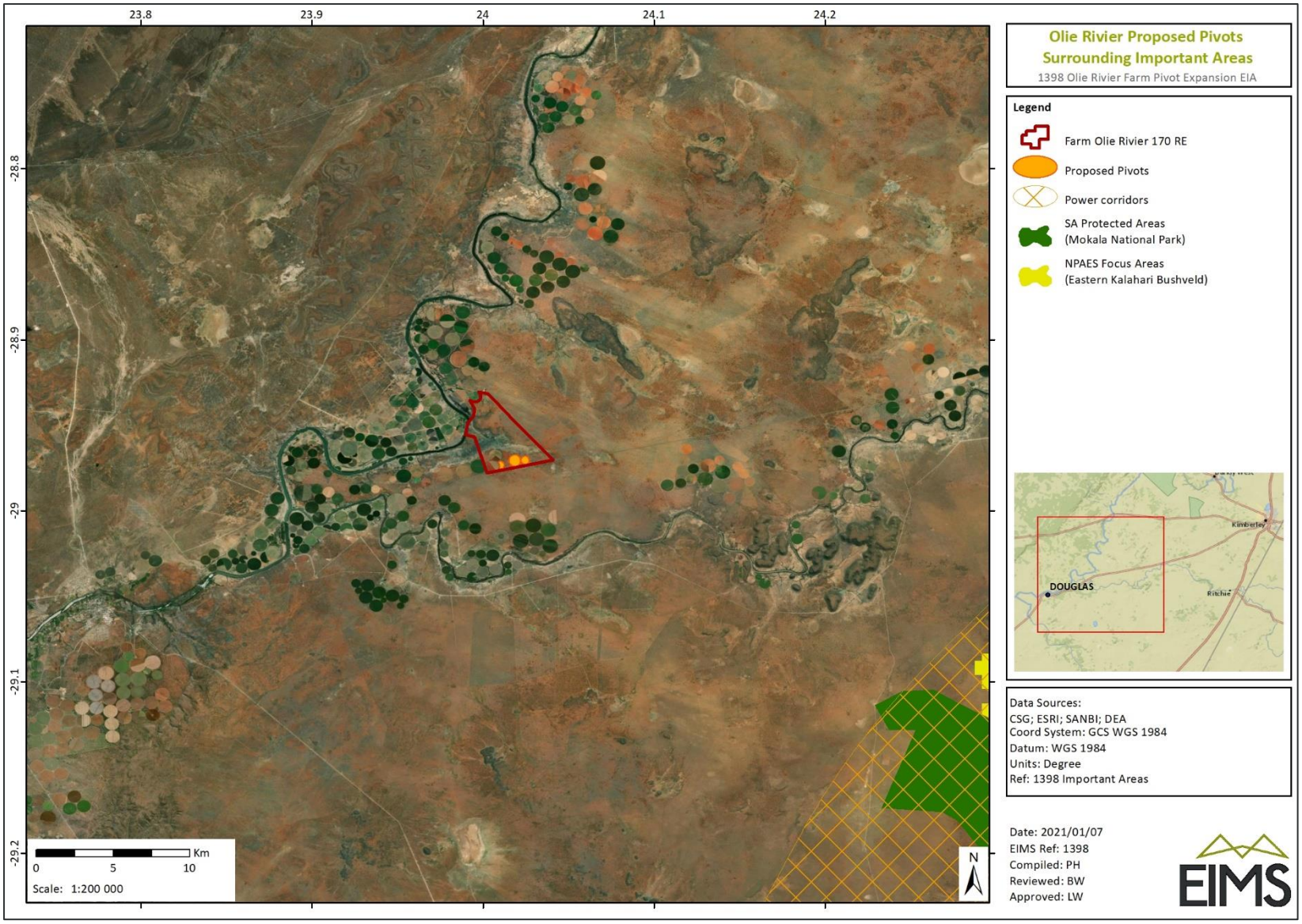


Figure 19: Important areas surrounding the proposed project site.

9.12 SITE SPECIFIC PHOTOGRAPHS

On-site photographs were taken depicting the areas where the three different pivots are proposed, to give a visual indication of the site-specific attributes. The table of figures below, Table 14, include these photos and a short description of each.

Table 14: Table of figures showing photos of the proposed project area.

Photograph	Description
	This is the proposed area for the 40 ha pivot (pivot 1). It will be situated on old lands, which has been allowed to revegetate into a semi-natural state over time.
	This is the proposed area for the 20 ha pivot (pivot 2). It will be situated on old lands, which has been allowed to revegetate into a semi-natural state over time.

	This is the proposed area for the 10 ha half-pivot (pivot 3). It will be situated on mixed *Vachellia* Savannah vegetation type. This vegetation community contains a tree layer which is mainly comprised of *Vachellia erioloba* and *Vachellia tortilis*. Three vegetation strata are evident within this vegetation unit. There is a prominent tree layer between 2.5m – 5m, a shrub layer, between 1.5m – 2.5m and a grass layer with an average height of 50cm. *Vachellia erioloba*, and *Vachellia tortilis* are prominent within this vegetation type.

10 ENVIRONMENTAL IMPACT ASSESSMENT

This section aims to identify and do a preliminary assessment on the potential environmental impacts associated with the proposed pivot development. This impact assessment will be used to guide the identification and selection of preferred alternatives, and management and mitigation measures, applicable to the proposed activities. The preliminary assessment will also serve to focus the subsequent EIA phase on the key issues and impacts.

10.1 PROCEDURE

The impact significance rating methodology, as presented herein and utilised for all EIMS Impact Assessment Projects, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. The ER is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives.

10.1.1 DETERMINATION OF ENVIRONMENTAL RISK

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 15 below.

Table 15: Criteria for Determining Impact Consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary)
	3	Local (i.e. the area within 5 km of the site)
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)

	3	Medium term (6-15 years)
	4	Long term (15-65 years), the impact will cease after the operational life span of the project)
	5	Permanent (>65 years), no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 16.

Table 16: Probability Scoring.

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$\boldsymbol{ER = C \; x \; P}$$

Table 17: Determination of Environmental Risk.

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Probability				

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 4.

Table 18: Environmental Risk Scores.

ER Score	Description
<9	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
≥9 ≤17	Medium (i.e. where the impact could have a significant environmental risk/ reward),
>17	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

10.1.2 IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

- Cumulative impacts; and
- The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 19: Criteria for Determining Prioritisation.

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.

	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$\boldsymbol{Priority = CI + LR}$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 20).

Table 20: Determination of Prioritisation Factor.

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 21: Final Environmental Significance Rating.

Significance Rating	Description
<-17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
≥-17, ≤-9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
>-9, < 0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact

>0, <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥9, ≤17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
>17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

10.2 IDENTIFICATION OF IMPACTS

Potential environmental impacts were identified during the Scoping phase. These impacts were identified by the EAP, the appointed specialist, as well as information received from the public. Section 10 provides the list of preliminary impacts identified during scoping, some of which will be further assessed in the EIA phase. Moreover Section 10 presents the combined details of the preliminary impact assessment calculations undertaken towards determining the pre- and post-mitigation impact significance, as well as the final significance scores.

Without proper mitigation measures and continual environmental management, most of the identified impacts may potentially become cumulative, affecting areas outside of their originally identified zone of impact. The potential cumulative impacts have been identified, evaluated, and mitigation measures suggested which will be updated during the detailed EIA phase level of investigation. When considering cumulative impacts, it is vitally important to bear in mind the scale at which different impacts occur. There is not much potential for a cumulative effect at a broad scale because of the proposed project, however, finer scale effects could occur in the area surrounding the activity.

10.2.1 PLANNING PHASE IMPACTS

No planning phase impacts are expected because of the proposed project.

10.2.2 CONSTRUCTION PHASE IMPACTS

10.2.2.1 HABITAT FRAGMENTATION, LOSS OF NATURAL VEGETATION AND ALIEN INVASION IN A CBA 2

Vegetation clearing will occur because of the development of irrigation pivots. The two large pivots will be developed in an area that contains secondary vegetation. The previously old lands have been fallow for some time which has allowed natural successional processes to occur and re-establish some of the naturally occurring species, however there are still structural and compositional differences in the secondary and primary vegetations present on site. As primary vegetation is more functional in an ecosystem, the loss of this secondary vegetation is not as severe as the loss of primary vegetation and is unlikely to significantly increase the fragmentation of the habitat within the CBA2.

As with all disturbance, there is an increased risk of alien infestation. Many alien species proliferate in disturbed areas such as the periphery of the irrigation lands. Invasive species affect our natural biodiversity in several ways. They may compete directly with natural species for food or space, may compete indirectly by changing the food web or physical environment, or hybridize with indigenous species. Rare species with limited ranges and restricted habitat requirements are often particularly vulnerable to the influence of these alien invaders. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Vegetation clearing should be restricted to areas of the pivots only.
- Alien vegetation that has grown because of land clearing must be removed through approved methods.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of habitat fragmentation, loss of natural vegetation and alien invasion in this CBA2 area.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of habitat fragmentation, loss of natural vegetation and alien invasion in this CBA2 area.

10.2.2.2 LOSS OF SPECIES OF CONSERVATION CONCERN

Vegetation clearing will occur because of the development of irrigation pivots. The area where the two large pivots are planned comprises of secondary vegetation (old lands). The field survey revealed that the loss of floral species of conservation concern is unlikely as it is very unlikely that these species occur within the secondary vegetation. The exception is the protected tree *Vachellia erioloba* which occurs within the proposed development footprint. These trees have re-colonised the area over the last 20 odd years which is evident in terms of population size and structure. The density of these trees is less than the density in areas of primary vegetation. The half pivot planned falls within an area of primary vegetation, thus the likelihood of floral species of conservation concern being affected is higher but is not considered significant.

In terms of the loss of faunal species of conservation concern, it is very unlikely that the loss of habitat consisting of secondary vegetation would affect faunal species of conservation concern. The small patch of primary vegetation that will be removed for the half pivot is already very fragmented by the adjacent pivots and the secondary gravel road and it is unlikely that this will result in a loss of faunal species of conservation concern from the area. This impact was rated as low negative before and after implementation of mitigation measures

(i) Mitigation measures

- A search and rescue operation should be performed prior to clearing, it is however not a feasible or practical option regarding the protected trees, so it is important to ensure that trees between the pivots remain undisturbed. A permit is required if any protected trees needs to be cut or removed within the development footprint.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of the possible loss of species of conservation concern.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss is expected because of the possible loss of species of conservation concern.

10.2.2.3 ANTHROPOGENIC DISTURBANCES, INTENTIONAL AND/OR ACCIDENTAL KILLING OF FAUNA

Anthropogenic disturbances include aspects such as, vibrations caused by machinery & vehicles. These aspects will impact on invertebrate species more than faunal species. These anthropogenic disturbances impact on the way invertebrates forage. For example, some invertebrates use vibrations produced by their prey to locate and catch them. Vibrations caused by construction equipment will make this impossible. Smaller fauna will inevitably be killed during land clearing activities as these activities will destroy their habitat. In addition to unintentional killing of fauna, some faunal species, particularly herpetofaunal species, are often intentionally killed as they are thought to be dangerous. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- There is no mitigation for the vibrations caused by machinery/vehicles.
- As the intentional killing of herpetofauna is considered a result of ignorance, this can be ameliorated through education. The labour force involved should be educated regarding the conservation importance of herpetofauna (especially snakes).

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of anthropogenic disturbances, intentional and/or accidental killing of fauna.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss is expected because of anthropogenic disturbances.

10.2.2.4 LOSS OF FOSSIL HERITAGE

The site clearance and excavations of the development footprint will include diggings into the sediment cover. The excavations will change the topography of the development site. Fossil heritage could possibly be destroyed or permanently sealed in at or below the ground surface. These fossils will then be unavailable for research. According to the Geology of the project site there is a moderate possibility of finding fossils. This impact was rated as low negative before implementation of mitigation measures. If a chance find is made and the correct mitigation procedures followed, the impact will be low positive due to preservation of a fossil.

(i) Mitigation measures

- The following Chance Find Protocol should be followed if fossils are uncovered during excavation:
  - If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
  - The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the farm manager. The farm manager or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
  - A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
  - Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
  - Upon receipt of the preliminary report, the Heritage Agency will inform the farm manager (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
  - The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
  - In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossil finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
  - Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of the loss of fossil heritage.

(iii) Irreplaceable loss of Resources

- Impacts on fossil heritage are irreversible. Scientifically, all well-documented reports of fossils uncovered during construction would be a positive impact. A negative impact can be limited by the application of adequate mitigation measures, in this case the chance find protocol. If mitigation is properly undertaken the project will fall within the beneficial category.

10.2.2.5 GAIN OF FOSSIL HERITAGE

The site clearance and excavations of the development footprint will include diggings into the sediment cover. The excavations will change the topography of the development site. According to the Geology of the project site there is a moderate possibility of finding fossils. If a chance find is made and the correct mitigation procedures followed, the impact will be low positive due to preservation of a fossil.

(iv) Mitigation measures

- The following Chance Find Protocol should be followed if fossils are uncovered during excavation:
  - If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
  - The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the farm manager or site manager. The farm manager or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
  - A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
  - Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
  - Upon receipt of the preliminary report, the Heritage Agency will inform the farm manager (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
  - The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
  - In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossil finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
  - Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

(v) Cumulative Impacts

- No cumulative impacts are expected because of the loss of fossil heritage.

(vi) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of a gain of fossil heritage. All well-documented reports of fossils uncovered during construction would be a positive impact. If mitigation is properly undertaken the project will fall within the beneficial category.

10.2.2.6 NOISE NUISANCE

Heavy vehicles will be required for the removal of vegetation and ripping of the soil layer within the development footprint. This impact is not anticipated to be significant as there are no nearby receptors to any noise nuisance. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Ensure that all vehicles used during construction are serviced and in a good working condition.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of noise impacts.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of noise impacts.

10.2.2.7 FIRE DAMAGE

The possibility of fire is a serious threat within the site area given the vegetation types and climate within the region. Fire should be prevented at all costs as it could spread easily and has the capability of quickly spreading to neighbouring areas. This impact was rated as medium negative before mitigation and was reduced to low negative after implementation of the proposed mitigation measures.

(i) Mitigation measures

- Ensure that construction vehicles are equipped with the necessary firefighting equipment, specifically fire extinguishers.
- Workers must be adequately trained in the handling of firefighting equipment.
- No open fires will be permitted on-site.
- No smoking will be allowed within close vicinity of the site.
- It is recommended that fire breaks be created around each pivot.

(ii) Cumulative Impacts

- If a fire is accidentally started and not managed promptly, it has the capability to quickly spread and cause major damage within the surrounding area. Damages can be caused to the environment, neighbouring crops, and nearby infrastructure.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of fire.

10.2.2.8 DUST NUISANCE

Dust will be generated during the construction phase because of vegetation removal and soil ripping/ tillage. This is not anticipated to be a significant impact as there are no nearby receptors. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Ensure that access roads to the development footprint are well maintained.
- Construction vehicles should not exceed 30 km/h on access roads or in-field.
- Construction should preferably take place on non-windy days.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of dust impacts during construction.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of dust impacts during decommissioning.

10.2.2.9 OIL/ FUEL SPILLAGES CAUSING SOIL AND GROUNDWATER CONTAMINATION

There are no surface water features close to the proposed development footprint. However, any leaks on construction vehicles or tractors or accidental spillages can seep into and contaminate soil and possibly the groundwater. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Ensure that all vehicles used during construction are serviced and in a good working condition.
- Ensure that every construction vehicle has a spill prevention kit, to be used for accidental spillages of oil or fuel.
- No storage of oil or fuel is allowed on-site. Any storage, if necessary, should be within a designated area and no direct contact between the storage containers and the ground is allowed.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of spillages during construction. It is not anticipated that large quantities of oil/ fuel will be required as part of construction. Only small amounts of oil/ fuel can spill because of leaks on construction vehicles. These could be easily managed.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of spillages.

10.2.2.10 LITTERING

Littering is a possibility during the construction phase. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Every construction vehicle should have a dedicated waste bin, which should be emptied regularly.
- Littering in the environment is not allowed.

(ii) Cumulative Impacts

- Although littering is not expected, littering is a serious concern in our country. Every piece of waste that is littered into the environment decreases the aesthetic and visual value of the environment and could potentially cause harm to animals that get stuck because of the waste or ingest the waste.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of littering.

10.2.2.11 SOCIO-ECONOMIC IMPACTS

The proposed project will create employment opportunities and contribute to food security. During construction 5 temporary skilled job opportunities and 20 unskilled job opportunities will be made available. These opportunities are temporary as they are only applicable to the construction phase. The crops will also be sold locally. This impact was rated as medium positive before and after implementation of improvement measures.

(i) Improvement measures

- The socio-economic impact can be improved by employing a work force from the local community as far as reasonably possible.

- Utilise existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities and informing the Applicant of possible contractors in the local community.
- Opportunities should first be given to previously disadvantaged individuals where practically possible.
- Employees should be trained and continuously developed.
- It is proposed that the product also be sold locally if viable, to contribute to local food security.

(ii) Cumulative Impacts

- Every employment opportunity can positively contribute to certain livelihoods in the community through income generation. Overall, any job opportunities will contribute to reducing unemployment.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of socio-economic impacts.

10.2.2.12 VISUAL IMPACT

This impact was rated as medium negative; however, this is not anticipated to be a significant negative impact. No mitigation measures exist with regards to a visual impact for the proposed project. The impact is not expected to be significant as one of the major surrounding land uses in the area is pivot irrigation, however, the visual aesthetic of the directly affected footprint area will be different than its current, semi-vegetated natural state.

(i) Mitigation measures

- None.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of visual impacts.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of visual impacts.

10.2.2.13 EROSION

Topographically the area is flat, which will prevent major erosion and water runoff during rainfall events. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- It is recommended that construction take place during the dry season as far as possible.
- Possible water flow during rainfall events must be controlled, using preferred storm water management techniques, before discharge into natural existing drainage lines.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of erosion.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of erosion.

10.2.2.14 IMPACT ON HERITAGE RESOURCES

Despite an intensive walkthrough of the footprint area, no evidence for any significant archaeological or heritage sites could be identified. As a result, a low impact is expected from the proposed development on heritage. It is however possible that cultural material could be exposed during construction and may be recoverable. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented:
    - An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon if any possible heritage resources or artefacts are identified.
    - Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
    - The qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the Heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
    - The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
    - Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/ archaeologist.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of an impact on heritage resources.

(iii) Irreplaceable loss of Resources

- if a heritage resource is accidentally uncovered and destroyed it cannot be replaced.

10.2.3 OPERATIONAL PHASE IMPACTS

10.2.3.1 HABITAT FRAGMENTATION, LOSS OF NATURAL VEGETATION AND ALIEN INVASION IN A CBA 2

As with all disturbance, there is an increased risk of alien infestation. Many alien species proliferate in disturbed areas such as the periphery of the irrigation lands. Invasive species affect our natural biodiversity in several ways. They may compete directly with natural species for food or space, may compete indirectly by changing the food web or physical environment, or hybridize with indigenous species. Rare species with limited ranges and restricted habitat requirements are often particularly vulnerable to the influence of these alien invaders. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Alien vegetation that has grown within the pivot footprints or because of production activities must be removed through approved methods.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of habitat fragmentation, loss of natural vegetation and alien invasion in this CBA2 area.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss is expected because of habitat fragmentation, loss of natural vegetation and alien invasion in this CBA2 area.

10.2.3.2 ANTHROPOGENIC DISTURBANCES, INTENTIONAL AND/OR ACCIDENTAL KILLING OF FAUNA

Anthropogenic disturbances include aspects such as, vibrations caused by machinery & vehicles. These aspects will impact on invertebrate species more than faunal species. These anthropogenic disturbances impact on the way invertebrates forage. For example, some invertebrates use vibrations produced by their prey to locate and catch them. Vibrations caused by construction equipment will make this impossible. Smaller fauna will inevitably be killed during land clearing activities as these activities will destroy their habitat. In addition to unintentional killing of fauna, some faunal species, particularly herpetofaunal species, are often intentionally killed as they are

thought to be dangerous. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- There is no mitigation for the vibrations caused by machinery/vehicles, except ensuring that activities are kept to a minimum.
- As the intentional killing of herpetofauna is considered a result of ignorance, this can be ameliorated through education. The labour force involved should be educated regarding the conservation importance of herpetofauna (especially snakes).

(ii) Cumulative Impacts

- No cumulative impacts are expected because of anthropogenic disturbances, intentional and/or accidental killing of fauna.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of anthropogenic disturbances, intentional and/or accidental killing of fauna.

10.2.3.3 NOISE NUISANCE

Heavy operation vehicles will be required for ripping/ ploughing/ tilling of the soil layer, seed sowing, fertilizing, and harvesting within the development footprint. This impact is not anticipated to be significant as there are no nearby receptors to any noise nuisance. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Ensure that all vehicles used during operation are serviced and in a good working condition.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of noise impacts.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of noise impacts.

10.2.3.4 FIRE DAMAGE

The possibility of fire is a serious threat within the site area given the vegetation types and climate within the region. Fire should be prevented at all costs as it could spread easily and has the capability of quickly spreading to neighbouring areas. This impact was rated as medium negative before mitigation and was reduced to low negative after implementation of the proposed mitigation measures.

(i) Mitigation measures

- Ensure that operation vehicles are equipped with the necessary firefighting equipment, specifically fire extinguishers.
- Workers must be adequately trained in the handling of firefighting equipment.
- No open fires will be permitted on-site.
- No smoking will be allowed within close vicinity of the site.
- It is recommended that if fire breaks were created around each pivot, that they be maintained and regularly cleared of any vegetation.

(ii) Cumulative Impacts

- If a fire is accidentally started and not managed promptly, it has the capability to quickly spread and cause major damage within the surrounding area. Damages can be caused to the environment, neighbouring crops, and nearby infrastructure.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of fire.

10.2.3.5 DUST NUISANCE

Dust will be generated during the operation phase because of frequent movement of heavy vehicles over the development footprint. This is not anticipated to be a significant impact as there are no nearby receptors. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Ensure that access roads to the development footprint are well maintained.
- Production phase vehicles should not exceed 30 km/h on access roads or in-field.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of dust impacts during construction.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of dust impacts during decommissioning.

10.2.3.6 OIL/ FUEL SPILLAGES CAUSING SOIL AND GROUNDWATER CONTAMINATION

There are no surface water features close to the proposed development footprint. However, any leaks on production phase vehicles or accidental spillages can seep into and contaminate soil and possibly the groundwater. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Ensure that all vehicles used are serviced and in a good working condition.
- Ensure that every vehicle used on-site has a spill prevention kit, to be used for accidental spillages of oil or fuel.
- No storage of oil or fuel is allowed on-site. Any storage, if necessary, should be within a designated area and no direct contact between the storage containers and the ground is allowed.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of spillages during operation. It is not anticipated that large quantities of oil/ fuel will be required as part of operation. Only small amounts of oil/ fuel can spill because of leaks on vehicles. These could be easily managed.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of spillages.

10.2.3.7 LITTERING

Littering is a possibility during the operational phase. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Every vehicle on-site should have a dedicated waste bin, which should be emptied after every day of use or when full.
- Littering in the environment is not allowed.

(ii) Cumulative Impacts

- Although a large amount of litter is not expected, littering is a serious concern in our country. Every piece of waste that is littered into the environment decreases the aesthetic and visual value of the environment and could potentially cause harm to animals that get stuck because of the waste or ingest the waste.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of littering.

10.2.3.8 SOCIO-ECONOMIC IMPACTS

The proposed project will create employment opportunities and contribute to food security. During operation, 5 skilled opportunities and 110 un-skilled opportunities will be created. These are more permanent in nature as the workforce will be required during each harvest for the duration of the project. The crops will be sold locally. This impact was rated as medium positive before and after implementation of improvement measures.

(i) Improvement measures

- The socio-economic impact can be improved by employing a work force from the local community as far as reasonably possible.
- Utilise existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities and informing the Applicant of possible contractors in the local community.
- Opportunities should first be given to previously disadvantaged individuals where practically possible.
- Employees should be trained and continuously developed.
- It is proposed that the product also be sold locally, if viable, to contribute to local food security.

(ii) Cumulative Impacts

- Every employment opportunity can positively contribute to certain livelihoods in the community through income generation. Overall, any job opportunities will contribute to reducing unemployment.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of socio-economic impacts.

10.2.3.9 VISUAL IMPACT

This impact was rated as medium negative. No mitigation measures exist with regards to a visual impact. The impact is not expected to be significant as one of the major surrounding land uses in the area is pivot irrigation, however, the visual aesthetic of the directly affected footprint area will be different than its current, semi-vegetated natural state.

(i) Mitigation measures

- None.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of a visual impact.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of a visual impact.

10.2.3.10 EROSION

Topographically the area is flat, which will prevent major erosion and water runoff during rainfall events. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Possible water flow during rainfall events must be controlled, using preferred storm water management techniques, before discharge into natural existing drainage lines.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of erosion.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected because of erosion.

10.2.4 DECOMMISSIONING, REHABILITATION AND CLOSURE PHASE IMPACTS

Decommissioning of a pivot is not a high impact process. It will entail removal of the centre pivot system and allowing natural rehabilitation to occur over time. The applicant will be responsible for ensuring that alien/ invasive species do not occur within the footprint and will have to remove these from time-to-time as they occur on the site while the land naturally rehabilitates. Alternatively, the farmer may remove the pivot system and still grow crops without artificial irrigation

10.2.4.1 HABITAT FRAGMENTATION, LOSS OF NATURAL VEGETATION AND ALIEN INVASION IN A CBA 2.

As with all disturbance, there is an increased risk of alien infestation. Many alien species proliferate in disturbed areas such as the periphery of the irrigation lands. Invasive species affect our natural biodiversity in several ways. They may compete directly with natural species for food or space, may compete indirectly by changing the food web or physical environment, or hybridize with indigenous species. Rare species with limited ranges and restricted habitat requirements are often particularly vulnerable to the influence of these alien invaders. This impact was rated as low negative before and after implementation of mitigation measures.

(i) Mitigation measures

- Alien vegetation that has grown because of the open lands must be removed through approved methods.
- The pivot footprints need to be revegetated with local indigenous grass species.

(ii) Cumulative Impacts

- No cumulative impacts are expected because of habitat fragmentation, loss of natural vegetation and alien invasion in this CBA2.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss is expected because of habitat fragmentation, loss of natural vegetation and alien invasion in this CBA2.

10.2.5 NO-GO ALTERNATIVE

The no-go alternative option means ‘do nothing’ or the option of not undertaking the proposed pivot construction project or any of its activities, consequently leading to the continuation of the current land-use, which is leaving the location as a natural semi-vegetated area. As such, the ‘do nothing’ alternative or keeping the current status quo with no activities occurring on-site also provides the baseline against which the impacts of the preferred alternative was compared.

10.2.5.1 HABITAT FRAGMENTATION, LOSS OF NATURAL VEGETATION AND ALIEN INVASION IN A CBA 2

If the No-Go alternative is considered, then no habitat fragmentation or loss of natural vegetation will occur because of the preferred alternative activities. The invasion of alien vegetation however could continue in nature without any interference from anthropogenic activities. This impact was rated as medium positive.

10.2.5.2 LOSS OF SPECIES OF CONSERVATION CONCERN

No species of conservation concern will be killed, or their habitat destroyed because of activities proposed as part of the preferred alternative. This impact was rated as medium positive.

10.2.5.3 ANTHROPOGENIC DISTURBANCES, INTENTIONAL AND/OR ACCIDENTAL KILLING OF FAUNA

Intentional or accidental killing will not occur because of the preferred alternative activities. However, intentional killing of fauna is not impossible. Sometimes individuals from local communities do set traps to hunt for animals illegally in natural areas, mostly without the knowledge of the landowner. This impact was rated as being low positive.

10.2.5.4 LOSS OF FOSSIL HERITAGE

No fossil heritage, if any are present underground, will be destroyed if the No-Go option is considered. This impact has been rated as medium positive.

10.2.5.5 NOISE NUISANCE

No noise will be generated on site. This impact was rated as medium positive.

10.2.5.6 FIRE DAMAGE

Even though no fire damage will occur because of activities subject to the preferred alternative, fire damage is still a reasonable threat in the area, as a fire can start easily (accidental or intentional) and spread fast over a large area. Therefore, albeit lower than the preferred alternative, fire damage is still rated as a negative impact.

10.2.5.7 DUST NUISANCE

Dust will not be caused because of activities proposed in the preferred alternative. The current vegetation cover greatly lowers the risk of dust nuisance during windy days. This impact was rated as medium positive.

10.2.5.8 OIL/ FUEL SPILLAGES CAUSING SOIL AND GROUNDWATER CONTAMINATION

Oil/ fuel spillages are unlikely on-site if the No-Go alternative is considered as vehicle passage through the area is not expected. This impact was rated as medium positive.

10.2.5.9 LITTERING

Littering is considered a low negative impact. Even though the activities of the preferred alternative will not take place if the No-Go option is considered, litter is a universal problem and chances are good that litter will find its way on-site through wind, especially as the sit is situated next to a road.

10.2.5.10 SOCIO-ECONOMIC IMPACTS

Socio-economics was rated as a medium negative impact if the No-Go option is considered. The preferred alternative will create job opportunities as well as contribute to food security.

10.2.5.11 VISUAL IMPACT

No visual impact will occur if the No-Go option is considered. This impact was rated as low positive.

10.2.5.12 EROSION

Erosion will not occur because of activities which form part of the preferred alternative. This impact was rated as medium positive.

10.2.5.13 IMPACT ON HERITAGE RESOURCES

If any heritage resources exist underground, these will not be impacted on if the No-Go option is considered. This impact was rated as medium positive.

10.2.6 OVERALL PREFERRED ALTERNATIVE

The proposed activities on site are preferred, considering that no other alternatives other than the preferred activities and the No-Go alternative could be identified. No other alternative seemed reasonable or feasible for the proposed project and site location. The reasoning is that the proposed activities, construction of new pivots, align with the surrounding land uses and current farming activities being undertaken by Williet Boerdery. The location of the proposed activities is ideally situated as it is on the applicant's property, mostly on previously cultivated lands (minimising the negative impact), and it falls within the potential intensive irrigation agriculture area (see Figure 6). The preferred alternative will also have significant positive socio-economic impacts for its scale in creating employment opportunities and contributing to food security.

No significant/ detrimental negative impacts were identified with regards to the preferred alternative. All impacts and associated risks can be minimised if the mitigation measures are adhered to.

10.3 SUMMARY OF PRELIMINARY IMPACTS

A summary of all the identified preliminary impact, their associated phase, as well as their impact calculations and significance are presented in Table 22 below. The No-Go alternative was also included in this table.

Table 22: Significance rating of identified impacts.

IMPACT DESCRIPTION			Pre-Mitigation							Post Mitigation								Priority Factor Criteria			
Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
Habitat fragmentation, loss of natural vegetation and alien invasion ir	Alternative 1	Construction	-1	1	4	2	2	3	-6.75	-1	1	4	2	2	2	-4.5	High	1	1	1.00	-4.5
Loss of species of conservation concern	Alternative 1	Construction	-1	2	4	2	2	3	-7.5	-1	1	4	2	2	3	-6.75	High	1	1	1.00	-6.75
Anthropogenic disturbances, intentional and/or accidental killing of fa	Alternative 1	Construction	-1	1	3	1	2	2	-3.5	-1	1	3	1	2	1	-1.75	Medium	2	1	1.13	-1.96875
Loss of fossil heritage	Alternative 1	Construction	-1	1	5	2	5	1	-3.25	1	1	5	1	5	1	3	Low	1	3	1.25	3.75
Gain of fossil heritage	Alternative 1	Construction	1	1	5	2	5	1	3.25	1	1	5	2	5	1	3.25	Medium	1	1	1.00	3.25
Noise nuisance	Alternative 1	Construction	-1	1	4	3	2	2	-5	-1	1	4	1	2	1	-2	Medium	1	1	1.00	-2
Fire damage	Alternative 1	Construction	-1	3	2	4	4	4	-13	-1	2	2	2	2	2	-4	Medium	1	1	1.00	-4
Dust nuisance	Alternative 1	Construction	-1	3	4	2	2	3	-8.25	-1	2	4	1	2	2	-4.5	Medium	1	1	1.00	-4.5
Oil/ fuel spillages causing soil and groundwater contamination	Alternative 1	Construction	-1	1	2	3	3	2	-4.5	-1	1	2	2	2	2	-3.5	Medium	1	1	1.00	-3.5
Littering	Alternative 1	Construction	-1	2	4	2	2	2	-5	-1	1	4	1	1	1	-1.75	Medium	1	1	1.00	-1.75
Socio-economic impacts	Alternative 1	Construction	1	4	4	2	1	5	13.75	1	4	4	3	1	5	15	Medium	1	1	1.00	15
Visual impact	Alternative 1	Construction	-1	1	4	1	2	5	-10	-1	1	4	1	2	5	-10	Medium	1	1	1.00	-10
Erosion	Alternative 1	Construction	-1	1	4	3	2	2	-5	-1	1	4	2	2	2	-4.5	Medium	1	1	1.00	-4.5
Impact on heritage resources	Alternative 1	Construction	-1	1	5	2	5	2	-6.5	-1	1	5	1	1	1	-2	High	1	1	1.00	-2
Habitat fragmentation, loss of natural vegetation and alien invasion ir	Alternative 1	Operation	-1	1	4	2	2	3	-6.75	-1	1	4	2	2	2	-4.5	High	1	1	1.00	-4.5
Anthropogenic disturbances, intentional and/or accidental killing of fa	Alternative 1	Operation	-1	1	4	1	2	2	-4	-1	1	4	1	2	1	-2	Medium	2	1	1.13	-2.25
Noise nuisance	Alternative 1	Operation	-1	1	4	3	2	2	-5	-1	1	4	1	2	1	-2	Medium	1	1	1.00	-2
Fire damage	Alternative 1	Operation	-1	3	2	4	4	4	-13	-1	2	2	2	2	2	-4	Medium	1	1	1.00	-4
Dust nuisance	Alternative 1	Operation	-1	3	4	2	2	3	-8.25	-1	2	4	1	2	2	-4.5	Medium	1	1	1.00	-4.5
Oil/ fuel spillages causing soil and groundwater contamination	Alternative 1	Operation	-1	1	2	3	3	2	-4.5	-1	1	2	2	2	2	-3.5	Medium	1	1	1.00	-3.5
Littering	Alternative 1	Operation	-1	2	3	2	2	2	-4.5	-1	1	3	1	1	1	-1.5	Medium	1	1	1.00	-1.5
Socio-economic impacts	Alternative 1	Operation	1	4	4	2	1	5	13.75	1	4	4	3	1	5	15	Medium	1	1	1.00	15
Visual impact	Alternative 1	Operation	-1	1	4	1	2	5	-10	-1	1	4	1	2	5	-10	Medium	1	1	1.00	-10
Erosion	Alternative 1	Operation	-1	1	4	3	2	2	-5	-1	1	4	2	2	2	-4.5	Medium	1	1	1.00	-4.5
Habitat fragmentation, loss of natural vegetation and alien invasion ir	Alternative 1	Rehab and closure	-1	1	4	2	2	3	-6.75	-1	1	4	2	2	2	-4.5	High	1	1	1.00	-4.5
Habitat fragmentation, loss of natural vegetation and alien invasion ir	No-Go		1	1	4	2	2	4	9	1	1	4	2	2	4	9	Medium	1	1	1.00	9
Loss of species of conservation concern	No-Go		1	2	4	2	2	4	10	1	2	4	2	2	4	10	Medium	1	1	1.00	10
Anthropogenic disturbances, intentional and/or accidental killing of fa	No-Go		1	1	3	1	2	3	5.25	1	1	3	1	2	3	5.25	Medium	1	1	1.00	5.25
Loss of fossil heritage	No-Go		1	1	5	2	3	5	13.75	1	1	5	2	3	5	13.75	Medium	1	1	1.00	13.75
Noise nuisance	No-Go		1	1	4	3	2	4	10	1	1	4	3	2	4	10	Medium	1	1	1.00	10
Fire damage	No-Go		-1	3	2	4	4	2	-6.5	-1	3	2	4	4	2	-6.5	Medium	1	1	1.00	-6.5
Dust nuisance	No-Go		1	3	4	2	2	4	11	1	3	4	2	2	4	11	Medium	1	1	1.00	11
Oil/ fuel spillages causing soil and groundwater contamination	No-Go		1	1	2	3	3	4	9	1	1	2	3	3	4	9	Medium	1	1	1.00	9
Littering	No-Go		-1	2	4	2	2	1	-2.5	-1	2	4	2	2	1	-2.5	Medium	1	1	1.00	-2.5
Socio-economic impacts	No-Go		-1	4	4	2	2	5	-15	-1	4	4	2	2	5	-15	Medium	1	1	1.00	-15
Visual impact	No-Go		1	1	4	1	2	4	8	1	1	4	1	2	4	8	Medium	1	1	1.00	8
Erosion	No-Go		1	1	4	3	2	4	10	1	1	4	3	2	4	10	Medium	1	1	1.00	10
Impact on heritage resources	No-Go		1	1	5	2	3	5	13.75	1	1	5	2	3	5	13.75	Medium	1	1	1.00	13.75

11 PLAN OF STUDY FOR THE IMPACT ASSESSMENT

The section below outlines the proposed plan of study which will be conducted for the various environmental aspects during the EIA phase. It is also important to note that the plan of study will also be guided by comment obtained from I&APs and other stakeholders during the Scoping Report public review period.

11.1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED

Only incremental alternatives will be considered further going into the EIA phase. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation and management measures and are not specifically identified as distinct alternatives. Incremental alternatives to be considered by the applicant and which will be explored further during the EIA phase include the type of irrigation system to be used and the method of sourcing power to the pivot to turn around its centre. These will be investigated further during the EIA phase and will form part of the EMPr.

11.2 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The following aspects will be assessed further during the EIA phase investigations to be undertaken:

- It is the EAP and specialist's opinion that no additional specialist studies will have to be considered during the EIA phase. EIA level specialist studies were done during this scoping phase for biodiversity, heritage, and palaeontology.
- An overall sensitivity map of the proposed project will be created to rank the different site sensitivities.
- Incremental alternatives as mentioned in Section 11.1 above will be further assessed during the EIA phase.
- Any comments received from the competent authority, I&APs and other stakeholders will be taken into account and assessed during the EIA phase.

11.3 ASPECTS TO BE ASSESSED BY SPECIALISTS

EIA level biodiversity, heritage and palaeontological specialist studies have already been undertaken for the proposed project during this scoping phase assessment. The impacts and their ratings as identified by the specialists and the EAP is unlikely to change during the impact assessment phase of this study. However, comments as received by the competent authority, I&APs and other stakeholders will be considered during the EIA phase and the impact ratings adjusted if necessary.

11.4 PROPOSED METHOD OF ASSESSING ENVIRONMENTAL ASPECTS

EIA level specialist studies, assessing the environmental aspects, were already done for biodiversity, heritage and palaeontology. No additional specialist studies were considered necessary and a desktop assessment was conducted by the EAP for these environmental fields. It is unlikely that any additional specialist assessment of environmental aspects will be required however, any comments received from the competent authority, I&AP's and other stakeholders with regards to environmental aspects will be taken in consideration.

Further to the above-mentioned environmental sensitivity mapping will be conducted during the EIA phase. Environmental sensitivity mapping provides a strategic overview of the environmental, cultural and social assets in a region. The sensitivity mapping technique integrates numerous datasets (base maps and shapefiles) into a single consolidated layer making use of Geographic Information System (GIS) software and analysis tools. Environmental sensitivity mapping is a rapid and objective method applied to identify areas which may be particularly sensitive to development based on environmental, cultural and social sensitivity weightings – which is determined by specialists' input within each respective field based on aerial or ground-surveys as well as desktop input where required. Therefore, the sensitivity mapping exercise assists in the identification of low,

medium and highly sensitive areas within and surrounding the proposed development footprint area. The sensitivity/ composite map will only consist of information as received from the specialist as well as desktop information where specialist studies were considered unnecessary relating to the proposed project

11.5 PROPOSED METHOD FOR ASSESSING SIGNIFICANCE

As done is this Scoping phase assessment, the significance of environmental impacts will be rated before and after the implementation of mitigation measures. These mitigation measures may be existing measures or additional measures that may arise from the public participation process. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation. The proposed method for the assessment of environmental issues is set out in the Section 10. This assessment methodology enables the assessment of environmental issues including: the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

11.6 COMPETENT AUTHORITIES CONSULTATION

Competent authorities were notified of the proposed project during the initial notification period of the scoping phase and will further be included and notified of the project proceedings during the EIA phase. This Scoping report was also sent to the competent authorities for comment, as will the EIA report. If and/ or when an authority requires a meeting, one will be arranged. Should a meeting be required, the date, time, and venue of the meeting will be scheduled post dissemination of the project notification documents. The purpose of an authority meeting would be to explain the project in detail to authorities and clarify the process going forward if uncertainties exist.

11.7 PROPOSED METHOD OF PUBLIC PARTICIPATION

An overview of the proposed public participation process to be followed for the EIA phase is provided below. The commenting periods that will be provided to the I&APs (and the competent authorities) will be thirty (30) days long. Two commenting periods are provided for during this EIA process, these will be during the review period of the:

- Scoping Report; and
- EIA Report and associated EMPr.

All comments received during the initial notification and call to register have been included in this Scoping Report, and comments received during the Scoping Report comment period will be included in the finalised Scoping Report for submission to the competent authority. The details pertaining to the review of the EIA Report and EMPr, the venue where the report will be placed for review, as well as the duration of the comment period, will be determined at a later date and communicated to all registered I&APs.

11.7.1 STEPS TO BE TAKEN TO NOTIFY INTERESTED AND AFFECTED PARTIES

The Public Participation Process will continue to be undertaken in accordance with the NEMA EIA Regulations (2014, as amended). The information submitted by I&APs will be utilised during the Impact Assessment and compilation of the EIA Report and associated EMPr. An EIA Report will be compiled presenting the findings of the EIA phase, this report will be made available for public review and comment for 30 days.

Feedback from registered I&APs will solicited through the following means:

- Registered letters;
- Facsimile and e-mails; and
- Any other communication with EIMS, which includes SMS's.

11.7.2 DETAILS OF ENGAGEMENT PROCESS TO BE FOLLOWED

I&APs will be afforded the following opportunities to participate in the project:

- Registered I&APs will be requested via written notifications distributed to provide their views, queries and / or comments on the project;
- The EIA Report and EMPr will be available for comment for a period of 30 days at the same public places in the project area that the Scoping Report was made available. Furthermore, copies of the said report sent to stakeholders who request a copy and placed on the EIMS website: www.eims.co.za.

All comments and issues raised during the EIA Report 30-day public comment period will be incorporated into the final EIA Report and EMPr to be submitted to the competent authority for decision-making.

11.7.3 DESCRIPTION OF INFORMATION TO BE PROVIDED

The following information will be provided during the EIA phase PPP:

- The site layout plan;
- List of activities to be authorised;
- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised (e.g. surface disturbance, dust, noise, drainage, etc.);
- The duration of the activity;
- Sufficient detail of the intended operation to enable communities to assess what impact the activities will have on them;
- The purpose of the proposed project;
- Details of the affected properties (including parent farm and portion);
- Details of the NEMA Regulations that must be adhered to;
- Date by which comment, concerns and objections must be forwarded through to both EIMS and/ or the competent authority respectively; and
- Contact details of the Environmental Assessment Practitioner (EAP).

11.8 DESCRIPTION OF TASKS THAT WILL BE UNDERTAKEN DURING THE EIA PROCESS

The plan of study is summarised below. The following tasks will be undertaken as part of the EIA phase of the project:

- Public consultation:
    - Notification of the availability of the EIA Report for review and comment to all registered I&APs;
    - Informing registered I&APs of the project progress; and
- Authority consultation:
    - Consultation with the competent authorities if required; and
    - Other relevant/ commenting authorities' consultation to provide authorities with project related information and obtain their feedback.
- Document compilation:

- The EIA Report and associated EMPr will be compiled in line with the requirements of Appendix 3 and 4 of the NEMA EIA Regulations (2014, as amended);
- The EIA Report and EMPr will be made available for public comment for a period of 30 days; and
- The EIA Report and EMPr will be finalised and submitted to the competent authority.

11.9 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IMPACTS

All comments received by I&APs will be taken into consideration and will inform the high-level mitigation measures. The potential impacts identified during the Scoping phase will further be assessed in terms of the mitigation potential, taking into consideration the following:

- Reversibility of impact:
  - Reversible;
  - Partially reversible.; and
  - Irreversible.
- Irreplaceable loss of resources:
  - Replaceable;
  - Partially replaceable; and
  - Irreplaceable.
- Potential of impacts to be mitigated:
  - High;
  - Medium; and
  - Low.

The assessment findings for each identified impact taking the above into consideration will be provided in the EIA Report and associated EMPr.

12 ASSUMPTIONS, LIMITATIONS AND UNCERTAINTIES

Certain assumptions, limitations, and uncertainties are associated with the Scoping Phase. This report is based on information that is currently available and, as a result, the following limitations and assumptions are applicable:

- The scoping process and report is based on the technical information and process description provided by the client;
- The description of the baseline environment has been obtained from specialist studies and a desktop analysis.

13 UNDERTAKINGS

13.1 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I **Pieter Holtzhausen** herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of the EAP

Date: 02 February 2021

13.2 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I **Pieter Holtzhausen** herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of the EAP

Date: 02 February 2021

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