PROPOSED GROOTVLEI 600MW SOLAR PV PLANT, BESS AND GRID CONNECTION, NEAR VENTERSDORP, DR KENNETH KAUNDA AND NGAKA MODIRI MOLEMA DISTRICT MUNICIPALITIES, NORTH WEST PROVINCE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

DFFE REFERENCE NO: 14/12/16/3/3/2/2840

DRAFT

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PREPARED FOR:

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Amendments Page

Date:	Nature of Amendment	Amendment Number:
2026/10/30	Draft EIA Report for Client Review	00
2026/11/11	Draft EIA Report for Public Review	01

Executive Summary

A. PURPOSE OF THIS DOCUMENT

Nemai Consulting (Pty) Ltd was appointed by LTM Green Energies (Pty) Ltd (the "Applicant"), to conduct the Environmental Impact Assessment (EIA) for the Proposed Grootvlei 600MW Solar PV Plant, Battery Energy Storage System (BESS) and Grid Connection, near Ventersdorp, Dr Kenneth Kaunda and Ngaka Modiri Molema District Municipalities, North West Province (the "Project").

This document serves as the draft EIA Report for the proposed Project.

B. PROJECT BACKGROUND AND MOTIVATION

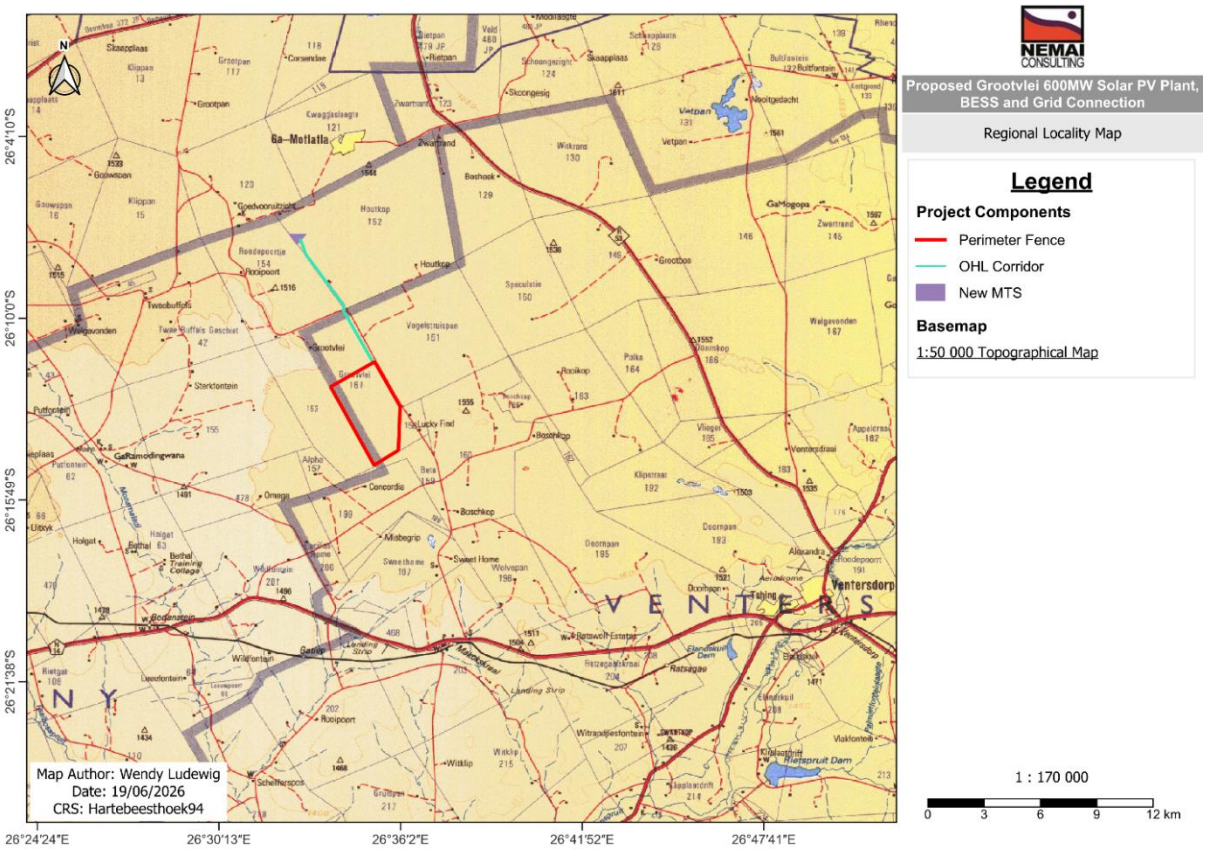
The South African Government ratified the Paris Agreement in 2016, thereby demonstrating the country's commitment to contributing to the global effort to address climate change. Electricity generation sources need to be diversified to ensure security of supply and reduce the carbon footprint created by South Africa's (SA) current heavy reliance on coal for electricity production. Electricity demand is increasing in SA, and to meet that demand, there is a need to supply a diversified power generation mix that includes renewable energy technologies.

On 13 December 2023, the Applicant received Environmental Authorisation (EA) for the development of the Grootvlei 600MW Solar Plant, BESS and Grid Connection Project (DFFE Reference Number: 14/12/16/3/3/2/2386). Upon optimising the layout plan for the Proposed Grootvlei 600MW Solar PV Plant, BESS, and Grid Connection near Ventersdorp, North West Province, the Applicant determined that the previously secured land would be insufficient to accommodate the planned power capacity. To ensure that no incremental decision-making occurs, as guided by DFFE, the Applicant applied to amend the existing EA to lapse. The amendment was granted on 07 April 2026 (DFFE Reference Number: 14/12/16/3/3/2/2386/AM1). The Applicant is now applying for an EA for the entire Project site, including the originally authorised site and the expansion area.

The Applicant intends to bid for the current and future Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) bid windows and/or other renewable energy markets within SA.

C. PROJECT LOCATION

The Project is located approximately 20km to the north-west of Ventersdorp and falls within Ward 34 of the JB Marks LM and Ward 17 of the Ditsobotla LM in the North West Province. The N14 runs approximately 10 km to the south of the Project site, with the R53 approximately 15 km to the east of the Project site. The Regional Locality Map is illustrated below.



Regional Locality Map for the Project Footprint

D. LEGISLATION AND GUIDELINES CONSIDERED

Pertinent legislation that has a possible bearing on the proposed Project from an environmental perspective is briefly discussed in this EIA Report.

The relationship between the Project and the following key pieces of environmental legislation are also explained:

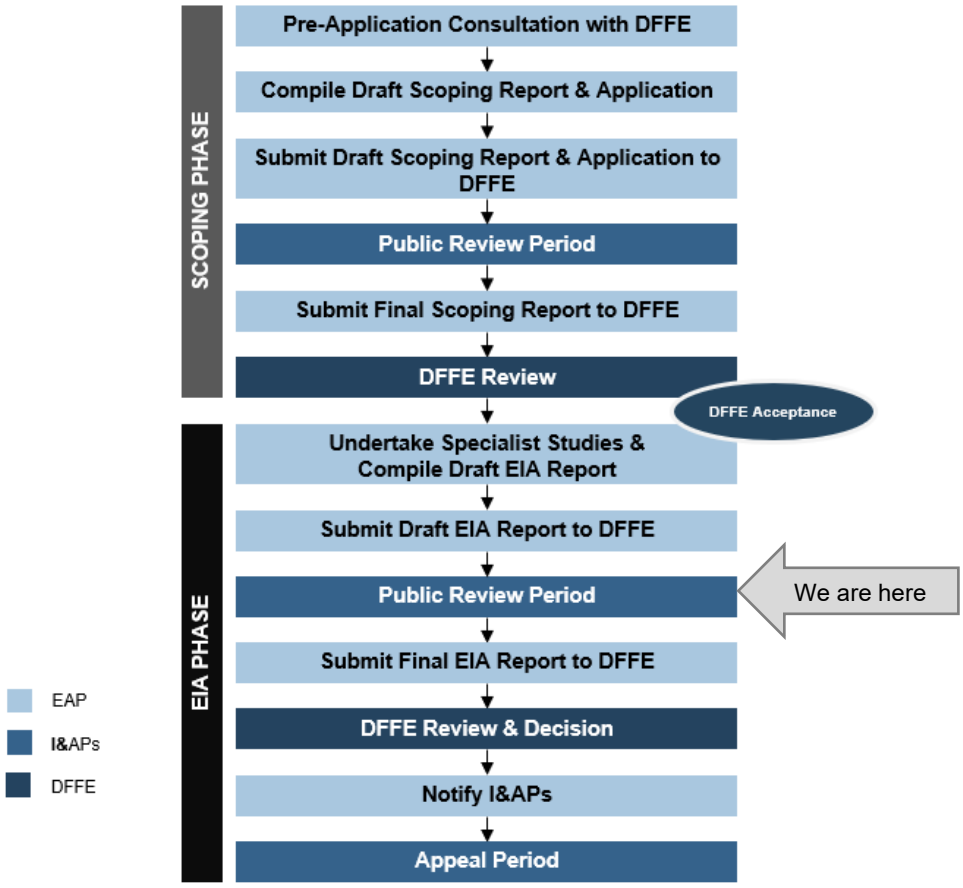
- National Environmental Management Act (Act No. 107 of 1998);
- National Water Act (Act No. 36 of 1998);
- National Environmental Management: Waste Act (Act No. 59 of 2008);
- National Environmental Management: Air Quality Act (Act No. 39 of 2004);
- National Environmental Management: Protected Areas Act (Act No. 57 of 2003);
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004); and
- National Heritage Resources Act (Act No. 25 of 1999).

E. SCOPING AND EIA PROCESS

The process for seeking Environmental Authorisation for the Project under the National Environmental Management Act (Act No. 107 of 1998) (NEMA) is being undertaken in accordance with the EIA Regulations of 2014 (as amended). In terms of NEMA, the lead

decision-making authority for this application is the Department of Forestry, Fisheries and the Environment (DFFE).

Based on the listed activities triggered, the requisite environmental assessment for the Project is a Scoping and Environmental Impact Reporting (S&EIR) Process. An outline of the process follows.



Outline of the Overall S&EIR Process for the proposed Project

F. PROJECT DESCRIPTION

The Project consists of the following systems, sub-systems or components (amongst others):

- 600MW PV solar panels or modules (arranged in arrays);
- Mounting structures to support the PV panels;
- DC-AC current inverter stations, transformers, and internal electrical reticulation (underground cabling);
- Transmission Line: The Project includes transmission infrastructure with an installed capacity at both distribution (132 kV) and transmission (2x 275 kV) levels, comprising an on-site 132/33 kV collector substation, an on-site 132 kV switching station, three 132 kV overhead lines linking the switching station to a new 400/132 kV substation located

approximately 8.4 km north of the site on Portion 1 of the farm Houtkop 152 IP, and two 275 kV tie-in lines connecting to the existing Pluto-Watershed 275 kV line, thereby facilitating connection to the national grid with potential for electricity wheeling to off-site offtakers.

- New 400/132kV Main Transmission Substation;
- Administration Buildings (Offices);
- Workshop areas for maintenance and storage;
- Temporary laydown areas;
- Internal access roads and perimeter fencing of the footprint area;
- BESS;
- Security Infrastructure; and
- Site access from unnamed gravel road via the N14 and/or R53.

An overview of the project life cycle and the resources required to execute the Project is provided in the EIA Report.

G. PROFILE OF THE RECEIVING ENVIRONMENT

The EIA Report provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the assessment was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed Project. A brief overview of the manner in which the environmental features may be affected by the proposed Project is also provided.

The following features of the receiving environment are discussed in the EIA Report:

- Land Use
- Climate
- Geology, Soil and Geohydrology
- Topography
- Surface Water
- Terrestrial Biodiversity
- Socio-Economic Environment
- Air Quality
- Visual Quality
- Noise and Vibration
- Agriculture
- Planning
- Waste
- Transportation
- Heritage and Palaeontology
- Existing Structures and Infrastructures
- Health

H. SPECIALIST STUDIES

The following studies were undertaken for the Project, based on the outcomes of the Scoping exercise and Screening:

- Wetland Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Avifaunal Impact Assessment

- Agricultural Compliance Statement
- Phase 1 Heritage Impact Assessment
- Palaeontology Impact Assessment
- Visual Impact Assessment
- Social Impact Assessment

A suitably qualified professional also undertook a Geotechnical and Dolomitic Desktop Study.

The information obtained from the respective specialist studies was incorporated into the EIA Report in the following manner:

- The assumptions and limitations identified in each study were included;
- The information was used to complete the description of the receiving environment in a more detailed and site-specific manner;
- A summary of each specialist study is provided, focusing on the approach to each study, key findings and conclusions drawn;
- The specialists' impacts assessments, and the identified mitigation measures, were included in the overall project impact assessment;
- Specialist input was obtained to address comments made by Interested and Affected Parties (I&APs) that related to specific environmental features pertaining to each specialist discipline; and
- Salient recommendations made by the specialists were taken forward to the EIA conclusions.

I. IMPACT ASSESSMENT

The EIA Report assessed the potentially significant environmental impacts that may arise during the pre-construction, construction and operational phases of the Project. The impacts were identified through consideration of:

- Impacts associated with listed activities contained in the EIA Regulations' Listing Notices;
- Impacts identified during the Scoping phase;
- An appraisal of the Project's activities and components;
- An assessment of the receiving biophysical, social, economic and built environments;
- Findings from specialist studies;
- Issues highlighted by environmental authorities; and
- Comments received from Interested and Affected Parties (I&APs) during public participation.

The assessment focused on potentially significant direct, indirect and cumulative impacts. These included impacts associated with land use and agriculture; soils, geology and geohydrology; surface water and wetlands; terrestrial biodiversity and avifauna; heritage and palaeontology; visual quality; air quality; noise and vibration; traffic; hazardous substances and waste; existing infrastructure; health and safety; and the social and socio-economic environment.

Impacts and their proposed management measures were considered qualitatively and thereafter quantitatively assessed in terms of their nature, extent, magnitude, duration, probability and overall significance. Impacts were assessed both before and after mitigation to determine the residual significance following implementation of the proposed mitigation measures.

Mitigation follows the hierarchy of preventing, reducing, rehabilitating/remediating and, where necessary, compensating for environmental impacts. The assessment incorporates measures identified by the technical team, environmental specialists, and environmental authorities, together with environmental best practice. Detailed management requirements are contained in the Generic EMPrs for the overhead electricity transmission/distribution and substation infrastructure and the project-specific EMPr for the Solar PV Plant.

The impact assessment indicates that appropriate avoidance, mitigation, rehabilitation, and management can reduce most identified adverse impacts. Important residual impacts nevertheless remain, particularly in relation to the loss and fragmentation of natural habitat and avifaunal habitat, the long-term conversion of grazing land, and alteration of the rural landscape visual character.

The palaeontological assessment identified a Very High construction-phase impact before mitigation due to the sensitivity of the underlying Malmani Subgroup; however, this reduces to Low following implementation of the prescribed Chance Find Protocol. Wetland impacts are expected to be predominantly Low to Very Low subject to implementation of the required mitigation, monitoring and 30 m wetland buffers.

The Project also has the potential to generate positive socio-economic effects through employment, local procurement, skills development and opportunities for local businesses. The Social Impact Assessment concludes that, following mitigation, the Project is expected to have a net positive impact on the regional social environment.

The implications of the No-Go Alternative were also assessed. While the No-Go Alternative would avoid Project-related environmental impacts and largely retain the existing agricultural and rural environment, the Project objectives and anticipated renewable-energy and socio-economic benefits would not be realised. Considering the need and desirability of the Project and the ability to avoid or mitigate identified impacts, the No-Go Alternative is not preferred.

The cumulative assessment considered the Project in combination with existing land uses and infrastructure, as well as approved and reasonably foreseeable developments. A 30 km radius was used as the initial regional screening area for renewable-energy developments, supplemented by receptor-specific study areas applied by the specialists.

Nine approved renewable-energy applications occur within the broader 30 km screening area. The principal cumulative impacts identified include:

- Loss and fragmentation of natural and semi-natural habitat and reduced ecological connectivity;
- Loss and fragmentation of avifaunal habitat and additional infrastructure-related risks to birds;
- Changes to runoff, erosion, sedimentation and water quality;
- Conversion and fragmentation of agricultural and grazing land;
- Alteration of the rural landscape character and sense of place;
- Heritage and palaeontological impacts;
- Traffic, dust, noise and construction-related disturbance;
- Pressure on local roads, services and surrounding communities; and
- Positive cumulative socio-economic effects arising from employment, procurement, skills development and economic diversification.

The most notable residual cumulative impacts relate to progressive habitat transformation and fragmentation affecting terrestrial biodiversity and avifauna, both of which remain Medium negative after mitigation. Cumulative wetland, heritage, palaeontological and visual impacts are generally Low following mitigation, while cumulative social impacts are expected to be predominantly positive. No cumulative impact constituting a fatal flaw to the Project was identified, subject to implementation of the prescribed mitigation and management measures.

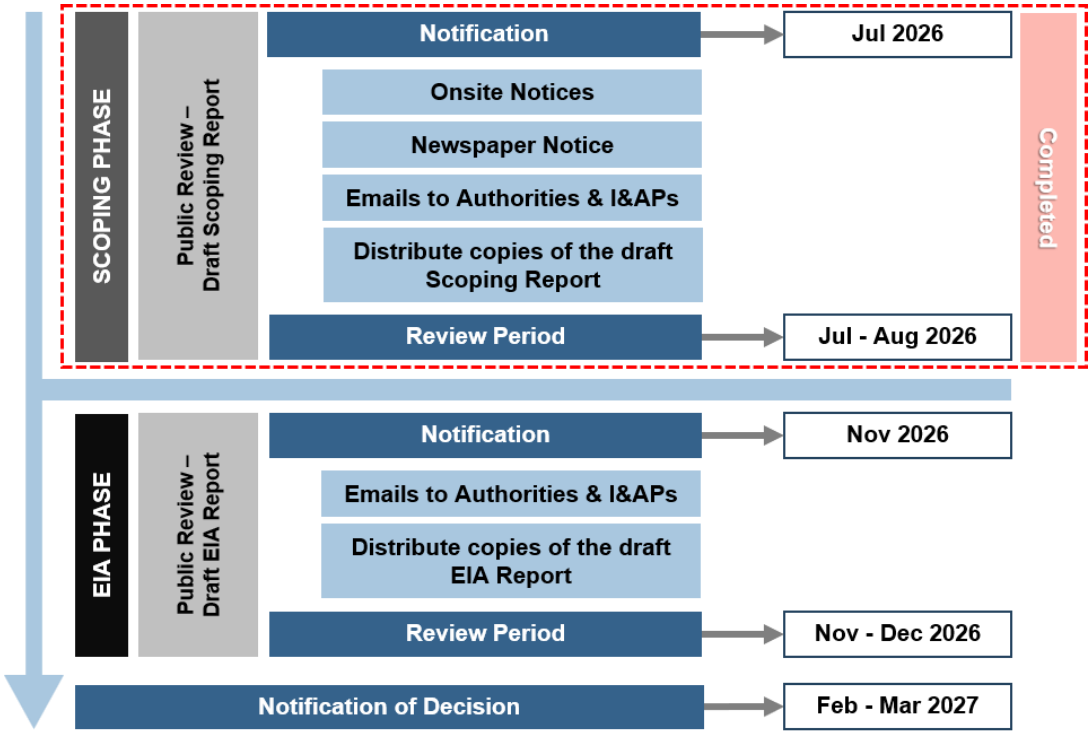
J. ANALYSIS OF ALTERNATIVES

No alternative development properties were considered, as the application is site-specific and the selected Project area was identified based on land availability, solar resource, grid access, transport access and the ability to accommodate environmental constraints. Rather than assessing multiple fixed layouts, the Project layout was iteratively refined in response to specialist findings, including realignment of internal roads to avoid wetlands and associated 30 m no-go buffers. Solar PV and BESS technology options remain subject to detailed design within the assessed Project parameters. The resulting preferred layout is considered the Best Practicable Environmental Option (BPEO).

The No-Go Alternative would avoid Project-related environmental impacts but would also forgo the anticipated renewable-energy and socio-economic benefits and is therefore not preferred.

K. PUBLIC PARTICIPATION

The following diagram outlines the public participation process for the Scoping Phase (completed) and EIA Phase (current).



Note: *Dates may change throughout the EIA process*

Outline of the Overall Public Participation Process to be followed for the proposed Project

The EIA Report explains the following public participation tasks:

- Maintaining the database of I&APs;
- Review of draft EIA Report:
  - Period to review the draft EIA Report;
  - Notification of Review of the draft EIA Report;
  - Accessing the draft EIA Report; and
  - Commenting on the draft EIA Report.

L. CONCLUSIONS

The following key tasks were undertaken during the EIA phase for the proposed Project:

- The specialist studies identified in the Plan of Study for the EIA were undertaken, and the findings were incorporated into the EIA Report in terms of understanding the environmental status quo and sensitive features, assessing the potential impacts and establishing concomitant mitigation measures, and informing the iterative alternatives assessment;
- Potentially significant impacts pertaining to the pre-construction, construction and operational phases of the Project were identified and assessed, and mitigation measures were provided; and

- Reasonable and feasible alternatives were considered, and the preferred Project footprint was identified as the Best Practicable Environmental Option (BPEO). The No-Go Alternative is not preferred when the Project's need and desirability, residual impacts and benefits foregone are considered.

The specialist investigations identified particular environmental sensitivities that require attention. Key considerations include the delineated wetlands and associated 30 m buffers, natural and semi-natural grassland and avifaunal habitat, identified heritage resources, and the underlying dolomitic geology. The preferred layout has been informed by these constraints, and the associated avoidance, mitigation, management and monitoring requirements are incorporated into the EIA Report and EMPr.

An Environmental Impact Statement has been compiled which identifies the key environmental findings and requirements that may warrant inclusion as conditions of Environmental Authorisation. The EIA recognises that certain residual impacts cannot be completely eliminated, notably cumulative impacts on terrestrial biodiversity and avifauna and the long-term modification of the landscape. Notwithstanding these residual impacts, the specialist investigations identified no environmental or social fatal flaw that would preclude development of the preferred Project footprint.

With implementation of the BPEO, adherence to identified avoidance areas and buffers, adoption of the specialist mitigation measures, and dedicated implementation and monitoring of the EMPr, the significant environmental and social impacts associated with the Project are considered manageable to acceptable levels. It is therefore recommended that Environmental Authorisation be granted, subject to implementation of the environmental management provisions and conditions identified through the EIA process.

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List of Acronyms and Abbreviations

AC	Alternating Current
AEL	Atmospheric Emission License
AGIS	Agricultural Geo-Referenced Information System
APHP	Association of Professional Heritage Practitioners
ASAPA	Association of Southern African Professional Archaeologists
BESS	Battery Energy Storage System
BPEO	Best Practicable Environmental Option
BSP	Biodiversity Sector Plan
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CBD	Central Business District
CRR	Comments and Response Report
CPV	Concentrated Photovoltaics
DARD	Department of Agriculture and Rural Development
DC	Direct Current
DEA	Department of Environmental Affairs
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DEM	Digital Elevation Model
DFFE	Department of Forestry, Fisheries and the Environment
DMPR	Department of Mineral and Petroleum Resources
DPSH	Dynamic Probe Super Heavy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECO	Environmental Control Officer
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
EMS	Environmental Management System
ESA	Ecological Support Areas
EWULAAS	Electronic Water Use License Application and Authorisation System
GA	General Authorisation
GCCA	Grid Connection Capacity Assessment
GHG	Greenhouse Gas
GIS	Geographical Information Systems

GN	Government Notice
I&APs	Interested and Affected Parties
IAIA	International Association for Impact Assessment
IBBA	Important Bird and Biodiversity Areas
IDP	Integrated Development Plan
IFC	International Finance Corporation
IHC	Inherent Hazard Class
IPP	Independent Power Producer
LILO	Loop In-Loop Out
LM	Local Municipality
LSU	Large Stock Unit
MSc	Master of Science
MVPS	Medium Voltage Power Station
NaS	Sodium-Sulphur
NPAES	National Protected Area Expansion Strategy
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NHRA	National Heritage Resources Act (Act No. 25 of 1999).
NWA	National Water Act (Act No. 36 of 1998)
NWM5	National Wetland Map 5
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
PHRA-NW	Provincial Heritage Resources Authority-North West
PAOI	Project Area of Influence
PS	Performance Standards
PSSA	Paleontological Society of South Africa
RAM	Risk Assessment Matrix
REC	Recommended Ecological Categories
REDZ	Renewable Energy Development Zone
REEA	Renewable Energy EIA Application
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SA	South Africa
SABAP2	Second Southern African Bird Atlas Project
SACNASP	South African Council for Natural Scientific Professions
S&EIR	Scoping and Environmental Impact Reporting
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute

SAPAD	South African Protected Area Database
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SEI	Site Ecological Importance
SOTER	Soil and Terrain
SSV	Site Sensitivity Verification
VAC	Visual Absorption Capacity
VFB	Vanadium Flow Battery
VRB	Vanadium Redox Battery
WMA	Water Management Area
WUL	Water Use License
ZVI	Zone of Visual Influence

1 PURPOSE OF THIS DOCUMENT

Nemai Consulting was appointed by LTM Green Energies (Pty) Ltd (the "Applicant"), as the independent Environmental Assessment Practitioner (EAP), to conduct the Environmental Impact Assessment (EIA) for the **Proposed Grootvlei 600MW Solar PV Plant, Battery Energy Storage System (BESS) and Grid Connection, near Ventersdorp, Dr Kenneth Kaunda and Ngaka Modiri Molema District Municipalities, North West Province** (the "Project").

The EIA is being undertaken according to the process prescribed in the EIA Regulations of 2014, published under Government Notice (GN) No. 982 in Gazette No. 38282 of 4 December 2014 and amended by GN 326 of 7 April 2017 published in Gazette No. 40772 (the "EIA Regulations"). The EIA Regulations were promulgated in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA). This document serves as the **draft Environmental Impact Assessment (EIA) Report** for the proposed Project.

The Scoping phase of the overall environmental assessment for the Project has been completed. The final Scoping Report and Plan of Study for the EIA were approved by the Department of Forestry, Fisheries and the Environment (DFFE) on 02 October 2026. DFFE is the competent authority to decide on the application in terms of NEMA.

According to the EIA Regulations, the objectives of the EIA process are to undertake the following through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context.
- Describe the proposed activity's need and desirability, including the activity's need and desirability in the context of the development footprint on the approved site as contemplated in the accepted Scoping Report.
- Identify the location of the development footprint within the approved site as contemplated in the accepted Scoping Report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment.
- Determine the -
  - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives.
  - Degree to which these impacts -
    - Can be reversed;
    - May cause irreplaceable loss of resources; and
    - Can be avoided, managed or mitigated.

- Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted Scoping Report based on the lowest level of environmental sensitivity identified during the assessment.
- Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted Scoping Report through the life of the activity.
- Identify suitable measures to avoid, manage or mitigate identified impacts.
- Identify residual risks that need to be managed and monitored.

The draft EIA Report will be made available to Interested and Affected Parties (I&APs) for a 30-day review period from **11 November 2026 until 11 December 2026**. All comments received will be addressed in the final EIA Report and included in the Comments and Responses Report (CRR). The final EIA Report will be submitted to the DFFE for review and decision-making.

2 DOCUMENT ROADMAP

As a minimum, this EIA Report aims to satisfy the requirements stipulated in Appendix 3 of the EIA Regulations. **Table 1** presents the document's composition in terms of the aforementioned regulatory requirements.

Table 1: EIA Report Roadmap

Chapter	Title	Correlation with Appendix 3 of the EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
1	Purpose of this Document	–	–
2	Document Roadmap	–	–
3	Project Background and Motivation	-	-
4	Project Location	3(1)(b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted Scoping Report, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.
		3(1)(c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure 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; and (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.
5	Legislation and Guidelines Considered	3(1)(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.
6	S&EIR Process	3(1)(a)	Details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae.
		3(1)(u)	An indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation.
		3(1)(v)	Any specific information that may be required by the competent authority.
7	Assumptions and Limitations	3(1)(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.
8	Need and Desirability	3(1)(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

Chapter	Title	Correlation with Appendix 3 of the EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
			preferred development footprint within the approved site as contemplated in the accepted Scoping Report.
9	Project Description	3(1)(d)	A description of the scope of the proposed activity, including- (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development.
		3(1)(g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.
		3(1)(h)(i)	A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including- (i) details of the development footprint alternatives considered.
		3(1)(h)(ix)	If no alternative development footprints for the activity were investigated, the motivation for not considering such.
10	Profile of the Receiving Environment	3(1)(h)(iv)	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
11	Summary of Specialist Studies	3(1)(k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.
12	Impact Assessment	3(1)(h)(v)	The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (i) can be reversed; (ii) may cause irreplaceable loss of resources; and (iii) can be avoided, managed or mitigated.
		3(1)(h)(vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.
		3(1)(h)(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.
		3(1)(h)(viii)	The possible mitigation measures that could be applied and level of residual risk.
		3(1)(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including - (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or

Chapter	Title	Correlation with Appendix 3 of the EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
			addressed by the adoption of mitigation measures.
		3(1)(j)	An assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated.
		3(1)(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr) as well as for inclusion as conditions of authorisation.
13	Analysis of Alternatives	3(1)(h)(i)	Details of the development footprint alternatives considered.
		3(1)(h)(ix)	If no alternative development locations for the activity were investigated, the motivation for not considering such.
		3(1)(h)(x)	A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted Scoping Report.
		3(1)(n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.
14	Public Participation	3(1)(h)(ii)	Details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.
15	Conclusions	3(1)(l)	An environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.
		3(1)(o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.
		3(1)(q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.
16	References	-	-

Chapter	Title	Correlation with Appendix 3 of the EIA Regulations	Description of Content of Appendix 3 of the EIA Regulations
Appendix A	Locality Maps	3(1)(c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale.
Appendix F	Specialist Reports	R23(5)	Specialist Reports containing all information set out in Appendix 6 of the EIA Regulations.
Appendix H	EMPr	R23(4)	Environmental Management Programme containing all information set out in Appendix 4 of the EIA Regulations.
Appendix I	Comments and Responses Report	3(1)(h)(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.
		3(1)(h)(iii)	A summary of the issues raised by Interested and Affected Parties (IAPs), and an indication of the manner in which the issues were incorporated, or the reasons for not including them.
Appendix D	Oath of the Environmental Assessment Practitioner	3(1)(s)	An undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and IAPs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to IAPs and any responses by the EAP to comments or inputs made by IAPs.
N/A		3(1)(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised.
N/A		3(1)(w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.

3 PROJECT BACKGROUND AND MOTIVATION

The South African Government ratified the Paris Agreement in 2016, thereby demonstrating the country's commitment to contributing to the global effort to address climate change. Electricity generation sources need to be diversified to ensure security of supply and reduce the carbon footprint created by South Africa's (SA) current heavy reliance on coal for electricity production. Electricity demand is increasing in SA, and to meet that demand, there is a need to supply a diversified power generation mix that includes renewable energy technologies.

On 13 December 2023, the Applicant received Environmental Authorisation (EA) for the development of the Grootvlei 600MW Solar Plant, BESS and Grid Connection Project (DFFE Reference Number: 14/12/16/3/3/2/2386). Upon optimising the layout plan for the Proposed Grootvlei 600MW Solar PV Plant, BESS, and Grid Connection near Ventersdorp, North West Province, the Applicant determined that the previously secured land would be insufficient to accommodate the planned power capacity. To ensure that no incremental decision-making occurs, as guided by DFFE, the Applicant applied to amend the existing EA to lapse. The amendment was granted on 07 April 2026 (DFFE Reference Number: 14/12/16/3/3/2/2386/AM1). The Applicant is now applying for an EA for the entire Project site, including the originally authorised site and the expansion area.

The Applicant intends to bid for the current and future Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) bid windows and/or other renewable energy markets within SA.

4 PROJECT LOCATION

4.1 Location of Project relative to Solar Yield Area

The location of the Project in relation to SA's PV power potential is shown in Figure 1 below. The Project Area is considered to have favourable solar irradiation levels, making it ideal for producing solar power via PV Panels.

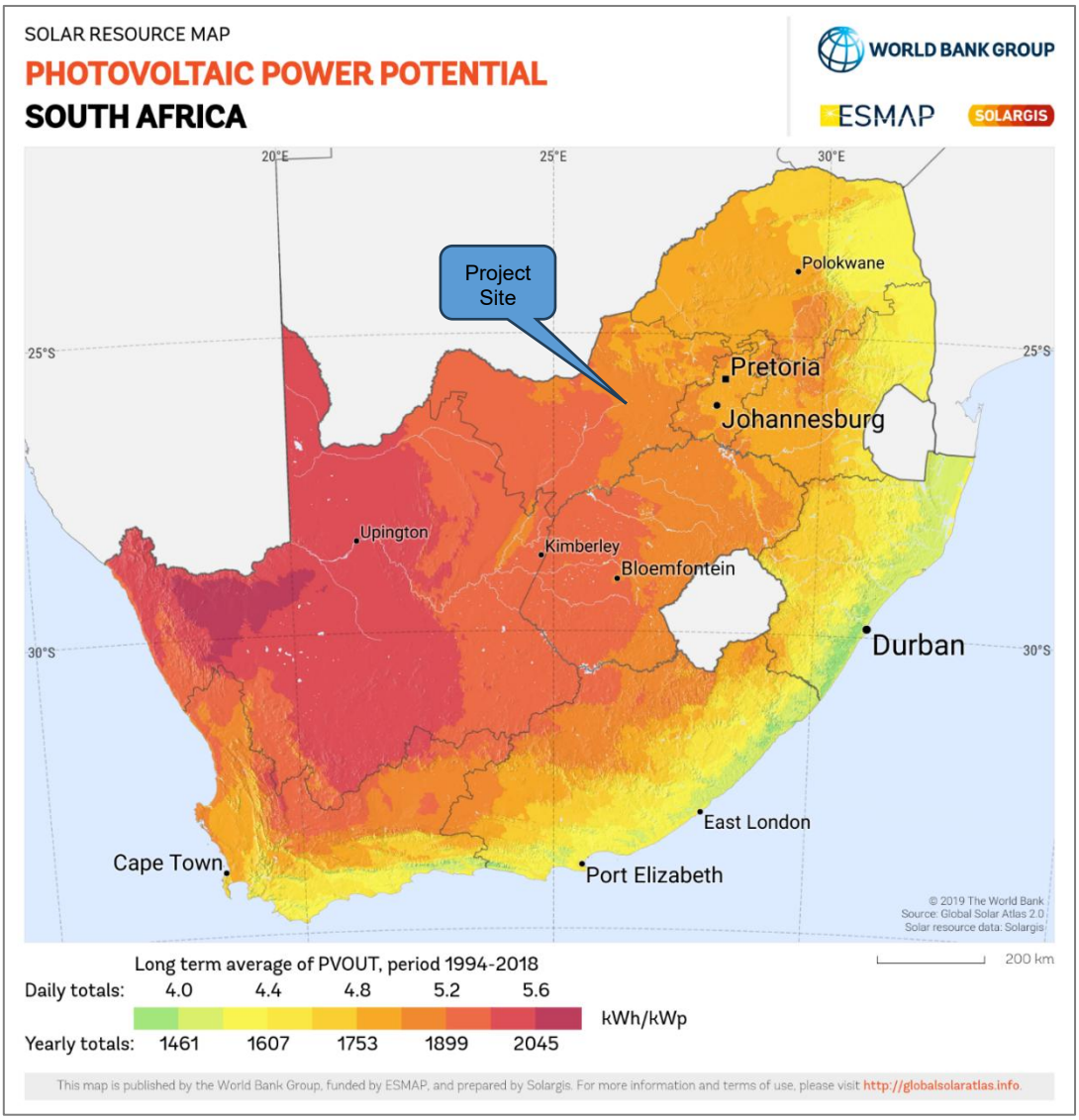

Figure 1: Location of the Project relative to PV Power Potential

(© 2019 The World Bank, Source: Global Solar Atlas 2.0, Solar resource data: Solargis)

4.2 Geographical Context

The Project is located approximately 20km to the north-west of Ventersdorp and falls within Ward 34 of the JB Marks LM and Ward 17 of the Ditsobotla LM in the North West Province.

The N14 runs approximately 10 km to the south of the Project site, with the R53 approximately 15 km to the east of the Project site. The Regional Locality Map is in **Figure 2** and in **Appendix A**.

The Project site is approximately 1 300 ha, with the power line to the grid connection approximately 8.5 km long. The details of the affected properties are provided in **Table 2** and shown in **Figure 3**.

Table 2: Details of affected properties

Farm Details	21-digit Surveyor General No.
Solar PV Plant Site	
Portion 0 of Farm Grootvlei 161 IP	T0IP00000000016100000
Powerline Route	
Portion 0 of Farm Grootvlei 161 IP	T0IP00000000016100000
Portion 1 of Farm Roodepoortje 154 IP	T0IP00000000015400001
Portion 12 of Farm Houtkop 152 IP	T0IP00000000015200012
Portion 11 of Farm Houtkop 152 IP	T0IP00000000015200011
Portion 9 of Farm Houtkop 152 IP	T0IP00000000015200009
Portion 1 of Farm Houtkop 152 IP	T0IP00000000015200001
MTS	
Portion 1 of Farm Houtkop 152 IP	T0IP00000000015200001

The coordinates of the Project are provided in **Table 3** and shown in **Figure 4**. The coordinates of the approximate centre point of the site are 26˚12'56.12"S 26˚35'9.18"E.

Table 3: Coordinates of proposed Project

Feature	Latitude (S)	Longitude (E)
Solar PV Plant Site		
Point 1a	26˚11'23.49"S	26˚35'12.38"E
Point 1b	26˚12'49.03"S	26˚36'1.22"E
Point 1c	26˚14'13.11"S	26˚35'58.28"E
Point 1d	26˚14'41.5"S	26˚35'11.72"E
Point 1e	26˚12'11.19"S	26˚33'47.86"E
Powerline		
Point 2a	26˚11'26.96"S	26˚35'10.83"E
Point 2b	26˚9'44.29"S	26˚34'12.29"E
Point 2c	26˚9'35.32"S	26˚34'13.48"E
Point 2d	26˚7'57.38"S	26˚33'0.75"E
Point 2e	26˚7'29.53"S	26˚32'50.26"E
Point 2f	26˚7'23.65"S	26˚32'47.63"E
Point 2g	26˚7'16.02"S	26˚32'50.65"E

Feature	Latitude (S)	Longitude (E)
Point 2h	26˚7'24.93"S	26˚32'49.39"E
Point 2i	26˚7'16.08"S	26˚32'52.97"E
MTS		
Point 3a	26˚7'18.41"S	26˚33'0.48"E
Point 3b	26˚7'37.5"S	26˚32'42.91"E
Point 3c	26˚7'17.85"S	26˚32'28.2"E

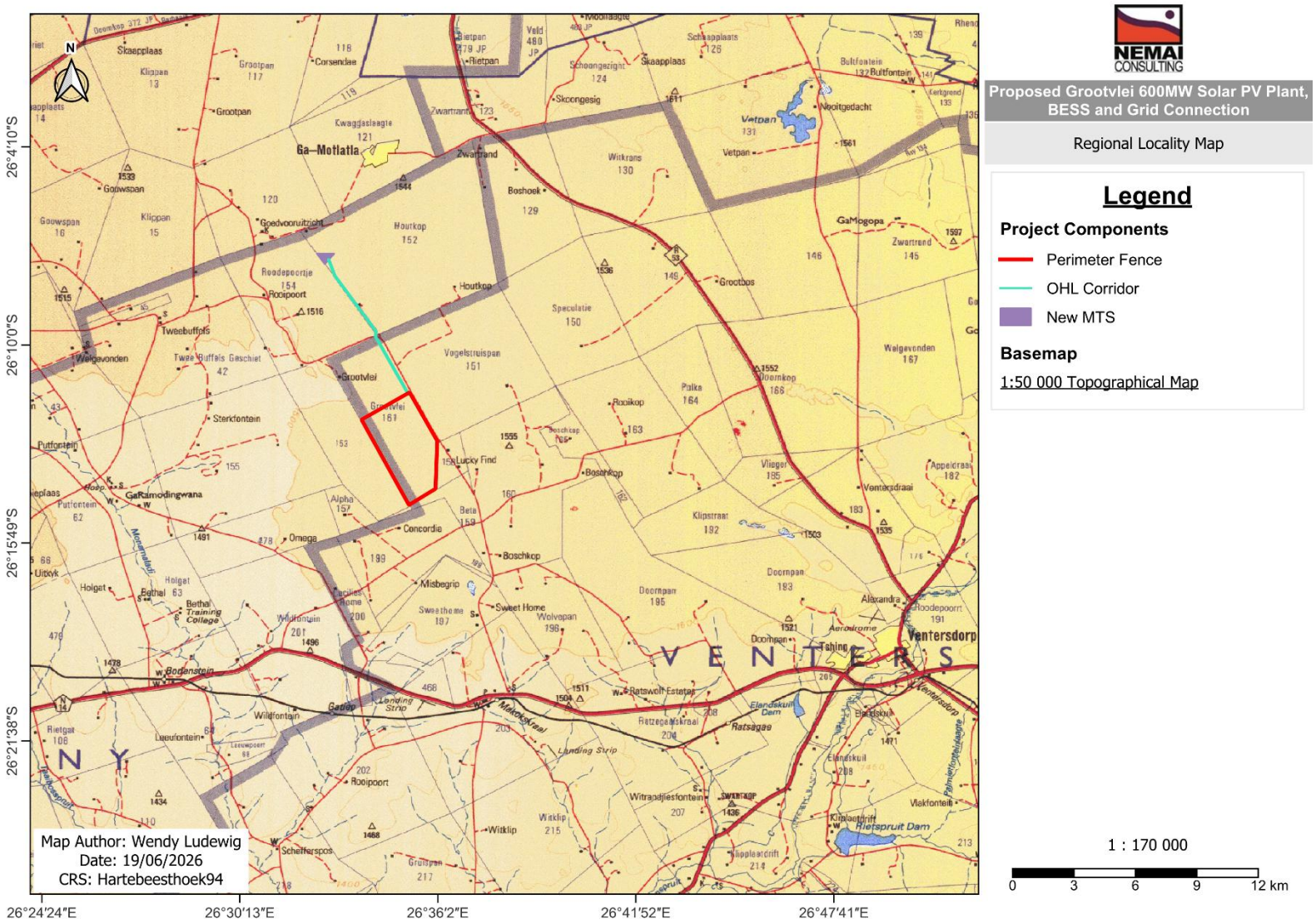

Figure 2: Regional Locality Map

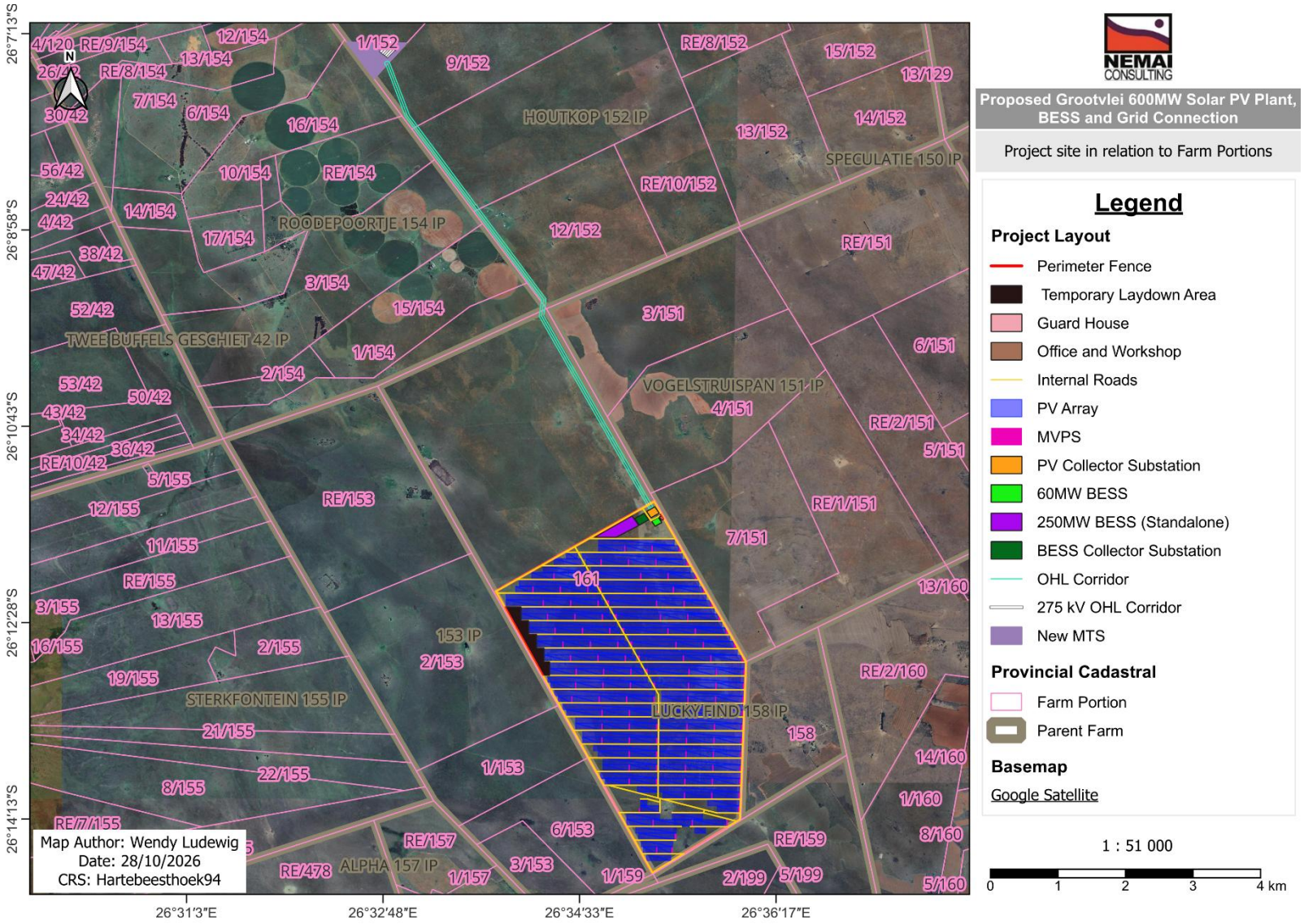

Figure 3: Locality Map for Cadastral Information

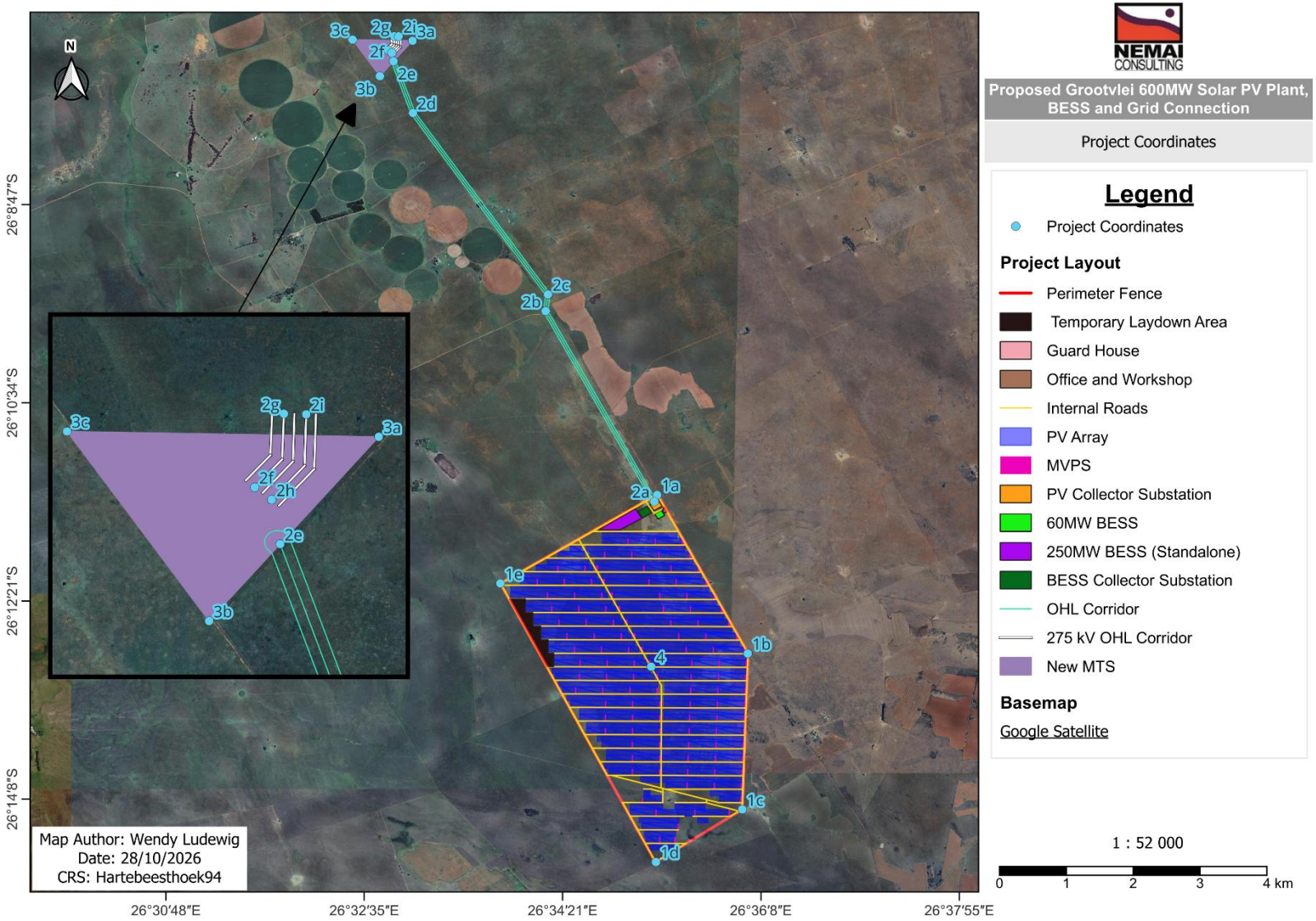

Figure 4: Aerial view of the proposed Project site coordinates points

5 LEGISLATION AND GUIDELINES CONSIDERED

5.1 International Finance Corporation – Performance Standards & Guidelines

Where relevant, the Project would strive to satisfy and incorporate the International Finance Corporation (IFC) Performance Standards (PS), which serve as an international benchmark for identifying and managing environmental and social risks.

The IFC PS offer a framework for understanding and managing environmental and social risks for high-profile, complex, international and potentially high-impact projects. The IFC PS encompass the following eight topics:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;
- Performance Standard 2: Labour and Working Conditions;
- Performance Standard 3: Resource Efficiency and Pollution Prevention;
- Performance Standard 4: Community Health, Safety, and Security;
- Performance Standard 5: Land Acquisition and Involuntary Resettlement;
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- Performance Standard 7: Indigenous Peoples; and
- Performance Standard 8: Cultural Heritage.

IFC's Environmental, Health, and Safety (EHS) Guidelines provide technical guidelines with general and industry-specific examples of good international industry practice to meet IFC PS.

5.2 Legislation

5.2.1 Environmental Statutory Framework

The legislation that has a possible bearing on the proposed Project from an environmental perspective is captured in **Table 4**. **Note:** *This does not attempt to provide an exhaustive explanation, but rather represents an identification of some of the most appropriate sections from pertinent pieces of legislation.*

Table 4: Environmental Statutory Framework

Legislation	Description and Relevance
Constitution of the Republic of South Africa, (No. 108 of 1996)	▪ Chapter 2 – Bill of Rights. ▪ Section 24 – Environmental Rights.
National Environmental Management Act (Act No. 107 of 1998) (NEMA)	▪ Key sections (amongst others): o Section 2 – Principles. o Section 24 – EA (control of activities which may have a detrimental effect on the environment). o Section 28 – Duty of care and remediation of environmental damage.

<table>
<tr><th>Legislation</th><th colspan="2">Description and Relevance</th></tr>
<tr><td></td><td colspan="2">▪ Authorisation type – EA (required for the Project).
▪ Authorities – DFFE (national) (Competent Authority for this Application) and North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT) (provincial).</td></tr>
<tr><td>GN No. 326 of 7 April 2017 (EIA Regulations)</td><td colspan="2">▪ Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for EA's for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.</td></tr>
<tr><td rowspan="3">GN No. 327 of 7 April 2017 (Listing Notice 1)</td><td colspan="2">▪ Purpose - identify activities that would require EA's prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA.
▪ The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment process, as prescribed in regulations 19 and 20 of the EIA Regulations. However, according to Regulation 15(3) of the EIA Regulations, an S&EIR Process must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.
▪ Activities under Listing Notice 1 that are relevant to this Project follow.</td></tr>
<tr><td>GN No. R. 327 – Activity 11(i):
The development of facilities or infrastructure for the transmission and distribution of electricity
(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or
(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more,
excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is
(a) temporarily required to allow for maintenance of existing infrastructure;
(b) 2 kilometres or shorter in length;
(c) within an existing transmission line servitude; and
(d) will be removed within 18 months of the commencement of development.</td><td>The proposed Project includes a Grid Connection with an installed capacity of up to 132 kV and a total line length of approximately 8.5 km.</td></tr>
<tr><td>GN No. R.327 – Activity 12(ii):
The development of
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or
(ii) infrastructure or structures with a physical footprint of 100 square metres or more,
where such development occurs
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse,
excluding
(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;
(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;
(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;
(dd) where such development occurs within an urban area;</td><td>Three depression wetlands were delineated by a wetland specialist near the Project site. The construction of the Project site may occur within the 32 m buffer of these watercourses; therefore, this activity will be triggered and included as part of the application.</td></tr>
</table>

Legislation	Description and Relevance	
	(ee) where such development occurs within existing roads road reserves or railway line reserves; or *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of the development and where indigenous vegetation will not be cleared.*	
	GN No. R. 327 – Activity 28(ii): *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes*	*The Project Footprint is on land that was previously used for agricultural purposes, outside of an urban area.*
GN No. 325 of 7 April 2017 (Listing Notice 2)	▪ Purpose - identify activities that would require EA's prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. ▪ The investigation, assessment and communication of potential impact of activities must follow a S&EIR Process, as prescribed in regulations 21 - 24 of the EIA Regulations. ▪ Activities under Listing Notice 2 that are relevant to this Project follow.	
	GN No. R.325 – Activity 1: *The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs* *(a) within an urban area; or* *(b) on existing infrastructure.*	*The proposed Project is for the development of a 600MW Solar PV Site that is outside an urban area and not on existing infrastructure.*
	GN No. R.325 – Activity 9: *The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex, excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.*	*The proposed Project includes the development of 2 x 275 kV lines to tie into the existing grid via the Pluto-Watershed 275 kV line.*
	GN No. R.325 – 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 purposes undertaken in accordance with a maintenance management plan*	*The proposed Project site is approximately 1300 hectares and is situated on vegetated land.* *According to the Terrestrial Site Sensitivity Verification (SSV) Report, the site contains both natural and disturbed grassland. The extent of clearance of indigenous vegetation will be*

Legislation	Description and Relevance	
		determined upon completion of the Terrestrial Biodiversity Impact Assessment. *Explanatory Note: It is noted that based on the results of the Terrestrial Biodiversity Impact Assessment, more than 20 hectares of indigenous vegetation will be cleared.*
GN No. 324 of 7 April 2017 (Listing Notice 3)	▪ Purpose - list activities and identify competent authorities under sections 24(2), 24(5) and 24D of NEMA, where EA is required prior to commencement of that activity in specific identified geographical areas only. ▪ The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment process, as prescribed in regulations 19 and 20 of the EIA Regulations. However, according to Regulation 15(3) of the EIA Regulations, an S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which an S&EIR must already be applied in respect of any of the activities. ▪ Activities under Listing Notice 3 that are relevant to this Project follow.	
	GN No. R.324 – Activity 4(h)(iv): *The development of a road wider than 4 metres with a reserve less than 13.5 metres.* *(h) North West* *(i) A protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation;* *(ii) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority;* *(iii) Sites or areas identified in terms of an international convention;* *(iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;* *(v) Core areas in biosphere reserves;* *(vi) Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;* *(vii) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or* *(viii) All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act 25 of 1999).*	*New roads will be required for the Project (construction and operational phases):* ▪ *The internal roads will be up to 6m wide; and* ▪ *The main access road will be less than or equal to 6m wide.* *These roads occur within a Critical Biodiversity Area (CBA) 2 according to the North West Biodiversity Sector Plan (BSP).*
	GN No. R.324 – Activity 12(h)(iv)&(vi): *The clearance of an area of 300 square metres or more of indigenous vegetation, except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* *(h) North West* *(i) World Heritage Sites; core of biosphere reserve; or sites or areas identified in terms of an international convention;* *(ii) A protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation;* *(iii) All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act 25 of 1999);*	*The clearance of areas of indigenous vegetation will occur as part of the proposed Project within CBA2 according to the North West BSP.* *According to the Aquatic SSV Report (and the Wetland Impact Assessment), three depression wetlands have been delineated and occur within the southern portion of the Project site. Therefore, the PV Panels and internal roads will occur within 100 m of these wetlands.*

Legislation	Description and Relevance
	(iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; *(v) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; or* *(vi) Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.*
National Water Act (Act No. 36 of 1998) (NWA)	▪ Key sections (amongst others): o Chapter 3 – Protection of water resources. o Section 19 – Prevention and remedying effects of pollution. o Section 20 – Control of emergency incidents. o Chapter 4 – Water use. ▪ Authorisation type – General Authorisation (GA) / Water Use License (WUL) (*required for this Project).* ▪ Authority – Department of Water and Sanitation (DWS).
National Environmental Management Air Quality Act (Act No. 39 of 2004) (NEM:AQA)	▪ Key sections (amongst others): o Chapter 2 – National Framework and National, Provincial and Local Standards. o Chapter 4 – Air Quality Management Measures. o Chapter 5 – Licensing of Listed Activities. ▪ Authorisation type – Atmospheric Emissions License (AEL) (*not required for this Project*) ▪ Authority – DFFE (national) and DEDECT (provincial)
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)	▪ Management and conservation of the country's biodiversity. ▪ Protection of species and ecosystems. ▪ Authorisation type – Permit (*relevance to this Project is to be confirmed).* ▪ Authority – DFFE (national) and DEDECT (provincial)
National Environmental Management: Protected Areas Act (Act No. 57 of 2003) (NEM:PAA)	▪ Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes. ▪ Key sections (amongst others): o Chapter 2 – System of protected areas in SA. o Chapter 3 – Declaration of protected areas. o Chapter 4 – Management of protected areas. ▪ Management authorities include the organ of state or other institution or person in which the authority to manage the protected area is vested
National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA)	▪ Key sections (amongst others): o Part 2 – General duty on the holder of waste in respect of waste management. o Part 3 – Reduction, re-use, recycling and recovery of waste. o Part 4 – Regulation of waste management activities. o Part 5 – Storage, collection and transportation of waste. o Part 6 – Treatment, processing and disposal of waste. o Part 8 – Legal mechanism for managing contaminated land. ▪ Authorisation type – Waste Management Licence *(not required for this Project).* ▪ Authority – DFFE (national) and DEDECT (provincial)
National Forests Act (Act No. 84 of 1998)	▪ Supports sustainable forest management and the restructuring of the forestry sector, as well as the protection of indigenous trees in general. ▪ Key sections (amongst others): o Chapter 3 – Special Measures to Protect Forests and Trees. ▪ Authorisation type – License *(relevance to this Project is to be confirmed).* ▪ Authority – DFFE.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	▪ Equitable access to and sustainable development of the nation's mineral and petroleum resources and to provide for matters related thereto. ▪ Key sections (amongst others): o Section 22 – Application for mining right. o Section 27 – Application for, issuing and duration of mining permit. o Section 53 – Use of land surface rights contrary to objects of Act. ▪ Authorisation types:

Legislation	Description and Relevance
	○ Mineral resources – Reconnaissance Permit, Prospecting Right, Mining Permit, or Mining Right (*not required for the Project*). ○ Petroleum resources – Exploration Right or Production Right (*not required for the Project*). ▪ Authority – Department of Mineral and Petroleum Resources (DMPR).
Occupational Health & Safety Act (Act No. 85 of 1993)	▪ Provisions for Occupational Health & Safety. ▪ Authority – Department of Employment and Labour (DEL). ▪ Relevant regulations, such as Electrical Installation Regulations, Construction Regulations, etc.
National Heritage Resources Act (Act No. 25 of 1999) (NHRA)	▪ Protect and promote good management of SA's heritage resources, and encourage and enable communities to nurture and conserve their legacy so it is available to future generations. ▪ Key sections: ○ Section 34 – protection of structure older than 60 years. ○ Section 35 – protection of heritage resources. ○ Section 36 – protection of graves and burial grounds. ○ Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m^2 in extent, etc. ▪ Authorisation types: ○ Approval of HIA (*required for this* Project); ○ Permit *(relevance to this Project is to be confirmed).* ▪ Authority – South African Heritage Resources Agency (SAHRA) and Provincial Heritage Resources Authority-North West (PHRA-NW).
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	▪ Control measures for erosion. ▪ Control measures for alien and invasive plant species. ▪ Authority – North West Department of Agriculture and Rural Development (DARD).

The relationship between the Project and certain key pieces of environmental legislation is discussed in the subsections to follow.

5.2.2 National Environmental Management Act, 1998

5.2.2.1 Overview

NEMA is the framework legislation regulating the environment in SA and it provides for cooperative governance and establishes principles for decision-making on matters affecting the environment, such as:

- ❖ People and their needs must be placed at the forefront of environment management;
- ❖ Development must be sustainable and therefore requires avoidances of pollution and degradation of the environment, disturbances of landscapes and sites of cultural heritage;
- ❖ The integrated nature of the environment and that responsibility for environmental management exists throughout the life cycle of an activity (from cradle to grave);
- ❖ Public Participation;
- ❖ Transparent decision-making; and
- ❖ Intergovernmental co-ordination and harmonisation of policies, legislation and actions.

Some key definitions from NEMA include:

- ❖ "Environment" - the surroundings within which humans exist and that are made up of –
  (i) The land, water and atmosphere of the earth;
  (ii) Micro-organisms, plant and animal life;

(iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and

(iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

- "Pollution" - any change in the environment caused by –

  (i) substances;

  (ii) radioactive or other waves; or

  (iii) noise, odours, dust or heat;

  emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

Section 2(4)(p) of NEMA requires that 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 are paid for by those responsible for harming the environment.

Section 28(1) of NEMA imposes a duty of care and remediation for environmental damage and requires that "*every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*".

Section 24 of NEMA provides for the consideration, investigation, assessment and reporting of the potential consequences for, or impacts on, the environment of listed activities (or specified activities) to the Competent Authority. The EIA Regulations were promulgated to regulate the procedure and criteria as contemplated in Section 24 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for EAs for the commencement of activities, subject to an EIA, in order to mitigate detrimental impacts on the environment, and to optimise positive environmental impacts. The EIA Regulations were published under GN No. 982 in Gazette No. 38282 of 4 December 2014 and amended by GN 326 of 7 April 2017 published in Gazette No. 40772.

The EIA Regulations consist of the following:

- GN No. 326 of 7 April 2017 – EIA procedure;
- GN No. 327 of 7 April 2017 (Listing Notice 1) – activities that need to be subjected to a Basic Assessment process, as prescribed in Regulations 19 and 20 of the EIA Regulations;
- GN No. 325 of 7 April 2017 (Listing Notice 2) – activities that need to be subjected to an S&EIR Process, as prescribed in Regulations 21 - 24 of the EIA Regulations; and

- GN No. 324 of 7 April 2017 (Listing Notice 3) – activities in specific identified geographical areas that need to be subjected to a Basic Assessment process, as prescribed in Regulations 19 and 20 of the EIA Regulations.

5.2.2.2 Relevance to the Project

The Project triggers activities under Listing Notices 1, 2 and 3, and thus needs to be subjected to an S&EIR process. The listed activities are explained within the context of the Project in **Table 4** above.

Note that the dimensions of the Project's proposed infrastructure and components should be regarded as approximate due to the dynamic nature of the planning and design process. As a conservative approach, the Application Form included all possible activities that could be triggered by the Project and was submitted to the DFFE with the Scoping Report.

5.2.3 National Environmental Management: Waste Act, 2008

5.2.3.1 Overview

Amongst others, the purpose of the NEM:WA includes the following:

- To reform the law regulating waste management in the country by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development;
- To provide for institutional arrangements and planning matters;
- To provide for specific waste management measures;
- To provide for the licensing and control of waste management activities;
- To provide for the remediation of contaminated land; and
- To provide for compliance and enforcement.

Some key definitions from this Act include:

- "Disposal" – the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.
- "General waste" means waste that does not pose an immediate hazard or threat to health or to the environment, and includes -
  - domestic waste;
  - building and demolition waste;
  - business waste; and
  - inert waste.
- "Hazardous waste" – any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.
- "Storage" – the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.
- "Waste" – any substance, whether or not that substance can be reduced, re-used, recycled and recovered -

- That is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- Which the generator has no further use of for (he purposes of production;
- That must be treated or disposed of; or
- That is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but -
- A by-product is not considered waste; and
- Any portion of waste, once re-used, recycled and recovered, ceases to be waste.

GN No. R. 921 of 29 November 2013 (as amended) contains a list of waste management activities that have, or are likely to have, a detrimental impact on the environment. If any of the waste management activities are triggered in Category A and Category B, a Waste Management Licence is required. Activities listed in Category C need to comply with the relevant National Norms and Standards.

5.2.3.2 Relevance to the Project

No authorisation will be required in terms of NEM:WA, as the Project will not include any listed waste management activities. The following is noted with regard to waste management for the Project:

- Construction Phase –
  - Temporary waste storage facilities will remain below the thresholds contained in the listed activities under Schedule 1 of NEM:WA; and
  - The Environmental Management Programme (EMPr) will make suitable provision for waste management, including the storage, handling and disposal of waste.
- Operational Phase –
  - Minimum waste will be generated during the operational phase; and
  - Waste generated during maintenance works will be disposed of at a licensed waste disposal site.

5.2.4 National Water Act, 1998

5.2.4.1 Overview

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

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;

- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

DWS is the custodian of South Africa's water resources.

Some key definitions from this Act and associated regulations include:

- "Pollution" – the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it (a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or (b) harmful or potentially harmful;
- "Regulated area of a watercourse" means:
  - (a) The outer edge of the 1 in 100-year flood line or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, dams and lakes;
  - (b) In the absence of a determined 1 in 100-year flood line or riparian area as contemplated in (a) above the area within 100m distance from the edge of a watercourse where the edge of the watercourse (excluding flood plains) is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of NWA); and
  - (c) In respect of a wetland: a 500 m radius around the delineated boundary (extent) of any wetland (including pans).
- "Waste" – includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted;
- "Water resource" – includes a watercourse, surface water, estuary, or aquifer;
- "Watercourse" - a river or spring, natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which, or from which, water flows; and collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse include, where relevant, its bed and banks; and
- "Wetland" - land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Section 19 of the NWA addresses pollution prevention, in particular, situations in which pollution of a water resource occurs or may occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources.

Section 20 of the NWA addresses pollution of water resources following an emergency incident, such as an accident involving the spillage of a harmful substance that has entered or may enter a water resource. The responsibility for remedying the situation rests with the person responsible for the incident or the substance involved.

Sections 21(a) to (k) of the NWA list eleven types of water uses, which include taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation that must be authorised under a tiered authorisation system. This authorisation system includes scheduled uses that are subject to registration or licensing, as well as general authorisations (Section 39). In general, a water use must be licensed unless it is listed in Schedule 1, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a license.

5.2.4.2 Relevance to the Project

Based on the Wetland Impact Assessment (refer to **Section 11.4** for a summary of the study and **Appendix F1** for a copy of the full report), three Depression wetlands have been delineated on the southern side of the Project site. Therefore, the Solar PV Panels, internal roads, Medium Voltage Power Stations (MVPS), and boundary fence fall within the 500 m regulated area of these Depression wetlands. Therefore, the following water uses in terms of Section 21 of NWA are triggered by the development:

- Section 21 (c) – Impeding or diverting the flow of water in a watercourse; and
- Section 21 (i) – Altering the bed, banks, course or characteristics of a watercourse.

Based on the DWS Risk Assessment Matrix undertaken in the Wetland Impact Assessment, all assessed activities were classified as Low Risk. The specialist therefore concludes that the proposed Project should be authorised through the General Authorisation process rather than requiring a full Water Use Licence Application in terms of the Section 21 (c) and (i) triggered water uses.

Water for the proposed Project may be sourced from boreholes. Should this be the case, the Project will also trigger Section 21 (a) water uses for the boreholes. This may require the Applicant to apply for a full Water Use License.

Conservancy/Septic Tanks may be used for the proposed Project, dependent on the size and location of this infrastructure; these may trigger a Section 21 (g) water use and require the Applicant to apply for a full Water Use License.

The Applicant will apply for the applicable approval from DWS using the DWS online Electronic Water Use License Application and Authorisation System (EWULAAS).

5.2.5 National Environmental Management: Air Quality Act, 2004

5.2.5.1 Overview

The purpose of the NEM:AQA is to reform the law regulating air quality by providing measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This Act aims to promote justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government, and for specific air quality measures.

Some key definitions from this Act include:

- *"*Air pollution" – any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, aerosols and odorous substances.
- "Atmospheric emission" or "emission" – any emission or entrainment process emanating from a point, non-point or mobile source that results in air pollution.
- "Non-point source" – a source of atmospheric emissions which cannot be identified as having emanated from a single identifiable source or fixed location, and includes veld, forest and open fires, mining activities, agricultural activities and stockpiles.
- "Point *source"* – single identifiable source and fixed location of atmospheric emission, and includes smokestacks and residential chimneys.

Section 21 of the NEM:AQA provides for the listing of activities that result in atmospheric emissions that pose a threat to health or the environment, as set out in GN 893 of 22 November 2013. No person may, without an AEL, conduct any such listed activity.

National Dust Control Regulations (GN No. R. 827 of 1 November 2013), as amended, were gazetted in terms of NEM:AQA. The purpose of the regulations is to prescribe general measures for controlling dust in all areas. These Regulations prescribe acceptable dust fallout rates.

5.2.5.2 Relevance to the Project

A profile of the air quality of the receiving environment is conducted in **Section 10.9**. However, no AEL is required for the Project. Provisions are made in the EMPr (refer to **Appendix H**) to manage impacts to air quality that may be caused by the Project.

5.2.6 National Environmental Management: Protected Areas Act

5.2.6.1 Overview

The aim of the NEM:PAA is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural seascapes. The purpose of a Protected Environment is, among other things, to protect a specific ecosystem outside a special nature reserve, world heritage site, or nature reserve, and to ensure that the use of the area's natural resources is sustainable.

5.2.6.2 Relevance to the Project

The proposed Project does not occur within a protected area as contemplated in the NEM:PAA, and no known protected areas occur within 5 km of the site. The Makokskraal and Klipstraat Private Nature Reserves occur within 10 km, while the Wikrans Private Nature Reserve occurs more than 10 km from the site. The Terrestrial Biodiversity Specialist (refer to **Section 11.5** for a summary of the Terrestrial Biodiversity Impact Assessment and **Appendix F2** for a copy of the full report) considers the proposed Project to be sufficiently distant from these reserves that significant harm to species occurring within the reserves is unlikely. The project does, however, overlap NPAES Focus Areas identified as priorities for future

protected-area expansion, and consequently the specialist recommends minimising habitat fragmentation and retaining ecological connectivity, particularly through protection of delineated watercourses and their associated 30 m buffers.

5.2.7 National Environmental Management: Biodiversity Act, 2004

5.2.7.1 Overview

The purpose of NEM:BA is to provide for the management and conservation of SA's biodiversity within the framework of NEMA.

Some key definitions from this Act include:

- "Alien species" –
  - A species that is not an indigenous species; or
  - An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.
- "Biological diversity" or "biodiversity" – the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
- "Indigenous species" – a species that occurs, or has historically occurred, naturally in a free state in nature within the borders of the Republic but excludes a species that has been introduced in the Republic as a result of human activity.
- "Invasive species" – any species whose establishment and spread outside of its natural distribution range –
  - Threaten ecosystems, habitats or other species or have demonstrable potential; and
  - May result in economic or environmental harm or harm to human health.
- "Species" – a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind, and includes any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population.

This Act allows for the publication of provincial and national lists of ecosystems that are threatened and in need of protection. The list should include:

- Critically Endangered Ecosystems, which are ecosystems that have undergone severe ecological degradation as a result of human activity and are at extremely high risk of irreversible transformation.
- Endangered Ecosystems, which are ecosystems that, although they are not critically endangered, have nevertheless undergone ecological degradation as a result of human activity.
- Vulnerable Ecosystems, which are ecosystems that have a high risk of undergoing significant ecological degradation.

- Protected Ecosystems, which are ecosystems that are of a high conservation value or contain indigenous species at high risk of extinction in the wild in the near future.

Similarly, the NEM:BA allows for the listing of endangered species, including critically endangered, endangered, vulnerable, and protected species. A person may not carry out a restricted activity (including trade) involving listed threatened or protected species without a permit.

The Regulations on the management of Listed Alien and Invasive Species were promulgated on 1 August 2014. The Listed Invasive Species were also published on this date and were subsequently amended in GN 864 of 29 July 2016 and 2020.

5.2.7.2 Relevance to the Project

The implications of the NEMA for the Project *inter alia* include requirements for managing invasive and alien species, protecting threatened ecosystems and species, and rehabilitating areas affected by the Project (outside the development's physical footprint).

The findings from the Wetland Impact Assessment and Terrestrial Biodiversity Impact Assessment are included in **Section 11.4** and **Section 11.5** below, respectively.

5.2.8 National Heritage Resources Act, 1999

5.2.8.1 Overview

The purpose of the NHRA is to protect and promote good management of SA's heritage resources, and to encourage and enable communities to nurture and conserve their legacy so it is available to future generations.

Some key definitions from this Act include:

- ''Cultural significance'' – aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.
- ''Development'' – any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including -
  - Construction, alteration, demolition, removal or change of use of a place or a structure at a place;
  - Carrying out any works on or over or under a place;
  - Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
  - Constructing or putting up for display signs or hoardings;
  - Any change to the natural or existing condition or topography of land; and
  - Any removal or destruction of trees, or removal of vegetation or topsoil.
- ''Heritage resource'' – any place or object of cultural significance.

In terms of Section 38 of the NHRA, certain listed activities require authorisation from provincial agencies:

- The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- The construction of a bridge or similar structure exceeding 50 m in length;
- Any development or other activity which will change the character of a site -
  - Exceeding 5 000 m2 in extent; or
  - Involving three or more existing erven or subdivisions thereof; and
  - The re-zoning of a site exceeding 10 000 m2 in extent.

The SAHRA is the national heritage resources authority, with the PHRA-NW being the provincial heritage resources authority.

5.2.8.2 Relevance to the Project

The findings from the Phase 1 Heritage Impact Assessment and Palaeontological Impact Assessment that were undertaken for the Project are included in **Section 11.8** and **Section 11.9** below, respectively. These reports will be submitted to SAHRA via the South African Heritage Resources Information System (SAHRIS) during the public participation process of the EIA Phase of the Project, to enable SAHRA to provide comments on the affected heritage resources. The Project will need to apply for a permit if any heritage sites or graves are to be directly affected.

5.3 Governance of Energy in SA

SA has expressed and entrenched its commitment to promoting the use of renewable energy and implementing Energy Efficiency through the following (amongst others):

- SA is a signatory to various international treaties and conventions relating to climate change and greenhouse gas (GHG), such as –
  - United Nations Framework Convention on Climate Change;
  - Kyoto Protocol; and
  - Paris Agreement.
- SA has developed the following related policy frameworks –
  - White Paper on Energy Policy (1998);
  - White Paper on Renewable Energy (2003);
  - Integrated Energy Plan (2003);
  - IRP 2010;
  - IRP 2019
  - National Climate Change Response White Paper (2011);
  - Post-2015 National Energy Efficiency Strategy;
  - The National Development Plan (2030);
  - Climate Change Bill (2018); and
  - Carbon Tax Bill (2019).

- SA has developed the following related legal frameworks –
  - Electricity Regulation Act (Act No. 4 of 2006);
  - National Energy Act (Act No. 34 of 2008); and
  - Income Tax Act (1962) - tax incentive provided for Section 12L.
- The former Department of Environmental Affairs (DEA), which is now known as DFFE, developed EIA Guideline for Renewable Energy Projects (2015).
- SA's related voluntary instruments include –
  - South African National Standard (SANS) 941 energy-efficiency of electrical and electronic equipment; and
  - SANS 50001 energy management standard.

5.4 Guidelines

The following guidelines were considered during the preparation of the EIA Report:

- Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a);
- Guideline on Need and Desirability (DEA, 2017);
- Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010);
- EIA Guideline for Renewable Energy Projects (DEA) (DEA, 2015); and
- Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005).

5.5 National and Regional Plans

The following regional plans were considered during the execution of the EIA Phase (amongst others):

- Dr Kenneth Kaunda District Municipality Integrated Development Plan (IDP);
- Ngaka Modiri Molema DM IDP;
- JB Marks Local Municipality (LM) IDP and Spatial Development Framework (SDF);
- North West Biodiversity Sector Plan (BSP) (2025); and
- Relevant national, provincial, district and local policies, strategies, plans and programmes.

5.6 Renewable Energy Development Zones & Strategic Transmission Corridors

A Strategic Environmental Assessment (SEA) was undertaken by the former DEA, now known as DFFE, to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and the supporting electricity grid network. These areas are referred to as Renewable Energy Development Zones (REDZs), in which development will be incentivised and streamlined. The proposed Project footprint in relation to the REDZs is shown in **Figure 5** below. It is noted that the Project does not occur within any REDZ.

As shown in **Figure 5**, the Project is located within the Northern Corridor of the Strategic Transmission Corridors, in terms of GN No. 113 of 16 February 2018. The Strategic Transmission Corridors were identified through the SEA for Electricity Grid Infrastructure in SA. These corridors are important for the rollout of the supporting large-scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and Distribution.

According to GNR 114 of 16 February 2018, where an Application for EA for large-scale wind or solar PV facilities is made, and these facilities fall outside the REDZs, such applications will be considered in terms of the requirements of the EIA Regulations.

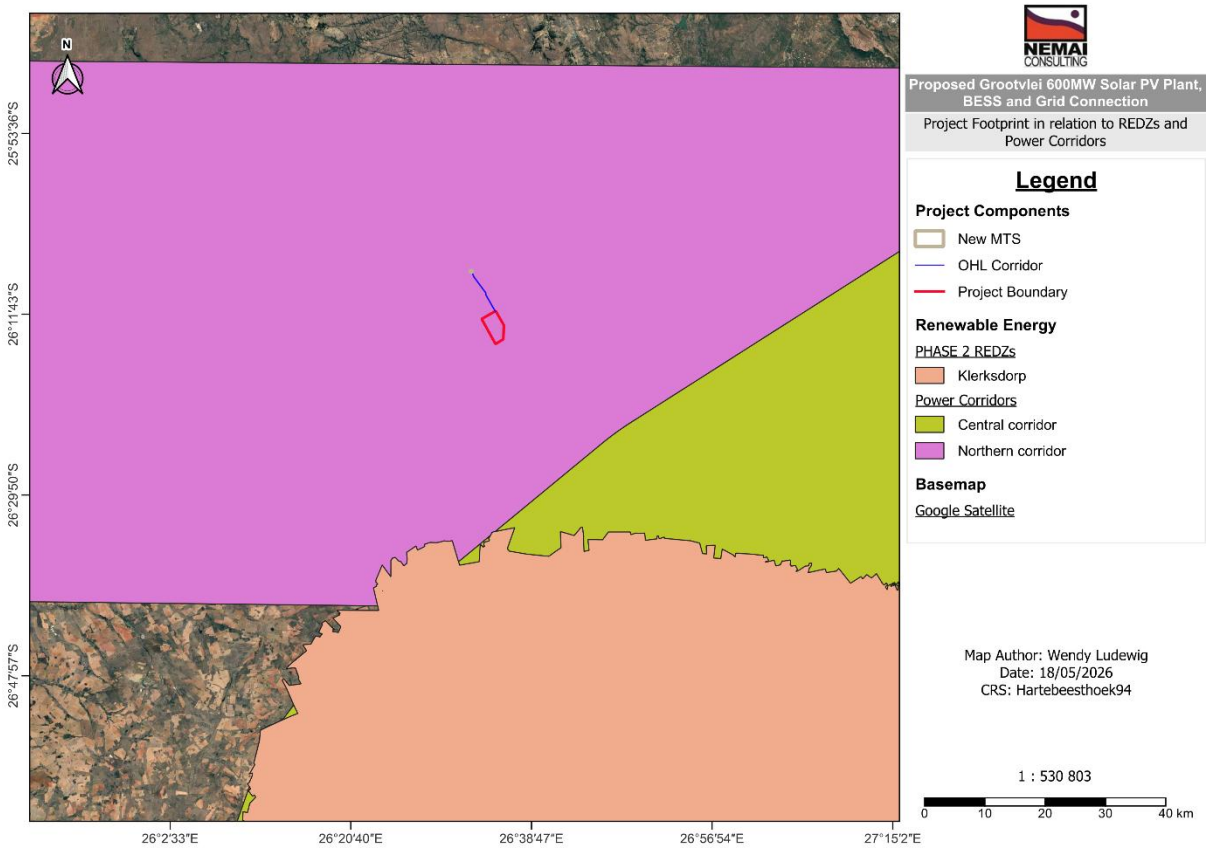

Figure 5: Project Footprint in relation to the REDZs and Power Corridors

6 S&EIR PROCESS

6.1 Competent Authority

In terms of NEMA, the DFFE is the Competent Authority to decide on the application for the Project. DEDECT is a key commenting authority under NEMA during the execution of the S&EIR Process, and all documentation will thus be copied to this party (amongst others).

Various other authorities with jurisdiction over elements of the receiving environment or project activities (refer to **Section 5.2** above) will also be consulted during the S&EIR Process. Refer to the database of I&APs contained in **Appendix B** for a list of the government departments.

6.2 Environmental Assessment Practitioner

Nemai Consulting was appointed as the independent EAP to undertake the S&EIR Process for the proposed Project.

In accordance with Appendix 3, Section 3(1)(a) of the EIA Regulations, this section provides an overview of Nemai Consulting and the company's experience with EIAs, as well as the details and experience of the EAPs that form part of the S&EIR team.

Nemai Consulting is an independent, specialist environmental, social development and Occupational Health and Safety (OHS) consultancy. The company is 100% black female-owned and holds a level 1 BBBEE rating. The company is directed by a team of experienced and capable environmental engineers, scientists, and specialists. The company has offices in Randburg (Gauteng) and Durban (KwaZulu-Natal).

The core members of Nemai Consulting who are involved with the S&EIR process for the Project are listed in **Table 5**. The Curriculum Vitae and oath of the registered EAP are contained in **Appendix C** and **Appendix D**, respectively.

Table 5: S&EIR Process Core Team Members

Name	Qualifications	Registration	Selected Experience for Solar PV Projects
D Henning (25 years of experience)	Master of Science (MSc) (River Ecology)	▪ South African Council for Natural Scientific Professions (SACNASP): Professional Natural Scientist (400108/17) ▪ Environmental Assessment Practitioners Association of South Africa (EAPASA): Registered EAP (2020/1217)	▪ Matjhabeng 400 MW Solar PV Power Plant with 80 MW (320 MWh) Battery Energy Storage Systems, Free State Province, SA. ▪ Beaufort West 75MW Solar PV Project, Western Cape, SA. ▪ Extraction of Gas and Electric Power Production Plant in the Rubavu District, Rwanda. ▪ Impompomo Hydropower Plant, Mpumalanga, SA. ▪ Hydropower Plant within Hydraulic Network at Rand Water's Zoekfontein Site, Gauteng Province, SA.

Name	Qualifications	Registration	Selected Experience for Solar PV Projects
			▪ uMkhomazi Water Project Phase 1 with hydropower facilities, KwaZulu-Natal, SA. ▪ Neptune-Poseidon Transmission Line, including 200km of 400 kV transmission line, Eastern Cape, SA. ▪ Makalu B (Igesi) Substation and Associated Transmission Loop-In Lines, Free State Province, SA. ▪ Anderson Dinaledi Transmission Line, including 80km of 132 kV transmission line with substations, North-West Province, SA.
WL Ludewig (2-3 years of experience)	MSc (Geographical Information Systems (GIS) and Remote Sensing)	▪ SACNASP: Candidate Natural Scientist (169572) ▪ EAPASA: Candidate EAP (2024/8548)	▪ Proposed Damara 1 up to 240 MW Solar Energy Facility, up to 960 MWh BESS and 33/132 kV Independent Power Producer Substation, Namakwa District Municipality, Northern Cape ▪ Proposed Altina 120 MW Solar PV & 40 MW BESS, Free State Province ▪ Proposed Paradise 100MW Solar PV & 40MW BESS, Free State Province

6.3 Environmental Screening

According to GN 960 of 5 July 2019, an application for Environmental Authorisation must be accompanied by a report generated by the National Web Based Environmental Screening Tool ("Screening Tool"), as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations.

The aims of the Screening Tool include the following:

- To screen a proposed site for any environmental sensitivity;
- To provide site-specific EIA process and review information;
- To identify related exclusions and/or specific requirements, including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site; and
- To allow for a Screening Report to be generated.

The Screening Report for the proposed Project were appended to the Application Form. The specialist studies undertaken for the Project further considered the Screening Tool results.

6.4 Environmental Assessment Triggers

The process for seeking authorisation under NEMA is undertaken in accordance with the EIA Regulations, promulgated in terms of Chapter 5 of NEMA. Based on the type of activity involved, the requisite environmental assessment for the Project is an S&EIR Process. Refer

to **Section 5** for the Project's legal framework and specifically the activities triggered by the Project in terms of Listing Notices 1, 2 and 3 of the EIA Regulations.

6.5 EIA Process

6.5.1 Formal Process

An outline of the S&EIR Process for the proposed Project is provided in **Figure 6**. The objectives of the EIA Phase, based on the EIA Regulations, are captured in **Section 1**.

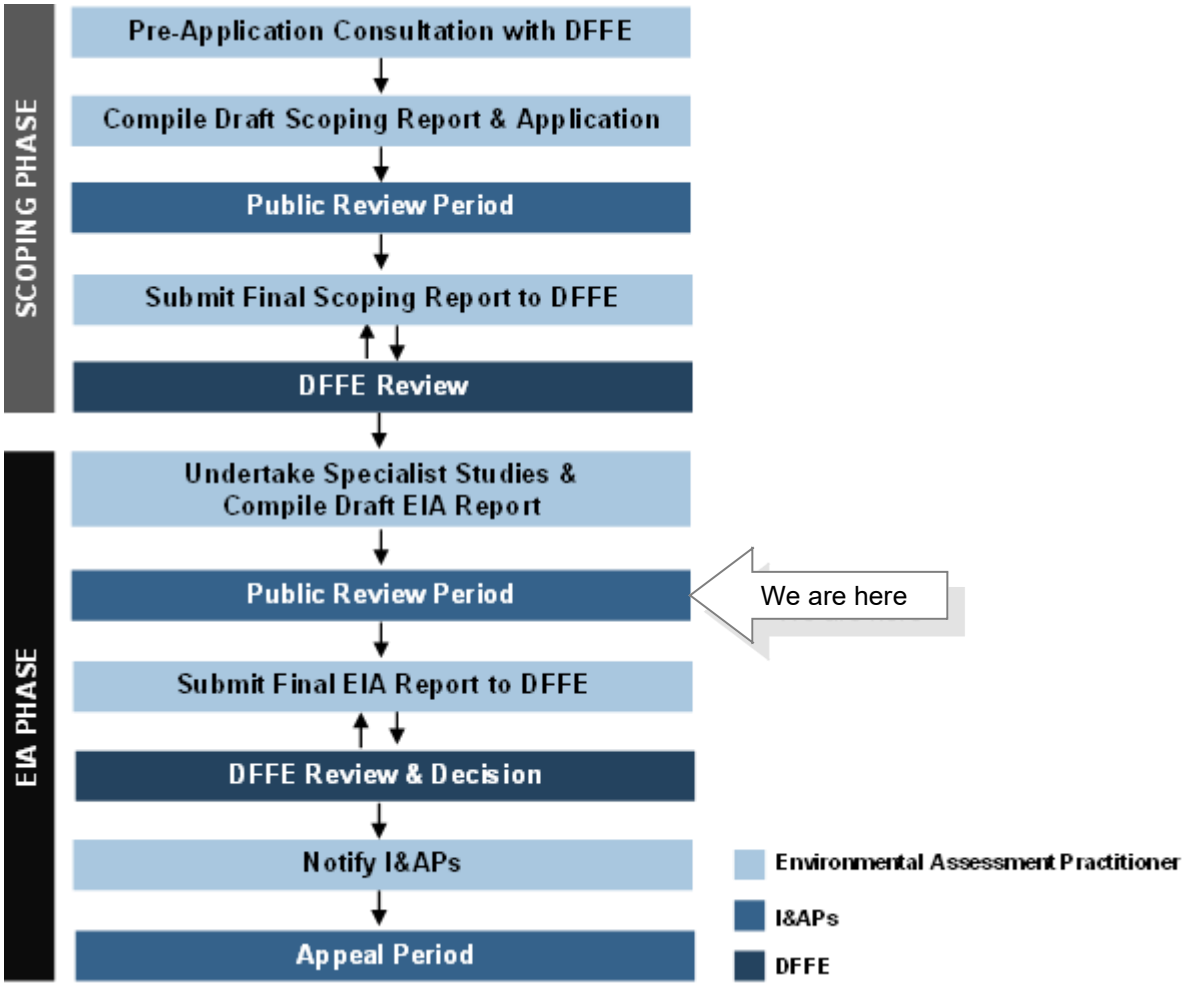

Figure 6: Outline of the S&EIR Process

6.5.2 The EIA Process to Date

The following key milestones have been reached to date as part of the EIA process:

1. A Pre-Application Meeting was held with DFFE on 27 February 2026.
2. A draft Scoping Report, which conformed to Appendix 2 of the EIA Regulations, was compiled. This document included the following salient information (amongst others):
    a. A Scoping-level impact assessment to identify potentially significant environmental issues for detailed assessment during the EIA phase;

b. Screening and investigation of feasible alternatives to the Project for further appraisal during the EIA phase; and
c. A Plan of Study, which explained the approach to be adopted to conduct the EIA for the proposed Project.

3. The Application for EA and draft Scoping Report were submitted to DFFE on 09 July 2026.
4. The draft Scoping Report was lodged for public review from 10 July 2026 to 11 August 2026.
5. The final Scoping Report was submitted to DFFE on 24 August 2026.
6. DFFE accepted the Scoping Report and Plan of Study for the EIA on 02 October 2026 (refer to **Appendix E**), which allowed the commencement of the EIA phase.

6.5.3 Alignment with the Plan of Study

The Plan of Study, contained in the Scoping Report and accepted by DFFE, explained the approach to conduct the EIA for the proposed Project. The manner in which the EIA Report addresses the requirements of the Plan of Study is shown in **Table 6**.

Table 6: Alignment of EIA Report with Plan of Study

No.	Plan of Study Requirement	Reference to Section in EIA Report
1.	Assess potentially significant environmental issues identified during Scoping through: ▪ Applying an appropriate impact assessment methodology. ▪ Conducting specialist studies. ▪ Identifying suitable mitigation measures.	▪ **Section 11** ▪ **Section 12**
2.	Assessment of feasible alternatives.	**Section 13**
3.	Specialist studies to be completed in accordance with Terms of Reference.	▪ **Section 11** ▪ **Appendix F**
4.	Public participation to include the following: ▪ Update the database of I&APs. ▪ Allow for the review of the draft EIA Report. ▪ Compile and maintain a Comments and Responses Report (CRR). ▪ Notification of DFFE's decision.	**Section 14**
5.	EIA Report to satisfy the minimum requirements stipulated in Appendix 3 of the EIA Regulations.	**Section 2**
6.	Authority Consultation.	**Section 14**

6.5.4 Addressing DFFE's Requirements

The manner in which DFFE's specific requirements, as listed in the letter received from this Department for the acceptance of the Scoping Report (refer to **Appendix E**), have been attended to and are described in **Table 7**.

Table 7: DFFE's Specific Requirements – Acceptance of the Scoping Report

DFFE's Requirements	Response/Status
a) Specific Comments (i) The specialist studies undertaken for the current application must be compared with those undertaken for the previously lapsed Environmental Authorisation	The specialist studies have incorporated the findings of the previous specialist studies that were undertaken for the previously authorised footprint.

DFFE's Requirements	Response/Status
(DFFE Reference Number: 14/12/16/3/3/2/2386) in terms of key findings, impacts, mitigation measures and recommendations, and update the current recommendations accordingly.	
(b) Listed Activities (i) Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description. (ii) The EIAr must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for. (iii) The listed activities represented in the EIAr and the application form must be the same and correct. (iv) The EIAr must assess the correct sub listed activity for each listed activity applied for.	All listed activities relevant to the Project are applied for and are listed in **Table 4** of this EIA Report. The assessment of impacts for the proposed Project is contained in **Section 12** including the assessment of impacts in relation to the relevant listed activities. The Mitigation measures are also outlined in **Section 12** and contained in further detail in the EMPr (refer to **Appendix H**). The listed activities in the EIA Report are the same as those in the Application Form and the correct sublisted activities are being applied for.
(c) Layout & Sensitivity Maps (i) The draft EIAr must provide coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities. (ii) Please provide a layout map which indicates the following: a. PV panel area; b. Internal roads; c. All supporting onsite infrastructure such as laydown area, guard house and control room etc. (existing and proposed); d. Substations, transformers, switching stations and inverters; e. Battery Energy Storage System; f. Connection routes (including pylon positions) to the distribution/transmission network; g. All existing infrastructure on the site, especially railway lines and roads; and h. Buildings, including accommodation. (iii) Please provide an environmental sensitivity map which indicates the following: a. The location of sensitive environmental features identified on site, e.g. CBAs, protected areas, heritage sites, wetlands, drainage lines, nest and roosting sites, etc. that will be affected by the facility and its associated infrastructure; b. Buffer areas; and c. All "no-go" areas. (iv) The above layout map must be superimposed (overlain) with the sensitivity map and a cumulative map which shows neighbouring and existing infrastructure. (v) Google maps will not be accepted.	Refer to **Section 4** for the Project coordinates and Project Layout Map (Locality Maps are also located in **Appendix A**). Environmental sensitivity maps are contained throughout the report at a desktop and site-specific level. The overall environmental sensitivity map is contained in **Section 15.2** with Google satellite imagery as the background to show the neighbouring and existing infrastructure.
(d) Public Participation (i) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations, 2014, as amended. (ii) It is imperative that the relevant authorities are continuously involved throughout the environmental impact assessment process as the development property possibly falls within geographically designated areas in terms of numerous GN R. 985 Activities. Written comments must be obtained from the relevant authorities and submitted to this Department. In	The Public Participation Process conducted to date, as well as the remainder of the process, is outlined in **Section 14**. All stakeholders are included in the I&AP Database (refer to **Appendix B**) and have been and will continue to be notified of the review periods associated with the relevant environmental reports.

DFFE's Requirements	Response/Status
addition, a graphical representation of the proposed development within the respective geographical areas must be provided. (iii) Please ensure that comments from all relevant stakeholders are submitted to the Department with the final EIAr. This includes but is not limited to the North West Department of Economic Development, Environment, Conservation & Tourism, the JB Marks and Ditsobotla Local Municipalities, the Dr Kenneth Kaunda and Ngaka Modiri Molema District Municipalities, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), BirdLife SA, EWT, Vulpro, the Department of Mineral Resources and Energy, and the Department of Forestry, Fisheries and the Environment: Directorate Biodiversity and Conservation at BCAdmin@dffe.gov.za. (iv) Please ensure that all issues raised and comments received during the circulation of the draft SR and draft EIAr from registered Interested and Affected Parties (I&APs) and organs of state (including this Department's Biodiversity and Protected Area Sections), as listed in your I&APs Database, and others that have jurisdiction in respect of the proposed activity are adequately addressed and included in the final EIAr and are incorporated into a Comments and Response Report (CRR). (v) Copies of original comments received from I&APs and organs of state, which have jurisdiction in respect of the proposed activity are submitted to the Department with the final EIAr. (vi) Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. In terms of Regulation 41(2)(b) of the EIA Regulations, 2014, as amended, please provide proof of written notice for the availability of the EIAr for comment. (vii) The CRR report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. (viii) Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to I&APs' comments. (ix) Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually. (x) Minutes and attendance registers (where applicable) of any physical/virtual meetings held by the Environmental Assessment Practitioner (EAP) with Interested and Affected Parties (I&APs) and other role players must be included in the final EIAr.	All comments received to date have been recorded and responded to in the CRR (refer to **Appendix I**). The CRR will continue to be updated with comments received during the EIA Phase and will be appended to the final EIA Report. We note the CRR format and content requirements, and the CRR will continue to comply with the Department's requirements. In addition, the EAP will append comments received verbatim, proof of notification and minutes of any meetings (if applicable) to the final EIA Report, which will be submitted to the Department for review and decision-making.
(e) Specialist assessments (i) The EAP must ensure that the terms of reference for all the identified specialist studies must include the following: a. A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, turbine positions and all other associated infrastructures that they have assessed and are recommending for authorisation.	The Terms of Reference for the respective specialist studies are provided for the requirements stipulated by DFFE. The specialist reports describe the methodologies applied, the project footprint and associated infrastructure assessed, assumptions and limitations, and applicable sensitivities, no-go areas and buffers. Where relevant, seasonality was considered in accordance with the applicable assessment requirements.

DFFE's Requirements	Response/Status
b. Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. c. Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. d. Should the specialist definition of 'no-go' area differ from the Department's definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable. e. **All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.** f. Avifaunal specialist studies must have support from Birdlife South Africa g. Should a specialist recommend specific mitigation measures, these must be clearly indicated. (ii) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice. (iii) Please ensure that all mitigation recommendations are in line with applicable and most recent guidelines. (iv) It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols. (v) The specialist reports must comply with Appendix 6 of the EIA Regulations, 2014, specifically, the specialist reports must include documentation to show expertise of the specialist to compile a specialist report including a curriculum vitae. (vi) As such, the Specialist Declaration of Interest forms must also indicate the scientific organisation registration/member number and status of registration/membership for each specialist. (vii) Please also ensure that the final EIAr includes the Site Verification Report as required by the relevant environmental themes and assessments. (viii) Please note further that the protocols, if applicable, require certain specialists' to be SACNASP registered. Please ensure that the relevant specialist certificates are attached to the relevant reports.	The specialist studies undertaken for the EIA do not recommend additional specialist studies following completion of the EIA. The Technical Geotechnical and Dolomitic Desktop Study, however, recommends further site investigations during detailed design to obtain information required for engineering design. These investigations are therefore associated with detailed design and do not constitute outstanding studies required to inform the EIA. BirdLife South Africa is included in the I&AP Database and will be notified of the public review of the Draft EIA Report, which includes the Avifaunal Impact Assessment in **Appendix F3**. Any comments received will be considered and addressed as part of the EIA process. The specialist mitigation and management measures have been incorporated into the EIA Report and, where applicable, the EMPr. No material contradictions were identified between specialist recommendations. The specialist assessments were undertaken in accordance with the applicable gazetted Protocols or Appendix 6 of the EIA Regulations, as applicable, and include the required information regarding specialist expertise, independence and professional registration. The SSV Report was included with the Final Scoping Report and informed the scope and level of specialist assessment undertaken during the EIA Phase. The findings of these assessments, including the identified and verified environmental sensitivities, have been incorporated into the EIA Report.
(f) Cumulative Assessment (i) A cumulative impact assessment for all identified and assessed impacts must be conducted to indicate the following:	Cumulative impacts associated with the proposed Project are assessed in **Section 12.28** of the EIA Report. A 30 km regional screening area was used to identify other renewable-

DFFE's Requirements	Response/Status
a. Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land. b. Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. c. The cumulative impacts significance rating must also inform the need and desirability of the proposed development. d. A cumulative impact environmental statement on whether the proposed development must proceed. (ii) Should there be any other similar infrastructure within a 30km radius of the proposed development site, a cumulative impact assessment for all identified and assessed impacts must be conducted to indicate the above point a to d. (iii) <u>It may be necessary to increase the 30km radius for certain specialist studies e.g. Avifauna to assess the cumulative impact on Critically Endangered Species and other avifaunal Species of Conservation Concern e.g. vultures etc.</u>	energy applications using the DFFE REEA Database, supplemented by the receptor-specific assessment areas applied by the relevant specialists. The assessment considers cumulative impacts associated with, inter alia, loss and fragmentation of natural and semi-natural habitat, ecological connectivity, avifauna, wetlands and water resources, agricultural land, visual and landscape character, heritage and palaeontology, construction-related impacts and socio-economic effects. The applicable specialist cumulative-impact findings, significance ratings and mitigation measures have been incorporated into the EIA assessment and EMPr. Cumulative vegetation loss has not been expressed as a combined hectare value where this could not be reliably substantiated. The authorised/project footprints of surrounding renewable-energy developments cannot reliably be equated with natural vegetation loss without comparable project-specific information distinguishing natural and semi-natural habitat from previously disturbed or transformed areas. The cumulative effect has therefore been assessed through the identified habitat-transformation and fragmentation pathway and the specialist cumulative-impact assessment. The cumulative findings and residual significance ratings are considered in the overall evaluation of the Project, together with its Need and Desirability. A Cumulative Environmental Impact Statement is provided in Section 12.28.4, which considers whether the cumulative impacts preclude the proposed development from proceeding. Refer to **Section 12.28** of the EIA Report and the relevant Specialist Studies contained in **Appendix F**.
<u>(g) General</u> (i) The EIAr must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions. A sample for the minimum information required is listed under Annexure 2 below. (ii) The EAP must provide landowner consent for all farm portions affected by the proposed project i.e., all farm portions where the access road, solar fields and associated infrastructure are to be located. (iii) (iii) A construction and operational phase EMPr that includes mitigation and monitoring measures must be submitted with the final EIAr, including the Generic EMPr for substations and powerlines.	The technical details and dimensions of the proposed Project infrastructure are provided in the requested tabular format in **Table 9**, with further descriptions of the Project components provided in **Section 9**. Written landowner consent for the Project site is appended to the Application Form contained in Appendix B of the Final Scoping Report. In accordance with Regulation 39(1) of the EIA Regulations, landowner consent is not required for linear developments; accordingly, this requirement does not apply to the powerline component of the Project. The EMPrs for the Project are contained in **Appendix H** of the EIA Report and include the EMPr for the Solar PV Plant and the Generic EMPrs applicable to the overhead powerline and substation infrastructure.

6.6 Other Applications in the Project Area

DFFE has created the SA Renewable Energy EIA Application (REEA) Database, which contains spatial data for renewable energy applications for EA. It includes spatial and attribute information for both active (in process and with valid authorisations) and non-active (lapsed or replaced by amendments) applications.

According to the REEA Database (REEA Quarter 1 of 2026), the following renewable energy applications have been made for properties that are located within a 30 km radius of the PV Site (refer to **Figure 7** below):

- The proposed Kiara PV1 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Reference (Ref) No.: 14/12/16/3/3/2/2171) (Status: Approved);
- The proposed Kiara PV2 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2172) (Status: Approved);
- The proposed Kiara PV3 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2173) (Status: Approved);
- The proposed Kiara PV4 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2174) (Status: Approved);
- The proposed Kiara PV5 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2175) (Status: Approved);
- The proposed Kiara PV6 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2176) (Status: Approved);
- The proposed Kiara PV7 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2177) (Status: Approved);
- Proposed Establishment Of A Photovoltaic (PV) Installation At The Bloemfontein Airport, Free State Province (Application Ref. No.: 12/12/20/2149) (Status: Approved);
- Proposed Establishment Of A Photovoltaic (PV) Installation At The Bloemfontein Airport, Free State Province (Application Ref. No.: 12/12/20/2149/A3) (Status: Approved); and
- The proposed development of Biochemical refinery plant, a 130MW PV solar plant and associated infrastructure JB Marks local municipality, Dr Kenneth Kaunda District, North West Province (Application Ref. No.: 14/12/16/3/3/2/2184) (Status: Approved).

In **Figure 7**, it appears that the Project is located on an already approved PV site. However, the REEA database includes the current Project as approved, before the EA was amended in order for the larger Project footprint to be applied for (refer to **Section 3** for further details). Therefore, there is currently no PV Project that is approved within this Project's footprint.

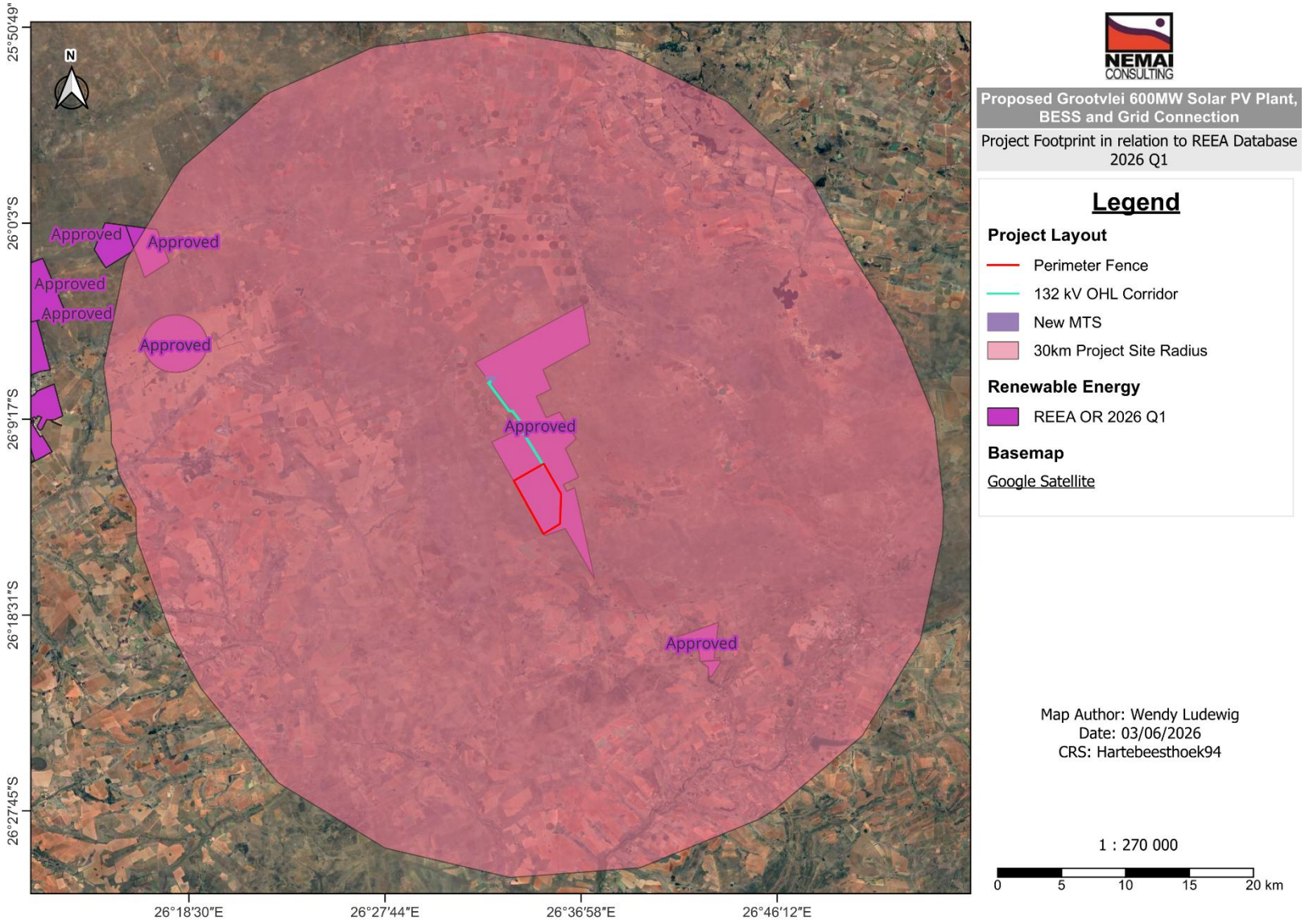

Figure 7: Renewable Energy Applications in relation to the Project (within a 30 km radius)

7 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations accompany the EIA Phase:

- As the design of the project components is still in feasibility stage, and due to the dynamic nature of the planning environment, the dimensions and layout of the infrastructure may change during the detailed design phase.
- Regardless of the analytical and predictive method employed to determine the potential impacts associated with the Project, the impacts are only predicted on a probability basis. The accuracy of the predictions is largely dependent on the availability of environmental data and the degree of understanding of the environmental features and their related attributes.
- The following assumptions, gaps and limitations were noted as part of the specialist studies:
  - Wetland Impact Assessment (Hoosen, 2026) –
    - The assessment was conducted within the South African National Biodiversity Institute (SANBI) prescribed wet season for the area. Furthermore, hydrophilic vegetation and soils were noted in the river and wetland habitats.
    - The layout provided to the specialist by the client is regarded as the preferred options. No other options were provided by the client, therefore, no other options will be assessed. The specialist will assess the preferred option and recommend an alternative options only if it is perceived that the preferred option is highly detrimental to the receiving aquatic environment.
    - Only those watercourses (rivers and wetlands) that may be of High or Medium risk of being impacted on by activities associated with the proposed development were accurately delineated in field and assessed further. The remaining watercourses that were deemed to be of Low risk of being impacted on by the proposed development were delineated at a desktop level with no further assessment being required within this project.
    - A transitional gradient occurs within wetlands from the saturated permanent zone to dry terrestrial areas. This gradient makes it difficult to determine the exact boundary of wetland features and some difference in opinion on wetland boundaries may, therefore, occur. The delineation as presented in this report is however considered to be a best estimate of the outer boundary of the temporary zone as determined by a wetland specialist with extensive experience in the wetland delineation techniques advocated by the DWS.
    - Wetland and/or riparian boundaries are essentially based on GPS coordinate waypoints taken on-site of soil sampling points and of important morphological features. The variations experienced in GPS precision will ultimately affect the accuracy of the GPS waypoints and consequently will affect the accuracy of the recorded freshwater resource boundaries. All sampling waypoints were recorded using a Garmin Montana 650 GPS (estimated accuracy rating of 3-5 metres) and

captured, analysed and geo-processed utilising a Geographic Information System (GIS) (i.e. QGIS and ArcGIS).

- Any artificially delineated watercourses were assessed in terms of their functionality and not integrity or importance.
- Formal vegetation sampling was not done by the specialist. All vegetation information recorded was based on the onsite visual observations of the author. Furthermore, only dominant, and noteworthy plant species were recorded. Therefore, the vegetation information provided has limitations for true botanical applications.
- Description of the depth of the regional water table, geohydrological and hydropedological processes falls outside the scope of the current assessment.
- The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological issues identified during the field survey and was based on the assessor's working knowledge and experience with similar projects.
- Deriving a 100% factual report based on field collecting and observations can only be done over several years and seasons to account for fluctuating environmental conditions and migrations. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage.
- The specialist responsible for this study reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.
- The realistic good mitigation scenario for the impact assessment assumes that all the mitigation measures recommended in this report will be adhered to, as well as monitoring requirements recommended in this report.

- Terrestrial Biodiversity Impact Assessment (Paul, 2026a) –
  - A 20 m Project Area of Influence (PAOI) has been determined for the nature and scale of this project. This area was accessible during the survey and was where surveys were confined to at the time.
  - Habitat descriptions were limited to within 20 m of the site, as well as the Site Ecological Importance (SEI) calculations.
  - The fieldwork for this assessment was undertaken over one (1) day on 27 March 2026. This was considered sufficient, and the findings of previously conducted ecological assessments undertaken during both the peak growing season (January 2023) and in Autumn (April 2023) were considered within this report.
  - The NEMA also endorses the precautionary principle. Chapter 1 Principles (NEMA) (4)(a)(vii) states "that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions".
  - The assessment of impacts is based on the baseline environment as it currently exists at the PAOI.

- Conclusions drawn in this study are based on experience of the specialists on the species found on site and similar species in different parts of South Africa. Animal behaviour can never be entirely reduced to formulas that will be valid under all circumstances.
- Assessment findings represent conditions observed at the time of the survey and may change over time due to ongoing land-use and environmental changes.
- No comprehensive long-term monitoring was undertaken as part of the assessment.
- To accurately record the species on site, long-term field assessments would have to be conducted to consider seasonal and temporal variations and provide more accuracy. This assessment however, is considered appropriate for the scale and nature of the proposed development as supplementary data already exists.

- Avifaunal Impact Assessment (Paul, 2026b) –
  - A 20 m PAOI has been determined for the nature and scale of this project. This area was accessible during the survey and was where surveys were confined to at the time. No further surveying was possible, as these areas fell on private property that was heavily fenced.
  - A 5 and 10 km radius was assessed at a desktop level to determine key bird and biodiversity areas which may occur within both radiuses.
  - Habitat descriptions were limited to within 20 m of the site, as well the SEI calculations.
  - The fieldwork for this assessment was undertaken over one (1) day on 27 March 2026. The findings and data presented in the previously completed reports were considered to remain relevant and accurate and were therefore used to supplement the findings of the 2026 assessment.
  - The Second Southern African Bird Atlas Project (SABAP2) data is regarded as an adequate indicator of the avifauna which could occur within the PAOI, and it is further supplemented with data collected during the on-site survey and past studies undertaken in the area.
  - The NEMA also endorses the precautionary principle. Chapter 1 Principles (NEMA) (4)(a)(vii) states “that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions”.
  - The assessment of impacts is based on the baseline environment as it currently exists at the PAOI.
  - Conclusions drawn in this study are based on experience of the specialists on the species found on site and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will be valid under all circumstances.
  - To accurately record the species on site, long-term field assessments would have to be conducted to consider seasonal and temporal variations and provide more accuracy. This assessment however, is considered appropriate for the scale and nature of the proposed development as supplementary data already exists.

- Agricultural Compliance Statement (Mchunu, 2026) –
  - It is assumed that the proposed infrastructure will be installed within the assessed project footprint, as indicated on the provided project layout.
  - The findings of this assessment were collectively inferred from in-situ soil data as well as desktop soil & terrain (SOTER) and land capability metadata.
  - It is acknowledged that it is virtually impossible to achieve 100% accuracy in soil mapping. Therefore, the delineated soil map units may include isolated pockets of the other identified soil forms, as the boundaries between the mapped soils are not absolute, but rather a continuum and may gradually change from one type to another between observation points.
  - The purpose and scope of this investigation did not include a geotechnical assessment; therefore, the geotechnical stability of the soils for the proposed infrastructure will require further assessment and verification by a Geotechnical Engineer.
- Phase 1 Heritage Impact Assessment (Kitto, 2026) –
  - The assessment assumes that all information provided by the Client EAP, including the proposed Project footprint and powerline alignments, is accurate, complete and current.
  - The Project area traverses several properties separated by fencing, and access to certain areas was restricted due to locked gates.
  - Survey coverage in some areas was further constrained by extremely dense and tall grass, as well as other dense vegetation, which reduced ground visibility during field investigations.
  - Numerous stone-clearing heaps occur throughout the Project area, which may obscure or conceal archaeological and heritage resources.
  - Due to the extensive size of the proposed PV facility and the alternative powerline corridors, it was not feasible to undertake a complete pedestrian survey of the entire Project area.
  - Fieldwork therefore comprised a combination of pedestrian surveys and vehicle-based investigations, with survey effort focused on accessible and representative areas.
  - Archaeological and heritage visibility was low in areas characterised by dense vegetation cover and extensive stone-clearing activities.
  - As a result of the access and visibility constraints encountered during the field survey, there remains a possibility that some heritage resources were not identified.
  - The heritage resources most likely to have been missed are informal graves and burial sites, which may be obscured by vegetation, stone-clearing heaps or other landscape features.
- Palaeontology Impact Assessment (Butler, 2026) –

- The assessment was based on available geological mapping, published literature, the SAHRIS Palaeosensitivity Map and field verification undertaken within the Project area.
- The assessment assumes that the Project layout and development footprint supplied by the Client and EAP are accurate and representative of the proposed development.
- Much of the Project area is covered by soil and weathered material, limiting visibility of the underlying fossil-bearing formations during field investigations.
- Palaeontological field assessments are limited to observations of exposed bedrock and surface outcrops and cannot identify fossil resources that may occur beneath the ground surface.
- Additional fossil material may be encountered during excavation and construction activities where previously unexposed geological formations are revealed.
- The assessment recommends implementation of a Chance Find Procedure to manage any palaeontological resources identified during construction.

➢ Visual Impact Assessment (Smith, 2026) –

- Determining the value, quality, and significance of a visual resource or the significance of the visual impact that any activity may have on it, in absolute terms, is not achievable. Visual perception is, by nature, a subjective experience, as it is influenced largely by personal opinions and world views. For instance, what one viewer may experience as an intrusion in the landscape, another may regard as positive. Such differences in perception are greatly influenced by culture, education, and socio-economic background. A degree of subjectivity is therefore bound to influence the rating of visual impacts. It is therefore impossible to conduct a visual assessment without relying to some extent on the opinion of a qualified consultant, which is inherently subjective. The subjective opinion of the visual consultant is, however, unlikely to materially influence the findings and recommendations of this study, as a wide body of scientific knowledge exists in the industry of Visual Impact Assessment, on which findings are based. This subjective opinion includes:
  - The primary objective of this study was to assess the visual environment.
  - The fieldwork relevant to this study was a once-off assessment that was conducted but takes into account the findings from the previous assessment conducted in 2023 (Report Reference: SPS-VIA-333-26_27).
  - The compiled viewshed was based on terrain level. As such, the viewshed does not incorporate distractive views in the form of vegetation or land use (infrastructure, buildings, etc.).
  - A detailed quantitative illumination modelling assessment was not undertaken as part of this Visual Impact Assessment. However, a qualitative assessment of potential night-time lighting effects was undertaken based on site observations, viewshed analysis, and professional judgement.

- ♦ The assessment of impacts and recommendation of mitigation measures was informed by the site-specific aspects identified and based on the assessor's working knowledge and experience with similar activities.

- Social Impact Assessment (Tanhuke and Chidley, 2026) –
  - The information obtained during the public participation phase provides a comprehensive account for the community structure and community concerns for the project.
  - The study was done with the information and the time frames available to the specialist at the time of executing the study. The specialist took an evidence-based approach in the compilation of this report and did not intentionally exclude information which is relevant to the assessment; and
  - No relocation of families will take place for this project.

8 NEED AND DESIRABILITY

This section describes the need for and desirability of the proposed Project, in terms of 3(1)(f) of Appendix 3 of the EIA Regulations. The format contained in the Guideline on Need and Desirability (DEA, 2017) was used in **Table 8**.

Table 8: Need for and desirability of the proposed Project

Question No.	Response
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area? *1.1. How were the following ecological integrity considerations taken into account?:* *1.1.1. Threatened Ecosystems.* *1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.* *1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").* *1.1.4. Conservation targets.* *1.1.5. Ecological drivers of the ecosystem.* *1.1.6. Environmental Management Framework.* *1.1.7. Spatial Development Framework.* *1.1.8. Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).*	The following Specialist studies were undertaken to assess the impacts of the Project on the ecological integrity of the area: ▪ Wetland Impact Assessment; ▪ Terrestrial Biodiversity Impact Assessment; and ▪ Avifaunal Impact Assessment. The findings of these studies are presented in this EIA Report. Management objectives are included in this EIA Report and the EMPr to safeguard the sensitive ecological features that were identified. One of the goals identified in the municipal IDP (JB Marks LM, 2022) to domesticate the Sustainable Development Goals is to promote renewable energy development. This IDP further states that the JB Marks LM uses large amounts of energy and will face increased energy demand due to climate change and population growth. The IDP notes that the energy sector is already embattled, and despite increased focus on greener energy, the country remains heavily dependent on fossil fuels. The Applicant intends to bid for the current and future REIPPPP bid windows and/or other renewable energy markets within SA. The REIPPPP is a competitive tender process designed to facilitate private-sector investment in grid-connected renewable energy generation in SA.
1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Potential direct disturbances to ecosystems may include the following (amongst others): ▪ Poor practices during the construction and operational phases may pollute the biophysical environment; ▪ Clearance of large areas of indigenous vegetation associated with the construction footprint of the Project; ▪ Potential loss of sensitive environmental features; ▪ Pollution of watercourses; ▪ Soil destabilisation and subsequent erosion; and ▪ Proliferation of alien and invasive species. Refer to response to question no. 1.1 above.
1.3. How will this development pollute and/or degrade the biophysical environment? 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 (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The Project may cause surface water, groundwater, soil, air, noise and light pollution during the construction and operational phases. The above impacts were assessed during the EIA Phase. Mitigation measures are included in this EIA Report and the EMPr to manage these impacts.
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be	The waste to be generated by the Project will be dealt with in the following manner (amongst others): ▪ Construction –

Question No.	Response
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 from site preparations (e.g. plant material), domestic waste, surplus and used building material, and hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags). Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g., at the construction camp) and removed at regular intervals for disposal at approved waste disposal sites. All the waste disposed of will be recorded. ○ Wastewater will include sewage, water used for washing purposes and drainage over contaminated areas. ▪ Operation – ○ Refuse (domestic waste) generated during the operational phase will be removed on a weekly basis and will be disposed of at a permitted waste disposal facility. Mitigation measures to manage all waste and wastewater generated during the construction and operational phases are included in the EMPr.
1.5. How will this development 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 (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Potential disturbances to cultural heritage may include the following: ▪ Possible direct impacts to graves, heritage resources and on below-ground archaeological deposits and fossils as a result of ground disturbance; and ▪ Possible impacts to the cultural landscape as a result of the introduction of incompatible structures and infrastructure to the rural landscape. A Phase 1 Heritage Impact Assessment was undertaken during the EIA Phase, and the findings are presented in this EIA Report.
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure 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 (including offsetting) the impacts? What measures were explored to enhance positive impacts?	During the construction phase, electricity will be obtained from diesel generators and/or a temporary supply via cables from the site power grid. No alternative energy sources were considered for electricity generation. Electricity will be generated from a renewable energy source, namely the sun. During the operational phase, electricity will be sourced from this renewable energy-generation facility itself and/or from the existing electrical infrastructure on the property.
1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account 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? *1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the*	The Solar Plant generates electricity from a renewable energy resource, namely the sun. The total generation capacity of the Project will be 600MW of renewable solar energy. Impacts on the receiving environment were assessed during the EIA Phase and presented in this EIA Report. Opportunity costs are associated with the net benefits forgone for the development alternative. This was assessed further during the EIA Phase.

Question No.	Response
amount of waste they generate, without compromising their quest to improve their quality of life). *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 (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)* *1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?*	
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)?* *1.8.2. What is the level of risk associated with the limits of current knowledge?* *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?*	Refer to response to question no. 1.1. above.
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?* *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 response to question no. 1.1. above regarding the ecological integrity of the area. Potential impacts to the social environment include the following: ▪ Construction phase – o Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes); o Safety and security; o Use of the local road network; o Nuisance from dust and noise; o Consideration of local labourers and suppliers in the area – stimulation of the local economy (positive impact); and o Transfer of skills (positive impact). ▪ Operational phase – o Direct and indirect economic opportunities as a result of the Project; and o Threats to human and animal health from electromagnetic fields. A Social Impact Assessment was undertaken during the EIA Phase, and the findings are presented in this EIA Report. Mitigation methods and recommendations are included in the EMPr.
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 the response to questions 1.1 and 1.9. above. The areas affected by the proposed Project footprint are rural in nature. The Project is located approximately 20 km north west of Ventersdorp's Central Business District (CBD). There is evidence that the Project Site was previously used for agricultural purposes.

Question No.	Response
	An Agricultural Compliance Statement was undertaken as part of the EIA Phase, and the findings are presented in this EIA Report.
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 response to question 1.1. above regarding the ecological integrity of the area.
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?	Project options are presented in **Section 13** below.
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?	Other renewable energy applications that have been made within a 30km radius of the Project Site, according to DFFE's REEA Database, are discussed in **Section 6.6** above. Cumulative impacts are assessed in **Section 12.28** below.
2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?: *2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,* *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.),* *2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and* *2.1.4. Municipal Economic Development Strategy ("LED Strategy").*	The socio-economic environment is discussed in **Section 10.7.4.4** below. The following is noted from a planning perspective: ▪ One of the goals identified in the municipal IDP (JB Marks LM, 2022) to domesticate the Sustainable Development Goals is to promote developments in renewable energy. ▪ The Project will contribute towards both National and Provincial targets for renewable energy and Eskom's target for Independent Power Producer (IPPs), as well as assist in meeting the increasing electricity demands in South Africa and specifically in the grid network. ▪ The Project falls within an area that is designated for crop farming in terms of the SDF (JB Marks LM, 2022). An Agricultural Compliance Statement was undertaken during the EIA Phase, and the findings are presented in this EIA Report. ▪ The Project Site and power line are located outside of the urban edge and should not impact future urban expansion. ▪ The Project's proposed overhead power line will be aligned alongside property boundaries and existing power lines as far as possible. ▪ According to the findings from the Screening Tool, the Project Site has low sensitivity in terms of the relative civil aviation theme.
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area? *2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?*	The socio-economic environments and potential impacts are discussed in **Section 10.7.4.4** below. Also refer to the response to question 1.9. and 2.1.
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	
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?	

Question No.	Response
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,* *2.5.2. reduce the need for transport of people and goods,* *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),* *2.5.4. compliment other uses in the area,* *2.5.5. be in line with the planning for the area,* *2.5.6. for urban related development, make use of underutilised land available with the urban edge,* *2.5.7. optimise the use of existing resources and infrastructure,* *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),* *2.5.9. discourage "urban sprawl" and contribute to compaction/densification,* *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,* *2.5.11. encourage environmentally sustainable land development practices and processes,* *2.5.12. take into account 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.),* *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),* *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, and* *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?*	2.5.1. The Project will result in increased economic activity, as well as increased opportunities for employment and for SMMEs. 2.5.2. Not deemed to be relevant, due to the nature of the development. 2.5.3. Not deemed to be relevant, due to the nature of the development. 2.5.4. Impacts on surrounding land uses were assessed as part of the Agricultural Compliance Statement, Social Impact Assessment and Visual Impact Assessment (amongst others). 2.5.5. Refer to the response to question no. 2.1. regarding planning. 2.5.6. The Project site and power line are located outside of the urban edge and should not impact future urban expansion, based on the SDF. 2.5.7. The resources and services required for construction and operation are discussed in **Section 9.10**. 2.5.8. The Project does not include the expansion of any bulk infrastructure. 2.5.9. Not deemed to be relevant, due to the nature of the development. 2.5.10. Not deemed to be relevant, due to the nature of the development. 2.5.11. Provision are made in the EMPr to manage impacts associated with the Project. 2.5.12. Locational factors that favour the proposed site include favourable solar irradiation levels, a short distance to the grid connection point, flat topography, suitable site access, and availability of land. 2.5.13. The EIA Phase further investigated the socio-economic benefits, with the results contained in this EIA Report and the Social Impact Assessment. 2.5.14. Refer to the response to question no. 1.5. above. 2.5.15. Refer to the response to question no. 2.1. above regarding planning.
2.6. How were 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)?* *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?* *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?*	Mitigation measures and recommendations for Socio-Economic Impacts are included in the EMPr. Findings of the Social Impact Assessment are included in this EIA Report.
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 responses to questions 1.9 above. These impacts were assessed as part of the Agricultural Compliance Statement, Social Impact Assessment and Visual Impact Assessment (amongst others). Mitigation measures and recommendations for Socio-Economic Impacts are also included in the EMPr.

Question No.	Response
2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	
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 socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	Refer to the responses to questions 1.1, 1.7, 1.9, and 1.10. above.
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	The Project options are presented in **Section 13** below.
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 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?*	
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?	Refer to responses to questions no. 1.7., 1.9., and 2.1. above.
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?	The findings of the Social Impact Assessment were included in this EIA Report. Mitigation measures were identified to manage impacts throughout the Project's life cycle and included in the EMPr.
2.13. What measures were taken to: *2.13.1. ensure the participation of all interested and affected parties,* *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 taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and* *2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?*	**Section 14** below provides an overview of the public participation process undertaken to date, which includes the following: ▪ Public Participation during the Scoping Phase; ▪ Maintenance of the i&APs Database; ▪ Period to review the draft EIA Report; ▪ Notification of review of the draft EIA Report ▪ Means of accessing the draft EIA Report; and ▪ Commenting on the draft EIA Report. Comments received from authorities and I&APs during the process are included in the CRR and will be submitted with the final EIA Report.
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 is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	The findings of the Social Impact Assessment are included in this EIA Report. Also refer to the response to question no. 1.9., 2.1., and 2.5. above.

Question No.	Response
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?	Health and safety-related risks associated with the Project during the construction and operational phases are assessed in this EIA Report. These risks were addressed through mitigation measures included in the EMPr. Additional management requirements will be included in the Project's OHS system.
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,* *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 (i.e. equitable distribution of costs and benefits), and* *2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).*	The Project will have a beneficial impact on local employment during the construction and operational phases. The results of the Social Impact Assessment are included in this EIA Report.
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, and* *2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?*	The relevant legislation and guidelines that were considered are outlined in **Section 5** above. SA's commitment to renewable energy is reflected in its ratification of the Paris Agreement and the country's long-term energy planning iterations. Solar power is a major component of the diversification needed for SA's electricity system. According to the Department of Energy (2017), energy is, by nature, an intergovernmental issue, cutting across energy security, economic prosperity, employment, and the environment, among others. In recognising these benefits, clean energy has been incorporated into the broader policy framework. The White Paper on Renewable Energy of 2003 is one of SA's policy documents that laid the foundation for promoting renewable energy technologies such as solar, hydro, biomass, and wind (http://www.energy.gov.za/files/renewables_frame.html). This policy document sets a ten-year target for how renewable energy technologies could diversify the country's energy mix and secure cleaner energy. The Applicant intends to bid for the current and future REIPPPP bid windows and/or other renewable energy markets within SA. The REIPPPP is a competitive tender process designed to facilitate private-sector investment in grid-connected renewable energy generation in SA. The S&EIR Process and the associated specialist studies aim to consider the various policies, strategies, plans, and programmes that bear on the Project. Various organs of state, as listed in the I&AP Database contained in **Appendix B** will continue to be notified of the Project and have the opportunity to comment on the Project during the Public Participation Process Phases of the review of the draft Scoping Report (completed) and the review of the draft EIA Report (current).
2.18. What measures were taken to ensure that the environment will be held in public trust for the people,	The Solar Plant proposes to generate electricity from a renewable resource, namely the sun. The total generation

Question No.	Response
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?	capacity of the Project will be 600MW of renewable solar energy. Some of the electricity generated from the renewable energy source will be stored in the BESS, which will generate electricity during peak evening hours when the sun goes down. During electricity distribution, as the energy source is renewable, no GHG Emissions, such as Carbon Dioxide, will be released into the atmosphere, thus providing a clean environment for the local community and the public in general. Impacts to the receiving environment are assessed through various specialist studies during the EIA Phase. This EIA Report contains the mitigation measures identified for the Project. The intention is for the mitigation measures included in the EIA Report and EMPr to be realistic, and for the residual risks to be managed to an acceptable level.
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	
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?	
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?	The Project options are presented in **Section 13** below.
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?	Other renewable energy applications that have been made within a 30km radius of the Project Site, according to DFFE's REEA Database, are discussed in **Section 6.6** above. Cumulative impacts are assessed in **Section 12.28** below.

9 PROJECT DESCRIPTION

9.1 Overview of Technical Details

The technical details of the proposed Project are captured in **Table 9** below.

Table 9: Overview of the technical details of the proposed Project

No.	Component	Description / Dimensions
1.	Location of the site	Centre Point of the Project site: 26˚12'56.12"S 26˚35'9.18"E
2.	Total area of Project (ha)	1300 ha
3.	Height of PV panels	4.5m (at maximum tilt)
4.	Facility generation capacity (MW)	662.4MWp/ 600MWac
5.	Area of PV Array	1060 ha
6.	Area and capacity of substations	▪ PV Collector Substation: o Area: 1.67 ha o Capacity: 640 MVA ▪ MTS: o Area: 4.00 ha o Capacity: 1000 MVA
7.	Area occupied by both permanent and construction laydown areas	19.8 ha
8.	Area and Capacity of BESS	▪ 60MW BESS: o Area: 1.15 ha o Capacity: 60MW/240MWh ▪ 250MW BESS: o Area: 9.2 ha o Capacity: 250MW/1000MWh o Collector Substation: 2.12ha/300MVA
9.	Area occupied by buildings	▪ Office & Workshop: 0.29 ha ▪ Guard House: 0.02 ha
10.	Length of internal roads	77.2 km
11.	Width of internal roads	6 m
12.	Proximity to grid connection	8.4 km
13.	Length, Width and capacity of power line corridor	132kV = 60 m total (30m on either side of the centre line) 275kV = 70 m total (35 m of either side of the centre line)
14.	Height of fencing	3 m
15.	Type of fencing	Type will vary around the site, welded mesh, palisade and electric fencing

9.2 Solar Technology

Solar energy facilities convert solar energy into a useful form (i.e. electricity). Using solar energy for electricity generation is a non-consumptive use of a natural resource and requires no fuel to continue operating. Solar power produces an insignificant quantity of greenhouse gases over its lifecycle compared with conventional coal-fired power stations. The operational phase of a solar facility does not produce carbon dioxide, sulphur dioxide, mercury, particulates, or any other form of air pollution, unlike fossil-fuel power generation technologies.

9.3 Photovoltaic

PV technology produces direct current (DC), which is then converted to alternating current (AC) via power electronic inverters. The main technology categories are crystalline modules (mono- or poly-crystalline), thin-film, and concentrated photovoltaics (CPV). **Figure 8** below provides an overview of a Solar PV Power Plant.

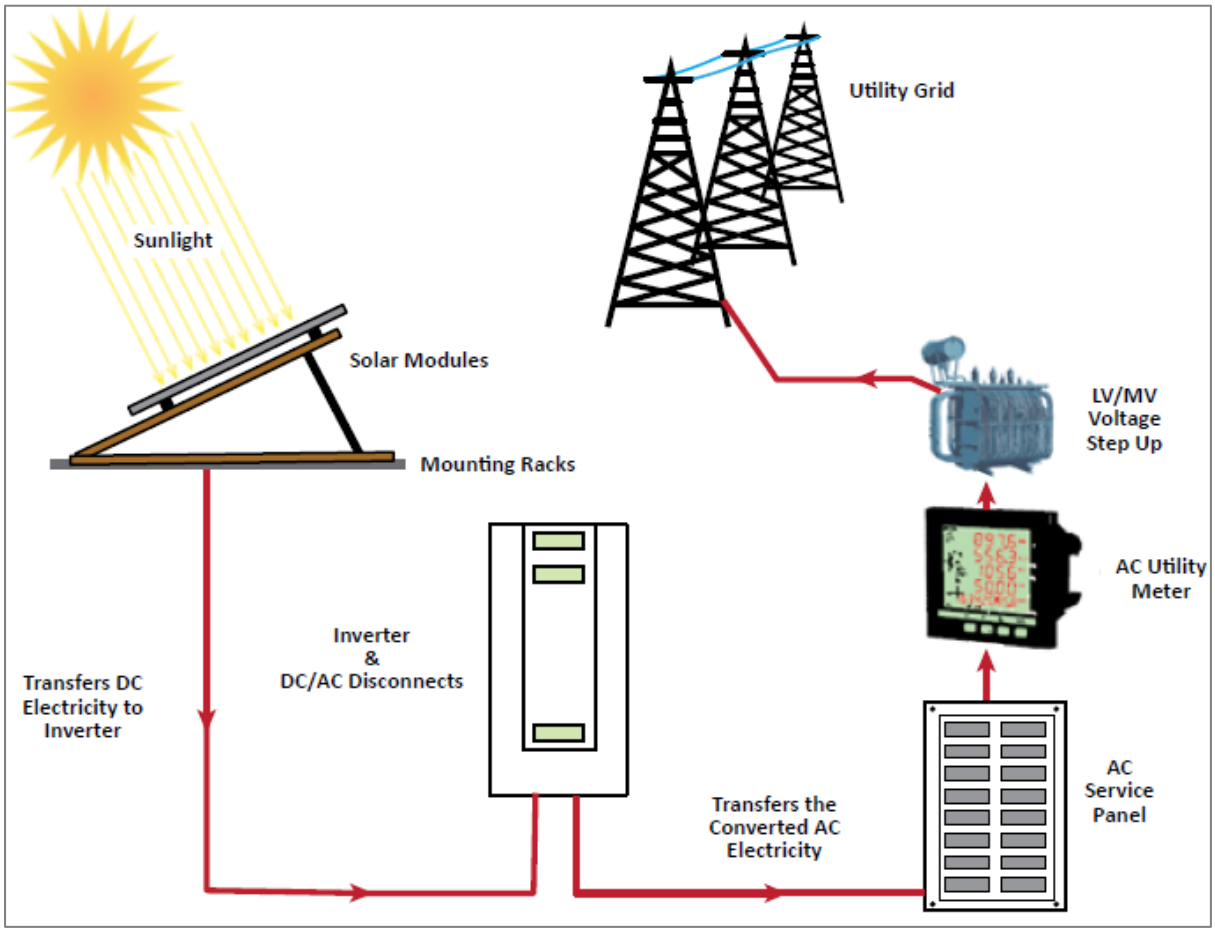

Figure 8: Overview of Solar PV Power Plant (IFC, 2015)

9.4 Project Layout

The layout of the proposed Project is illustrated in **Figure 9**. The desirability of the proposed development site for the proposed Project is due to the following key characteristics:

- **Solar Radiation**: The feasibility of a solar facility is dependent on the direct solar irradiation levels (refer to **Figure 1**).
- **Topography:** The suitability of the surface area is an important characteristic for the construction and operation of solar facilities. Most of the site has a low gradient slope and is suitable for this development
- **Grid capacity and connection:** In terms of the Grid Connection Capacity Assessment (GCCA) 2025, which is a report that presents the results of available generation connection capacity of all the transmission substations in all the supply areas in all the provinces of

South Africa, the Project is located within the North West Supply Area. Based on the latest GCCA released by Eskom in October 2023, the GCCA confirms that the North West Supply Area currently has 1660MW of generation connection capacity available. The Project Site is located approximately 8.8 km from the proposed Loop In-Loop Out (LILO) of the Pluto – Watershed 275kV power line and 2.8km from the Makokskraal Substation.

- **Extent of site:** The overall extent of the sites is sufficient for the installation of the PV facility, and allows for the avoidance of site sensitivities.
- **Site access and road infrastructure:** The site can be accessed via an unnamed gravel road off the N14 to the south and/or R53 to the east of the Project site.

The following factors were considered in determining the layouts (amongst others):

- Requirements of the Solar Plant;
- Understanding of the sensitive features on the site (e.g., watercourses and heritage sites from the specialists' studies); and
- Existing servitudes and infrastructure.

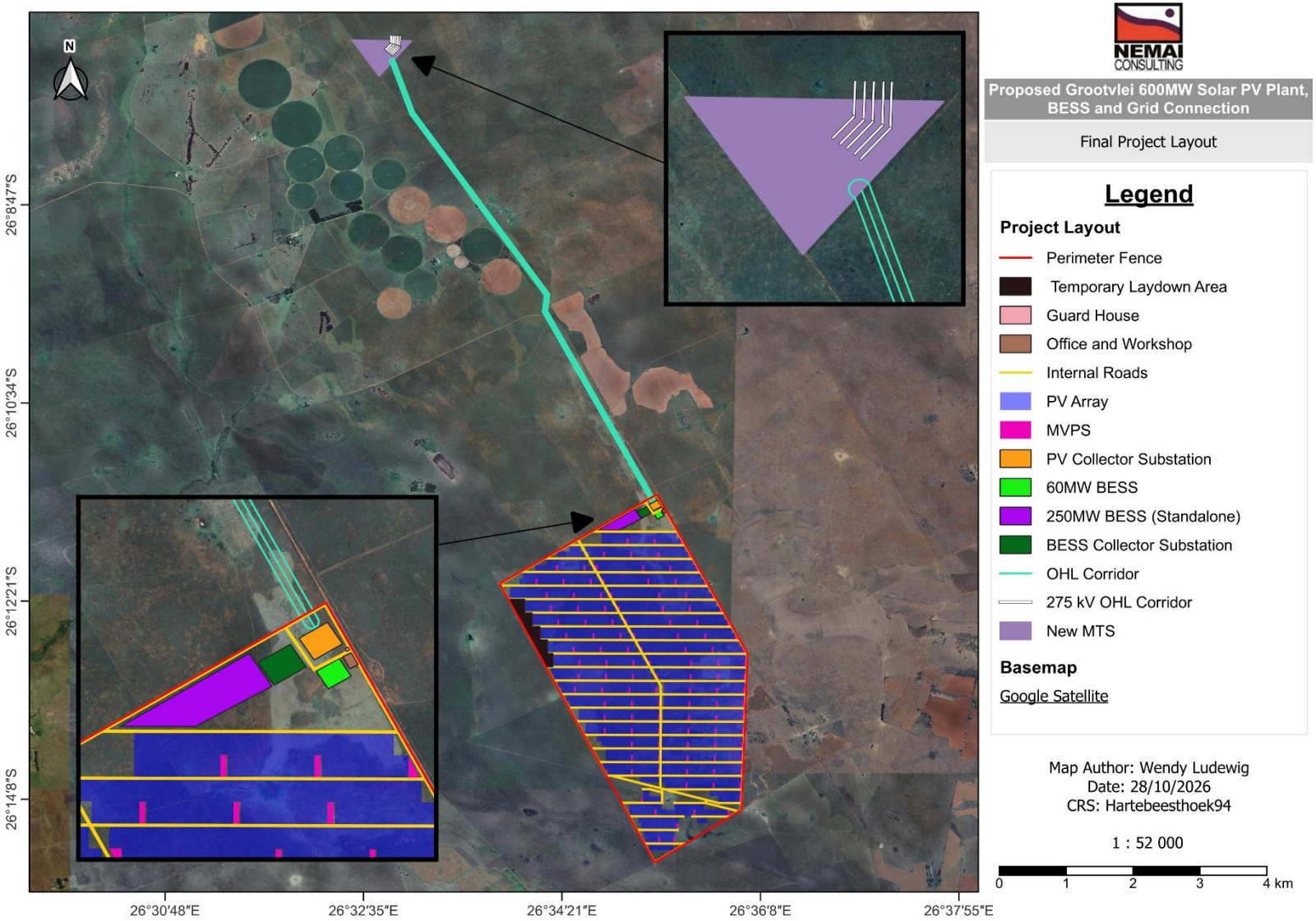

Figure 9: Overall Project Layout

9.5 Components of Proposed Solar PV Facility

The Project consists of the following systems, sub-systems or components (amongst others):

- 600MW PV solar panels or modules (arranged in arrays);
- Mounting structures to support the PV panels;
- DC-AC current inverters stations, transformers, and internal electrical reticulation (underground cabling);
- Transmission Line: The Project includes transmission infrastructure with an installed capacity at both distribution (132 kV) and transmission (2x 275 kV) levels, comprising an on-site 132/33 kV collector substation, an on-site 132 kV switching station, three 132 kV overhead lines linking the switching station to a new 400/132 kV substation located approximately 8.4 km north of the site on Portion 1 of the farm Houtkop 152 IP, and two 275 kV tie-in lines connecting to the existing Pluto-Watershed 275 kV line, thereby facilitating connection to the national grid with potential for electricity wheeling to off-site offtakers.
- New 400/132kV Main Transmission Substation;
- Administration Buildings (Offices);
- Workshop areas for maintenance and storage;
- Temporary laydown areas;
- Internal access roads and perimeter fencing of the footprint area;
- BESS;
- Security Infrastructure; and
- Site access from unnamed gravel road via the N14 and/or R53.

The components of the proposed Solar Facility are discussed below. Reference Source: Solar Power Plant - Types, Components, Layout and Operation (https://www.electricaltechnology.org/).

9.5.1 Solar PV Panels/Modules

The PV module comprises interconnected PV cells encapsulated between a transparent front layer (typically glass) and a backing material of either laminate or glass, and is either mounted within an aluminium frame or constructed as a frameless unit using durable tempered glass. The modules will typically appear dark blue or black and are designed to absorb solar radiation, thereby minimising reflection or glint. When glass is used on the rear surface, modules can capture reflected solar radiation from the ground, enabling bifacial operation. This bifacial module technology is widely available from various manufacturers and can be produced in either monocrystalline or polycrystalline form.

The proposed solar PV facility will utilise either monofacial or bifacial PV modules.

9.5.2 Mounting Structures

Solar PV modules will be mounted on support structures configured as either fixed-tilt or tracking systems (single- or double-axis), depending on the final design specifications. In tracking configurations, multiple PV modules are mounted on steel or aluminium racking systems that adjust their orientation to optimise solar irradiation throughout the day. Single-axis tracking systems allow the PV arrays to rotate along one axis, typically following the sun's movement from east to west, thereby reducing the angle of incidence and improving energy yield. The tracking movement is achieved through electrically powered motors and mechanical components, usually positioned at the end of each PV array, which control the tilt and alignment of the modules in response to the sun's position. Alternatively, fixed-tilt systems maintain a constant tilt and azimuth angle year-round. These mounting configurations are designed to maximise solar energy capture while remaining structurally stable under site-specific environmental conditions.

An example of PV modules mounted on a single-axis tracker is shown in **Figure 10** below.



Figure 10: Example of PV Module mounted on a Single Axis Tracker

9.5.3 Inverters

Inverters are installed to convert the DC electrical power generated by the PV modules into AC electrical power for use in the grid. In utility-scale PV plants, solar PV modules are connected in series to form PV strings that produce DC power at a low voltage (typically 1,000-1,500 V). This DC power is converted to AC using inverters, which also enable synchronisation

of the electricity with the grid frequency. The inverters control and maximise the conversion of power from the DC modules to low-voltage AC (i.e. less than 1,000 V).

There are three main inverter configurations, namely central inverters, string inverters, and micro inverters. String inverters have multiple inputs for connecting PV strings and are typically installed on steel structures beneath the PV modules. The final inverter design will be determined during the detailed design phase. Approximately 260 inverters are anticipated, each no more than 5 m tall.

9.5.4 Low Voltage AC Cabling

AC Cables are installed from the inverters to the distribution box adjacent to the medium-voltage transformers. These cables are installed underground in trenches.

9.5.5 Medium Voltage Step-Up Transformers

The purpose of medium-voltage transformers is to step up low-voltage power to medium voltage. To distribute the combined electrical power from a block of tracker rows, the voltage must be increased. Transformers will typically be in the order of 2.5MVA capacity and similar in appearance to the type shown in **Figure 11** below.



Figure 11: Example of Medium Voltage Transformer (Source: https://www.ulaginoli.com/)

Transformers are typically filled with oil to cool the windings. The cooling oil is circulated through radiator fins mounted on the side of the transformer. The oil remains in the transformer. Oil spills from transformers need to be contained with drip trays, and special care should be taken to clean up any spill.

9.5.6 Medium Voltage AC Cabling

Medium-voltage AC cabling from the transformers to the high-voltage substation is buried in underground trenches. The cables are protected from accidental damage by placing brightly coloured orange danger tape in the trench and, sometimes, on concrete slabs. Cable routes are marked with concrete cable markers on the ground at bends, road crossings, etc.

9.5.7 High Voltage Substrations

The medium-voltage cables are connected to a medium-voltage switchgear room located in a substation yard. High-voltage transformers step medium voltage up to high voltage.

A typical HV Substation will look like the substation shown in **Figure 12**, with large ground-mounted transformers and outdoor high voltage switchgear with overhead conductors and steel lattice structures. The yard is fenced off, and only authorised personnel are allowed inside the high-voltage yard (see the example shown in **Figure 13**).



Figure 12: Example of High Voltage Substation



Figure 13: Example of High Voltage Transformers

9.5.8 Guardhouses, Operation, Maintenance and Visitor Centre Buildings

Guardhouses, Operation and Maintenance, and Visitor Centre Buildings are required for the facility. Buildings will be single-story with a maximum height of 8m.

The purpose of the buildings is to provide space for on-site staff responsible for operating and maintaining the facilities, including storage for spare parts, tools, and related items. Computers will be installed to monitor electricity generation and report on the plant's condition. Toilets, kitchens, water, wastewater, and electricity will be required for staff and visitors. Note that no one will be living on-site during the construction and operational phases of the Project.

Sustainable building principles will be applied, including rainwater harvesting, energy-efficient lighting, and insulation.

9.5.9 Roads

The proposed development will make use of existing dirt roads on site, including an existing entrance road, which may require widening to ensure suitability for use. The main access road will be gravel-surfaced, with a width of up to 6 m and a length of up to 2 km. The access road corridor will have a maximum width of 100 m. Internal access roads within the site will also be gravel-surfaced and up to 6 m wide.

The basic layout consists of rows of PV modules with internal roads in between, similar to that shown in **Figure 14** below.



Figure 14: Example of roads between trackers and medium voltage substations (source: https://ecoinventos.com/)

9.5.10 Fencing, Security and Lighting

The site will be fenced, and access will be controlled through 24-hour security services (during the construction phase). The site may include a CCTV surveillance system to protect equipment, buildings, and personnel. Security lighting will be installed to illuminate the site during nighttime operations. The facility will be enclosed by either an electrified or non-electrified boundary fence with perimeter lighting. Access to the Solar PV Facility will be controlled through manned entry points.

9.5.11 Stormwater Infrastructure

Stormwater runoff from the Solar PV Facility will be collected in an open, V-shaped stormwater drain located along the edge of the site. The drain will discharge into a stormwater attenuation pond, from which stormwater will flow into the nearest drainage line. The Solar PV Facility is considered a ‘clean water’ area.

Road drainage will be collected in open, unlined channels or, where necessary, stone- or concrete-lined channels, and conveyed to natural discharge points. Where site topography or land use constraints prevent the use of open channels, stormwater will be directed to a concentration point and intercepted by a field inlet, from which it will be conveyed via concrete pipes to discharge points. Drift crossings will be considered the preferred road-crossing solution.

Surface drainage using open canals will be the primary approach, with safety, ease of maintenance, and operational considerations informing the design. The design principles include minimising alteration to the natural flow regime, simulating natural runoff conditions,

limiting stormwater convergence, promoting sheet flow, conserving the in-situ soil mantle, and addressing potential erosion associated with site activities. Energy dissipation measures, such as stone pitching, will be implemented where necessary, and open drainage channels will be protected and lined where required to limit erosion and water ingress.

The stormwater drainage system will be designed to accommodate a 50-year return period for internal drainage, the main access road, and external drainage.

9.6 Battery Energy Storage System

9.6.1 Types of Electrical Energy Storage Systems

Electrical Energy Storage Systems include mechanical, chemical, electrical, thermal, and electrochemical systems, as summarised in **Figure 15** below. For the proposed Project, an electrochemical (battery) storage system has been selected as the preferred solution to meet the Project requirements. The BESS can be broken into solid-state and flow battery systems.

Batteries are electrochemical devices composed of one or more cells with a positive terminal (cathode) and a negative terminal (anode). A range of battery chemistries exists, including lithium-ion and lead-acid, which are widely used in portable electronic devices and vehicles, as well as other solid battery types such as nickel-cadmium and sodium-sulphur. In addition, flow batteries utilise liquid electrolyte solutions, including vanadium redox, iron-chromium, and zinc-bromine chemistries, while zinc-air batteries represent an emerging technology.

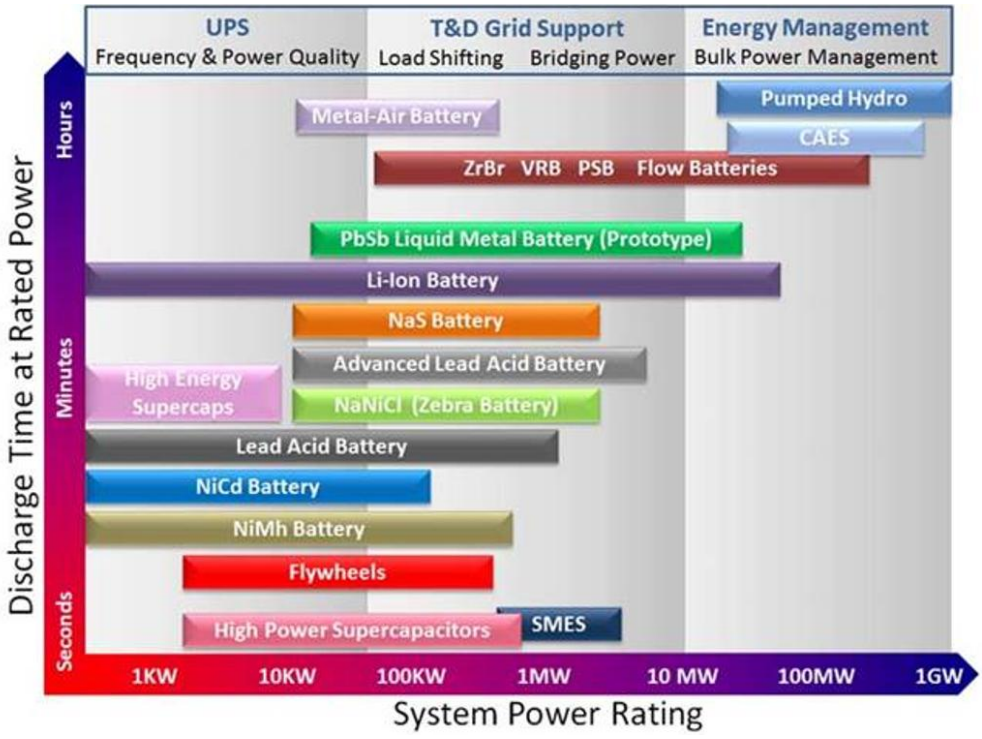

Figure 15: Grid Energy Storage Technologies and Applications (Adapted from Climate Policy Initiative for the Energy Transitions Committee)

9.6.1.1 Solid State Battery Systems

Solid-state batteries include lithium-ion and lead-acid batteries. Lithium-ion batteries are used extensively in electrical energy storage systems. Current estimates indicate that approximately 85% of the electrochemical systems installed use lithium-ion batteries. “Lithium-ion” refers to a wide array of chemistries in which lithium ions are transferred between the electrodes during the charge and discharge reactions. The construction/composition of lithium-ion batteries varies from manufacturer to manufacturer. Lithium-ion has the smallest installation footprint compared with technologies of similar energy capacity.

9.6.1.2 Flow Battery Systems

A flow or redox flow battery is a device in which chemical energy is supplied by two chemical components dissolved in liquids within the system, separated by a membrane. Typical systems use Vanadium or Zinc Bromine, which are further explained below:

- The vanadium redox battery (VRB), also known as the vanadium flow battery (VFB), is a rechargeable flow battery that employs vanadium ions in different oxidation states to store chemical potential energy. The battery consists of an assembly of cells in which the two electrolytes are separated by a proton exchange membrane; both half-cells are additionally connected to storage tanks and pumps so that the electrolytes can be circulated through the cell. The main advantages of the VRB are that it can offer almost unlimited energy capacity simply by using larger electrolyte storage tanks; it can be left completely discharged for long periods with no ill effects; if the electrolytes are accidentally mixed, the battery suffers no permanent damage; a single state of charge between the two electrolytes avoids the capacity degradation due to a single cell in non-flow batteries; the electrolyte is aqueous and inherently safe and non-flammable. The main disadvantage of vanadium redox technology is a relatively poor energy-to-volume ratio.
- Zinc Bromine flow battery uses a solution of Zinc bromide stored in two tanks. The electrolyte is pumped from one tank to the other during charging and discharging. The advantages and disadvantages listed for the vanadium redox flow battery are applicable to the zinc-bromine flow battery.
- Sodium-Sulphur (NaS) battery system is also an energy storage system based on electrochemical charge/discharge reactions that occur between a positive electrode (cathode) that is typically made of molten Sulphur and Sodium. The NaS battery has the general advantages of the Vanadium and Zinc-bromine batteries, i.e., long life, a high number of charge and discharge cycles, and the ability to discharge fully without affecting performance. The disadvantage is the low energy-to-size ratio.

9.6.2 The Projects BESS Infrastructure

The BESS will store surplus energy generated by the Solar PV site for later use, thereby helping balance electricity supply and demand. Stored energy will be utilised during peak demand periods, such as in the morning and evening. The PV panel array generates DC power, which inverters convert to AC and then transfer to the on-site substation. At the

substation, operators determine whether to evacuate the energy to the grid or transfer it to the BESS for storage. When energy is required, it is drawn from the grid network, and when it is not, it is stored in the BESS for later use.

The BESS will comprise stacked containerised units or a multi-storey building configuration. Several battery technologies are being considered for the proposed Project, including solid-state and flow-type batteries. The BESS units are expected to be approximately 6 m tall, equivalent to two standard containers stacked vertically.

At the time of Scoping, the specific BESS supplier and technology have not yet been selected, as detailed engineering design and procurement have not been finalised. The BESS may comprise commercially available utility-scale battery storage technologies, including lithium-ion battery technologies or other equivalent technologies available at the time of procurement. For the purposes of the environmental assessment, a precautionary approach will be applied during the EIA Phase to assess potential environmental impacts associated with the storage and handling of hazardous substances, fire risk, emergency response requirements and waste management. The detailed design and technology specification will be confirmed during the detailed design phase.

9.7 Grid Connection

The proposed development will include an on-site 132/33 kV collector substation and an on-site 132 kV switching station. The switching station will be connected via three 132 kV overhead power lines to a new 400/132 kV substation located approximately 8.4km north of the project site on Portion 1 of the Farm Houtkop 152 IP. In addition, two 275 kV tie-in lines will connect to the Watershed–Pluto 275 kV transmission line. These components will facilitate the connection of the Solar PV site to the national grid.

The Solar PV Facility will generate electricity, which will be collected through the internal reticulation network and conveyed to the on-site collector substation. From the collector substation, electricity will be routed through the switching station and transmitted via the proposed 132 kV overhead lines to the proposed 400/132 kV MTS. The MTS will facilitate integration of the generated electricity into the Eskom transmission network via the proposed 275 kV tie-in connection to the existing Watershed-Pluto transmission line. The connection may also allow for a wheeling option, whereby electricity generated at the Solar PV site could be transferred to an off-site offtaker.

Examples of a 132kV transmission line, as well as a high voltage transmission line connecting to a substation, are shown in **Figure 16** and **Figure 17** below, respectively.



Figure 16: Example of a 132kV transmission line



Figure 17: Example of High Voltage Transmission Line Connecting to Substation

9.8 Project Life-Cycle

The project life-cycle for a typical Solar Plant includes the following primary activities (high-level outline only):

- Feasibility phase - This phase includes confirming the feasibility of the Project by evaluating and addressing the following (amongst others) –
  - Solar resource assessment;

- Site selection;
- Project land allocation;
- Project yield assessment;
- Permitting and licensing;
- Legal agreements;
- Socio-economic development;
- Industrialisation and localisation;
- Project cost determination;
- Project financing; and
- Risk analysis.

❖ Design phase - This phase includes the following (amongst others) –

- Confirming key design features such as the type of PV module to be used, tilting angle, mounting and tracking systems, inverters, and module arrangement;
- Confirming specifications for the components of the Solar Plant;
- Preparing detailed designs (layout, civil, electrical);
- Preparing construction plans;
- Preparing the Project schedule; and
- Preparing the commissioning plans.

❖ Construction phase – During the implementation of the Project, the following construction activities will be undertaken –

- Pegging the footprint of the development;
- Establishing access roads;
- Preparing the site (fencing, clearing, levelling and grading, etc.);
- Establishing the site office;
- Establishing laydown areas and storage facilities;
- Transporting equipment to the site;
- Undertaking civil, mechanical and electrical work; and
- Reinstating and rehabilitating working areas outside of the permanent development footprint.

❖ Operational phase - Once the solar park is up and running, the facility will be largely self-sufficient. Operational activities associated with the maintenance and control of the Solar Plant will include the following (amongst others) –

- Testing and commissioning the facility's components;
- Cleaning of PV modules;
- Controlling vegetation;
- Managing stormwater and waste;
- Conducting preventative and corrective maintenance; and
- Monitoring of the facility's performance.

❖ Decommissioning –

- Panels are guaranteed to produce at least 80% of their rated power for 20 to 30 years. In practice, panels will perform satisfactorily well beyond this timeframe. At the end of the 20 to 30-year lifespan, two scenarios exist for the panels:

- The old, redundant panels can be disposed of (at a registered disposal facility designated for this purpose); or
- The panels can be recycled by either using their components to fix or make new panels, or be donated for use elsewhere (e.g., for the electrification of rural schools and clinics).

It is unlikely that the Solar Plant will be decommissioned after 30 years. Instead, the facility will continually be reconditioned as the panels are recycled and replaced with more advanced technology as it becomes available.

In the event that the Solar Plant must be decommissioned, the decommissioning phase will include measures for complying with the prevailing regulatory requirements, rehabilitation and managing environmental impacts in order to render the affected area suitable for a future desirable use

9.9 Implementation Programme

Key milestones during the Project's implementation programme include the following:

- Phase 1: Site Establishment & Mobilisation (Months 1 to 3);
- Phase 2: Civil & Infrastructure Works – PV Plant & BESS Sites (Months 2 to 10);
- Phase 3: Mechanical & Electrical Installation (Months 10 to 16);
- Phase 4: Commissioning & Grid Integration (Months 14 to 20); and
- Phase 5: Handover & Commercial Operation (Months 20 to 24).

9.10 Resources and Services Required for Construction and Operation

This section briefly outlines the resources required to execute the Project. Note that the EMPr will include provisions to manage impacts associated with the aspects listed below, as relevant.

9.10.1 Raw Materials

Construction

Material required for construction, including fencing and other materials (e.g., cement, sand, aggregate), will be sourced from suitable suppliers. The PV modules and other facility components will also be sourced from accredited suppliers.

Operation

During the operational phase, few raw materials will be required. Materials such as consumable spares will be used to operate the facility.

9.10.2 Water

Construction

During construction, water will be sourced from boreholes, whose locations are still to be identified, with all possible options shown on the permit drawings. Water will be conveyed to the Solar PV Plant either via pipelines or by trucking. The water will be stored in storage tanks and used to meet construction demands, including drinking, ablution facilities, access road construction, dust suppression, firefighting reserve, facility cleaning, and the construction of foundations for PV panel mounting structures and the substation. The estimated annual water consumption during construction is 60 000 m³.

Details on sourcing water for panel cleaning will be determined as the project design progresses. The EIA considered the potential impact of wash water on these features.

Operation

During operation, water will be supplied from boreholes through abstraction. The estimated annual water consumption during operation is 15 000 m³. Water will be used for drinking, ablution facilities, the fire-fighting reserve, and facility cleaning. PV panels will typically be cleaned using dry brush techniques; however, water cleaning may be used under certain circumstances to remove surface contaminants. No chemicals will be used to clean the PV modules, and cleaning is expected to occur primarily during the rainy season, when rainfall necessitates cleaning.

The washing methods used would affect the erosion mitigation requirements. If required, mitigation could involve phasing panel washing or optimising the method used. The overall effect on natural watercourses is expected to be very low, provided the cleaning water is free of detergents or contains approved biodegradable substances.

9.10.3 Sanitation

Construction

Workers' wastewater from temporary sanitation and ablution facilities during the construction phase will be collected in temporary septic or conservancy tanks. Sewage trucks will transport this wastewater to a licensed wastewater treatment or disposal facility. Approximately ≤20 000 m³ per annum of effluent may be generated during this phase. A Service Level Agreement will be established with the Ditsobotla Local Municipality to collect sewage from the project site using a honey sucker truck and dispose of it at the nearest wastewater treatment works during the 18-month construction period.

Operation

During the operational phase, the conservancy tanks will collect wastewater generated from the guard house and operation and maintenance (O&M) buildings. These will be sized to accommodate monthly emptying and disposal, or on-site treatment. Alternatively, wastewater may be connected to the mine’s existing sewage system. This phase may generate approximately ≤120 m³ of wastewater per annum.

9.10.4 Waste

Construction

General waste generation during construction is expected to be ≤500 m³ per quarter (90 days) and will include packaging materials (cardboard, plastic, and wood), building rubble (discarded bricks, wood, and concrete), domestic waste from workers and contractors, and organic waste from site-clearing activities. The Contractor will collect waste in bins located in contractor yards and across work areas, with routine site clean-ups. Waste will be temporarily stored in a weather-shielded central waste area and removed by the Contractor for disposal at a registered waste disposal facility.

The Contractor will provide temporary portable chemical toilets at work sites and empty and clean them regularly. Wastewater associated with these facilities will be collected and transported off-site for treatment or disposal, with an estimated volume of approximately 300 m³ per annum. Hazardous waste generation is expected to be ≤80 m³ per quarter (90 days) and may include used tins, oils, grease, fuel, and lubricants. In the event of leaks from transformers or containers, the material will be removed by a registered hazardous waste service provider and disposed of at an appropriate licensed facility.

Operation

General waste generated during operation will include food waste, packaging, and office consumables, with relatively small quantities expected (less than 500 m³ per quarter). The site will temporarily store waste in containers such as wheelie bins and skips, and a third-party contractor will collect it for disposal at a licensed landfill site. Waste will be sorted off-site, with recyclable materials such as metal, paper, plastic, and cardboard recovered for recycling.

Small quantities of hazardous waste, including used oil and fuel, may be generated during operations from maintenance activities involving hydraulic oils, grease, and other lubricants.

9.10.5 Roads

Construction

Temporary access roads will be created during the construction phase. The areas affected by temporary roads will be reinstated, as they will not be used permanently in the operational phase.

Operation

The Project site is accessible via an unnamed gravel road off the N14 and/or R53.

9.10.6 Transportation

Construction Phase

It is anticipated that there will be an average of 10 to 20 trucks per day (approximately 2 000 trucks in total) during the construction phase of the Project to deliver project components,

machinery, and labour. The transportation routes have not yet been finalised and will be confirmed after procurement, once all suppliers have been appointed.

Operation Phase

During the operational phase, traffic volumes are expected to decrease significantly, with only a limited number of vehicles travelling to and from the project site for operations and maintenance.

9.10.7 Stormwater

Construction

Stormwater runoff during construction will be managed using open, V-shaped stormwater drains along the site edge, discharging into a stormwater attenuation pond. From the attenuation pond, stormwater will flow into the nearest drainage line. The Solar PV Plant is considered a 'clean water' area. Road drainage will be managed through open, unlined channels or, where necessary, stone- or concrete-lined channels, and conveyed to natural discharge points. Where site topography or land-use constraints prevent open channels, stormwater will be directed to a concentration point, intercepted by a field inlet, and conveyed via concrete pipes to discharge points. Drift crossings will be considered the preferred road-crossing solution. Open canals will be the primary surface drainage approach, with safety, ease of maintenance, and operational considerations informing the design.

Best environmental practices will be implemented during construction to manage stormwater. These measures are included in the EMPr.

Operation

During operation, stormwater runoff from the Solar PV Plant will continue to be managed via open, V-shaped stormwater drains along the site boundary, which feed into a stormwater attenuation pond before discharge into the nearest drainage line. The Solar PV Plant is considered a 'clean water' area. Road drainage will continue to be managed through open, unlined or lined channels, or through field inlets and concrete pipe systems where required. Open canals will remain the primary surface drainage solution, with safety, ease of maintenance, and operation given due consideration. The stormwater management system will be designed to minimise alteration of the natural flow regime, simulate natural runoff conditions, limit stormwater convergence, promote sheet flow, conserve the in-situ soil mantle, and address potential erosion. Energy dissipation measures, such as stone pitching, will be implemented where necessary, and drainage channels will be protected and lined where required to limit erosion and water ingress. The stormwater drainage system will be designed to accommodate a 50-year flood return period for internal drainage, the main access road, and external drainage.

9.10.8 Electricity

Construction

The EPC Contractor will be responsible for supplying electricity during construction. The EPC Contractor will obtain electricity from diesel generators and/or temporary supply via cables from the site power grid (11 kV or 22 kV feeder line).

Operation

The plant will supply electricity during daylight hours (off-peak times – 07:00 to 17:00). The BESS will supply electricity during night hours (peak times – 05:00 to 07:00 and 17:00 to 19:00). During other times, the power grid will supply electricity.

9.10.9 Laydown Areas

Construction

A laydown area will be required during construction to temporarily store equipment and supplies. The proposed temporary laydown area of approximately 19.8 ha will be required (refer to **Figure 9** above).

9.10.10 Construction and Operation Workers

Construction

The appointed Contractor will primarily use skilled labour to construct the facility and its associated infrastructure. In those instances where casual labour is required, the Applicant will request that such persons be sourced from local communities, as far as possible.

During construction, at least 300 employment opportunities are anticipated. The number of personnel employed at any given time may vary depending on the specific contracts and subcontracts active during different stages of the Project.

Operation

During the operational phase, at least 23 people are expected to be employed. These personnel will primarily manage daily operations, security, and maintenance of the Project.

10 PROFILE OF THE RECEIVING ENVIRONMENT

10.1 Introduction

This section provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the EIA was conducted.

Where necessary, the regional context of the environmental features is also explained, with an ensuing focus on the local surrounding environment. The reader is referred to **Section 11** for more elaborate explanations of the specialist studies and their findings for specific environmental features.

This section allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed Project. The potential impacts to the receiving environment are discussed in **Section 12**.

10.2 Land Use

The Project is located approximately 20km to the north-west of the central business district of Ventersdorp and falls within Ward 34 of the JB Marks LM and Ward 17 of the Ditsobotla LM in the North West Province. The areas affected by the proposed Project footprint are rural in nature (**Figure 19**). The Project's PV Site is vacant and was historically used for agricultural purposes. Grazing is the dominant land use in the Project area (**Figure 18**). The following land uses are encountered around the Project's PV Site:

- Livestock production and cultivated land on the surrounding properties;
- The Schoonspruit Nature Reserve is located approximately 18km southeast of the site; and
- The National Road (N14) is located approximately 15km south of the site, which provides regional access to the area.



Figure 18: View of livestock on the Project site



Figure 19: Overall view of the Project site, showing the rural nature of the site

According to the National Land Cover Map for South Africa (2020) (refer to **Figure 20**), the Project site is predominantly classified as grassland, with portions of cultivated land and limited areas of forested and built-up land. This is consistent with the North West BSP Land Cover Map (refer to **Figure 21**), which reflects similar land cover characteristics across the Project site.

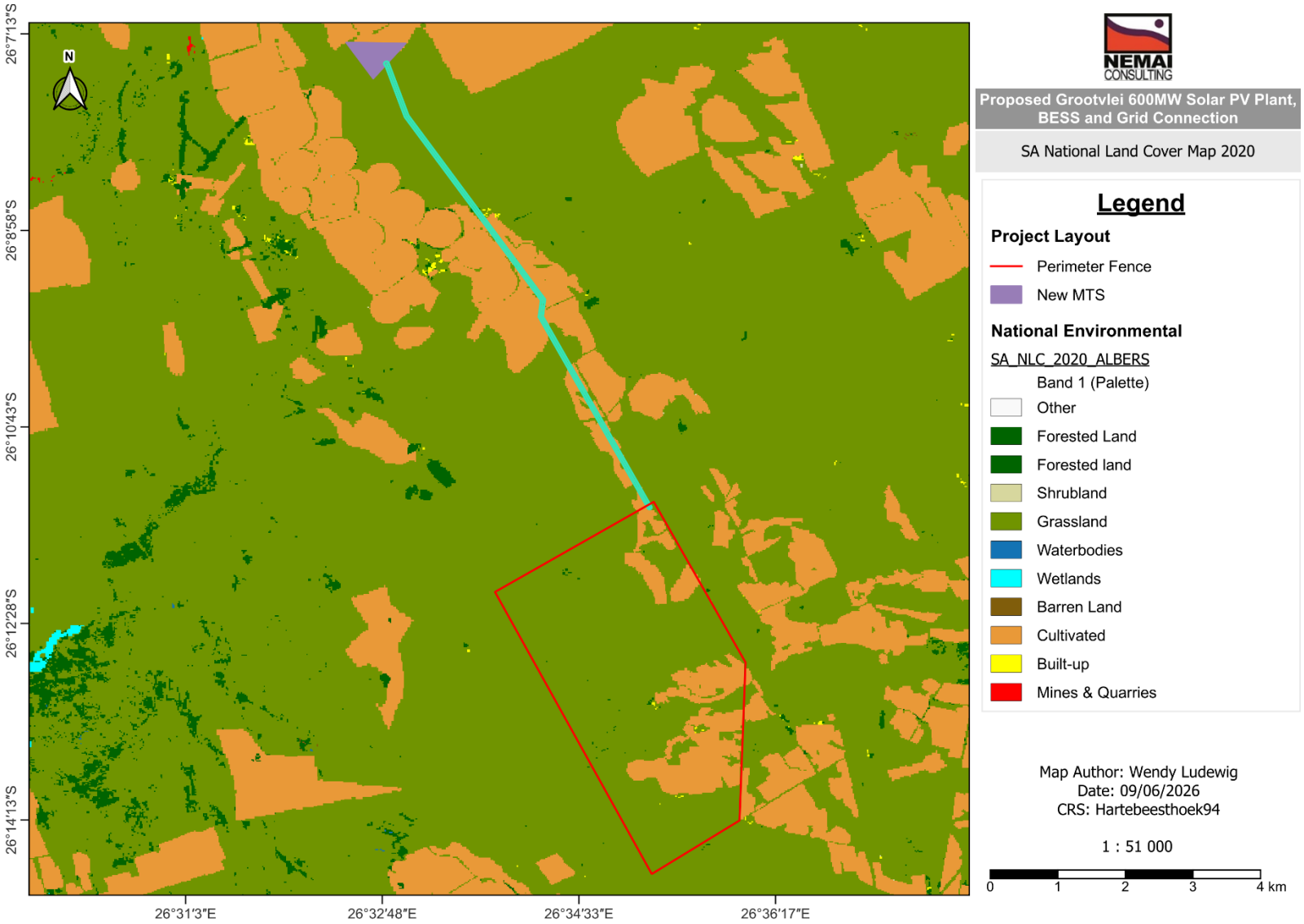

Figure 20: Project Site in relation to the SA National Land Cover Map 2020

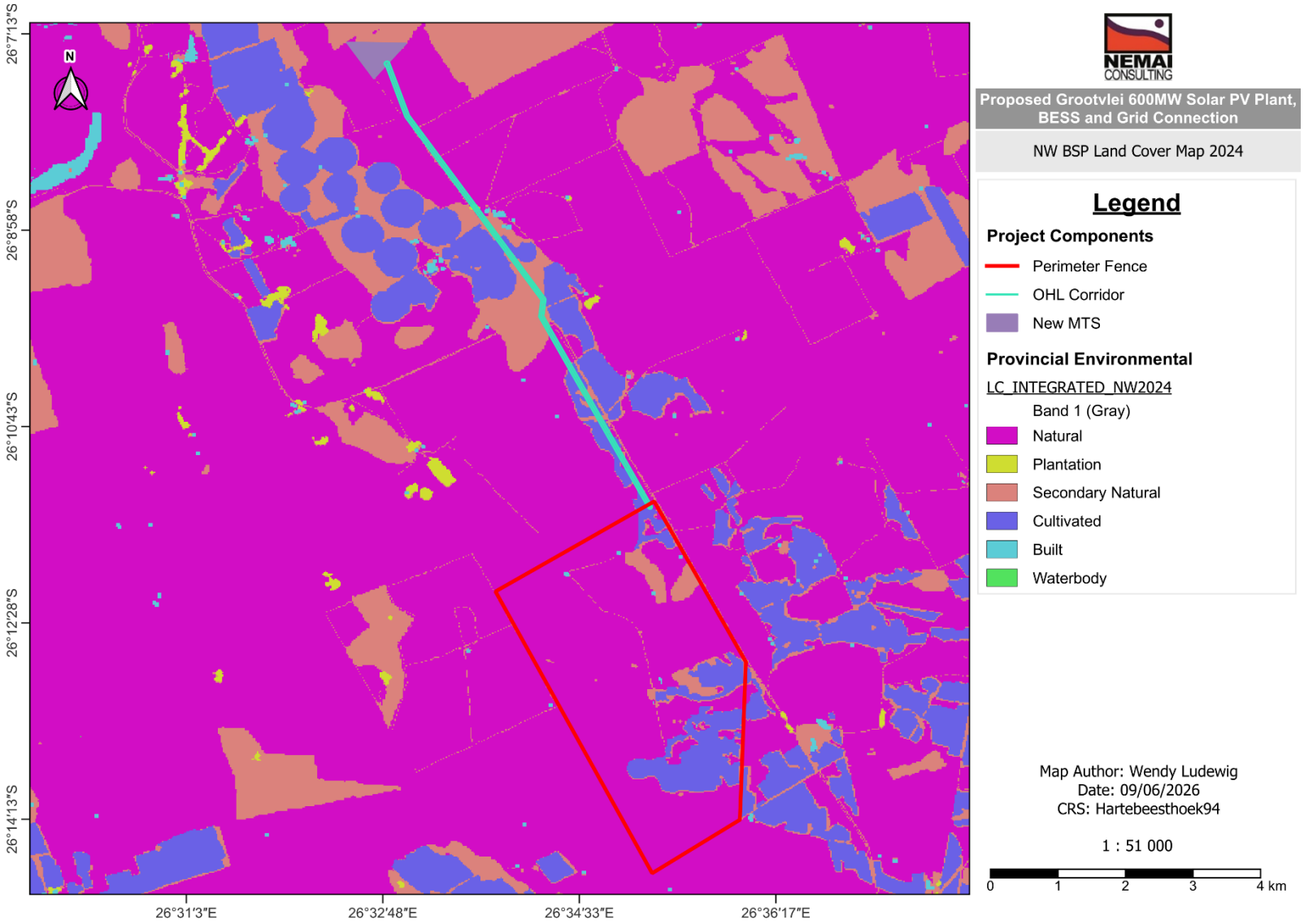

Figure 21: Project site in relation to the North West Biodiversity Sector Plan Land Cover Map 2024

10.3 Climate

10.3.1 Prevailing Climatic Conditions

The project site is located in a subtropical highland climate (Cwb) according to the Köppen-Geiger classification. The area is characterised as a warm-temperate, summer-rainfall region with an overall Mean Annual Precipitation MAP of 593 mm. Summer temperatures are high, and severe, frequent frost occurs in the winter (Mucina & Rutherford, 2006).

The Project site, located approximately 20 km from Ventersdorp, experiences a climate characterised by warm to hot summers and cooler winters. Summer temperatures (November to March) are relatively high, with average daily temperatures ranging from 20°C to 28°C and peak temperatures exceeding 30°C. During the winter months (May to August), temperatures decrease significantly, with average temperatures ranging from approximately 8°C to 18°C and occasional minimum temperatures approaching 0°C.

Rainfall is seasonal, with most precipitation occurring during the summer months (primarily between October and April). The highest rainfall events are observed during this period, with notable peaks in January, February, March and November. In contrast, the winter months (May to August) are characterised by very low to negligible rainfall, indicating a pronounced dry season.

Relative humidity varies throughout the year, generally remaining higher during the summer months and decreasing during winter, particularly around August and September, when lower humidity values are observed. Cloud cover follows a similar trend, with increased cloudiness during the wetter summer months and clearer conditions during the dry winter period.

Wind conditions are present throughout the year, with average wind speeds generally ranging from 10 to 20 km/h, and occasional higher gusts. Wind speeds appear to increase slightly during the late winter to early summer period (August to October).

Overall, the climatic conditions are characterised by a summer rainfall regime with warm, wetter summers and cooler, drier winters. **Figure 22** below illustrates the climatic conditions of the Project area.

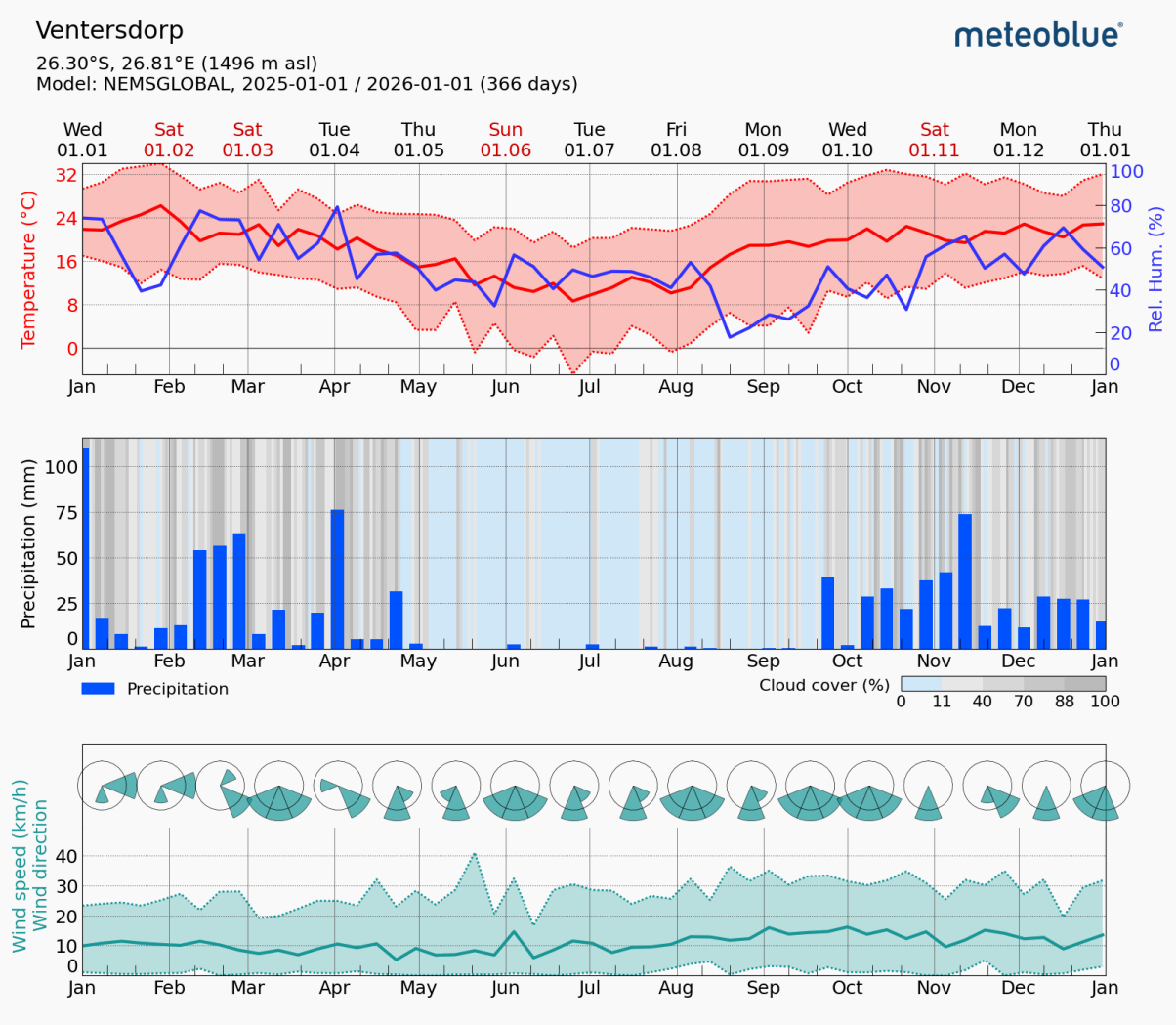

Figure 22: Temperature, humidity, precipitation, and wind speed and direction for Ventersdorp for 2025 (Meteoblue, 2026a)

10.3.2 Climate Change Considerations

Figure 23 illustrates the various environmental factors that influence Solar PV output (Bamisile *et al.*, 2025). Climate change is a key consideration for Solar PV facilities, as increasing temperatures can reduce PV efficiency by approximately 0.4–0.5% per degree Celsius (Bamisile *et al.*, 2025). A climate change model conducted by Meteoblue (Meteoblue, 2026b) indicates that the Project site has experienced a slight temperature increase of less than 2°C over the past 40 years (1979 to 2025).

Various studies have been undertaken to determine the most suitable PV module technologies for different climatic conditions, highlighting the importance of considering site-specific climate characteristics when selecting appropriate PV modules for the Project (Friesen and Micheli, 2025).



Figure 23: Environmental factors that affect Solar PV output (Bamisile et al., 2025)

South Africa is currently heavily reliant on coal for electricity generation. To mitigate the impacts of climate change, there is a need to diversify electricity generation sources to enhance security of supply and reduce the carbon footprint associated with reliance on coal. The proposed Project forms part of this broader initiative by contributing to the diversification of power generation through the incorporation of renewable energy technologies integrated into the existing grid.

The Applicant intends to participate in current and REIPPPP bid windows and/or other renewable energy markets within South Africa, with the aim of supporting the increased contribution of solar-generated power to the national electricity grid.

10.4 Geology, Soil and Geohydrology

10.4.1 Geology

According to the 2626 West Rand – 1:250 000 Geological map series, the study area is underlain by the Precambrian dolomites and associated marine sedimentary rocks of the Monte Christo Formation of the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup) (refer to **Figure 24** below).

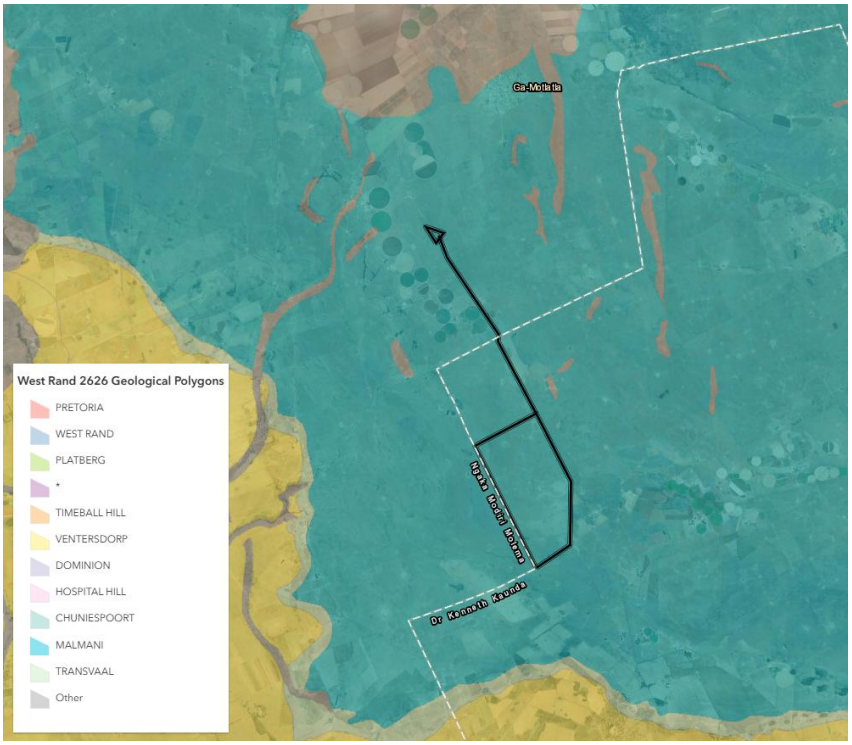

Figure 24: Extract of the 1:250 000 West Rand 2626 (1986) Geological Map indicating that the proposed development site is underlain by the Malmani Subgroup

The Geotechnical and Dolomite Desktop Study (Naturevhudi Group, 2026) confirms that the Project site is underlain by dolomite and chert of the Malmani Subgroup of the Chuniespoort Group within the Transvaal Supergroup. The dolomitic geology has resulted in the development of residual chert, dolomite residuum and locally occurring dolomite outcrops across portions of the site. Historical geotechnical investigations undertaken within the southern portion of the Project area identified significant variability in subsurface conditions, with the site comprising transported silty sands, residual chert horizons, dolomite residuum, weathered dolomite boulders and areas of shallow dolomite bedrock. Test pit investigations identified several geotechnical zones across the site, reflecting the heterogeneous nature of the underlying dolomitic terrain.

Laboratory testing on representative soil samples indicated that the transported soils, residual chert, and dolomite residuum are generally low-expansive and are predominantly classified as excellent to good subgrade materials. The investigation further recorded areas where weathered dolomite pinnacles, dolomite boulders and shallow bedrock may influence future foundation and infrastructure design.

10.4.2 Soil

Desktop data indicate that the Project site is predominantly characterised by Eutric Leptosols (LPe). These soils are typically very shallow, often underlain by continuous rock, and are characterised by a high content of coarse fragments. The term ‘Leptosols’ is derived from the Greek word leptos, meaning thin. These soil types generally occur at or near the surface as continuous rock or in extremely gravelly conditions and are commonly associated with areas

of strongly dissected topography across a range of climatic zones (Mchunu, 2026). Refer to **Figure 25** below for the soil classes associated with the Project site.

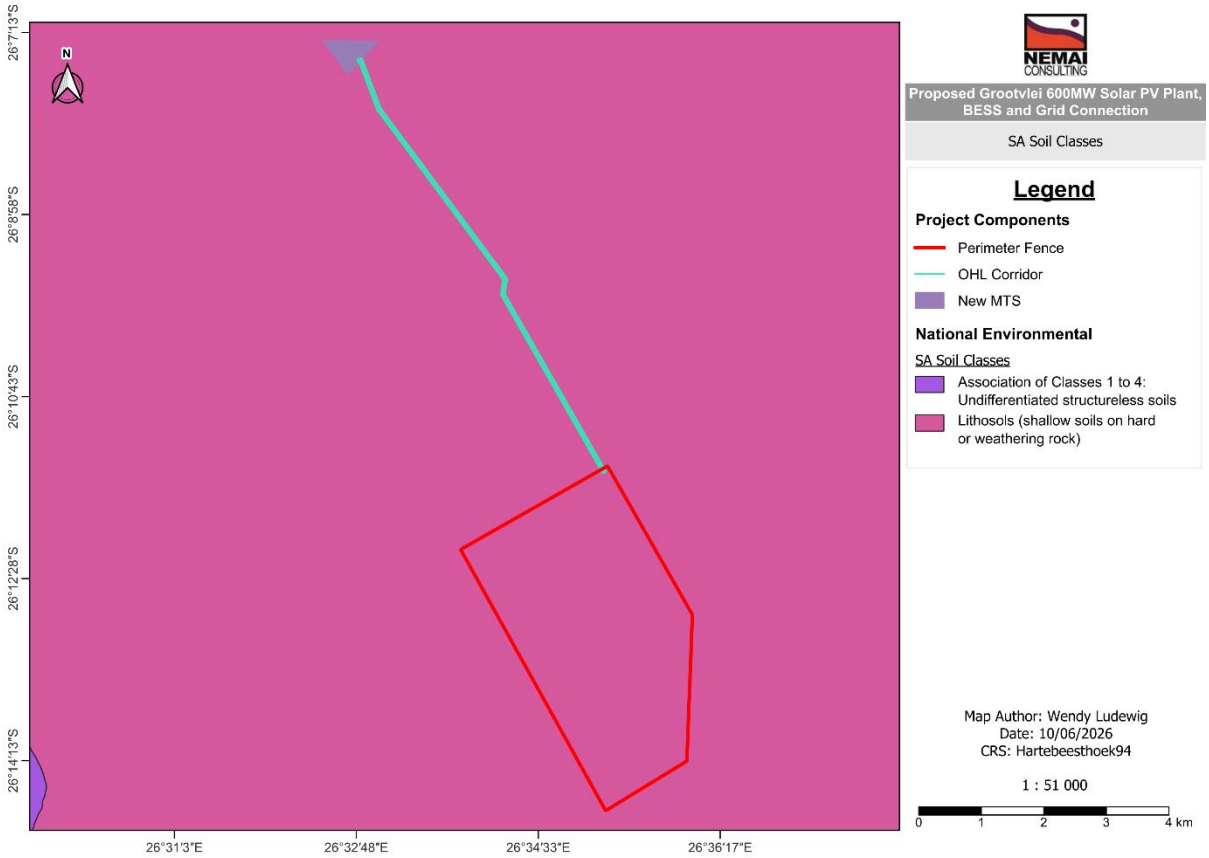

Figure 25: Project footprint in relation to SA soil classes

Site observations by the agriculture specialist indicate that the area is dominated by shallow Dresden, Mispah, Glenrosa, and Glencore (Type A) soil forms, with an effective rooting depth generally ranging between approximately 18 cm and 32 cm. In addition, a limited extent of moderately deep Glencore (Type B) soil was identified, with an effective rooting depth of approximately 35-48 cm (Mchunu, 2026).

10.4.3 Geohydrology

Groundwater is an important source of rural water supply within the JB Marks LM, and in the drier parts of the municipal area, groundwater constitutes the main source of water for rural domestic supplies and stock watering (JB Marks LM, 2025). Existing or new boreholes may be used as water sources for this Project. If this is not feasible, the alternative is to tanker in the required water.

The Project site is located within the Holpan Dolomite Groundwater Compartment and partially within the Schoonspruit Dolomite Compartment, as shown in **Figure 26**. Information from the DWS indicates groundwater levels within these dolomitic groundwater management units generally range from approximately 7.7 m to 18.8 m below ground level, with a median depth of approximately 14.5 m. The geotechnical investigation (Naturevhudi Group, 2026) did not

encounter groundwater seepage in any excavated test pits; however, the investigation was undertaken during the dry season, and temporary perched groundwater conditions may develop after periods of significant rainfall where less permeable horizons occur.

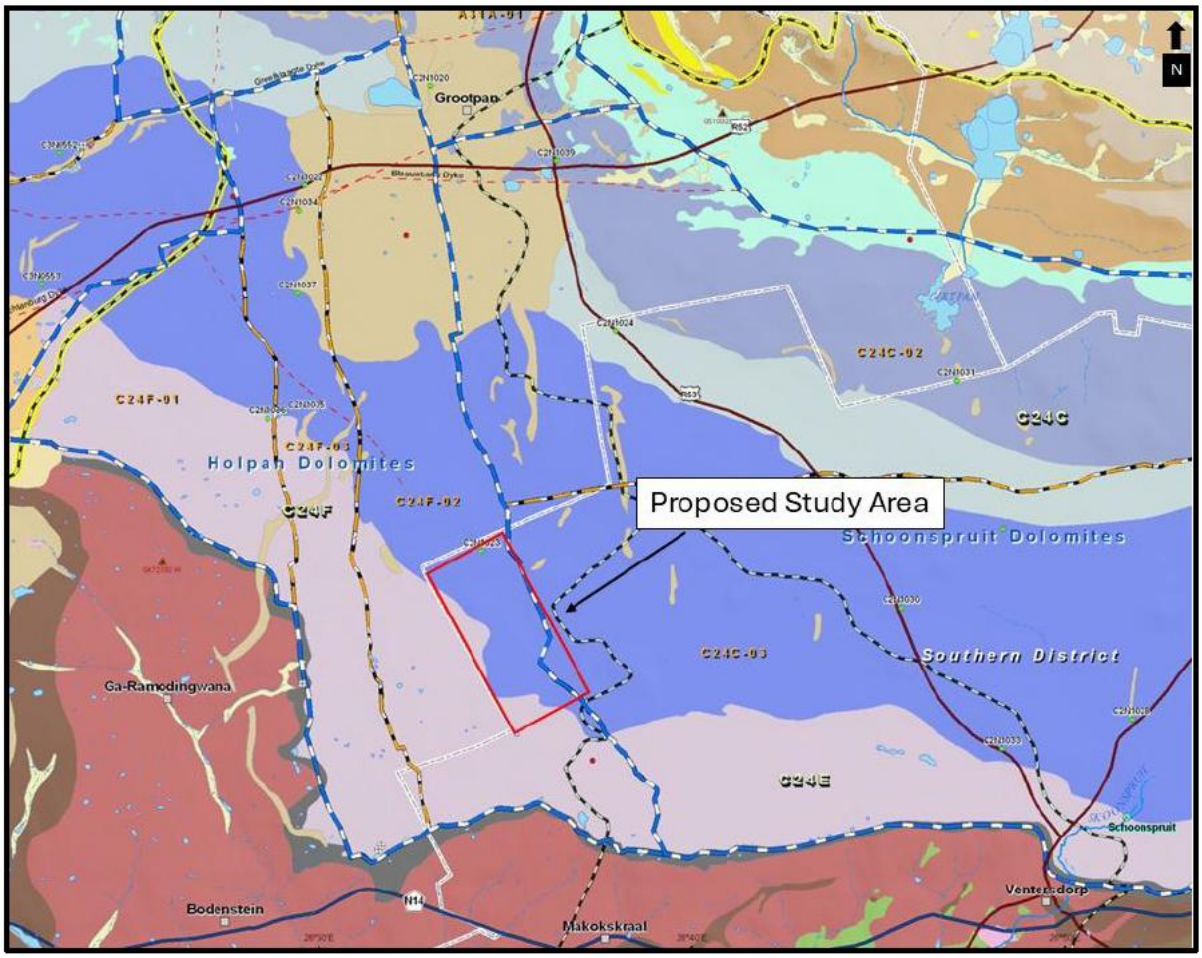

Figure 26: Extract from the North West Dolomite Units Map (Naturevhudi Group, 2026)

The dolomitic setting of the Project area is an important consideration from both geohydrological and engineering perspectives. Although no historical sinkholes have been recorded in the immediate vicinity of the Project area and no evidence of mining-related subsidence was identified during the desktop assessment, dolomite beneath the site may produce localised subsurface dissolution features, cavities, and weathered zones that influence groundwater movement. Previous investigations undertaken within the broader area indicated that permanent groundwater is generally located below the dolomite overburden profile and within the underlying bedrock. These findings support the need for careful stormwater management and water-loss control measures during construction and operation to minimise the potential mobilisation of dolomitic materials and maintain long-term ground stability.

10.5 Topography

10.5.1 General

The Project site elevation ranges from 1514 m to 1523 m above sea level. Across the entire Solar PV site, there is an elevation gain/loss of 24.5 m/-25.7 m with an average slope of 0.8%/-0.9%. This is illustrated in **Figure 27**. From east to west, the Project elevation ranges from 1524 m to 1509 m with an elevation gain/loss of 9.5 m/-19.0 m and an average slope of 0.8%/-1.1%.

The Project site's elevation is classified as level land that is a plain at a high level according to the SOTER Database (**Figure 28**).

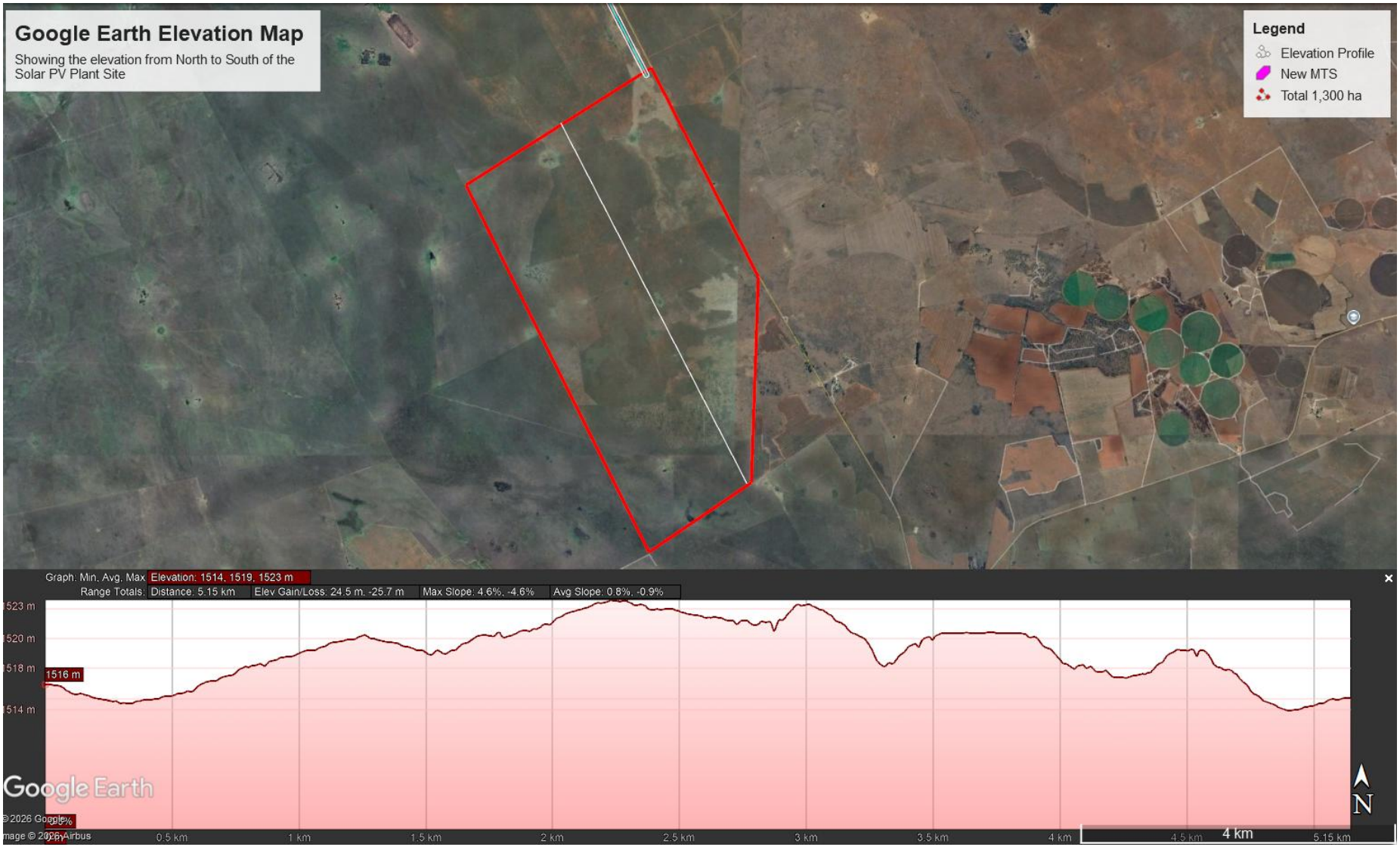

Figure 27: Elevation Profile of the Project site from Google Earth from north to south

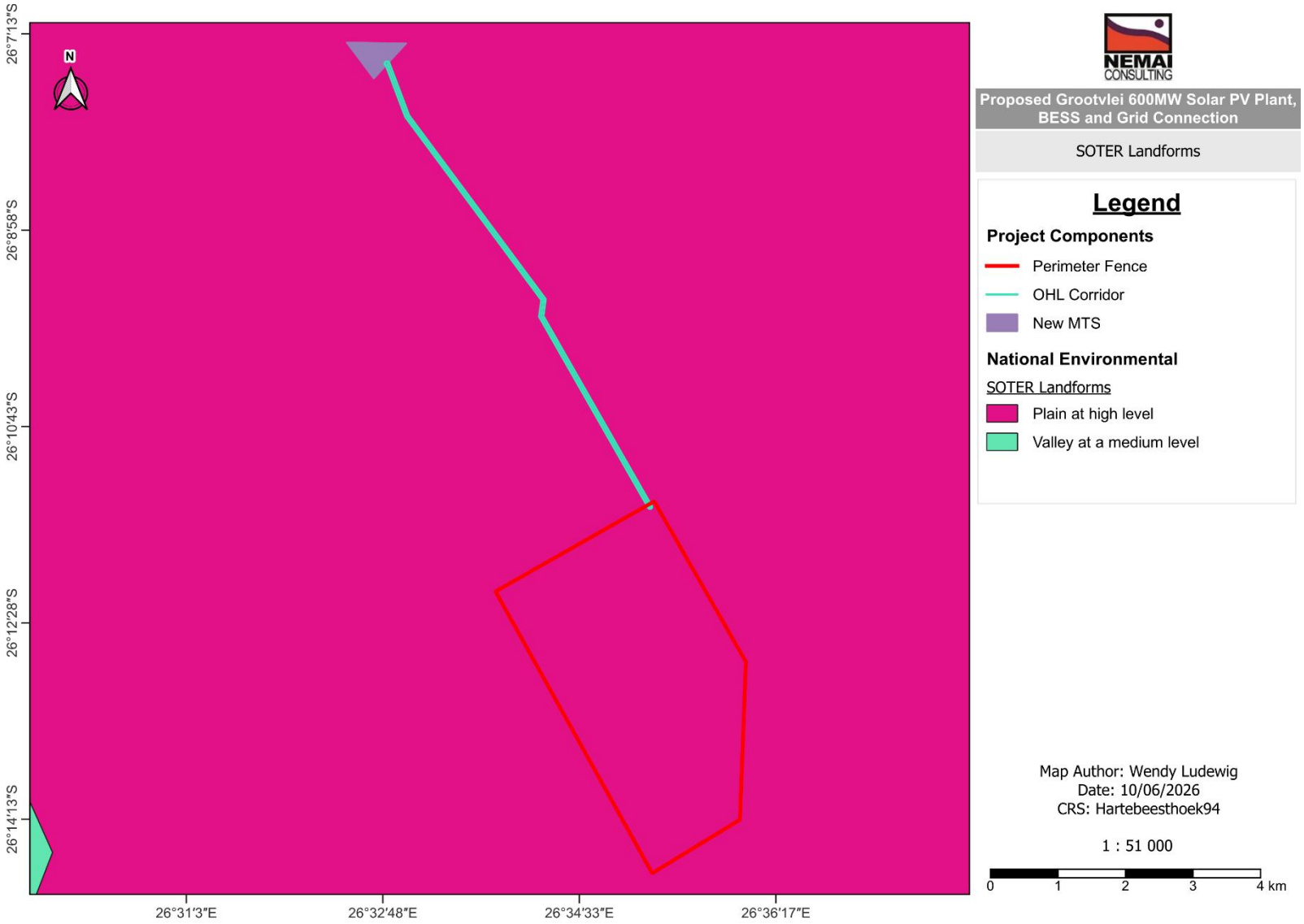

Figure 28: Topography of the Project site from the SOTER Landforms Database

10.5.2 The Screening Tool

According to the findings of the Screening Tool, the site consists of areas of very high sensitivity in terms of the relative landscape (solar) theme due to the occurrence of mountaintops and high ridges on the site (refer to **Figure 29** below).



Figure 29: Map of relative landscape (solar) theme sensitivity (Screening Tool)

10.6 Surface Water

Some of the information included in the following sub-sections was obtained from the Wetland Impact Assessment (Hoosen, 2026) (report contained in **Appendix F1**). Refer to **Section 11.4** and **Section 12.12** below for a synopsis of the study and a related impact assessment, respectively.

10.6.1 Hydrological Setting

The Project site falls within Quaternary catchment C24F (refer to **Figure 30**) which forms part of the Vaal-Orange Water Management Area (WMA), WMA 4. This WMA includes major rivers such as the Wilge, Liebenbergsvlei, Mooi, Renoster, Vals, Sand, Vet, Harts, Molopo and Vaal. **Figure 30** maps the closest rivers, dams and the quaternary catchment of the Project site.

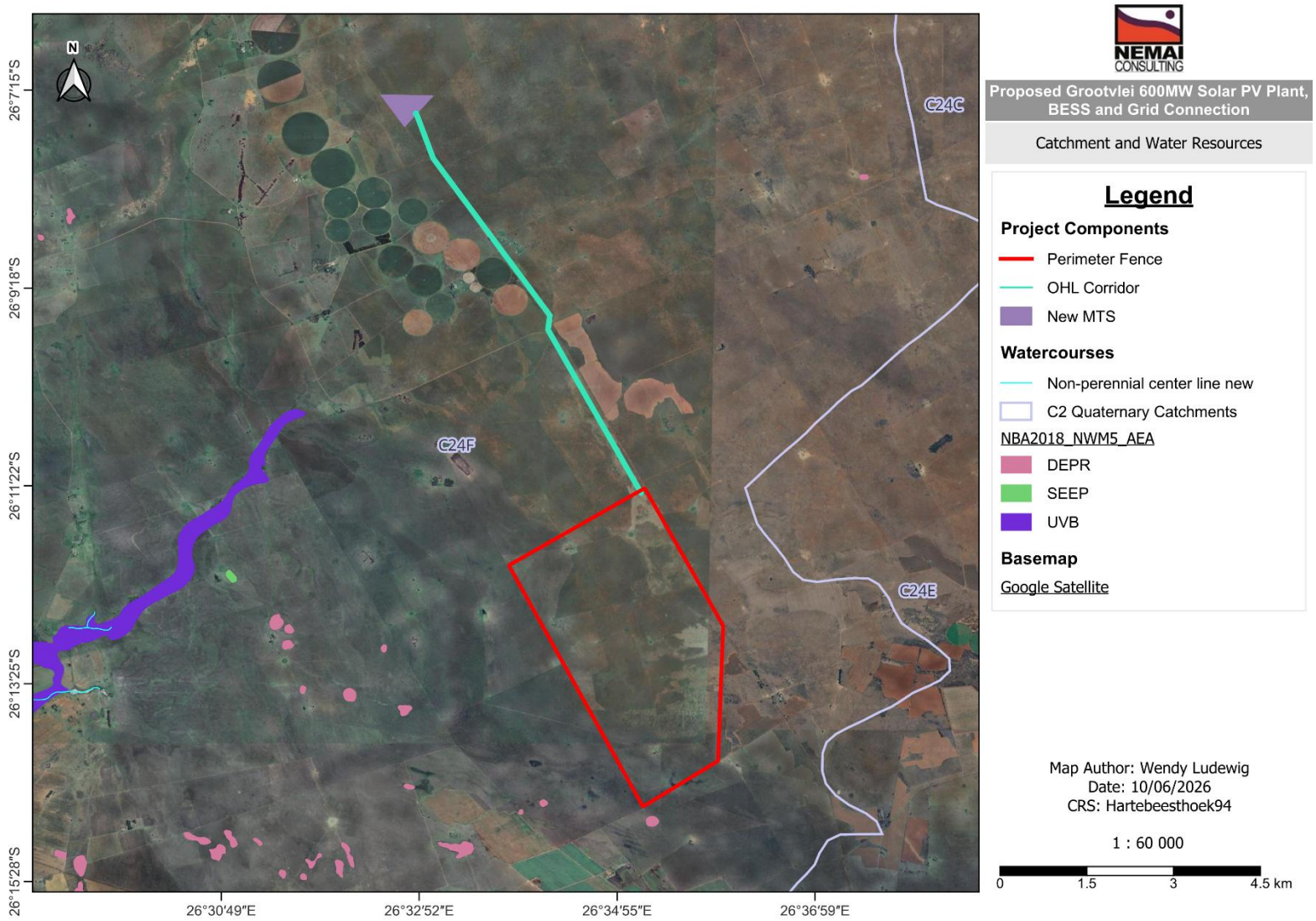

Figure 30: The Catchment, Rivers and NWM5 Wetlands near the Project site

10.6.2 Watercourses

The closest river to the Project site is a non-perennial watercourse located approximately 7 km away, which flows into the Taaibosspruit and ultimately drains into the Vaal River. No rivers occur within the Project site.

According to the National Wetland Map 5 (NWM5) (SANBI, 2018) and the North West BSP (Hawley *et al*., 2025), the Project site is located in proximity to a depression wetland and falls within areas classified as Wetland Critical Biodiversity Area (CBA) 1, ESA1, and ESA2 (refer to **Figure 30** and **Figure 31**).

The Wetland Impact Assessment (Hoosen, 2026) identified four watercourses within the PAOI, defined as a 500 m buffer around the Project site (refer to **Figure 32**). Of these, one feature was identified as an artificial livestock-watering dam, while the remaining three were classified as natural-depression wetlands. This means that the Project site falls within the 500 m regulated area of a wetland (according to the NWA).

The depression wetlands were historically disturbed by agricultural activities and are currently affected by sporadic farm dwellings, linear infrastructure (including dirt roads and overhead powerlines), and livestock grazing within the catchment. These activities have resulted in hydrological and geomorphological impacts. Vegetation within these areas comprises indigenous sedges (e.g. *Juncus spp*.) and hydrophilic grasses (e.g. *Imperata cylindrica*), as well as alien invasive species such as *Tagetes minuta*.

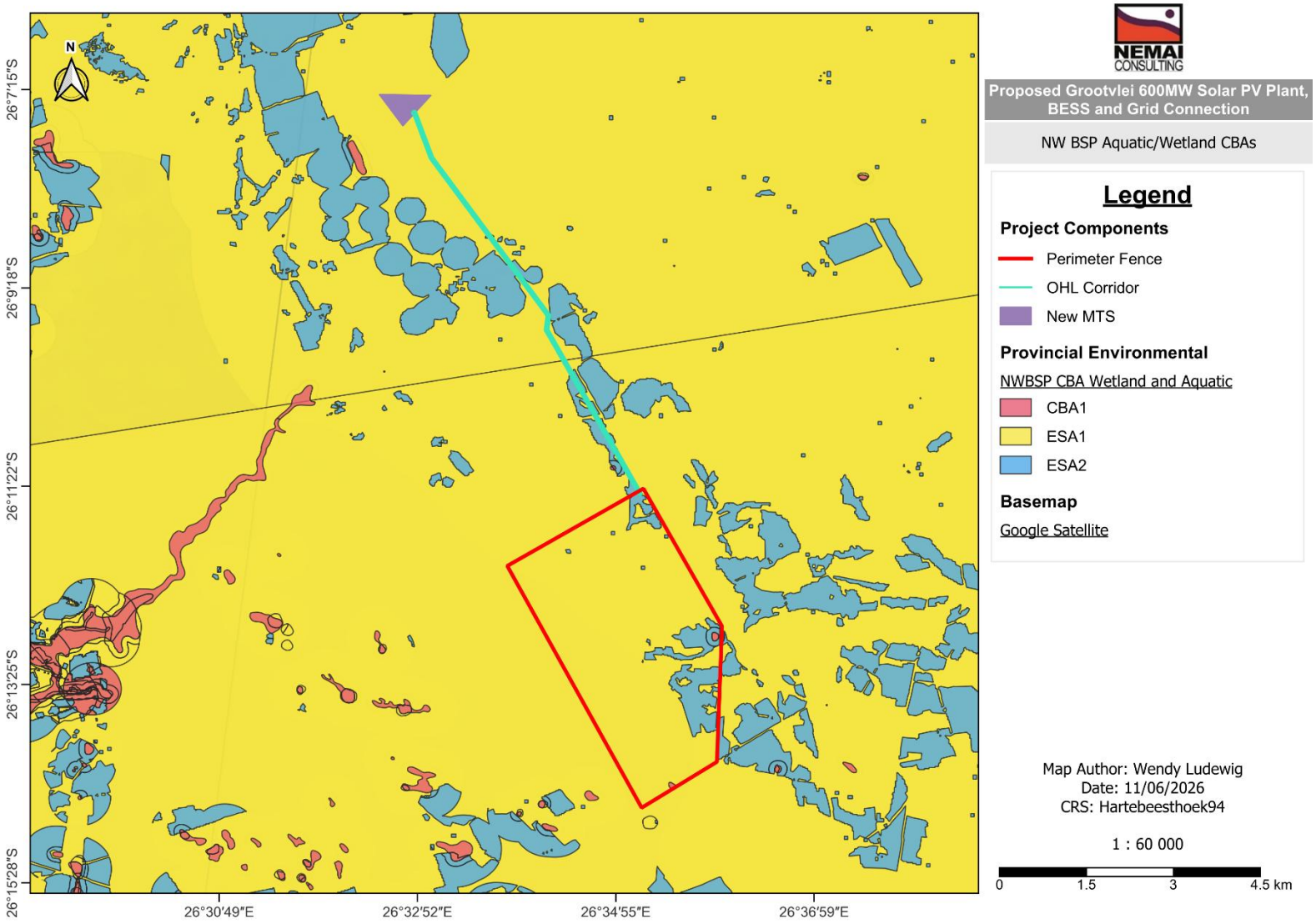

Figure 31: The North West BSP Aquatic/Wetland CBAs near the Project Site

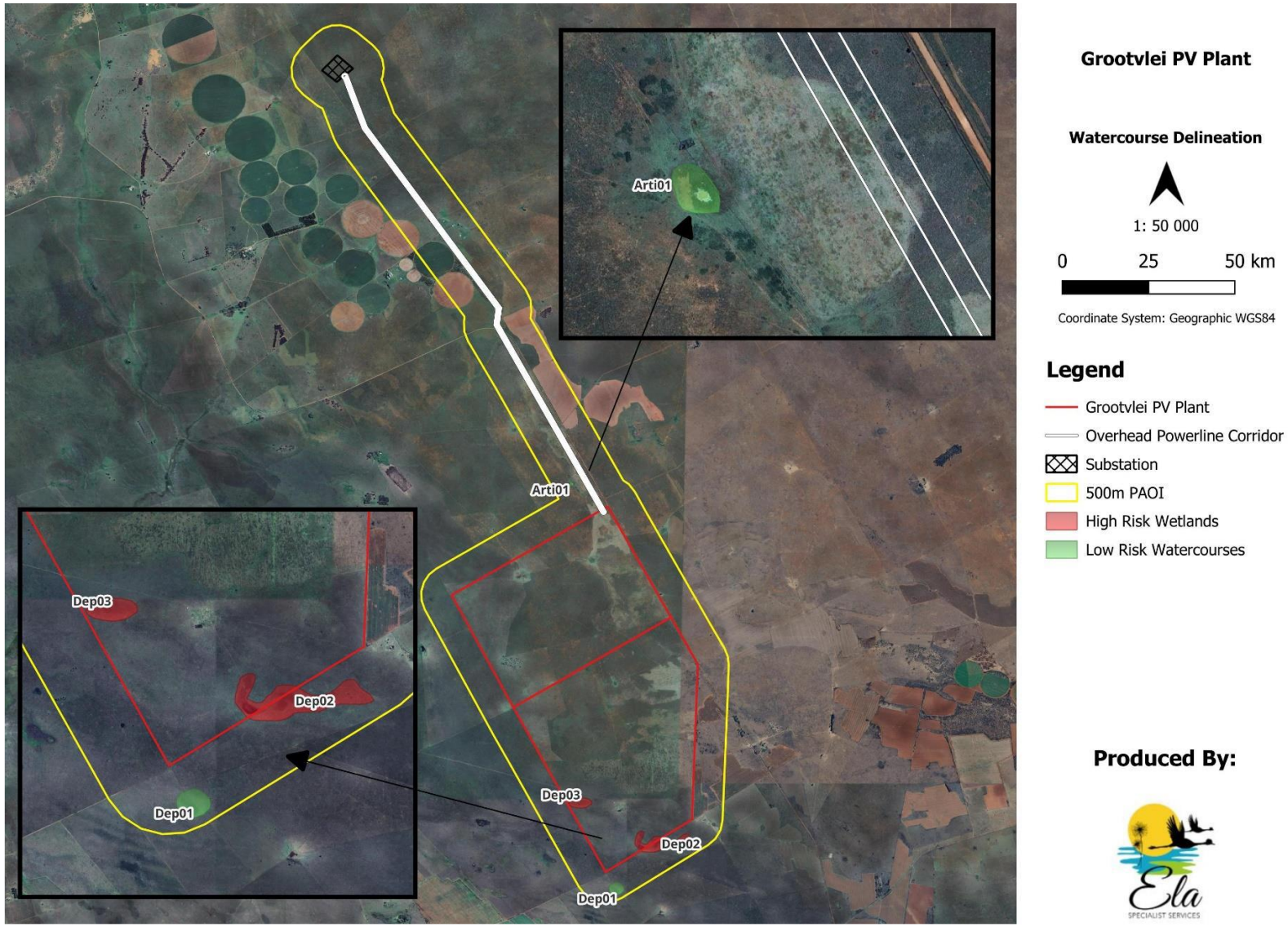

Figure 32: Delineated watercourses within the PAOI by the Aquatic Specialist (Hoosen, 2026)

10.6.3 The Screening Tool

According to the Screening Tool, most of the Project site occurs within a Very High Sensitivity area in terms of the Aquatic Biodiversity Theme, with only the southern section of the Project site occurring in a low sensitivity area (refer to **Figure 33**).



Figure 33: Map of relative Aquatic Biodiversity theme sensitivity for the Project Site (Screening Tool)

According to the SSV undertaken by an Aquatic specialist, the proposed Project is of very high sensitivity due to the depression wetlands falling within the proposed development footprint (refer to **Figure 32**).

10.7 Terrestrial Biodiversity

Some of the information included in the following sub-sections was obtained from the Terrestrial Biodiversity Impact Assessment (report contained in **Appendix F2**). Refer to **Section 11.5** and **Section 12.12.3** below for a synopsis of the study and a related impact assessment, respectively.

10.7.1 Biomes and Vegetation Types

The Project site is situated within the Grassland Biome. In South Africa, the Grassland Biome occurs mainly on the high central plateau (Highveld), the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal (KZN) and the central parts of the Eastern Cape (Mucina and Rutherford, 2006). However, grasslands also occur below the Drakensberg in KwaZulu-Natal and the Eastern Cape, with floristic links to the high-altitude Drakensberg grassland (Mucina and Rutherford, 2006). The Project site is found in the Carletonville Dolomite Grassland vegetation bioregion (Mucina and Rutherford, 2006) (**Figure 34**).

A brief description of the Carletonville Dolomite Grassland Vegetation Type according to Mucina and Rutherford (2006) follows:

- Distribution: North-West (mainly) and Gauteng and marginally into the Free State Province: In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.
- Vegetation and Landscape Features: Slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands form a complex mosaic pattern dominated by many species.

According to DFFE (2022), the conservation status of the vegetation type is as follows:

- The ecosystem is rated as Least Concern according to the 2022 Red List ecosystem data since there is 61% remaining of this ecosystem. It is not highly fragmented, and 6.1% is currently formally protected.

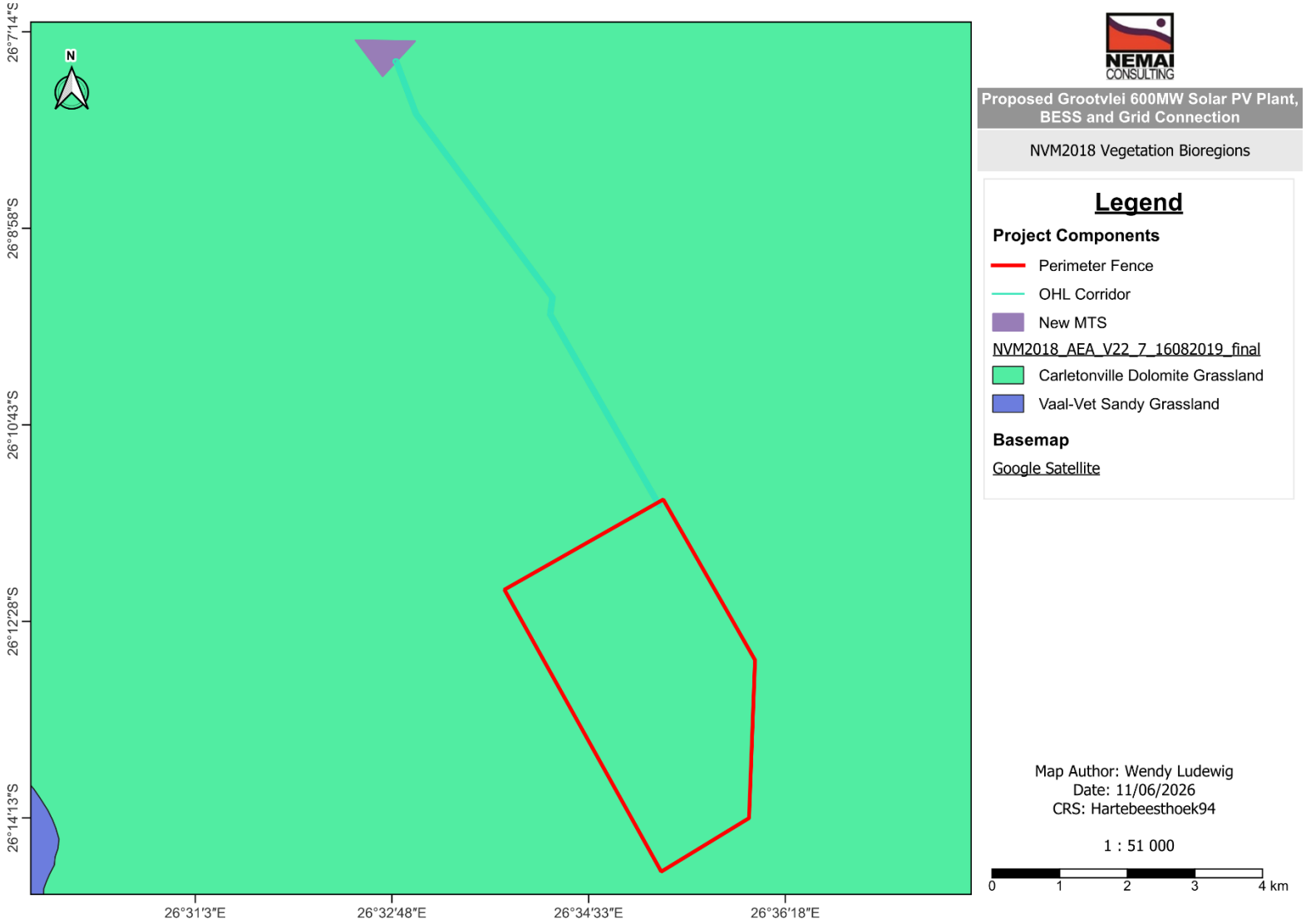

Figure 34: The vegetation bioregion associated with the Project area

10.7.2 Protected Areas

According to the spatial data from the South African Protected Area Database (SAPAD), the Klipstraat Private Nature Reserve and the Makokskraal Private Nature Reserve are located within 10 km of the site. As both reserves fall outside of any known important bird and biodiversity areas, this finding is unlikely to have a significant impact on the proposed development (**Figure 35**).

The site is also located within a Priority Focus Area in terms of the National Protected Area Expansion Strategy (NPAES) (**Figure 36**).

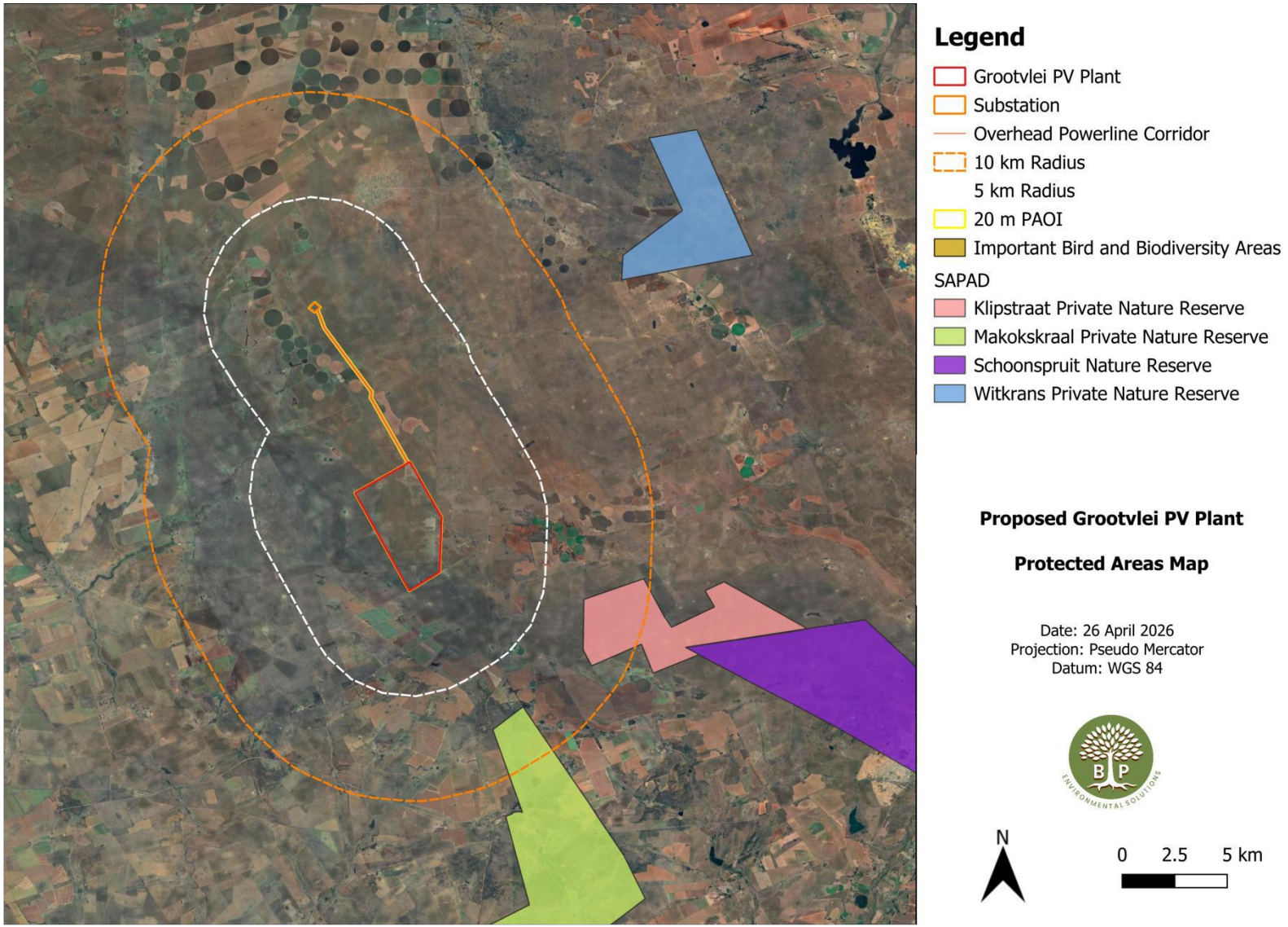

Figure 35: The Project area in relation to the nearest protected area (Paul, 2026)

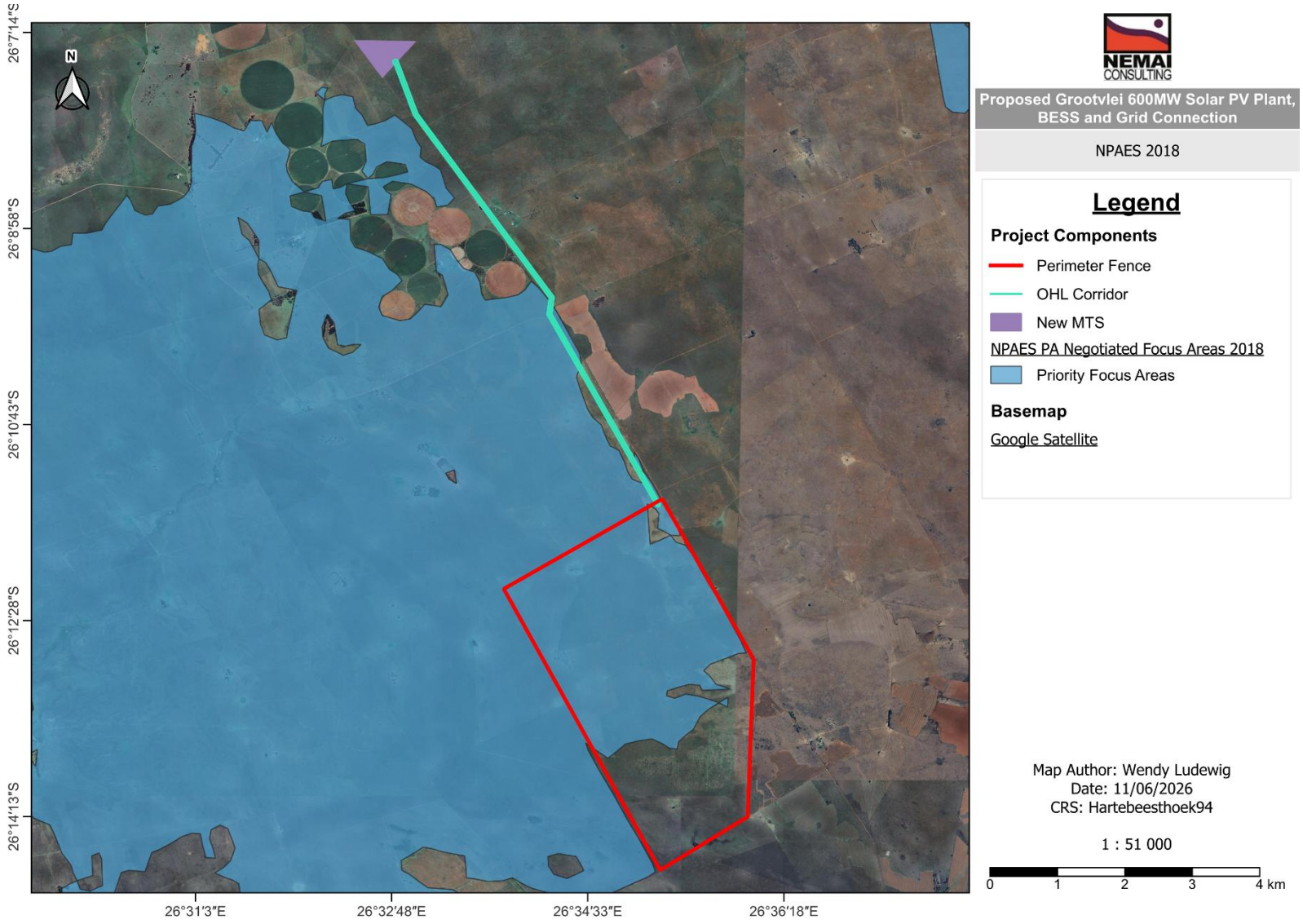

Figure 36: The Project area in relation to the NPAES of 2018

10.7.3 North West Biodiversity Sector Plan

According to the North West BSP Terrestrial CBAs, the Solar PV site falls within CBA2 and ESA1; sections of the Powerline fall within CBA1, CBA2, and ESA1; and the MTS falls within CBA1 (refer to **Figure 37** below).

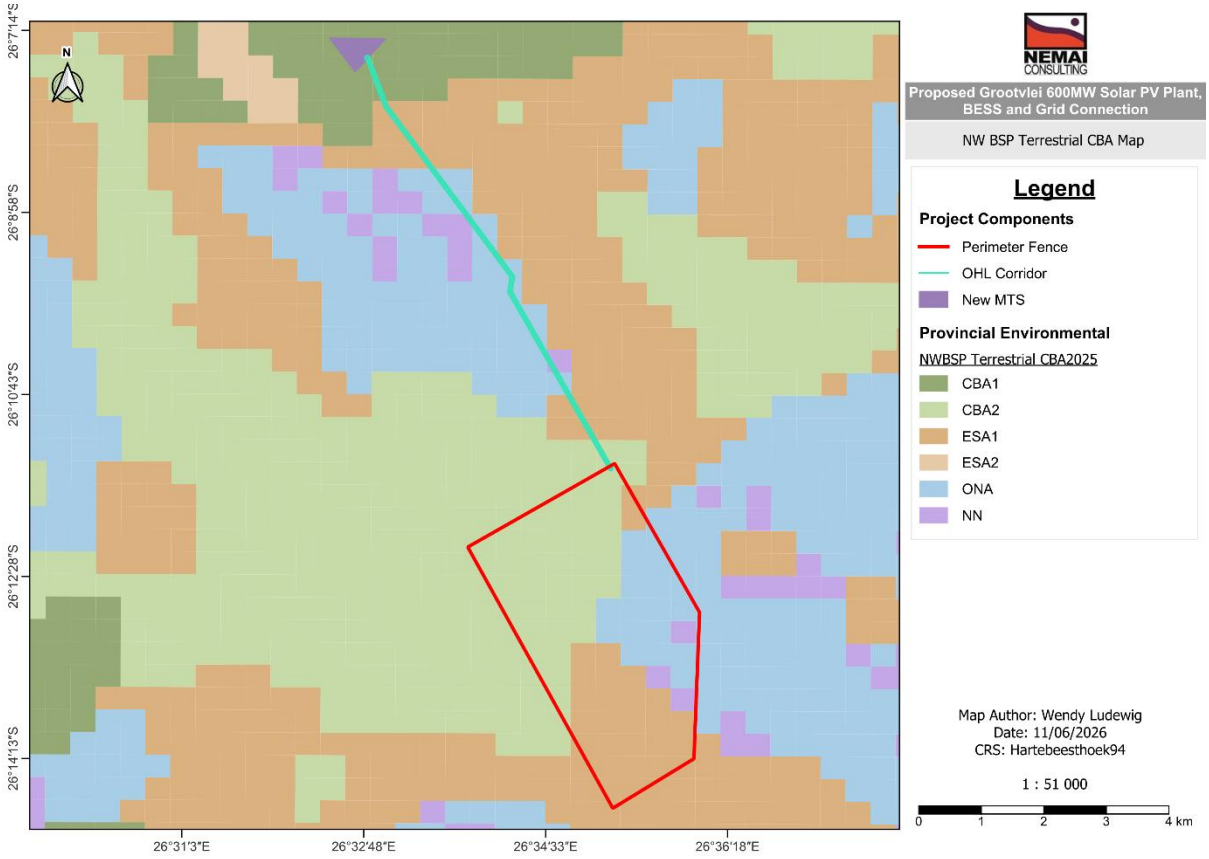

Figure 37: The Project site in relation to the North West BSP Terrestrial CBA Map

10.7.4 The Screening Tool

10.7.4.1 Animal Species Theme

According to the Screening Tool, most of the Project site falls within a Medium Sensitivity area in terms of the Animal Species Theme, with portions of the southern and northern sections of the Solar PV site and grid connection site occurring in a low sensitivity area (refer to **Figure 38**).

According to the SSV undertaken by a terrestrial specialist, the animal species theme sensitivity of the proposed Project ranges from very low to high sensitivity due to the presence of wetlands within the proposed development footprint (refer to **Figure 41**).



Figure 38: Map of relative Animal Species Theme Sensitivity for the Project Site (Screening Tool)

10.7.4.2 Plant Species Theme

According to the Screening Tool, most of the Project site falls within a Low Sensitivity area for the Plant Species Theme (refer to **Figure 39**).

According to the SSV undertaken by a terrestrial specialist, the plant species theme sensitivity of the proposed Project ranges from very low to high sensitivity due to the presence of wetlands within the proposed development footprint (refer to **Figure 41**).

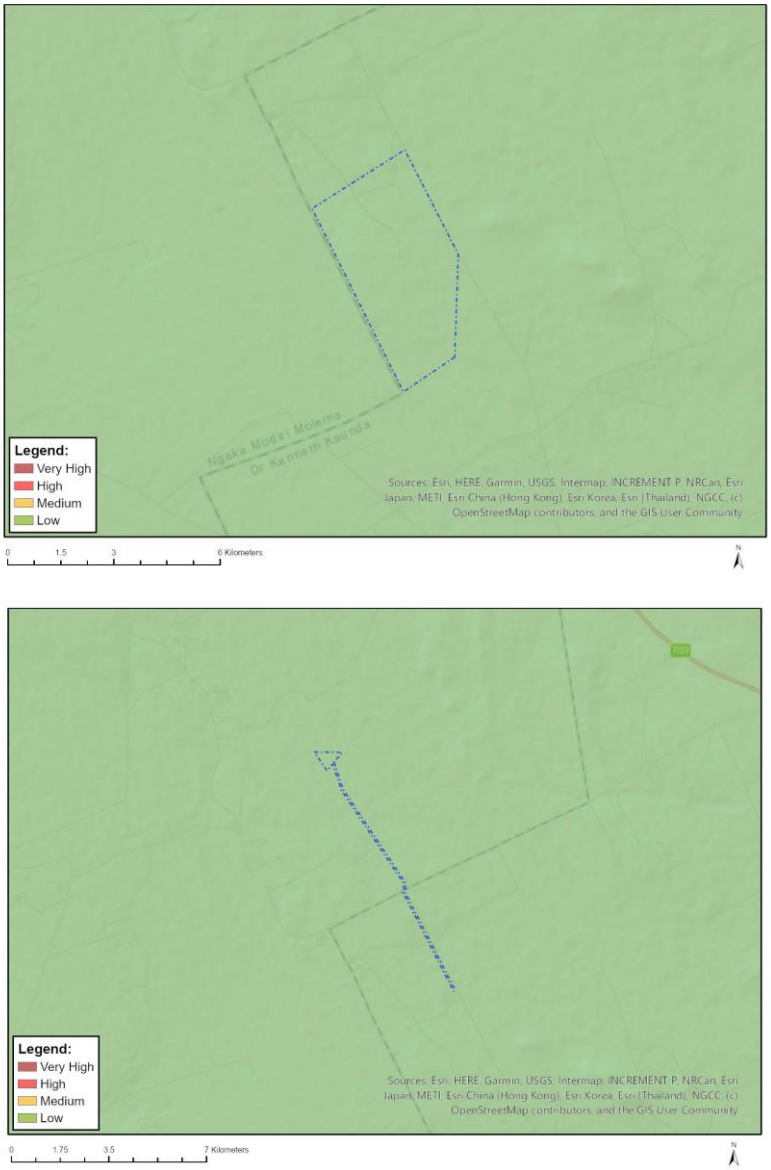

Figure 39: Map of relative Plant Species Theme Sensitivity for the Project Site (Screening Tool)

10.7.4.3 Terrestrial Biodiversity Theme

According to the Screening Tool, most of the Project site falls within a Very High Sensitivity area for the Terrestrial Biodiversity Theme, with portions of the southern and northern sections of the Solar grid connection site and portions of the southeastern section of the Solar PV site occurring in a low sensitivity area (refer to **Figure 40**).

According to the SSV undertaken by a terrestrial specialist, the terrestrial biodiversity theme sensitivity of the proposed Project ranges from very low to high sensitivity due to the presence of wetlands within the proposed development footprint (refer to **Figure 41**).

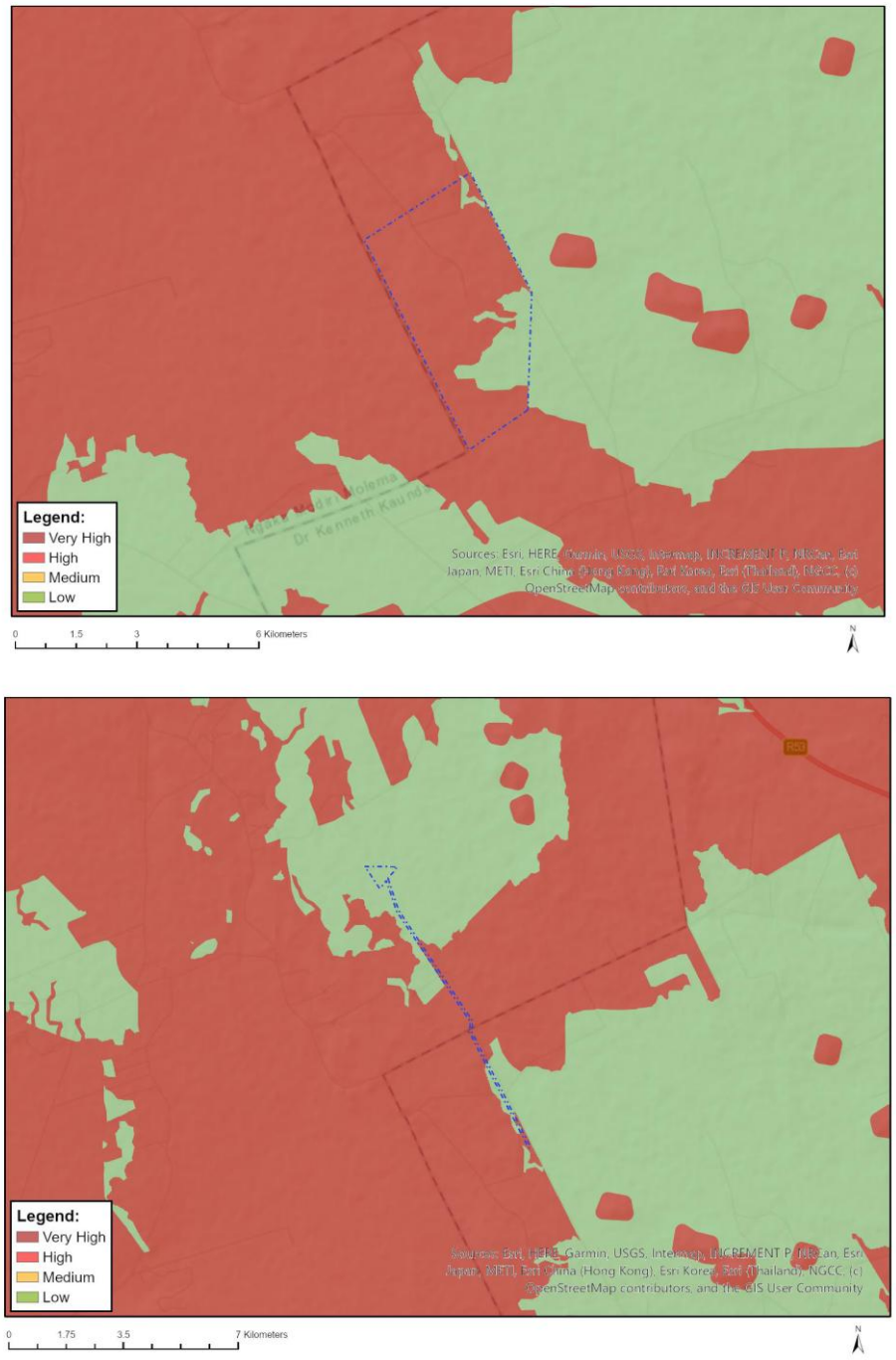

Figure 40: Map of relative Terrestrial Biodiversity Theme Sensitivity for the Project Site (Screening Tool)

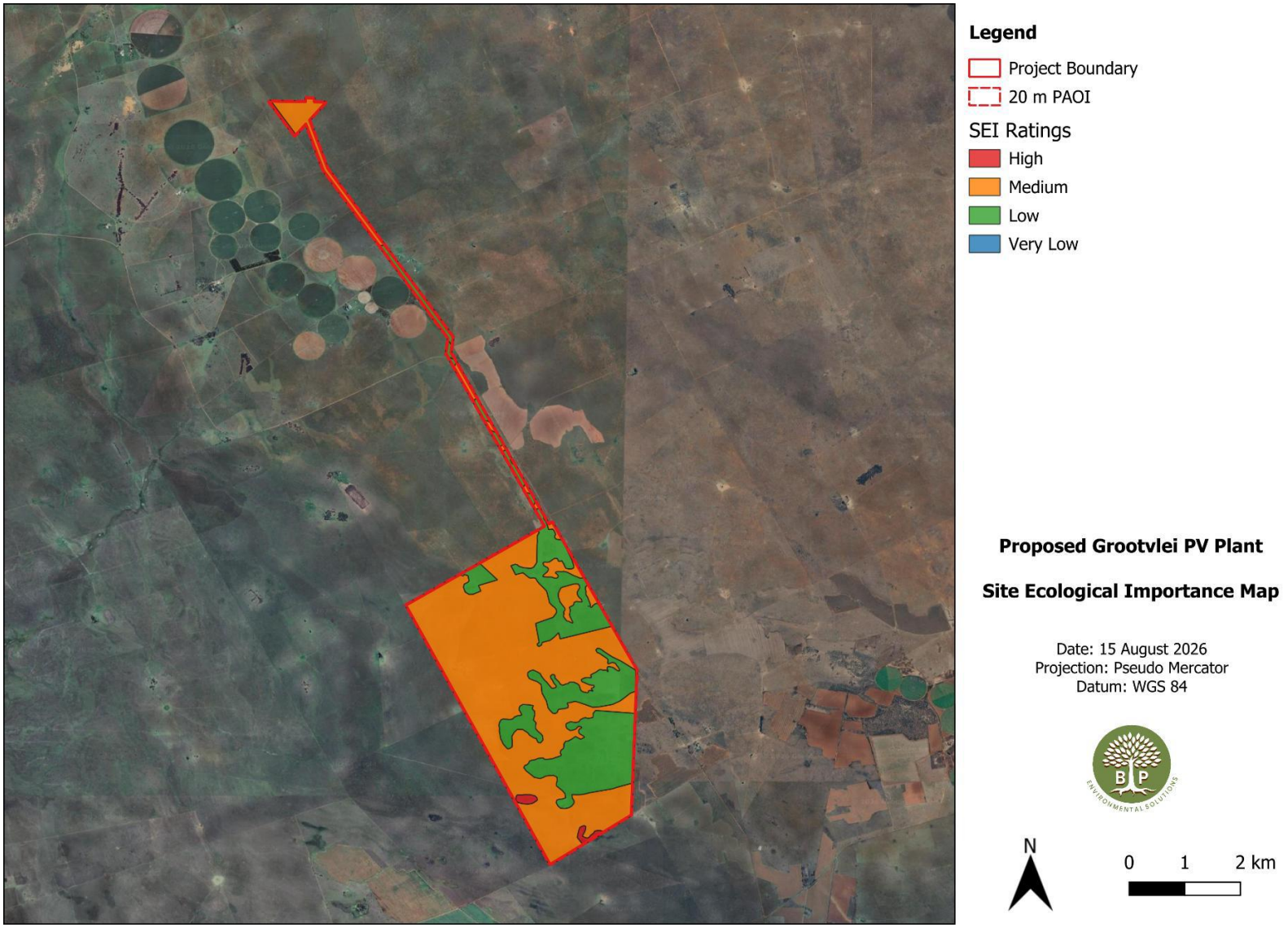

Figure 41: Site Ecological Importance (SEI) for the study area (Paul, 2026)

10.7.4.4 Avian Theme

According to the Screening Tool, most of the Project site falls within a low sensitivity for the Avian Theme. However, the southern section of the Project site falls within a high sensitivity area, as it is located within 20 km of a known Cape Vulture restaurant site (refer to **Figure 42**).

According to the SSV undertaken by the terrestrial specialist, the site does not occur within any known important bird areas.



Figure 42: Map of relative Avian Theme Sensitivity for the Project Site (Screening Tool)

10.8 Socio-Economic Environment

The Project Solar PV site and half of the power line are located within Ward 34 in the JB Marks LM, Dr Kenneth Kaunda DM. The rest of the powerline and the new MTS are located within Ward 17 of the Ditsobotla LM, Ngaka Modiri Molema DM.

10.8.1 JB Marks LM

JB Marks LM is a Category B municipality and the largest of the three in the district, making up almost half of the district's geographical area. The municipality was established by the amalgamation of the Ventersdorp and Tlokwe City Council LMs in August 2016.

The current socio-economic profile of the JB Marks LM reflects a relatively stable, moderately improving environment, characterised by a predominantly working-age population and gradual improvements in service delivery. As shown in **Table 10**, the demographic structure is dominated by individuals aged 15–64 years, indicating a strong economically active population, while the proportion of dependent age groups (children and the elderly) remains comparatively lower. This is further supported by a declining dependency ratio, which suggests a reduced economic burden on the working population. The population pyramid presented in **Figure 43** illustrates a broad-based but gradually stabilising age structure, with a slightly higher proportion of females across most age groups.

In terms of socio-economic conditions, there have been notable improvements in education and living standards. The proportion of individuals with no formal schooling has decreased, while access to higher education has remained relatively consistent. Household characteristics have remained stable, with only slight changes in the number of households and average household size. Importantly, access to basic services has improved significantly, with increases in formal housing, sanitation, piped water, electricity, and refuse removal, as reflected in **Table 10**.

The population is largely homogenous in terms of population group composition, with **Figure 44** indicating that the majority of the population is Black African, with relatively small proportions of other groups. Overall, the municipality demonstrates steady socio-economic progress, with ongoing improvements in infrastructure and service delivery that positively affect living conditions in the area.

Table 10: Key Statistics for the population in the JB Marks LM (Stats SA, 2026)

Name	2022 Census	2011 Census
Total population	212 670	219 463
Young children (0-14 years)	25,4%	27,4%
Working age population (15-64 years)	68,0%	66,8%
Elderly (65+ years)	6,5%	5,8%
Dependency ratio	47,0	49,7
Sex ratio	93,3	99,1
No schooling (20+ years)	6,3%	9,4%
Higher education (20+ years)	11,0%	11,6%
Number of households	66 719	67 098
Average household size	3,2	3,3
Formal dwellings	84,4%	78,5%
Flush toilets connected to sewerage	80,2%	75,4%
Weekly refuse disposal service	75,1%	57,1%
Access to piped water in the dwelling	57,7%	48,9%
Electricity for lighting	89,8%	87,4%



Figure 43: Sex & Age Distribution of the total population of the JB Marks LM (Stats SA, 2026)

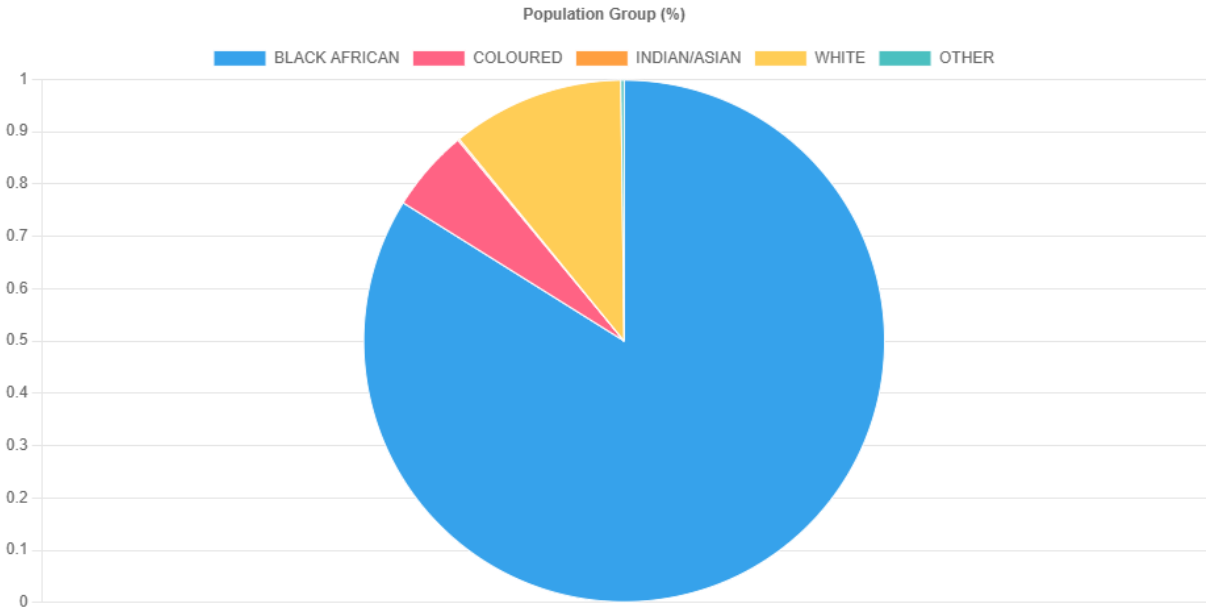

Figure 44: Population group ethnicity of the total population of the JB Marks LM (Stats SA, 2026)

10.8.2 Ditsobotla LM

Ditsobotla is one of five LMs in the Ngaka Modiri Molema DM, with the second-largest population in the DM (Ngaka Modiri Molema DM, 2025).

The current socio-economic environment of the Ditsobotla LM reflects a population that is gradually stabilising, with moderate improvements in service delivery alongside some persistent challenges. As presented in **Table 11**, the municipality is characterised by a predominantly working-age population, which increased from 61.9% in 2011 to 64.4% in 2022,

while the proportion of young children has declined. The elderly population remains relatively small but shows a slight increase, contributing to a reduction in the dependency ratio, indicating a decreasing burden on the economically active population. The population pyramid in **Figure 45** further reflects a youthful but gradually maturing population structure, with females slightly outnumbering males across most age groups.

In terms of socio-economic conditions, there have been notable improvements in education and household living conditions. The proportion of individuals with no schooling has decreased significantly, while the proportion with higher education has remained stable. Household characteristics remain relatively consistent, although there is a slight decline in the total number of households and a marginal increase in average household size. Access to basic services shows mixed trends. While there have been improvements in access to formal housing, sanitation, piped water, and electricity, as reflected in **Table 11**, there has been a decline in weekly refuse removal services, indicating potential service delivery challenges in certain areas.

The population composition, as illustrated in **Figure 46**, is dominated by the Black African group, with minimal representation from other population groups. Overall, the municipality demonstrates gradual socio-economic progress, particularly in infrastructure provision and education, although some service delivery gaps remain that may require targeted intervention.

Table 11: Key Statistics for the population in the Ditsobotla LM (Stats SA, 2026)

Name	2022 Census	2011 Census
Total population	164 176	168 902
Young children (0-14 years)	29,6%	32,6%
Working age population (15-64 years)	64,4%	61,9%
Elderly (65+ years)	6,0%	5,5%
Dependency ratio	55,3	61,5
Sex ratio	95,5	102,0
No schooling (20+ years)	9,7%	14,7%
Higher education (20+ years)	6,5%	6,5%
Number of households	42 416	44 500
Average household size	3,9	3,8
Formal dwellings	90,0%	74,2%
Flush toilets connected to sewerage	66,3%	47,3%
Weekly refuse disposal service	29,3%	37,6%
Access to piped water in the dwelling	44,5%	34,9%
Electricity for lighting	92,7%	74,0%

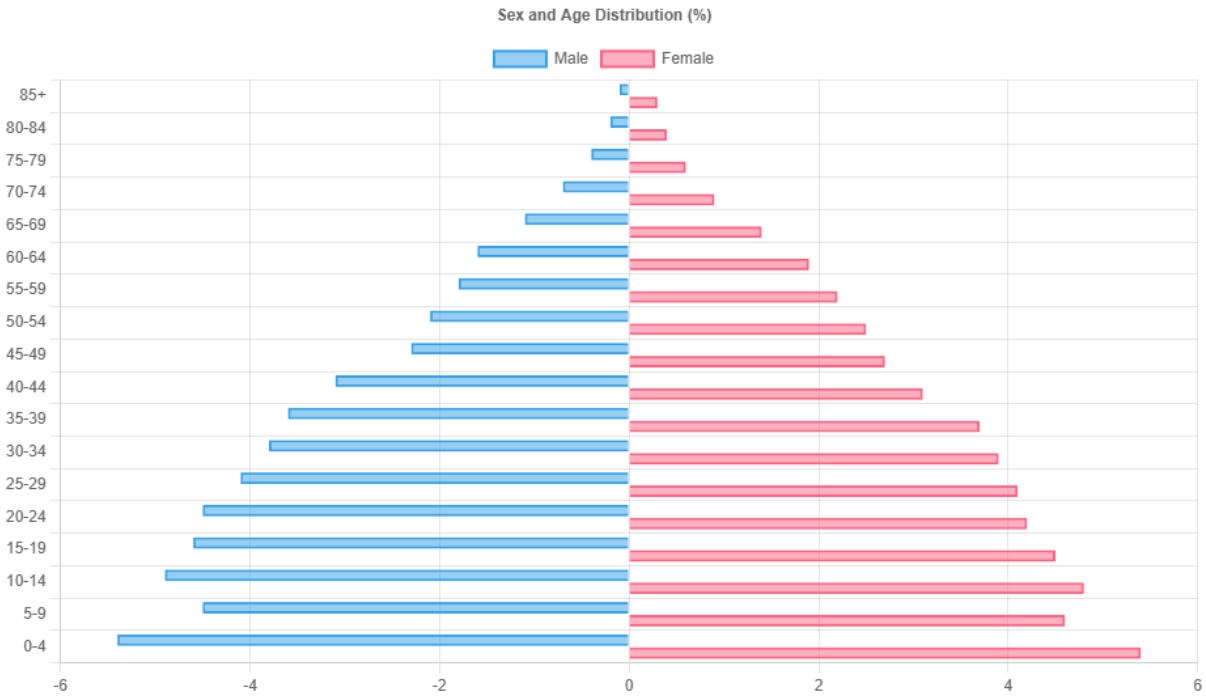

Figure 45: Sex & Age Distribution of the total population of the Ditsobotla LM (Stats SA, 2026)

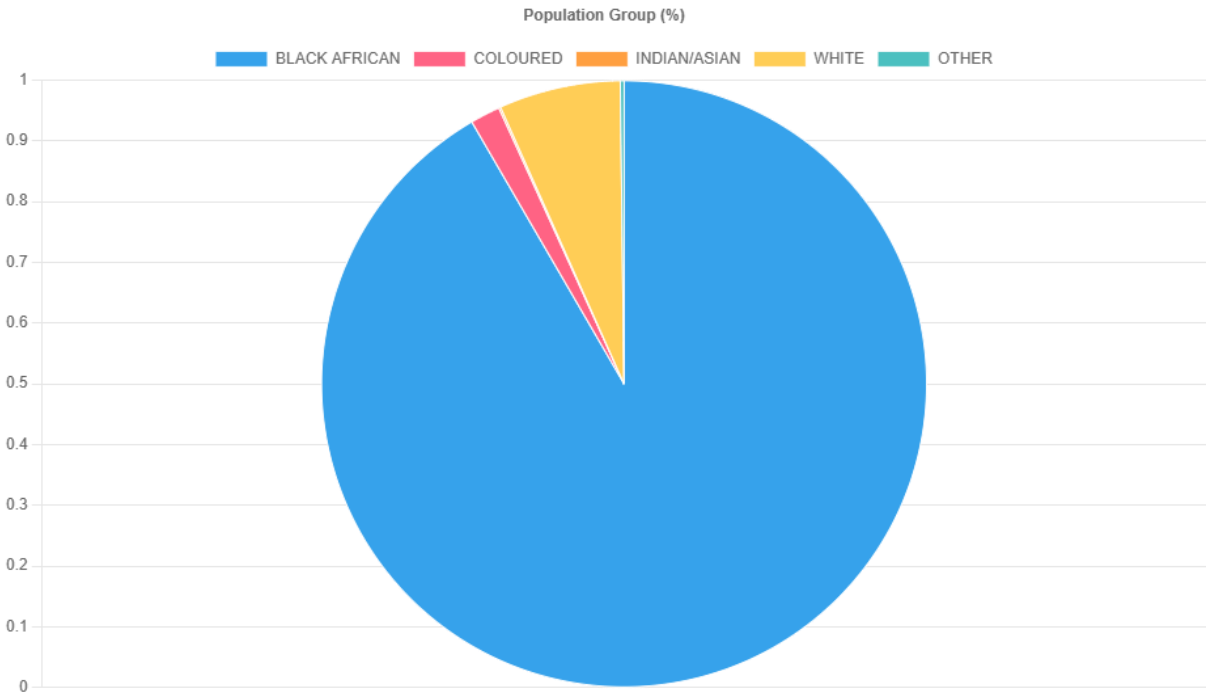

Figure 46: Population group ethnicity of the total population of the Ditsobotla LM (Stats SA, 2026)

10.9 Air Quality

The air quality in the vicinity of the project site is considered fair based on available information from AccuWeather (AccuWeather, 2026). Potential sources of air pollution in the region

include fugitive dust emissions associated with agricultural activities, as well as vehicle exhaust emissions from traffic on both paved and unpaved roads, including the N12, R53, surrounding regional routes, and local roads within Ventersdorp. Additional contributors may include biomass burning, such as veld fires, domestic fuel combustion, and emissions from industrial and mining operations in the broader area. Waste treatment and disposal activities may also contribute to localised air pollution, alongside other sources of fugitive dust such as wind erosion from exposed surfaces.

10.10 Visual Quality

The Project site and surrounding area are situated within a predominantly rural and agricultural landscape characterised by open grassland, grazing areas and cultivated agricultural land. The terrain is generally flat to gently undulating, and vegetation is predominantly low-growing, with scattered trees and local clusters of woody vegetation. Together, these characteristics create an open, predominantly horizontal landscape with broad views across the surrounding landscape.

Longstanding agricultural activities have modified the landscape. Existing visual elements within the site and surrounding landscape include cultivated fields, grazing areas, farm roads and tracks, fencing, scattered farmsteads and agricultural structures, centre-pivot irrigation systems and existing electrical infrastructure. Notwithstanding these modifications, the relatively low density of substantial built development allows the area to retain a distinctly open, rural and agricultural character.

Within the Project site, the landscape is predominantly open grassland used for livestock grazing, with areas of disturbed or exposed soil, existing tracks, and localised farm-related infrastructure. Trees and shrubs occur intermittently, providing localised variation within the otherwise open grassland setting. **Figure 47** to **Figure 50** provide representative views of the existing visual character of the Project site.



Figure 47: Livestock grazing area on the Project site



Figure 48: Stone-packed areas and scattered rocks on the Project site



Figure 49: Open grassland, flat topography and extensive views of the surrounding landscape of the Project site



Figure 50: Clump of trees on the Project site

10.11 Noise & Vibration

In terms of the local acoustical environment, the background noise levels are expected to be typical of a rural area. Noise in the greater area emanates primarily from farming operations (e.g., the use of farming equipment), vehicles on the surrounding road network, human activities in surrounding settlements, mining activities and trains passing along the railway.

10.12 Agriculture

Some of the information included in the following sub-sections was obtained from the Agricultural Compliance Statement (Mchunu, 2026) (report contained in **Appendix F4**). Refer to **Section 11.7** and **Section 12.16** for a synopsis of the study and a related impact assessment, respectively.

10.12.1 General

The Project area is characterised by a generally low agricultural potential, with the prevailing soils classified as non-arable and assigned a Class VI land capability rating, indicating that the land is best suited to grazing at most (Mchunu, 2026) (refer to **Figure 51**). Furthermore, data from the Agricultural Geo-Referenced Information System (AGIS) indicate that the grazing capacity within the project area ranges from 5 to 7 hectares per Large Stock Unit (LSU). This reflects the extent of land required to sustain grazing for a standard LSU, defined in terms of the Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA), (Regulation 10), as an animal weighing approximately 450 kg with a daily mass gain of 0.5 kg on forage with a digestible energy content of 55% (Mchunu, 2026).

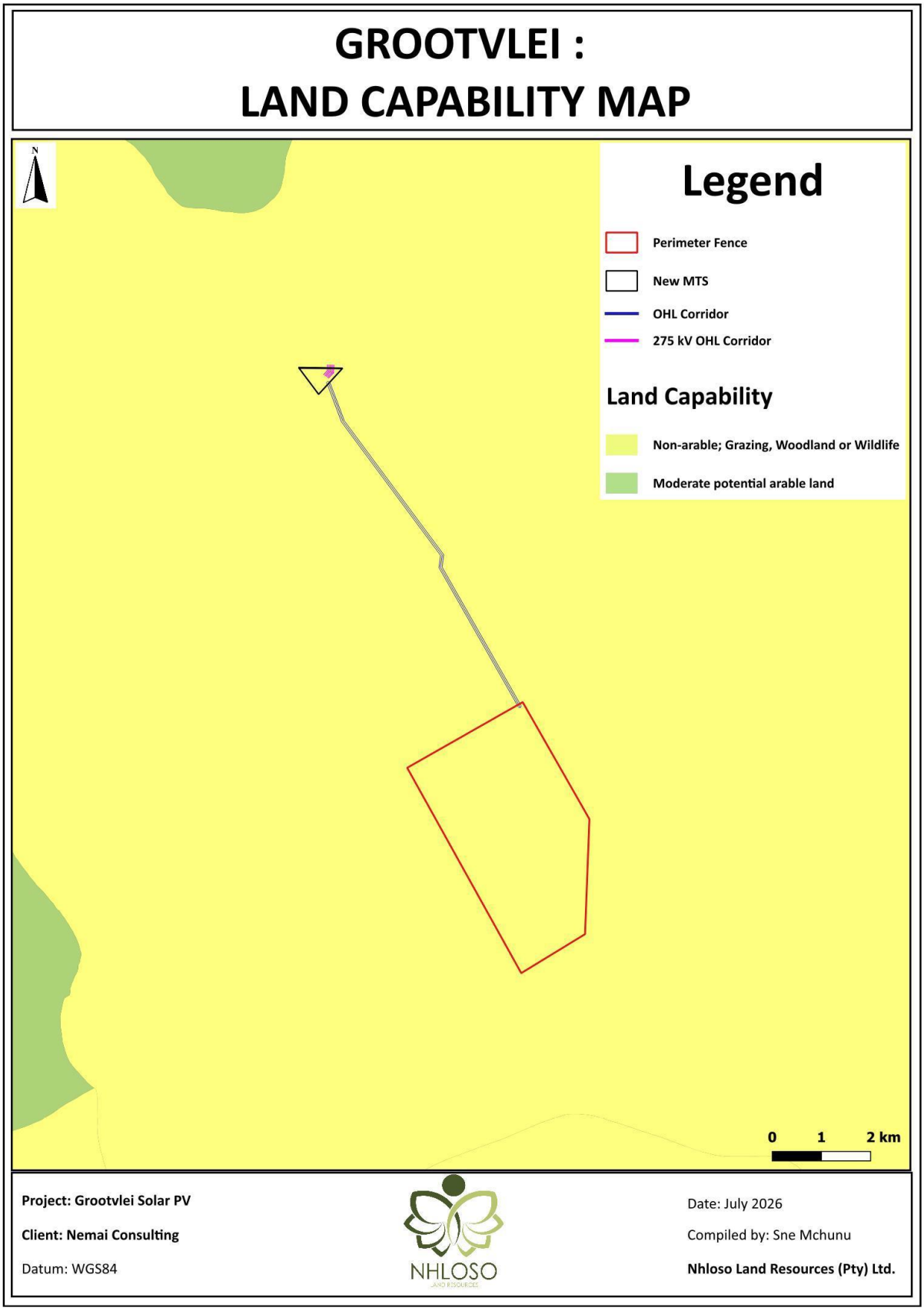

Figure 51: Land Capability in the vicinity of the Project site (Mchunu, 2026)

10.12.2 The Screening Tool

According to the Screening Tool, most of the Project site falls within a medium-sensitivity area for the Agriculture Theme, with scattered portions across the Project site within high-sensitivity areas (refer to **Figure 52**).

According to the SSV undertaken by an agricultural specialist, the agricultural theme sensitivity of the proposed Project is mostly low, with two small, isolated spots of medium sensitivity (refer to **Figure 53**).

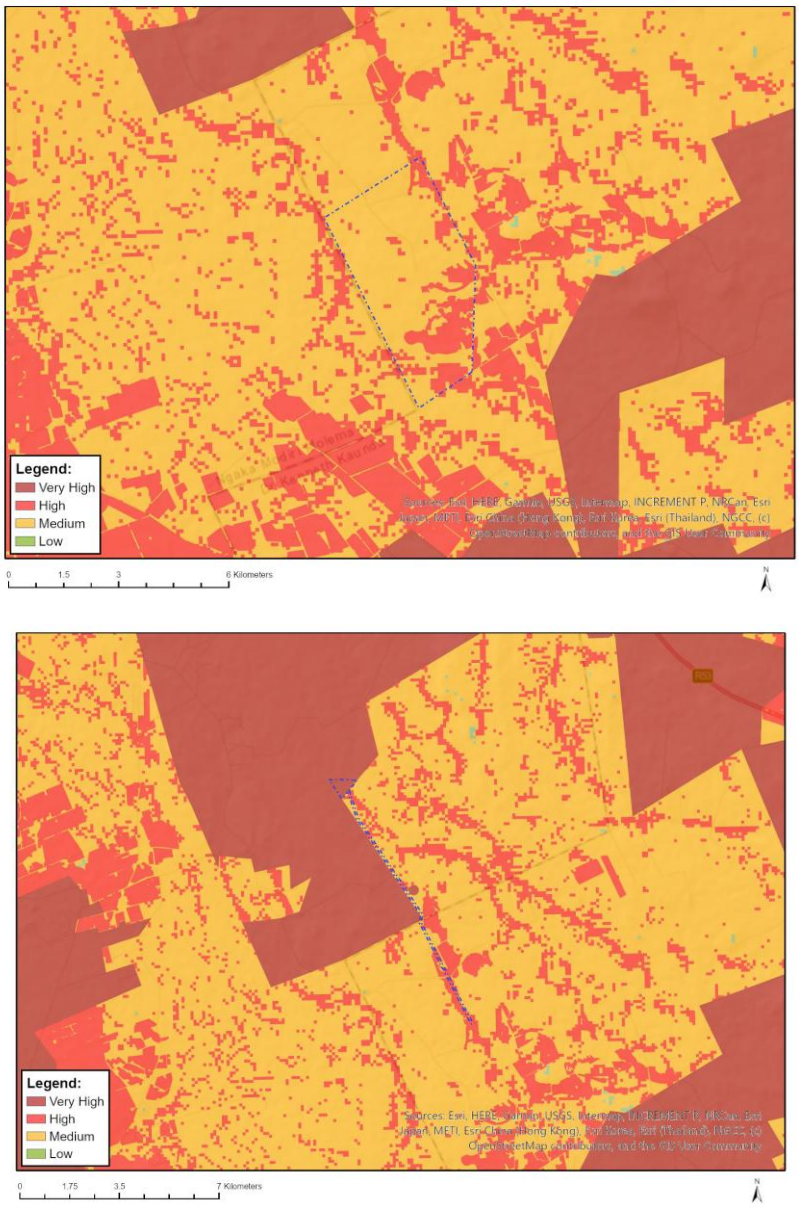

Figure 52: Map of relative Agriculture Theme Sensitivity for the Project Site (Screening Tool)

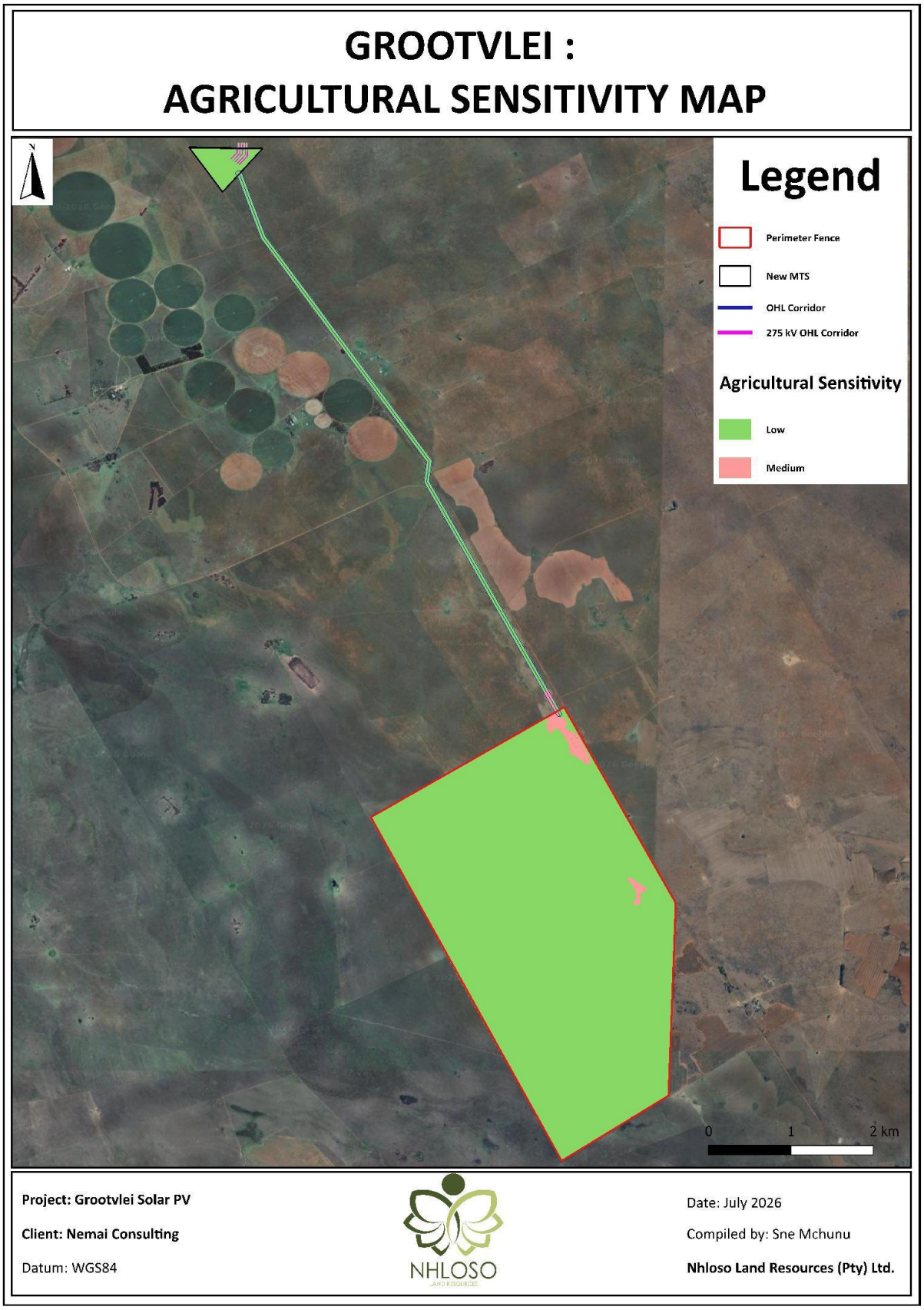

Figure 53: Agriculture Sensitivity within a 50 m buffer of the site (Mchunu, 2026)

10.13 Planning

The North West SDF (**Figure 54** and **Figure 55**) indicates that the Project site is located within identified Biodiversity Corridors and Corridor Nodes. This is consistent with the North West BSP, which classifies the area as comprising both Aquatic and Terrestrial CBAs and ESAs. Notwithstanding these sensitivities, the SDF further identifies the site as falling within a Green Economy Node. This designation supports the development of environmentally sustainable economic activities, including renewable energy infrastructure. In this context, the proposed Project is considered to align with the spatial development objectives of the SDF, insofar as it represents an appropriate green economy initiative within the identified node.

The Dr Kenneth Kaunda DM IDP identifies the expansion of solar energy infrastructure as a key objective to increase the contribution of renewable energy within the municipality, with the intention of transitioning towards solar power as a primary energy source. In this context, the proposed Solar PV development is considered aligned with the strategic objectives of the IDP, as it supports diversifying the local energy mix and advancing renewable energy initiatives within the municipal area.

In addition, the following is noted from a planning perspective for the Project itself:

- The proposed power line follows property boundaries for most of its route.
- The proposed Solar Site and power line are located outside of the urban edge and should not impact future urban expansion.
- In the event that the Solar PV Plant must be decommissioned, the decommissioning phase will include measures for complying with the prevailing regulatory requirements, rehabilitation, and managing environmental impacts in order to render the affected area suitable for a future desirable use.
- Other renewable energy applications that have been made within a 30km radius of the PV Site, according to DFFE's REEA Database (refer to **Section 6.6** above). The nearest approved PV plant is located approximately 14 km to the southeast of the Project Area.

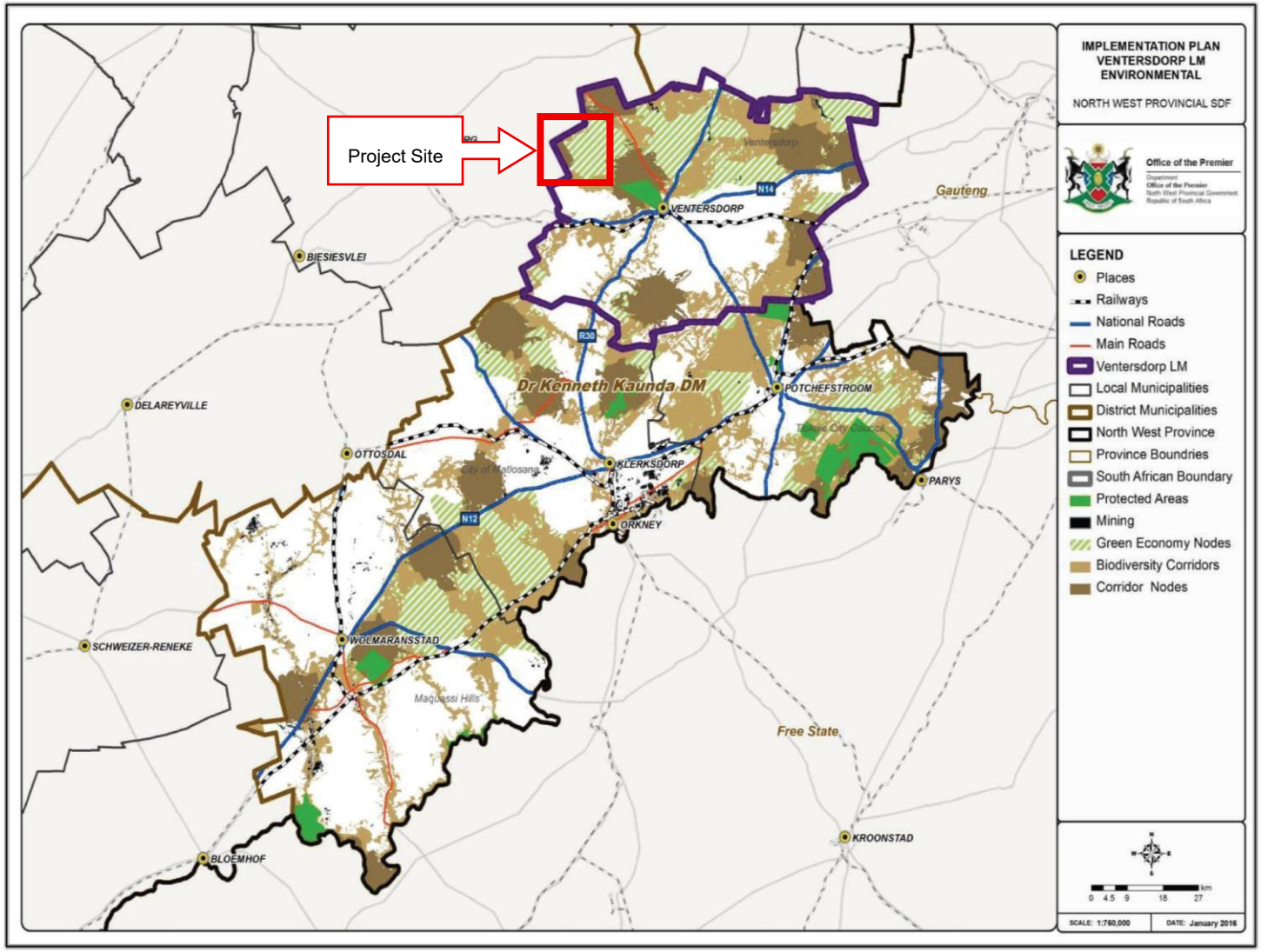

Figure 54: Dr Kenneth Kaunda DM Implementation Framework (Environmental) - Ventersdorp LM (North West SDF, 2017)

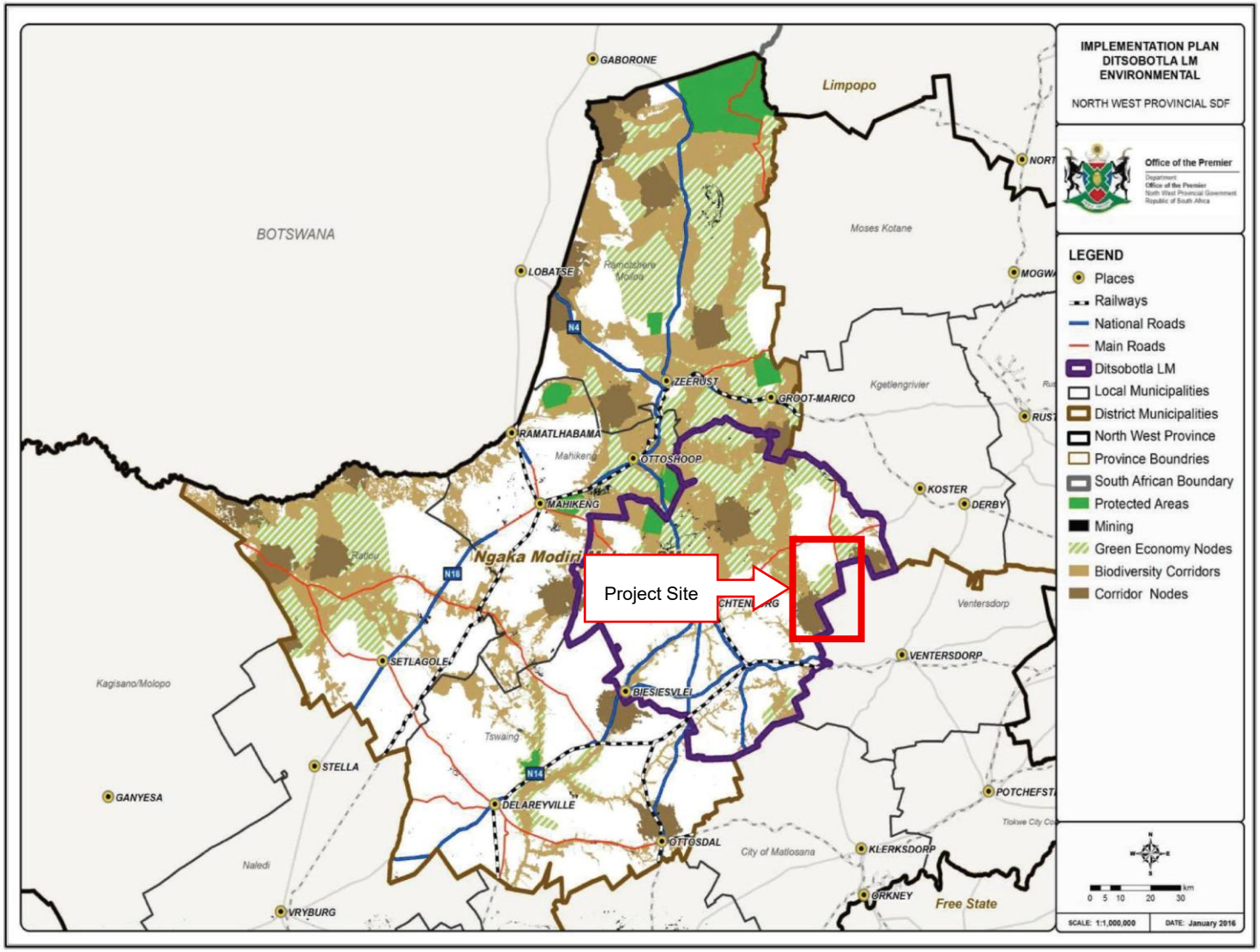

Figure 55: Ngaka Modiri Molema DM Implementation Framework (Environmental) – Ditsobotla LM (North West SDF, 2017)

10.14 Waste

According to Dr Kenneth Kaunda DM IDP, the majority of the landfill sites within the municipality are not compliant with their licensing conditions, with some requiring total closure and others needing to be upgraded. Therefore, the future approach to waste management has to take into account the potential to minimise waste transported to landfill sites by instead transporting it to recycling centres or transfer stations during the planning cycle. The municipality has planned projects to create new landfill sites, including within the JB Marks LM and roll out the new waste management facilities mentioned above.

10.15 Transportation

The municipality has a comprehensive road network comprising national, provincial, and secondary roads, as well as railway lines. The road network that surrounds the Project site is illustrated in **Figure 56**.

The site will be accessed from either the R53 or the N14, with the entrance gate on the eastern side of the Project boundary (refer to **Figure 57**).

The N14 is noted in the Ngaka Modiri Molema DM IDP as having the potential to be developed into a tertiary corridor, unlocking new development areas once the road is maintained (Ngaka Modiri Molema DM, 2025). According to Dr Kenneth Kaunda DM IDP, the N14 is designated a national provincial corridor, while the R53 (Ventersdorp-Potchefstroom-Parys) is designated a secondary transport corridor. The N14 is a Class 1 Important and Strategic transportation route, whereas the R53 is a Class 3 (Dr Kenneth Kaunda DM, 2025).

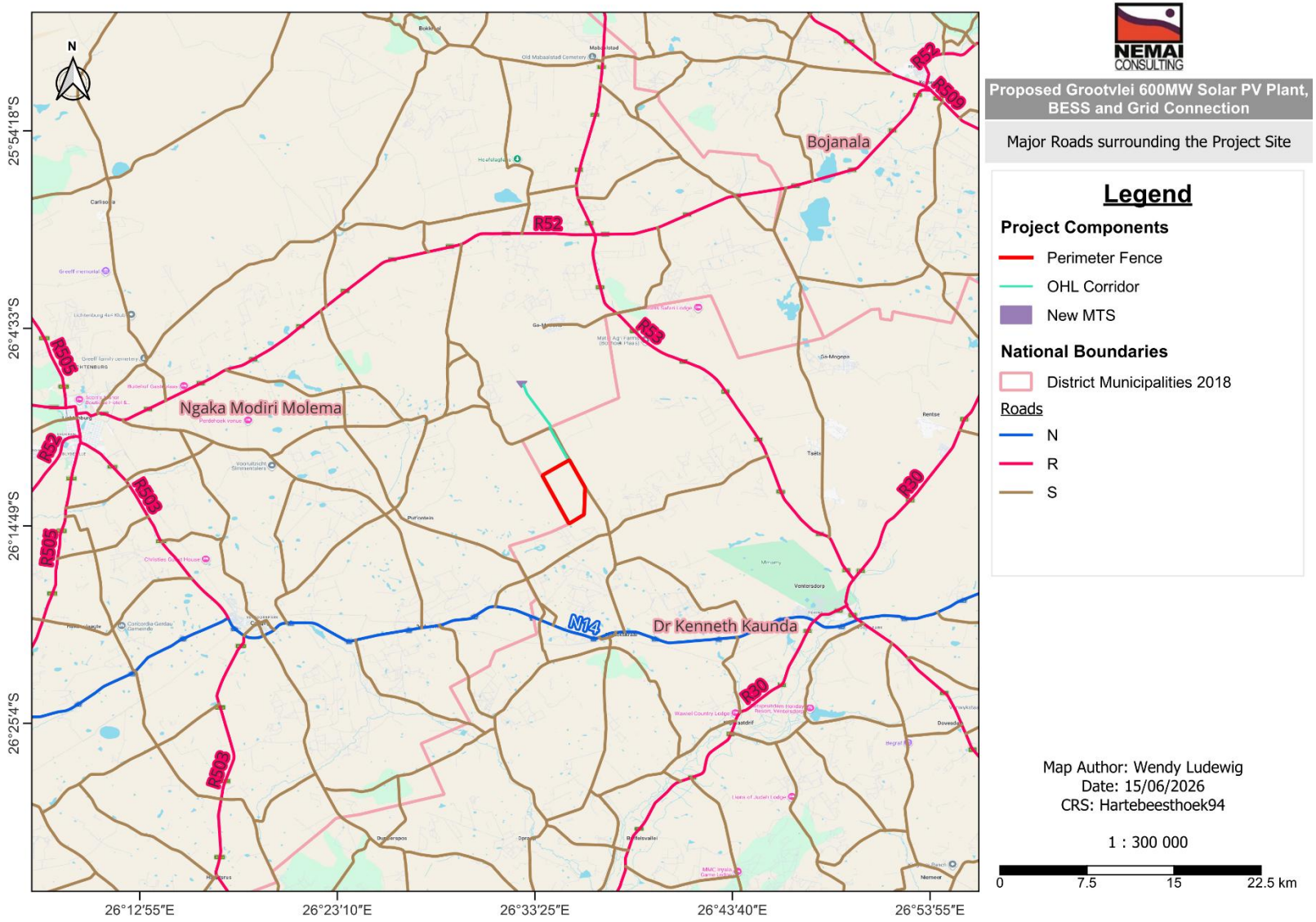

Figure 56: The road network surrounding the Project Site

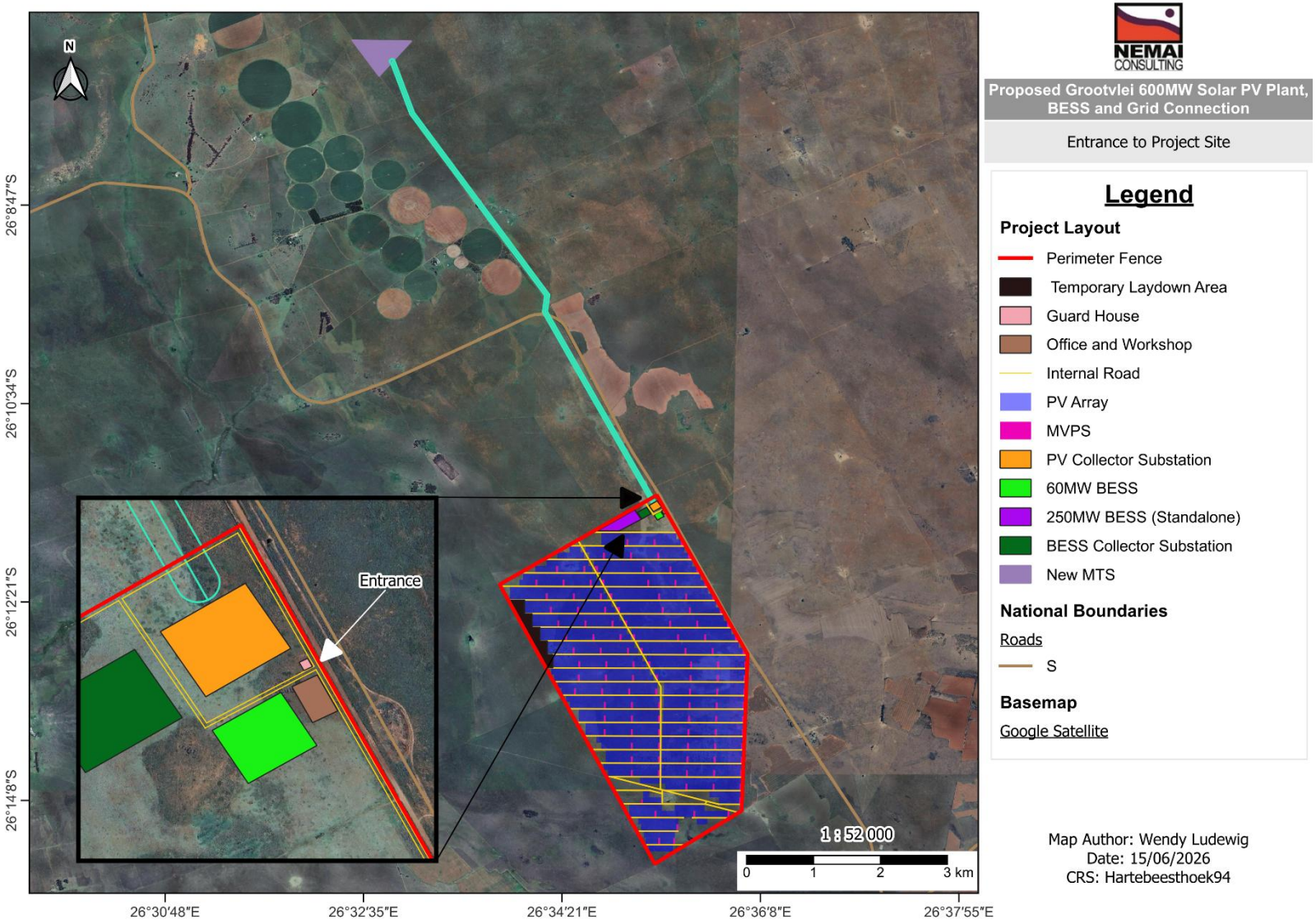

Figure 57: Entrance to the Project Site

10.16 Heritage and Palaeontology

Some of the information included in the following sub-sections was obtained from the Phase 1 Heritage Impact Assessment (Kitto, 2026) (report contained in **Appendix F5**). Refer to **Section 11.8** and **Section 12.17** for a synopsis of the study and a related impact assessment, respectively.

10.16.1 Cultural Heritage

A review of historical 1:50 000 topographic mapping (Sheet 2626BA Zwartrand) was undertaken to identify potential heritage features within and surrounding the Project area (Kitto, 2026). The earliest available mapping, based on aerial imagery from the mid-1960s, indicates the presence of a limited number of features, including kraals, farmsteads, ruins and structures located within and adjacent to the Solar PV footprint and the proposed powerline corridor. Later map editions reflect some changes in land use, including areas of cultivation and disturbance. The most recent mapping shows that a small number of structures remain within and near the Project area, and that parts of the proposed overhead line corridor traverse previously cultivated land (Kitto, 2026). Examination of Google Earth satellite imagery also showed partial disturbance of the Project site by agricultural activities between 2014 and 2023.

An on-site heritage inspection was undertaken over multiple site visits between 2023 and 2026 to assess the Project footprint (by a heritage specialist) (Kitto, 2026). Due to dense vegetation cover, ground visibility was generally low; however, the site was inspected as comprehensively as possible. The surveys identified a limited number of heritage resources within and adjacent to the Project site, including a stone kraal, a possible informal grave, scattered stone artefacts and a modern stock ramp, with additional historical features located nearby. Based on these findings, the overall heritage sensitivity of the project area is considered low, except for two features of medium significance: the stone kraal and the possible grave (refer to **Figure 58** below) (Kitto, 2026).

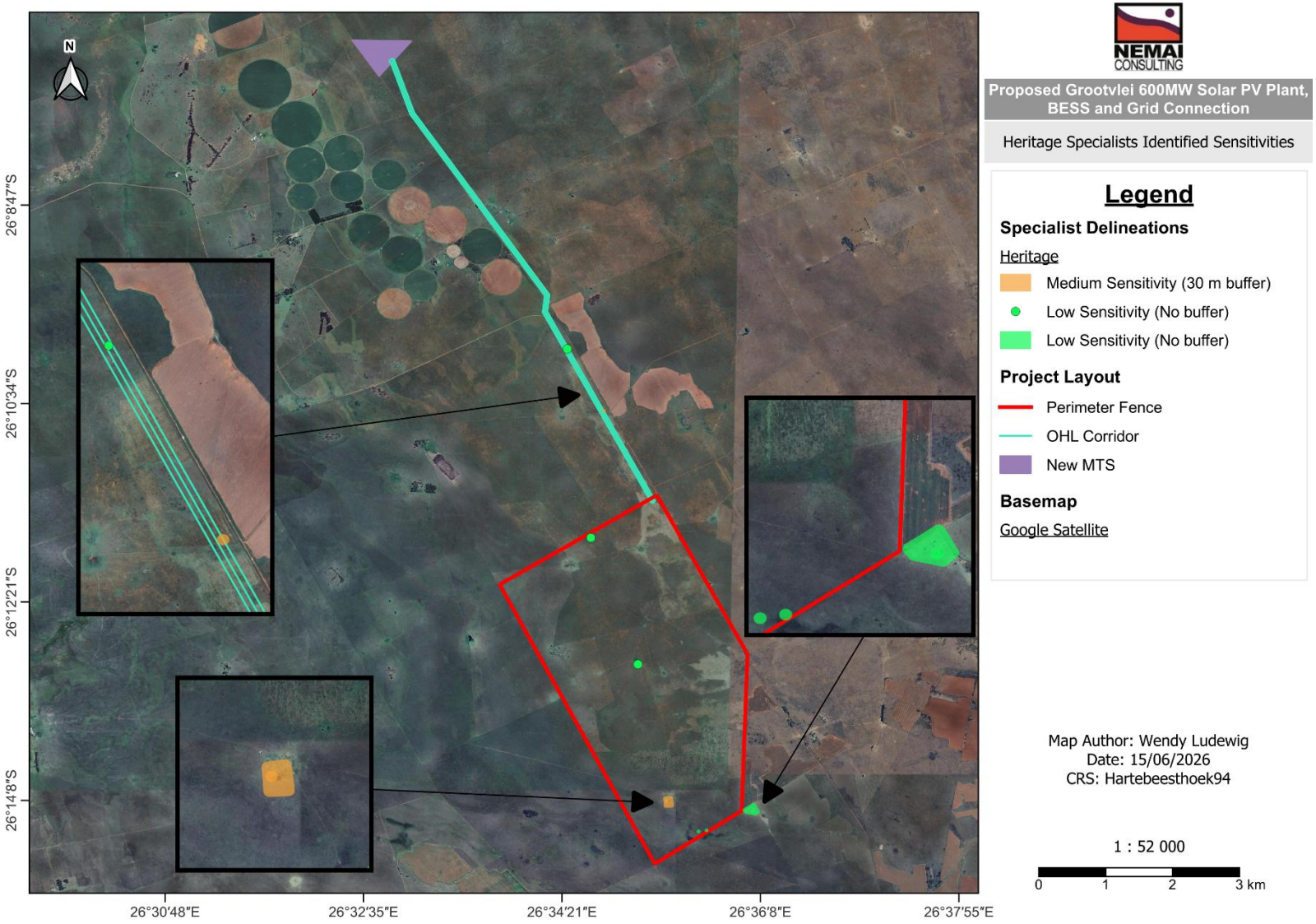

Figure 58: Sensitivities of heritage and archaeological features in relation to the Project site

10.16.2 Palaeontology

According to the SAHRIS database, South African Fossil Sensitivity Map, the Project footprint falls within an area with Very High fossil sensitivity (red) (refer to **Figure 59** below).

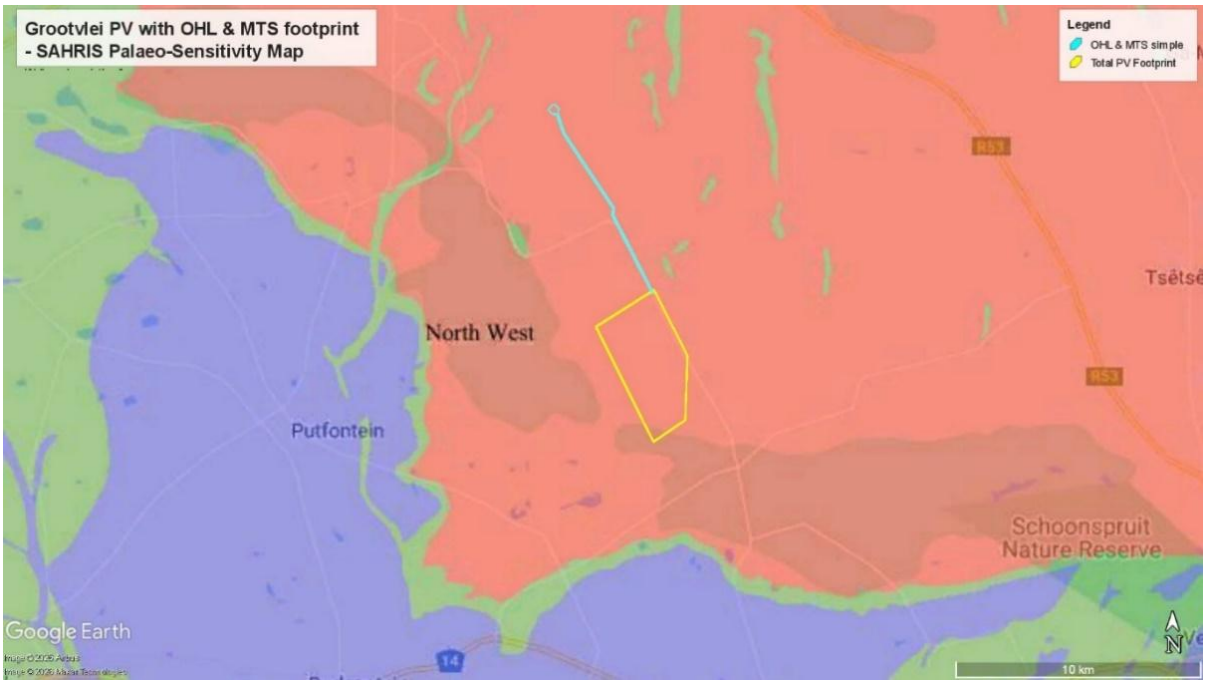

Figure 59: SAHRIS Palaeontological Sensitivity Map in relation to the Project Site

10.16.3 The Screening Tool

10.16.3.1 Archaeological and Cultural Heritage

According to the Screening Tool, the Project site falls within a low-sensitivity area for the Archaeological and Cultural Theme (refer to **Figure 60**).

According to the SSV undertaken by a heritage specialist, the archaeological and cultural theme sensitivity of the proposed Project is mostly low, with two small, isolated spots of medium sensitivity (refer to **Figure 58**).

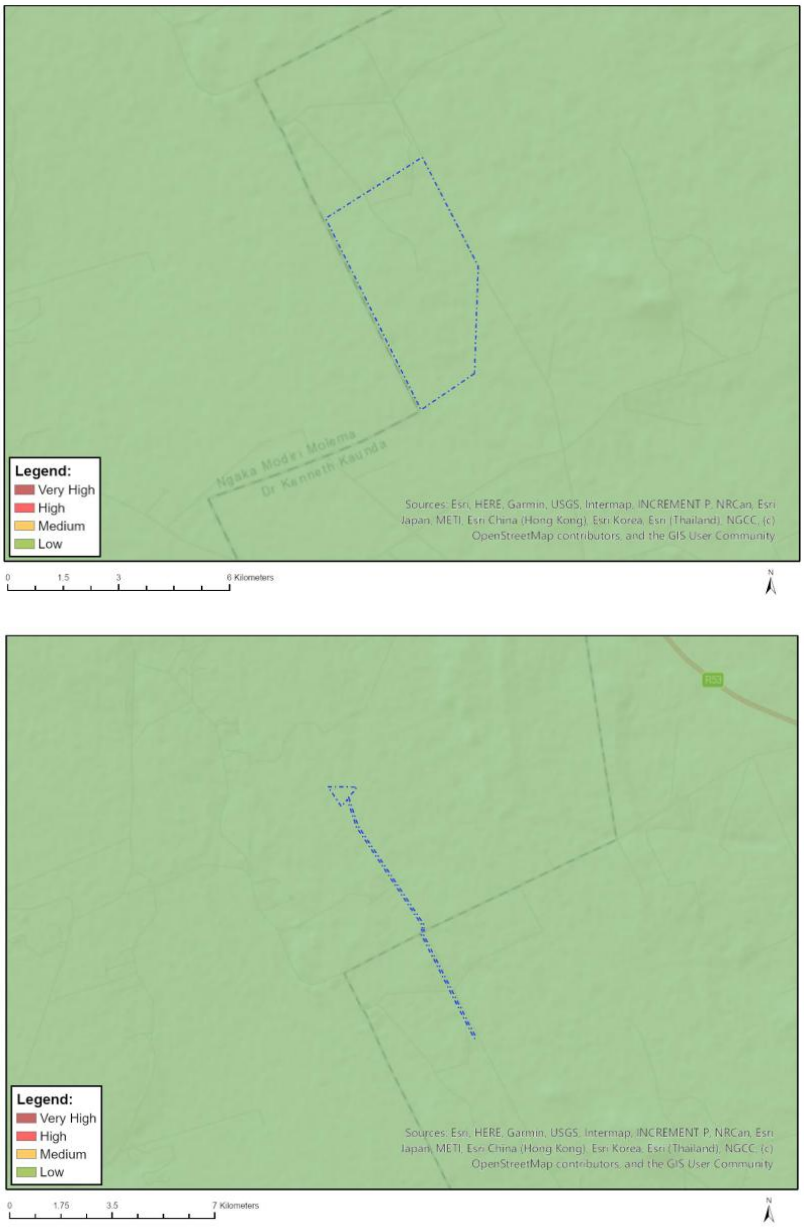

Figure 60: Map of relative Archaeological and Cultural Heritage Theme Sensitivity for the Project Site (Screening Tool)

10.16.3.2 Palaeontology

According to the Screening Tool, the Project site falls within a very high-sensitivity area for the Palaeontology Theme (refer to **Figure 61**).

According to the SAHRIS database, the palaeontology theme sensitivity of the proposed Project is mostly very high, likely as the Project site is within a dolomite area (refer to **Figure 59**).

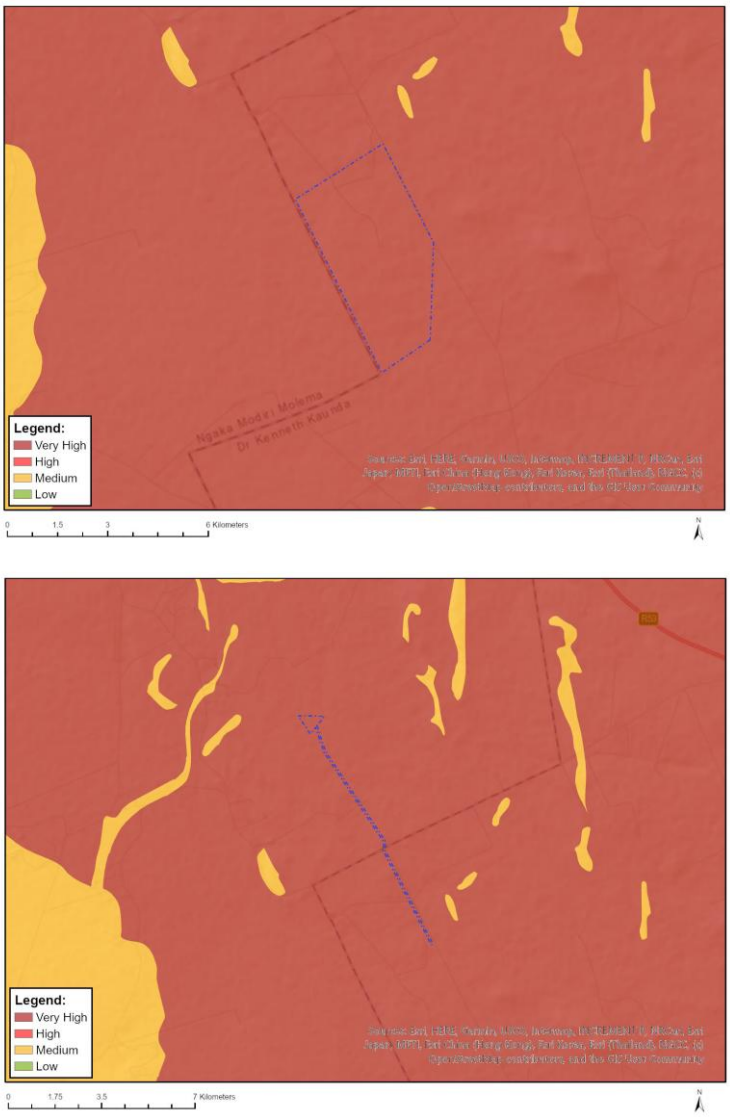

Figure 61: Map of relative Palaeontology Theme Sensitivity for the Project Site (Screening Tool)

10.17 Existing Structures and Infrastructure

The following is noted with regard to existing structures and infrastructure that occur within the Project's site:

- Powerlines traverse the site (**Figure 62**);
- Structures used for livestock grazing and feeding (**Figure 63**); and
- Internal access roads associated with the previous land uses traverse the site (**Figure 64**).



Figure 62: The existing powerline that traverses the Project Site



Figure 63: Example of one of the existing structures used for livestock feeding and grazing



Figure 64: Internal access roads within the Project Site

Apart from the above-mentioned infrastructure, other infrastructure may also be on the Project site.

10.18 Health

Healthcare services within the broader Project region are provided across the JB Marks and adjacent Ditsobotla Local Municipalities, supported by a network of primary, secondary and specialised facilities. Within JB Marks Local Municipality, Potchefstroom Hospital serves as a regional hospital offering general and specialist healthcare services, while facilities such as Witrand Psychiatric Hospital provide specialised mental health and rehabilitation services (North West Department of Health, 2026). In addition, community-level healthcare is supported through facilities such as the JB Marks Community Health Centre in Ventersdorp, which provides primary healthcare and emergency services.

Within the Ditsobotla Local Municipality, healthcare services are primarily concentrated in Lichtenburg, the area's main service centre. The General De La Rey Memorial Hospital provides district-level healthcare services, including inpatient, outpatient and emergency care, supported by a network of clinics and other healthcare facilities within the municipality (Ditsobotla, 2026).

The nearest hospital to the proposed project site is Ventersdorp Hospital, a public healthcare facility located in Ventersdorp that provides general inpatient and outpatient services to the surrounding communities (SA Doctors, 2026).

11 SUMMARY OF SPECIALIST STUDIES

11.1 Specialist Studies undertaken as part of the EIA

A crucial element of the Plan of Study for the EIA prepared during the Scoping phase was to provide the Terms of Reference for the requisite specialist studies triggered during Scoping. According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*".

The requisite specialist studies 'triggered' by the findings of the Scoping process, aimed at addressing the key issues and compliance with legal obligations, include the following:

1. Wetland Impact Assessment;
2. Terrestrial Biodiversity Impact Assessment;
3. Avifaunal Impact Assessment;
4. Agricultural Compliance Statement;
5. Phase 1 Heritage Impact Assessment;
6. Palaeontology Impact Assessment;
7. Visual Impact Assessment;
8. Social Impact Assessment; and
9. Geotechnical Assessment.

11.2 Excluded Specialist Studies identified during Environmental Screening

As mentioned in **Section 6.3**, the Screening Report for the Project was compiled by means of the Screening Tool, which is appended to the Application Form. **Table 12** lists the specialist studies that were identified in the Screening Report but which were not deemed to be necessary.

Table 12: Specialist studies identified in the Screening Report that are deemed unnecessary

No.	Specialist Study identified in Screening Report	Relevance to the Project following Site Sensitivity Verification
1.	**Civil Aviation Assessment**	According to the Screening Tool, the site is located in an area of low sensitivity for the Civil Aviation Theme. Based on the SSV findings, a Civil Aviation Assessment **will not** be compiled during the EIA Phase of the S&EIR Process.
2.	**Defence Assessment**	According to the Screening Tool, the site is located in an area of low sensitivity for the Defence Theme. Based on the SSV findings, a Defence Assessment **will not** be compiled during the EIA Phase of the S&EIR Process.
3.	**RFI Assessment**	According to the Screening Tool, the site is located in an area of low sensitivity for the RFI Theme.

No.	Specialist Study identified in Screening Report	Relevance to the Project following Site Sensitivity Verification
		Based on the SSV findings, an RFI Assessment **will not** be compiled during the EIA Phase of the S&EIR Process.

11.3 Incorporating the Findings from Specialist Studies

The Guideline for the review of specialist input in EIA processes (Keatimilwe & Ashton, 2005) was used for including the findings of the specialist studies into the EIA Report. Key considerations included the following:

- Ensuring that the specialists have adequately addressed I&APs' issues and specific requirements prescribed by environmental authorities;
- Ensuring that the specialists' input is relevant, appropriate and unambiguous; and
- Verifying that information regarding the receiving ecological, social and economic environment has been accurately reflected and considered.

The information obtained from the respective specialist studies was incorporated into the EIA report in the following manner:

- The assumptions and limitations identified in each study were included in **Section 7**;
- The information was used to complete the description of the receiving environment (**Section 10**) in a more detailed and site-specific manner;
- A summary of each specialist study is contained in the sub-sections to follow (**Section 11.4 – Section 11.12**), focusing on the approach to each study, key findings and conclusions drawn;
- The specialists' impacts assessments, and the identified mitigation measures, were included in the overall project impact assessment contained in **Section 12**;
- The evaluations performed by the specialists on the alternatives were included in **Section 13** to identify the most favourable option;
- Specialist input was obtained to address comments made by I&APs that related to specific environmental features pertaining to each specialist discipline; and
- Salient recommendations made by the specialists were taken forward to the final EIA conclusions in **Section 15**.

Refer to the content of each specialist study for the declarations from the respective specialists.

11.4 Wetland Impact Assessment

A summary of the Wetland Impact Assessment (Hoosen, 2026) (contained in **Appendix F1**) follows.

11.4.1 Details of Specialist

The details of the specialists who undertook the Wetland Impact Assessment are outlined in **Table 13**.

Table 13: Aquatic Specialist Details

Organisation	ELA Specialist Services
Name	S. Hoosen
Qualification	MSc (Environmental and Earth Science)
Affiliation (if applicable)	SACNASP Professional Natural Scientist (Environmental Science – 120680)

11.4.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Review available desktop information relevant to the aquatic receiving environment within the proposed Project area and the surrounding area.
- Undertake a desktop delineation of all watercourses located within the development footprint and the 500 m PAOI.
- Conduct a wet-season field assessment to delineate wetlands and other aquatic features in accordance with accepted DWS methodologies.
- Classify identified watercourses in accordance with the National Wetland Classification System for Wetlands and Other Aquatic Ecosystems in South Africa.
- Assess the ecological condition, functionality and the ecological importance and sensitivity of wetlands potentially affected by the proposed Project.
- Determine appropriate aquatic buffer zones and recommended ecological categories for identified wetlands.
- Undertake an assessment of potential construction, operational and cumulative impacts associated with the proposed Project.
- Assess potential water uses in terms of Sections 21(c) and 21(i) of the NWA.
- Develop mitigation and management measures for inclusion in the EMPr.
- Provide a specialist opinion regarding the environmental acceptability of the proposed Project from an aquatic ecology perspective.

11.4.3 Methodology

The assessment included the following tasks (amongst others):

- Review of available desktop information, including the NWM5, NFEPA, biodiversity planning information, land cover datasets and relevant aquatic sensitivity mapping.
- Delineation and verification of aquatic features through a wet-season field survey conducted on 27 March 2026.
- Identification of wetland boundaries using vegetation, soil and terrain indicators in accordance with recognised wetland delineation methodologies.

- Classification of identified aquatic features using the National Wetland Classification System.
- Assessment of wetland ecological condition using the WET-Health Version 2 methodology.
- Assessment of wetland ecosystem services using the WET-EcoServices Version 2 methodology.
- Determination of Ecological Importance and Sensitivity (EIS) and Recommended Ecological Categories (REC) for wetlands identified within the study area.
- Determination of aquatic buffer requirements in accordance with recognised buffer determination guidelines.
- Assessment of impacts associated with the construction, operation and rehabilitation phases of the proposed Project.
- Completion of the DWS Risk Assessment Matrix (RAM) to determine applicable water use authorisation requirements.
- Development of mitigation and monitoring measures to avoid, minimise and manage identified impacts.

11.4.4 Key Findings of the Study

The assessment identified four watercourses within the 500 m POAI, comprising three natural depression wetlands (Dep01, Dep02 and Dep03) and one artificial livestock-watering dam (refer to **Figure 65**). The presence of these wetland systems confirms that portions of the proposed Project occur within the regulated area of wetlands as defined by the NWA.

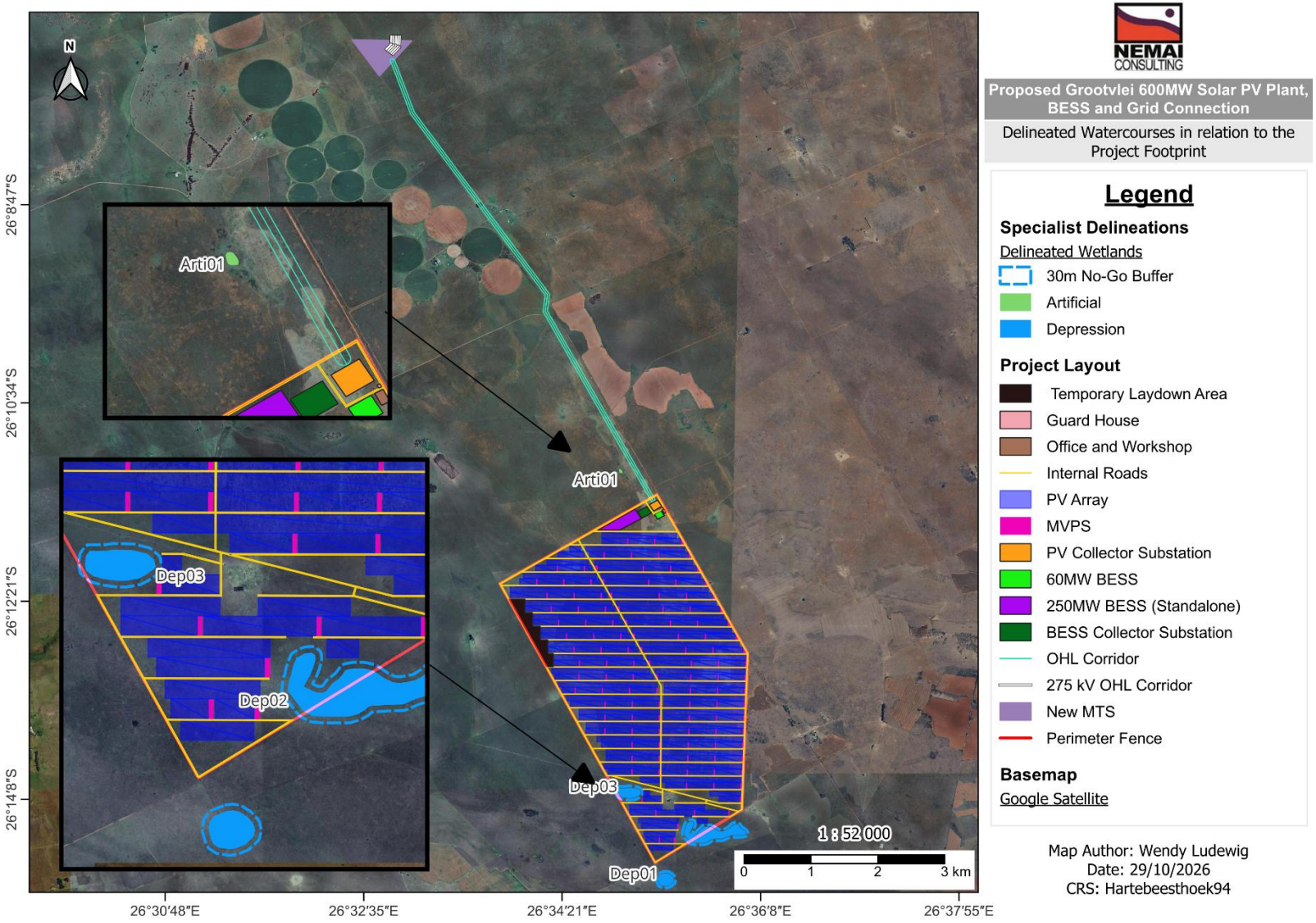

Figure 65: Delineated Watercourses with no-go buffers in relation to the Project components

The identified wetlands have experienced varying degrees of historical and ongoing disturbance from agricultural activities, livestock grazing, roads, powerline infrastructure, and farm-related land-use practices. Despite these disturbances, the wetlands continue to provide aquatic ecological functions and ecosystem services within the broader landscape.

The ecological condition assessment determined that Dep01 and Dep03 are in a Slightly Modified (PES Category B) condition, while Dep02 is Moderately Modified (PES Category C). EIS ratings ranged from Low to Moderate, with Dep01 exhibiting the highest ecological importance due to its association with nationally recognised wetland priority areas. RECs indicate that these wetlands should maintain their current ecological condition. **Table 14** below summarises the PES, EIS and RECs for each assessed wetland.

Table 14: Summary of the PES, EIS, RMO and REC for the delineated natural watercourses

Wetland	PES	Overall EIS	RMO and REC
Dep01	B – Slightly Modified	2.00 (Moderate)	▪ Recommended Management Objective (RMO) = B Maintain ▪ REC = B Maintain. This is due to the system falling within a catchment that has been slightly disturbed and will be further disturbed by the proposed activity. The best management objective for this wetland is to maintain its integrity.
Dep02	C – Moderately Modified	1.40 (Low)	▪ RMO = C Maintain ▪ REC = C Maintain. This is due to the system falling within a catchment that has been slightly disturbed and will be further disturbed by the proposed activity. The best management objective for this wetland is to maintain its integrity.
Dep03	B – Slightly Modified	1.40 (Low)	▪ RMO = B Maintain ▪ REC = B Maintain. This is due to the system falling within a catchment that has been slightly disturbed and will be further disturbed by the proposed activity. The best management objective for this wetland is to maintain its integrity.

The Aquatic Biodiversity SSV confirmed a Very High aquatic sensitivity for the proposed Project area due to the presence of depression wetlands within and adjacent to the proposed Project footprint. The study further identified that several proposed infrastructure components, including portions of the internal road network, occur in proximity to wetland systems and their associated regulated areas.

A 30 m aquatic buffer was recommended for the identified wetlands during both the construction and operational phases (refer to **Figure 65**). The specialist recommended that no temporary or permanent infrastructure should be located within these buffer areas in order to maintain the recommended ecological condition of the wetlands.

The DWS RAM determined that risks associated with the proposed activities are generally low and that the Project qualifies for a GA process from a water use authorisation perspective.

11.4.5 Impact Assessment

Please refer to **Section 12.12** for the results from the impact assessment from this study.

11.4.6 Conclusions

The Wetland Impact Assessment confirmed three natural depression wetlands and one artificial wetland feature within the PAOI. These wetlands are important aquatic features within the broader landscape and support local ecological functioning, despite historical agricultural activities and other anthropogenic disturbances.

The specialist concluded that the proposed Project can be considered environmentally acceptable from an aquatic ecology perspective, provided all recommended mitigation, monitoring and management measures are implemented throughout the construction, operation and rehabilitation phases. Key requirements include protecting wetland buffer areas, avoiding direct wetland encroachment, implementing effective stormwater and erosion control measures, and monitoring wetland condition.

Subject to compliance with the prescribed mitigation measures and the relevant water use authorisation requirements, including obtaining the necessary Water Use Authorisation from the DWS, the proposed Project is supported from a wetland and aquatic ecology perspective.

11.5 Terrestrial Biodiversity Impact Assessment

A summary of the Terrestrial Biodiversity Impact Assessment (Paul, 2026a) (contained in **Appendix F2**) follows.

11.5.1 Details of Specialist

The details of the specialists that undertook the Terrestrial Biodiversity Impact Assessment are outlined in **Table 15**.

Table 15: Terrestrial Biodiversity Specialist Details

Organisation	BP Environmental Solutions
Name	B.W. Paul
Qualification	BSc Honours (Environmental Management)
Affiliation (if applicable)	SACNASP Professional Natural Scientist (Ecological Science – 119552)

11.5.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Undertake a desktop assessment of the terrestrial biodiversity characteristics of the Project area.
- Verify and assess the terrestrial biodiversity sensitivity identified by the Screening Tool.
- Characterise the vegetation communities, habitat types and faunal assemblages occurring within the study area.
- Identify Species of Conservation Concern (SCC) and assess the likelihood of occurrence within the Project area.

- Assess ecological connectivity, habitat fragmentation and ecological processes associated with the site.
- Determine the ecological sensitivity and SEI of identified habitat units.
- Identify terrestrial biodiversity constraints associated with the proposed Project.
- Assess the potential impacts of the proposed Project on terrestrial biodiversity features.
- Develop suitable mitigation and management measures for incorporation into the EMPr.
- Provide a specialist opinion regarding the acceptability of the proposed Project from a terrestrial biodiversity perspective.

11.5.3 Methodology

The assessment included the following tasks (amongst others):

- Review of available desktop biodiversity information, including CBA, ESA, NPAES, vegetation type, threatened ecosystem, protected area and species distribution datasets.
- Review of available historical biodiversity studies undertaken within the Project area.
- Field verification assessment undertaken on 27 March 2026 and supplemented with the findings of previously conducted ecological assessments undertaken during both the peak growing season (January 2023) and in Autumn (April 2023).
- Habitat mapping and classification of vegetation and fauna habitat units occurring within and surrounding the Project footprint.
- Assessment of plant, mammal, reptile, amphibian, invertebrate and avifaunal species occurrence.
- Identification and assessment of SCC and protected species.
- Determination of the SEI in accordance with SANBI methodology.
- Assessment of ecological connectivity, habitat condition and ecological functioning.
- Identification of biodiversity constraints and sensitive ecological features.
- Impact assessment and development of mitigation and management measures.

11.5.4 Key Findings of the Study

The Screening Tool identified the Terrestrial Biodiversity Theme sensitivity as Very High because the Project area contains CBAs, ESAs, and NPAES Focus Areas. The specialist assessment confirmed the presence of ecologically important features but found that ecological sensitivity varies across the site and is not uniformly high.

The assessment identified five habitat units within the study area: old lands, transformed areas, natural grassland, disturbed grassland, and watercourses (refer to **Figure 66**). SEI assessments were undertaken for each habitat unit to determine their relative ecological value.

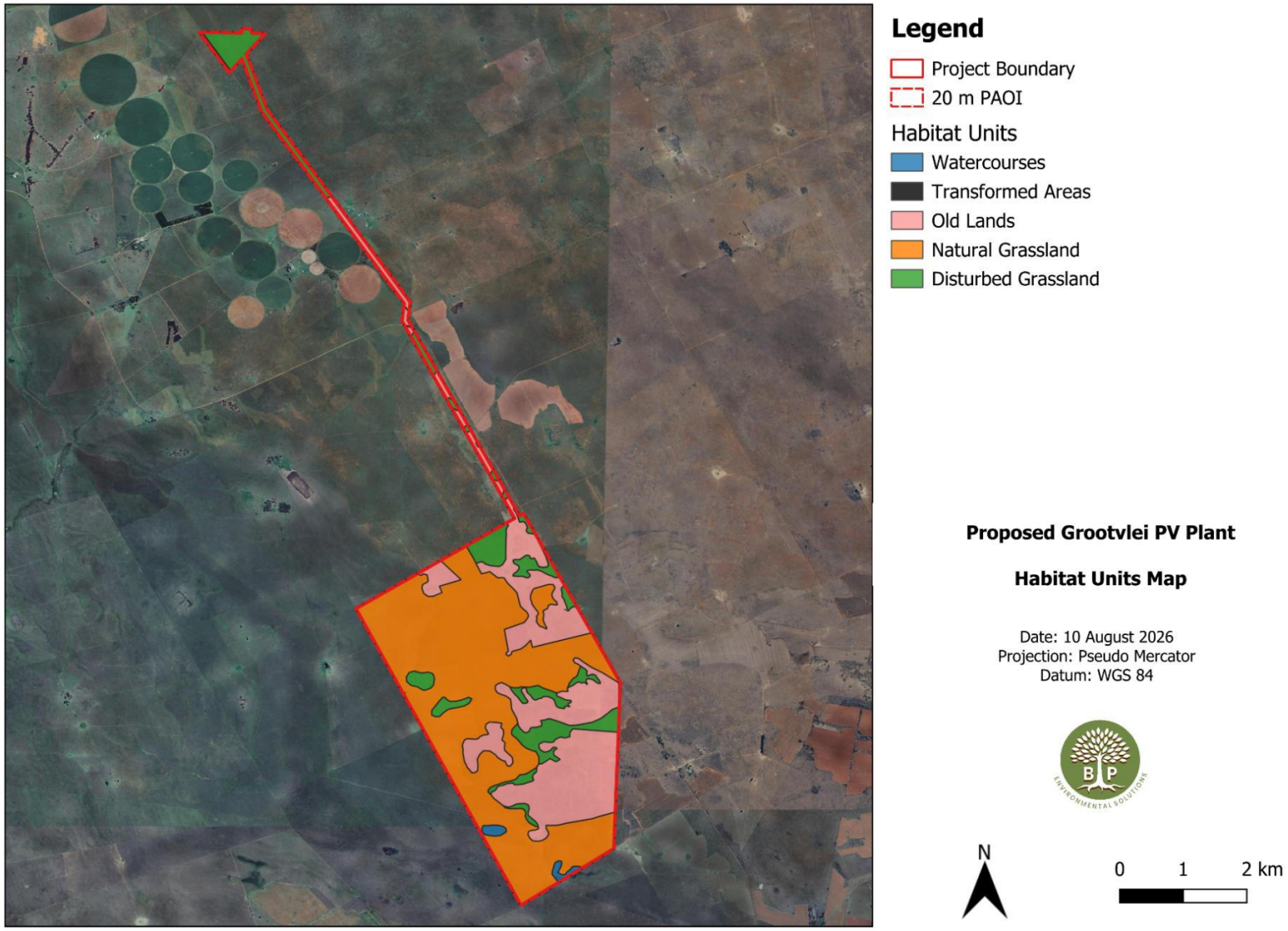

Figure 66: Land habitat units identified by the specialist during the site visit (Paul, 2026)

No floral SCCs were recorded during the field assessment. However, the specialist indicated that protected or conservation-important plant species may occur within portions of the site and recommended a pre-construction walkdown before vegetation clearance.

The field assessment recorded three mammal species, all categorised as Least Concern: Springbuck (*Antidorcas marsupialis*), Yellow Mongoose (*Cynictis penicillata*), and Meerkat (*Suricata suricatta*). Desktop assessment identified five mammal SCCs with potential to occur within the broader study area. **Table 16** below summarises the species threat statuses and applicability to this site. No herpetofaunal or invertebrate SCCs were identified as likely to occur within the Project area.

Table 16: Summary of animal species threat status and applicability to the site (Paul, 2026a)

Common (Scientific) Name	Regional Conservation Status	Discussion	Likelihood of Occurrence
Black-footed Cat *(Felis nigripes)*	Vulnerable	The surrounding open grassland provides broadly suitable habitat, particularly where grass cover is relatively intact and small mammal prey is available. However, the species is secretive, nocturnal and typically associated with extensive, relatively undisturbed grassland. Given the agricultural land use, grazing and disturbance evident around the site, occurrence on the development footprint is considered unlikely but cannot be completely excluded.	Low
Brown Hyena *(Parahyaena brunnea)*	Near Threatened	The broader open landscape could provide movement habitat, but the species has large home ranges and generally requires extensive areas with relatively low human disturbance. The fragmented agricultural landscape and existing infrastructure make regular use of the site unlikely. Occasional/transient movement through the broader landscape is possible, particularly where connectivity with more suitable habitat remains.	Low
Vlei Rat *(Otomys auratus)*	Near Threatened	This species is more closely associated with moist grassland and wetland margins than the drier terrestrial habitats. The presence of shallow depression wetlands and associated wet grassland provides potentially suitable localised habitat. It is therefore more likely to occur around suitable wetland margins than throughout the site as a whole.	Moderate (Wetland) to Low (Terrestrial)
White-tailed Rat *(Mystromys albicaudatus)*	Vulnerable	The species is associated with grassland habitats and may utilise areas with relatively dense natural vegetation and suitable ground cover. The more intact Highveld grassland portions of the site could provide potentially suitable habitat, although ongoing grazing, historical cultivation and habitat modification reduce suitability. Potential occurrence should therefore be acknowledged, but presence cannot be assumed without targeted evidence which was not found during both the historical, or more recent surveys.	Low to Moderate
Straw-coloured Fruit Bat *(Eidolon helvum)*	Near Threatened	This is a highly mobile species capable of travelling considerable distances between roosting and feeding areas. The open grassland habitat itself is unlikely to represent important roosting habitat, and the site lacks extensive woodland/forest habitat. Occasional overflight or	Low

Common (Scientific) Name	Regional Conservation Status	Discussion	Likelihood of Occurrence
		opportunistic foraging is possible, but the species is unlikely to be resident on the site.	

The SEI assessment assigned High ecological importance to watercourses, Medium ecological importance to natural and disturbed grassland habitats, Low ecological importance to old lands and Very Low ecological importance to transformed areas, as summarised in **Table 17**.

Table 17: Summary of Site Ecological Importance and Rationale (Paul, 2026a)

Habitat	SEI	Rationale
Old Lands	Low	Historically cultivated areas showing variable degrees of natural recovery and ongoing disturbance. Vegetation is generally shorter and more open than natural grassland, with a greater ruderal and herbaceous component, exposed soil and evidence of continued livestock grazing. These areas provide supplementary habitat, foraging opportunities and refuge for a range of common and disturbance-tolerant mammals, reptiles, amphibians and invertebrates, while also contributing to movement and connectivity within the broader landscape. However, the altered vegetation structure, historical cultivation and ongoing disturbance reduce their value for habitat specialist species and species dependent on more intact grassland conditions.
Transformed Areas	Very Low	Highly modified areas associated primarily with existing roads, tracks, infrastructure and other disturbed surfaces, with limited remaining natural vegetation and low habitat complexity. These areas have limited intrinsic value for terrestrial biodiversity and are expected to support mainly disturbance-tolerant and generalist species. Although isolated opportunities for foraging, movement or temporary refuge may remain, particularly along vegetated margins, the existing condition provides limited habitat for species requiring continuous or structurally complex natural vegetation. The already highly transformed condition also means that further disturbance is unlikely to result in substantial additional loss of functional terrestrial habitat.
Natural Grassland	Medium	Relatively intact Highveld grassland supporting a structurally heterogeneous perennial grass layer, tussock-forming grasses, forbs and limited woody encroachment. The habitat provides a range of resources for terrestrial fauna, including foraging, refuge, movement and potential breeding opportunities for grassland-associated mammals, reptiles, amphibians and invertebrates. Species potentially associated with the grassland include Highveld Gerbil (*Gerbilliscus brantsii*), Springhare (*Pedetes capensis*), Cape Hare (*Lepus capensis*), Yellow-throated Plated Lizard (*Gerrhosaurus flavigularis*) and a range of seasonally active amphibians such as Common Sand Frog (*Tomopterna cryptotis*). The habitat also supports a predominantly common fauna assemblage, while retaining potential value for mobile or habitat-associated Species of Conservation Concern. Its continued extent, vegetation structure and connectivity within the wider Highveld grassland matrix therefore support a moderate SEI.
Disturbed Grassland	Medium	Grassland areas retaining a substantial natural vegetation component but showing increased disturbance through livestock grazing, trampling and localised reductions in vegetation cover. Despite this disturbance, these areas retain natural grassland characteristics and remain suitable for a range of mammals, reptiles, amphibians and invertebrates, particularly generalist and disturbance-tolerant species. They also remain functionally connected to areas of more intact grassland and contribute to movement and foraging opportunities within the broader habitat matrix. Their intermediate condition reduces their ecological value relative to less disturbed natural grassland, but their retained vegetation cover and connectivity support a moderate SEI.
Watercourses	High	Small, shallow depression wetlands and associated watercourses that provide locally distinct wetland habitat within an otherwise predominantly terrestrial landscape. Although disturbed and limited in size, these features provide seasonal moisture, vegetation cover, foraging opportunities and refuge for terrestrial fauna and are particularly relevant to amphibians and moisture-

Habitat	SEI	Rationale
		associated invertebrates. The wetland margins may also provide drinking and foraging opportunities for mammals and reptiles moving through the surrounding grassland. The desktop species assemblage includes a range of amphibians potentially associated with seasonally wet habitat, while the broader fauna assessment indicates potential use of these features by other terrestrial species. Their high SEI is therefore based primarily on the scarcity and functional distinctiveness of wetland habitat within the surrounding grassland matrix, their seasonal ecological function and their contribution to local habitat connectivity, rather than on the presence of a specialised or highly diverse wetland fauna assemblage.

The assessment identified watercourses as the most ecologically important features within the Project area. The field assessment identified no biodiversity fatal flaws and recorded no confirmed occurrences of SCCs within the development footprint.

11.5.5 Impact Assessment

Please refer to **Section 12.12.3** for the results of the impact assessment from this study.

11.5.6 Conclusions

The Terrestrial Biodiversity Impact Assessment confirmed that the Project area contains biodiversity features of varying ecological importance and that several biodiversity sensitivities occur within the broader Project area. However, the field assessment recorded no floral SCCs, identified no confirmed occurrences of faunal SCCs within the proposed Project footprint, and identified no terrestrial biodiversity fatal flaws. The specialist further determined that the site's ecological value varies and that sensitivity is not uniformly high across the Project area.

Based on the assessment findings, the specialist concluded that the proposed Project is acceptable from a terrestrial biodiversity perspective. The assessment found that the most sensitive biodiversity features within the Project area are associated with the identified watercourses, while natural and disturbed grassland habitats retain moderate ecological importance within the broader landscape. Subject to implementing the recommended management and mitigation measures, the specialist supports the proposed Project and considers it suitable to proceed from a terrestrial biodiversity perspective.

11.6 Avifaunal Impact Assessment

A summary of the Avifaunal Impact Assessment (Paul, 2026b) (contained in **Appendix F3**) follows.

11.6.1 Details of Specialist

The details of the specialists that undertook the Avifaunal Impact Assessment are outlined in **Table 18**.

Table 18: Avifaunal Specialist Details

Organisation	BP Environmental Solutions
Name	B.W. Paul
Qualification	BSc Honours (Environmental Management)
Affiliation (if applicable)	SACNASP Professional Natural Scientist (Ecological Science – 119552)

11.6.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Undertake a desktop assessment of avifaunal sensitivities associated with the Project area.
- Verify the avifaunal sensitivities identified by the Screening Tool.
- Identify bird species occurring within the Project area and broader landscape.
- Identify avifaunal SCCs with potential to occur within the Project area.
- Assess habitat utilisation by avifauna and identify key habitat features.
- Assess ecological sensitivity and determine the SEI of habitat units from an avifaunal perspective.
- Identify important flight corridors, nesting sites and areas of concentrated bird activity, where present.
- Identify avifaunal constraints associated with the proposed Project.
- Assess the potential impacts of the proposed Project on avifaunal receptors.
- Develop appropriate mitigation and management measures for inclusion in the EMPr.
- Provide a specialist opinion regarding the acceptability of the proposed Project from an avifaunal perspective.

11.6.3 Methodology

The assessment included the following tasks (amongst others):

- Review of relevant desktop information, including SABAP2 bird distribution records, Red Data species lists, protected area information, Important Bird and Biodiversity Areas (IBBAs), biodiversity planning datasets and species occurrence records.
- Review of historical avifaunal assessments undertaken within the Project area and surrounding landscape, including previous surveys completed during 2021, 2022 and 2023.
- Verification of avifaunal sensitivities identified by the Screening Tool and assessment of the relevance of these sensitivities to the Project area.
- Field surveys undertaken between 21 and 24 April 2023 and on 27 March 2026, comprising standardised point counts, incidental observations, random meanders and road-based surveys across the Project area.
- Compilation of avifaunal species lists and verification of SCCs through a combination of desktop records and field observations.
- Assessment of bird habitat utilisation, nesting opportunities, flight paths and the potential occurrence of priority species within the Project area.

- ❖ Identification of primary avifaunal species of concern based on conservation status, habitat requirements, likelihood of occurrence and susceptibility to energy infrastructure.
- ❖ Determination of SEI ratings for identified habitat units in accordance with the SANBI Species Environmental Assessment Guidelines.
- ❖ Identification of avifaunal constraints associated with the proposed Project and assessment of the ecological significance of identified receptors.
- ❖ Assessment of potential Project-related impacts and development of mitigation and management measures for inclusion in the EMPr.

11.6.4 Key Findings of the Study

The Screening Tool identified Avian Theme Sensitivity as High and the Animal Species Theme as Medium to High because avifaunal SCCs could occur and a Cape Vulture feeding site is within 20 km of the Project area. Following site verification, the specialist concluded that the identified sensitivities relate to specific habitat features and species records rather than the entire Project area.

The SABAP2 assessment undertaken across six pentads identified 153 bird species that may potentially occur within the broader study area. The desktop assessment identified 12 avifaunal SCCs. These include the Black-winged Kite (*Elanus caeruleus*), Secretarybird (*Sagittarius serpentarius*), White-backed Vulture (*Gyps africanus*), Cape Vulture (*Gyps coprotheres*), Maccoa Duck (*Oxyura maccoa*), Lesser Kestrel (*Falco naumanni*), Hamerkop (*Scopus umbretta*), and several waterbird SCCs.

Site visits between 2023 and 2026 recorded predominantly common grassland and agricultural bird species. Field surveys recorded only one SCC, the Near Threatened Black-winged Kite (*Elanus caeruleus*). The site assessments recorded no vultures, Secretarybirds, or other high-profile SCCs. **Table 19** summarises the species observed within the study area.

Table 19: Record of species observed within the study area during the 2023 and 2026 site visits

Common *(Scientific)* Name	Threat Status		Observation	
	Regional (2025)	Global (2025)	2023	2026
Northern Black Korhaan (*Afrotis afraoides*)	LC	LC	X	X
Egyptian Goose (*Alopochen aegyptiaca*)	LC	LC	X	X
African Black Duck (*Anas sparsa*)	LC	LC	X	
African Pipit (*Anthus cinnamomeus*)	LC	LC	X	X
Plain-backed Pipit (*Anthus leucophrys*)	LC	LC	X	X
Grey Heron (*Ardea cinerea*)	LC	LC	X	X
Hadada Ibis (*Bostrychia hagedash*)	LC	LC		X
Western Cattle Egret (*Bubulcus ibis*)	LC	LC	X	X
Sabota Lark (*Calendulauda sabota*)	LC	LC	X	
Kalahari Scrub Robin (*Cercotrichas paena*)	LC	LC		X

Common *(Scientific)* Name	Threat Status		Observation	
	Regional (2025)	Global (2025)	2023	2026
Spike-heeled Lark (*Chersomanes albofasciata*)	LC	LC	X	
Desert Cisticola (*Cisticola aridulus*)	LC	LC	X	
Wing-snapping Cisticola (*Cisticola ayresii*)	LC	LC	X	X
Rattling Cisticola (*Cisticola chiniana*)	LC	LC	X	X
Zitting Cisticola (*Cisticola juncidis*)	LC	LC	X	X
Speckled Mousebird (*Colius striatus*)	LC	LC	X	X
Speckled Pigeon (*Columba guinea*)	LC	LC	X	
Common Quail (*Coturnix coturnix*)	LC	LC	X	
African Palm Swift (*Cypsiurus parvus*)	LC	LC	X	
Black-winged Kite (*Elanus caeruleus*)	NT	LC	X	X
Grey-backed Sparrow-Lark (*Eremopterix verticalis*)	LC	LC	X	
Southern Red Bishop (*Euplectes orix*)	LC	LC	X	
Greater Kestrel (*Falco rupicoloides*)	LC	LC	X	
Southern Fiscal (*Lanius collaris*)	LC	LC		X
Cape Longclaw (*Macronyx capensis*)	LC	LC	X	X
Helmeted Guineafowl (*Numida meleagris*)	LC	LC		X
Namaqua Dove (*Oena capensis*)	LC	LC	X	X
Capped Wheatear (*Oenanthe pileata*)	LC	LC	X	
Quailfinch (*Ortygospiza atricollis*)	LC	LC	X	
Southern Grey-headed Sparrow (*Passer diffusus*)	LC	LC		X
House Sparrow (*Passer domesticus*)	LC	LC		X
Southern Masked Weaver (*Ploceus velatus*)	LC	LC	X	X
Swainson's Spurfowl (*Pternistis swainsonii*)	LC	LC	X	
Red-billed Quelea (*Quelea quelea*)	LC	LC	X	X
Banded Martin (*Riparia cincta*)	LC	LC	X	
Pink-billed Lark (*Spizocorys conirostris*)	LC	LC	X	
Scaly-feathered Weaver (*Sporopipes squamifrons*)	LC	LC	X	
Ring-necked Dove (*Streptopelia capicola*)	LC	LC	X	X
Blue Waxbill (*Uraeginthus angolensis*)	LC	LC		X
Blacksmith Lapwing (*Vanellus armatus*)	LC	LC	X	X
Crowned Lapwing (*Vanellus coronatus*)	LC	LC	X	X
Pin-tailed Whydah (*Vidua macroura*)	LC	LC		X

The assessment determined that although several SCCs may occur within the broader landscape, most are highly mobile species and their occurrence within the Project area is likely to be infrequent. The specialist found no evidence that the Project area represents critical habitat for these species.

No confirmed nesting sites were identified during the field assessments or previous site visits. Furthermore, the study identified no distinct or concentrated avifaunal flight paths across the Project area. The study therefore found no evidence that the site functions as a significant breeding area, migration corridor or bird concentration area.

The assessment identified watercourses and associated wetland habitats as the most important avifaunal features within the Project area due to their role in providing seasonal foraging, drinking and refuge opportunities for bird species. The specialist further confirmed that no avifaunal fatal flaws were identified.

11.6.5 Impact Assessment

Please refer to **Section 12.14** for the results of the impact assessment from this study.

11.6.6 Conclusions

The Avifaunal Impact Assessment identified several avifaunal SCCs that could occur within the broader study area. However, field surveys recorded only one SCC, the Near Threatened Black-winged Kite (*Elanus caeruleus*). The assessment further confirmed that no important nesting sites, concentrated flight paths or regionally significant bird concentration areas were identified within the Project area.

The specialist concluded that the Project area is not an irreplaceable avifaunal resource and that the proposed Project is not associated with any avifaunal fatal flaws. Based on the assessment findings, the specialist supports the proposed Project and considers it acceptable from an avifaunal perspective. Subject to implementing the recommended management and mitigation measures, there is no avifaunal reason the proposed Project should not be authorised.

11.7 Agricultural Compliance Statement

A summary of the Agricultural Compliance Statement (Mchunu, 2026) (contained in **Appendix F4**) follows.

11.7.1 Details of Specialist

The details of the specialists that undertook the Agricultural Compliance Statement are outlined in **Table 20**.

Table 20: Agricultural Specialist Details

Organisation	Nhloso Land Resources (Pty) Ltd.
Name	S. Mchunu
Qualification	MSc (Soil Science)
Affiliation (if applicable)	SACNASP (008755)

11.7.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Review the agricultural sensitivity assigned to the Project area by the Screening Tool.
- Verify agricultural sensitivity through desktop assessment and field investigation.
- Characterise the agricultural potential and land capability of the Project area.
- Assess soil characteristics, including soil depth, texture, structure and agricultural suitability.
- Determine whether the proposed Project footprint contains soils of high agricultural value.
- Assess compliance with the requirements of the Agricultural Protocol.
- Identify agricultural constraints associated with the proposed Project.
- Determine whether a detailed Agricultural Impact Assessment is required.
- Provide a specialist opinion regarding the suitability of the Project area for the proposed Project from an agricultural perspective.

11.7.3 Methodology

The assessment included the following tasks (amongst others):

- Review of the agricultural sensitivity assigned to the Project area by the Screening Tool and verification requirements prescribed by the Agricultural Theme Protocol.
- Review and interpretation of available desktop information, including land capability mapping, land type information, soil databases, topographic information, historical aerial imagery and recent satellite imagery.
- Assessment of historical and current land use practices to determine the extent of cultivation, grazing and transformation across the Project area.
- Delineation of agricultural sensitivity units and identification of areas requiring field verification.
- Site verification surveys undertaken to assess soil characteristics, terrain conditions and agricultural capability within the proposed Project footprint.
- Description and classification of representative soil profiles, including the assessment of soil depth, texture, structure, drainage conditions, stoniness, rock occurrence and other factors influencing agricultural potential.
- Verification of the agricultural sensitivity classes identified during the desktop assessment through in situ observations and soil investigations.
- Evaluation of the agricultural production potential and land capability of the Project area based on observed soil and terrain characteristics.
- Assessment of compliance with the requirements of Government Notice 320 of 2020 (as amended), including the determination of whether the site warrants a full Agricultural Impact Assessment.
- Formulation of professional findings and recommendations regarding the suitability of the Project area for the proposed Project from an agricultural perspective.

11.7.4 Key Findings of the Study

The Screening Tool identified portions of the Project area as having High and Medium Agricultural Theme Sensitivity. The specialist assessment verified these sensitivities through a combination of desktop analysis and field investigations.

The assessment confirmed that the Project area has been extensively used for agriculture, primarily grazing and cultivation. Soil investigations identified varying soil forms (refer to **Figure 67** for an illustration of the soil forms across the site) and land capability classes across the site, with agricultural potential ranging from low to moderate (refer to **Figure 68** for an illustration of the agricultural potential across the site).

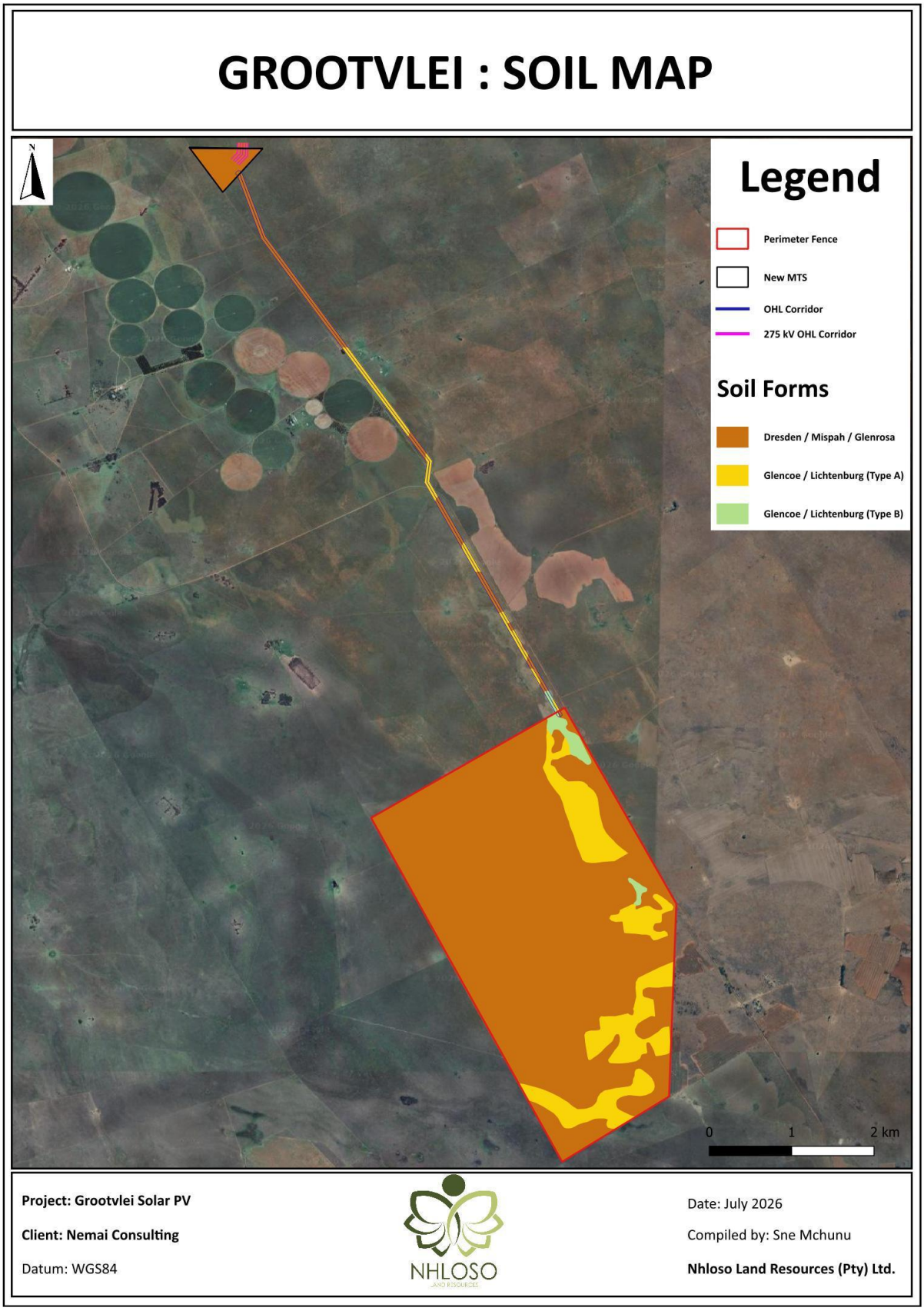

Figure 67: Identified soil forms within the Project footprint

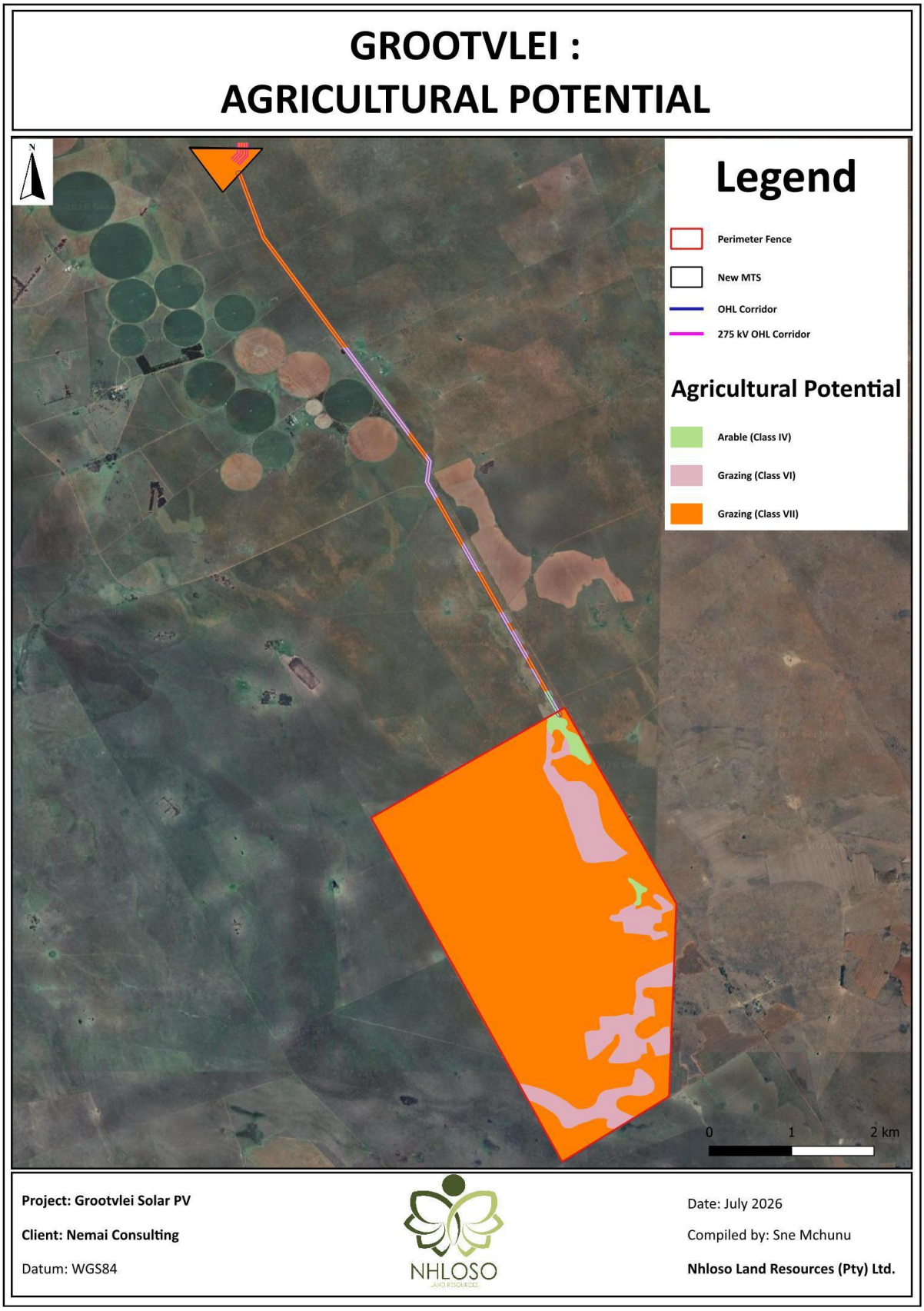

Figure 68: Agricultural Potential within the proposed Project footprint

The study found that historical agricultural activities have transformed large portions of the Project area, reducing agricultural capability compared to undisturbed agricultural land. Several areas were identified as containing shallow soils, rock outcrops and other limiting factors that reduce their long-term cultivation potential.

The specialist verified the agricultural sensitivity of the Project area and determined that the site does not comprise extensive contiguous areas of unique high-potential agricultural land that would preclude the proposed Project (refer to **Figure 68**). Agricultural sensitivity was found to vary across the site and is not uniformly high throughout the development footprint (refer to **Figure 53**).

The assessment further concluded that the compliance assessment findings satisfy the requirements of the Agricultural Protocol and that the proposed Project does not require a detailed Agricultural Impact Assessment. The assessment identified no agricultural fatal flaws.

11.7.5 Impact Assessment

Please refer to **Section 12.16** for the results of the impact statement from this study.

11.7.6 Conclusions

The Agricultural Compliance Statement confirmed that the Project area's agricultural sensitivity varies across the site and that existing land-use practices, soil characteristics, and other physical limitations influence agricultural potential. While portions of the Project area have moderate agricultural value, the assessment did not identify extensive areas of irreplaceable or uniquely high-potential agricultural land within the proposed Project footprint.

The specialist concluded that, under the Agricultural Protocol requirements, a detailed Agricultural Impact Assessment is not warranted. The specialist identified no agricultural fatal flaws and supports the proposed Project from an agricultural perspective.

11.8 Phase 1 Heritage Impact Assessment

A summary of the Phase 1 Heritage Impact Assessment (Kitto, 2026) (contained in **Appendix F5**) follows.

11.8.1 Details of Specialist

The details of the specialists who undertook the Phase 1 Heritage Impact Assessment are outlined in **Table 21**.

Table 21: Heritage Specialist Details

Organisation	Nitai Consulting
Name	J. Kitto
Qualification	BA Honours (Social Anthropology)

Affiliation (if applicable)	Association of Southern African Professional Archaeologists (ASAPA) – Technical member No.444 International Association for Impact Assessment (IAIAsa) – Member No. 7151 Association of Professional Heritage Practitioners (APHP) - Professional Member No. PHP0156

11.8.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Identify heritage resources occurring within the proposed Project area.
- Assess the heritage significance of identified resources.
- Determine whether any heritage resources may be impacted by the proposed Project.
- Identify archaeological, historical, cultural and palaeontological heritage constraints associated with the Project area.
- Assess compliance with the requirements of the NHRA.
- Evaluate the significance of identified heritage resources within their local and regional context.
- Develop appropriate recommendations for the management of heritage resources.
- Provide a specialist opinion regarding the acceptability of the proposed Project from a heritage perspective.

11.8.3 Methodology

The assessment included the following tasks (amongst others):

- Review of available desktop information, including previous heritage studies, historical aerial photography, topographic mapping, published archaeological literature and heritage resource databases.
- Review of historical land use information and available records relating to archaeological, historical and cultural heritage resources within the broader Project area.
- Field surveys undertaken on 22 March 2023, 24 April 2023 and 27 March 2026 across the Project footprint to identify and record heritage resources that may be protected under the NHRA.
- Documentation and mapping of identified heritage resources using photographic records, GPS coordinates and site descriptions.
- Assessment of the heritage significance of identified resources in terms of their historical, archaeological, cultural and social value.
- Evaluation of the likelihood of previously unidentified heritage resources occurring within the Project area based on observed landscape characteristics and historical land use patterns.
- Identification of heritage constraints and determination of appropriate avoidance requirements and management measures.
- Assessment of heritage resource sensitivity and compatibility with the proposed Project.
- Formulation of specialist findings and recommendations regarding the heritage suitability of the Project area.

11.8.4 Key Findings of the Study

The heritage survey identified eight heritage resources within the Project area. These resources comprise two historical structure sites (GVL-01 and GVL-04), one potential informal grave (GVL-07), four archaeological findspots (GVL-02, GVL-03, GVL-06, and GVL-08) and one modern stock-loading ramp (GVL-05). The location of the heritage resources in relation to the Project footprint is illustrated in **Figure 69** below.

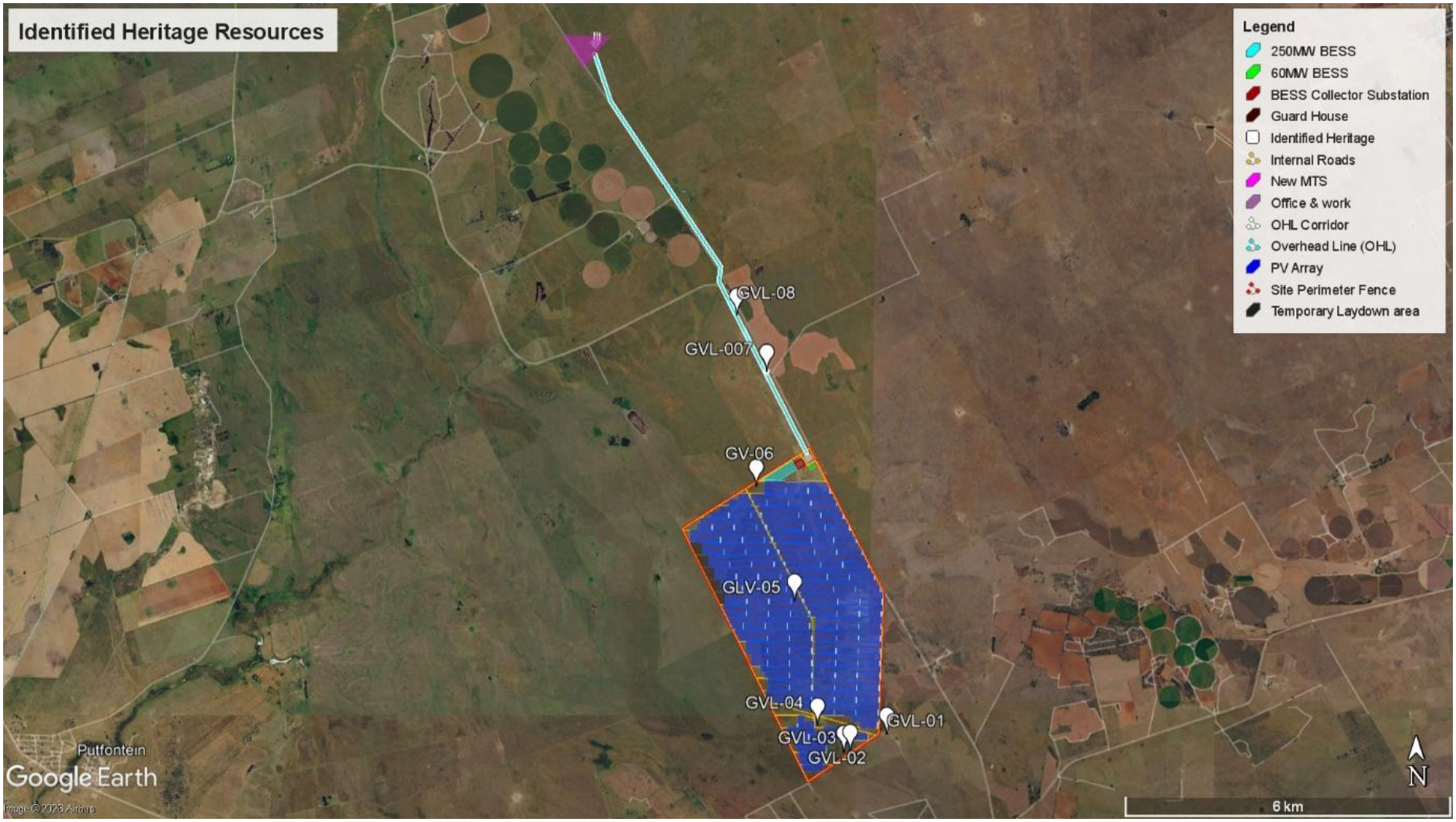

Figure 69: Proposed Project Layout in relation to identified heritage resources

The historical structure sites were identified as older than 60 years and are therefore protected under the NHRA. The structures are associated with historical farming activities in the area and represent the most significant built heritage resources identified during the assessment. **Figure 70** illustrates the identified historical structures, including GVL-01 on the right (a house, outbuilding, and kraal) and GVL-04 on the left (a historical stone kraal and associated long trough).



Figure 70: Onsite photos of the historical structures identified as older than 60 years

The assessment identified one potential informal grave (GVL-07), illustrated in **Figure 71**. Because of the cultural and social sensitivity associated with graves and burial grounds, the specialist recommended treating the feature as a heritage resource requiring formal verification and protection until its status can be conclusively determined.



Figure 71: Onsite photo of stone cairn/potential grave

The specialist recorded four archaeological findspots within the Project area, illustrated in **Figure 72**. These consist primarily of isolated stone artefacts and low-density archaeological

material that provide evidence of past human occupation of the area. The specialist concluded that these resources are of local archaeological significance.

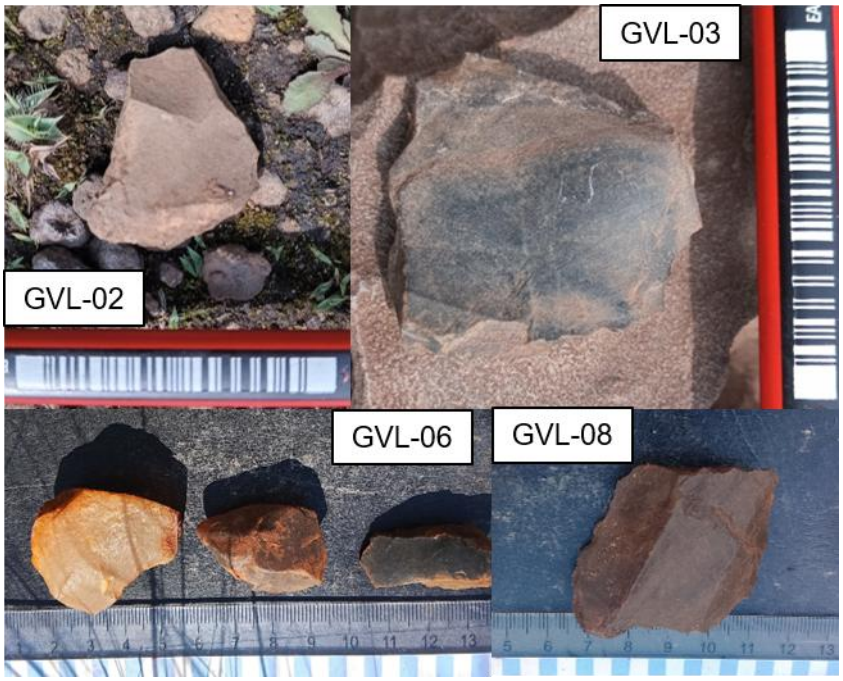

Figure 72: Onsite photos of stone artefacts found at the four archaeological find spots

The assessment further identified a modern stock-loading ramp, illustrated in **Figure 73**. The feature was determined to be of negligible heritage significance and does not constitute a significant heritage constraint to the proposed Project.



Figure 73: Onsite photo of modern stock-loading ramp

Table 22 below summarises the identified heritage resources, their significance and associated determined no-go buffer zones. **Figure 58** illustrate the heritage sensitivity and associated no-go buffer zones of each identified heritage resource in relation to the Project footprint.

Table 22: Identified heritage resources, their significance and determined no-go buffer zones

Heritage Resource	Number Recorded	Significance	No-Go Buffer
Historical structure sites	2	Medium to High	GVL-01 – 30 m GVL-04 – 30 m
Potential informal grave	1	High	30 m
Archaeological findspots	4	Low to Medium	No mitigation required. However, Section 35 protects all archaeological material, and it cannot be removed without a permit.
Modern stock-loading ramp	1	Low/Negligible	No mitigation required

The assessment concluded that the identified heritage resources are localised and can be managed through appropriate avoidance measures where required. No heritage resources of national or provincial significance were identified within the Project area. The assessment also identified no heritage fatal flaws.

11.8.5 Impact Assessment

Please refer to **Section 12.17** for the results from the impact assessment from this study.

11.8.6 Conclusions

The Heritage Impact Assessment identified a limited number of heritage resources within the Project area, comprising historical structures, archaeological findspots, a potential informal grave and a modern stock-loading ramp. The most significant heritage resources identified are the historical structures and the potential grave, both of which warrant protection and careful consideration during project planning.

The specialist concluded that the identified heritage resources are localised and do not pose a fatal constraint to the proposed Project. No heritage fatal flaws were identified, and no heritage resources of national or provincial significance were recorded within the Project area.

Based on the assessment findings, the specialist supports the proposed Project from a heritage perspective, provided identified heritage resources are appropriately managed in accordance with the NHRA and the specialist recommendations.

11.9 Palaeontology Impact Assessment

A summary of the Palaeontology Impact Assessment (Butler, 2026) (contained in **Appendix F6**) follows.

11.9.1 Details of Specialist

The details of the specialists that undertook the Palaeontology Impact Assessment are outlined in **Table 23**.

Table 23: Palaeontology Specialist Details

Organisation	Banzai Environmental (Pty) Ltd
Name	E. Butler
Qualification	MSc (Zoology)
Affiliation (if applicable)	Member of the Paleontological Society of South Africa (PSSA)

11.9.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Determine the palaeontological sensitivity of the Project area.
- Verify the sensitivity assigned to the Project area by the Screening Tool.
- Identify palaeontological resources that may occur within the proposed Project footprint.
- Determine whether fossils or fossil-bearing geological formations may be affected by the proposed Project.
- Assess the significance of identified palaeontological resources.
- Identify palaeontological constraints associated with the proposed Project.
- Assess the potential impacts of the proposed Project on palaeontological resources.
- Develop appropriate management recommendations for fossil resources.
- Provide a specialist opinion regarding the acceptability of the proposed Project from a palaeontological perspective.

11.9.3 Methodology

The assessment included the following tasks (amongst others):

- Review of available palaeontological literature, previous specialist studies and published research relating to the geology and fossil heritage of the broader Ventersdorp region.
- Review of geological maps, stratigraphic information and available geoscientific data to determine the geological formations underlying the Project area and their associated fossil potential.
- Review of the SAHRIS Palaeosensitivity Map and associated palaeontological sensitivity classifications applicable to the Project area.
- Assessment of the regional geological setting, including the occurrence and distribution of the Malmani Subgroup formations known to contain fossil-bearing stromatolitic horizons.
- Field verification undertaken on 31 May 2023 to inspect exposed bedrock, weathered outcrops and areas where fossil-bearing material may occur within the proposed Project footprint.
- Identification and documentation of fossil-bearing geological features observed during field investigations, including stromatolitic structures and other palaeontologically significant exposures.
- Assessment of soil cover, weathering profiles and surface exposure conditions to evaluate the likelihood of fossil occurrences being exposed during construction activities.

- ❖ Verification of the palaeontological sensitivity assigned by the Screening Tool and SAHRIS mapping through comparison with site-specific geological and field observations.
- ❖ Evaluation of the significance of identified fossil resources and assessment of their potential vulnerability to disturbance associated with the proposed Project.
- ❖ Development of specialist recommendations and management requirements in accordance with the NHRA and SAHRA requirements.

11.9.4 Key Findings of the Study

The SAHRIS Palaeosensitivity Map assigns a Very High palaeontological sensitivity to the majority of the Project area. This sensitivity is associated with Malmani Subgroup formations, which contain fossil-bearing stromatolitic horizons and other palaeontological material of scientific significance.

A field survey on 31 May 2023 confirmed weathered stromatolitic horizons in exposed Malmani Subgroup outcrops (**Figure 74**). These fossil-bearing formations provide evidence of early microbial life and are recognised as palaeontological resources protected under the NHRA.



Figure 74: Onsite photos of small, discontinuous dolomite outcrops exposed at the surface within the grassveld of the Project footprint

The assessment found that much of the Project area has shallow soil cover and weathered bedrock exposures, creating opportunities for fossil-bearing material to occur near the ground surface. The specialist confirmed that palaeontological resources are likely to occur within portions of the Project area where excavation activities may expose previously buried fossil material.

The study concluded that fossil resources within the Project area are primarily associated with stromatolitic structures preserved in the dolomitic formations underlying the site. The field assessment identified no vertebrate fossils or exceptionally rare palaeontological resources.

The specialist verified that the Very High sensitivity assigned by the screening tools accurately reflects the palaeontological sensitivity of the area. However, the presence of palaeontological material does not represent a fatal flaw to the proposed development and can be appropriately

managed through recognised heritage management procedures. The assessment identified no palaeontological fatal flaws.

11.9.5 Impact Assessment

Please refer to **Section 12.18** for the results of the impact assessment from this study.

11.9.6 Conclusions

The Palaeontological Impact Assessment confirmed that the Project area is underlain by Malmani Subgroup formations containing fossil-bearing stromatolitic horizons and is therefore assigned a Very High palaeontological sensitivity. Field verification confirmed weathered stromatolitic material in parts of the Project area and validated the screening tool's sensitivity classification.

Although fossil-bearing formations occur within the Project area, the specialist identified no palaeontological fatal flaws. The specialist concluded that the identified palaeontological resources can be appropriately managed through recognised heritage management procedures and do not preclude the proposed Project.

Based on the assessment findings, the specialist supports the proposed Project from a palaeontological perspective and considers the development acceptable, subject to compliance with applicable palaeontological management requirements and heritage legislation.

11.10 Visual Impact Assessment

A summary of the Visual Impact Assessment (Smith, 2026) (contained in **Appendix F7**) follows.

11.10.1 Details of Specialist

The details of the specialists that undertook the Visual Impact Assessment are outlined in **Table 24**.

Table 24: Visual Specialist Details

Organisation	ENVASS
Name	D. Smith
Qualification	MSc (Environmental Science)
Affiliation (if applicable)	SACNASP Professional Scientist (Environmental Science – 146281)

11.10.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Assess the visual characteristics and sense of place associated with the Project area.

- Identify visually sensitive receptors that may be affected by the proposed Project.
- Determine the visual absorption capacity of the receiving environment.
- Assess the visibility of the proposed solar PV facility, BESS, MTS, overhead power line, and associated infrastructure.
- Verify the visual sensitivity assigned by the Screening Tool.
- Identify visual constraints associated with the proposed Project.
- Assess potential visual impacts associated with the construction, operational and decommissioning phases of the Project.
- Develop mitigation and management measures to reduce visual impacts where practicable.
- Provide a specialist opinion regarding the acceptability of the proposed Project from a visual perspective.

11.10.3 Methodology

The assessment included the following tasks (amongst others):

- Review of available desktop information, including topographical information, aerial imagery, land cover data, road networks, settlement patterns and regional landscape characteristics.
- Review of the visual sensitivity assigned to the Project area by the Screening Tool and verification of this sensitivity through site-specific assessment.
- Site reconnaissance and field observations to assess landscape character, visual quality, scenic attributes and existing sources of visual disturbance within the Project area and surrounding landscape.
- Identification and mapping of visually sensitive receptors, including farmsteads, residences, roads, settlements and other areas from which the Project may be visible.
- Viewshed analysis and visibility modelling to determine the theoretical extent of visibility associated with the proposed Project components.
- Assessment of landscape sensitivity, viewer incidence, viewer expectations and visual absorption capacity.
- Preparation and assessment of visual simulations to evaluate the likely visual appearance of the proposed Project within the receiving landscape.
- Identification of visual constraints and determination of the compatibility of the proposed Project with the surrounding landscape character.
- Development of specialist findings and recommendations regarding the visual acceptability of the proposed Project.

11.10.4 Key Findings of the Study

A total of 18 representative viewpoints (VPs) were selected throughout the 10 km study area to assess the existing visual character of the landscape, identify visually sensitive receptors and evaluate the potential visibility of the proposed Project from a range of observation locations (**Figure 75**). The viewpoints represent both static receptors, such as farmsteads and rural residences, and transient receptors, including users of the surrounding road network.

The assessment found that the study area is characterised by a predominantly open rural and agricultural landscape with extensive views across cultivated lands, grazing areas and existing farming infrastructure. Although visibility is generally high due to the relatively flat topography and limited vegetation screening, it varies locally with topography, vegetation cover, farm infrastructure, and viewing distance.

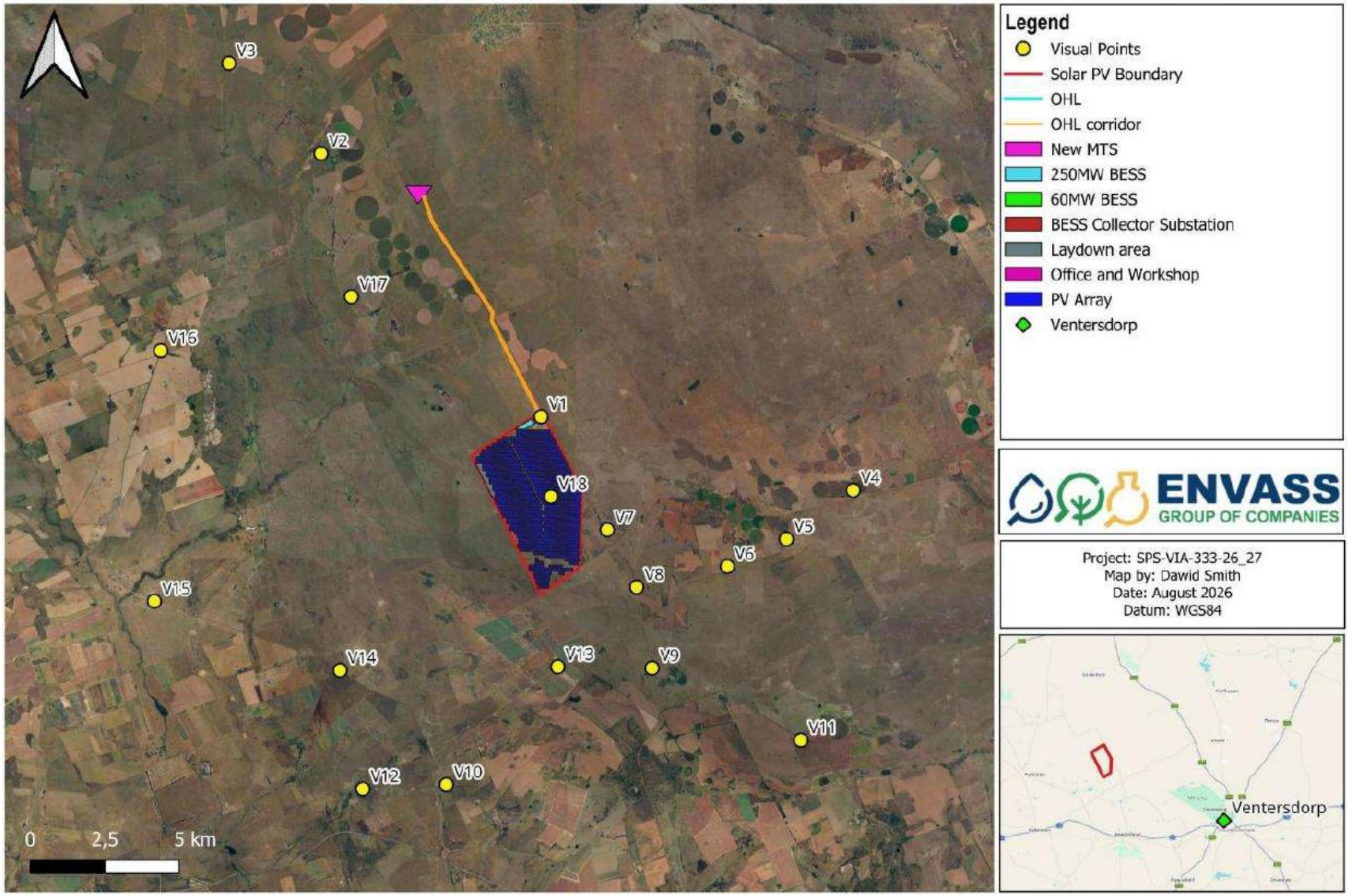

Figure 75: Visual viewpoint locations for the proposed Project

The visual resource value assessment considered the scenic quality, landscape character and overall visual quality of the receiving environment. The study found that the Project area lies within a predominantly rural and agricultural landscape characterised by cultivated land, grazing areas, scattered farmsteads, centre-pivot irrigation systems, roads and existing electrical infrastructure. While the area retains an open rural character and sense of place, agricultural and infrastructure-related activities have already modified the landscape. Consequently, the study area's visual resource value was not considered exceptionally high or unique in a regional context. The assessment concluded that the landscape has moderate visual resource value and can accommodate additional infrastructure, provided appropriate mitigation measures are implemented. **Table 25** summarises the results of the visual resource value assessment.

Table 25: Visual resource value determination

Visual Baseline Attributes	Visual resource value score
Topography	2
Hydrology	1
Vegetation	2
Land Uses	2
Total	7

The Visual Absorption Capacity (VAC) assessment evaluated the ability of the receiving environment to visually absorb or screen the proposed Project. Factors considered included topography, vegetation cover, landscape complexity and existing infrastructure. The assessment found that the Project area has relatively flat terrain, limited opportunities for topographic screening, and generally low vegetation cover, resulting in low VAC across much of the study area. Consequently, larger Project components, including the Solar PV facility, MTS, BESS and OHL, are expected to remain visually apparent within portions of the surrounding landscape. The low VAC reflects the landscape's open nature and contributes to the area's overall visual sensitivity. Consequently, a high weighting factor (1.2) was applied to the VAC component of the visual impact assessment.

The Visual Impact Assessment identified both static and transient visual receptors within the study area. Static receptors comprise scattered farmsteads, rural residences and residents within the broader area who may experience prolonged or repeated views of the proposed development. Transient receptors primarily include motorists travelling along the R53, N14 and local farm roads that traverse the surrounding agricultural landscape. Although the open landscape allows relatively extensive visibility, the study found that the number of people likely to view the Project is comparatively low and widely dispersed. The assessment concluded that both static and transient receptors exhibit moderate sensitivity to visual change because of the landscape's existing modified nature and the presence of agricultural and electrical infrastructure. Based on the receptor sensitivity assessment, the number of potentially affected viewers was classified as low (fewer than 100 people), resulting in a low receptor weighting factor (0.8) for the visual impact assessment.

A viewshed analysis undertaken as part of the Visual Impact Assessment assessed the theoretical visibility of the proposed Solar PV facility, BESS, MTS and OHL infrastructure within a 10 km study area. The analysis utilised a Digital Elevation Model (DEM) and GIS software to evaluate the Zone of Visual Influence (ZVI) associated with the proposed Project. Separate viewshed analyses were undertaken for the Solar PV facility (5 m height) (**Figure 76**) and the OHL infrastructure (19 m height) (**Figure 77**) to account for the differing visual characteristics of these Project components. The specialist then verified the theoretical visibility assessment through field observations from the eighteen representative viewpoints distributed throughout the study area. The assessment concluded that the Project exhibits a High visibility rating, as more than half of the study area falls within the theoretical ZVI. However, the specialist noted that viewshed analyses provide conservative estimates of visibility and do not account for local screening effects associated with vegetation, farm infrastructure or buildings.

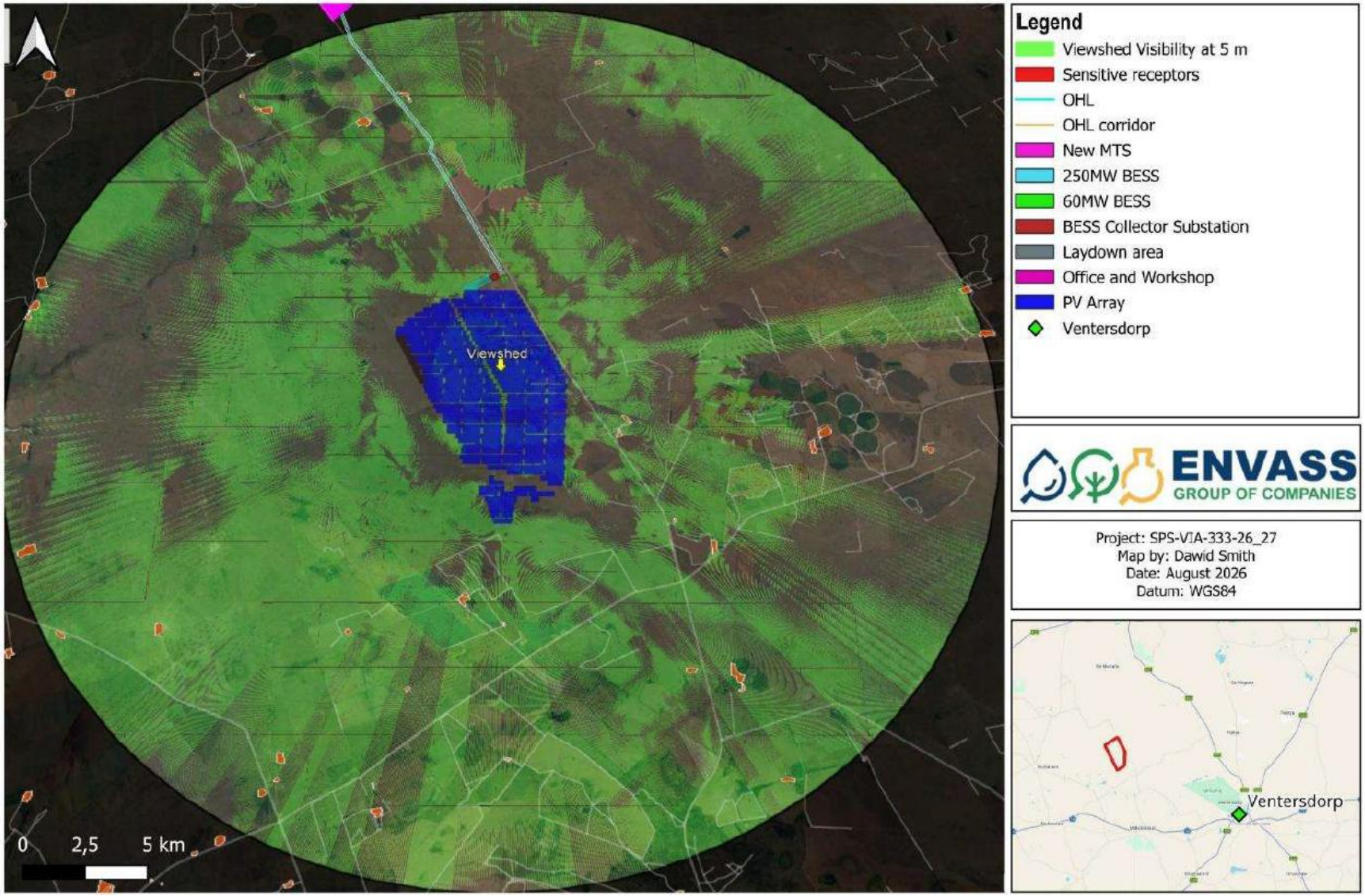

Figure 76: Viewshed analysis illustrating the potential visibility of the proposed solar development at 5 m

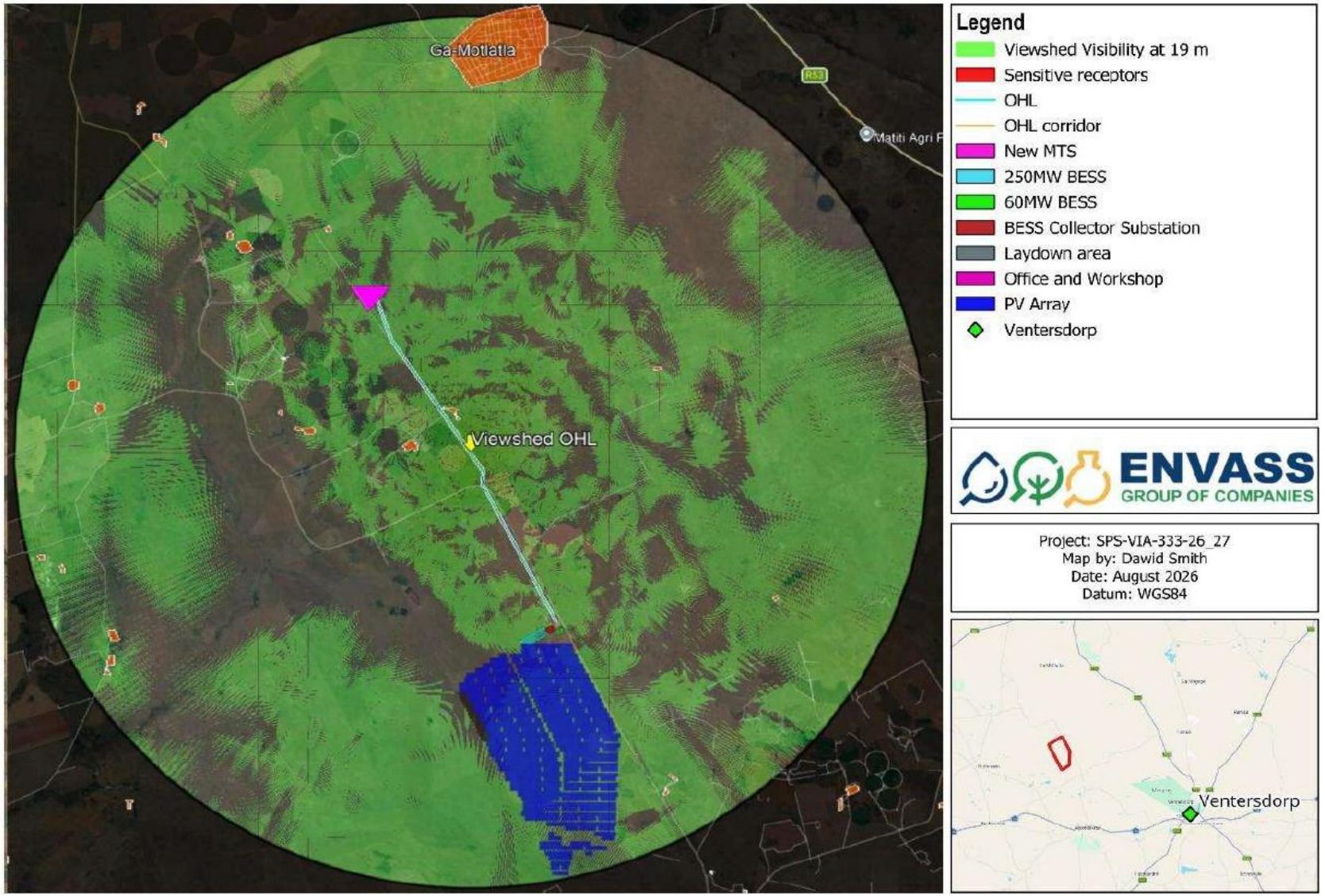

Figure 77: Viewshed analysis illustrating the potential visibility of the proposed OHL development at 19 m

The visual intrusion assessment considered how the proposed Solar PV facility, BESS, MTS, and OHL infrastructure would alter the existing visual character of the receiving environment. The assessment found that the Project will introduce large-scale engineered infrastructure into a predominantly rural and agricultural landscape currently characterised by cultivated lands, grazing areas, farmsteads and existing utility infrastructure. While some visual precedent already exists in the form of agricultural and electrical infrastructure, the Solar PV facility's extensive footprint and geometric appearance, together with the vertical elements associated with the OHL and MTS, are expected to increase visual modification within the study area. The degree of visual intrusion is expected to vary with viewing distance, orientation, local screening, and receptor location, with the greatest intrusion anticipated at viewpoints closest to the development footprint. Nevertheless, the assessment concluded that the receiving landscape has already been modified to an extent that reduces the perceived severity of visual intrusion when considered within the regional context.

The visual exposure assessment considered the extent to which identified receptors may be exposed to views of the proposed Project and the significance of those views. The Visual Impact Assessment identified scattered rural residences and farmsteads as the primary static receptors, together with motorists and travellers using the R53, N14 and local farm roads as the principal transient receptors. Distance from the Project, local topography, vegetation, farm infrastructure, and the orientation of individual receptors influenced visual exposure. Although the open landscape provides relatively extensive visibility, the study area has relatively few sensitive receptors, which are broadly dispersed. Static receptors may experience repeated or prolonged views of the Project and are therefore considered more sensitive to visual change, while transient receptors are expected to experience temporary and intermittent visual exposure. Overall, the Visual Impact Assessment concluded that both static and transient receptors exhibit moderate visual sensitivity. However, the relatively low receptor incidence, dispersed settlement pattern, and existing modifications to the receiving environment reduce the overall significance of visual exposure associated with the proposed Project.

11.10.5 Impact Assessment

Please refer to **Section 12.19** for the results from the impact assessment from this study.

11.10.6 Conclusions

The Visual Impact Assessment confirmed that the proposed Project will introduce a large-scale Solar PV facility and associated infrastructure into a predominantly rural and agricultural landscape. Although the study area retains an open rural character and is generally highly visible, agricultural activities, roads, and existing electrical infrastructure have already modified the landscape.

The assessment found that the study area has moderate visual resource value, low VAC, and moderate visual receptor sensitivity. While the Project will alter the visual character of the local

landscape and be visible from portions of the surrounding area, the number of sensitive receptors is relatively low and geographically dispersed.

The specialist concluded that the proposed Project is visually acceptable and that the recommended mitigation measures can reduce visual impacts to acceptable levels. The specialist identified no visual fatal flaws and supports the proposed Project from a visual perspective.

11.11 Social Impact Assessment

A summary of the Social Impact Assessment (Tanhuke and Chidley, 2026) (contained in **Appendix F8**) follows.

11.11.1 Details of Specialist

The details of the specialists that undertook the Social Impact Assessment are outlined in **Table 26**.

Table 26: Social Specialist Details

Organisation	Nemai Consulting	
Name	C. Tanhuke	C. Chidley
Qualification	BA Honours (Environmental Management)	▪ BA (Economics) ▪ BSc Eng (Civil); MBA
Affiliation (if applicable)	-	-

11.11.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- ❖ Describe the social baseline conditions that may be affected by the proposed Project.
- ❖ Determine the social characteristics and socio-economic profile of the receiving environment.
- ❖ Identify the potential social issues associated with the proposed Project.
- ❖ Assess the potential positive and negative social impacts associated with the planning, construction, operational and decommissioning phases of the Project.
- ❖ Evaluate employment, procurement, skills development and local economic development opportunities associated with the proposed Project.
- ❖ Identify social risks, opportunities and constraints relating to the proposed Project.
- ❖ Develop appropriate mitigation and enhancement measures to address identified impacts.
- ❖ Provide recommendations regarding the social acceptability of the proposed Project and preferred Project alternatives

11.11.3 Methodology

The assessment included the following tasks (amongst others):

- ❖ Review of available demographic, socio-economic, institutional and planning information relevant to the regional and local study area.
- ❖ Review of Census 2022 information, municipal planning documents and other publicly available socio-economic datasets.
- ❖ Desktop assessment of baseline social and economic conditions, including demographic characteristics, livelihoods, employment, income, service delivery and institutional structures.
- ❖ GIS analysis to assess settlement patterns, land use characteristics, infrastructure and socio-economic features within the study area.
- ❖ Public participation processes undertaken during the Scoping and EIA phases to obtain stakeholder input and identify social issues relevant to the Project.
- ❖ Rapid Rural Assessment investigations to assess local social dynamics, infrastructure, community resources and development constraints.
- ❖ Stakeholder consultations with community members, landowners, farm workers and other affected and interested parties within the study area.
- ❖ Key informant interviews undertaken to obtain site-specific information regarding local livelihoods, economic activities, community concerns and development opportunities.
- ❖ Site visits undertaken in January 2023 and August 2026 to verify socio-economic baseline conditions and assess the receiving environment.
- ❖ Assessment of potential social impacts associated with the planning, construction, operation and decommissioning phases of the proposed Project.
- ❖ Development of mitigation and enhancement measures aimed at reducing negative impacts and maximising socio-economic benefits.

11.11.4 Key Findings of the Study

The Social Impact Assessment identified the receiving environment as a predominantly rural and agriculture-based area comprising portions of JB Marks LM and Ditsobotla LM. The local study area has an estimated population of approximately 10 000 residents and is characterised by dispersed settlements, commercial farming operations and low-density rural homesteads. The study found that while local employment opportunities should be prioritised where possible, the wider municipal labour market is likely to provide a significant proportion of the skilled and semi-skilled workforce required by the proposed Project.

The assessment found that agriculture remains the dominant land use and primary source of livelihoods within the study area. Economic activities centre on crop production, livestock farming, game farming, and seasonal agricultural employment, supplemented by regenerative agricultural activities, tourism-related enterprises, grain storage facilities, and limited mining activities. Agriculture was identified as the primary contributor to local economic sustainability, with employment opportunities largely linked to seasonal production cycles and farming operations.

Stakeholder engagement and site investigations highlighted strong social networks and long-standing relationships between farming communities and nearby settlements. These

relationships have contributed to a well-established rural cultural landscape characterised by social cohesion, interdependence and strong links between landowners, farm workers and surrounding communities. Traditional leadership structures remain relevant within the broader social environment, particularly within Ga-Motlatla, which maintains social and economic links to the surrounding agricultural sector.

The assessment identified several socio-economic challenges within the receiving environment. Farmworker households, in particular, largely depend on farming operations and landowners for access to basic services. Stakeholders noted concerns about the reliability of electricity and water supply, limited sanitation infrastructure, restricted access to healthcare services, and poor conditions on secondary gravel roads. Public transport services are limited, resulting in heavy reliance on employer-provided transport, school transport services, and private vehicles.

A Rapid Rural Assessment and stakeholder engagement process were undertaken to obtain community input and understand local perceptions of the proposed Project. The assessment found that stakeholder perceptions towards the Project are generally positive, with many respondents identifying employment creation, local procurement opportunities, skills development and broader economic stimulation as key potential benefits. Several stakeholders also indicated that the Project could contribute to local economic development and potentially support related agricultural and tourism activities in the area.

Despite the generally favourable response to the Project, stakeholders also raised several concerns. These included the potential loss of productive agricultural land; uncertainty about the extent of local community benefits; limited livelihood opportunities for youth and women; inadequate skills development opportunities; deteriorating road infrastructure; and challenges in service provision for vulnerable groups. The assessment concluded that targeted mitigation and enhancement measures can address these concerns, including local employment commitments, skills development programmes, transparent recruitment processes, local procurement initiatives, and appropriate community investment programmes. **Table 27** summarises the key stakeholder concerns and recommended enhancement measures identified during the assessment.

Table 27: Summary of the community attitudes and recommended enhancement measures

Key Needs / Issues Identified	Recommended Mitigation / Enhancement Measures
Limited livelihood and economic opportunities within surrounding farming communities, particularly for women and youth.	▪ Prioritise local employment and procurement opportunities during the construction and operational phases. ▪ Encourage the participation of women, youth, and historically disadvantaged individuals in project-related employment and supplier opportunities. ▪ Support community development initiatives that promote economic diversification and sustainable livelihood opportunities beyond seasonal agricultural employment. ▪ Communicate employment and procurement opportunities transparently to surrounding communities.
Limited skills development opportunities for youth and	▪ Develop and implement skills development and training programmes targeting matriculants, school leavers, unemployed youth, and women.

Key Needs / Issues Identified	Recommended Mitigation / Enhancement Measures
unemployed community members.	▪ Where feasible, provide technical training, apprenticeships, internships, or mentorship opportunities linked to project activities. ▪ Promote exposure to renewable energy technologies and other sustainable industry skills that may improve future employability.
Poor road infrastructure and accessibility. Local roads are predominantly gravel and are prone to erosion, potholes, and deterioration following rainfall events.	▪ Ensure that project-related traffic does not unnecessarily damage existing road infrastructure. ▪ Implement Road maintenance measures where project activities contribute to road deterioration. ▪ Liaise with local authorities and landowners regarding access routes and road condition management during construction. ▪ Where practicable, support improvements to road safety and accessibility along frequently used project access routes.
Concerns regarding the well-being of elderly residents within farming communities, including access to services, healthcare, and suitable living conditions.	▪ Support community investment initiatives that contribute to the well-being of vulnerable groups, including the elderly. ▪ Facilitate engagement with local stakeholders to identify priority community needs. ▪ Promote safe working and living environments and ensure that community development initiatives consider the needs of elderly and vulnerable residents.

The assessment identified no social fatal flaws. Furthermore, the assessment concluded that the proposed Project could provide meaningful socio-economic benefits to the local and regional economy, particularly through temporary employment creation, local procurement, skills development, and enterprise development opportunities.

11.11.5 Impact Assessment

Please refer to **Section 12.26** for the results of the impact assessment from this study.

11.11.6 Conclusions

The Social Impact Assessment confirmed that the proposed Project is located in a predominantly rural, agriculture-based receiving environment where livelihoods are strongly linked to commercial farming, seasonal agricultural employment, and related economic activities. The assessment identified both socio-economic challenges and development opportunities within the study area, including limited employment opportunities, constrained service delivery, and the need for skills development and economic diversification.

Stakeholder engagement indicated generally positive perceptions of the proposed Project, particularly its potential to create employment opportunities, support local businesses, stimulate economic activity, and contribute to skills development. Concerns raised by stakeholders primarily related to the potential loss of agricultural land, equitable distribution of benefits, road infrastructure and the need for transparent recruitment and procurement processes.

The specialist concluded that the proposed Project has the potential to generate meaningful socio-economic benefits at both local and regional levels, particularly through employment creation, local procurement, enterprise development and skills transfer opportunities. No social fatal flaws were identified, and the specialist supports the proposed Project from a social perspective, subject to implementing the recommended mitigation and enhancement measures.

11.12 Geotechnical and Dolomite Desktop Study

A summary of the Geotechnical and Dolomite Desktop Study (Naturevhudi Group, 2026) (contained in **Appendix G**) follows.

11.12.1 Details of Specialist

The details of the specialists that undertook the Geotechnical and Dolomite Desktop Study are outlined in **Table 28**.

Table 28: Geotechnical Specialist Details

Organisation	Naturevhudi Group
Name	T.W. Muofhe
Qualification	B-Tech in Geology
Affiliation (if applicable)	SACNASP (400639/15)

11.12.2 Objectives of the Study

The following tasks were completed in fulfilment of the terms of reference for this study:

- Assess the regional geological, geotechnical and dolomitic conditions underlying the proposed Project area.
- Identify potential geotechnical constraints that may influence the design, construction and operation of the proposed Project infrastructure.
- Assess the occurrence of dolomite and the potential implications of dolomitic ground conditions for the proposed Project.
- Review available geotechnical investigation data and previous site investigations undertaken within the Project area.
- Identify areas requiring additional geotechnical and dolomite investigations prior to detailed design.
- Provide geotechnical recommendations regarding the suitability of the site for the proposed development.

11.12.3 Methodology

The assessment included the following tasks (amongst others):

- Review of available geological, geotechnical and hydrogeological information applicable to the Project area.
- Desktop assessment of regional geology, climate, topography, seismicity and land use characteristics.
- Review of previous geotechnical investigations, including test pit data, laboratory testing, Dynamic Probe Super Heavy (DPSH) testing and associated geotechnical findings.
- Assessment of the geological setting and occurrence of dolomite and chert associated with the Malmani Subgroup.

- ❖ Evaluation of potential geotechnical constraints affecting foundations, roads and associated infrastructure.
- ❖ Assessment of potential dolomite-related instability hazards and compliance requirements associated with development on dolomitic land.
- ❖ Preparation of recommendations regarding further investigation requirements and site suitability.

11.12.4 Key Findings of the Study

The Geotechnical and Dolomite Desktop Study found that the Project area is characterised by gently undulating agricultural land underlain predominantly by dolomite and chert of the Malmani Subgroup. These geological formations are known to present potential geotechnical and dolomite-related constraints that require consideration during the planning, design and construction phases of the proposed Project. The desktop assessment confirmed that the site occurs within a region where dolomitic conditions may result in the formation of sinkholes, subsidence features and other ground instability hazards if not appropriately investigated and managed.

The study reviewed historical geotechnical investigations previously undertaken within a portion of the Project area. These investigations identified a variable subsurface profile comprising transported soils, residual chert material and weathered dolomitic formations. Laboratory testing indicated that the transported and residual soils generally comprise silty sands, clayey sands and clayey gravels exhibiting low expansiveness and favourable subgrade characteristics. The assessment found that the tested materials are generally suitable for construction purposes; however, considerable variability in the depth, composition and engineering properties of subsurface materials is expected across the broader Project footprint. The principal geotechnical findings of the study are summarised in **Table 29**.

Table 29: Summary of geotechnical and dolomite constraints identified during the assessment

Geotechnical Aspect	Key Finding	Development Implication
Geology	Site underlain by dolomite and chert of the Malmani Subgroup	Potential dolomite-related instability requires further investigation
Soil Conditions	Variable transported and residual soils identified across the site	Different foundation solutions may be required in different areas
Ground Conditions	Variable subsurface conditions expected across the development footprint	Additional geotechnical investigations required prior to detailed design
Dolomite Stability	No dolomite stability investigation completed at the time of assessment	Feasibility-level dolomite stability assessment required
Compliance Requirements	Development located on dolomitic land	Compliance with SANS 1936 requirements required
Fatal Flaw Status	No geotechnical fatal flaws identified	Site considered potentially suitable for development

The investigation further identified that different foundation requirements may be needed across the Project area due to variations in ground conditions. As a result, the study concluded that the available geotechnical information is insufficient for detailed engineering design across the entire Project footprint. Additional geotechnical investigations will therefore be required during the detailed design phase to verify founding conditions and inform final

infrastructure design. The specialist recommended additional test pits, DPSH testing, laboratory testing and geophysical investigations to adequately characterise subsurface conditions across the site.

A key finding of the study was the presence of dolomitic geology beneath the Project area. Although the site is confirmed to be underlain by dolomite, no dedicated dolomite stability investigation had been undertaken at the time of the assessment. Consequently, the site's Inherent Hazard Class (IHC), Dolomite Risk Classification and Dolomite Area Designation could not be determined. In accordance with the requirements of SANS 1936, the specialist recommended that a feasibility-level dolomite stability investigation be completed prior to development. This investigation should include percussion borehole drilling, gravity geophysical surveys and hydrogeological investigations to assess potential subsidence and sinkhole risks.

The assessment highlighted that all future infrastructure design, construction and operational activities should take cognisance of SANS 1936 requirements applicable to development on dolomitic land. The assessment placed particular emphasis on stormwater management, water leakage prevention, drainage control, and long-term monitoring measures to reduce the likelihood of dolomite-related instability. The study also recommended that the detailed design of the solar facility consider the possibility of localised ground movement and the potential loss of isolated infrastructure elements if dolomitic instability occurs.

Despite the dolomitic geology and the need for additional investigations, the desktop study did not identify any geotechnical or dolomite-related fatal flaws that would preclude development of the proposed Project. The assessment concluded that the site is potentially suitable for the proposed Solar PV facility, BESS, MTS and associated grid infrastructure, provided that the recommended geotechnical investigations and dolomite stability assessments are undertaken and incorporated into the detailed engineering design process.

11.12.5 Impact Assessment

Please refer to **Section 12.11** for the results of the impact assessment from this study.

11.12.6 Conclusions

The Geotechnical and Dolomite Desktop Study confirmed that the proposed Project area is underlain by dolomite and chert formations associated with the Malmani Subgroup. While the assessment identified variability in subsurface conditions and the presence of dolomitic geology, no geotechnical fatal flaws were identified that would prevent development of the proposed Project.

The assessment concluded that the Project area is potentially suitable for the proposed Project, subject to the completion of detailed geotechnical investigations and a feasibility-level dolomite stability assessment in accordance with SANS 1936 requirements. These investigations will be required to confirm founding conditions, assess dolomite-related risks and provide site-specific design recommendations for the proposed infrastructure.

The specialist supports the proposed Project from a geotechnical perspective, provided that the recommendations in the study are implemented and incorporated into the Project's detailed design, construction, and operational phases.

12 IMPACT ASSESSMENT

12.1 General

This section focuses on the potential environmental impacts that may occur during the pre-construction, construction, and operational phases of the Project.

Note that an 'impact' refers to the change to the environment resulting from an environmental aspect (or activity), whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.

Potential impacts were identified as follows:

- Impacts associated with listed activities contained in the EIA Regulations' Listing Notices;
- Impacts identified during the Scoping phase;
- An appraisal of the Project's activities and components;
- An assessment of the receiving biophysical, social, economic and built environments;
- Findings from specialist studies;
- Issues highlighted by environmental authorities; and
- Comments received during public participation from I&APs.

12.2 Impacts Associated with Listed Activities

As mentioned, the Project requires an EA for certain activities listed in the EIA Regulations, which serve as triggers for the EIA. The potential impacts associated with the key listed activities are broadly stated in **Table 30**.

Table 30: Potential Impacts associated with the key listed activities

Listed Activities	Potential Impact Overview
GN No. 327 of 7 April 2017 (Listing Notice 1)	
GN No. R. 327 – Activity 11(i): *The development of facilities or infrastructure for the transmission and distribution of electricity* *(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or* *(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more,* *excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.*	▪ Loss, transformation and fragmentation of natural habitat and vegetation associated with the powerline footprint and supporting infrastructure. ▪ Disturbance and displacement of fauna, including avifauna, during construction and operation. ▪ Collision and electrocution of avifauna associated with overhead electrical infrastructure. ▪ Soil disturbance, compaction, erosion and loss of topsoil resulting from vegetation clearance, excavations, tower foundations and construction access. ▪ Disturbance or destruction of archaeological, historical and palaeontological resources through excavation and other ground-disturbing activities. ▪ Visual intrusion and alteration of the rural landscape character associated with overhead powerline infrastructure. ▪ Temporary construction-related dust, noise and traffic disturbance.

Listed Activities	Potential Impact Overview
GN No. R.327 – Activity 12(ii): *The development of* *(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) infrastructure or structures with a physical footprint of 100 square metres or more,* *where such development occurs* *(a) within a watercourse;* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse,* *excluding* *(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;* *(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;* *(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;* *(dd) where such development occurs within an urban area;* *(ee) where such development occurs within existing roads road reserves or railway line reserves; or* *(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of the development and where indigenous vegetation will not be cleared.*	▪ Alteration of wetland hydrology, drainage patterns and runoff. ▪ Erosion and increased sedimentation of wetland systems. ▪ Deterioration of water quality through contamination and pollution. ▪ Disturbance or degradation of wetland habitat and ecological functioning. ▪ Disturbance of wetland-associated fauna and vegetation. ▪ Soil disturbance and compaction associated with construction activities in proximity to wetland areas.
GN No. R. 327 – Activity 28(ii): *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes*	▪ Loss or restriction of land currently available for agricultural activities and livestock grazing. The agricultural specialist confirms current land use is primarily livestock grazing. ▪ Fragmentation and disturbance of agricultural activities. ▪ Disturbance of farm operations, livestock, equipment and private property. ▪ Soil disturbance, compaction, erosion and loss of topsoil. ▪ Construction-related traffic, access, safety and security impacts on surrounding agricultural properties. ▪ Alteration of the rural/agricultural landscape character and sense of place.
GN No. 325 of 7 April 2017 (Listing Notice 2)	
GN No. R.325 – Activity 1: *The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs* *(a) within an urban area; or* *(b) on existing infrastructure.*	▪ Loss, transformation and fragmentation of natural vegetation and faunal habitat. ▪ Disturbance and displacement of fauna, including avifauna. ▪ Direct wildlife mortality, collision, electrocution, entrapment and snagging associated with project infrastructure. ▪ Spread or establishment of alien and invasive vegetation following disturbance. ▪ Alteration of surface runoff, drainage and hydrological processes. ▪ Erosion, sedimentation and contamination of wetlands/watercourses. ▪ Soil erosion, compaction, topsoil loss, contamination and altered infiltration.

Listed Activities	Potential Impact Overview
	▪ Loss/restriction and fragmentation of agricultural and grazing land. ▪ Disturbance or destruction of archaeological, historical and palaeontological resources during ground disturbance. ▪ Landscape transformation, visual intrusion, glint/glare and night-time illumination. ▪ Construction-related dust, noise, vibration and traffic disturbance. ▪ Increased traffic and deterioration of local/gravel roads. ▪ Workforce influx, employment expectations, pressure on services, and community safety and security concerns. ▪ Positive employment, procurement, skills-development and local economic impacts. ▪ Waste generation and associated soil, water, health, safety and visual pollution risks if inadequately managed. ▪ Fire and explosion risks associated with the BESS.
GN No. R.325 – Activity 9: *The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex, excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is* *(a) temporarily required to allow for maintenance of existing infrastructure;* *(b) 2 kilometres or shorter in length;* *(c) within an existing transmission line servitude; and* *(d) will be removed within 18 months of the commencement of development.*	▪ Loss, transformation and fragmentation of natural vegetation and habitat associated with transmission infrastructure. ▪ Disturbance and displacement of fauna, including avifauna. ▪ Collision and electrocution of avifauna associated with overhead electrical infrastructure. ▪ Soil disturbance, compaction, erosion and topsoil loss associated with foundations, access and construction. ▪ Disturbance or destruction of archaeological, historical or palaeontological resources during excavation and ground disturbance. ▪ Visual intrusion and long-term alteration of landscape character due to the vertical prominence of OHL/MTS infrastructure. ▪ Loss or restriction of agricultural/grazing land and disturbance of farming activities. ▪ Construction traffic, access disturbance and safety/security risks.
GN No. R.325 – 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 purposes undertaken in accordance with a maintenance management plan*	▪ Direct loss and transformation of indigenous vegetation and natural habitat. ▪ Habitat fragmentation, edge effects and reduced ecological connectivity. ▪ Disturbance and displacement of fauna, including avifauna. ▪ Loss or disturbance of habitat potentially used by species of conservation concern. ▪ Establishment or spread of alien and invasive vegetation following clearance and disturbance. ▪ Soil exposure, erosion, compaction and loss of topsoil. ▪ Alteration of runoff and increased sediment mobilisation into wetland/watercourse systems. ▪ Loss/reduction of vegetation available for livestock grazing. ▪ Visual alteration of the landscape through vegetation clearance and subsequent infrastructure development. ▪ Potential disturbance of archaeological and palaeontological resources during vegetation clearance and subsequent ground disturbance.

Listed Activities	Potential Impact Overview
GN No. 324 of 7 April 2017 (Listing Notice 3)	
GN No. R.324 – Activity 4(h)(iv): The development of a road wider than 4 metres with a reserve less than 13.5 metres. (h) North West (i) A protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation; (ii) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; (iii) Sites or areas identified in terms of an international convention; (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; (v) Core areas in biosphere reserves; (vi) Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve; (vii) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or (viii) All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act 25 of 1999).	▪ Loss and fragmentation of natural vegetation and habitat within the CBA. ▪ Reduction in ecological connectivity and impediment to fauna movement. ▪ Disturbance and displacement of fauna associated with road construction and use. ▪ Soil stripping, compaction, erosion and loss of topsoil. ▪ Altered surface runoff and drainage associated with road construction. ▪ Increased sedimentation and potential contamination of downstream wetlands/watercourses. ▪ Fragmentation or restriction of grazing and agricultural activities. ▪ Increased construction traffic, road-safety risks and disturbance of local access. ▪ Visual disturbance associated with vegetation clearance, earthworks and road infrastructure.
GN No. R.324 – Activity 12(h)(iv)&(vi): The clearance of an area of 300 square metres or more of indigenous vegetation, except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (h) North West (i) World Heritage Sites; core of biosphere reserve; or sites or areas identified in terms of an international convention; (ii) A protected area including municipal or provincial nature reserves as contemplated by NEMPAA or other legislation; (iii) All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act 25 of 1999); (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; (v) Sensitive areas as identified in an environmental management framework as contemplated in Chapter 5 of the Act and as adopted by the competent authority; or (vi) Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.	▪ Loss and transformation of indigenous vegetation and natural habitat within sensitive/CBA areas. ▪ Habitat fragmentation and loss of ecological connectivity. ▪ Disturbance and displacement of fauna, including avifauna. ▪ Alteration of wetland hydrology, drainage and runoff. ▪ Erosion and sedimentation of wetlands and associated aquatic habitat. ▪ Water-quality deterioration through contamination and pollution. ▪ Degradation of wetland habitat and ecological functioning. ▪ Soil exposure, erosion, compaction and topsoil loss following vegetation clearance. ▪ Establishment or spread of alien and invasive vegetation within disturbed areas. ▪ Loss/reduction of vegetation available for grazing. ▪ Visual alteration of the existing rural landscape through vegetation clearance and infrastructure development.

12.3 Comments Raised by Organs of State and I&APs

The comments raised by authorities (both regulatory and commenting) and I&APs to date during the execution of the EIA are captured and addressed in the CRR (refer to **Appendix I**).

The consolidated comments raised by authorities and I&APs have been succinctly grouped into the following main categories (*note: please refer to the CRR for a comprehensive and accurate representation of the issues raised*):

- Alternatives Assessment and Identification of the BPEO
  - Assessment of alternative development footprints, layouts and infrastructure configurations.
  - Assessment of technology alternatives, including BESS technology options.
  - Consideration of alternative grid connection infrastructure and corridor feasibility.
  - Comparative assessment of alternatives, including the No-Go Alternative.
  - Identification and motivation of the BPEO.
- Need and Desirability
  - Demonstration of the need and desirability of the proposed Project at the selected location.
  - Consideration of environmental opportunities and constraints associated with the site.
  - Relationship between renewable energy objectives and local environmental sensitivities.
  - Confirmation of the environmental acceptability of the preferred Project footprint.
- Specialist Studies and Impact Assessment
  - Biodiversity, avifaunal and ecological impacts.
  - Wetland and aquatic resource impacts.
  - Agricultural impacts and implications for land capability.
  - Heritage, archaeological and palaeontological impacts.
  - Visual and landscape impacts.
  - Geotechnical, geological and geohydrological considerations.
  - Social and socio-economic impacts.
  - Assessment of groundwater, dolomitic and environmental risks.
  - Specialist methodologies, qualifications and compliance with applicable protocols.
- Cumulative Impact Assessment
  - Assessment of cumulative impacts associated with existing, approved and reasonably foreseeable developments.
  - Assessment of cumulative impacts on biodiversity, avifauna, agricultural resources and environmental corridors.
  - Receptor-based cumulative impact assessment and specialist study areas.
  - Assessment of cumulative impacts associated with regional renewable energy developments and supporting infrastructure.
- Existing Infrastructure and Grid Connection Infrastructure
  - Assessment of impacts associated with the MTS and associated powerline infrastructure.
  - Potential impacts on existing Eskom and telecommunications infrastructure.
  - Wayleave requirements and infrastructure protection measures.
  - Clearance requirements, maintenance access and infrastructure servitudes.
  - Compatibility with existing utilities and associated infrastructure.
- Land Use Compatibility and Third-Party Interests
  - Compatibility of the proposed Project with surrounding and future land uses.
  - Feasibility of the proposed infrastructure corridor.

- Consideration of existing third-party development interests and associated infrastructure requirements.
- Potential interactions with future renewable energy and grid infrastructure developments.

❖ Legislative Compliance and Authorisation Requirements
- Agricultural approval requirements and associated compliance obligations.
- Water use authorisation requirements.
- Heritage and biodiversity approval requirements.
- Compliance with applicable environmental legislation, protocols and specialist reporting requirements.
- Identification of permits and authorisations required for implementation of the Project.

❖ BESS, Health and Safety
- Final BESS technology considerations and associated environmental risks.
- Hazardous substances and waste management requirements.
- Fire risk assessment and emergency response planning.
- Management of contaminated firewater and hazardous incidents.
- OHS requirements during construction, operation and decommissioning.
- Health and safety considerations associated with existing infrastructure and services.

These issues received further attention during the EIA investigations, including the environmental specialist studies.

12.4 Project Activities

To understand the Project's impacts, it is necessary to unpack the activities associated with the Project life-cycle, as outlined in the sub-sections that follow.

12.4.1 Project Phase: Pre-Construction

Some of the main Project activities, as well as high-level environmental activities, to be undertaken in the pre-construction phase are listed in **Table 31**.

Table 31: Simplified list of activities associated with Pre-Construction Phase

Project Phase: Pre-construction
Project Activities
Negotiations and agreements with the affected landowner, stakeholders and authorities
Lease Agreement
Registration of power line servitude
Detailed engineering design
Detailed geotechnical investigations, including dolomitic stability assessment
Survey and mark development
Procurement process for Contractor
Review Contractor's method statements (as relevant)
Establish new access roads and undertake selective improvements to existing access roads to facilitate the delivery of construction plant and materials

Project Phase: Pre-construction
Arrangements for accommodation of construction workers (off site)
The building of a site office and ablution facilities
Confirmation of the location and condition of all structures and infrastructure on the PV Site
Determining and documenting the conditions of the roads to be used during construction
Fencing off PV Site
High Level Environmental Activities
Diligent compliance monitoring of the EMPr, Environmental Authorisation and other relevant environmental legislation
Pre-construction environmental survey
Develop Environmental Monitoring Programme (air quality, water quality, noise, traffic, social)
Barricading of sensitive environmental features (e.g. wetland buffer)
Obtain permits for impacts to SCC, if avoidance is not possible (if required)
Obtain permits if heritage resources are to be impacted and for the relocation of graves (if required)
Ongoing consultation with I&APs
Other activities as per EMPr

12.4.2 Project Phase: Construction

Some of the main Project activities, as well as high-level environmental activities, to be undertaken in the construction phase are listed in **Table 32**.

Table 32: Simplified list of activities associated with Construction Phase

Project Phase: Construction
Project Activities
Site establishment
Relocation of existing structures and infrastructure
Prepare access roads
Establish construction laydown area
Bulk fuel storage
Delivery of construction material
Transportation of equipment, materials and personnel
Storage and handling of material
Construction employment
Site clearing (as necessary)
Excavation
Concrete Works
Mechanical and Electrical Works
Electrical supply
Material delivery and offloading
Construction of PV Plant infrastructure
Stockpiling
Stringing of transmission lines
Waste and wastewater management
High-Level Environmental Activities
Diligent compliance monitoring of the EMPr, Environmental Authorisation and other relevant environmental legislation

Project Phase: Construction
Implement Environmental Monitoring Programme (air quality, water quality, noise, traffic, social)
Reinstatement and rehabilitation of construction domain (as necessary)
Ongoing consultation with I&APs
Other activities as per EMPr

12.4.3 Project Phase: Operation

Some of the main Project activities, as well as high-level environmental activities, to be undertaken in the operational phase are listed in **Table 33**.

Table 33: Simplified list of activities associated with Operational Phase

Project Phase: Operation
Project Activities
Testing and commissioning the facility's components
Cleaning of PV modules
Servitude access arrangements and requirements
Routine maintenance inspections of power lines and servitudes
Controlling vegetation
Managing stormwater and waste
Conducting preventative and corrective maintenance
Ongoing consultation with directly affected parties
Monitoring of the facility's performance
High Level Environmental Activities
Ongoing consultation with I&APs
Other activities as per EMPr for Operational Phase

12.5 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact.

The environmental aspects that have been identified for the proposed Project, which are linked to the Project activities, are provided in **Table 34**. Note that only high-level aspects are provided.

Table 34: Environmental Aspects associated with Project life-cycle

Project Phase: Pre-construction
Environmental Aspects
Inadequate consultation with landowner and other relevant stakeholders
Inadequate environmental and compliance monitoring
Poor construction site planning and layout
Site-specific environmental issues not fully understood
Land occupancy by temporary buildings, provisional on-site facilities and storage areas
Inaccurate pre-construction environmental survey

Absence of relevant permits (e.g. for protected plants, heritage resources)
Lack of barricading of sensitive environmental features (e.g., wetland buffer)
Poor waste management
Absence of ablution facilities
Project Phase: Construction
Environmental Aspects
Inadequate consultation with landowner
Inadequate environmental and compliance monitoring
Lack of environmental awareness creation
Indiscriminate site clearing
Poor site establishment
Poor management of access and use of access roads
Disruptions to traffic
Poor transportation practices
Poor fencing arrangements
Erosion
Disruptions to existing services
Disturbance of topsoil
Poor management of excavations
Inadequate storage and handling of material
Inadequate storage and handling of hazardous material
Poor maintenance of equipment and plant
Poor management of labour force
Pollution from ablution facilities
Inadequate management of construction camp
Poor waste management practices – hazardous and general solid, liquid
Wastage of water
Poor management of pollution generation potential
Damage to significant flora (if encountered)
Damage to significant fauna (if encountered)
Impact to resource quality of wetland near PV site
Inadequate stormwater management
Environmental damage to sensitive areas
Damage to cultural heritage and palaeontological features (if encountered)
Poor reinstatement and rehabilitation
Project Phase: Operation
Environmental Aspects
Inadequate environmental and compliance monitoring
Inadequate management of access, routine maintenance and maintenance works
Inadequate management of vegetation
Inadequate stormwater management
Pollution caused by cleaning of panels
Impacts caused by fire, explosion or leaks associated with BESS
Pollution caused by dangerous goods (e.g. transformer oils) associated with substation

Inadequate management of light pollution
Failure to comply with health, safety and environmental specifications

12.6 Potentially Significant Environmental Impacts

Environmental impacts are the change to the environment resulting from an environmental aspect, whether desirable or undesirable.

Note that it is not the intention of the impact assessment to evaluate all potential environmental impacts associated with the Project's environmental aspects, but rather to focus on the potentially significant direct, indirect and cumulative impacts identified during the Scoping phase and any additional issues uncovered during the EIA phase.

The potentially significant environmental impacts associated with the Project, as listed in **Table 35** below were identified through an appraisal of the following:

- Project-related components and infrastructure (see **Section 9**);
- Activities associated with the project life-cycle (i.e. pre-construction, construction and operation);
- Nature and profile of the receiving environment and potential sensitive environmental features and attributes (see **Section 10**);
- Findings from specialist studies (see **Section 11**);
- Understanding of direct and indirect effects of the Project as a whole (see **Section 12**);
- Comments received during public participation (see **Section 14**); and
- Legal and policy context (see **Section 5**).

It is noted that the potentially significant environmental impacts listed in **Table 35** were evaluated as part of the specialist studies, and suitable mitigation measures were identified where it was found that these impacts could possibly occur. These impacts are assessed in **Sections 12.9** – **12.28** below.

Table 35: Potentially Significant Environmental Impacts Associated with the Project

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
Land Use	▪ Temporary and permanent change in existing land use. ▪ Loss or restriction of land available for agricultural and grazing activities. ▪ Fragmentation and disruption of existing land-use activities. ▪ Restrictions associated with infrastructure footprints, access requirements and servitudes.	▪ Permanent conversion of portions of the existing agricultural/rural land use to renewable-energy and electrical infrastructure. ▪ Long-term restriction of agricultural/grazing activities within infrastructure footprints and servitudes. ▪ Ongoing fragmentation of existing land-use activities.
Climate	▪ Emission of GHG during construction.	▪ Climate change may impact in various ways, including increased temperature affecting the PV modules. However, the Engineering team can mitigate this through the PV module design chosen during the detailed design phase.

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
		▪ There is also a positive impact as the increase in renewable energy on the existing grid assists in reducing SA's overall reliance on coal as the only energy resource.
Soils	▪ Soil erosion and soil loss. ▪ Soil compaction and deterioration of soil structure. ▪ Loss, mixing, burial or inappropriate handling of topsoil. ▪ Soil contamination from fuels, oils, chemicals and waste. ▪ Alteration of soil infiltration and runoff. ▪ Reduced ability of disturbed soils to support vegetation establishment and rehabilitation.	▪ Soil erosion associated with disturbed surfaces and concentrated runoff. ▪ Soil compaction associated with maintenance activities and vehicle movement. ▪ Soil contamination from accidental spills/leaks. ▪ Long-term alteration of soil infiltration and runoff characteristics.
Geology, Geohydrology and Dolomite	▪ Ground instability and potential surface subsidence associated with underlying dolomitic conditions. ▪ Potential sinkhole formation. ▪ Destabilisation of dolomitic residuum through concentrated water ingress or ponding. ▪ Alteration of groundwater recharge and infiltration conditions. ▪ Potential groundwater contamination.	▪ Potential ground instability/subsidence associated with water ingress and the underlying dolomitic conditions. ▪ Altered groundwater recharge/infiltration conditions. ▪ Potential groundwater contamination. ▪ Potential impacts associated with groundwater abstraction, where applicable.
Topography	▪ Localised alteration of existing landform through grading, levelling, excavation and earthworks. ▪ Changes to natural surface drainage resulting from modification of local topography.	▪ Long-term retention of altered landforms within developed areas.
Surface Water / Wetlands	▪ Alteration of surface-water runoff, drainage patterns and wetland hydrology. ▪ Increased erosion and sediment mobilisation. ▪ Sedimentation of wetland systems. ▪ Contamination and deterioration of water quality. ▪ Disturbance/degradation of wetland habitat and ecological functioning. ▪ Disturbance of wetland-associated fauna and vegetation. ▪ Establishment/spread of alien and invasive vegetation in disturbed wetland-associated areas.	▪ Alteration of runoff and wetland hydrology associated with PV infrastructure, roads and stormwater management. ▪ Erosion and sedimentation. ▪ Water-quality deterioration associated with spills, contaminants and maintenance activities. ▪ Degradation of wetland habitat and ecological functioning. ▪ Establishment/spread of alien invasive vegetation affecting wetland systems. ▪ Cumulative degradation of wetland habitat.
Terrestrial Biodiversity	▪ Permanent loss and transformation of natural and semi-natural vegetation and habitat. ▪ Loss/disturbance of protected plant species and Plant SCC. ▪ Loss/disturbance of faunal SCC. ▪ Disturbance, displacement and direct mortality of fauna. ▪ Habitat fragmentation and edge effects.	▪ Continued habitat fragmentation and edge effects. ▪ Reduced ecological connectivity and ecosystem functioning. ▪ Disturbance/displacement and potential mortality of fauna associated with operation and maintenance. ▪ Continued establishment and spread of alien and invasive plant species. ▪ Cumulative loss, transformation and fragmentation of natural habitat.

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
	▪ Reduction of ecological connectivity and ecosystem functioning. ▪ Establishment and spread of alien and invasive plant species. ▪ Disturbance/degradation of sensitive wetland-associated terrestrial habitats.	
Avifauna	▪ Loss and transformation of avifaunal habitat. ▪ Habitat fragmentation and edge effects. ▪ Disturbance and displacement of avifauna. ▪ Direct mortality associated with construction activities, vehicle movement and increased human activity/access. ▪ Entrapment and snagging associated with fencing and infrastructure.	▪ Continued habitat loss, fragmentation and displacement. ▪ Collision with overhead electrical and other project infrastructure. ▪ Electrocution associated with electrical infrastructure. ▪ Entrapment and snagging associated with project infrastructure. ▪ Direct avifaunal mortality. ▪ Pollution of avifaunal habitat/water sources associated with project activities, including PV-panel cleaning where applicable. ▪ Potential heat-radiation effects associated with PV/BESS infrastructure. ▪ Cumulative habitat-loss, fragmentation, collision and disturbance impacts.
Socio-Economic Environment	▪ Positive: Temporary employment and associated income generation. ▪ Positive: Local procurement and business opportunities. ▪ Positive: Skills development and training. ▪ Construction-related dust, noise, traffic and general disturbance. ▪ Effects on farming operations, livestock, game, equipment and private property. ▪ Job-seeker influx. ▪ Conflict associated with local versus non-local employment and employment expectations. ▪ Increased pressure on local infrastructure and services. ▪ Safety and security concerns associated with contractor access and increased movement of people. ▪ Increased community-health risks associated with workforce/job-seeker influx. ▪ Increased risk of adverse social pathologies associated with influx and workforce activities.	▪ Positive: Local and regional economic stimulus. ▪ Positive: Operational employment and skills development. ▪ Positive: Local procurement and opportunities for local enterprises/SMMEs. ▪ Positive: Contribution to electricity supply and broader economic participation. ▪ Loss/restriction of productive agricultural and grazing land and associated economic effects. ▪ Long-term effects on farming/land-use activities. ▪ Ongoing access and safety/security considerations associated with operation and maintenance.
Air Quality	▪ Dust and particulate emissions from vegetation clearing, earthworks, excavation, piling, material handling and vehicle movement. ▪ Temporary deterioration of local air quality. ▪ Dust-related nuisance and potential health effects on surrounding receptors..	▪ Limited dust emissions from maintenance activities and vehicle movement on unpaved roads, where applicable.

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
Visual Quality / Sense of Place	▪ Temporary visual intrusion associated with vegetation clearance and earthworks. ▪ Visual impacts from construction equipment, activities, dust and temporary infrastructure. ▪ Progressive visual change as project infrastructure is installed. ▪ Temporary alteration of rural landscape character and sense of place.	▪ Permanent alteration of the existing rural/agricultural landscape character and sense of place. ▪ Visual intrusion/exposure associated with PV, BESS, MTS, OHL and associated infrastructure. ▪ Glint and glare. ▪ Night-time illumination. ▪ Cumulative visual effects. Permanent landscape modification and infrastructure visibility are principal long-term effects, together with glint/glare, night-time illumination and cumulative effects.
Noise & Vibration	▪ Noise and vibration associated with site clearance, earthworks, piling, excavation, machinery and vehicle movement. ▪ Noise-related nuisance/disturbance of surrounding receptors. ▪ Disturbance of fauna from construction noise.	▪ Operational noise associated with inverters, transformers, substations and electrical/mechanical equipment. ▪ Potential disturbance/nuisance to nearby receptors.
Agriculture	▪ Loss/restriction of agricultural and grazing land within construction footprints. ▪ Fragmentation and disturbance of agricultural activities. ▪ Interference with farming operations and livestock movement. ▪ Disturbance of agricultural soils. ▪ Potential disturbance/damage to agricultural infrastructure.	▪ Long-term loss/restriction of agricultural and grazing land occupied by project infrastructure. ▪ Continued fragmentation/restriction of agricultural activities and livestock movement. ▪ Long-term reduction in land available for agricultural use.
Hazardous Substances and Waste	▪ Generation of general and hazardous waste. ▪ Soil and water contamination from inappropriate storage, handling or disposal of waste and hazardous substances. ▪ Accidental fuel, oil and chemical spills/leaks. ▪ Litter and visual pollution. ▪ Human-health and ecological risks associated with inadequate waste/hazardous-material management.	▪ Generation of general and hazardous operational/maintenance waste. ▪ Soil and water contamination from accidental spills/leaks, chemicals and hazardous substances. ▪ Human-health and ecological risks associated with inappropriate hazardous-material and waste management.
Transportation	▪ Increased construction traffic on public and local gravel roads. ▪ Increased accident and road-safety risks. ▪ Deterioration/damage to gravel and local access roads. ▪ Traffic-related dust, noise and nuisance. ▪ Temporary disruption/restriction of local or property access. ▪ Movement of construction materials/equipment and associated heavy vehicles.	▪ Additional traffic associated with operation and maintenance activities. ▪ Potential road-safety impacts. ▪ Potential ongoing deterioration of access roads associated with project traffic.
Cultural Heritage	▪ Damage or destruction of protected historical structures.	▪ Potential indirect impacts on retained heritage resources associated with ongoing activities, where relevant.

Environmental Factor	Construction Phase Potential Issues / Impacts	Operational Phase Potential Issues / Impacts
	▪ Damage/destruction of archaeological sites, artefacts or material. ▪ Disturbance or destruction of graves/burial grounds, including the potential informal grave. ▪ Accidental disturbance of previously unidentified heritage resources during ground disturbance.	▪ Existing protected heritage resources and associated buffers require continued protection.
Palaeontology	▪ Damage, destruction or loss of palaeontological resources through vegetation clearance, site preparation, excavation, trenching and other ground disturbance. ▪ Exposure and potential disturbance/destruction of previously concealed fossil material.	▪ No significant operational palaeontological impacts anticipated.
Civil Aviation	▪ Potential aviation-safety implications associated with construction activities and establishment of project infrastructure, where applicable.	▪ Potential interference/conflict with aviation activities associated with the presence of project and grid infrastructure, where applicable.
Existing Structures & Infrastructure	▪ Damage to existing roads, fences, gates, agricultural infrastructure, pipelines, services or utilities. ▪ Temporary interruption of existing services. ▪ Restricted access to existing properties/infrastructure. ▪ Conflicts with existing infrastructure and utility servitudes.	▪ Long-term land-use/access restrictions associated with electrical servitudes. ▪ Potential conflicts with existing services and infrastructure. ▪ Maintenance-related access impacts.
Health and Safety	▪ Occupational injuries and health and safety risks to construction workers. ▪ Community safety risks associated with construction activities and increasing vehicle movements. ▪ Exposure to construction-related dust, noise and other hazards.	▪ Electrical safety risks associated with substations, powerlines and electrical equipment. ▪ Fire and safety risks associated with project infrastructure. ▪ Occupational health and safety risks during inspection, maintenance and repair activities. ▪ Fire and explosion risks during BESS operation.

The cumulative impacts are discussed in **Section 12.28**.

The specialists' findings are particularly important for understanding the Project's impacts and managing them throughout the project life-cycle, as these studies focused on the significant environmental issues identified during the execution of the EIA. As shown by the various impact assessments performed by the specialists, a host of cross-cutting impacts are addressed in several of these studies. The specialists' proposed mitigation measures for similar impacts are complementary and align with best practices and principles.

12.7 Impact Assessment Methodology

The impacts and the proposed management thereof are first discussed in **Section 12.9** to **Section 12.26** below on a qualitative level and thereafter quantitatively assessed by

evaluating the nature, extent, magnitude, duration, probability and ultimately the significance of the impacts (refer to methodology provided in **Table 36** below). Where applicable, the impact assessments and significance ratings provided by the respective specialists are included.

The assessment considers impacts before and after mitigation, where in the latter instance the residual impact following the application of the mitigation measures is determined.

In the case of the specialist studies, some of the impact assessment methodologies deviated from the approach shown in **Table 36** below. However, the quantitative basis for these specialist evaluations of the impacts to specific environmental features still satisfied the intention of the EIA.

Table 36: Quantitative Impact Assessment Methodology

Nature (/Status) The project could have a positive, negative or neutral impact on the environment.
Extent ▪ Local - extend to the site and its immediate surroundings. ▪ Regional - impact on the region but within the province. ▪ National - impact on an interprovincial scale. ▪ International - impact outside of SA.
Magnitude Degree to which impact may cause irreplaceable loss of resources. ▪ Low - natural and social functions and processes are not affected or minimally affected. ▪ Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way. ▪ High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.
Duration ▪ Short term - 0-5 years. ▪ Medium term - 5-11 years. ▪ Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention. ▪ Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability ▪ Almost certain - the event is expected to occur in most circumstances. ▪ Likely - the event will probably occur in most circumstances. ▪ Moderate - the event should occur at some time. ▪ Unlikely - the event could occur at some time. ▪ Rare/Remote - the event may occur only in exceptional circumstances.
Significance Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows- 0 – Impact will not affect the environment. No mitigation necessary. 1 – No impact after mitigation. 2 – Residual impact after mitigation. 3 – Impact cannot be mitigated.

12.8 Impact Mitigation

12.8.1 Mitigation Hierarchy

Impacts are to be managed by assigning suitable mitigation measures, where the objectives are to:

- Find more environmentally sound ways of executing an activity;
- Enhance the environmental benefits of a proposed activity;
- Avoid, minimise or remedy negative impacts; and
- Ensure that residual negative impacts are within acceptable levels.

Mitigation should strive to abide by the following hierarchy – (1) prevent; (2) reduce; (3) rehabilitate (or remediate); and/or (4) compensate for the environmental impacts.

The proposed mitigation of the impacts associated with the Project includes specific measures identified by the technical team (including engineering solutions), environmental specialists, and environmental authorities, as well as environmental best practices.

Note that the mitigation measures in the subsequent sections are not intended to be exhaustive but rather focus on the potentially significant impacts identified. The EMPr (contained in **Appendix H**) provide a comprehensive list of mitigation measures for specific elements of the Project and the receiving environment, which extends beyond the impacts evaluated in the body of the EIA Report.

12.8.2 EMPr Framework

An EMPr represents a detailed plan of action prepared to ensure that recommendations for enhancing positive impacts and/or limiting or preventing negative environmental impacts are implemented during the life-cycle of a project.

The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a Government Notice. Once the Minister has identified, through a Government Notice, that a generic EMPr is relevant to an application for Environmental Authorisation, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the Applicant and the Competent Authority.

In accordance with the above, the following EMPr's were developed for the Project:

- Generic EMPr for the development and expansion of overhead electricity transmission and distribution infrastructure (contained in **Appendix H1**);
- Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity (contained in **Appendix H2**); and
- EMPr for the Solar PV Plant (contained in **Appendix H3**).

All liability for the implementation of the EMPr (as well as the EIA findings and Environmental Authorisation, if granted) lies with the Applicant.

The following considerations and assumptions accompany the compilation of the EMPr for the Solar PV Plant:

- The EMPr is guided by the following principles, based on Lochner (2005) –

- **Continuous improvement** - The Applicant should be committed to review and to continually improve environmental management, with the objective of improving overall environmental performance;
- **Broad level of commitment** - A broad level of commitment is required from all levels of management as well as the workforce in order for the implementation of the EMPr to be successful and effective; and
- **Flexible and responsive** - The implementation of the EMPr needs to be responsive to new and changing circumstances. The EMPr report is a dynamic "living" document that will need to be updated regularly throughout the duration of the project life-cycle.

❖ Compliance with the EMPr must be audited in terms of Regulation 34 of the EIA Regulations.

❖ The EMPr provides the framework for the overarching environmental management requirements for the project life-cycle. Following detailed design and planning, the EMPr may need to be revised to render the management actions more explicit and accurate to the final project specifications. Any amendments to the EMPr must be undertaken in accordance with Regulations 35 – 37 of the EIA Regulations.

❖ The EMPr will be linked to the project's overall Environmental Management System (EMS) (if applicable), where the EMS constitutes an iterative process that aims to achieve continuous improvement and enhanced environmental performance.

❖ Although every effort has been made to ensure that the scope and level of detail of the EMPr are tailored to the level of environmental risk (i.e., type and scale of activity and the sensitivity of the affected environment) and the project- and site-specific conditions, certain of the environmental management requirements within the EMPr may be regarded as generic to make provision for activities that may take place as part of the overall Project.

12.9 Land Use

12.9.1 Impact Description

The proposed Project will result in a change in land use within the development footprint through the establishment of the Solar PV site and associated infrastructure on land currently utilised predominantly for agricultural activities. Construction activities will temporarily and permanently occupy portions of the site, reducing the area available for existing grazing and agricultural practices. A degree of land transformation will therefore occur within the Project footprint, although agricultural activities are expected to continue on portions of the broader property that will remain unaffected by the development.

During the operational phase, the Project will introduce a long-term renewable energy land use within an area currently characterised by agricultural and rural land uses. The development has the potential to alter existing land use patterns and the character of the immediate area; however, the Project is consistent with national objectives relating to renewable energy generation and diversification of the energy mix. The impact on surrounding

land uses is anticipated to be localised and can be managed through appropriate planning, site management measures, and implementation of the EMPr.

The conversion of agricultural land to renewable energy infrastructure represents the primary land use impact associated with the Project. While this will permanently lose a portion of the existing agricultural land within the development footprint, the impact must be considered in the context of the broader economic and environmental benefits of renewable energy generation. With mitigation measures and responsible site management, the impact on land use is not expected to preclude compatible land uses in the surrounding area.

12.9.2 Impact Assessment

Environmental Feature	Land Use
Relevant Alternatives & Activities	Establishment and operation of the Solar PV arrays, BESS, MTS, substations, overhead powerlines, internal roads, underground cabling, buildings, fencing, temporary laydown areas and associated infrastructure.
Project life-cycle	Construction & operational phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Conversion of predominantly livestock-grazing and agricultural land to renewable-energy infrastructure ▪ Temporary restriction of farming activities during construction. ▪ Long-term reduction and fragmentation of available grazing land ▪ Loss of agricultural use beneath permanent infrastructure ▪ Impediment to livestock and agricultural implements ▪ Possible secondary pressure on the carrying capacity of the remaining grazing land.	▪ Restrict development to the authorised footprint ▪ Minimise the permanent and temporary disturbance footprint ▪ Use existing roads and previously disturbed areas where practicable ▪ Avoid unnecessary fragmentation of grazing camps ▪ Retain indigenous vegetation beneath and between panels where operationally feasible ▪ Rehabilitate temporary disturbance areas ▪ Reinstate disturbed soils and vegetation ▪ Control alien invasive plants ▪ Rotate livestock grazing on the remaining land according to its carrying capacity ▪ Maintain access for agricultural activities where compatible with project safety and operation.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Long-term	Almost certain	2
After Mitigation	-	Local	Low	Long-term	Almost certain	2
Residual Risk Explanation	A residual negative land-use impact will remain due to the permanent conversion of grazing land within the Project footprint to renewable energy infrastructure. The impact is not considered a fatal flaw as it is localised, affects predominantly grazing land, does not compromise significant areas of high-potential agricultural land, and can be managed to an acceptable level through the implementation of the EMPr and specialist recommendations.					

12.10 Soils

12.10.1 Impact Description

Project construction will require vegetation clearance, grading, excavation, trenching, road construction, foundation preparation, and repeated movement of vehicles and heavy machinery. These activities may strip, mix, compact, or displace the shallow soil profile, resulting in loss of topsoil, deterioration of soil structure, reduced infiltration, and reduced

capacity for vegetation to re-establish. Exposed or compacted areas may become susceptible to wind and water erosion, particularly where PV panels, internal roads, hard-standing surfaces, stockpiles, or altered drainage pathways concentrate stormwater. Soil erosion is a concern because the dominant soils are generally shallow, and erosion and exposed bedrock have already been observed in parts of the site.

Soil quality may also be affected by accidental releases of fuels, oils, hydraulic fluids, transformer fluids, chemicals or potentially contaminated liquids associated with construction equipment, workshops, substations and the BESS. Poor management of concrete wash water, cement, waste, wastewater and contaminated stormwater could introduce pollutants into the soil profile and connected drainage systems. During operation, erosion may continue where runoff concentrates beneath panel drip lines, along roads, or at stormwater outlets, while maintenance activities may cause localised soil disturbance, compaction, or accidental contamination. These risks are particularly important given the underlying dolomitic geology, which requires strict water precautions and the maintenance of free-flowing drainage.

The impact can be reduced by limiting clearing and earthworks to the approved footprint, retaining ground cover where practicable, separating and protecting topsoil, loosening compacted temporary areas, progressively rehabilitating disturbed surfaces and maintaining effective stormwater, erosion, sediment and pollution controls. Appropriate storage, containment and spill-response measures will substantially reduce the likelihood of soil contamination. Nevertheless, permanent infrastructure and roads will retain compacted or sealed surfaces throughout the Project's operational life, while a residual risk of localised occupation and modification of soils will remain.

12.10.2 Impact Assessment

Environmental Feature	Soils
Relevant Alternatives & Activities	Site clearing; vegetation removal; stripping, handling and stockpiling of topsoil; grading and earthworks; excavation and trenching; construction and maintenance of PV arrays, BESS, substations, buildings, roads, powerlines and underground services; vehicle and machinery movement; storage and handling of hazardous substances; waste and wastewater management; stormwater management; and rehabilitation.
Project life-cycle	Construction & operational phases including rehabilitation
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Soil erosion and loss of soil ▪ Soil compaction and deterioration ▪ Loss, mixing, burial or contamination of topsoil ▪ Soil pollution ▪ Alteration of infiltration and runoff patterns ▪ Reduced capacity of disturbed soil to support vegetation and rehabilitation	▪ Restrict disturbance to the approved footprint ▪ Progressively clear only areas required for construction ▪ Retain vegetation and ground cover where practicable ▪ Strip topsoil separately from subsoil ▪ Protect, stabilise and manage stockpiles ▪ Locate stockpiles outside wetlands, buffers and drainage pathways ▪ Control stormwater, erosion and sediment ▪ Restrict vehicles and machinery to designated routes ▪ Rip or loosen compacted temporary areas ▪ Reinstate subsoil and topsoil in the correct sequence ▪ Revegetate temporary disturbance areas with locally appropriate indigenous grasses ▪ Provide contained refuelling, servicing and hazardous-material storage areas ▪ Maintain spill-response equipment

	▪ Immediately remove and appropriately dispose of contaminated soil ▪ Inspect erosion controls and rehabilitated areas after significant rainfall ▪ Implement corrective rehabilitation where vegetation establishment or soil stability is inadequate.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Long-term	Likely	3
After Mitigation	-	Local	Low	Long-term	Unlikely	2
Residual Risk Explanation	Despite mitigation measures, a residual negative impact on soils will remain due to the permanent occupation and modification of soils within the proposed Project's footprint. This impact is not considered a fatal flaw as it is confined to the development footprint, affects predominantly shallow soils of low agricultural potential, and can be reduced to an acceptable level through the implementation of rehabilitation, erosion-control and soil-management measures contained in the EMPr.					

12.11 Geology and Geohydrology

12.11.1 Impact Description

The Project site is underlain by dolomite and chert of the Malmani Subgroup and is characterised by variable transported soils, residual chert, dolomitic residuum, dolomite boulders and localised dolomite outcrops. Construction-related excavation, trenching, foundation preparation and loading may encounter variable or unfavourable ground conditions, potentially affecting foundation performance and infrastructure stability. Inappropriate stormwater management, leaking services, ponding or concentrated infiltration could mobilise susceptible dolomitic materials and increase the risk of localised ground movement, subsidence or sinkhole formation.

The Project may also affect geohydrological conditions through alteration of local infiltration, recharge and drainage patterns and through accidental contamination of groundwater. Potential pollution sources include fuels, oils, hydraulic fluids, transformer fluids, chemicals, BESS-related liquids or contaminated firewater, cement-contaminated water, waste and wastewater. These substances could enter groundwater pathways if they are inadequately stored, contained or managed. Operational roads, panel arrays, buildings and hardened areas may continue to modify the distribution and concentration of runoff and infiltration for the operational life of the Project.

These impacts can be reduced by completing the required dolomite stability, geohydrological, and detailed geotechnical investigations; incorporating the findings into the final layout and foundation design; implementing strict water-loss and stormwater controls; and implementing effective containment, spill-response, and pollution-prevention measures. The desktop geotechnical specialist identified no fatal flaw and considered the site potentially suitable, but expressly made that conclusion conditional on the required follow-up investigations and implementation of the resulting design requirements.

12.11.2 Impact Assessment

Environmental Feature	Geology and Geohydrology

Relevant Alternatives & Activities	Detailed design, construction and operation of the Solar PV arrays, BESS, collector and switching substations, MTS, transmission infrastructure, foundations, cable trenches, internal roads, buildings, workshops, laydown areas and stormwater infrastructure; storage and handling of fuels, oils, transformer fluids, chemicals and waste; management of BESS incidents and contaminated firewater; and groundwater abstraction if boreholes are used.
Project life-cycle	Detailed design, construction and operational phases.
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Excavation and foundation construction within variable ground conditions ▪ Localised ground instability, subsidence or sinkhole formation associated with dolomitic conditions ▪ Mobilisation of dolomitic residuum through uncontrolled water ingress, leakage or ponding ▪ Altered infiltration, recharge and drainage patterns ▪ Contamination of groundwater ▪ Groundwater abstraction may also affect groundwater resources if boreholes are used without appropriate investigation and authorisation	▪ Complete a feasibility-level dolomite stability assessment before development, incorporating gravity geophysical surveys, percussion borehole drilling and a geohydrological study ▪ Undertake a detailed design-level geotechnical investigation across the complete footprint ▪ Determine site-specific founding requirements and micro-site infrastructure where necessary ▪ Comply with applicable SANS 1936 requirements ▪ Prevent ponding, uncontrolled infiltration and water leakage ▪ Maintain effective, free-draining stormwater infrastructure ▪ Separate clean stormwater from potentially contaminated runoff ▪ Store hazardous substances within impermeable and appropriately bunded areas ▪ Provide secondary containment for transformers ▪ Provide containment and drainage controls for the BESS and contaminated firewater ▪ Make spill-response equipment available and immediately remediate accidental releases ▪ Prevent the discharge of cement wash water, wastewater or contaminated water to soil or drainage pathways ▪ Routinely inspect and maintain stormwater, containment and drainage infrastructure

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Long-term	Likely	3
After Mitigation	-	Local	Low	Long-term	Unlikely	2
Residual Risk Explanation	A residual negative impact will remain because permanent infrastructure will continue to modify local infiltration and drainage conditions over dolomitic ground, while a low likelihood of localised ground instability or groundwater contamination cannot be completely eliminated. The impact is not considered a fatal flaw because it is expected to be localised and can be reduced to an acceptable level through investigation-led design, strict water and stormwater controls, pollution containment and ongoing monitoring. This conclusion is conditional on completion of the required detailed geotechnical, dolomite stability and geohydrological investigations before development.					

12.12 Surface Water

The findings from the Wetland Impact Assessment (Hoosen, 2026) follow. The specialist report is contained in **Appendix F1**.

12.12.1 Impact Description

The proposed Project may affect surface water resources and wetlands through changes to surface runoff and drainage patterns, increased erosion and sedimentation, deterioration of water quality, and the partial loss of wetland functionality. These impacts may arise during the construction, operation and decommissioning phases and are expected to occur primarily through indirect effects on the wetland catchments and associated drainage pathways.

Construction activities such as vegetation clearing, earthworks, road construction, and infrastructure development may alter hydrological processes, increase erosion and sediment mobilisation, and increase the risk of contamination from fuels, oils, and other pollutants. During operation, runoff from PV infrastructure and roads, maintenance activities, and accidental spillages may continue to affect wetland hydrology and water quality. Rehabilitation and alien invasive plant control are expected to provide a net positive effect by improving vegetation cover, soil stability, and ecological functioning. However, if not implemented appropriately, these activities may also alter drainage patterns or cause localised erosion and sedimentation. Subject to the implementation of the prescribed mitigation measures, monitoring requirements and 30 m wetland buffer areas, impacts on wetlands are expected to be predominantly indirect and of Low to Very Low significance.

12.12.2 Impact Assessment

Table 37 contains the results of the impact assessment, which was obtained from the Wetland Impact Assessment (Hoosen, 2026).

Table 37: Wetland Impact Assessment

Activity	Potential Impact	Probability	Significance without mitigation	Mitigation efficiency	Significance with mitigation
Construction Phase					
Site clearance and stripping of topsoil for the construction of PV solar panels, mounting structure, DC-AC current inverters stations, transformers, and internal electrical reticulation (underground cabling) on terrestrial areas.	Removal of vegetation and disturbance of topsoil can increase surface runoff, soil erosion and sediment mobilisation, potentially resulting in sedimentation and increased turbidity within downstream wetlands. Soil compaction and changes to surface drainage patterns may also alter the quantity, timing and distribution of flows entering wetlands, thereby affecting wetland hydrological functioning. Construction activities additionally introduce risks associated with accidental spills, contaminated runoff, dust deposition, invasive alien plant establishment and unnecessary encroachment into wetland habitat or associated buffer areas.	3	30 Low	0,6	18 Very Low
Site clearance and stripping of topsoil for the construction of internal access roads and perimeter fencing on terrestrial area.	Access roads can be particularly significant because compacted road surfaces may alter natural surface and shallow subsurface flow pathways, concentrate runoff, increase flow velocities and potentially reduce or redirect water inputs to wetlands. Roadside drains may further concentrate flows and cause erosion or sediment deposition at wetland margins. Excavations associated with fencing and road construction may also disturb soils, facilitate invasive alien plant establishment and create pathways for pollutants to enter wetlands. Where roads or fences occur near wetland boundaries, there is an additional risk of physical encroachment and disturbance of wetland vegetation and habitat.	3	30 Low	0,6	18 Very Low
Site clearance and stripping of topsoil for the construction of transmission lines, Main Transmission Substation, offices, workshop area for storage and maintenance, BESS and security infrastructure on terrestrial area.	Impacts are primarily indirect and associated with catchment processes, including increased runoff and erosion, sediment mobilisation, alteration of natural drainage patterns, and accidental releases of hydrocarbons, chemicals or other contaminants that could potentially migrate toward downstream wetland systems through connected drainage pathways. Provided appropriate stormwater, erosion, sediment and pollution controls are implemented, the residual effects on wetlands are expected to be limited.	2	16 Very Low	0,6	9,6 Very Low

Activity	Potential Impact	Probability	Significance without mitigation	Mitigation efficiency	Significance with mitigation
Placement of temporary stockpile area on terrestrial area.	Impacts are primarily indirect and relate to erosion of stockpiled material, generation of sediment-laden runoff, alteration of local drainage patterns, dust generation, and accidental contamination, particularly if stockpiles contain potentially contaminated material. Given the separation distance, impacts on wetlands are expected to be limited to negligible provided that stockpiles are appropriately located, contained, managed and rehabilitated and are not situated within drainage pathways hydrologically connected to wetlands.	2	16 Very Low	0,6	9,6 Very Low
Operation Phase					
Operation and maintenance of PV solar panels, internal roads and underground cabling on terrestrial area.	Impacts are indirect and associated with changes in surface runoff, erosion and sediment transport from internal roads, concentrated runoff from PV panels, maintenance-related vehicle movements, vegetation management, and accidental spills of hydrocarbons or other contaminants. Poorly maintained road drainage structures may alter the distribution and velocity of flows entering downstream wetlands, potentially resulting in erosion, sedimentation or changes to wetland hydrological inputs. Maintenance or repair of underground cables may also cause temporary soil disturbance and sediment mobilisation. With appropriate operational stormwater, erosion, pollution and vegetation management, impacts on wetland ecological condition and functioning should remain limited.	3	39 Low	0,6	23,4 Low
Operation and maintenance of transmission lines, Main Transmission Substation, offices, workshop area for storage and maintenance, BESS and security infrastructure.	Impacts are indirect, associated with accidental releases of hydrocarbons, transformer oils, chemicals or other contaminants; potentially contaminated runoff from workshop, MTS or BESS areas; contaminated firefighting water during emergency incidents; erosion or sediment mobilisation during maintenance activities; and alterations to catchment drainage associated with stormwater infrastructure. These impacts would generally only affect wetlands where there is a hydrological connection between the operational areas and downstream wetland systems. With appropriate pollution prevention, stormwater management and emergency-response measures, impacts on wetland ecological condition and functioning are expected to be limited.	2	18 Very Low	0,6	10,8 Very Low
Rehabilitation Phase					
Replacement of topsoil and subsoil over disturbed areas that will not be utilized during the operation phase,	Successful rehabilitation will improve soil stability and infiltration, reduce erosion and sediment transport, and assist in restoring more natural runoff characteristics within the wetland catchment. Potential adverse impacts may nevertheless arise from incorrect soil	2	16 Very Low	0,8	12,8 Very Low

Activity	Potential Impact	Probability	Significance without mitigation	Mitigation efficiency	Significance with mitigation
followed by revegetation with locally indigenous grass species to restore ground cover.	placement, excessive soil compaction, alteration of natural drainage pathways, erosion of recently reinstated soils, sediment-laden runoff entering wetlands, inappropriate species selection, and establishment or spread of invasive alien plants. Where rehabilitation occurs near wetlands, inappropriate grading or earthworks could also alter surface and shallow subsurface water movement to wetland systems.				
Ongoing alien invasive plant control and follow-up monitoring, particularly within wetlands and buffer zones, to ensure successful vegetation re-establishment.	Overall positive impact on wetland ecological condition and rehabilitation success. Effective control can reduce competition with indigenous wetland vegetation, improve indigenous vegetation re-establishment, maintain habitat integrity and support wetland ecological functioning. However, inappropriate control methods may result in disturbance of wetland soils, trampling and loss of indigenous vegetation, increased erosion, mobilisation of sediment, herbicide contamination of wetland water and soils, and temporary creation of bare areas susceptible to reinvasion. Poor disposal of removed alien vegetation may also facilitate further spread. Control should therefore be undertaken using wetland-sensitive methods and supported by systematic follow-up monitoring.	2	16 Very Low	0,8	12,8 Very Low

12.12.3 Mitigation Measures

The following mitigations are summarised from the Wetland Impact Assessment (Hoosen, 2026):

- Construction Phase –
  - Demarcate all wetland boundaries, aquatic buffers and no-go areas prior to construction and prohibit any disturbance within these areas.
  - Locate all project infrastructure, access roads, stockpiles and temporary work areas outside wetlands and associated buffer zones wherever practicable.
  - Restrict vegetation clearing, topsoil stripping and excavation activities to the minimum footprint required for construction.
  - Undertake phased clearing and rehabilitation to minimise the duration and extent of exposed soils.
  - Maintain natural drainage patterns and hydrological connectivity, and avoid diverting, obstructing, or concentrating runoff towards wetlands.
  - Implement appropriate erosion, stormwater, and sediment control measures, including berms, sediment traps, drainage controls, and erosion-protection structures.
  - Store topsoil separately from subsoil and locate stockpiles outside wetlands, drainage lines and preferential flow paths.
  - Stabilise exposed soils, stockpiles and disturbed areas to prevent erosion, sediment mobilisation and dust generation.
  - Restrict vehicle movement to designated access routes and prevent unnecessary disturbance of natural vegetation and drainage features.
  - Ensure all fuels, oils, chemicals and hazardous substances are stored, handled and used in designated contained areas.
  - Maintain spill response equipment on site and immediately contain and remediate any spills or contamination incidents.
  - Prevent cement wash water, contaminated runoff, construction waste and hazardous materials from entering wetlands or drainage pathways.
  - Rehabilitate temporary construction areas promptly following construction and revegetate disturbed areas with suitable indigenous species.
  - Monitor and control invasive alien plants throughout the construction period.
  - Conduct regular inspections of erosion controls, drainage infrastructure and construction activities, particularly after rainfall events.
  - Appoint an Environmental Control Officer (ECO) to monitor compliance with wetland protection measures and environmental management requirements.
- Operational Phase –
  - Confine all operational and maintenance activities to approved development areas and prohibit unnecessary access into wetlands and buffer zones.
  - Maintain clearly marked wetland no-go areas and provide environmental awareness training for operational personnel and contractors.

- Maintain roads, culverts, drainage systems, stormwater infrastructure and erosion-control measures in good working condition.
- Maintain natural drainage patterns and prevent stormwater discharges from causing erosion or concentrated flows towards wetlands.
- Maintain adequate vegetation cover within the facility footprint to minimise runoff, erosion and sediment transport.
- Control erosion, scour, sediment accumulation and altered flow paths through routine inspections and corrective maintenance.
- Manage vegetation clearing and alien invasive species control to minimise disturbance to wetland habitats.
- Limit herbicide use and ensure appropriate application practices to prevent runoff or drift into wetlands.
- Store fuels, oils, transformer fluids, chemicals and hazardous materials within appropriate bunded and contained facilities.
- Maintain spill response equipment and immediately contain and remediate any spillages.
- Ensure contaminated stormwater, wash water, firefighting water and hazardous runoff are contained and managed appropriately.
- Dispose of maintenance waste and hazardous materials at authorised facilities and prevent release into drainage systems.
- Rehabilitate and stabilise any areas disturbed during maintenance activities as soon as practicable.
- Monitor operational areas for erosion, sediment transport, contamination, and invasive alien plant establishment, and implement corrective measures as required.

❖ Rehabilitation Phase –

- Initiate rehabilitation as soon as practicable following completion of construction or decommissioning activities.
- Reinstate subsoil and topsoil in the correct sequence and restore pre-construction landform and drainage patterns as far as practicable.
- Avoid creating artificial channels, berms, depressions or drainage diversions that could alter wetland hydrology.
- Rip or loosen compacted areas where necessary to improve infiltration and support vegetation establishment.
- Stabilise rehabilitated areas and maintain erosion and sediment control measures until vegetation is adequately established.
- Revegetate disturbed areas using locally indigenous species appropriate to site conditions and wetland ecological requirements.
- Prevent the introduction or spread of invasive alien species during rehabilitation activities.
- Implement ongoing monitoring and control of invasive alien plants within wetlands, buffer zones, and rehabilitated areas.

- Use wetland-sensitive alien plant control methods that minimise soil disturbance, erosion and impacts on indigenous vegetation.
- Remove and appropriately dispose of alien plant material to prevent re-establishment and downstream spread.
- Monitor vegetation establishment, ground cover, erosion, soil stability, and invasive species occurrence until rehabilitation objectives are achieved.
- Undertake remedial actions where monitoring identifies poor vegetation recovery, erosion, altered runoff patterns or recurring alien plant infestations.
- Maintain photographic records and conduct periodic compliance inspections to assess rehabilitation success and protect the wetland long term.
- Consider rehabilitation complete only once stable landforms, indigenous vegetation cover, controlled erosion and no project-related impacts on downstream wetlands are evident.

12.13 Terrestrial Biodiversity

The findings from the Terrestrial Biodiversity Impact Assessment (Paul, 2026a) follow. The specialist report is contained in **Appendix F2**.

12.13.1 Impact Description

The proposed Project may affect terrestrial biodiversity through the loss and transformation of natural and semi-natural habitat, fragmentation of remaining habitat, displacement and disturbance of fauna, the potential loss of protected plant species and SCC, and the establishment and spread of alien invasive plant species. These impacts may arise during the construction, operation and decommissioning phases and are primarily associated with vegetation clearing, earthworks, infrastructure development, vehicle movement and ongoing maintenance activities.

Construction of the solar facility, BESS, substations, transmission infrastructure, and associated roads will directly remove vegetation within the development footprint, with the greatest impact on remaining natural and disturbed grassland habitats that provide ecological connectivity, habitat resources, and movement opportunities for fauna. Operational activities may contribute to ongoing habitat disturbance, barrier effects and the spread of alien invasive species, while cumulative habitat transformation within the broader landscape may further reduce habitat availability and ecological connectivity. Wetland and watercourse features, and their associated 30 m buffers, are important biodiversity features within the study area, and retaining them will help maintain habitat connectivity and ecological functioning. Rehabilitating temporarily disturbed areas and implementing alien invasive species control measures will further reduce residual impacts. Subject to implementing the recommended mitigation measures and avoiding sensitive habitat areas, the Terrestrial Biodiversity Impact Assessment concluded that the Project is acceptable from a terrestrial biodiversity perspective and identified no fatal biodiversity constraints.

12.13.2 Impact Assessment

Table 38 presents the impact assessment results, obtained from the Terrestrial Biodiversity Impact Assessment (Paul, 2026a).

Table 38: Terrestrial biodiversity impact assessment

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Loss of Plant Communities							
Without Mitigation	Direct	1	5	6	5	60	High
With Mitigation	Direct	1	4	4	5	45	Medium
Loss of Protected Plant Species and Plant SCC							
Without Mitigation	Direct	1	2	8	4	44	Medium
With Mitigation	Direct	1	2	4	2	14	Low
Loss of Faunal SCC							
Without Mitigation	Direct	3	4	6	4	52	High
With Mitigation	Direct	1	3	4	2	16	Low
Fragmentation, Loss of Ecosystem Function and Edge Effects							
Without Mitigation	Direct	2	5	6	5	65	High
With Mitigation	Direct	1	4	4	4	36	Medium
Invasion of Alien Invasive Plant Species (AIPS)							
Without Mitigation	Direct	2	5	6	4	52	High
With Mitigation	Direct	1	3	2	3	18	Low

12.13.3 Mitigation Measures

The following mitigation measures are summarised from the Terrestrial Biodiversity Impact Assessment (Paul, 2026a):

- Construction Phase –
  - Vegetation and Habitat Protection
    - Restrict all construction activities to the approved development footprint.
    - Clearly demarcate no-go areas and retained natural vegetation prior to construction.
    - Locate temporary construction areas, laydown areas and facilities within previously disturbed areas where practicable.
    - Limit vegetation clearing to the minimum area required for construction.
    - Retain natural vegetation and ecological corridors wherever feasible, especially around watercourses and buffer areas.
    - Retain the 30 m watercourse buffers as undeveloped natural areas.
  - Soil, Erosion and Rehabilitation
    - Strip and separately stockpile topsoil for rehabilitation purposes.
    - Prevent unnecessary soil compaction and mixing of topsoil and subsoil.
    - Implement stormwater and erosion-control measures to prevent sediment movement into natural areas.
    - Stabilise and rehabilitate erosion-prone areas as soon as possible.
    - Progressively rehabilitate disturbed areas using indigenous vegetation.
  - Flora Protection
    - Undertake a pre-construction botanical walkdown to identify protected plant species and plant SCC.
    - Avoid protected plant species and plant SCC wherever possible.
    - Implement search-and-rescue or relocation measures where avoidance is not possible.
    - Obtain all required permits before removing or relocating protected species.
    - Maintain records of protected and SCC species encountered.
  - Faunal Protection
    - Conduct pre-construction faunal walkdowns prior to vegetation clearance and earthworks.
    - Prohibit hunting, trapping, collection, poisoning or killing of wildlife.
    - Ensure trapped, injured or immobile fauna are reported to the ECO and managed appropriately.
    - Cover or provide escape routes for open excavations and trenches.
    - Limit vehicle speeds to reduce fauna mortality.
    - Minimise noise and artificial lighting impacts.
    - Provide environmental awareness training to all personnel.
  - Alien Invasive Plant Management
    - Develop and implement an Alien and Invasive Plant Management Programme before construction.

- Control existing invasive species before and during construction.
- Ensure machinery and vehicles do not introduce or spread alien species.
- Monitor and control new infestations as they arise.

❖ Operational Phase –

➢ Habitat and Biodiversity Protection
- Maintain all retained natural habitat and watercourse buffer areas.
- Preserve ecological connectivity across the site.
- Retain indigenous vegetation beneath and between solar infrastructure where operationally feasible.
- Minimise unnecessary habitat disturbance associated with maintenance activities.

➢ Faunal Protection
- Maintain low traffic speeds throughout the facility.
- Continue minimising night-time lighting and noise.
- Maintain fauna movement corridors and incorporate fauna-friendly fencing where feasible.
- Continue environmental awareness programmes for operational staff and contractors.

➢ Alien and Invasive Plant Control
- Continue implementation of the Alien and Invasive Plant Management Programme.
- Conduct routine monitoring and treatment of invasive species infestations.
- Monitor rehabilitation success and control invasive species in disturbed areas.

➢ Stormwater and Erosion Management
- Maintain stormwater infrastructure to prevent erosion and sediment transport.
- Inspect and rehabilitate erosion-prone areas following major rainfall events.

❖ Rehabilitation and Closure Phase –

➢ Rehabilitation of Disturbed Areas
- Remove temporary construction infrastructure and rehabilitate disturbed areas.
- Re-establish indigenous vegetation and ecological functioning.
- Stabilise soils and rehabilitate erosion features.
- Monitor rehabilitation areas to ensure successful vegetation establishment.

➢ Alien Invasive Plant Management
- Continue alien invasive plant control throughout rehabilitation and closure.
- Monitor and treat new infestations until rehabilitation objectives are achieved.

➢ Cumulative Impact Management
- Avoid unnecessary additional habitat transformation.
- Consolidate infrastructure and access routes to minimise habitat fragmentation.
- Monitor rehabilitation effectiveness and implement corrective measures where objectives are not being met.
- Maintain ecological connectivity and protect retained natural habitat during closure activities.

12.14 Avifauna

The findings from the Avifaunal Impact Assessment (Paul, 2026b) follow. The specialist report is contained in **Appendix F3**.

12.14.1 Impact Description

The proposed Project may affect avifauna through habitat loss and transformation, habitat fragmentation, disturbance and displacement of birds, and infrastructure-related risks including collisions, electrocutions, entrapment and direct mortality. These impacts are associated with vegetation clearing, construction activities, the establishment of solar and electrical infrastructure, increased human activity, and the operation of the facility. The loss of natural grassland habitat represents the most significant impact, while construction activities may temporarily disturb birds utilising the site for foraging, movement and potential breeding. The Project may also introduce localised collision, electrocution, and entrapment risks associated with electrical infrastructure and perimeter fencing, as well as limited risks related to vehicle movement and water-quality deterioration from operational activities.

The Project is located within an already modified agricultural landscape characterised by grazing, cultivation, roads and existing infrastructure, and will therefore contribute to existing habitat transformation and fragmentation. Retaining watercourses and associated buffers, minimising habitat disturbance, implementing bird-friendly electrical and fencing designs, and ongoing monitoring of avifaunal incidents are expected to substantially reduce impacts. Habitat loss and transformation remain the primary residual impacts. Subject to implementing the recommended mitigation measures, the Project identified no fatal avifaunal constraints.

12.14.2 Impact Assessment

Table 39 presents the impact assessment results, obtained from the Avifaunal Impact Assessment (Paul, 2026b).

Table 39: Avifaunal impact assessment

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Habitat loss and transformation							
Without Mitigation	Direct	2	5	8	4	60	High
With Mitigation	Direct	1	5	6	7	48	Medium
Fragmentation and Edge Effects							
Without Mitigation	Direct	3	4	6	4	48	Medium
With Mitigation	Direct	2	3	6	4	44	Medium
Disturbance and displacement of Avifauna							
Without Mitigation	Direct	2	3	6	4	44	Medium
With Mitigation	Direct	2	3	4	4	36	Medium
Collisions with infrastructure associated with the PV facility							
Without Mitigation	Direct	1	4	8	3	39	Medium
With Mitigation	Direct	1	4	6	2	22	Medium
Electrocution associated with infrastructure associated with the PV facility							
Without Mitigation	Direct	1	4	4	3	27	Medium
With Mitigation	Direct	1	4	4	2	18	Low
Entrapment and snagging associated with infrastructure associated with the PV facility							
Without Mitigation	Direct	1	4	4	2	18	Low
With Mitigation	Direct	1	4	2	2	14	Low
Direct mortality from roadkills, prosecution or poaching of avifauna							

Impact	Nature	Effect			Probability	Total Score	Significance
		Extent	Duration	Magnitude			
Without Mitigation	Direct	2	4	6	3	36	Medium
With Mitigation	Direct	1	4	4	2	18	Low
Pollution of water sources and surrounding habitat due to cleaning products of the PV panels							
Without Mitigation	Direct	1	4	4	3	27	Low
With Mitigation	Direct	1	4	2	2	14	Low
Heat radiation from the BESS and PV panels							
Without Mitigation	Direct	2	4	6	4	48	Medium
With Mitigation	Direct	2	4	4	4	40	Medium

12.14.3 Mitigation Measures

The following mitigation measures are summarised from the Avifaunal Impact Assessment (Paul, 2026b):

- All Project Phases –
  - Environmental Awareness and Compliance
    - Ensure environmental awareness training is provided to all personnel.
    - Prohibit hunting, collecting, trapping or harming birds and other wildlife.
    - Install signage reinforcing wildlife protection requirements.
    - Maintain compliance with all demarcated no-go areas and environmental controls.
- Design and Planning Phase –
  - Habitat and Biodiversity
    - Restrict the proposed development footprint to the minimum practicable extent.
    - Declare and demarcate environmentally sensitive no-go areas.
    - Demarcate all approved development areas to prevent unnecessary disturbance of surrounding habitat.
    - Use pile-driven or screw foundations in preference to large concrete foundations to reduce impacts on soil functioning and biodiversity.
    - Consolidate infrastructure as far as possible to minimise habitat fragmentation and land take.
  - Avifaunal Protection
    - Design the perimeter fence to minimise bird entanglement and avoid fencing close to watercourses where possible.
    - Utilise bird-friendly fencing and avoid razor-wire designs where feasible.
    - Place electrical infrastructure underground where technically feasible.
    - Incorporate bird-safe pole configurations and insulation of exposed electrical components.
    - Minimise overhead powerlines and incorporate bird-flight diverters where overhead lines are required.
    - Design the PV facility and grid infrastructure in accordance with Eskom–EWT Strategic Partnership on Birds and Energy and BirdLife South Africa guidelines.
    - Locate loop-in/loop-out connections at the closest practicable point to existing infrastructure.
    - Install anti-perch and nest-proofing devices on structures that pose electrocution risks.
    - Insulate and preferably bury internal power cables.
    - Ensure the BESS is enclosed within a non-reflective structure.
    - Fit non-polarising white strips along PV panel edges to reduce reflectivity and water-body mimicry effects.
- Construction Phase –
  - Habitat Protection and Rehabilitation
    - Restrict all construction activities to the approved development footprint.

- Retain indigenous vegetation where possible and maintain vegetation beneath solar panels.
- Rehabilitate all disturbed areas using indigenous vegetation and grasses.
- Replace topsoil and re-vegetate denuded areas to reduce erosion and alien plant invasion.
- Prevent vehicle and personnel access into undisturbed habitat outside approved areas.

➢ Pollution and Hazardous Substances
- Implement a hydrocarbon spill management plan.
- Maintain spill kits on site and use drip trays beneath vehicles and machinery.
- Properly contain hydrocarbons, diesel storage tanks and machinery spills.
- Remove or remediate contaminated soil where spills occur.
- Cement, concrete wash water, chemicals, hydrocarbons and other potentially polluting substances must not be disposed of, or allowed to enter wetlands, drainage features or stormwater pathways.
- Concrete washout water, cement-contaminated water, chemicals and other potentially polluting liquids must be contained and must not be discharged into natural drainage features.
- Repair or remove leaking equipment and vehicles immediately.

➢ Fire Risk Management
- Compile and implement a fire management plan.

➢ Avifaunal Protection
- Protect active bird nests identified during construction until breeding has been completed.
- Conduct pre-construction walk-through inspections to ensure no nests or SCC avifauna occur within work areas.
- Obtain specialist advice if Species of Conservation Concern or nests are encountered.
- Prohibit hunting, trapping, collecting or harming birds.
- Implement appropriate speed limits on internal roads.
- Record and investigate any bird mortalities.
- Minimise construction duration to reduce disturbance to avifauna.
- Implement noise mitigation measures to reduce disturbance to birds.
- Design external lighting to avoid sensitive habitats and minimise avifaunal impacts.

❖ Operational Phase –

➢ Habitat Management
- Maintain indigenous vegetation beneath and around solar infrastructure where practicable.
- Restrict operational activities to approved areas and prevent unnecessary habitat disturbance.
- Avoid unnecessary vegetation clearing around the BESS and PV facility.

➢ Pollution Prevention

- Clean solar panels using water-only methods or environmentally benign cleaning products where possible.
- Prevent panel cleaning runoff from entering watercourses or associated buffers.
- Avoid chemical cleaning agents where practical.

➢ Avifaunal Protection

- Continue implementing speed restrictions on internal roads.
- Maintain bird flight diverters and electrocution prevention measures.
- Maintain bird-friendly fencing.
- Continue noise and lighting management measures.
- Operate BESS and PV infrastructure according to manufacturer specifications and safety requirements.

❖ Closure and Rehabilitation Phase –

➢ Rehabilitation and Monitoring

- Undertake post-construction and post-closure avifaunal monitoring.
- Use monitoring results to improve rehabilitation and operational management measures.
- Monitor the recovery of avifaunal communities following closure of the facility.

12.15 Air Quality

12.15.1 Impact Description

Construction activities associated with the proposed Project may result in the generation of fugitive dust and vehicle emissions. Vegetation clearance, topsoil stripping, excavation, earthworks, stockpiling and the movement of vehicles and machinery across exposed surfaces have the potential to elevate dust levels within the Project area and along access routes. Dust generation may temporarily reduce local air quality and cause nuisance effects for nearby receptors, including surrounding agricultural activities and natural vegetation. Exhaust emissions from construction vehicles, generators and machinery may contribute to localised increases in particulate matter and combustion-related pollutants.

During operation, air-quality impacts are expected to be limited and largely restricted to emissions associated with routine maintenance vehicles and occasional repair activities. Unlike conventional power-generation facilities, the Solar PV facility will not involve continuous combustion processes or routine atmospheric emissions during normal operation. Air-quality impacts are therefore expected to decrease substantially after the construction phase is complete.

The impact can be reduced through dust-suppression measures, rehabilitation of disturbed areas, vehicle-speed restrictions, good housekeeping practices, and proper maintenance of vehicles and equipment. With mitigation in place, air-quality impacts are expected to remain localised, temporary and manageable.

12.15.2 Impact Assessment

Environmental Feature	Air Quality
Relevant Alternatives & Activities	Vegetation clearing; topsoil stripping; earthworks; excavation and trenching; road construction; movement of construction vehicles and heavy machinery; transportation of materials; operation of diesel-powered equipment and generators; storage and handling of construction materials; and operational maintenance activities.
Project life-cycle	Construction and operational phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Generation of fugitive dust from vegetation clearance, earthworks, exposed surfaces, stockpiles and vehicle movement ▪ Exhaust emissions from construction vehicles, machinery and generators; temporary deterioration of local ambient air quality ▪ Nuisance dust affecting adjacent land users, vegetation and agricultural activities ▪ Minor operational emissions associated with maintenance vehicles and equipment	▪ Limit vegetation clearance and disturbance to authorised areas ▪ Implement progressive rehabilitation ▪ Regularly suppress dust on roads and exposed surfaces during dry and windy conditions ▪ Enforce speed limits on unpaved roads ▪ Cover material transported to and from site where necessary ▪ Maintain vehicles and equipment in good working order ▪ Minimise vehicle idling ▪ Maintain effective housekeeping measures ▪ Promptly rehabilitate disturbed areas ▪ Monitor dust complaints where required

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Medium term	Likely	3
After Mitigation	-	Loca	Low	Short term	Unlikely	1

12.16 Agricultural

An Agricultural Compliance Statement was undertaken for the proposed Project as the agricultural sensitivity was determined to be low (A summary is contained in **Section 11.7** and the full Report is contained in **Appendix F4**). The findings of the Agricultural Compliance Statement were used to inform the impact assessment undertaken below.

12.16.1 Impact Description

The proposed Project will temporarily disrupt and long-term reduce agricultural activities within the Project footprint. Construction activities, including vegetation clearance, earthworks, trenching and vehicle movement, may impede livestock and agricultural implements, disturb grazing camps and temporarily reduce access to portions of the property. During operation, land occupied by the permanent infrastructure will be unavailable or restricted for conventional agricultural use, reducing and fragmenting the area available for livestock grazing. The associated powerline infrastructure is expected to be less restrictive because its linear configuration generally allows livestock and common agricultural implements to manoeuvre beneath or around it.

The agricultural specialist confirmed that the Project area is currently used primarily for livestock grazing and that the site survey observed no active crop fields or recent cultivation.

Approximately 84.7% of the assessed area comprises shallow Dresden/Mispah/Glenrosa soils with Class VII, inherently poor agricultural potential; approximately 14.2% comprises Glencoe/Lichtenburg Type A soils with Class VI, poor agricultural potential; and approximately 1.1% comprises Glencoe/Lichtenburg Type B soils with Class IV, marginal arable potential and medium agricultural sensitivity. Although arable potential is therefore predominantly limited, the available information indicates a grazing capacity of approximately 5–7 ha per large stock unit, meaning that the land retains a productive grazing function.

The impact can be reduced by restricting development to the assessed footprint, minimising fragmentation of grazing camps, maintaining compatible agricultural access, rehabilitating temporary disturbance areas, re-establishing palatable indigenous vegetation, controlling alien plants, and managing livestock numbers and camp rotation according to the remaining land's carrying capacity. These measures will protect the agricultural functionality of unaffected and rehabilitated areas but cannot fully avoid reducing grazing land beneath the permanent Project footprint.

12.16.2 Impact Assessment

Environmental Feature	Agriculture
Relevant Alternatives & Activities	Construction and operation of the proposed Project. Activities include site clearance, vegetation removal, earthworks, excavation, vehicle and machinery movement, establishment of permanent infrastructure and temporary construction areas, and operational maintenance.
Project life-cycle	Construction and operational phases, including rehabilitation
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Temporary disruption of livestock movement and farming activities during construction ▪ Impediment to agricultural implements and access between grazing camps ▪ Loss and fragmentation of grazing land ▪ Long-term reduction in available grazing capacity ▪ Increased grazing pressure on the remaining agricultural land ▪ Localised soil disturbance and erosion affecting agricultural capability ▪ Alien plant establishment reducing grazing value ▪ Permanent occupation of soils by relevant permanent infrastructure	▪ Keep all infrastructure within the assessed footprint ▪ Minimise unnecessary fragmentation and disturbance of grazing camps ▪ Avoid or minimise development within the limited Glencoe/Lichtenburg Type B medium-sensitivity areas where technically feasible ▪ Restrict construction vehicles and machinery to designated routes and work areas ▪ Maintain reasonable livestock and agricultural access where compatible with construction and operational safety ▪ Separately manage and reinstate topsoil in temporary disturbance areas ▪ Progressively rehabilitate temporary construction areas using palatable indigenous grasses ▪ Remove and control alien invasive plants ▪ Prevent erosion and land degradation ▪ Rotate livestock between the remaining grazing camps in accordance with the carrying capacity of the remaining land. ▪ Any approval required under the Subdivision of Agricultural Land Act must be obtained from the relevant agricultural authority

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Long-term	Almost certain	3
After Mitigation	-	Local	Low	Long-term	Almost certain	2

Residual Risk Explanation	A residual negative agricultural impact will remain due to the long-term loss of grazing land and associated carrying capacity within the permanent Project footprint. Although rehabilitation, alien plant control and appropriate grazing management will maintain the agricultural functionality of the remaining land, the loss of grazing areas beneath permanent infrastructure cannot be fully avoided during operation. The impact is not considered a fatal flaw as it is localised, affects predominantly low-potential grazing land with shallow soils, does not result in the loss of extensive high-potential agricultural land, and can be managed to an acceptable level through implementation of the EMPr and specialist recommendations. The agricultural specialist identified no fatal agricultural impacts and considers the Project acceptable from an agricultural perspective.

12.17 Cultural Heritage

The findings from the Phase 1 Heritage Impact Assessment (Kitto, 2026) follow. The specialist report is contained in **Appendix F5**.

12.17.1 Impact Description

The proposed Project may affect heritage resources through the damage, disturbance or destruction of identified and previously undiscovered archaeological, historical and burial-related resources during planning, construction and operational activities. Heritage resources identified within and adjacent to the Project area include two historical structure sites older than 60 years of age, four low-density archaeological findspots containing stone artefacts, and one potential informal grave. Construction-related activities such as vegetation clearing, earthworks, excavation, road construction and associated infrastructure development have the potential to result in direct or indirect impacts on these resources where they occur within or adjacent to the Project footprint.

The most sensitive heritage resources identified are the historical stone kraal and associated trough (GVL-04), the historical farmstead (GVL-01) and the potential informal grave (GVL-07), which are protected under the NHRA and require avoidance through the implementation of exclusion buffers. Archaeological resources identified within the Project area comprise isolated finds and very low-density scatters of stone artefacts considered of low heritage significance. In addition to impacts on known resources, there remains a possibility that additional buried or obscured heritage resources, particularly graves, may be encountered during construction due to dense vegetation cover and limited visibility during field surveys. Implementing the recommended buffer areas, permitting requirements, and heritage chance-find procedures will substantially reduce impacts on heritage resources. Subject to these measures, the Heritage Impact Assessment concluded that no fatal heritage flaws were identified and that the Project may proceed from a heritage perspective.

12.17.2 Impact Assessment

Table 40 to **Table 42** presents the impact assessment results, obtained from the Phase 1 Heritage Impact Assessment (Kitto, 2026).

Table 40: Heritage resources impact assessment for the historical structure remains

Environmental Feature		Heritage resources – historical structure remains (GVL-01, GVL-04)				
Project life-cycle		Planning, Construction and Operation				
Potential Impact		**Proposed Management Objectives / Mitigation Measures**				
Possible damage to or destruction of historical structure remains		▪ GVL-04 historical kraal: A buffer of at least 30 m must be implemented to ensure that during construction there is no direct impact which could damage any structures ▪ GVL-01 historical farmstead: A buffer of at least 30m must be implemented to ensure that during construction there is no indirect impact which could damage any structures ▪ The materials demarcating the buffer must be highly visible and made of durable material ▪ If any impact is anticipated, then a permit will be required for the alteration or destruction of any of the structures (from NW PHRA or SAHRA)				
Possible damage to or destruction of unidentified historical structure remains		If any changes are made to the final design footprint prior to construction, monitoring of the site clearance activities must be undertaken by a heritage specialist to identify any additional historical structure remains				
	Nature	**Extent**	**Magnitude**	**Duration**	**Probability**	**Significance**
Before Mitigation	Negative	Local	Medium	Permanent	Moderate	2
After Mitigation	Positive	Local	Low	Long- term	Unlikely	1
Significance of Impact and Preferred Alternatives	The location of GVL-04 is within the PV area of the project footprint. GVL-01 is located just outside the southeast boundary. The structures at both sites are protected under section 34 of the NHRA.					

Table 41: Heritage resources impact assessment for the archaeological material

Environmental Feature		Heritage resources – archaeological material (GVL- 02, GVL-03, GVL-06, GVL-08)				
Project life-cycle		Planning, Construction and Operation				
Potential Impact		**Proposed Management Objectives / Mitigation Measures**				
Possible damage to or destruction of archaeological material		No mitigation is required. However, all archaeological material is protected by section 35 and cannot be removed without a permit (from SAHRA)				
Possible damage to or destruction of unidentified archaeological material		The Heritage Chance Finds procedure must be implemented.				
	Nature	**Extent**	**Magnitude**	**Duration**	**Probability**	**Significance**
Before Mitigation	Negative	Local	Medium	Permanent	Moderate	2
After Mitigation	Negative	Local	Low	Long- term	Unlikely	1
Significance of Impact and Preferred Alternatives	The sites comprise isolated to very low-density find spots. The material is protected under Section 35 of the NHRA.					

Table 42: Heritage resources impact assessment for the potential informal grave

Environmental Feature	Heritage resources – potential information grave (GVL-07)
Project life-cycle	Planning, Construction and Operation
Potential Impact	**Proposed Management Objectives / Mitigation Measures**
Possible damage to or destruction of potential grave	▪ GVL-07 potential grave: A buffer of at least 30 m must be implemented to ensure that during construction there is no direct impact which could damage any structures

		▪ The materials demarcating the buffer must be highly visible and made of durable material ▪ If there will be an impact, a test excavation must be conducted by an archaeologist accredited for grave exhumations. A "rescue" exhumation permit from SAHRA may be required if a grave is confirmed.				
Possible damage to or destruction of unidentified graves or burials		If any changes are made to the final design footprint prior to construction, monitoring of the site clearance activities must be undertaken by a heritage specialist to identify any additional historical structure remains				
	Nature	**Extent**	**Magnitude**	**Duration**	**Probability**	**Significance**
Before Mitigation	Negative	Local	Medium	Permanent	Moderate	2
After Mitigation	Positive	Local	Low	Long- term	Unlikely	1
Significance of Impact and Preferred Alternatives	The location of GVL-07 underneath the OHL corridor, southern section. All graves are protected under section 36 of the NHRA.					

12.17.3 Mitigation Measures

The mitigation measures from the Phase 1 Heritage Impact Assessment (Kitto, 2026) are contained in **Table 40** to **Table 42** above.

12.18 Palaeontology

The findings from the Palaeontology Impact Assessment (Butler, 2026) follow. The specialist report is contained in **Appendix F6**.

12.18.1 Impact Description

The proposed Project may affect palaeontological heritage through the destruction, displacement or permanent sealing of fossil material occurring at or below the ground surface. The Project footprint is underlain by the palaeontologically sensitive Malmani Subgroup, and weathered stromatolitic material was identified during the field investigation. Although the observed material was generally weathered and poorly preserved, construction may expose previously concealed or better-preserved stromatolitic horizons. Vegetation clearance, site preparation, excavations, trenching and other ground-disturbing activities could therefore damage or destroy fossil resources and permanently remove them from scientific study.

Potential impacts are confined principally to the construction phase, with no significant palaeontological impacts anticipated during operation or decommissioning. The construction-phase impact is rated Very High before mitigation, reducing to Low after implementing the Chance Find Protocol. Should significant fossil material be exposed, work in the immediate area must cease, and the find must be protected and assessed by a qualified palaeontologist before construction resumes. Subject to implementation of the prescribed mitigation measures, the Project may proceed across the proposed footprint.

12.18.2 Impact Assessment

Table 43 presents the impact assessment results, obtained from the Palaeontological Impact Assessment (Butler, 2026).

Table 43: Palaeontological impact assessment

Nature	Loss of fossil heritage by destruction, movement or sealing in of fossil heritage in or below the earth's surface					
		Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Mitigation Measure**
Construction Phase	**Extent**	1	1	Negative Very High impact	Negative low impact	Chance Find Protocol
	Probability	4	2			
	Reversibility	4	4			
	Irreplaceability	4	4			
	Duration	4	4			
	Cumulative Effect	2	1			
	Magnitude	4	1			
	Impact Significance	76	16			

12.18.3 Mitigation Measures

The mitigation measures from the Palaeontological Impact Assessment (Butler, 2026) are contained in **Table 43** above.

12.19 Visual Quality

The findings from the Visual Impact Assessment (Smith, 2026) follow. The specialist report is contained in **Appendix F7**.

12.19.1 Impact Description

The proposed Project may affect the visual environment by altering the existing rural landscape character and sense of place, increasing visual intrusion, and introducing large-scale engineered infrastructure into a predominantly open agricultural setting. These impacts may arise during the construction, operation, and decommissioning phases and are primarily associated with vegetation clearing, earthworks, construction activities, establishing the solar PV facility and associated grid infrastructure, and the long-term presence of the Solar PV arrays, BESS, MTS, OHL, and associated infrastructure.

Construction activities may temporarily increase visual disturbance through exposed soils, stockpiles, construction equipment, dust generation, lighting and increased vehicle movement, resulting in localised visual contrast and clutter within the landscape. During operation, the Project will permanently modify the site's visual character by replacing open grassland and agricultural land with a large-scale renewable energy facility. The extensive horizontal footprint

of the solar arrays, together with the more visually prominent vertical elements associated with the MTS and OHL infrastructure, may be visible from surrounding farmsteads, rural residences and road corridors, particularly where unobstructed views occur. Additional operational impacts include glint and glare, night-time lighting and cumulative visual effects associated with the increasing presence of renewable-energy and electrical infrastructure within the broader landscape. Decommissioning activities may cause temporary visual disturbance similar to that experienced during construction; however, successful rehabilitation and vegetation re-establishment are expected to help the rural landscape character and sense of place recover over time. Subject to implementing the recommended mitigation measures, construction and decommissioning impacts are expected to reduce to Low significance, while permanent landscape modification and the visibility of the solar and grid infrastructure remain Medium residual impacts due to the Project's scale and long-term presence. The Visual Impact Assessment concluded that no High residual visual impacts were identified and that the Project is acceptable from a visual perspective.

12.19.2 Impact Assessment

Table 44 presents the impact assessment results, obtained from the Visual Impact Assessment (Smith, 2026).

Table 44: Visual impact assessment

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
Construction Phase												
Site establishment: ▪ Vegetation clearance, soil stripping and temporary stockpiling within the development footprint will result in increased visual contrast between disturbed and undisturbed areas. ▪ Removal and disturbance of the predominantly low-growing vegetation may further reduce the existing VAC and increase the visual exposure of construction activities. ▪ Localised changes to land cover, colour and surface texture may temporarily alter the existing rural and agricultural character and sense of place	6	3	2	4	44	Medium	4	2	2	3	24	Low
Site Preparation and Minor Earthworks: ▪ Site preparation, grading and earthworks associated with foundations, internal roads, laydown areas and other infrastructure may result in localised modification of the ground surface. ▪ Given the predominantly flat to gently undulating terrain, substantial modification of the existing landform is not anticipated. ▪ Exposed soils, excavations, stockpiles and disturbed surfaces may temporarily increase visual contrast within the surrounding grassland and agricultural landscape	6	3	2	4	44	Medium	4	2	2	3	24	Low
Construction of PV and Associated Infrastructure: ▪ The progressive installation of solar PV panels, mounting structures, BESS infrastructure, the MTS, internal roads and associated ancillary infrastructure will introduce new engineered elements into the existing open rural landscape. ▪ Partially completed structures, construction materials, equipment and temporary laydown areas may create visual clutter and appear visually discordant during the construction period.	6	3	2	4	44	Medium	4	2	2	3	24	Low

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
▪ The extensive footprint of the PV array may result in construction activities being visible across a relatively broad area, particularly from nearby locations with unobstructed views.												
Construction of the OHL and Grid Connection Infrastructure: ▪ Construction of the proposed OHL will introduce temporary construction activity along the approximately 8.5 km corridor, including foundation works, tower/pole assembly, conductor stringing and associated vehicle movements. ▪ The progressive installation of OHL structures will introduce additional vertical elements into the predominantly horizontal landscape and may be visible from surrounding farms, rural residences and local roads. ▪ Construction activities associated with the MTS and OHL may be visually prominent from nearby receptors due to the greater vertical extent of this infrastructure compared with the PV panels.	6	3	2	4	44	Medium	4	2	2	3	24	Low
Construction Activity and Movement: ▪ The increased presence and movement of construction vehicles, machinery, equipment and personnel will result in temporary visual disturbance within and around the Project area. ▪ Construction traffic along existing and temporary access roads may increase the visibility of Project-related activities to nearby rural residents and users of the surrounding gravel and farm road network.	5	3	2	4	40	Medium	3	2	2	3	21	Low
Waste Management: ▪ Temporary storage of construction materials, general waste and hazardous waste may introduce localised visual clutter and adversely affect the appearance of the construction site if not appropriately contained and managed.	4	2	2	3	24	Low	3	2	2	3	21	Low
Dust Generation: ▪ Dust generated during vegetation clearance, site preparation, earthworks and vehicle movement on unpaved surfaces may intermittently reduce visual clarity and increase the perceptibility of construction activities. ▪ Dust plumes may be visible from surrounding receptors, particularly during dry and windy conditions.	6	2	2	4	40	Medium	4	2	2	3	24	Low
Night-time Visual Impacts:	4	3	2	3	27	Low	4	2	2	2	16	Low

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
▪ Artificial lighting associated with construction activities, including security lighting, vehicle headlights and temporary work lighting, may introduce localised nighttime visual disturbance into the predominantly rural environment. ▪ Construction lighting is expected to be temporary and primarily confined to active construction and site establishment areas. ▪ Given the open and relatively low-VAC character of the landscape, individual light sources may be visible from surrounding rural receptors where unobstructed views occur. ▪ Potential light spill and localised skyglow may occur, particularly around construction compounds, the BESS and MTS construction areas. These effects are expected to be temporary and can be reduced through appropriate positioning, shielding and directional lighting.												
Operational Phase												
Permanent Landscape Modification: ▪ The establishment of the solar PV facility and associated infrastructure will result in a permanent change to the existing land cover and visual character within the development footprint. ▪ The extensive PV footprint will replace portions of the existing open grassland and agricultural landscape with a highly ordered and engineered development pattern. ▪ Given the predominantly flat to gently undulating terrain, substantial modification of the existing landform is not anticipated; however, the change in land use and surface character may influence the existing rural sense of place.	6	5	3	4	56	Medium	5	4	3	3	36	Low
Visibility of Solar PV and Associated Infrastructure: ▪ The solar PV arrays, mounting structures, inverter stations, internal roads, BESS and associated infrastructure will introduce extensive engineered elements into the predominantly open rural landscape. ▪ The generally flat to gently undulating terrain, low-growing vegetation and limited VAC may allow portions of the development to be visible from surrounding locations where unobstructed views occur.	6	5	3	4	56	Medium	5	4	3	3	36	Low

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
▪ The degree of visual exposure will vary according to receptor location, viewing distance, orientation, intervening vegetation and minor variations in topography. ▪ Although the PV array has a relatively low vertical profile, its extensive horizontal footprint may result in it forming a noticeable component of views from nearby receptors, with its visual prominence reducing progressively with distance.												
Visibility of OHL and Grid Connection Infrastructure: ▪ The proposed OHL and MTS will introduce additional engineered elements into the landscape, with the OHL structures representing more prominent vertical features than the PV arrays. ▪ Due to their height and linear configuration, portions of the OHL may be visible over greater distances than the lower-profile PV infrastructure, particularly within the open landscape where vegetation and topographic screening are limited. ▪ The MTS and associated electrical infrastructure may similarly be visually prominent from nearby receptors where direct and unobstructed views occur. ▪ Existing overhead electrical distribution infrastructure within the study area provides some visual precedent for linear electrical infrastructure; however, the proposed grid infrastructure will be larger in scale and may increase the overall degree of visual modification.	6	5	3	4	56	Medium	5	4	3	3	36	Low
Operational Activity: ▪ Operational activities are expected to be limited and will primarily comprise periodic inspection, maintenance and associated vehicle movements. ▪ Visual disturbance associated with operational personnel and vehicle movement is therefore expected to be intermittent and substantially lower than during the construction phase.	3	5	2	3	30	Medium	3	3	2	3	24	Low
Solar Glint and Glare: ▪ Glint and glare may occur as a result of sunlight reflecting from the surfaces of the PV panels. ▪ Glint refers to short-duration, momentary flashes of reflected light, while glare refers to more sustained reflections that may occur under specific viewing and solar geometries.	5	4	3	3	36	Medium	4	3	2	3	27	Low

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
▪ Potential effects may be experienced by sensitive receptors such as nearby residents and road users where the relative position of the receptor, PV panels and sun results in reflected sunlight being directed towards the observer. ▪ Modern PV panels are generally designed to maximise the absorption of solar radiation and typically incorporate anti-reflective properties. Consequently, reflected light is generally limited and highly dependent on panel orientation, tilt, solar position and receptor location. ▪ The potential for glint and glare should nevertheless be considered where sensitive receptors or public roads occur within potentially affected viewing directions												
Night-time Illumination: ▪ Operational lighting is expected to be primarily associated with security and safety requirements at key infrastructure components, including the BESS, MTS and other operational areas. ▪ Lighting requirements across the PV array itself are expected to be limited, and continuous illumination of the entire development footprint is not anticipated. ▪ Given the open character and relatively low existing levels of night-time illumination within the rural landscape, individual light sources may be visible from surrounding receptors where unobstructed views occur. ▪ Potential light spill and localised skyglow can be minimised through the use of appropriately positioned, downward-directed and shielded lighting and by limiting illumination to areas where it is required for operational or security purposes.	3	4	2	3	27	Medium	3	4	2	2	18	Low
Decommissioning and Closure Phase												
Dismantling and Removal of Infrastructure: ▪ The dismantling and removal of solar PV panels, mounting structures, inverter stations, BESS infrastructure, MTS components, OHL infrastructure and other associated facilities will result in temporary visual disturbance across the Project area.	6	2	2	4	40	Medium	4	2	2	3	24	Low

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
▪ Dismantling, loading, handling and transportation of infrastructure and materials may temporarily increase visual clutter and activity within the otherwise rural landscape. ▪ Removal of the OHL and associated structures may involve temporary activity along the approximately 8.5 km corridor, extending decommissioning-related visual disturbance beyond the main PV footprint												
Temporary stockpiles and disturbed surfaces: ▪ Decommissioning activities may require the temporary stockpiling of dismantled materials, structural components, waste and soils, resulting in localised visual clutter and contrast with the surrounding landscape. ▪ Removal of foundations, internal infrastructure and other Project components may result in exposed soils and disturbed surfaces that could remain visually noticeable until rehabilitation has been completed.	6	2	2	4	40	Medium	4	2	2	3	24	Low
Increased activity and equipment presence: ▪ Heavy vehicles, lifting equipment, machinery and personnel associated with dismantling and material removal will temporarily increase visual activity within the Project area and along access routes. ▪ These effects will be temporary and will progressively decrease as infrastructure is removed and decommissioning activities are completed.	4	2	2	4	32	Medium	3	2	2	3	21	Low
Dust generation and atmospheric effects: ▪ Dismantling activities, vehicle movement and earthworks associated with the removal of infrastructure may generate intermittent dust. ▪ Dust plumes may temporarily reduce visual clarity and increase the perceptibility of decommissioning activities, particularly during dry and windy conditions.	6	2	2	4	40	Medium	4	2	2	3	24	Low
Long-term visibility of rehabilitated areas: ▪ During the initial stages of rehabilitation, differences in vegetation cover, colour and surface texture may remain visible from surrounding viewpoints. ▪ As vegetation becomes established, these contrasts are expected to progressively diminish and the rehabilitated areas	4	3	2	4	36	Medium	2	2	2	3	18	Low

Potential Visual Impacts	Visual Significance											
	Before Mitigation						After Mitigation					
	M	D	S	P	SR	Rating	M	D	S	P	SR	Rating
should become increasingly integrated with the surrounding landscape. ▪ Removal of the PV arrays, BESS, MTS, OHL and associated infrastructure will substantially reduce the visual intrusion associated with the operational project.												
Positive (Beneficial) Effects												
Recovery of Landscape Character and Sense of Place: ▪ Successful decommissioning and rehabilitation will result in the progressive recovery of the predominantly open and rural character of the landscape. ▪ The removal of large-scale engineered infrastructure is expected to reduce the visual modification associated with the Project and improve the landscape's sense of place over time. ▪ Where rehabilitation successfully re-establishes vegetation and land uses compatible with the surrounding grassland and agricultural landscape, the long-term visual character of the Project area is expected to become increasingly consistent with its surrounding rural setting.	3	5	2	3	30	Medium (Positive)	4	5	3	3	36	Medium (Positive)
Rehabilitation and Vegetation Re-establishment: ▪ Following the removal of infrastructure, disturbed areas will be rehabilitated through appropriate soil preparation, stabilisation and revegetation. ▪ Rehabilitation will progressively reduce visual contrast between disturbed and surrounding areas and assist in reintegrating the Project footprint into the broader rural landscape. ▪ The effectiveness and rate of visual recovery will depend on the successful establishment of vegetation and the extent to which disturbed landforms and drainage patterns are restored	3	3	2	3	24	Low (Positive)	4	4	2	4	40	Medium (Positive)

12.19.3 Mitigation Measures

The following mitigation measures are summarised from the Visual Impact Assessment (Smith, 2026):

- Construction Phase –
  - General site management:
    - Restrict vegetation clearance and disturbance to the approved development footprint;
    - Retain existing vegetation, particularly along the Project periphery, where practicable;
    - Locate laydown areas, stockpiles and temporary facilities to minimise unnecessary visual exposure;
    - Maintain construction areas in a neat and orderly condition and regularly remove waste and redundant materials; and
    - Progressively rehabilitate areas no longer required for construction.
  - Infrastructure:
    - Use subdued, non-reflective finishes for buildings and ancillary infrastructure, where technically feasible; and
    - Minimise unnecessary vegetation clearance along the OHL corridor and rehabilitate temporary construction areas following completion.
  - Dust and lighting:
    - Implement dust suppression on unpaved roads and disturbed surfaces where required;
    - Enforce appropriate speed limits on unpaved roads; and
    - Limit construction lighting and direct lights downward to minimise light spill into the surrounding rural landscape.
- Operational Phase –
  - Retain existing vegetation that provides visual screening, where practicable;
  - Use subdued and non-reflective finishes on ancillary infrastructure to reduce visual contrast;
  - Maintain the site and associated infrastructure in a neat and orderly condition;
  - Maintain rehabilitated and disturbed areas and control invasive alien plant species;
  - Use targeted vegetation screening around visually prominent ancillary infrastructure where practicable and appropriate;
  - Limit operational lighting to that required for safety and security, with lighting directed downward and shielded to minimise light spill and skyglow;
  - Use warm-white lighting, preferably with a colour temperature of 3 000 K or lower, where feasible;
  - Use motion sensors, timers or similar controls where continuous lighting is not required; and

- Where significant unforeseen glint or glare is experienced at sensitive receptors, investigate the affected location and implement appropriate site-specific mitigation where feasible.

❖ Decomissioning and Closure Phase –

- Remove redundant PV, BESS, MTS, OHL and associated infrastructure.
- Restrict dismantling activities and disturbance to the minimum area required.
- Remove waste, dismantled materials and redundant equipment from the site as soon as practicable.
- Implement dust suppression where required.
- Rehabilitate disturbed areas progressively through appropriate soil preparation, stabilisation and revegetation.
- Re-establish disturbed areas to integrate with the surrounding rural and agricultural landscape as far as practicable.
- Monitor vegetation establishment and undertake corrective rehabilitation where necessary.

12.20 Noise & Vibration

12.20.1 Impact Description

The proposed Project will result in an increase in noise levels within and surrounding the Project footprint during both the construction and operational phases. Construction activities associated with site establishment, vegetation clearance, earthworks, excavation, piling, vehicle movements and the operation of construction equipment and machinery will generate temporary noise that may affect nearby receptors and fauna occurring within proximity of active work areas. As construction activities progress across the site, noise impacts are expected to be localised and temporary in nature, with the highest noise levels occurring during periods of intensive construction activity.

During the operational phase, the Project will introduce ongoing noise sources associated with inverters, transformers, substations, battery energy storage infrastructure and routine maintenance activities. Operational noise levels are anticipated to be substantially lower than those generated during construction and are expected to remain largely confined to the immediate vicinity of the Project infrastructure. Given the rural nature of the surrounding area and the localised extent of operational noise sources, significant disturbance to surrounding land uses is not anticipated.

The increase in noise levels represents the primary noise-related impact associated with the Project and has the potential to result in temporary disturbance to nearby receptors and fauna. However, the impact is expected to be localised, largely confined to the construction phase, and reversible once construction activities have ceased. Through the implementation of appropriate mitigation measures, including maintenance of equipment, management of working hours, stakeholder engagement and adherence to the EMPr, the impact can be effectively managed and reduced to a low level of significance.

12.20.2 Impact Assessment

Environmental Feature	Noise and Vibration
Relevant Alternatives & Activities	Construction and operational activities
Project life-cycle	Construction and operational phases, with the principal impact anticipated during construction
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Localised increases in ambient noise from construction equipment, machinery and vehicles. ▪ Noise from delivery vehicles and construction traffic. ▪ Noise from site clearance, earthworks, piling, trench excavation, etc. ▪ Noise associated with construction camps, personnel and general site activities. ▪ Temporary disturbance and irritation of nearby landowners, residents and farm workers. ▪ Temporary disturbance and displacement of fauna and avifauna from habitat near active construction areas. ▪ Operational noise from rack-mounted inverters, transformers, substations and O&M vehicles and activities.	▪ Notify surrounding landowners and communities in advance of unusually noisy activities, particularly blasting if required. ▪ Restrict construction work to 07h00–17h00 on weekdays and 07h00–14h00 on Saturdays. ▪ Where noise-generating overtime work is unavoidable, consult the affected landowner or community beforehand. ▪ Restrict noisy activities to the approved development footprint and designated construction areas. ▪ Maintain construction equipment, vehicles, generators and machinery in good working order and fit effective silencers or acoustic covers where applicable. ▪ Avoid unnecessary idling of vehicles and machinery. ▪ Locate stationary noise-generating equipment and construction camps as far as reasonably practicable from residences and other sensitive receptors. ▪ Limit vehicle speeds and unnecessary hooting; select reversing alarms that achieve safety requirements while minimising off-site disturbance. ▪ Schedule simultaneous noisy activities to avoid unnecessary cumulative noise where reasonably practicable. ▪ Keep affected landowners informed of the construction programme and expected periods of elevated noise. ▪ Record and investigate noise complaints through the project grievance mechanism and implement corrective measures where warranted. ▪ Undertake attended noise measurements if repeated or substantiated complaints indicate that existing controls are ineffective. ▪ During operation, maintain inverters, transformers, cooling systems and other equipment to prevent abnormal tonal or mechanical noise. ▪ Incorporate these requirements into contractor specifications and the construction and operational EMPr, with compliance monitored by the ECO.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term	Likely	2
After Mitigation	-	Local	Low	Short-term	Unlikely	1

12.21 Hazardous Substances & Waste

12.21.1 Impact Description

The proposed Project will generate, store, handle, and dispose of general and hazardous waste during the construction and operational phases. Construction-related waste will include cleared vegetation, packaging, domestic waste, surplus and used building materials, rubble, wastewater and potentially hazardous waste such as used oils, grease, fuel, lubricants, contaminated absorbent materials and soil affected by accidental spillages. Using, storing, and handling fuels, oils, chemicals, cement, and other potentially hazardous substances during construction may contaminate soil, surface water, and groundwater if these materials are spilt, leak, are stored incorrectly, or are disposed of inadequately. Poor waste storage and

housekeeping may also result in windblown litter, odours, vermin, visual degradation and risks to the health and safety of workers and surrounding land users.

During the operational phase, the Project will generate comparatively small quantities of domestic, office and maintenance waste. Hazardous waste may include used oils, lubricants, contaminated materials, damaged electrical equipment, transformer fluids and damaged or end-of-life battery components. Operating and maintaining the BESS, transformers, substations, workshops, and associated infrastructure may also introduce a risk of accidental releases of hydrocarbons, insulating fluids, chemicals, and potentially contaminated runoff. Emergency incidents associated with the BESS or MTS may generate contaminated firefighting water that could affect surrounding soils, groundwater, natural drainage features, and downstream wetlands if not properly contained.

Contamination is expected to remain localised if incidents are promptly contained; however, pollutants entering stormwater, natural drainage pathways, or subsurface flow paths could migrate beyond the immediate source area and adversely affect aquatic habitat, avifauna, and other fauna and flora. The risk is particularly relevant to the delineated wetlands and associated drainage systems, while panel-cleaning runoff may also affect water quality where cleaning products are used, or runoff is not adequately managed. With appropriate waste segregation, contained storage, bunding, spill prevention and response measures, separation of clean and contaminated stormwater, containment of potentially contaminated firefighting water, and disposal through appropriately authorised service providers and facilities, the potential impact can be effectively managed and reduced to a low residual level.

12.21.2 Impact Assessment

Environmental Feature	Hazardous Substances and Waste
Relevant Alternatives & Activities	Storage, handling and use of hazardous substances; generation, temporary storage, transportation and disposal of general and hazardous waste; construction and operational activities associated with the Solar PV facility, BESS, substations, workshop, offices, powerlines and ancillary infrastructure.
Project life-cycle	Construction and operational phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Improper storage, handling or disposal of hazardous substances, general waste, hazardous waste and wastewater may result in contamination of soil, surface water and groundwater ▪ Degradation of wetlands and surrounding habitat ▪ Harm to fauna and flora ▪ Occupational and community health and safety risks ▪ Odours, vermin, smoke or emissions if waste is burnt; windblown litter; and visual degradation	▪ Implement a Waste Management Plan in accordance with applicable waste-management legislation and the requirements of the EMPr. ▪ General and hazardous waste must be separated at source and stored in designated, clearly labelled containers until removal from site by appropriately authorised waste contractors. ▪ All waste, including hazardous waste, contaminated materials, used oils, chemicals and damaged equipment, must be disposed of or recycled at appropriately licensed or authorised facilities. Waste disposal records must be maintained. ▪ Fuels, oils, lubricants, chemicals, transformer fluids and other hazardous substances must be stored within designated bunded and contained areas with adequate spill-containment capacity. ▪ Refuelling, servicing and maintenance of vehicles and equipment must take place within designated controlled areas and away from wetlands, drainage features and sensitive habitats. ▪ Appropriate spill-response equipment must be available on site at all times, and any spills or leaks must be immediately contained, cleaned and

▪ Potential pollution sources include fuels, oils, lubricants, transformer fluids, chemicals, cement and concrete wash water, contaminated soil, sewage, panel-cleaning runoff, damaged battery units and contaminated firefighting water (amongst others)	remediated to prevent contamination of soil, groundwater and surface-water resources. ▪ Clean stormwater must be separated from potentially contaminated runoff. Contaminated water, concrete wash water, chemicals, wastewater and potentially contaminated firefighting water must be contained and prevented from entering the surrounding environment. ▪ The BESS, transformers, substations, workshops and hazardous-material storage areas must incorporate appropriate containment measures to prevent contamination resulting from leaks, spills or emergency incidents. ▪ Waste, rubble, hazardous materials, wastewater and contaminated soils may not be dumped, buried or stored within wetlands, watercourses, drainage pathways or ecological buffer areas. ▪ Water used for cleaning of PV panels will not contain any harmful chemicals or additives. ▪ Site personnel must receive environmental awareness training regarding waste management, pollution prevention, spill response and emergency procedures. Environmental compliance must be monitored through the EMPr and ECO inspections.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	High	Long-term	Likely	3
After Mitigation	-	Local	Low	Long-term	Unlikely	1

Potential risks and related control measures associated with the BESS facility are captured in **Table 45** below. A detailed risk assessment will need to be undertaken based on the type of BESS technology selected and the final design of the Solar PV Plant. The outcomes of this risk assessment will need to be incorporated into the Operational EMPr.

Table 45: Proposed management of risk to BESS (based on Arup, 2018)

No.	Risk	Possible Consequences	Control Measures
1	Risk posed by veld fires (external to site) to BESS facility	Damage to BESS	▪ Implementation of a fire break around the site ▪ Include measures to deal with veld fires in the Emergency Response Plan ▪ Coordination with local fire authorities ▪ Provide fire extinguishers on site
2	Damage caused to cells by an external event	Lithium-ion cell leakage	▪ Lithium batteries do not contain free liquid electrolytes ▪ Individual cells are used which minimises extent of release
3	Damage to batteries from vehicle collision	Damage to battery cells Electrical risks	▪ Use of perimeter fence around BESS facility ▪ Appropriately designed internal access roads ▪ Limit of speed limit within fenced facility ▪ Earthing system installed as per normal electrical facilities
4	Transformer oil leakage due to corrosion of tank base or leakage of oil tank	Leakage of transformer oil to environment, with resultant pollution	▪ Use of fully bunded oil storage for transformers ▪ Regular tank inspections
5	Collapse or fall of overhead electricity line onto BESS facility	Damage to BESS facility	▪ BESS facility to be located outside of power line servitude
6	Security breach into BESS facility for theft of components	Theft of equipment or risk to personnel	▪ Installation of security fencing around entire Solar PV Plant and around the BESS facility ▪ Installation of security system to monitor key areas ▪ Inspections to monitor for security breaches
7	Spread of fire across BESS facility between battery packs	Localised fire causing damage by spreading to BESS facility	▪ Separation distances between battery packs in accordance with manufacturer recommendations ▪ Adherence to fire management measures ▪ Provide fire extinguishers on site ▪ BESS area will have a non-flammable buffer area to prevent the spread of fire. ▪ BESS will have electrical and fire protection measures in the form of battery temperature monitoring, circuit breakers, fire detection and fire suppression
8	Electrocution due to electrical fault	Electrical fault causing personnel injury	▪ Normal electrical standards and installation of appropriate earthing system ▪ Use of appropriately qualified maintenance personnel
9	Lightning striking BESS facility	Lightning strike causing damage to facility or personnel	▪ Include lightning protection measures, if deemed necessary
10	High rainfall and flooding to site	Damage to electrical equipment	▪ BESS facility to be developed outside of the 1:100 year floodline of any watercourse
11	High wind events and seismic events	Structural damage to equipment or battery packs	▪ Appropriate design of BESS facility, taking into consideration *inter alia* climatic and geotechnical conditions

12.22 Traffic

12.22.1 Impact Description

The proposed Project will result in an increase in traffic volumes within and surrounding the Project footprint during the construction and operational phases. Construction activities will require transporting workers, machinery, equipment, Solar PV components, BESS infrastructure, transformers, and construction materials to the site via existing regional and local road networks. The movement of construction vehicles, including heavy vehicles and abnormal loads, may place additional pressure on local road infrastructure, increase road safety risks and temporarily affect access to surrounding properties.

During the operational phase, traffic volumes are expected to decrease substantially and will primarily involve maintenance personnel, security staff, and occasional deliveries of equipment and replacement components. As a result, operational traffic impacts are expected to be significantly lower than during construction.

Increased traffic and transportation activities represent the primary traffic-related impact associated with the Project and have the potential to contribute to road deterioration, temporary disruption of local road users and increased safety risks. However, these impacts are expected to be localised and largely confined to the construction phase. Through the implementation of appropriate traffic management measures, route planning, road maintenance and adherence to the EMPr, the impact can be effectively managed and reduced to a low level of significance.

12.22.2 Impact Assessment

Environmental Feature	Traffic
Relevant Alternatives & Activities	Transportation of construction personnel, materials, machinery, Solar PV components, BESS equipment, transformers and abnormal loads; movement of construction vehicles on the N14, R53, secondary gravel roads and internal access roads; and transportation associated with operations and maintenance.
Project life-cycle	Construction and operational phases, with the principal impact anticipated during construction
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Increased traffic volumes ▪ Heavy-vehicle movements ▪ Deterioration of gravel and access roads ▪ Dust and noise generated by vehicles ▪ Potential congestion or temporary delays ▪ Unsafe interaction with local road users, pedestrians, school transport, agricultural vehicles and livestock ▪ Speeding or reckless driving	▪ Restrict all construction vehicles to approved access routes and designated internal roads. Appropriate permits and approvals must be obtained for abnormal-load transportation. ▪ Maintain safe access to surrounding properties and ensure that site entrances, warning signage, traffic-control measures and vehicle-management procedures are implemented to minimise safety risks to other road users. ▪ Enforce speed limits and driver conduct requirements for all Project-related vehicles. Speeding, reckless driving and unnecessary disturbance to surrounding landowners must not be tolerated. ▪ Schedule deliveries and large vehicle movements to minimise disruption to existing road users and avoid peak traffic periods where reasonably practicable. ▪ Restrict vehicle movement to designated areas and avoid wetlands, drainage features and environmentally sensitive areas. Any temporary access routes no longer required must be rehabilitated following construction.

▪ Restricted access to farms or properties ▪ Disruption associated with oversized or abnormal loads	▪ Maintain a stakeholder communication and complaints mechanism through which traffic-related concerns can be recorded, investigated and addressed. Compliance with traffic management requirements must be monitored through the EMPr and ECO inspections.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term	Likely	2
After Mitigation	-	Local	Low	Short-term	Moderate	1

12.23 Civil Aviation

12.23.1 Impact Description

The proposed Project may affect civil aviation during construction and operation through the temporary use of construction machinery and lifting equipment, the establishment of overhead electrical infrastructure, and potential sunlight reflection from the Solar PV panels. Construction activities may temporarily introduce elevated equipment or cranes and generate localised dust that could affect visibility in the immediate vicinity of the construction works. However, these effects are expected to be temporary and confined to active construction areas.

During the operational phase, the principal potential civil aviation considerations relate to the overhead powerline and MTS infrastructure, together with the potential for sunlight reflected from the Solar PV panels to cause glint or glare under particular solar and viewing conditions. The Solar PV infrastructure will have a comparatively low vertical profile, with the panels reaching approximately 4.5 m at maximum tilt, while the overhead powerline infrastructure will represent the more prominent vertical component of the Project. The Solar PV modules are designed to absorb solar radiation and minimise reflection, and modern panels typically incorporate anti-reflective properties.

The SSV confirmed that the Project occurs within an area of low civil aviation sensitivity and found no evidence of civil aviation infrastructure near the Project site. The potential civil aviation impact is therefore anticipated to be limited and localised. By managing temporary elevated construction equipment, controlling construction-related dust, and implementing appropriate measures should unforeseen glint or glare occur, the impact can be effectively managed and reduced to a negligible or low residual level.

12.23.2 Impact Assessment

Environmental Feature	Civil Aviation
Relevant Alternatives & Activities	Construction and operation of the Solar PV facility, BESS, MTS, substations, overhead powerlines and associated infrastructure; use of temporary lifting equipment and construction machinery.
Project life-cycle	Construction and operational phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**

▪ Temporary elevated construction equipment and localised dust generation ▪ Introduction of overhead electrical infrastructure ▪ Potential glint or glare from Solar PV panels, which could cause localised interference with civil aviation under particular viewing and solar conditions	▪ Manage the use of cranes, lifting equipment and other temporary elevated construction equipment through the construction planning process and restrict such equipment to the approved Project footprint. ▪ Implement dust-suppression measures on unpaved roads, disturbed surfaces and active construction areas where required, particularly during dry and windy conditions. ▪ Use PV modules designed to maximise solar absorption and minimise reflection. The selected panels should retain the anti-reflective properties normally incorporated into modern PV modules. ▪ Confirm the final panel orientation, tilt and tracking configuration during detailed design, as the occurrence of glint and glare is dependent on panel orientation, tilt, solar position and receptor location. ▪ Record and investigate any substantiated reports of unforeseen glint or glare affecting aviation receptors and implement appropriate site-specific corrective measures where feasible. ▪ Ensure that any aviation-related requirements arising from the detailed design or applicable authority engagement are incorporated into the final design, contractor specifications and EMPr before construction of the relevant infrastructure.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Low	Long-term	Unlikely	2
After Mitigation	-	Local	Low	Long-term	Rare/Remote	1

12.24 Existing Structures and Infrastructure

12.24.1 Impact Description

The proposed Project may result in impacts on existing structures and infrastructure during the construction and operational phases. Construction activities associated with site clearance, earthworks, trenching, excavation, road construction, powerline installation and the establishment of associated infrastructure have the potential to damage, disrupt or restrict access to existing infrastructure and services within and surrounding the Project footprint. Potentially affected infrastructure may include existing roads, access routes, fences, farm infrastructure, electrical infrastructure, water-related infrastructure and other services associated with surrounding agricultural activities.

During the operational phase, the Project will introduce permanent renewable-energy infrastructure into an area currently characterised predominantly by agricultural land uses and associated rural infrastructure. While the majority of existing infrastructure is expected to remain functional, access requirements, servitudes and maintenance activities associated with the Project may affect the use of certain infrastructure features and require ongoing coordination with landowners and infrastructure custodians.

Damage to, disruption of, or restricted access to existing infrastructure and services represents the primary infrastructure-related impact associated with the Project. However, these impacts are anticipated to be largely localised and can be effectively managed through careful planning, avoidance of existing infrastructure where feasible, adherence to wayleave and servitude requirements, engagement with infrastructure owners and implementation of the EMPr.

12.24.2 Impact Assessment

Environmental Feature	Existing Structures and Infrastructure
Relevant Alternatives & Activities	Construction and operational phases
Project life-cycle	Construction and operational phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Damage to existing roads, access tracks, fences, agricultural infrastructure and services. ▪ Temporary disruption or interruption of existing services during construction. ▪ Restriction of access to existing infrastructure and facilities. ▪ Potential conflict with existing electrical infrastructure, servitudes and utility services. ▪ Disturbance or removal of infrastructure within the development footprint where avoidance is not possible. ▪ Increased maintenance requirements associated with construction activities and heavy vehicle movements.	▪ Identify, map and record all existing infrastructure, services and utilities prior to commencement of construction ▪ Optimise the Project layout, where feasible, to avoid existing infrastructure and services ▪ Comply with all wayleave requirements, servitude restrictions and conditions imposed by infrastructure owners and service providers ▪ Maintain uninterrupted access to existing infrastructure and services for landowners, infrastructure custodians and service providers throughout the Project life cycle ▪ Any damage to existing infrastructure or interruption of services must be reported immediately and repaired or reinstated in consultation with the relevant infrastructure owner or service provider ▪ Disturbed areas must be rehabilitated and all affected infrastructure, roads, fences and access routes reinstated to a condition acceptable to the relevant landowner or infrastructure custodian ▪ Compliance with infrastructure-protection measures must be monitored through the EMPr and ECO inspections

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term to Long-term	Likely	2
After Mitigation	-	Local	Low	Short-term	Unlikely	1

12.25 Health and Safety

12.25.1 Impact Description

The proposed Project has the potential to result in health and safety risks during both the construction and operational phases. Construction activities associated with site establishment, earthworks, excavation, installation of Solar PV infrastructure, construction of substations and powerlines, movement and operation of vehicles and machinery, and general construction activities may expose workers and surrounding receptors to occupational and community health and safety risks. These may include physical injuries, exposure to dust and noise, interaction with construction traffic and machinery, electrical hazards, poor sanitation, contamination and communicable diseases.

During the operational phase, health and safety risks will primarily be associated with maintenance activities and the operation of electrical infrastructure, including the Solar PV facility, BESS, transformers, substations and transmission infrastructure. Of particular relevance is the potential for fire and explosion incidents associated with the BESS, along with the need for appropriate fire prevention, detection, emergency response, and access controls.

The operational health and safety risk will generally involve fewer personnel than during construction but will persist throughout the operational life of the Project.

Health and safety risks represent an important consideration throughout the Project life cycle due to the potential consequences for workers and surrounding communities. However, these risks can be effectively reduced through implementation of an appropriate OHS system, hazard identification and risk assessment, worker training, access control, provision of appropriate personal protective equipment, emergency preparedness and adherence to the EMPr and applicable health and safety requirements.

12.25.2 Impact Assessment

Environmental Feature	Health and Safety
Relevant Alternatives & Activities	Construction activities
Project life-cycle	Construction phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Occupational injuries and diseases associated with construction activities ▪ Interaction with vehicles, machinery and equipment ▪ Exposure to dust and noise ▪ Health risks associated with inadequate water and sanitation ▪ Contamination; communicable diseases ▪ Safety and security risks ▪ Electrical hazards ▪ Potential risks to surrounding communities	▪ A dedicated OHS system must be implemented for the construction phase by the Contractor, in accordance with the applicable requirements of the OHS Act and Construction Regulations. ▪ Hazard identification and risk assessments must be undertaken for construction activities, with appropriate preventative and protective measures implemented before work commences. ▪ All construction personnel must receive induction and relevant health and safety awareness training, and must be provided with appropriate personal protective equipment for their assigned tasks. ▪ Adequate potable water, sanitation and welfare facilities must be provided and maintained for construction personnel. ▪ Access to active construction areas must be controlled, and workers must remain within authorised work areas. Construction personnel must be clearly identifiable. ▪ An Emergency Response Plan must be implemented covering reasonably foreseeable construction emergencies, with responsibilities and emergency arrangements communicated to personnel. ▪ Appropriate measures must be implemented to prevent or manage worker exposure to dust, excessive noise, pollution and other environmental health hazards identified elsewhere in the EIA and EMPr. ▪ Worker health programmes must include suitable measures addressing communicable diseases, including, amongst others, HIV/AIDS awareness programmes at construction camps. ▪ Construction activities near existing electrical infrastructure and servitudes must comply with the relevant infrastructure custodian's safety and clearance requirements. ▪ Geotechnical and dolomite-related design and construction requirements must be incorporated into the Project's detailed design and construction controls. The geotechnical study requires a dolomite stability assessment before development and compliance with SANS 1936 Parts 3 and 4 for design, construction and long-term monitoring.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	High	Short-term	Likely	2
After Mitigation	-	Local	Low	Short-term	Unlikely	1

Environmental Feature	Health and Safety
Relevant Alternatives & Activities	Operation activities
Project life-cycle	Operation phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
▪ Occupational health and safety risks associated with operation and maintenance activities ▪ Electrical hazards associated with operational energy infrastructure ▪ Fire and explosion risks associated with the BESS ▪ Exposure to hazardous substances and contaminated materials following abnormal incidents ▪ Risks to personnel or unauthorised persons entering controlled infrastructure areas	▪ Implement and maintain a dedicated OHS system applicable to all operational and maintenance activities. ▪ Undertake activity-specific hazard identification and risk assessment for operational and maintenance tasks and implement the identified controls. ▪ Provide appropriate health and safety induction, competency training and personal protective equipment to all operational and maintenance personnel. ▪ Restrict access to the BESS, substations, transformers, switchgear and other hazardous electrical infrastructure to authorised personnel and provide appropriate warning and safety signage. ▪ Prepare, implement and periodically review an operational Emergency Response Plan addressing reasonably foreseeable emergency situations associated with the Project. ▪ Implement appropriate fire prevention, detection and emergency-response measures for the BESS and associated electrical infrastructure. ▪ Incorporate appropriate arrangements for BESS emergency incidents, including hazardous-material management and management of potentially contaminated water generated during emergency response. ▪ Ensure that electrical infrastructure is inspected and maintained in accordance with applicable operational requirements and that safe working procedures are followed during maintenance. ▪ Maintain emergency access to the BESS, substations and other critical infrastructure and ensure that emergency routes are kept unobstructed. ▪ Maintain appropriate potable water, sanitation and welfare facilities for operational personnel. ▪ Maintain security and access controls throughout operation to prevent unauthorised entry into electrical and BESS infrastructure areas. ▪ Incorporate the long-term geotechnical and dolomite monitoring requirements into infrastructure inspection and maintenance arrangements.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	High	Long-term	Moderate	2
After Mitigation	-	Local	Low	Long-term	Unlikely	1

12.26 Social Environment

The Social Impact Assessment findings (Tanhuke and Chidley, 2026) follow. The specialist report is contained in **Appendix F8**.

12.26.1 Impact Description

The proposed Project has the potential to result in both positive and negative impacts on the social and socio-economic environment throughout the Project life cycle. The Social Impact Assessment identifies impacts relating to health and well-being, quality of the living environment, economic and material well-being, cultural considerations and gender relations, with some impacts extending across more than one of these categories.

During the planning and construction phases, establishing the Project may result in the loss or restriction of productive agricultural land, disturbance to existing farming activities, and potential impacts on property, livestock, and game. Construction activities may also cause temporary dust and noise impacts, increase interaction between construction workers and surrounding communities, raise worker health and safety risks, create security concerns, and attract an influx of job seekers. These may contribute to community conflict over employment expectations and increase certain health and social risks if not appropriately managed. These impacts are generally concentrated within and surrounding the Project area and are predominantly associated with the construction phase.

The construction phase will also generate positive socio-economic effects through employment, local procurement and opportunities for local businesses. The Social Impact Assessment identifies opportunities for local SMMEs to supply services, materials, and equipment, as well as opportunities for skills development and local labour participation. The assessment further identifies the importance of equitable employment opportunities and measures to support gender inclusivity within the Project workforce.

During the operational phase, employment opportunities will be lower than during construction, but the Project is expected to continue contributing positively to the regional economy through employment, procurement of goods and services, skills development and opportunities for local enterprises. The Social Impact Assessment rates the operational economic impact as positive, regional, high in magnitude and long-term, and recommends local procurement and skills-transfer measures to maximise these benefits. At the same time, converting productive and grazing land to Solar PV infrastructure has a negative social and economic effect for existing land users, although the Social Impact Assessment assesses this effect as low.

Overall, the Social Impact Assessment concludes that the Project has relatively few social receptors in its immediate surroundings and that the negative social impacts are limited in nature and scope and can be mitigated to an acceptable level. The assessment further concludes that, after implementing the recommended mitigation measures, the Project will have a net positive impact on the social environment of the regional study area, primarily by stimulating and diversifying the local economy.

12.26.2 Impact Assessment

Table 46 to **Table 55** presents the impact assessment results, obtained from the Social Impact Assessment (Tanhuke and Chidley, 2026).

Table 46: Social Environment Planning Phase Impacts - Institutional, Legal, Political and Equity

Environmental Feature	Social Environment: Institutional, Legal, Political and Equity
Project life-cycle	All Phases
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**

Loss of land through project infrastructure	▪ Where the construction takes place will result in the land being acquired, and so adequate steps must be taken to ensure that the owner is not treated unfairly in the process. ▪ Promptly address any concerns raised by the public in a transparent manner. ▪ Include all relevant community members in decisions affecting them.
Some restrictions on use of productive land	Once the project is operational, the land will be dedicated exclusively to the project, and so its prior productivity will no longer apply. This must be clearly communicated, and the owner should be adequately compensated.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Site	Medium	Long-term	High	2
After Mitigation	-	Site	Low	Long-term	High	1
Significance of Impact and Preferred Alternatives	Unaddressed grievances could significantly delay project progress. This can be mitigated by establishing a grievance procedure and adhering to local by-laws. The impact has no consequence for project alternatives.					

Table 47: Social Environment Construction Phase Impacts - Economic Opportunities

Environmental Feature	**Social Environment: Economic Opportunities**
Project life-cycle	Construction phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Economic and social stimuli arising from the developmental initiative of the project.	▪ Local SMMEs should be given an opportunity to participate in the construction of the project through the supply of services, material or equipment. ▪ Youth development should be considered as an initiative so that there is a benefit of transferring skills to the community. This can be achieved through the assistance of the local municipality. ▪ The main contractor should employ non-core labour from the regional study area as far as possible during the construction phase.
Informal trading being established at the site boundaries	Spaza/informal trader shops may open next to the site to cater for construction workers. These should be controlled by the contractor to limit their footprint and to ensure that the MLM By-laws are complied with.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	+	Regional	Medium	Short-term	Likely	1
After Mitigation	+	Regional	High	Short-term	Likely	3
Significance of Impact and Preferred Alternatives	Individuals who will benefit during the construction are limited to those who actively participate in the construction activity through employment, sub-contracting or other economic opportunities. Active participation should be encouraged. The benefits on such a construction will take place irrespective of which site alternative is preferred.					

Table 48: Social Environment Construction Phase Impacts - Gender Relations

Environmental Feature	**Social Environment: Gender Relations**
Project life-cycle	Construction phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Cultural resistance towards women because of increased gender representation in the workforce	▪ Sensitise staff in respect of gender sensitive issues that are pertinent to the workplace. ▪ Ensure gender inclusivity and equity with respect to all compensation. ▪ Prioritise gender inclusivity and equity in access to resources, goods, services and decision making with the aim of empowering women. ▪ Promote equal job opportunities for women and men during the construction and operational processes.

	▪ Prioritise and articulate gender inclusivity and equity in the project documents by including specific strategies and guidelines for implementation. ▪ The project documents should also include clear mechanisms through which the actual implementation of the activities and the impact on the ground can be monitored and evaluated. ▪ Develop a grievance procedure to specifically address gender matters. ▪ Factors such as culture should be considered when planning for gender activities since they play a great role in influencing gender relations.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Site	Medium	Short-term	High	2
After Mitigation	-	Site	Low	Short-term	High	1
Significance of Impact and Preferred Alternatives	The impact on project equity promotion would be moderate if this impact were not addressed. This can be effectively mitigated through the design of a specific gender-focused approach. The impact has no impact on alternative project layouts.					

Table 49: Social Environment Construction Phase Impacts - Property and Production

Environmental Feature	**Social Environment: Property and Production**
Project life-cycle	Construction phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Risk of intrusion	The project proponent should ensure entrance management and control.
Livestock and game animals Safety	There should be clear demarcation of the area in development so that livestock and game animals are prevented from wandering nearby.
Loss of agricultural production	The project proponent should ensure that the schedule for construction is made available to the local community so that they can suitably prepare.
Damage to property	▪ If a risk exists of damage taking place on a property as a result of construction, a condition survey should be undertaken prior to construction; ▪ The contractor is to make good and acknowledge any damage that occurs on any property as a result of construction work; ▪ Where crops and agricultural machinery are damaged, compensation is to be paid to the farmer for the proven loss of these crops; ▪ The farmer should be compensated for any loss of income experienced at the account of the contractor.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term	Likely	1
After Mitigation	+	Local	Minor	Short-term	Likely	3
Significance of Impact and Preferred Alternatives	Costs related to damage and theft should be borne by the developer. There are no alternatives suggested.					

Table 50: Social Environment Construction Phase Impacts - Disturbances Arising from Construction

Environmental Feature	**Social Environment: Disturbances Arising from Construction**
Project life-cycle	Construction phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Increase in Dust	▪ Dust and disturbance can be mitigated through the use of appropriate dust suppression mechanisms. ▪ Adherence to road signage can be added as an advantage and a measure to manage the increase in dust levels. ▪ Mitigation measures management should be adhered to according to the relevant specialist studies.

Noise Impacts	▪ Prior notice should be given to surrounding communities of noisy event such as blasting. ▪ Construction work should take place during working hours – defined as 07h00 to 17h00 on weekdays and 07h00 to 14h00 on Saturdays. Should overtime work be required, that will generate noise, consultation with the affected community or landowner should take place.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term	Likely	2
After Mitigation	-	Local	Low	Short-term	Moderate	1
Significance of Impact and Preferred Alternatives	Disturbances and irritation during construction is to be expected. These can then be successfully mitigated through contractor specifications that are issued at a tender stage and through the continuous monitoring of contractor proceedings and performance during the construction phase. Negative impacts owing to the construction will unfortunately be experienced irrespective of the site and routing alternative that is most preferred and chosen.					

Table 51: Social Environment Construction Phase Impacts - Worker Health and Safety

Environmental Feature	**Social Environment**
Project life-cycle	Construction Phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Injuries on Site	▪ The provisions of the OHS Act 85 of 1993 and the Construction Regulations of 2014 should be implemented on all sites. ▪ Account should be taken of the safety impacts on the local community when carrying out the longitudinal aspects of the project, such as the powerline. ▪ Contractors should establish HIV/AIDS awareness programmes at their site camps. ▪ Gender sensitive work place practises should be planned for and adopted on site. Employment practises should be demonstrated free of coercion or harassment.
Protecting the Vulnerable	▪ There should be a policy on harassment that is well understood by all. ▪ There should be separate changing facilities for men and women, and they should be clearly marked as such. ▪ There should separate toilet facilities for men and women, and they should be clearly marked as such.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term	Likely	2
After Mitigation	-	Local	Low	Short-term	Moderate	1
Significance of Impact and Preferred Alternatives	The significance of the impact is high as community attitudes can be altered. The implementation of the overall mitigation measures is essential and necessary to minimise the impact from workers' health and safety and community impacts.					

Table 52: Social Environment Construction Phase Impacts – Influx of Job Seekers

Environmental Feature	**Social Environment: Influx of Job Seekers**
Project life-cycle	Construction Phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Job seekers influx into the community	▪ All employment of locally sourced labour should be controlled and formalised. No employment should take place from the project gate and contracts of employment should be entered into taking into account the Labour Relations Act. ▪ If possible, and if the relevant Ward Councillors deems it necessary, the employment process should include the affected Ward Councillors and their ward committee.

	▪ To limit the growth of informal settlements in the project area, labour should be sourced from existing labour sending areas, from people who resided in the area prior to appointment. This process should include the Ward Councillor to ensure that only local residents are employed, rather than labour migrants. ▪ No staff accommodation should be allowed on site. ▪ To limit the growth of settlements near the project site the project proponent should provide worker transport to and from the work site for the duration of construction.
Increased community conflicts due to employment of local and non-local labourers	Programmes should be developed to boost the local economy. These can be in the form of Corporate Social Responsibility (CSR) that will favour local empowerment.
Increase health risk	Measures should be taken to provide condoms and, where necessary, access to counselling to address any risks to health.
Increased social pathologies such as crime, drug abuse and sexual behaviours	The mitigation method will require a change in community values and attitudes; This can be done through creating social awareness, and educating the workforce with regards crime awareness and social pathology prevention

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Site	Medium	Short-term	High	2
After Mitigation	-	Site	Low	Short-term	High	1
Significance of Impact and Preferred Alternatives	The significance of the impact is high as community attitudes can be altered. The implementation of the overall mitigation measures is essential and necessary to minimise the impact from job-seekers influx and community impacts.					

Table 53: Social Environment Construction Phase Impacts – Security

Environmental Feature	**Social Environment: Security**
Project life-cycle	Construction Phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Ensuring the security of the project site	▪ The camp site for the project and the longitudinal construction subsite laid down areas should be fenced for the duration of construction. ▪ All contractors' staff should be easily identifiable through their respective uniforms. ▪ A project policy on management of workers should be developed. This would include education and awareness to be conducted with regards crime, trespassing and not gathering outside the site could be conducted. ▪ Security staff should only be allowed to reside at contractor camps and no other employees.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Medium	Short-term	Likekly	2
After Mitigation	-	Local	Low	Short-term	Moderate	1
Significance of Impact and Preferred Alternatives	Disturbances and irritation during construction are to be expected. These can then be successfully mitigated through contractor specifications that are issued at a tender stage and through the continuous monitoring of contractor proceedings and performance during construction phase.					

Table 54: Social Environment Operation Phase Impacts –Economic Impacts (positive)

Environmental Feature	**Social Environment: Economic Impacts (positive)**
Project life-cycle	Operation Phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**

Economic	▪ The solar park will stimulate the local economy through the provision of jobs and through local procurement. ▪ It will contribute to the improvement of the national electricity supply at a price that has been set by a competitive bidding process
Local Procurement	▪ Local SMMEs should be given an opportunity to participate in the operation of the project through the supply of services, material or equipment. ▪ A procurement policy promoting the use of local business where possible, should be put in place and applied throughout the operational phases of the project.
Job Creation and Skills Development	▪ Women should be given equal employment opportunities and encouraged to apply for positions. ▪ A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills whilst in employment.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	+	Reiongal	High	Long-term	Likely	3
After Mitigation	+	Regional	High	Long-term	Likely	3
Significance of Impact and Preferred Alternatives	The solar park in the regional study area will provide economic stimulus to the regional study area for the long-term. The solar park should adopt policies that are supportive of local procurement and support for local enterprises. Economic impact considerations require that the most cost-effective transmission power line route be adopted to service the project.					

Table 55: Social Environment Operation Phase Impacts – Economic and material well-being (negative)

Environmental Feature	**Social Environment: Economic and material well-being (negative)**
Project life-cycle	Operation Phase
Potential Aspects & Impacts	**Proposed Management Objectives / Mitigation Measures**
Loss of productive land	The agricultural specialist report is definitive in this regard, but there is a very low social impacts that does not require mitigation.
Loss of grazing land	The agricultural specialist report is definitive in this regard, but there is a very low social impacts that does not require mitigation.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	Local	Low	Short-term	Low	1
After Mitigation	-	Local	Low	Short-term	Low	1
Significance of Impact and Preferred Alternatives	This impact is not considered significant. It should be noted that this study defers to the agricultural specialists with regards the impact of the project on regional production.					

12.27 "No-Go" Impacts

The "no-go option" is the alternative of not implementing the proposed Project and provides the baseline against which the impacts associated with Project implementation can be considered.

The "no-go option" needs to be considered in light of the motivation for the Project (refer to **Section 3**) as well as its need and desirability (refer to **Section 8**).

SA has identified the need to diversify its electricity generation mix, including through renewable energy technologies such as that proposed by the Project. This is considered in

the context of the country's commitment to reducing the carbon footprint associated with its reliance on coal for electricity generation and improving security of electricity supply.

Should the proposed Project not proceed, the potentially significant environmental impacts associated with its construction and operation, as assessed in **Sections 12.9 to 12.26**, would not occur as a consequence of the Project, and the existing status quo of the local receiving environment would largely remain unaffected by Project-related activities. The site is currently used for agriculture, and under the "no-go option", the future use of the affected land would remain subject to the landowner's decisions and any applicable statutory requirements.

However, the Project's objectives would not be achieved, and the anticipated benefits would not materialise. Taking into consideration the findings of the impact assessment, the Project's need and desirability, and the ability to avoid or mitigate identified impacts, the "no-go option" is not preferred.

12.28 Cumulative Impacts

12.28.1 Introduction

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

Cumulative impacts are contextual and may occur at different spatial and temporal scales. The cumulative assessment for the Project therefore considered the combined effects of the Project together with existing, approved and reasonably foreseeable developments and land-use activities within the relevant area of influence. The cumulative assessment was not limited to a uniform geographical distance for all environmental themes. The applicable study area was determined according to the environmental receptor and impact pathway under consideration.

A 30 km radius was used as the initial regional screening area for identifying other renewable energy applications in the surrounding area. The specialist assessments applied receptor-specific assessment areas where appropriate, including a 20 km cumulative assessment context for avifauna, a 10 km visual study area, a 30 km social study area and a 500 m PAOI for the wetland assessment.

The cumulative assessment considered the Project in combination with existing agriculture, livestock grazing, roads, settlements, electrical infrastructure, mining and prospecting-related activities, and other renewable energy developments in the broader area. It also considered the complete Project footprint, including the Solar PV Facility, BESS, substations, overhead powerlines, roads, servitudes and ancillary infrastructure.

The principal cumulative impact pathways identified for the Project relate to:

- progressive loss and fragmentation of natural and semi-natural habitat;
- reduction in ecological connectivity and ecosystem functioning;
- loss and fragmentation of avifaunal habitat and the incremental introduction of infrastructure-related mortality risks;
- changes to runoff, erosion, sedimentation, hydrological functioning and water quality;
- incremental conversion and fragmentation of agricultural and grazing land;
- alteration of the rural landscape character and sense of place;
- impacts on heritage and palaeontological resources;
- traffic, dust, noise and construction-related disturbance;
- pressure on local roads, services and surrounding communities; and
- positive cumulative socio-economic effects associated with employment, procurement, skills development and economic diversification.

It is noted that the accurate characterisation of the future state of the Project Area is inherently speculative to an extent, as it is not known whether all authorised or reasonably foreseeable developments will proceed, whether they will be constructed to their full authorised footprints, or whether their construction periods will overlap with that of the Project. The assessment therefore focuses on cumulative receptors and impact pathways supported by the information available at the time of the EIA.

12.28.2 Other Renewable Energy Projects in Proximity to the Proposed PV Site

DFFE has developed the REEA Database, which contains spatial and attribute information for renewable energy applications for Environmental Authorisation, including active applications and non-active applications that have lapsed or have been replaced by amendments.

According to the REEA Database (REEA Quarter 1 of 2026), the following renewable energy applications have been made for properties that are located within a 30 km radius of the PV Site (refer to **Figure 7** in **Section 6.6**):

- The proposed Kiara PV1 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Reference (Ref) No.: 14/12/16/3/3/2/2171) (Status: Approved);
- The proposed Kiara PV2 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2172) (Status: Approved);
- The proposed Kiara PV3 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2173) (Status: Approved);
- The proposed Kiara PV4 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2174) (Status: Approved);
- The proposed Kiara PV5 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2175) (Status: Approved);
- The proposed Kiara PV6 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2176) (Status: Approved);
- The proposed Kiara PV7 Facility and associated Infrastructure, near Lichtenburg, North West Province (Application Ref. No.: 14/12/16/3/3/2/2177) (Status: Approved);

- Proposed Establishment Of A Photovoltaic (PV) Installation At The Bloemfontein Airport, Free State Province (Application Ref. No.: 12/12/20/2149) (Status: Approved);
- Proposed Establishment Of A Photovoltaic (PV) Installation At The Bloemfontein Airport, Free State Province (Application Ref. No.: 12/12/20/2149/A3) (Status: Approved); and
- The proposed development of Biochemical refinery plant, a 130MW PV solar plant and associated infrastructure JB Marks local municipality, Dr Kenneth Kaunda District, North West Province (Application Ref. No.: 14/12/16/3/3/2/2184) (Status: Approved).

The occurrence of another renewable energy application within 30 km does not necessarily mean that a cumulative impact will arise for every environmental receptor. The relevant consideration is whether the Project and another development affect the same receptor through the same or interacting impact pathways. Accordingly, the Project was assessed against the general 30 km renewable energy context and the receptor-specific study areas adopted by the specialists.

The cumulative assessment also considered established agricultural land uses, existing electrical and road infrastructure, settlements, mining-related activities, and other land-use pressures in the surrounding area. These existing activities form part of the environmental baseline against which the Project's incremental contribution has been assessed.

12.28.3 Proposed Project contributions towards cumulative impacts

12.28.3.1 General Project Cumulative Impacts

The Project will introduce a large-scale Solar PV Facility, BESS, substations, overhead powerlines, internal roads, buildings, fencing and associated infrastructure into an existing rural and agricultural landscape. The Project will therefore contribute incrementally to existing and reasonably foreseeable environmental change within the broader area.

The following is noted in terms of the Project's general contribution towards cumulative impacts:

- Loss and fragmentation of natural habitat: Clearance required for the Project footprint will contribute to the progressive transformation of remaining natural and semi-natural grassland. The cumulative effect is particularly relevant where natural grassland, wetland-associated habitat, CBAs, ESAs and ecological connections are affected. The ecological consequence of the Project depends on the sensitivity and condition of the habitat affected and not only on the total size of the development area.

  The cumulative extent of natural and semi-natural vegetation loss has not been expressed as a combined hectare value. While the Project will contribute to vegetation and habitat transformation within its development footprint, the authorised/project footprints of surrounding renewable energy developments cannot be assumed to represent equivalent areas of natural vegetation loss. Reliable cumulative quantification requires comparable project-specific information that distinguishes natural and semi-natural habitat from previously transformed or disturbed land within each development footprint. Without consistent information of this nature, a combined hectare value would not reliably

represent cumulative vegetation loss. The cumulative effect has therefore been assessed based on the identified habitat-transformation and fragmentation pathway and the specialist cumulative impact assessment.

- Reduction in ecological connectivity: Roads, fencing, electrical infrastructure and permanently transformed areas may contribute to habitat fragmentation, edge effects and restrictions on the movement of fauna. These impacts will occur within a landscape already affected by agriculture, livestock grazing, roads and electrical infrastructure.
- Avifaunal impacts: The Project will contribute to the cumulative reduction and fragmentation of grassland habitat and will introduce additional fencing and electrical infrastructure into the surrounding landscape. These features may incrementally contribute to collision, electrocution, disturbance, entrapment, and other infrastructure-related mortality risks.
- Wetland and water-resource impacts: Project activities may contribute to altered runoff, erosion, sedimentation, hydrological changes and contamination where these impacts are not adequately controlled. However, none of the Projects identified through the REEA Database occurs within the same quaternary catchment as the proposed Project. One Project identified through the REEA Database occurs within the same secondary catchment (C2), while the other Projects occur in a different secondary catchment (C3). Therefore, cumulative impacts on watercourses would not affect the same catchment.
- Agricultural land: The Project will result in the long-term conversion of land currently used for agricultural and grazing purposes. The Project may therefore contribute incrementally to the loss and fragmentation of grazing land and may increase pressure on any remaining grazing areas.
- Soil erosion and contamination: Vegetation clearance, earthworks, construction traffic and concentrated runoff may exacerbate existing erosion processes. Poor handling of hydrocarbons, construction materials, transformer oils, BESS-related substances, waste and wastewater could also contribute to cumulative soil and water contamination if not properly managed. These cumulative impacts will be managed by the provisions of the EMPr for the respective renewable energy developments.
- Traffic and road infrastructure: Construction will result in additional heavy vehicles, equipment deliveries, worker transport and other Project-related traffic. Should construction overlap with other developments or existing intensive agricultural or mining-related traffic, the combined use of rural access roads may increase traffic-related disturbance and road deterioration. These cumulative impacts will be managed by the provisions of the EMPr for the respective renewable energy developments.
- Dust and noise: Construction-related vegetation clearing, earthworks, material handling and vehicle movements will generate localised dust and noise. These impacts may contribute to cumulative disturbance where other construction or land-use activities occur concurrently near the same receptors. These cumulative impacts will be managed by the provisions of the EMPr for the respective renewable energy developments.
- Visual and landscape impacts: The Project will introduce Solar PV and electrical infrastructure into an open rural and agricultural landscape, with some electrical

infrastructure. The Project will therefore contribute incrementally to the landscape's visual transformation and alter the existing rural sense of place.

- Heritage and palaeontological resources: Ground disturbance may contribute to the cumulative damage or loss of identified and previously unknown heritage or palaeontological resources. Avoidance, demarcation of sensitive resources, implementation of prescribed buffers, and application of the relevant Chance Find Procedures can reduce the cumulative contribution.
- Socio-economic impacts: The Project may contribute to cumulative pressure on roads, employment expectations, community services and the equitable distribution of Project benefits. Conversely, the Project may contribute to positive cumulative effects through employment creation, local procurement, skills development, enterprise development and regional economic diversification.

The Project's contribution to these cumulative impact pathways is discussed further below, based on the findings of the specialist assessments.

12.28.3.2 Specialists' Assessments of Cumulative Impacts

The specialist studies undertaken during the EIA Phase considered cumulative impacts where relevant to the environmental receptor being assessed. The following is noted:

- Wetland Impact Assessment:
  - The wetland assessment applied a 500 m PAOI and identified three natural depression wetlands and one artificial wetland within the study area.
  - Potential cumulative impact pathways include altered runoff, erosion, sedimentation, hydrological changes and contamination.
  - The specialist concludes that the potential cumulative impact on wetland habitats is Low.
  - The Low cumulative conclusion is dependent on the implementation of the prescribed mitigation and avoidance measures.
  - A final aquatic buffer of 30 m is required around the delineated wetlands, within which no temporary or permanent Project activities are to occur.
- Terrestrial Biodiversity Impact Assessment:
  - The principal cumulative terrestrial biodiversity impact relates to the progressive loss and fragmentation of remaining natural and semi-natural habitat, particularly natural grassland and wetland-associated habitat.
  - Associated cumulative effects include reduced habitat availability, ecological connectivity, and ecosystem functioning.
  - The specialist rates cumulative impacts as Medium negative without mitigation (score 48) and Medium negative with mitigation (score 40).
  - Mitigation reduces the cumulative impact score but does not reduce the residual significance below Medium.
  - The specialist determined that the cumulative impact is considered important but manageable, provided that individual developments minimise unnecessary transformation of natural habitat, preferentially utilise already transformed or

historically disturbed areas, retain ecological connectivity where practicable, protect important habitat features such as the delineated watercourses and associated 30 m buffers, and rehabilitate areas temporarily disturbed during construction.

- Avifaunal Impact Assessment:
  - The avifaunal assessment considered eight other authorised PV developments within the broader 20 km cumulative assessment context.
  - The principal cumulative impacts relate to progressive loss and fragmentation of remaining natural grassland and the incremental introduction of infrastructure-related mortality risks.
  - The specialist rates cumulative impacts on avifauna as Medium negative without mitigation (score 48) and Medium negative with mitigation (score 40).
  - The residual significance therefore remains Medium after mitigation.
  - The cumulative impact is considered manageable provided that unnecessary habitat transformation is minimised, watercourses and their 30 m buffers are protected, appropriate fencing is used near sensitive features, bird-safe electrical infrastructure is implemented, and mortality monitoring is undertaken.
- Agricultural Compliance Statement:
  - The agricultural assessment identifies livestock grazing as an existing land use and assesses the agricultural potential and sensitivity of the Project area.
  - The Project will result in a long-term reduction in the area available for grazing and may contribute to the cumulative conversion and fragmentation of agricultural land. However, agricultural sensitivity was determined to be low across most of the Project site, with a small section rated medium.
  - The Agricultural Compliance Statement does not provide a standalone cumulative impact rating. This EIA therefore considers the cumulative agricultural pathway qualitatively.
  - Implementing the specialist-recommended mitigation measures can reduce the cumulative impact, including restricting disturbance to the approved footprint, avoiding unnecessary fragmentation of agricultural activities, rehabilitating temporary disturbance areas, and managing the remaining grazing areas in accordance with their carrying capacity.
- Heritage Impact Assessment:
  - Agricultural activities, cattle and game farming, and previous or proposed development in the surrounding area have already affected the heritage receiving environment.
  - The baseline impact on heritage resources is considered Low to Moderate.
  - The cumulative impact is assessed as Low to Moderate before mitigation, reducing to Low following mitigation.
  - The Project's contribution can be reduced through avoidance and demarcation of identified heritage resources, implementing the prescribed buffers, obtaining required heritage permits where impacts cannot be avoided, and implementing the Chance Find Procedure included in the EMPr.
- Palaeontological Impact Assessment:

- The Project lies within the Malmani Subgroup, which has Very High palaeontological sensitivity, and field investigations identified weathered stromatolitic horizons.
- The Project's direct construction-phase impact is assessed as Very High before mitigation, reducing to Low following implementation of the prescribed mitigation and Chance Find Protocol.
- The cumulative palaeontological impact associated with other developments in the broader area is assessed as Low before and after mitigation and is considered to be within acceptable limits.
- The Low cumulative rating must therefore be distinguished from the Very High unmitigated direct construction-phase impact.

❖ Visual Impact Assessment:

- The Visual Impact Assessment applied a 10 km visual study area.
- The Project will cause an unavoidable long-term alteration of the visual character and sense of place of the immediate area.
- Permanent landscape modification and visibility of the Solar PV and grid infrastructure remain Medium negative residual impacts following mitigation.
- Cumulative visual effects are, however, assessed as Low following mitigation.
- Mitigation should focus on minimising unnecessary vegetation clearance, retaining screening vegetation where practicable, controlling dust and artificial lighting, maintaining good site housekeeping and rehabilitating disturbed areas.
- No High residual visual impacts were identified by the specialist.

❖ Social Impact Assessment:

- The Social Impact Assessment applied a 30 km cumulative study area.
- Potential positive cumulative effects relate to employment creation, skills development, local procurement and economic diversification.
- Potential adverse cumulative effects relate to employment expectations, perceptions regarding the equitable distribution of benefits, existing socio-economic vulnerabilities and additional pressure on rural road infrastructure.
- The specialist concludes that cumulative social impacts are expected to be predominantly positive, provided mitigation measures are implemented, including (amongst others) prioritising local employment, skills development, and procurement, and maintaining continued community engagement.

12.28.4 Cumulative Environmental Impact Statement

The cumulative impact assessment considered the Project together with existing land uses, infrastructure and approved or reasonably foreseeable developments within the relevant receptor-specific study areas. The assessment considered the complete Project footprint, including the Solar PV Facility, BESS, substations, overhead powerlines, roads, servitudes and associated infrastructure.

Nine approved renewable energy applications occur within the broader 30 km regional screening area. The cumulative significance of these developments depends on whether they

affect the same environmental receptor through the same or interacting impact pathways. The mere occurrence of another development within 30 km does not, in itself, indicate that a significant cumulative impact will arise.

The most notable residual cumulative negative impacts relate to the progressive transformation and fragmentation of remaining natural and semi-natural grassland and the associated effects on terrestrial biodiversity and avifauna. Both the terrestrial biodiversity and avifaunal specialists assess cumulative impacts as Medium negative before and after mitigation.

These residual Medium cumulative impacts indicate that mitigation will reduce, but will not eliminate, the Project's contribution to regional habitat transformation and fragmentation. Therefore, particular emphasis must be placed on avoiding sensitive habitat, limiting the development footprint to the approved footprint, maintaining ecological connectivity, protecting watercourses and their buffers, rehabilitating temporarily disturbed areas, controlling alien invasive plants, and implementing bird-safe infrastructure and mortality monitoring.

Cumulative wetland impacts are assessed as Low, provided the wetlands and their associated 30 m buffers are avoided. Cumulative heritage impacts are assessed as Low to Moderate before mitigation, reducing to Low following mitigation. Cumulative palaeontological impacts are assessed as Low before and after mitigation and within acceptable limits. Cumulative visual effects are assessed as Low after mitigation, although permanent landscape modification and visibility associated with the Project itself remain Medium negative residual impacts. The Agricultural Compliance Statement does not provide standalone cumulative significance ratings. The cumulative agricultural pathway relates mainly to incremental conversion and fragmentation of grazing land. However, the site is determined to be mainly of low agricultural sensitivity.

The Project may also contribute to positive cumulative socio-economic effects through employment, local procurement, skills development and economic diversification. The Social Impact Assessment concludes that cumulative social impacts are expected to be predominantly positive, subject to the implementation of the recommended mitigation measures including (amongst others) transparent local recruitment and procurement, skills development and continued community engagement.

Based on the findings of the cumulative assessment, no cumulative impact that constitutes a fatal flaw to the Project has been identified. The Project is therefore not precluded from authorisation on cumulative-impact grounds provided all mitigation measures contained in the specialist studies, the EIA Report and the EMPr are implemented.

13 ANALYSIS OF ALTERNATIVES

13.1 General

Alternatives are the different ways in which a project can be executed to ultimately achieve its objectives. Examples could include carrying out a different type of action, choosing an alternative location or adopting a different technology or design for the project.

By conducting the comparative analysis, the Best Practicable Environmental Option (BPEO) can be selected with technical and environmental justification. Münster (2005) defines BPEO as the alternative that "*provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term*".

For the purposes of this EIA, alternatives have therefore been considered at the level at which reasonable and feasible choices remained available to the Applicant, namely the development footprint and layout within the Project area, technology/design options, and the No-Go Alternative. Alternatives that were rendered unsuitable through specialist avoidance requirements or that were not considered reasonable and feasible in the context of the Project objectives were not carried forward as separate alternatives for detailed impact assessment.

13.2 Site Alternatives

No alternative development properties are proposed for comparative assessment as part of this application. The Project is a site-specific application relating to land secured by the Applicant for development of the proposed Project. The identification of the Project area was informed by a combination of technical, environmental and logistical considerations, including:

- The availability of contiguous land of sufficient extent to accommodate the proposed Project;
- Favourable solar irradiation characteristics;
- Proximity to suitable grid infrastructure and grid connection opportunities;
- Access to existing transport infrastructure;
- Landowner willingness to host the development; and
- The ability to optimise the layout to avoid or minimise impacts to environmentally sensitive features identified through the Environmental Authorisation Application process.

The current application relates solely to the identified project area and associated grid connection infrastructure. Accordingly, no other development properties were identified as reasonable and feasible site alternatives for detailed comparative assessment in the current S&EIR process. Instead, the environmental acceptability of the selected Project area has been tested through specialist assessment and the overall S&EIR Process assessment, refinement

of the development footprint, consideration of design and technology alternatives, and comparison with the No-Go Alternative.

13.3 Layout / Design Alternatives

An initial layout for the Solar PV Facility was developed and assessed as part of the previous environmental authorisation process, for which Environmental Authorisation was granted on 13 December 2023 (DFFE Reference Number: 14/12/16/3/3/2/2386) (refer to **Figure 78**). The authorised layout incorporated the preferred layout alternative from the previous assessment process and was refined to avoid identified environmental sensitivities, including the depression wetland and associated buffer areas, as well as identified heritage resources and their respective buffer areas. Two grid connection powerline alternatives were also assessed and authorised.

After further optimisation of the Project layout, the Applicant determined that the land associated with the authorised Solar PV Facility would be insufficient to accommodate the required infrastructure for the planned generation capacity and respond appropriately to the environmental constraints identified within the development footprint. The Applicant therefore applied to have the existing Environmental Authorisation lapse, which was approved on 7 April 2026 (DFFE Reference Number: 14/12/16/3/3/2/2386/AM1), and subsequently expanded the Project footprint to include additional land.

For the current EIA process, the Applicant adopted an iterative design approach rather than developing multiple fixed-layout alternatives for comparative assessment. An initial Project footprint was provided to the relevant specialists, who undertook specialist investigations, including field surveys where applicable, to verify and delineate environmental sensitivities and identify areas requiring avoidance or other management measures. The preliminary layout within the expanded Project footprint was then refined to account for the identified environmental constraints and no-go areas.

The refined layout was thereafter provided to the specialists for impact assessment (refer to **Figure 79**). As part of this process, the Wetland Impact Assessment identified that sections of the proposed internal road network traversed Depression Wetlands Dep02 and Dep03 and their associated buffer areas. The wetland specialist therefore required an updated layout to avoid traversing these wetlands. A 30 m aquatic buffer was determined for the at-risk and regulated wetlands, within which no temporary or permanent proposed activities are recommended. The internal road layout was accordingly further refined to avoid the affected wetlands and associated no-go areas. The principal change between the specialist-assessed layout and the preferred layout was therefore the realignment of the affected internal roads to avoid Dep02, Dep03 and their associated aquatic buffer/no-go areas.

The layout presented in **Figure 80** therefore reflects an iterative design and environmental optimisation process, rather than an initial fixed layout selected without alternatives. Earlier layout iterations were progressively refined in response to verified environmental constraints

and were therefore not carried forward as separate reasonable and feasible layout alternatives for detailed comparative impact assessment.

Accordingly, the preferred layout is considered to represent the BPEO from a layout/design perspective amongst the reasonable and feasible layout options identified through the iterative design process, subject to implementation of the mitigation and management measures identified by the specialists and contained in the EIA Report and the EMPr.

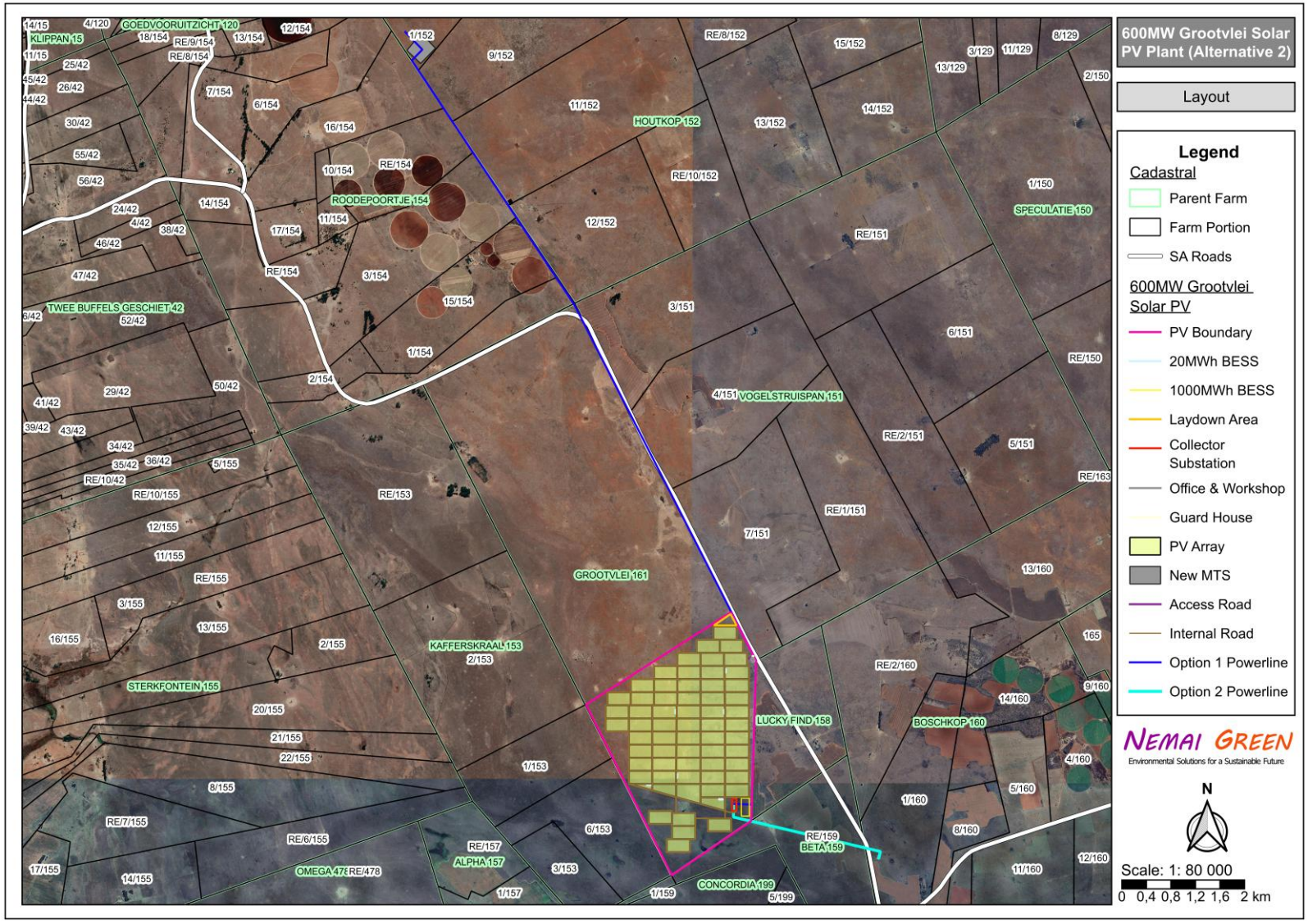

Figure 78: The previously authorised layout of the proposed Project

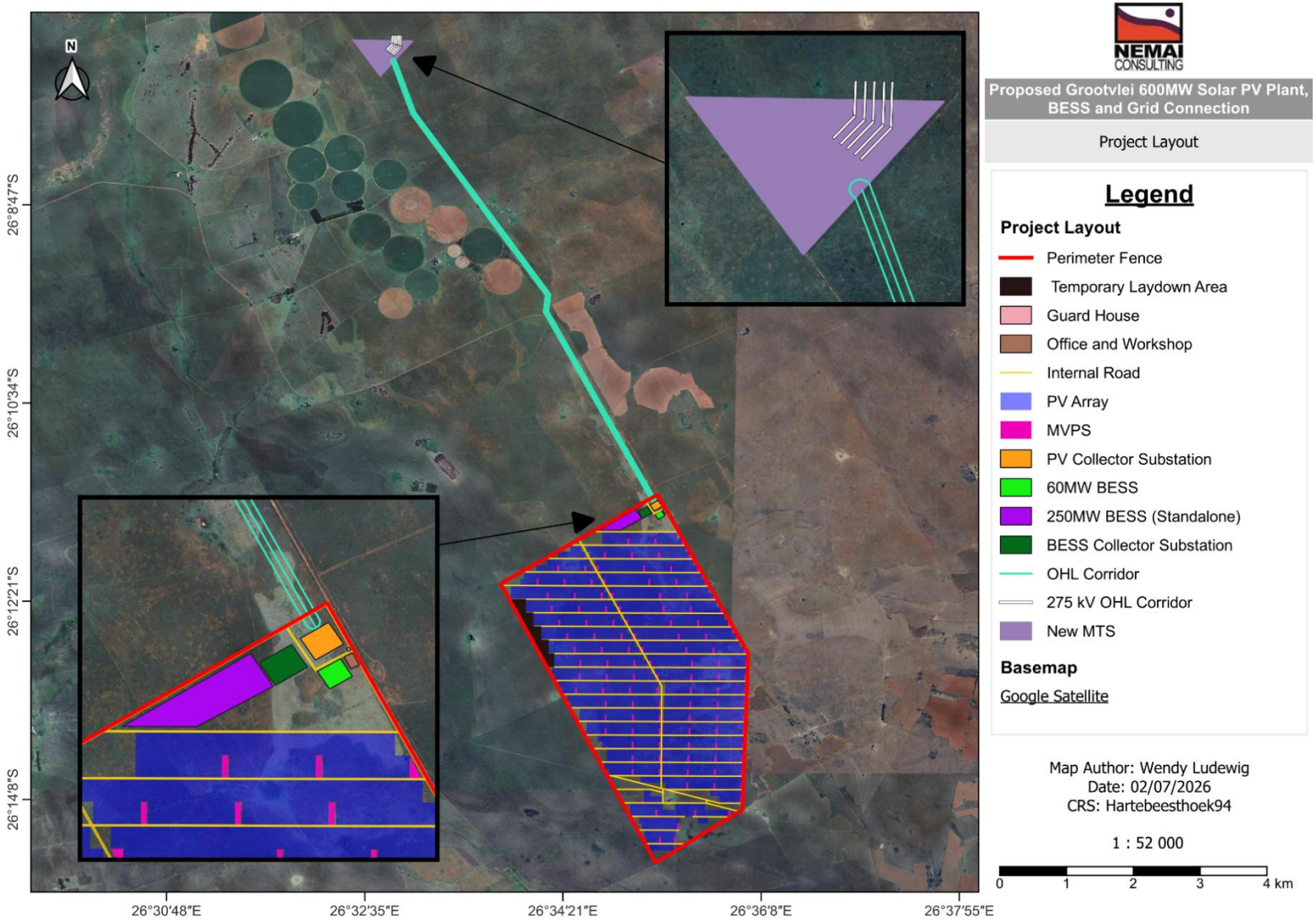

Figure 79: Initial overall Project Layout determined based on specialist-identified sensitivities

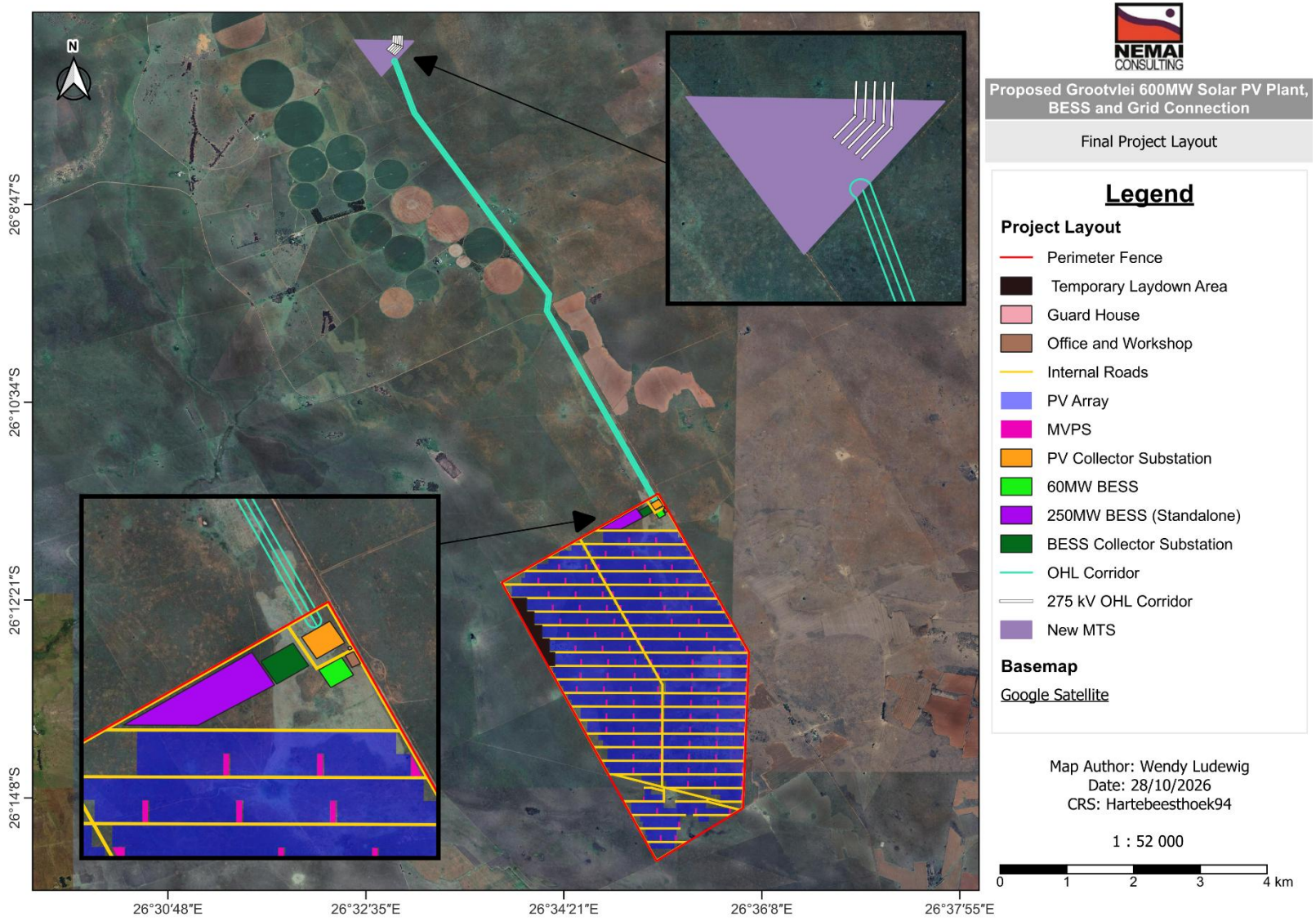

Figure 80: Final overall Project layout with the refined internal roads layout

13.4 Technology Alternatives

Technology alternatives were considered where the final equipment selection remains subject to detailed design and Project optimisation. As the principal technology options applicable to the Solar PV Facility and BESS are described in **Section 9** of this EIA Report, they are not repeated in detail below. The final technology selected must remain within the Project parameters and environmental impact envelope assessed in this EIA Report.

13.4.1 Solar PV Technology

Solar PV technology consists of monofacial or bifacial solar panels mounted on fixed or tracking systems. These options remain available for the Project, with the final selection to be informed by detailed design and Project optimisation, provided that the selected technology remains within the development footprint and Project parameters assessed in this EIA Report.

13.4.2 BESS Technology

The BESS can be broken into solid-state and flow battery systems. Refer to **Section 9.6** above for the advantages and disadvantages associated with the types of BESS. A single battery technology, or a combination of two or more technology alternatives, may be implemented for the Project, provided that the final technology remains within the development footprint, capacity and environmental impact envelope assessed as part of this EIA.

Accordingly, technology alternatives do not identify a separate preferred development footprint. Final equipment selection will occur within the environmental and spatial parameters assessed through the EIA process.

13.5 No-Go Option

The “no-go option” is the alternative of not implementing the proposed Project. It represents the continuation of the existing environmental and land-use conditions and provides the baseline against which the environmental impacts and benefits associated with implementation of the proposed Project are considered.

The no-go option must be considered in light of the Project's need and desirability, together with the findings of the impact assessment and specialist investigations. If the Project does not proceed, construction and operation would not occur, and Project-related impacts would be avoided. The existing predominantly rural and agricultural character and current land uses would continue, subject to changes unrelated to the proposed Project. The Project area currently lies within a predominantly rural, agriculture-based receiving environment.

The no-go option would therefore provide certain environmental benefits. In particular, there would be no Project-related loss, transformation or fragmentation of terrestrial habitat; impacts on wetlands associated with altered runoff, erosion and sedimentation, hydrological changes or potential contamination; reduction and fragmentation of grazing land associated with

permanent Project infrastructure; or infrastructure-related avifaunal impacts. The EIA nevertheless indicates that avoidance, appropriate layout design, rehabilitation, mitigation, and ongoing management can reduce several of these impacts, although residual impacts will remain for certain environmental features.

Similarly, the no-go option would avoid potential impacts on identified cultural and palaeontological heritage resources. The Heritage Impact Assessment identified heritage resources requiring avoidance and mitigation, including historical structures, archaeological material, and a potential informal grave; however, it identified no fatal heritage flaws, and the heritage specialist concluded that the Project could proceed subject to implementing the prescribed recommendations and mitigation measures. The Palaeontological Impact Assessment identifies Very High pre-mitigation construction-phase significance due to the palaeontological sensitivity of the underlying Malmani Subgroup and the presence of weathered stromatolitic material, but assesses the residual impact as Low after implementing the recommended mitigation measures and the Chance Find Protocol. The palaeontological specialist therefore considers the development able to proceed subject to these requirements.

The no-go option would also avoid long-term alteration of the Project's existing visual character and sense of place. This consideration is particularly relevant because, following mitigation, permanent landscape modification and visibility of the Solar PV and grid infrastructure were assessed as Medium negative residual impacts. These effects cannot reasonably be eliminated due to the scale and long-term presence of the Project within the open landscape. However, no High residual visual impacts were identified, and the visual specialist considers the Project acceptable for authorisation subject to implementation of the prescribed mitigation measures.

Conversely, implementing the no-go option would mean the Project's intended positive outcomes would not materialise. The proposed 600 MW renewable-energy development would not be realised, along with its intended contribution to diversifying South Africa's electricity generation mix and improving the security of electricity supply. The Project motivation identifies the need to diversify electricity generation, improve supply security, and reduce the carbon footprint associated with South Africa's heavy reliance on coal-fired electricity generation.

The Project would also forgo employment, local procurement, skills development, enterprise development, and broader economic opportunities. The Social Impact Assessment specifically identifies that the no-go alternative would result in the loss of opportunities for employment and skills development, economic stimulus, SMMEs and local labour, as well as the opportunity to improve electricity supply. Having considered these implications and the absence of fatal socio-economic flaws, the Social Impact Assessment does not support the no-go alternative. The Social Impact Assessment further concludes that the Project is expected to have a net positive impact on the regional social environment once the recommended mitigation measures are implemented.

The specialist investigations and EIA have not identified a fatal environmental flaw that necessitates abandonment of the Project as a whole. Instead, the assessments identify environmental sensitivities, constraints, and residual impacts that require avoidance, appropriate layout design, and the implementation of mitigation, rehabilitation, management, and monitoring measures. This approach aligns with the mitigation hierarchy adopted in the EIA, which seeks to prevent, reduce, rehabilitate, or compensate for environmental impacts and ensure residual negative impacts remain within acceptable levels.

Of particular importance, the Wetland Impact Assessment requires a 30 m aquatic buffer for the identified wetlands during construction and operation, within which no temporary or permanent proposed activities are to occur. The terrestrial biodiversity assessment similarly requires avoiding and protecting sensitive habitat and watercourse buffers and concludes that the Project is acceptable from a terrestrial biodiversity perspective, subject to implementing the recommended mitigation measures and avoiding sensitive habitat areas.

The geotechnical findings also require qualification. No fatal flaws were identified from a geotechnical perspective; however, the desktop study recommends a feasibility-level dolomite stability assessment and a detailed geotechnical investigation before development. The site is therefore regarded as potentially suitable, rather than unconditionally suitable, subject to these further investigations and implementation of their recommendations.

Accordingly, the No-Go Alternative would avoid the adverse biophysical, land-use and visual impacts directly attributable to the Project, including residual impacts that cannot be fully eliminated through mitigation. However, it would also result in the loss of the Project's renewable-energy and socio-economic benefits. The specialist assessments have not identified a fatal environmental or social flaw that would preclude development of the Project, although several environmental sensitivities require strict avoidance, mitigation, management and monitoring, and the geotechnical suitability of the site remains subject to the further investigations prescribed by the geotechnical specialist.

Having regard to the need and desirability of the Project, the specialist findings, the residual impacts following mitigation and the benefits that would be foregone under the No-Go Alternative, the No-Go Alternative is not considered the preferred option. The proposed Project and preferred development footprint are therefore recommended over the No-Go Alternative, subject to implementation of the specialist recommendations, mitigation and monitoring measures incorporated into the EIA Report and EMPr, and compliance with any conditions of Environmental Authorisation.

14 PUBLIC PARTICIPATION

14.1 Introduction

The purpose of public participation includes the following:

1. To provide I&APs with an opportunity to obtain information about the Project;
2. To allow I&APs to express their views, issues and concerns with regard to the Project;
3. To grant I&APs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the Project; and
4. To enable the Applicant to incorporate the needs, concerns and recommendations of I&APs into the Project, where feasible.

The public participation process that is being undertaken is governed by NEMA and the EIA Regulations. **Figure 81** outlines the public participation process for the Scoping Phase (completed) and EIA Phase (current). Note that the dates reflected in the diagram may change due to the dynamic nature of the S&EIR Process.

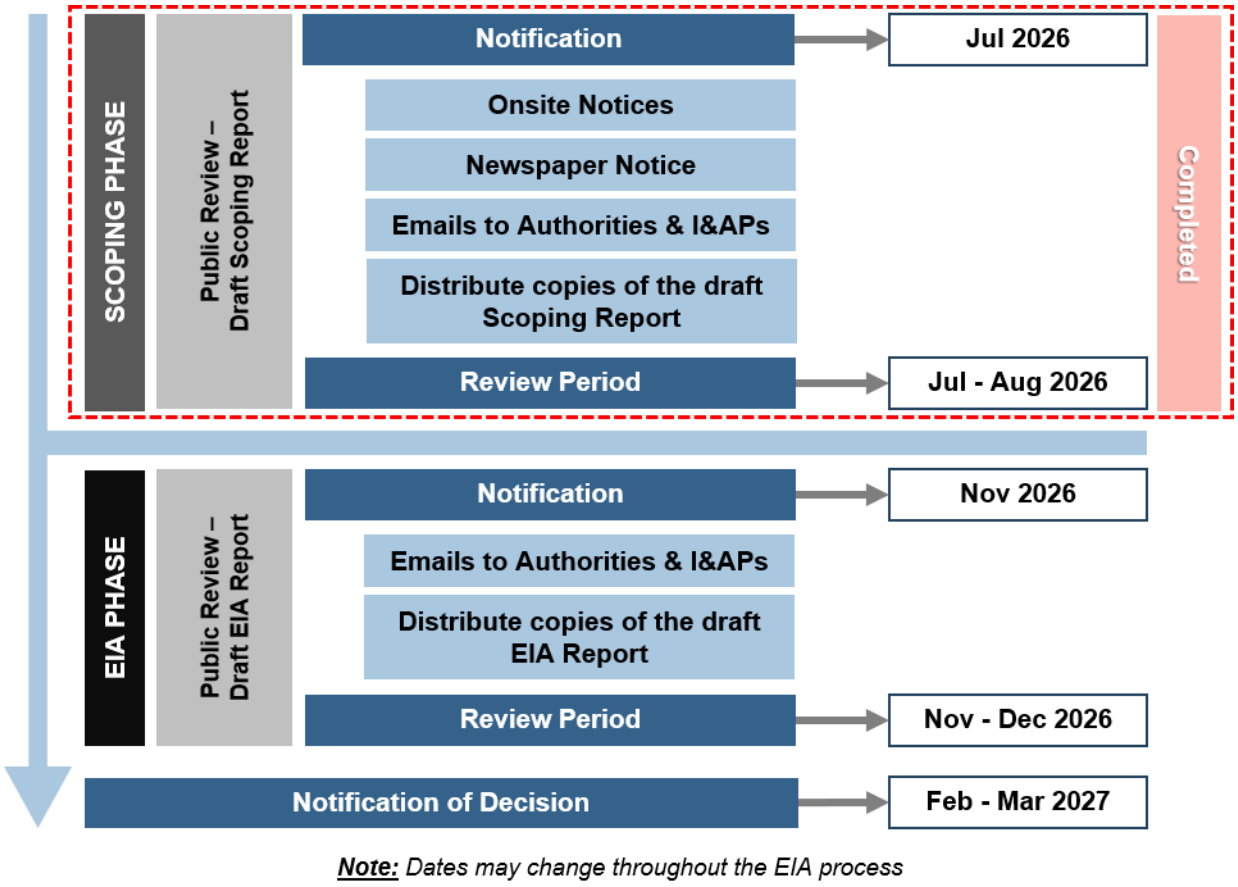

Figure 81: Outline of Public Participation Process *(note: dates are subject to change)*

14.2 Public Participation during the Scoping Phase

The primary tasks undertaken as part of public participation during the Scoping Phase included the following (details provided in the Scoping Report):

- Compiling a database of organs of state and I&APs;
- Lodging the draft Scoping Report for public review from 10 July 2026 to 11 August 2026 by:
  - Placing notices in the Potchefstroom Herald Newspaper in English, Afrikaans and Setswana;
  - Erecting site notices at strategic points within and surrounding the Project area;
  - Emailing notifications to organs of state and I&APs that are contained in the database;
  - Placing a hard copy of the report at the Ventersdorp Community Library; and
  - Uploading an electronic copy of the report to the Nemai Consulting website (https://nemai.co.za/downloads/).
- Compiling and maintaining a CRR (contained in **Appendix I**).

14.3 Public Participation during the EIA Phase

14.3.1 Maintenance of I&APs Database

A database of I&APs, which includes authorities, different spheres of government (national, provincial and local), parastatals, Ward Councillors, stakeholders, landowners, interest groups and members of the general public, is being maintained during the EIA phase and is contained in **Appendix B**.

14.3.2 Period to Review the draft EIA Report

In accordance with Regulation 43(1) of the EIA Regulations, I&APs are granted an opportunity to review and comment on the draft EIA Report from **11 November 2026 to 11 December 2026**.

14.3.3 Notification of Review of draft EIA Report

Authorities and I&APs contained in the database (refer to **Appendix B**) were notified of the review of the draft EIA Report. Proof of notification will be included in the final EIA Report.

14.3.4 I&AP Access to the draft EIA Report

The draft EIA Report can be accessed as follows:

- A hard copy of the report was placed at the Ventersdorp Public Library (Van Tonder Crescent, Ventersdorp, 2710); and
- An electronic copy was uploaded to the following website for downloading purposes: https://nemai.co.za/downloads/.

A comment sheet is provided in **Appendix J**, which can be used to provide comments on the draft EIA Report.

14.3.5 Commenting on the draft EIA Report

Comments on the draft EIA Report need to be forwarded in writing to the contact person stated in **Table 56** within the review period stipulated in **Section 14.3.2** above (note that the Comment Sheet contained in **Appendix J** may be used for this purpose).

Table 56: Public Participation Contact Person Details

Contact Person:	Wendy Ludewig
Telephone Number:	011 781 1730
Email Address:	wendyl@nemai.co.za
Postal Address	PO Box 1673, Sunninghill, 2157

14.3.6 Public Meeting to Present the draft EIA Report

Anyone who has an interest in attending a public meeting will need to inform Nemai Consulting in writing by **18 November 2026**. Only preregistered parties that confirmed interest will receive an invitation to the public meeting.

14.3.7 Comments received on the draft EIA Report

The CRR will be updated with all comments received from authorities and I&APs during the review period of the draft EIA Report. The updated CRR will be appended to the final EIA Report that will be submitted to DFFE.

14.4 Notification of DFFE's Decision

Registered I&APs will be notified after receiving written notice from DFFE (in terms of NEMA) on the final decision for the Project. The notification will include the appeal procedure to the decision and key reasons for the decision.

15 CONCLUSIONS

15.1 Outcomes of the EIA Phase

The following key tasks were undertaken during the EIA phase for the proposed Project:

- The specialist studies identified in the Plan of Study for the EIA were undertaken, and the findings were incorporated into the EIA Report in terms of understanding the environmental status quo and sensitive features, assessing the potential impacts and establishing concomitant mitigation measures, as well as informing the iterative alternatives assessment;
- Potentially significant impacts pertaining to the pre-construction, construction and operational phases of the Project were identified and assessed, and mitigation measures were provided; and
- Alternatives for achieving the objectives of the proposed activity were considered, and the BPEO was identified. The “no-go” option is not supported when considering the implications of not implementing the Project.

The outcomes of these tasks are captured below.

15.2 Sensitive Environmental Features

The EIA and associated specialist investigations identified a number of environmental features and aspects that require specific consideration and management during the further design, construction and operation of the Project. Appropriate mitigation and management measures for these features are included in the EIA Report and EMPr.

The following sensitive and significant environmental features and considerations associated with the Project and its receiving environment are highlighted:

- Three natural depression wetlands, namely Dep01, Dep02 and Dep03, as well as one artificial wetland, were identified within the wetland study area. Dep02 and Dep03 were identified as being at risk from the proposed Project, while Dep01 occurs within the applicable regulated area. A 30 m no-go buffer is required around the relevant delineated wetlands.
- The Project occurs within a landscape containing remaining natural and semi-natural grassland and wetland-associated habitats. These areas perform biodiversity and ecological-connectivity functions and require appropriate protection and management. The terrestrial biodiversity specialist requires the delineated watercourses and associated 30 m buffers to remain free of development and recommends minimising permanent vegetation loss and fragmentation, retaining indigenous vegetation where practicable, rehabilitating temporarily disturbed areas, managing alien invasive vegetation and undertaking ecological monitoring.

- From an avifaunal perspective, natural grassland and watercourse-associated habitats provide functional bird habitat. The principal concerns relate to habitat loss and transformation, fragmentation, disturbance and displacement, and infrastructure-related collision, electrocution, entrapment and mortality risks. Particular attention is required to protect watercourses and their 30 m buffers, minimise unnecessary habitat transformation, design appropriate fencing, ensure bird-safe electrical infrastructure, and monitor mortality. No fatal flaw was identified from an avifaunal perspective.
- Agricultural land within the Project area is predominantly used for livestock grazing. The agricultural assessment determined that the agricultural sensitivity is predominantly low, with a limited area of medium sensitivity, with the Project resulting in a long-term reduction in land available for grazing.
- Heritage resources identified within the Project area include historical structures, a potential informal grave and low-density or isolated archaeological material. The potential grave and protected historical structures are particularly important and require avoidance, prescribed buffers, and, where avoidance is not possible, compliance with applicable heritage permitting requirements. A Chance Find Procedure is also required during construction.
- The Project occurs within the Malmani Subgroup, which is regarded as having Very High palaeontological sensitivity, and weathered stromatolitic horizons were identified during the field investigation. The construction-phase palaeontological impact is assessed as Very High before mitigation but reduces to Low following implementation of the prescribed mitigation measures and Chance Find Protocol.
- The receiving landscape is predominantly open, rural and agricultural, with a Moderate visual resource value and Low VAC. The Project will produce an unavoidable long-term alteration of the local landscape character and sense of place. Permanent landscape modification and visibility of the Solar PV and grid infrastructure remain Medium negative residual visual impacts following mitigation; however, no High residual visual impacts were identified.
- The site is underlain by dolomite and chert and is therefore subject to important geotechnical and dolomitic considerations. While no fatal geotechnical flaw was identified during the desktop assessment, no dolomite stability investigation has yet been undertaken. A feasibility-level dolomite stability assessment and detailed geotechnical investigation are therefore required prior to development to verify the suitability of the proposed infrastructure locations and determine appropriate engineering design measures.

The combined environmental sensitivity map overlaid with the preferred Project layout is provided in **Figure 82** and **Figure 83**. The environmental sensitivities reflected on this map, together with the specialist recommendations and associated buffers/no-go requirements, must inform detailed design of the Project infrastructure.

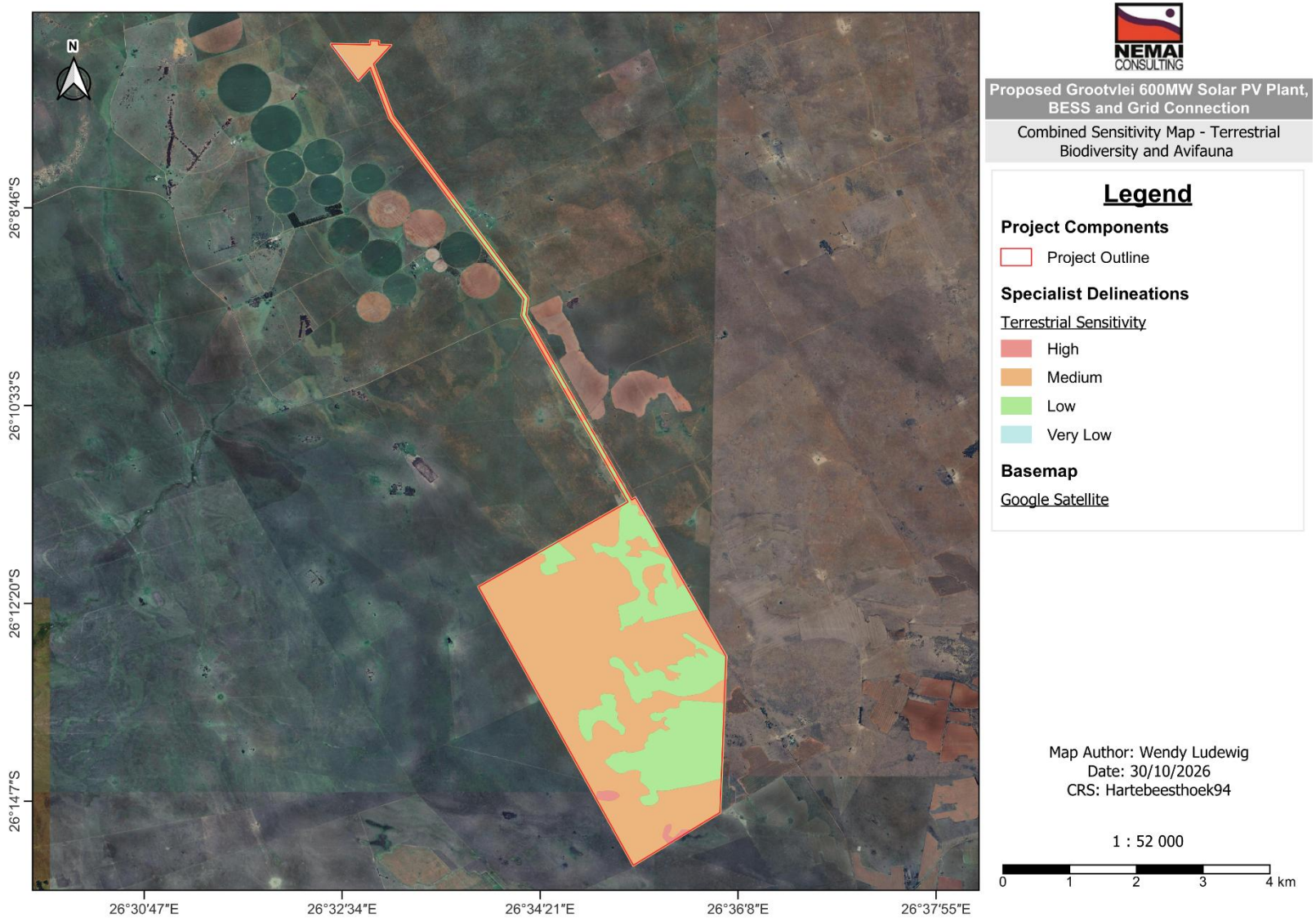

Figure 82: Combined sensitivity map – terrestrial biodiversity and avifauna

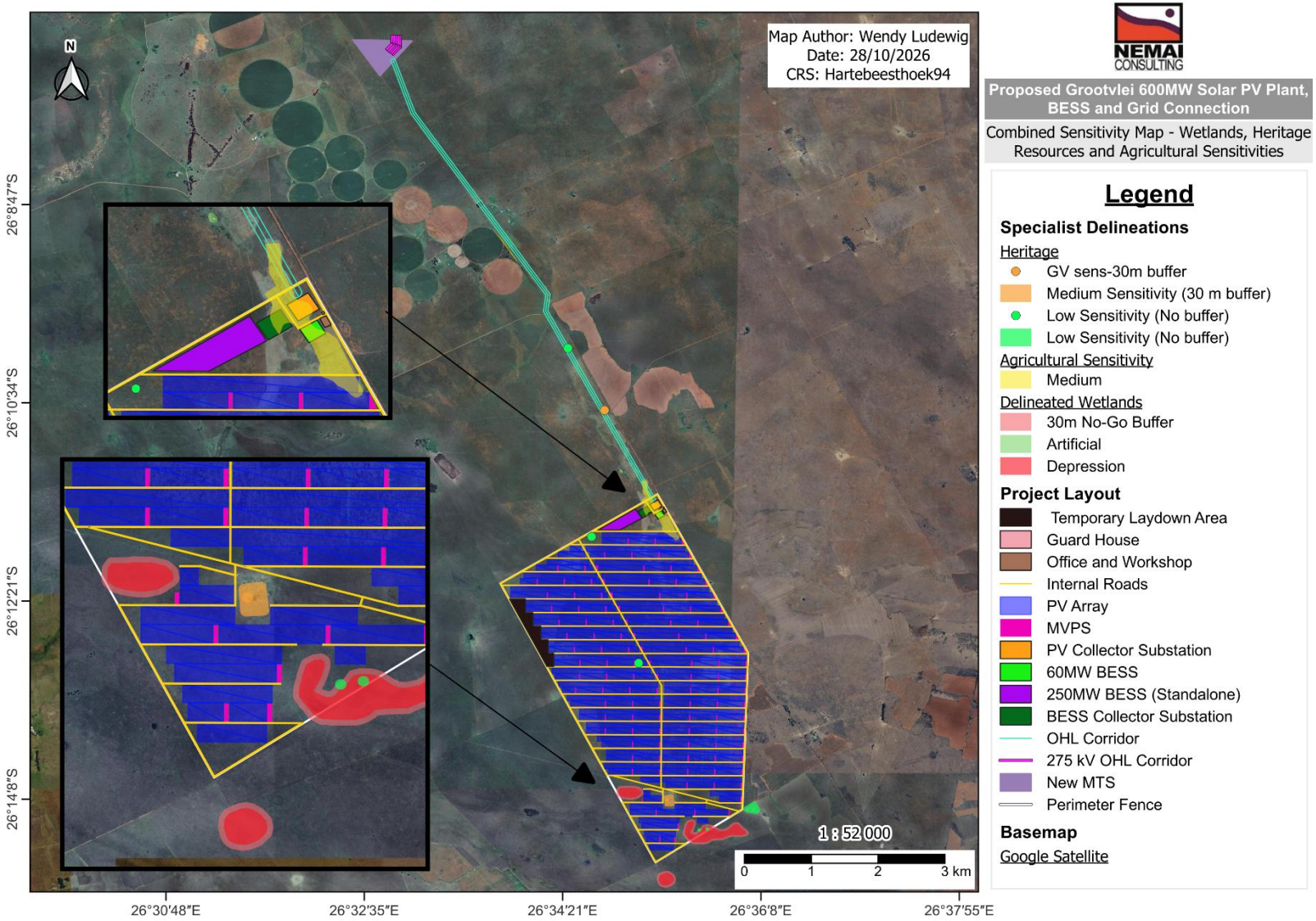

Figure 83: Combined sensitivity map – wetlands, heritage resources and agricultural sensitivities

15.3 Environmental Impact Statement

The Project's strategic intent aligns with South Africa's transition to a more diversified electricity generation mix that incorporates renewable-energy technologies. The Applicant intends to bid the Project into current and future REIPPPP bid windows and/or other renewable-energy markets in South Africa. The Project comprises a proposed 600 MW Solar PV Plant, BESS and associated grid connection infrastructure near Ventersdorp in the North West Province.

The need and desirability of the proposed Project must be considered in conjunction with the environmental characteristics and constraints of the receiving environment. The EIA process therefore sought to balance the Project's development objectives against the need to avoid, minimise, and appropriately manage impacts on the environmental and social environment.

The potentially significant environmental impacts associated with the Project were investigated through the EIA process and the relevant specialist studies. The assessments indicate that the Project will result in unavoidable environmental change, including the long-term transformation of portions of the Project footprint, reduction in land available for grazing and a long-term change in landscape character. However, the specialist investigations have not identified an environmental or social fatal flaw that would preclude development, subject to implementation of the prescribed avoidance, mitigation, management and monitoring requirements.

Mitigation does not reduce every impact to Low significance. The EIA identifies Medium negative residual cumulative impacts for terrestrial biodiversity and avifauna, while permanent landscape modification and visibility of the Solar PV and grid infrastructure also remain Medium negative following mitigation. These residual effects need to be considered by the Competent Authority together with the Project's need and desirability and environmental-management commitments.

Key findings and requirements arising from the EIA and specialist assessments, which may also warrant consideration as conditions of the Environmental Authorisation (if granted), include the following:

- The delineated wetlands and their associated 30 m aquatic buffers must be protected from Project infrastructure and unnecessary disturbance, with the wetland monitoring requirements incorporated into the EMPr and implemented throughout the applicable Project phases.
- The final detailed Project layout must minimise unnecessary loss and fragmentation of natural and semi-natural habitat, protect ecological corridors and retained natural vegetation where feasible, and incorporate the terrestrial biodiversity walkdown, rehabilitation, alien invasive plant management and ecological monitoring requirements recommended by the specialist.

- Bird-safe electrical infrastructure and appropriate collision mitigation must be incorporated where relevant. Watercourse-associated habitat and buffers must be protected, fencing close to sensitive habitat must be appropriately designed, and bird mortality and infrastructure-related incidents must be monitored to allow adaptive management where necessary.
- Identified heritage resources must be avoided and protected in accordance with the prescribed buffers. Where impacts on protected heritage resources cannot be avoided, the necessary approvals or permits from the relevant heritage authority must be obtained prior to disturbance. A Chance Find Procedure must be implemented during construction in the event that previously unidentified archaeological material, graves or other heritage resources are exposed.
- The palaeontological Chance Find Protocol must be incorporated into the EMPr and implemented during ground-disturbing activities.
- The visual mitigation measures must be implemented, including (amongst others) limiting unnecessary vegetation clearance and disturbance, retaining screening vegetation where practicable, minimising visual contrast of ancillary infrastructure, controlling dust and artificial lighting, maintaining good housekeeping and progressively rehabilitating disturbed areas.
- A feasibility-level dolomite stability assessment must be undertaken prior to development. The specialist specifies that this should include an appropriate gravity geophysical survey, percussion borehole drilling to meet applicable SANS requirements and a geohydrological study. A detailed geotechnical investigation must also be undertaken to verify founding conditions across the remainder of the site and inform final engineering design.
- A detailed risk assessment will need to be undertaken based on the type of BESS technology selected and the final design of the Solar PV Plant. The outcomes of this risk assessment will need to be incorporated into the Operational EMPr.
- Suitable erosion-control, stormwater, topsoil, rehabilitation and pollution-prevention measures must be implemented throughout the Project life cycle, particularly given the interaction between land disturbance, wetland protection, grassland rehabilitation and the site's dolomitic geological setting.

The EIA further considered cumulative impacts associated with the Project and other renewable-energy development within the broader receiving environment. Although Medium residual cumulative effects remain for terrestrial biodiversity and avifauna, the specialist indicated these effects can be managed through the recommended mitigation measures.

Based on the findings of the EIA and specialist studies, the proposed Project is considered environmentally acceptable provided that all mitigation, management and monitoring measures contained in this EIA Report, the specialist studies, EMPr and conditions of the Environmental Authorisation are implemented. No fatal environmental or social flaw has been identified that would, on the information currently available, preclude authorisation of the preferred Project footprint.

With the implementation of the preferred Project footprint/BPEO, adherence to the identified avoidance areas and buffers, adoption of the mitigation measures contained in this EIA Report and specialist studies, and dedicated implementation and monitoring of the EMPr, it is the EAP's reasoned opinion that the significant environmental and social impacts associated with the Project can be managed to acceptable levels. On this basis, it is recommended that Environmental Authorisation be granted for the Project, subject to the environmental management provisions and conditions identified through the EIA process.

It is further the opinion of the EAP and EIA team that the EIA has been undertaken in an objective manner and that the EIA process and EIA Report have been prepared to address the applicable requirements of NEMA and the EIA Regulations. The final EIA Report will also need to take account of comments received during review of the draft EIA Report prior to submission to the Competent Authority.

15.4 EA Authorisation Period

The Environmental Authorisation is required to remain valid for a sufficient period to enable the Applicant to complete the detailed design, pre-construction activities and commencement and completion of construction associated with the proposed Project, including the implementation of the required rehabilitation measures.

It is recommended that the Environmental Authorisation provide a period of 10 years from the date of issuance of the EA for commencement and completion of construction, including rehabilitation, subject to the final wording and validity provisions determined by the Competent Authority.

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APPENDICES