DRAFT EIA REPORT FOR THE ELAND MINE PV SOLAR PROJECT

Reference No: NWP/EIA/103/2021

Report No: JEMS-ELAND- DEIAR-01

Report Prepared by

JEMS Pty Ltd

26 In-Full Flight Mooikloof, 0059

Tel: 083 776 7898 / 082 892 4282

Email: stephan@jems.co.za / jannie@jems.co.za

Author: Stephan Barkhuizen
Report Reviewer: Jannie Cronje

Draft EIA Report in support of the application for an environmental authorisation ("**EA Application**") for the proposed Eland Mine PV Solar Energy Project ("**EM PV Solar Project**") in terms of the National Environmental Management Act, No 107 of 1998 (as amended).

NAME OF APPLICANT: **Eland Platinum (Pty) Ltd ("EP"), a subsidiary of Northam Platinum Limited ("Northam").**

TEL NO: **+27 12 381 4099**

FAX NO: **+27 11 325 4795**

POSTAL ADDRESS: **PO Box 3436, Brits, 0250, South Africa**

PHYSICAL ADDRESS: **Farm Elandsfontein 440 JQ, District of Brits**

JEMS Report Revision and Tracking Schedule		
Document Title:	**DRAFT EIA REPORT FOR THE ELAND MINE PV SOLAR ENERGY PROJECT (Reference No: NWP/EIA/103/2021)**	
Status:	Final	
Issue Date:	12 July 2022	
Lead Author:	Stephan Barkhuizen	
Project Reviewer:	Jannie Cronje	
Report Distribution and Review	**Report Version**	**Date**
Sandra Gore	JEMS-ELAND- DEIAR-01	12-7-2022
Suan Mulder		
Keneilwe Sanyane		
Tim Hill		
Final Report Approval		
Report Distribution	**Approval**	**Date**
Sandra Gore	Draft EIAR	20-7-2022
Suan Mulder		
Keneilwe Sanyane		

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

a) 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;
b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
c) identify the location of the development footprint within the preferred site 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;
d) determine the—-
e) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
f) degree to which these impacts—
   (aa)can be reversed;
   (bb) may cause irreplaceable loss of resources, and
   (cc) can be avoided, managed or mitigated;
g) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
h) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
i) identify suitable measures to manage, avoid or mitigate identified impacts; and
j) identify residual risks that need to be managed and monitored.

EXECUTIVE SUMARY

1. Background

Eland Platinum Proprietary Limited ("**EP**"), a wholly owned subsidiary of Northam Platinum Limited ("**Northam**"), owns and operates the Eland Platinum Mine and Concentrator Plant ("**EM**"). EM is located in the North-West Province ("**NWP**") of the Republic of South Africa ("**RSA**") and falls under the local jurisdiction of the Madibeng Local Municipality ("**MLM**"), situated in the larger district of the Bojanala Platinum District Municipality ("**BPDM**"). The town of Brits is located 10km east of the application site, with the Tshwane Metropolitan 60 km to the west. The northern boundary of the area on which the EM surface infrastructure is situated ("**EM Surface Area**") is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

EM is an established (est. 2006) platinum group metals ("**PGMs**") and chrome mining and processing operation and comprises of a consolidated mining right, namely Department of Mineral Resources and Energy ("**DMRE**") Ref. No: NW 30/5/1/2/2/280MR ("**Elandsfontein Mining Right**").

2. Application

An Environmental Authorisation ("**EA**") Application under the National Environmental Management Act 107 of 1998 ("**NEMA**") was submitted to the North West Department of Economic Development, Environment, Conservation and Tourism ("**NWDEDECT**"). JEMS Pty Ltd ("**JEMS**") was appointed by EP as the independent Environmental Assessment Practitioner ("**EAP**") for the EA Application.

The EA application is submitted for the following activities:

- a PV Plant, with a generating capability of 40 MW ("**PV Plant**"), situated within an overall 105 Ha project area ("**PV Project Area**");
- Inverters, transformers and battery storage facilities;
- Up to 33 kV transmission lines and transmission towers;
- Cabling between project components;
- New access and internal roads;
- On-site substation;
- Borehole for construction and operational water requirements;
- Operations and maintenance ("**O&M"**) buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;

- Water and sewage pipelines; and
- Temporary laydown area,

  (to be known as the "**EM PV Solar Project**").

Note: The 5MW PV Plant which would have been coupled with a hydrogen fuel cell ("**HFC**") installation, that formed part of the initial EA Application has been excluded from the EM PV Solar Project, as the HFC project was not feasible.

The NWDEDECT is the competent authority ("**CA**") for the EA Application.

3. Scoping Phase

JEMS prepared the Draft and Final Scoping Report ("**FSR**"), in line with the requirements contained in Annexure 2 of the 2014 Environmental Impact Assessment ("**EIA**") Regulations, promulgated under the NEMA.

In conjunction with the inception of the public participation process ("**PPP**"), the Draft Scoping Report ("**DSR**") was submitted to interested and affected parties ("**I&APs**") and stakeholder for their review and comments. The DSR was available for review and comments for thirty (30) days from 4 February to 7 March 2022 at the following locations:

- EM Security Office;
- Maroelabult Mine ("**MM**") entrance;
- Madibeng Local Municipality ("**MLM**") Library in Brits;
- Moumong Store in Mmakau
- The Community Library (at the Community Hall) Damonsville;
- Community Hall in Oukasie;
- The Community Hall in Mothotlung;
- De Wildt Helpmekaar Offices; and
- Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.

In addition to the above, the following PPP activities were also performed as part of the initial project announcement phase of the EM PV Solar Project (***Refer to Appendix 6 for more information on the Public Participation Process***):

- Newspaper advertisements was placed in the Britspos and Rustenburg Herald;
- Emails and letters were sent to I&APs and stakeholders; and
- Site notices was erected at key locations at and around the EM.

As part of the project announcement phase and DSR review period, the concerns and issues raised by I&APs and stakeholders were summed-up to the following points:

- Nuisance impact associated with current mining activities (i.e. noise, dust, etc.);
- Possible job and business opportunities; and
- Socio-economic impact of EM on the surrounding community and businesses.

The FSR was approved by NWDEDECT on 18 May 2022.

4. EIA Phase

The 2014 EIA Regulations and EA process requires that an EIA Report ("**EIAR**") be compiled. This Draft EIA Report ("**DEIAR**") and Draft Environmental Management Programme Report ("**DEMPR**") was compiled to comply with the requirements of the 2014 EIA Regulations.

Specialist studies have been finalised for the EIA Phase of the EM PV Solar Project. The specialist studies and the DEIAR / DEMPR will be made available for public comment. The following specialist studies were undertaken for the EM PV Solar Project:

- Terrestrial Biodiversity Assessment;
- Avifauna Impact Assessment
- Soil and Land Capability Assessment;
- Visual Impact Assessment ("**VIA**"); and
- Socio-Economic Assessment ("**SEIA**").

In addition to the Specialist studies mentioned above the following existing Specialist assessments and information from previous environmental applications relevant to the area held under the Elandsfontein Mining Right (referred to as the "**EM Consolidated MR Area**") were utilised to determine the baseline and pertinency of possible impacts in relation to the EM PV Solar Project:

- EM's environmental licences, particularly recently submitted EIARs and environmental monitoring reports;
- Specialist reports conducted on and around the PV Project Area in previous applications lodged for EM, namely:
    - Groundwater Impact Assessment;
    - Freshwater and Aquatic Assessment;
    - Noise Impact Assessment ("**NIA**");
    - Heritage Impact Assessment(s) ("**HIA**");
    - Air Quality Impact Assessment ("**AQIA**"); and
    - Hydrology Assessment.

The PPP that was and will be followed for the EIA Phase include the following:

- I&APs and stakeholders will be informed of the DEIAR via emails, registered mail and hand delivered notices;
- Stakeholder forums and discussions will be held with various I&APs on the application upon request;
- The DEIAR and DEMPR will be available for review and comments for thirty (30) days at the following locations:
    - EM Security Office;
    - MLM Library in Brits;
    - Moumong Store in Mmakau
    - The Community Library (at the Community Hall) Damonsville;
    - Community Hall in Oukasie;
    - The Community Hall in Mothotlung;
    - De Wildt Helpmekaar Offices; and
    - Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.

The concerns and issues raised by I&APs and stakeholders during the DEIAR will be addressed and responded to in the Final EIA Report ("**FEIAR**").

5. Conclusion and recommendation

The EM PV Solar Project has been subjected to a comprehensive Scoping / EIA process and the potential socio-economic and environment impacts have been identified, investigated, assessed and will be subsequently mitigated in accordance with the 2014 EIA Regulations. Potential positive impacts associated with the EM PV Solar Project include the following:

- Increased competitiveness of EM by means of independent energy generation and minimisation of downtime as a result of national electricity load reduction;
- Reduction of the Scope 2 greenhouse gas ("**GHG**") Emissions generated by EM;
- Climate change knock-on benefits by means of GHG emission reduction;
- Continuance of the surrounding land use (DeWildt Solar Project), within an existing mining operation;
- Socio-economic benefits associated with job creation; skills development; capital and operational expenditure on local procurement opportunities for small, micro and medium enterprises ("**SMMEs**"), materials and equipment; and downstream spending; and
- Promotion of sustainable development by proficiently utilising renewable resources.

The potential negative impacts identified include the following aspects:

- Socio-economic effects associated with the current local socio-economic constraints;
- Loss of floral and faunal/avifauna habitat and potential species of conservation concern ("**SCC**");
- Visual and noise intrusion and potential nuisance to surrounding land users;
- Air Quality Impacts, relating to dust fallout;
- Groundwater quantity;
- Loss of soil and land with agricultural potential;
- Land degradation associated with erosion and alien and invasive plant ("**AIP**") establishment.

However, from the existing Specialist studies and commissioned; and the impact assessment undertaken for the Project Area, it has been determined that the potential negative impacts associated with the preferred alternative can be mitigated to an acceptable level.

Based on the outcomes of the impact and risk assessments conducted, coupled with the Specialists' recommendations, the EAP has established that the EM PV Solar Project will contribute positively to the national, local and regional socio-economic sphere. The EM PV Solar Project has the potential to reduce the electricity supply challenges experienced by the EM by alleviating its sole reliance on electricity generated by non-renewable resources. In addition, the Project will result in a reduction of the Scope 2 GHG emissions generated by the EM, which will likely have a positive impact on climate change and its associated impacts. This will likely ensure the competitiveness/sustainability of the EM, given that the potential negative environmental impacts will be managed in accordance with the mitigation measures and Specialists' recommendations.

The EAP therefore finds it rational to recommend that the EM PV Solar Project be authorised to proceed as it is the most preferred option, subsequent to the satisfaction of the regulatory processes and collaboration of the authorities, I&APs and stakeholders.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDIXES

LIST OF ABBREVIATIONS

Term/Abbreviation	Definition
2013 WML Regulations	The Regulations published under NEMWA in Government Notice ("GN") 921 of Government Gazette ("GG") 37083 on 29 November 2013
2014 EIA Regulations	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 982 of GG 38282 on 4 December 2014 (as amended in 2017).
AIPs	Alien and Invasive Plants
BIC	Bushveld Igneous Complex
BID	Background Information Document
BSP	Biodiversity Sector Plan
BPDM	Bojanala Platinum District Municipality
CA	Competent Authority
CAA	Civil Aviation Authority
CARA	Conservation of Agricultural Resources Act (Act No. 43. of 1983)
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFFE Screening Tool	Department of Forestry, Fisheries and Environment National web-based environmental screening tool
CBA	Critical Biodiversity Area
DEIAR	Draft EIA Report
DFFE	Department of Forestry, Fisheries and Environment
DMR	The former Department of Mineral Resources
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DWA	Then former Department of Water Affairs,
DWAF	Then former Department of Water Affairs and Forestry

DWS	Then former Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EM	Eland Platinum Mine
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
EP	Eland Platinum (Pty) Ltd, a subsidiary of Northam
FEIAR	Final EIA Report
FSR	Final Scoping Report
GDP	Gross Domestic Product
GG	Government Gazette
GHG	Greenhouse Gas
GN	Government Notice
GN 509	General Authorisation in terms of section 39 of the NWA for water uses as defined in section 2(c) or section 2(i), published in GG 40229 on 26 August 2016
GN 983	Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 983 of GG 38282 on 4 December 2014 (as amended on various occasions).
GN 984	Listing Notice 1 of the Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 984 of GG 38282 on 4 December 2014 (as amended on various occasions various occasions).
GN 984	Listing Notice 2 of the Environmental Impact Assessment Regulations promulgated in terms of NEMA in GN 985 of GG 38282 on 4 December 2014 (as amended in 2017).
HA	Hectares (measure of area, 10 000 square metres)
HFC	Hydrogen Fuel Cell
HIA	Heritage Impact Assessment
HSEC	Health Safety Environment Community
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWULA	Integrated water use licence application
km	Kilometres
LCC	Land Claims Commissioner
LIA	Late Iron Age
LOM	Life of Mine
m^2	Square Metres
mamsl	mean sea level
MAP	mean annual precipitation
MAR	mean annual runoff
MLM	Madibeng Local Municipality
mm	Millimetres
MM	Maroelabult Mine, now part of Eland Mine
MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002), as amended
NCCAS	National Climate Change Adaptation Strategy, 2020
NDC	Nationally Determined Contribution
NEMA	National Environmental Management Act (Act No. 107 of 1998), as amended
NEMAQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004), as amended
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004), as amended
NEMPAA	National Environmental Management: Protected Area Act (Act No. 57 of 2003), as amended

NEMWA	National Environmental Management: Waste Act (Act No. 59 of 2008), as amended
2013 WML Regulations	Published in GNR 921 under the NEMWA in *Government Gazette* 37083 on 29 November 2013, as amended in GNR 633 of 24 July 2015
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NDP	National Development Plan 2030
NWA	National Water Act (Act No. 36 of 1998), as amended
NWBSP	North West Biodiversity Sector Plan
NWDEDECT	North West Department of Economic Development, Environment, Conservation and Tourism
Northam	Northam Platinum Limited
NWP	North-West Province
O&M	Operations and maintenance
OHL	Overhead power lines
PGM	Platinum Group Metals
POS	Plan of Study
PPP	Public Participation Process
PV	Photovoltaic
Pr. Sci. Nat	Professional Natural Scientists
ROM	Run-of-mine
RSA	Republic of South Africa
SACNASP	South African Council of Natural Scientific Professions
SAHRA	South African National Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAWS	South African Weather Service;
SCC	Species of Conservation Concern (SCC))
SDF	Spatial Development Framework
SEIA	Socio-Economic Impact Assessment
SES	Socio-Economic Survey
SHE	Safety Health Environment
SMME	Small, micro and medium enterprises
TSF	Tailings storage facility
VIA	Visual Impact Assessment
WBNPA	Waterberg-Bojanala National Priority Area
WTP	Water Treatment Plant

1. INTRODUCTION

EP is planning to construct a PV Solar Energy Project within the mining right area of the EM, to be known as the "**EM PV Solar Project**".

JEMS was appointed by EP as the independent EAP for the EA Application for the EM PV Solar Project.

EP owns and operates the EM and Concentrator Plant at EM. EM is located in the NWP of the RSA and falls under the local jurisdiction of the MLM, situated in the larger district of the BPDM. The town of Brits is located 10km east of EM, with the Tshwane Metropolitan 60 km to the west. The northern boundary of the area on which the EM infrastructure is situated ("**EM Surface Area**") is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

Established in 2006, EM is a PGMs and chrome mining and processing operation and is operated under a consolidated mining right, the Elandsfontein Mining Right, granted in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) ("**MPRDA**") by the DMRE, over various properties, which include opencast and underground mining sections ("**EM Consolidated MR Area**").

EP's core business is to extract ore and process PGMs, and chromite concentrate at the EM. The EM Surface Area is approximately 1624 Ha.

The existing combined mining, processing and auxiliary infrastructure on the EM Surface Area comprise of the following:

- Workshops and Stores;
- Overburden and Topsoil Stockpiles;
- Opencast Mining Pits;
- Concentrator Plant;
- On-site Laboratory;
- Mine clinic and training centre;
- Water Management Infrastructure (i.e., dams, channels and pipelines);
- Wastewater Treatment Plant and Water Treatment Plant ("**WTP**");
- Decline Shafts (Maroelabult, Kukama and Nyala) and supporting infrastructure;
- Tailings Storage Facility ("**TSF**"), comprising of four Paddocks;
- Waste Rock Dumps ("**WRDs**");

- Offices and auxiliaries;
- Recreational Area (Game Farm);
- Agricultural fields; and
- Haul and internal Roads.

The purpose of the proposed EM PV Solar Project is to generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid. The EM PV Solar Project will be constructed within the EM Surface Area. The EA application is submitted for a PV Plant, with a generating capability of 40 MW and associated activities, situated within a 98 Ha project area ("**PV Project Area**");

The activities associated with the EM PV Solar Project will comprise the following:

- Inverters and transformers;
- Up to 33 kV transmission lines and transmission towers;
- Cabling between project components;
- Access and internal roads;
- On-site facility substation;
- Borehole for supply of construction and operational water needs;
- Telecommunications mast;
- O&M buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;
- Water and sewage pipelines; and
- Temporary laydown area.

Note: The 5MW PV Plant which would have been coupled with a HFC installation, that formed part of the initial EA Application has been excluded from the EM PV Solar Project, as the Project was not feasible.

The DEIAR has been compiled in line with the Appendix 3 of the 2014 EIA Regulations.

2. CONTACT PERSON AND CORRESPONDENCE ADDRESS:

2.1 DETAILS OF THE APPLICANT:

Details of the applicant and the contact details of the responsible person are captured in ***Table 1*** below.

Table 1: Details of the applicant and contact person

Project applicant:	Eland Platinum Proprietary Limited, a wholly owned subsidiary of Northam Platinum Limited
Registration no:	2016/427918/07
Trading name:	Eland Platinum
Responsible person:	Jacques Pretorius (General Manager)
Physical address:	Farm Elandsfontein 440 JQ, District of Brits, South Africa
Postal address:	PO Box 3436, Brits, 0250, South Africa
Telephone no:	087 158 8000
Fax no:	086 411 8000
Email:	Jacques.Pretorius@norplats.co.za
For the purpose of the application process the following people may be contacted at Eland Platinum:	
Mr. S Phalatsi SHEQ Manager Tel No: 087 158 8000 Email: Samuel.Phalatsi@norplats.co.za	Mrs. Keneilwe Sanyane Environmental Officer Tel: 087 158 8000 Email: Keneilwe.sanyane@norplats.co.za

2.2 THE EAP WHO PREPARED THE REPORT:

JEMS has been appointed as the independent EAP by EP to undertake the EA Application in terms of the NEMA, the 2014 EIA Regulations and the required water use authorisations in terms of the National Water Act 36 of 1998 ("**NWA**").

JEMS is a multi-skilled Environmental and Water Management Consultancy, providing independent and professional services to the industrial, mining, and commercial sectors. It is a proudly South African, level 2 Broad-Based Black Economic Empowerment company.

GS Barkhuizen is the lead EAP for the project. Mr. Thembani Mashamba the EAP Reviewer of the EA Application, with the support of JG Cronje (Project Sponsor).

Mr Barkhuizen has 12 years' experience in the environmental field. His experience is in the management of EIA, EMPR and Integrated Water Use Licence Applications ("**IWULA**") processes; coordination and execution of PPP; and management of multi-disciplinary project teams, mainly for mining related projects. He is also involved in conducting environmental

audits and site assessments. Mr. Barkhuizen is a Certified Natural Scientist in the Environmental Sciences Field (Registration number: 115982) with the South African Council for Natural Scientific Professions ("**SACNASP**") and his EAP registration is pending with Environmental Assessment Practitioners Association of South Africa ("**EAPASA**").

Mr. Thembani Mashamba is the EAP reviewer for the application and has 25 years' experience in the Environmental Management and Impact Assessment Sector. Mr. Mashamba experience include amongst others, implementation and administration of the NWA, implementation of the MPRDA and NEMA (EIA Regulations) requirements and waste management.

Mr. Jannie Cronje will be the project sponsor and reviewer of the Environmental Scoping and EIAR. He is a director of JEMS, with 30 years' experience in the environmental and geohydrology consultancy industry. Mr. Cronje is appropriately qualified and registered with the relevant professional bodies. He is registered as a Pr. Sci. Nat (Pr.Sci. Nat. 400063/93) with the SACNASP.

Refer to ***Appendix 1*** for copies of the EAP's qualifications as listed above for this project. Curriculum Vitae ("**CVs**") of the project team members listed above, with their past experience, can be found in ***Appendix 2***.

Table 2: Details of the EAP

EAP:	Gerhardus Stephanus Barkhuizen		
EAP Reviewer	Thembani Mashamba		
Company:	JEMS (Pty) Ltd		
Address:	26 In Full Flight, Mooikloof, 0059		
P.O. Box	92269 P O Box, Mooikloof, Pretoria, 0059		
Tel:	082 892 4282	083 776 7898	082 908 2881
Fax:	086 658 3132		
Email:	stephan@jems.co.za	jannie@jems.co.za	Thembani@jems.co.za

JEMS Team Details				
Designation	**Name**	**Qualification**	**Registration**	**Experience**
Project Manager/reviewer and Sponsor	JG Cronje	Hons. BSc Geohydrology Post Grad Dipl. Terrain Evaluation	Professional Natural Scientists (Pr.Sci. Nat. 400063/93) with the SACNASP	30 Years
Lead EAP	GS Barkhuizen	BTech Landscape Technology Hons. BSc Environmental Monitoring and Modelling	Certified Natural Scientist in the Environmental Sciences Field (Registration number: 115982), with SACNASP	12 Years

			EAP registration pending with EAPASA	
EAP Reviewer	T Mashamba	BSC Degree and Higher Education Diploma; Management Development Program (MDP); Master of Business Leadership (MBL)		24 Years

3. DESCRIPTION OF THE PROPERTY

The town of Brits is located 10km west of the EM PV Solar Project, with the Tshwane Metropolitan Municipality 60 km to the east. The northern boundary of the EM Surface Area is bounded by the R566 (Brits - Rosslyn) provincial road and N4 Bakwena National Highway (Pretoria-Rustenburg) to the south.

The surrounding communities and their proximity to EM PV Solar Project include:

- Brits (10km west);
- Damonsville (1 km north);
- Mothotlung (2 km north);
- Moumong (1.2 km north-east);
- Mmakau (3 km north); and
- De Wildt (3.7 km east).

Land surrounding the EM PV Solar Project is mainly used for livestock grazing, agriculture, mining, Hernic Ferrochrome's Smelter and Mine, and granite mining further north); renewable power producer (De Wildt Solar Plant); future filling station (Q4); and several community residential area and related activities. The Zilkaatsnek Eco-estate (mixed land-use development), small holdings and other businesses are located directly to the south (across the N4 highway), with several conservancy and protected areas further to the south (i.e., Magaliesberg Biosphere Area, Peglerae Conservancy and De Wildt Cheetah Research Area, etc.). (Refer to ***Figure 1*** and ***Figure 2***). The EM PV Solar Project will be located within the EM Surface Area on the following properties as listed in ***Table 3***, below and ***Table 4*** for the Owner Details for the applicable properties:

Table 3: Locality and Property description of the Eland Mine PV Solar Project

EA Application Property Description incl. 21-digit Surveyor General Code for each farm portion:	The EM PV Solar Project components will be located on the following properties, which are all owned by EP: **PV Solar Area** **Schietfontein 437 JQ** ■ Portion 13 (a portion of Portion 2) - T0JQ00000000043700013 ■ Portion 14 (a portion of Portion 2) - T0JQ00000000043700014 **Option 1 Option 1 - Preferred Dual Circuit 11kV** **Elandsfontein 440 JQ:** ■ Remaining Extent of Portion 58 (a portion of Portion 19) - T0JQ00000000044000058 ■ Remaining Extent of Portion 63 (a portion of Portion 58) - T0JQ00000000044000063 ■ Remaining Extent of Portion 59 (a portion of Portion 58) - T0JQ00000000044000059 ■ Remaining Extent of Portion 32 (a portion of Portion 18) - T0JQ00000000044000032 ■ Portion 39 (a portion of Portion 17) - T0JQ00000000044000039 **Option 2 - PV Evacuation 33kV Dual Circuit** **Elandsfontein 440 JQ:** ■ Portion 37 (a portion of Portion 16) - T0JQ00000000044000037 ■ Remaining Extent of Portion 58 (a portion of Portion 19) - T0JQ00000000044000058 ■ Remaining Extent of Portion 63 (a portion of Portion 58) - T0JQ00000000044000063 ■ Remaining Extent of Portion 59 (a portion of Portion 58) - T0JQ00000000044000059 **Zilkaatsnek 439JQ:** ■ Portion 83 (a portion of Portion 58) - T0JQ00000000043900083 ■ Portion 84 (a portion of Portion 58) - T0JQ00000000043900084 ■ Portion 86 (a portion of Portion 58) - T0JQ00000000043900086 ■ Portion 197 (a portion of Portion 113) - T0JQ00000000043900197 ■ Portion 200 (a portion of Portion 14) - T0JQ00000000043900200
Application area (Ha):	The entire EM Surface Area is approximately 1624 Ha in extent. The area for the PV Plant and associated infrastructure ("**Plant Project Area**") and the overhead power lines ("**OHL**") will be placed on an area of approximately 105 Ha within the EM Surface Area. The estimated length of the OHLs are 3,5km and 6,5km for the OHL Option 1 and 2 routes, with a 22m building restriction ("**OHL Route Area**"). The Plant Project Area and OHL Route Area are collectively referred to as the "**PV Project Area**"
Province:	North-West Province
District Authority	Bojanala Platinum District Municipality
Local Authority	Madibeng Local Municipality
Magisterial district:	Brits
Municipal Wards	Ward 21
Distance and direction from nearest town:	The Proposed Project is located near the town of Brits (10 km west). Surrounding communities include Damonsville, Mothotlung, Mmakau, De Wildt and private landowners and farmers.
Catchment	Situated in the Quaternary Sub-Catchment A21J, that drains to the Crocodile River Catchment and forms part of the Limpopo Water Management Area ("**WMA"**)
Servitudes	Several servitudes, including Eskom OHL, are located within the PV Project Area. Servitudes to north and south of the EM Surface Area boundary include a railway and national road route (N4 – Bakwena)
Major roads and routes	The R566 forms the northern boundary of the EM Surface Area, linking Brits and Rosslyn. The N4 Bakwena national highway is located directly south of EM, linking Pretoria with Rustenburg, Brits and Mafikeng.

Table 4: Landowner details of the PV Project Area (including the alternative power line)

Property Description	Landowner Details
The Farm Zilkaatsnek 439JQ	
Portion 83 (a portion of Portion 58)	Eland Platinum Proprietary Limited
Portion 84 (a portion of Portion 58)	
Portion 86 (a portion of Portion 58)	
Portion 197 (a portion of Portion 113)	
Portion 200 (a portion of Portion 14)	
The Farm Elandsfontein 440 JQ	
Remaining Extent of Portion 58 (a portion of Portion 19)	Eland Platinum Proprietary Limited
Remaining Extent of Portion 63 (a portion of Portion 58)	
Remaining Extent of Portion 59 (a portion of Portion 58)	
Remaining Extent of Portion 32 (a portion of Portion 18)	
Portion 37 (a portion of Portion 16)	
Portion 39 (a portion of Portion 17)	
The Farm Schietfontein 437 JQ	
Portion 13 (a portion of Portion 2)	Eland Platinum Proprietary Limited
Portion 14 (a portion of Portion 2)	

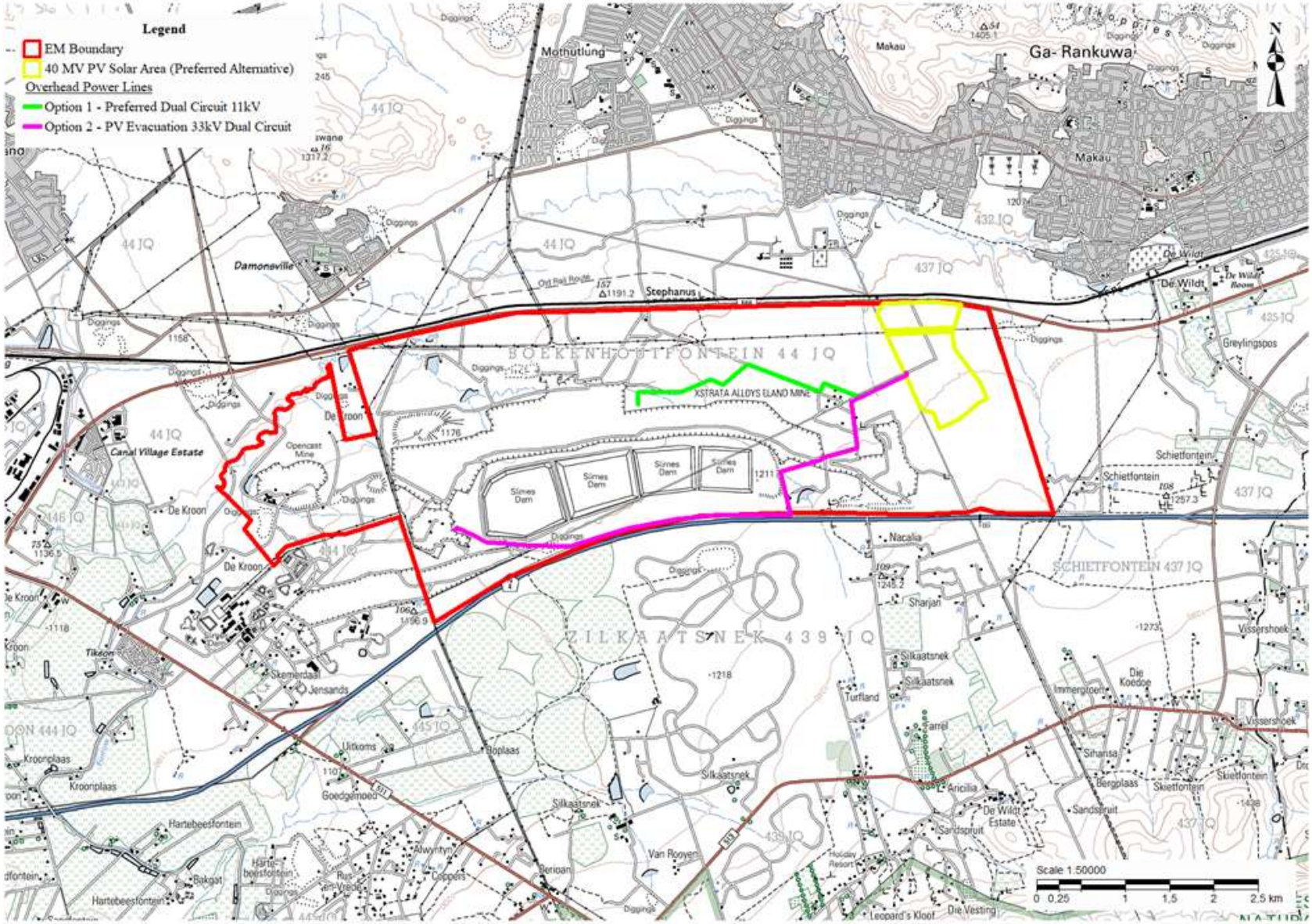


Figure 1: 1:50 000 Topographical Map for the PV Project Area.

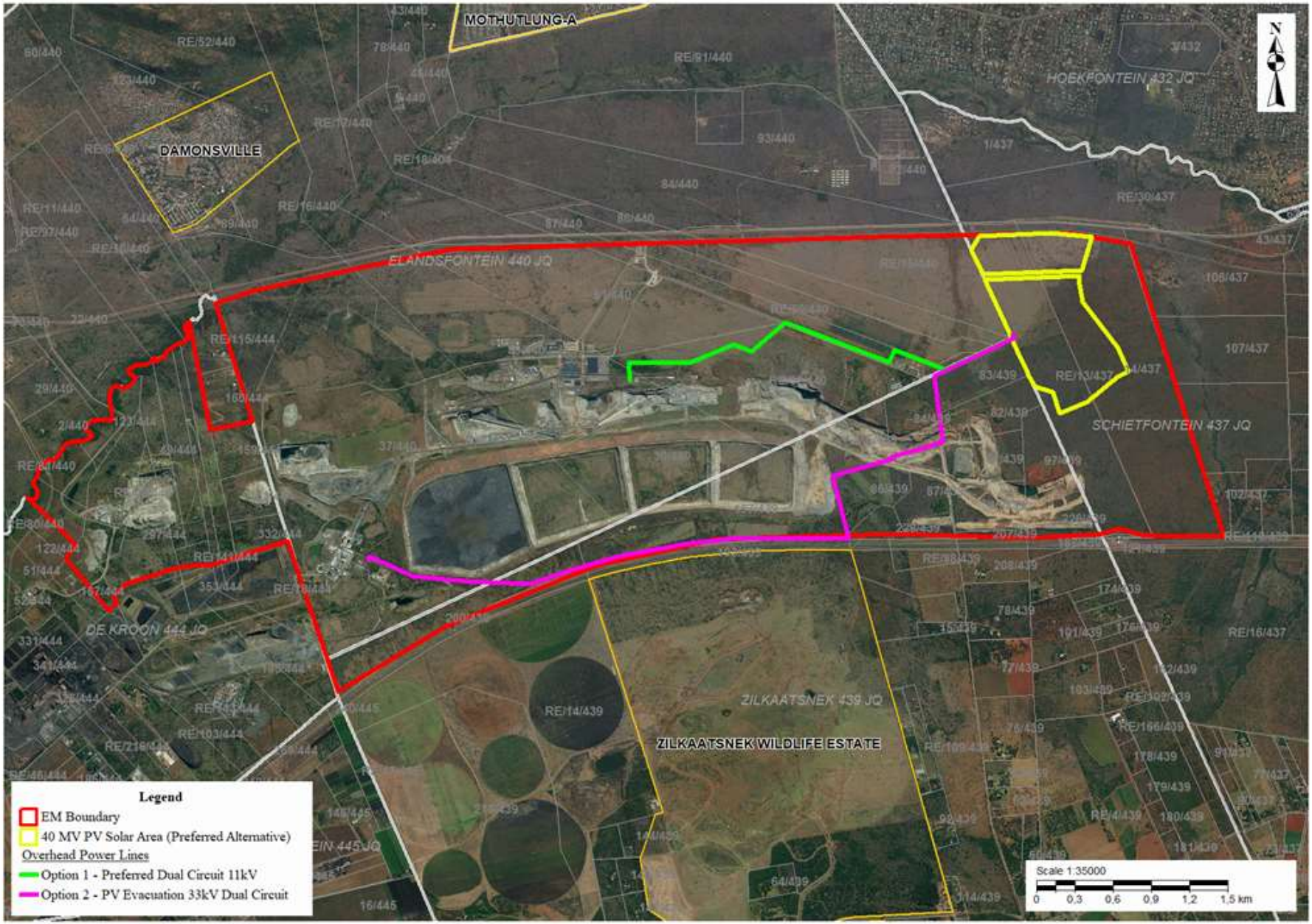


Figure 2: Aerial Map for the PV Project Area

4. OVERVIEW OF THE EM

4.1 LEGAL FRAMEWORK

EM is an operational mine and is governed by various legislation, including the MPRDA and its Regulations; NEMA and the 2014 EIA Regulations; and the NWA. Existing Environmental Authorisation(s), Environmental Management Programmes (EMPr(s), Water Use License(s) and approvals have been issued for the EM Consolidated MR Area.

4.2 OVERVIEW OF CURRENT OPERATION

4.2.1 Mine Overview

EM is an established mine, with a Concentrator Plant that produces PGM and chromite concentrate. A description of the operational mining and processing activities is provided below (Refer to ***Figure 3***).

4.2.2 The Mining Processes

Different mining methods are undertaken at EM at three sections, namely opencast mining at Zilkaatsnek and underground mining at Elandsfontein and MM.

4.2.3 The mineral processing operations

The current mineral processing operations comprise of one Concentrator Plant, with the option of expanding the Concentrator Plant in future. The Concentrator Plant has a capacity to process 250 000 tonnes per month and is designed to produce PGM and chromite concentrate.

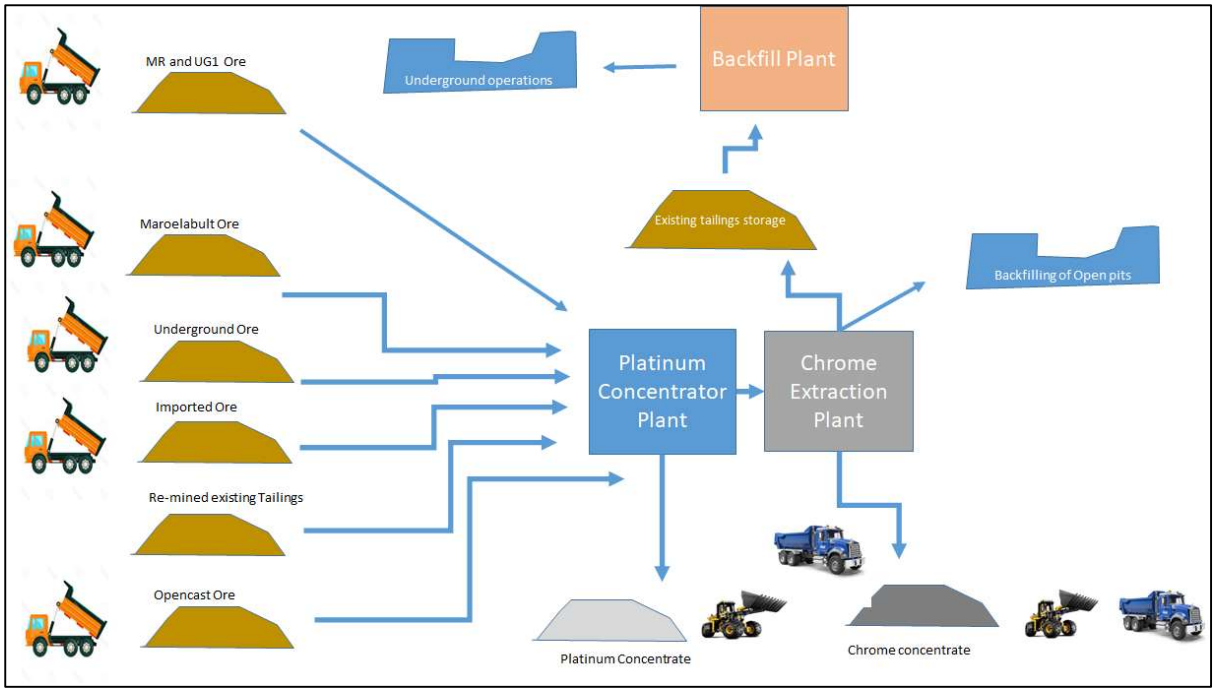


Figure 3: EM Operation Process Flow Diagram.

4.3 PROPOSED ACTIVITIES

The purpose of the proposed EM PV Solar Project is to generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid. The EM PV Solar Project will be constructed within the EM Surface Area and comprise of a PV Plant, with a generating capability of 40 MW, situated within a 105 Ha project area. The activities associated with EM PV Solar Project will comprise the following:

- a 40MW PV Plant,
- Inverters and transformers;
- 11 kV and 33 kV transmission lines and transmission towers;
- Cabling between project components;
- Access and internal roads;
- Borehole for the supply of water for construction and operation needs;
- On-site facility substation;
- Telecommunications mast;
- O&M buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;

- Water and sewage pipelines; and
- Temporary laydown area.

The following proposed listed activities in NEMA will be triggered as part of the EM PV Solar Project:

Table 5: General list of proposed activities

NAME OF ACTIVITY	AERIAL EXTENT OF ACTIVITY [2]	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
1. **Establishment of laydown area (5Ha for PV Project Area)**	**+/- 5 Ha**	**X**	**GNR 983**
2. **Upgrading and expansion of haul roads for the transportation of material and general equipment movement**	**+/- 1 Ha**	**X**	**GNR 983 GNR 985**
3. **Construction of a new access road from the R566 (Brits-Rosslyn Road) to the PV Project Area**	**+/- 0.5 Ha**	**X**	**GNR 983 GNR 985**
4. **Expansion of existing or development of new water and sewage pipelines**	**+/-1 Ha**	**X**	**GNR 983 GNR 985**
5. **Vegetation clearance and soil disturbance of 105 Ha for the PV Project Area, including the associated infrastructure, roads, power lines, pipelines, sewage facilities and O&M facilities at the PV Project Area**	**+/- 105 Ha**	**X**	**GNR 984 GNR 985**
6. **Construction and operation of the EM PV Solar Project, including the associated infrastructure, transmission lines, roads, pipelines and O&M buildings at EM**	**+/- 100 Ha**	**X**	**GNR 983 GNR 984 GNR 985**
7. **Construction and operation of an onsite substation complex**	**+/- 2 Ha**	**X**	**GNR 983 GNR 985**
8. Building rubble and construction waste will be generated during the construction phase.	+/- 500 m^2	N/A	Not listed
9. Drilling of a borehole to supply construction and operation water needs.	+/- 100 m^2	N/A	Not listed
10. Rehabilitate and revegetate the areas affected by construction and land clearance.	Unknown	N/A	Not listed
11. Environmental monitoring	Unknown	N/A	Not listed
12. Maintaining and training of emergency preparedness and response plan	Unknown	N/A	Not listed

4.4 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

4.4.1 Overview of Solar PV Technology

Solar energy facilities, such as those which utilise PV technology, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. Generating electricity using the Photovoltaic Effect is achieved by using the following components:

4.4.1.1 Photovoltaic Modules

PV cells are made of crystalline silicon, the commercially predominant PV technology, that includes materials such as polycrystalline and monocrystalline silicon or thin film modules

manufactured from a chemical ink compound. They are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV module (Solar Panel). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)).

When sunlight hits the PV panels free electrons are released and flow through the panels to produce DC. DC then needs to be converted to Alternating Current (AC), using an inverter, before it can be directly fed into the electrical grid.

4.4.1.2 Inverters

Inverters are used to convert electricity produced by the PV panels from DC into AC, to enable the facility to be connected to the mine electrical distribution system. Numerous inverters will be arranged in several arrays, to collect and convert power produced by the facility.

Figure 4: Example of a PV Solar Panel.

4.4.1.3 Support Structures

PV panels will be fixed to a support structure. They can either utilise fixed / static support structures, or alternatively single or double axis tracking support structures. PV panels which utilise fixed / static support structures are set at an angle (fixed tilt PV system), to optimise the amount of solar irradiation. With fixed / static support structures, the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support

structures track the movement of the sun throughout the day, to receive the maximum amount of solar irradiation.

4.4.1.4 PV array areas (40 MW)

Fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology will be used for the project. Monofacial or bifacial panels are both also considered. The EM PV Solar Project will comprise solar panels which, once installed, will stand approximately 5m above ground level. The solar panels will include centralised inverter stations, or string inverters mounted above ground. If centralised inverter stations are used, megavolt distribution transformers are located internally, whereas string inverters are containerised with switchgear. The main transformer capacity varies according to detailed design and project-specific requirements.

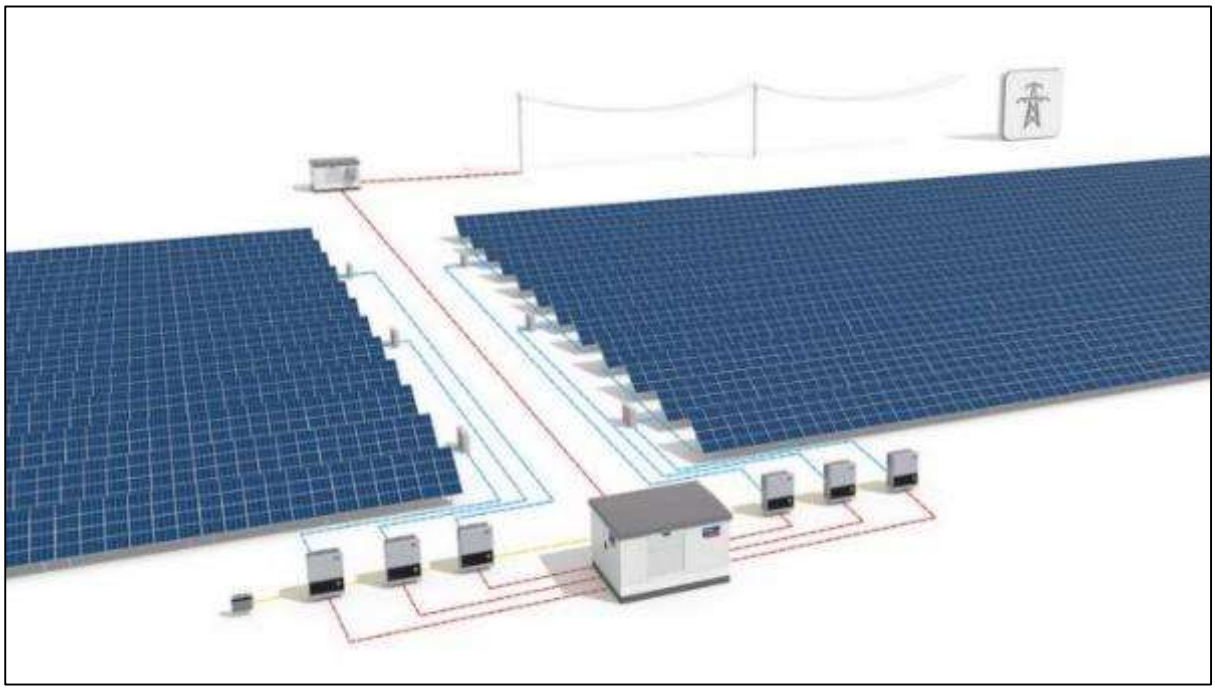


Figure 5: Typical PV Solar Plant diagram (source: Solardao) [1]

4.4.1.5 Substation Complexes

One onsite substation complexes will be developed to receive, convert and step up the electricity generated by the PV Plant to evacuate power to the existing consumer substation. The infrastructure will cover an area of approximately 2 Ha, with a maximum height of 5m. The onsite substation complexes will be divided into a medium and high voltage sides. The medium voltage side of the onsite substation complexes contain collection, transformation

[1] (https://medium.com/@solar.dao/how-pv-solar-plants-work-a-beginners-guide-79f085b8ee88).

(i.e., 11 kV to 33 kV) and measurement equipment. The high voltage side contains mainly measurement equipment and connection to the 11 or 33 kV transmission line.

4.4.1.6 Stormwater control

Where required, stormwater infrastructure will be constructed on the site to ensure that stormwater run-off from the site is appropriately managed. Sheet flow for run-off will be promoted and the concentration of water/run-off will be minimised through strategic placing of berms, canals, grading/slope and other infrastructure.

4.4.1.7 Telecommunications

A radio telecommunication mast of a height of >15 m (lattice or monopole type) will be installed within the substation complex for any data communications required for the EM PV Solar Project during its construction and operation phases.

4.4.1.8 Temporary structures

Temporary structures will be installed within the PV Project Area, with a combined maximum size of 5 Ha, including:

- temporary offices,
- construction yard, and
- a laydown area.

The construction yard will be used to perform small tasks during the construction phase, including equipment preparation and cleaning activities, and will include one or few container-type offices for contractors and technical staff. The laydown area will be used for storage of material and equipment during the construction phase. This area will be rehabilitated on completion of construction activities.

4.4.1.9 Operations and maintenance buildings

Additional building infrastructure is required to support the functioning of the EM PV Solar Project and provide services to personnel that will operate and maintain the Project. These O&M buildings, of approximately 1 Ha in size, will be located next to the onsite substation complex and include:

- workshops;
- small storage areas for materials and spare parts for use on site for maintenance activities during the operation phase;
- single storey concrete house with offices and ablutions facilities for staff, security and visitors;

- guard hut at the entrance of the proposed site with a mobile toilet;
- septic tanks and sewer lines connected to the service ablution facilities;
- water storage tanks or covered lined ponds;
- small diameter water supply pipeline, connecting the borehole to the water storage tanks
- central waste collection and storage area; and
- parking area.

4.4.1.10 Services to facility

Service connections and water supply required for the construction and operational activities will be sourced from a borehole that will be drilled within the PV Project Area. Alternatively, water will be supplied via trucks from the on-site sources.

During the construction phase water will be required for consumption and services; and dust suppression on the roads and within the construction area. An estimated 1 600 m^3 will be required for the construction phase. Water will be recycled/treated where possible.

The PV panel will require regular cleaning and maintenance activities (at least quarterly), to ensure optimal operation and generation of electricity. EP will implement environmentally friendly dry-cleaning methods, if possible and available, or use water to clean the panels. Dirty water will be re-used as far as possible. During the operational phase (minimum of 25 years) approximately 1 600m^3/annum of water will be used annually for the cleaning of panels; road maintenance and general employee usage.

The applicant will obtain the required water use authorisation under the NWA to abstract water from the groundwater resources.

Portable sanitation facilities (i.e., chemical toilets) will be used during the construction phase and septic tanks or self-sustaining bioreactor process will be used to manage sewage generated during the operational phase. It is estimated that up to 10 kl of sewage (wastewater) will be produced during the construction phase and waste water will either be disposed at the Municipal works or the EM waste water treatment plant. During the operational phase, limited activities would occur on the site thus the production of sewage (wastewater) will be minimal; and a septic tanks or self-sustaining bioreactor process will be sufficient to manage sewage generated.

It is likely that new internal roads will have to be constructed to allow for the movement of construction vehicles. The new roads will not likely be wider than 8m. A new access road will possibly be constructed near the PV Plant Area from the R566 Provincial Road.

Waste management will be a priority and all waste will be handled according to the Municipal By-laws and legislative requirements. The preliminary types of waste that will be generated include:

- Building rubble (mainly in the form of construction material, excavated substrate and domestic solid waste);
- General Waste (i.e., cardboard waste (panel packaging), waste (rubber caps on panel edges, wooden pallets, plastic wrapping etc.); and
- Hazardous Waste (i.e., waste oil and paint, etc.).

The EA Application is therefore submitted for the abovementioned activities. The PV Project Area will consist of a total footprint of **+/- 105 Ha**. The EM PV Solar Project will be constructed and operated within the existing EM Surface Area. Refer to the ***Figure 8 - 10*** below for an indication of the location of the EM PV Solar Project.

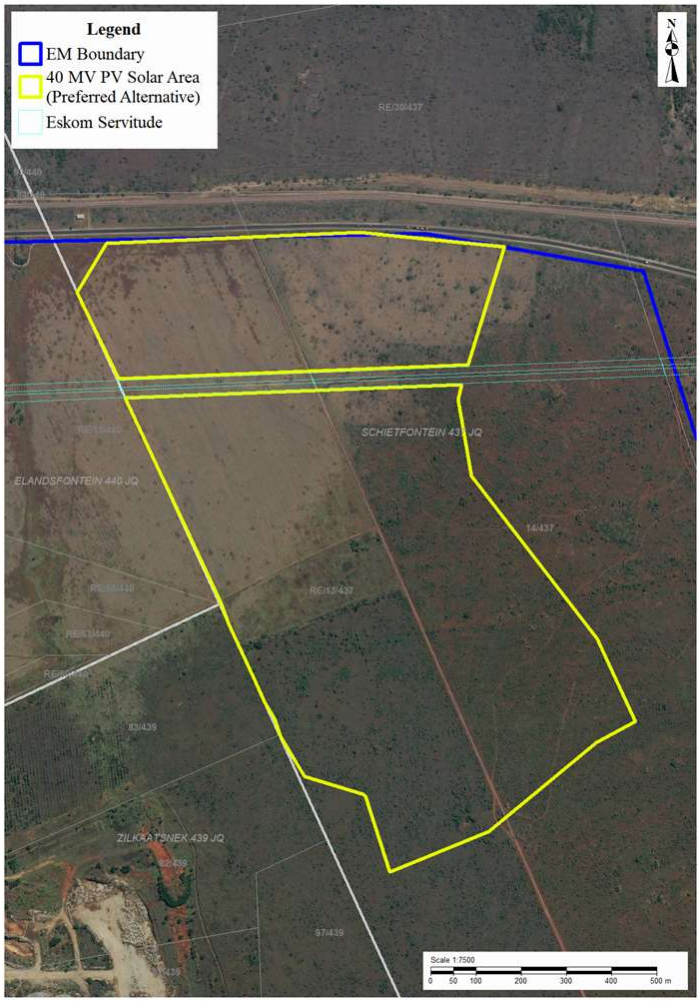


Figure 6: Location of the PV Plant Area.

Figure 7: Locality of the PV Project Area in relation to the Existing Mining and Surface Infrastructure.

5. POLICY AND LEGISLATIVE CONTEXT

Table 6: Policy and legislative context of the EA Application

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
1. Constitution of the Republic of South Africa (Act No. 108 of 1996) ("Constitution") Environmental legislation is shaped by the Bill of Rights set out in the Constitution. Section 24 of the Constitution, known as the '**Environmental Right**', guarantees every person the right to an environment that is not harmful to their health or well-being; provides for environmental protection against pollution and degradation and centres sustainable development as the cornerstone of South Africa's environmental law regime. This right is binding on the State and people, both natural and juristic. In fulfilment of its constitutional mandate to take reasonable legislative measures to give effect to section 24 of the Constitution, the government has promulgated several environmental laws. These laws provide a legal framework that embodies internationally recognised legal principles. The principal act governing activities that affect the environment is NEMA. In accordance with the constitutional mandate to protect the environment, on 1 November 2012 the National Council of Provinces ratified the Paris Agreement, adopted under the United Nations Framework Convention on Climate Change, which has been said to represent a turning point in global climate governance. In September 2021, South Africa updated its Nationally Determined Contribution ("**NDC**"). South Africa's National Climate Change Adaptation Strategy, 2020 ("**NCCAS**") supports the country's ability to meeting its obligations under of the Paris Agreement.	The Constitution itself has no permitting requirements. However, the manner in which the Environmental Right is applied implies that environmental impacts associated with developments should be considered separately and cumulatively. Furthermore, section 24 includes the notion that justifiable economic and social development should be promoted, through using natural resources and ecologically sustainable development. The EM PV Solar Project is a renewable energy project which promotes South Africa's obligations in terms of the Paris Agreement and NDC and, due to GHG emission reduction, promotes an environment that is not harmful to persons' health or wellbeing and sustainable development. The Scoping/EIA and EMPr was compiled considering the Constitution, Paris Agreement and the NCCAS.
2. National Environmental Management Act (Act No. 107 of 1998) ("NEMA") In terms of sections 24(2) and 24D of NEMA the Minister of Forestry and Fisheries and Environmental Affairs promulgated certain activities that may not commence without an EA. Activities promulgated in terms of GN983 and GN9835 require a basic assessment process, while activities promulgated in terms of GN984 require that a full Scoping and EIA process be conducted. GN 983, 984 and 985 are promulgated under NEMA in GG 38282 of 4 December 2014 (as amended). The requirements for an EIA and EMP are specified in Appendixes 3 and 4 of the 2014 EIA Regulations. Section 28 of NEMA also places a duty of care on all persons to prevent, limit or remediate any pollution or degradation of the environment.	The EM PV Solar Project includes activities listed in terms of GN R983, GN R984 and GN R985 which require an EA from the CA, in terms of 2014 EIA Regulations. This EA must be obtained prior to the commencement of the activities. The application for the EA will be made to the NWDEDECT as CA for the EM PV Solar Project. DFFE confirmed to Northam as part of another solar project in April 2021 that the provincial environmental departments should be the CA. The DMRE is the CA under the 2014 EIA Regulations where the listed activities are directly related to mining activities. As with the previous solar project, the EM PV Solar Project will generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
	to the national grid. The EM PV Solar Project is therefore not directly related to mining activities and the provincial environmental department is the CA. EP is committed to always during construction, operation and decommissioning of the EM PV Solar Project comply with the duty of care as set out in Section 28. The duty of care applies to all activities taking place at the PV Project Area and also the EM and is not solely focused on the listed activities being applied for. While no permitting or licensing requirements arise through section 28 of NEMA, this section is applicable through the consideration of potential cumulative, direct, and indirect impacts and the implementation of the required mitigation measures.
3. <u>EIA Regulations (2014 EIA Regulations)</u> Chapter 6 of the 2014 EIA Regulations provides for the requirements for PPP, which must be carried out as part of the EA application process. In terms of Regulations 21 and 23, the outcome of the PPP must be reported in the FSR and EIAR submitted to the CA. The PPP, "*must give all potential or registered interested and affected parties, including the competent authority a period of at least 30 days to submit comments on each of the EMPR, scoping report and environmental impact assessment report, and where applicable the closure plan, as well as the report contemplated in regulation 32, if such reports or plans are submitted at different times*" (Regulation 40 (1)). The PPP must also: ■ provide access to all information that reasonably has or may have the potential to influence any decision regarding an application; ■ involve consultation with the CA, every state department that administers a law relating to the environment relevant to the application, all relevant organs of state, and all I&APs; and ■ provide opportunity for I&APs to comment on reports and plans prior to submission of an application but must be provided with an opportunity to comment on such reports once an application has been submitted to the CA. The process must include: ■ notification of the application to all I&APs, as stipulated in Regulation 41; ■ registration of all I&APs, as required in Regulations 42 and 43; and ■ a record of comments and responses and records of meetings of and with I&APs, as outlined in Regulation 44. Regulation 39 of the 2014 EIA Regulations requires that: "*(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental*	A PPP was/will be undertaken to make provision for the consultation process during the EM PV Solar Project. The PV Project Area is owned by EP. Surrounding landowners were notified as part of PPP process.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land. *(2) Sub regulation (1) does not apply in respect of—* *(a) linear activities; and* *(c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014."*	
4. <u>DFFE Web-Based Screening Tool</u> In terms of Regulation 16(1)(b)(v), read with regulation 21 of the 2014 EIA Regulations, it is compulsory for an EA application to include a sensitivity report generated by the **national web based environmental screening tool** (GN R960 of GG 42561, dated 5 July 2019) ("**DFFE Screening Tool**"). Where themes are identified for an EA application, specialist reports are prescribed in the 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 NEMA[2] ("**Assessment Procedures**") for certain of the themes. Two Assessment Procedures have been gazetted, in March 2020 ("**March 2020 Assessment Procedures"**) and October 2020 ("**October 2020 Assessment Procedures"**)	The requirement for the submission of a screening report for the EM PV Solar Project is applicable, as it triggers Regulation 21 of the EIA Regulations, 2014. The screening report has been compiled and is attached to this EIA Report under ***Appendix 7***. The screening report identified the following environmental sensitivity themes: ■ Agricultural – Very High Sensitivity; ■ Terrestrial Biodiversity – Very High Sensitivity ■ Plant Species – Medium Sensitivity; ■ Palaeontology – Medium Sensitivity; ■ Animal Species - Medium Sensitivity; ■ Civil Aviation – Medium Sensitivity; ■ Aquatic Biodiversity – Low Sensitivity; ■ Archaeological and Cultural Heritage – Low Sensitivity; ■ Defence – Low Sensitivity; Specialist studies have been undertaken to verify the sensitivity themes as identified in the DFFE Screening Tool (Refer to Appendixes). Specific requirements for assessment reports are included in the Assessment Procedures for the agricultural; aquatic and terrestrial biodiversity; plant and animal species themes. The Agricultural and Biodiversity Impact Assessments comply with these requirements. Assessments Procedures do not prescribe impact assessments for HIA and previous HIA, including the PV Project Area, have been relied on for the EIA. The Assessment Procedures also do not prescribe impact assessments for civil aviation and defence and the EAP was of the reasoned opinion that specialist assessments were not required for these themes.
5. <u>Environment Conservation Act (Act No. 73 of 1989) ("ECA")</u>	Noise impacts are expected to be associated with the EM PV Solar Project's construction phase. The necessity for a noise permit in terms of ECA appears

2 Published in GN R320 of GG 43110 on 20 March 2020 and GN R1150 of GG 43855 on 30 October 2020

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
The Noise Control Regulations in terms of Section 25 of the ECA are still applicable for noise control in the NWP.	unlikely, due to the nature of the Project. The Municipal By-Laws and approvals will be verified before the project initiation phase.

6. NEMA Listed Activities (GN983, 984 and 985)

A scoping and EIA process is being followed in terms of the 2014 EIA Regulations for activities listed under GN983, GN984 and GN 985. This report constitutes the EIA report circulated to I&APs and State Organs, in the EIA process being undertaken. The listed activities applicable to the EM PV Solar Project are given in the Table below.

Number and date of relevant notice	Activity No.	Description of each listed activity as per the GN.	Description of the proposed activities in relation to the listed activities being applied for.
GN R. 983	12(ii)(c)	Development of (ii) infrastructure or structures with a physical footprint of 100m^2, or more (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse.	Pump stations, pipelines and associated infrastructure required for the EM PV Solar Project may be constructed in proximity to watercourses, although currently it is not envisaged that such infrastructure will be 32m of a watercourse. However, provision is made to include the listed activity should this be required.
GN R. 983	19	Infilling or depositing of any material of more than 10m^3 into, or the dredging, excavation, removal or moving of soil, sand, …, pebbles or rock of more than 10m^3 from a watercourse.	It is unlikely that pipelines and roads required for the EM PV Solar Project will traverse watercourses or that the transmission lines will trigger this activity. However, provision is made to include the listed activity should this be required.
GN R. 983	24(ii)	Development of a road: (ii) with a reserve wider than 13,5 m, or where no reserve exists where the road is wider than 8 m	New internal roads will have to be constructed to allow for the movement of construction vehicles. A new access road will also be constructed to the PV Project Area from the R566 provincial road. The new roads will unlikely be wider than 8m however provision is made to include the listed activity should this be required.
GNR. 983	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 1 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 Ha	The EM PV Solar Project Area will be 105 Ha; and consist of the 40 MW PV Plant, which may be considered industrial activities. The 40MW PV Plant will be located on land previously utilised for crop production; larger than 1 Ha; and outside an urban area.
GN R. 983	48(i)(a) (c)	Expansion of: (i) infrastructure or structures where the physical footprint is expanded by 100m^2 or more, where such expansion occurs— (a) within a watercourse;	It is possible that existing infrastructure will need to be expanded that might be close to watercourses, including pump stations, pipelines and associated infrastructure required for the EM PV Solar Project.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT			REFERENCE WHERE APPLIED
		(c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse	It is not foreseen that any expansion activities will be undertaken within 32m of a watercourse. However, provision is made to include the listed activity should this be required.
GN R. 984	1	Development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20MW or more.	EP is planning to construct the EM PV Solar Project within the EM Consolidated MR Area. The Project will consist of a 40 MW PV Plant. The EM PV Solar Project's purpose is to generate electricity for use at the EM's offices, workshops, concentrator plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid.
GN R. 984	15	Clearance of an area of 20 Ha or more of indigenous vegetation.	The EM PV Solar Project will be constructed on a footprint of 105 Ha; and consist of a 40 MW PV Plant. More than 20ha of indigenous vegetation will be cleared.
GN R. 985	4 (h) (iv) & (vi)	Development of a road wider than 4m with a reserve less than 13,5m, whereas the development takes place: iv) CBAs; vi) Areas within 5km from protected areas identified in terms of the National Environmental Management: Protected Areas Act 57 of 2003 ("**NEMPAA**") or a biosphere reserve ("**Protected Area**").	A new access road and new internal roads will have to be constructed to allow for construction and maintenance of the PV Plant and for the movement of construction vehicles respectively. The new roads will likely not be wider than 8m however provision is made to include the listed activity should this be required.. The proposed roads will be located inside the existing EM Surface Area; within / near the Marikana Thornveld ecosystem; and is situated in a CBA2, as per the North-West Biodiversity Sector Plan ("**NW BSP**"). The EM is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
GN R. 985	12 (h)(iv) and (vi)	Clearance of an area of 300m2 or more of indigenous vegetation (except where such clearance is required for maintenance purposes undertaken in accordance with a maintenance management plan) in the NWP on land situated within; iv) CBA; and vi) Areas within a watercourse or wetland, or within 100m from the edge of a watercourse or wetland.	The EM PV Solar Project will be constructed on a footprint of 105 Ha; and consist of a 40MW PV Plant. It is likely that the impacted vegetation will include indigenous vegetation and is within / near the Marikana Thornveld ecosystem and is/or situated in a CBA2 as per the NW BSP.
GN R. 985	14(ii)(a)(c)(h)(iv) & (vi)	Development of infrastructure or structures with a physical footprint of 10m2 or more; where such development occurs – (a) within a watercourse; or (c) if no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse in the NWP in: iv) CBAs; and vi) Areas within 5km from Protected Areas or core areas of a biosphere reserve.	Pump stations, pipelines, OHLs and associated infrastructure required for the EM PV Solar Project may be constructed in proximity to watercourses, although currently it is not envisaged that such infrastructure will be within 32m of a watercourse. However, provision is made to include the listed activity should this be required. The proposed activities are within / near the Marikana Thornveld ecosystem and situated in a CBA2 as per the NWBSP. The EM Surface Area is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT			REFERENCE WHERE APPLIED
GN R. 985	18(h)(ii) & (v) & (ix)	Widening of a road by more than 4m, or the lengthening of a road by more than 1km, in the NWP in: ii) Areas within 5km from Protected Areas or a biosphere reserve; v) CBAs; and (ix) Areas within a watercourse or wetland, or within 100m from the edge of a watercourse or wetland.	It is likely that existing internal roads will have to be widened to allow for the movement of construction vehicles. The roads will likely need to be widened by 4m. The internal roads are located inside the existing EM Surface Area and within / near the Marikana Thornveld ecosystem and situated in a CBA2, as per the NW BSP. The EM is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
GN R. 985	23(ii)(a) & (c) (h), (iv) & (vi)	The expansion of: (ii) infrastructure or structures where the physical footprint is expanded by 10m2 or more, where such expansion occurs— (a) within a watercourse; (c) if no development setback has been adopted, within 32m of a watercourse, measured from the edge of a watercourse, in the NWP in: iv) CBAs; and vi) Areas within 5 km from Protected Areas or from the core area of a biosphere reserve.	Pump stations, pipelines, transmission lines and associated infrastructure required for the EM PV Solar Project may be constructed in proximity to watercourses, although currently it is not envisaged that such infrastructure will be within 32m of a watercourse. However, provision is made to include the listed activity should this be required. The proposed activities are within / near the Marikana Thornveld ecosystem and situated in a CBA2 as per the NW BSP. The EM is within 5km of the Mnandi Nature Reserve and falls within the Magaliesberg Biosphere Buffer Area.
7. <u>National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEMAQA)</u> NEMAQA was promulgated to ensure the protection and regulation of air quality and provide measures that will prevent pollution and sustainability. Under NEMAQA, the Minister of Forestry and Fisheries and Environmental Affairs must identify substances in ambient air which present a threat to health, well-being or the environment and establish national standards for ambient air quality, including the permissible quantity or concentration of each substance in ambient air. The following regulations promulgated under NEMAQA were considered for the EM PV Solar Project: ■ *List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage, published under GN 893 in GG 37054 of 22 November 2013 (as amended)* ("**AEL List**"), which lists activities that could result in atmospheric emissions requiring an Atmospheric Emissions Licence before being undertaken. ■ *Waterberg-Bojanala National Priority Area ("**WBNPA**"), GN1207 in GG 39489 on 9 December 2015*: The WBNPA was established due to the exceedance of the ambient air quality standards or alternatively that a situation exists within the area which is causing or may cause a significant negative impact on air quality in the			Renewable energy projects, such as the EM PV Solar Project, satisfy NEMAQA's objectives, being clean air quality. The EM PV Solar Project does not trigger any listed activities in the AEL List. The EM and the EM PV Solar Project is located within the WBNPA, as contemplated in section 18(1) of NEMAQA. An existing dust fallout monitoring network and programme is in place for EM. EP will continuously be monitoring the dust fallout impacts at EM, which would include the PV Project Area. Dust control measures are included in the EMPr.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
area and the area requires specific air quality management action to rectify the situation. ■ *National Dust Control Regulations, published under GN827 in GG 36974 of 1 November 2013*, which provide that an acceptable dust fallout rate for a non-residential area is considered more than 600 mg/m2/day but less than 1200 mg/m2/day (30-day average), with maximum allowable two exceedances per year, provided these exceedances do not take place in consecutive months. Where the dust fallout rate is exceeded, a dust fall monitoring programme, as prescribed in terms of the Regulations, must include: ▪ the establishment of a network of dust monitoring points, using method ASTM D1739:1970 (or an equivalent standard), sufficient in number to establish the contribution to dust fallout in residential and non-residential areas near the premises; monitor identified or likely sensitive receptor locations; and establish the baseline dust fall for the district; and ▪ a schedule for submitting to the air quality officer dust fallout monitoring reports annually or at more frequent intervals, if requested by the air quality officer. ■ GHG have been declared priority pollutants under the Declaration of Greenhouse Gases as Priority Air Pollutants published GN 710 in GG 40996 of 21 July 2017, in terms of NEMAQA, with potential reporting requirements for EM.	
8. <u>National Environmental Management: Biodiversity Act (Act No. 10 of 2004) ("NEM:BA")</u> In line with the Convention on Biological Diversity, NEM:BA aims to legally provide for biodiversity conservation, sustainable use and equitable access and benefit sharing. NEM:BA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and identification of biodiversity hotspots and bioregions, which may then be given legal recognition. It imposes obligations on landowners (state or private) regarding alien invasive species. NEM:BA requires that provision be made by a site developer to remove any aliens which have been introduced to the site or are present on the site. The NEM:BA also provides for listing of threatened or protected ecosystems in one of four categories: critically endangered, endangered, vulnerable or protected. Threatened ecosystems are listed to reduce the rate of ecosystem and species extinction, by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value. Section 53 of NEM:BA provides that:	The vulnerable Marikana Thornveld Ecosystem is located over sections of the PV Project Area. As part of the Proposed Project, indigenous vegetation clearance and removal will likely be undertaken. A biodiversity Specialist has been appointed to determine the impact of the Proposed Project on the biodiversity and the findings/recommendations have been included in the DEIAR. Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species. A biodiversity impact assessment has been undertaken and the findings and recommendations of the study are discussed in the DEIAR.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
"*(1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.* *(2) A threatening process identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act and a listed ecosystem must be regarded as an area identified for the purpose of that section."* No notices have been published yet under this section. Picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species is a restricted activity under NEM:BA. A permit is required for a restricted activity involving a listed threatened or protected ("**TOPS**") species without a permit. Chapter 7 of the NEM:BA regulates the process for application of a permit under NEM:BA. The following notices have been published in terms of section 56(1) of NEM:BA: ■ National List of Ecosystems that are Threatened and in need of protection ("**TOPS List**"), published under GN1002 in GG34809 on 9 December 2012, which contains the National List of Ecosystems that are threatened and in need of protection. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems and preserving witness sites of exceptionally high conservation value. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction; ■ Lists of Critically Endangered, Endangered, Vulnerable and Protected Species, published under GNR151 in GG 29567of 23 February 2007; and ■ Threatened and Protected Species Regulations, published under GNR152 in GG 29657of 23 February 2007. Chapter 5 of NEM:BA pertains to alien and invasive plants ("**AIP**") and provides that a person may not carry out a restricted activity involving a specimen of an AIP without a permit issued in terms of Chapter 7 of NEM:BA. Such permit can only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted AIP are contained within the Alien and Invasive Species List 2020, GNR 1003 of GG No. 43726. Note: The National List of Threatened Terrestrial Ecosystems published in terms of the NEMBA in 2011 remains in legal force. The data contained in NBA 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.	
9. <u>National Environmental Management: Waste Act (Act No. 59 of 2008) ("NEMWA")</u>	No waste management listed activities will be triggered by the EM PV Solar Project therefore, no WML is required to be obtained in terms of NEMWA.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
NEMWA's purpose is to: assist in regulating waste management; ensure the protection of human health; and prevent pollution and environmental degradation through sound waste management principles and guidelines. It furthermore provides for: ■ national norms and standards for regulating waste management by all spheres of government; ■ licensing and control of waste management activities; ■ remediation of contaminated land; ■ a national waste information system; and ■ provision for compliance and enforcement. The NEMWA currently defines waste broadly, as set out below. This definition will be amended when the National Environmental Management Laws Amendment Act 2 of 2022 commences: *"(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or* *(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste—* *(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;* *(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;* *(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or* *(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste*." The NEMWA imposes a general duty upon waste holders to take reasonable measures to avoid waste generation and, where this is impossible, to: minimise the toxicity and quantities of waste generated; reuse, reduce, recycle and recover waste; and ensure that it is treated and disposed of in an environmentally sound way. Failure to do so is a criminal offence, with a maximum fine of R10 million or imprisonment of up to 10 years, or both. It is necessary to hold a WML for defined waste management activities. The DEA promulgated the 2013 WML Regulations, which provides that a waste management licence ("**WML**") is required for undertaking certain waste management	Best Practice waste management practices and measures will be implemented to manage general and hazardous waste on the EM PV Solar Project. The Waste Management Hierarchy of Controls will be applied during the different phases of the project. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926), published under Section 7(1)(c) of NEMWA, will be considered.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
activities ("**Waste Listed Activities**"). The Waste Listed Activities are separated into three categories, namely Category A, Category B and Category C. Category A and B Waste Listed Activities require a WML, for which either a basic assessment or an EIA process needs to be undertaken that complies with the 2014 EIA Regulations. The procedures for licensing Waste Listed Activities are stipulated in Chapter 5 of Waste Act and will have to be considered in the overall EIA process. Category C activities do not require a WML but must comply with *inter alia* the Norms and Standards for Storage of Waste, 2013 (published in GN 926 of GG 37088 on 29 November 2013). Such facilities need to be registered with the DEA 90 days before construction commences. Classification of certain waste streams is required in terms of the Waste Classification and Management Regulations, published in GN634 of GG 36784 on 23 August 2013, to ensure that the correct waste management standards and disposal methods are implemented. The National Norms and Standards for the Assessment of Waste for Landfill Disposal and the National Norms and Standards for the Disposal of Waste to Landfill (published under GN R635 and GN R636 respectively in GG 36784 of 23 August 2013) provide the norms and standards for disposal of waste to landfill. The National Waste Information Regulations (published in GN 625 of GG 35583 on 13 August 2012) regulate the collection of data and information to fulfil the objectives of the national waste information system, as set out in section 61 of the NEMWA, and includes reporting obligations. A registered person must keep a record of the information submitted to the SAWIS or the Department.	
10.<u>National Heritage Resources Act (Act No. 25 of 1999) ("NHRA")</u> The protection and management of South Africa's heritage resources are controlled by the NHRA. The national enforcing authority for the NHRA is the South African Heritage Resources Agency ("**SAHRA**"). In terms of the NHRA, historically important features such as graves, archaeology and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of section 38 of the NHRA, a permit is required for certain categories of development as follows: *"(1) (a): The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;* *(c): Any development or other activity which will change the character of a site -* *i. exceeding 5 000m² in extent;* *ii. involving three or more existing erven or subdivisions thereof;*	The EM PV Solar Project Area has already been fundamentally transformed by agricultural, mining and processing activities. HIAs have been conducted for the larger EM Consolidated MR Area, which covers the PV Project Area. The process envisaged by section 38(8) of the NHRA will be followed and a separate permit under section 38 of the NHRA will not be required. There are no graves or artifacts with heritage significance located within the PV Project Area, refer to the ***Section 8.14***.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
iii. involving three or more erven or divisions thereof which have been consolidated within the past 5 years; or *iv. the costs of which will exceed a sum in terms of regulations by SAHRA or a provincial heritage resource authority."* In terms of section 38(8) of the NHRA, section 38(1) approval from SAHRA is not required where an environmental impact assessment is undertaken under NEMA, including a HIA, and SAHRA's requirements are considered by the competent authority when granting the EA. Section 38(8) of the NHRA provides that: "*The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent."* Accordingly, provision is made for the assessment of heritage impacts as part of an EIA process and, if such an assessment complies with the NHRA and SAHRA's requirements and the CA considers heritage impacts when granting the EA, a separate application for consent under the NHRA is not required.	
11.<u>National Water Act (Act No. 36 of 1998 (NWA)</u> The NWA is the primary legislation controlling and managing the use of water resources and pollution thereof. It provides for fundamental reformation of legislation relating to water resource use. The NWA's preamble recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that water resources quality protection is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The NWA's purpose is stated in section 2 and enforced by the DHSWS. Section 2 of the NWA relates to the following: ■ Promoting the efficient, sustainable and beneficial use of water in the public interest; ■ Facilitating social and economic development; ■ Protecting aquatic and associated ecosystems and their biological diversity; ■ Reducing and preventing pollution and degradation of water resources; and ■ Meeting international obligations.	The EM PV Solar Project involve Water Uses. A borehole will be utilised to supply water for the construction and operational phase. A GA will likely be applicable for the proposed abstraction. Roads, pipelines and OHLs could possibly be constructed with 100m of watercourses or 500m from wetlands. If so, a GA, in terms of GNR 509 of the NWA, may be applicable for these sections 21 (c) and (i) water uses.. The proposed waste water containment facility (i.e. septic tank) will be a section 21(g) water use, for which a GA will likely be applicable. If GAs are applicable, they will need to be registered with the DHSWS. If not, WULs would be required.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
The NWA presents strategies to facilitate sound management of water resources; provides for the protection of water resources; and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. As the NWA is founded on the principle of trusteeship, the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Industry (including mines) can therefore only be entitled to use water if the use is permissible under the NWA. In terms of section 21 of the NWA, certain consumptive and non-consumptive water uses are identified and can only commence once authorised. Water use is broadly defined in the NWA and includes taking and storing water; activities which reduce stream flow; waste discharges and disposals; controlled activities; altering a watercourse; removing water found underground for certain purposes; and recreation. Consumptive water uses for the EM PV Solar Project will include taking water from a water resource (section 21(a) of NWA) and storing water (section 21(b)). Non-consumptive water uses may include impeding or diverting a watercourse's flow (section 21(c)); altering a watercourse's bed, banks, course or characteristic or impeding the flow of a watercourse (sections 21 (c) and (i)); and disposal of waste in a matter that may detrimentally impact on a watercourse (section 21(g)). Where a water use constitutes a Scheduled 1 Use (permissible use without an authorisation requirement); permissible water uses in terms of section 22 of the NWA; or is authorised in terms of a General Authorisation ("**GA"**), a WUL is not required. Various Gas have been published under the NWA, including for Sections 21I, (i),(g), and (a) water uses. In respect of Sections 21(c) and (i) water uses, activities can be conducted within 100m of a watercourse and 500m of a wetland without a WUL if the impacts to the watercourse / wetland are low. Water uses that will be conducted under a GA need to be registered with the DHSWS. In terms of Section 19 of the NWA, EP must ensure that reasonable measures are taken throughout the EM PV Solar Project's lifecycle to prevent and remedy pollution to water resources from occurring, continuing, or recurring.	
12. <u>Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)</u> The MPRDA governs mineral resources in South Africa, regulates mining and mining authorisations and has as one of its principal objectives the equitable access and the sustainable development of the South Africa's mineral resources. Section 5A of the MPRDA indicates that: "*No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and*	EM is a mining operation and is operated in compliance with the MPRDA and its mining rights and SLP. EP is the holder of a mining right over the PV Project Area. The EM PV Solar Project will however not be governed by the MPRDA. The prescribed approval under section 53 of the MPRDA will however be obtained for use of the surface of Portions 13 and 14 of Schietfontein 437 JQ.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
produce any mineral or petroleum or commence with any work incidental thereto on any area without – (a) an environmental authorisation".	
13. <u>Conservation of Agricultural Resources Act, No 43 of 1998 (CARA)</u> In terms of CARA, landowners are legally responsible for the control of weeds and AIPs. CARA makes provision for three categories of AIPs: ■ *Category 1a*: must immediately be removed and destroyed; ■ *Category 1b*: need to be immediately removed and contained; ■ *Category 2*: requires a permit to retain the species on site and it must be ensured that they do not spread. All category 2 plants in riparian zones need to be removed; and ■ *Category 3*: require a permit to retain these species. All category 3 plants in the riparian zone need to be removed. CARA also regulates the conservation of soil and states that degradation of the agricultural potential is illegal. It furthermore requires the protection of land against soil erosion and the prevention of water logging and associated salinization. Permissions / permits are required under CARA for the 'cultivation' of 'virgin soil'; cultivation and/or draining vlei(s), marshes or water sponges; and cultivation of an area within a watercourse's flood area.	EP is obligated to manage AIPs occurring on the entire EM Surface Area, including the PV Project Area. AIP Management Measures have been included in the EMPr. Permissions / permits required under CARA are not necessary for the EM PV Solar Project.

14. <u>Mine Health and Safety Act (Act No. 29 of 1996) ("MHSA")</u>
 	
The MHSA aims to provide for protection of the health and safety of all employees and other personnel at RSA mines. Its main objectives are:
 	
■ Protection of the health and safety of all persons at mines;
■ Requiring employers and employees to identify hazards and eliminate them, control and minimise the risks relating to health and safety at mines;
■ Giving effect to South Africa's public international law obligations that concern health and safety at all mines;
■ Providing for –
  ▪ employee participation in matters of health and safety through health and safety representatives and the health and safety committees at mines;
  ▪ effective monitoring of health and safety conditions at mines;
  ▪ enforcement of health and safety measures at mines;
  ▪ investigations and inquiries to improve health and safety at mines; and
■ To promote:
  ▪ a culture of health and safety in the mining industry;
  ▪ training in health and safety in the mining industry; and
	EP already complies with the MHSA and it will be applicable to the EM PV Solar Project. An application for exemption will however be submitted, as the Project will be operated by independent third parties.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
▪ cooperation and consultation on health and safety between the State, employers, employees and their representatives.	
15. <u>Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)</u> The MHSA provides that OHSA is not applicable to any matter in respect of which any provision of the MHSA is applicable. Certain regulations under OHSA, discussed below regulate matters not provided for in MHSA and would thus be relevant to mines.	If an exemption is obtained from the MHSA, OHSA will be applicable. EP will take cognisance of the requirements of the OHSA for the EM PV Solar Project.
16. <u>Hazardous Substance Act (Act No. 15 of 1973) (HSA)</u> The HSA provides for the: ■ Control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; ■ Control of certain electronic products; ■ Division of such substances or products into groups in relation to the degree of danger, with licensing requirements for certain activities undertaken in respect of Groups I and III; ■ Prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and ■ Matters connected therewith.	EP will take cognisance of the requirements of the HSA in relation to hazardous substances that will be used for the EM PV Solar Project during the construction and operational phase.
17. <u>Aviation Act (Act No. 74 of 1962) – 13th amendment of the Civil Aviation Regulations (CARS) 1997</u> Any communications structure, building or other structures, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace or interfere with the operation of navigation or surveillance systems or Instruments Landing Systems, including meteorological systems for aeronautical purposes, is considered an obstacle and motivation must be submitted to the Commissioner for Civil Aviation for evaluation (Refer SA_CAR Part 139.01.33) and providing consent for the development. The following structures require markings: ■ Any structure exceeding 45m above ground level or structures where the top of the structure exceeds 150m above the mean ground level, the mean ground level considered to be the lowest point in a 3km radius around such structure. ■ Structures lower than 45m, which are considered as a danger to aviation shall be marked as such when specified. ■ Overhead wires, cable etc. crossing a river, valley or major roads shall be marked, and in addition their supporting towers marked and lighted if an aeronautical study indicates it could constitute a hazard to aircraft.	EP must ensure that the correct marking of infrastructure >45 m above ground level is undertaken during the operational phase of the EM PV Solar Project, (refer to CAR Part 139.01.33). The South African Civil Aviation Authority ("**CAA**") will be contacted to confirm whether any obstacle approvals would be required.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
18. <u>Electronic Communications Act 36 of 2005 ("ECA")</u> Section 29 of the ECA provides that any party who constructs, equips or carries on *inter alia*, power by means of electricity must conform to the requirements of an electronic communications network service licensee for the prevention of damage to any of its electronic communications network and facilities or works by such construction. Before commencing construction such a party must give thirty days prior written notice to the licensee of its intention to commence the construction and provide the licensee with the required information. Such information includes a plan of the proposed works, showing the manner the manner and position of the works to be constructed and such further information as may be required.	EP will take cognisance of the requirements of the ECA in relation to the EM PV Solar Project if applicable.
19. <u>Electricity Regulation Act, 2006 ("ERA") and IRP, 2019</u> In terms of the exemption notice dated 5 October 2021 for electricity generation facilities that have a capacity of more than 100MW, a generation licence under section 7 (Activities requiring Licensing) of the ERA must be applied for and obtained. If the facility is 100MW or below, then it will be subject to the exemption and no generation licence will be required, although registration in terms of section 3.1 of Schedule 2 (Exemption from obligation to apply for and hold a License) of the ERA will still be required. The IRP, 2019 makes provision, for the period from 2019 - 2022, for an allocation for distributed generation to the extent of the short-term capacity and energy gap (i.e. there is not a specific, determined allocation for distributed generation). For the period from 2023 to 2030, the allocated amount for distributed generation is 500MW per year. Consequently, if the EM PV Solar Project is commissioned prior to the end of 2022 then no Ministerial deviation would be required from the IRP because the Minister has deliberately left the exact allocation open ended in cognisance of the energy shortfall in the country. For the period from 2023 to 2030, the allocated amount for distributed generation is 500MW per year. Accordingly, to the extent that the EM PV Solar Project will only be commissioned in or after 2023 and more than 500MW of distributed generation is under development / seeking licensing or registration in South Africa, then a Ministerial deviation would need to be applied for and obtained for purposes of the EM PV Solar Project.	As the EM PV Solar Project will have a capacity of less than 100MW, it would therefore be exempted from the requirements for a Generation Licence.
20. <u>Restitution of Land Rights Act 22 of 1994 ("RLRA")</u> The RLRA governs land restitution claims. Initially, the RLRA only allowed land claims to be lodged until December 1998 ("**Initial Period**"). This period was amended with the promulgation of the Restitution of Land Rights Amendment Act of 2014 and the process for the lodgement of claims was extended to 2019 ("**Extended Period**"). However, a few months thereafter, the Constitutional Court delivered a judgment, *Access Movement of South Africa and Others v Chairperson of the National Council of Provinces and Others*	EP will take cognisance of the requirements of the RLRA relation to the EM PV Solar Project. It has received information from the Regional Land Claims Commission ("**LCC**") about land claims over the PV Solar Area; and will provide notices in terms of section 11(7) of the RLRA where necessary.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
2016(5) SA 635 (CC) ("**LAMOSA**") In terms of the LAMOSA judgment, the DRDLR is interdicted from processing those claims lodged after December 1998 until those lodged prior to this date have been finalised. Under section 11(7) of the RLRA no person may sell, exchange, donate, lease, subdivide, rezone or develop a land in respect of which a land claim has been published in a GG without having given the Regional Land Claims Commissioner ("**LCC**") one month's written notice of the intention to do so.	The LCC has confirmed that land claims were lodged in respect of the farm Schietfontein 437 JQ (being the Plant Project Area) and on Portion 37 of the Farm Elandsfontein in the Extended Period. The confirmation provides that section 11(7) of the RLRA does not apply unless the LCC has accepted the claim for investigation and published it in the GG This is currently not possible in respect of claims in the Extended Period. A land claim was lodged in the Initial Period over the Remainder of Portion 32 of the Farm Elandsfontein by the Bakgatla Ba Rampakong, the resolution of which is still pending. The preferred OHL Route is over this property.
21. National Road Traffic Act (Act No 93 of 1996) ("NRTA") The technical recommendations for highways (TRH 11): "*Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads*" set out the conditions and rules which apply to the transportation of abnormal vehicles and loads on public roads and procedures in applying for exemption permits.	An abnormal load/vehicle permit may be required to transport the various components to site for the construction phase. EP takes note of the requirements of the NRTA and will comply with them where relevant.
22 National Veld and Forest Fire Act, 101 of 1998 ("NVFFA") Chapter 4 of the NVFFA (Veldfire Protection through Firebreaks) provides that owners must prepare and maintain firebreaks. This chapter sets out the procedure in this regard and the role of neighbouring landowners and the fire protection association. Landowners must ensure that: (i) firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring property, (ii) that it does not cause soil erosion; and (iii) it is reasonably free of inflammable material capable of carrying a veldfire across it. Chapter 5 (Fire Fighting) places a duty on all owners to acquire equipment and have available personnel to fight fires.	The NVFFA has no permitting or licensing requirements. However, EP will take cognisance of the requirements of the NVFFA relation to the EM PV Solar Project.
23.National Forests Act, No 84 of 1998 ("NFA") In terms of section 15(3) of the NFA, the Minister published a list of protected tree species (GN 536 of 7 September 201, GG 41887). The effect thereof is that no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated.	A permit would need to be obtained for any protected trees that are affected by the EM PV Solar Project. A biodiversity assessment and a walk-through survey have been conducted for the EIA to assess the need for such permits.
24.Environmental Impact Assessment Guideline for Renewable Projects (GN 989 of 16 October 2015)	The guideline was considered in the preparation of the DEIAR.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
The purpose of this document is primarily to provide guidance on the environmental management legal framework applicable to renewable energy operations and all the role players in the sector (DEA, 2015). The guideline is principally intended for use by the following stakeholder groups (DEA, 2015): ■ Public Sector Authorities (as regulator and/or CA); ■ Joint public sector authorities and project funders, e.g., Eskom, IDC, etc; ■ Private Sector Entities (as project funder/developer/consultant); and ■ Other I&APs (as determined by the project location and/or scope). The guideline seeks to identify activities requiring authorisation prior to commencement of that activity; and provide an interface between national EIA regulations and other legislative requirements of various authorities (DEA, 2015).	
25. International Instruments and Commitments International instruments considered as part of the application process include: ■ The UNFCC Kyoto and Paris Agreements ■ Equator Principles of Financial Institutions ■ Sustainable Development Goals	Where necessary, EP will take cognisance of these international instruments and commitments in relation to the EM PV Solar Project.
26. Land Use Legislation Spatial Planning and Land Use Management Act 16 of 2013; Subdivision of Agricultural Land Act 70 of 1970'; Madibeng Local Municipality: Madibeng Spatial Planning and Land Use Management Bylaws, 2016; Advertising on Roads and Ribbon Development Act 21 of 1940 ("**ARRD**"); and provincial road legislation will be applicable to the EM PV Solar Project. This legislation requires approval from local municipalities for use of land for certain specified purposes. Approval is required from Department of Agriculture, Land Reform and Rural Development ("**DALRRD**") for the subdivision of agricultural land.	EP intends to subdivide Portions 13 and 14 of the Farm Schietfontein 37 JQ, with the PV Project Area being becoming a new, consolidated property. DALRRD approval will be obtained for the subdivision and MLM's consent for the use of the PV Project Area for renewable energy purposes. Any consent required for the new access road to adjoin the R566 (Brits - Rosslyn) provincial road under AARD and provincial legislation will also be obtained.
27. Other Legislation and Policy Other policies, legislation and associated regulations (where applicable) considered as part of the application process include: ■ National Development Plan ("**NDP**") 2030. ■ Spatial Development Framework ("**SDF**"), 2016: North West Province, as amended. ■ BPDM Integrated Development Plan ("**IDP**"), 2012 and 2019/20 reviewed IDP. ■ MLM IDP, 2017-2018. ■ Madibeng Environmental Management Framework, 2009. ■ Water Services Act 108 of 1997. ■ Transvaal Nature Conservation Ordinance, 12 of 1983.	EP takes note of the requirements of the mentioned documents and will comply with them where relevant.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
■ DFEE Consultation Guidelines. ■ Traditional and Khoi-San Leadership Act, No. 3 of 2019. ■ Municipal Systems Act, No 32 of 2000. ■ Regulations of Gatherings Act, No. 205 of 1993. ■ Protection of Personal Information Act, No. 4 of 2013.	
28. Provincial and Municipal Bylaws The MLM and BPDM have developed local bylaws and various policies relating to waste disposal, water, economic development, air quality etc. The following provincial and Municipal Bylaws are applicable to EM: ■ Madibeng Local Municipality: Air Quality Management By-Laws, 2013, as amended; ■ Madibeng Local Municipality: Waste Management By-Laws, 2008, as amended; ■ Madibeng Local Municipality: Storm water management By-laws, 2013, as amended; and ■ Madibeng Local Municipality: Water & Sanitation By-Laws, 201, as amended.	EP will ensure that MLM's policies and bylaws are adhered to during the commencement and operation of the EM PV Solar Project and its operations in general. Any consent required will be obtained before the construction phase. This includes potential requirements relating to the drilling and operation of a borehole on the PV Project Area; and the possible use of water and sewage services providers other than MLM.
29. Standards and Guidelines In addition to the abovementioned Acts and their associated Regulations, the following guidelines and standards have been taken cognisance of during the application process: ■ SANS 10103 of 2008. ■ SANS 10210 of 2004. ■ NEMA Implementation Guidelines: Sector Guidelines for Environmental Impact Assessment Regulation (published under GN 654 in GG 3333 of 29 June 2010). ■ DEA (2011): A user friendly guide to the National Environmental Management: Waste Act, 2008. South Africa, Pretoria. ■ Department of Environmental Affairs and Tourism (2004): Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11. ■ Guideline for Implementation: Public Participation in the EIA Process (published in under GN 807 in GG 35769 of 10 October 2012). ■ Publication of Public Participation Guideline (GN 807 of 10 October 2012 GG No. 35769)	EP will ensure that such standards and guidelines, as far as possible, are adhered to during the EM PV Solar Project.
30. Eland Platinum Safety Health and Environmental Policy (SHE) A copy of EP's SHE Policy can be found under ***Appendix 5***.	EP will ensure that its SHE Policy is adhered to during the EM PV Solar Project construction and operational phase.

6. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

The EM PV Solar Project's need and desirability has been identified as the following:

a) Solar resource

The viability of a solar PV renewable project is dependent on the solar irradiation values of the area where it is located. The Global Horizontal Irradiation for the PV Project Area is between 1972 and 2118 kWh/m^2/annum, which is favourable for solar projects.

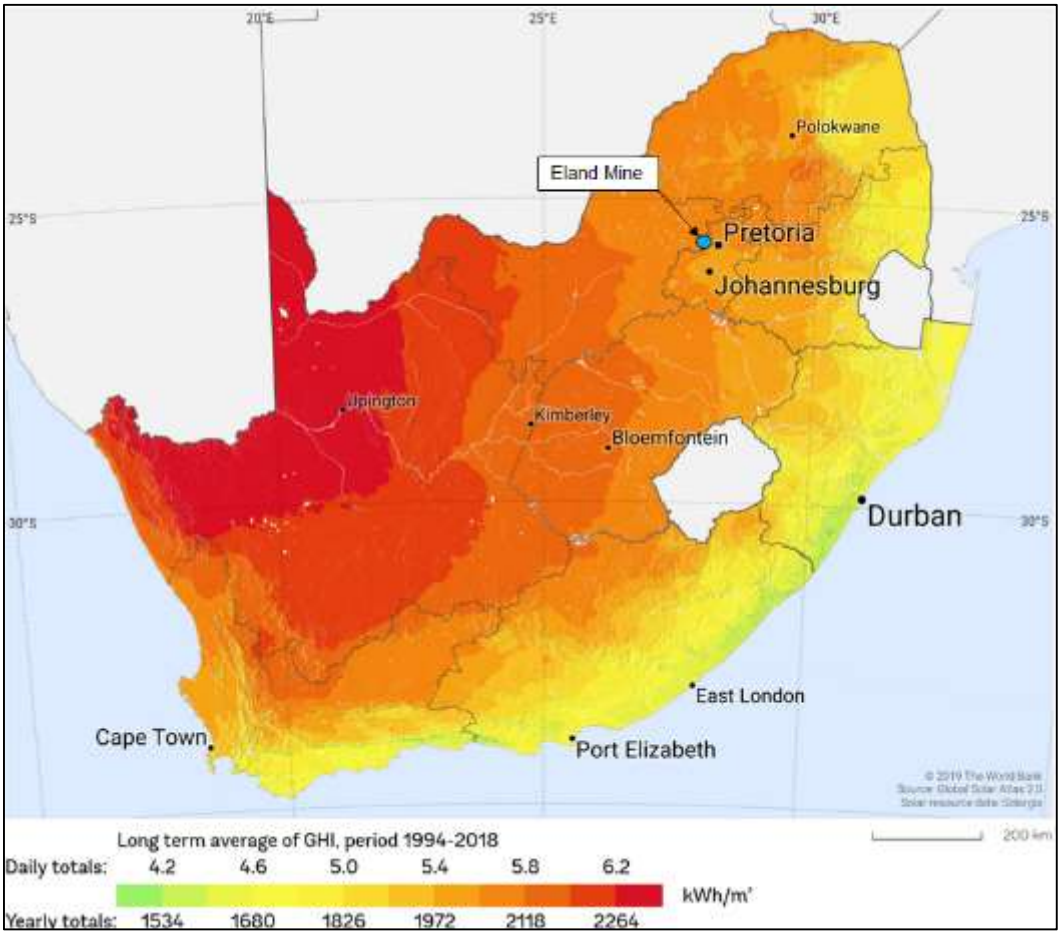


Figure 8: South African Global Horizontal Irradiation (GHI) Map for South Africa and the Eland Mine (Global Solar Atlas 2.0).

b) Landscape and Topography

The PV Project Area's topography is relatively flat, with a slope of 0-3%. The topography is ideal for construction and civil activities. The PV Project Area will be mainly located on

previous agricultural crop fields and a section located on undisturbed vegetation area, with the OHL Routes also traversing areas disturbed by mining activities.

c) Access to Facility and Existing Land-use

The EM PV Solar Project will be located within the existing EM Surface Area, that has already been impacted by anthropogenic activities, such as mining and agricultural. The site infrastructure has to a large extent been established over the entire EM Surface Area. The EM is accessed through the R566 Provincial Road or alternatively the existing tarred and dirt roads on the EM Surface Area.

The existing De Wildt Solar Project is located directly east of the EM Surface Area and the EM PV Solar Project will therefore fit in with the surrounding land-uses. The EM PV Solar Project will utilise a large section of land previously disturbed by crop production and grazing within the boundary of the EM Surface Area.

d) Job Creation

The EM PV Solar Project will create temporary (construction phase) and a limited number of permanent (operational phase) job opportunities. Both skilled and unskilled temporary employment opportunities would be created through the Project. This will have a beneficial impact on the local economy through salaries and local spending.

e) *Capital Investment*

Northam intends to make a capital investment of R120 million in sustainable infrastructure and technology for EM and the local economy. This will result in likely small business opportunities and procurement opportunities for local contractors and suppliers.

f) Promotion of sustainable development

It is likely that the EM PV Solar Project will reduce the Scope 2 GHG emissions generated by the EM. This is in line with Northam‘s renewable energy strategy to reduce GHG emissions and supports the international and South African Government commitments to the Paris Climate Accord. The reduction of GHG emissions will also have environmental benefits for the local and provincial environmental health.

g) Climate Change and GHG Emission Reduction

There is a proliferation of policies, legislation and associated regulations aimed at or which include reference to the just transition to a low carbon economy and the various energy issues currently affecting South Africa.

The SDF, 2016: North West Province sets out that one of its spatial development values is the optimum use of renewable energy potential and that several strategic requirements need to be addressed in order to meet the vision for the NWP, including the creation of opportunities for renewable energy development. This is in line with the broader country strategy, as underpinned by the NDP 2030 that sets out on various occasions the importance of renewable energy resources in South Africa's future plans, and the NCCAS, 2020 which supports the South Africa's ability to meeting its obligations in terms of the Paris Agreement. In September 2021, South Africa updated its NDC. The updated NDC contains South Africa's first Adaptation Communication, detailing the country's adaptation goals to be implemented via the NCCAS, and updated mitigation targets for 2025 and 2030. This updated NDC provides that: *"Implementing the NDC will require the implementation of South Africa's Integrated Resource Plan (most recently finalised in 2019), which contemplates a massive investment in renewable energy over the next decade."*

Accordingly, it is clear that the development of a renewable energy facility such as the EM PV Solar Project is in line with the policies, legislation and associated regulations in South Africa related to climate change, spatial planning and energy.

h) Ensuring the continued economic viability of Eland Mine

South Africa's industry and residents are consistently impacted by load reduction and high energy costs. The Proposed Project will likely reduce economic losses sustained by EP from load reductions / operational downtime; ensure its continued economic viability; and increase EM's competitiveness, by reducing its reliance on Eskom Holding SOC Ltd ("**Eskom**") supply and energy costs, whilst promoting sustainable self-energy generation and demand management.

6.1 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE.

As mentioned previously, the EM PV Solar Project will be located within the existing EM Surface Area. The **site selection** was done primarily on the location of the EM and site infrastructure. The following factors were considered in the final site selection:

- Location of existing disturbed footprints;
- Mining and associated activities (i.e. blasting and dust)

- Existing and future infrastructure and servitudes e.g., future plant upgrades, mining etc.;
- Position and distance of the EM PV Solar Project in relation to other operational infrastructure;
- Area and footprint available for proposed activities;
- Environmental (terrestrial, fauna and flora) and social constraints;
- General topography;
- Geology of the site;
- Surface geotechnical conditions in the footprint zone;
- Geohydrological features and optimal resource locations;
- Watercourse locations;
- Land use;
- Heritage and archaeological sites;
- Security and safety concerns;
- Land ownership; and
- Proximity to settlements.

6.2 ALTERNATIVES

Alternatives considered for the EM PV Solar Project comprised of the following:

6.2.1 Technology Alternatives

Different technology alternatives were investigated for energy generation by means of solar radiation. Solar PV was determined as the most suitable option, considering the climatic conditions, topography and location of the EM. Northam identified several other Solar PV technology alternatives, namely:

- Bifacial PV Panels;
- Monofacial PV Panels;
- Fixed mounted PV Systems (Static/fixed-tilt panels);
- Single axis tracking or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and
- Monocrystalline modules, polycrystalline modules or thin film modules.

Monofacial and bifacial panels were considered for the EM PV Solar Project.

6.2.2 Energy Source Alternatives

As part of the initial feasibility of the EM PV Solar Project, different renewable and/or energy sources were investigated. The sources included Hydrogen Fuel Cell ("**HFC**"), wind, solar and combustible fuel burning. The wind and combustible fuel burning sources were found to not feasible based on the lack of adequate wind levels; the high emission levels associated with burning of fuels; and the sustainability of fuel sources in the long term. The HFC Process was found not to be economic feasible given the high capital and operation cost of the process.

6.2.3 Site Alternatives

As part of the feasibility assessment of the EM PV Solar Project, several site alternatives within the EM Surface Area were considered, Refer to ***Figure 9***. The alternative locations were rejected during the Scoping Phase based on the location of sensitive features, security and vandalism risks, existing mining and operational infrastructure and site constraints (i.e. dust, blasting and active mine areas) that would influence the efficiency of the Project.

6.2.4 Route Alternatives for Infrastructure

Route Alternatives for the 11 kV and 33 kV transmission lines and transmission towers were considered as part of the EIA Phase (Refer to ***Figure 9***). The route alternatives included a northern (option 1) and southern route (option 2). Other route alternatives that were investigated during the pre-feasibility phases included access and service road alternatives based on the site alternatives.

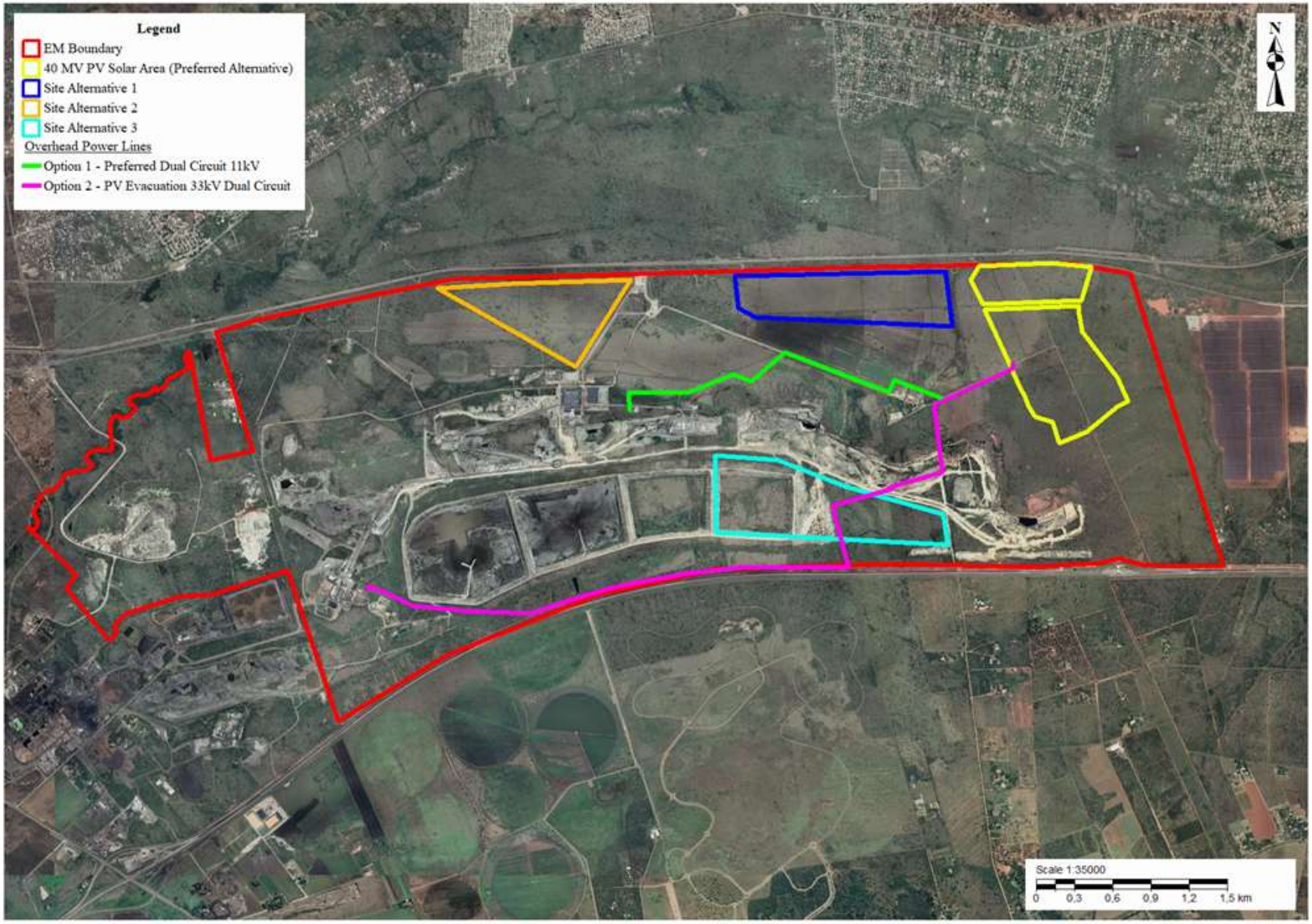


Figure 9: Map indicating the Preferred Alternatives and the Location Alternatives.

6.3 DETAILS OF ALL ALTERNATIVES CONSIDERED.

6.3.1 Alternative 1 (proposed, preferred Alternative)

The EM PV Solar Project has been identified with the goal of optimising existing infrastructure; upscaling production and processing capacities and efficiency; reducing operational cost; improving sustainability of operational practices; and optimising resource utilisation.

The **preferred alternative** was based on the following:

- The proposed activities will be located within the established EM Surface Area, where majority of the necessary services (i.e., roads, etc.) have already been developed.
- A large section of the Plant Project Area was previously disturbed by agricultural activities; and sections have been disturbed by internal roads. The OHL Routes have been disturbed in sections by both agricultural and mining activities;
- Lowest security and vandalism risks;
- Distance of existing mining operations and activities (i.e. blasting, dust etc.);
- Economic benefits due to resource optimisation and increase competitiveness.
- Reduce the Scope 2 GHG Emissions.
- Enable EP to implement electricity demand and supply management.

The preferred alternative will be situated on the following properties, refer to:

Table 7: List of the Alternative 1 (preferred alternative) activities and the applicable property description.

Table 7: List of the Alternative 1 (preferred alternative) activities and the applicable property description.

Facility	Activity Description	Property Description
40MW PV Plant	- 40MW Solar Panels. - Substation to facilitate the connection between the Solar PV Plant and mine electrical distribution system as needed. - Telecommunications mast. - On-site facility substation to facilitate the connection between the PV Plant and mine electrical distribution system as needed. - Borehole to supply construction and operational water supply. - O&M buildings. - New access road. - Internal roads. - Perimeter fencing.	Schietfontein 437 JQ Remaining Extent of Portion 13 (a portion of Portion 2); and Portion 14 (a portion of Portion 2).

Facility	Activity Description	Property Description
	- Access control gate. - Security guard hut. - Temporary offices. - Construction yard. - Temporary laydown area. - Sewage facilities.	
Transmission line and transmission towers	Up to 33 kV transmission lines and transmission towers	Elandsfontein 440 JQ: Remaining Extent of Portion 58 (a portion of Portion 19); Remaining Extent of Portion 63 (a portion of Portion 58); Remaining Extent of Portion 59 (a portion of Portion 58); Remaining Extent of Portion 32 (a portion of Portion 18); and Portion 39 (a portion of Portion 17)

6.3.2 Alternatives (various)

Alternatives for the EM PV Solar Project included technology, layout and site alternatives. Refer to ***Table 8***.

Table 8: Detail of the Alternatives (Alternative) activities that were considered.

Preferred Activities	Alternatives
Solar PV Plant	Three Alternative site locations, namely: - Alternative 2: Portion 61 (a portion of Portion 32) and Remaining Extent of Portion 59 (a portion of Portion 58) of the Farm Elandsfontein 440JQ - Alternative 3: Remaining Extent of Portion 15 and Remaining Extents of Portion 59 and 58 (a portion of Portion 58) of the Farm Elandsfontein 440JQ. - Alternative 4: Portion 30 (a portion of Portion 17) and Remaining Extent of Portion 32 (a portion of Portion 18) of the Farm Elandsfontein 440JQ; Portion 197 (a portion of Portion 4), Portion 97 (a portion of Portion 4); Remaining Extent of Portion 58; and Portions 86, 87 and 228 (a portion of Portion 58) of the Farm Zilkaatsnek 439 JQ.
	Alternative layout of the PV Panels and Operational and Maintenance Building.
	Alternative PV Technology, namely - Fixed mounted PV Systems (Static/fixed-tilt panels);

	- Single axis tracking or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and - Monocrystalline modules, polycrystalline modules or thin film modules.
	Alternative route for the OHL and transmission towers
Possible 5 MW PV HFC	Portion 37 (a portion of Portion 16) of the Farm Elandsfontein 440JQ.

6.3.3 No Go Alternative

The no-go option entails that none of the EM PV Solar Project's activities are undertaken. The No Go Alternative is considered and described below in ***Table 9***:

Table 9: No Go Alternative option and the preliminary risks identified for each activity.

No Go Alternative	Risks
Solar PV Plant	**Negative:** - No gain in economic value. - Increased long term Scope 2 GHG Emissions. - No additional employment and procurement opportunities. - EM impacted by national load reduction and curtailment, which will have a negative economic impact. - Long-term sustainability of the EM will be impacted negatively. - Long-term energy cost for the EM. - Reduced competitiveness of Northam in the industry. **Positive:** - No vegetation clearance. - No water usage for construction of the Plant and PV panel washing. - No soil disturbance and compaction. - Limited levels of possible pollution of the surface and groundwater. - Retain agricultural land. - Limited biodiversity disturbance (as area will continue to be used for agricultural processes).

7. DETAILS OF THE PUBLIC PARTICIPATION PROCESS (PPP) FOLLOWED

The Stakeholder Engagement Process that was undertaken during the project announcement and Scoping phase and now part of the EIA phase will be undertaken in terms of Regulations 40 and 41 of the 2014 EIA Regulations.

The following tasks were and will be performed during the PPP to inform stakeholders and I&APs. Evidence of PPP that had been conducted up to date has been appended under ***Appendix 6 – I&AP Consultation Report***:

7.1 SCOPING PHASE

- Newspaper advertisements were placed in the 'Britspos' and 'Rustenburg Herald' local newspapers on 11 February 2022;
- A2 Site notices were erected at the following locations:
  - Site Entrance of the EM and MM;
  - MLM Local Library;
  - Mmakau Police Station Notice Board;
  - Mothotlung Municipal Services Building;
  - Damonsville Community Library;
  - Easy-build Hardware Centre in DeWildt;
  - Oukasie Community Hall;
  - Moumong Store in Mmakau;
  - De Wild Helpmekaar Offices;
- Public notices / flyers and letters were distributed to the following stakeholders and I&APs:
  - Government Departments (i.e., NWDEDECT; DHSWS; DFFE; DMRE; MLM; and BDPM), and DALRRD;
  - Eskom;
  - Ward No. 21 Councillor in the MLM;
  - Surrounding Ward Councillors (Wards 13, 17, 18, 19, 20, 21 and 35 of the MLM);
  - Bakgatla-Ba-Mmakau Tribal Council;
  - Landowner and neighbouring farms surrounding the EM Surface Area;
  - Villages, Townships and Small Dorpies (VTSD) Forum;
  - LCC;
  - EP employees and contractors;

- Surrounding Mines; and
- Community Members.

- A public meeting was held on the 1 March 2022 at the Madibeng Townhall in Brits.
- A stakeholder forum meeting was held with the Ward No. 21 Councillor of MLM on 14 February 2022.
- The I&APs were informed of the availability of the DSR for comment; where/how these reports can be accessed and the commenting timeframes; and how comments can be submitted to the EAP. The DSR was made available for comment at following locations for 30 days from 4 February to 7 March 2022:
  - EM Security Office;
  - MLM Library in Brits;
  - Moumong Store in Mmakau;
  - The Community Library (at the Community Hall) Damonsville;
  - The Community Hall in Mothotlung;
  - The Community Hall in Oukasie;
  - De Wildt Helpmekaar Organisation; and
  - Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices.
- Correspondence was provided in electronic format.
- The I&APs were informed of EP's intention to submit the FSR via electronic correspondence.

All comments received from the I&APs during the project announcement phase were incorporated into the FSR together with a preliminary response from the EAP. As part of the project announcement phase and DSR review period, the following concerns and issues raised by I&APs and stakeholders can be summed-up to the following points:

- Noise impact associated with mining activities;
- Possible job and business opportunities; and
- Socio-economic impact of the Proposed Project on the surrounding community and businesses.

The concerns raised by I&APs were investigated via Specialist investigation and impact assessments. Further inputs via workshops and additional consultation with I&APs will be undertaken during the EIA Phase's PPP.

7.2 EIA PHASE

Proof of the PPP that was and will be undertaken during the Impact Assessment Phase is appended under ***Appendix 6***. Tasks to be performed to inform the registered I&APs of the availability of the documents for comment in the EIA Phase will be as follows:

- All registered I&APs will be informed of the availability of the reports for comment by means of notices sent via a notice in the form of registered letters, e-mails, facsimile and SMS;
- The DEIAR will be made available to the public for a 30-day commenting period at the following locations:
  - EM Security Office;
  - MLM Library in Brits;
  - Moumong Store in Mmakau;
  - The Community Library (at the Community Hall) Damonsville;
  - The Community Hall in Mothotlung;
  - The Community Hall in Oukasie;
  - De Wildt Helpmekaar Organisation;
  - Mmakau Police Station next to the Bakgatla-Ba-Mmakau Tribal Council offices;
- A stakeholder meeting will be held with relevant stakeholders upon request; and
- The I&APS will be notified of EP's intent to submit the final reports.

7.3 SUMMARY OF ISSUES RAISED BY I&AP'S

Table 10: Table summarising comments and issues raised, and reaction to those responses

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
Affected Parties					
Landowners					
Eland Platinum Mines (Pty) Ltd				*The EP is the lawful occupier of the land.*	*Section 7 and Appendix 6*
Lawful occupier/s of the land					
EP is the lawful occupier of the land.					*Section 7 and Appendix 6*
Landowners or lawful occupiers on adjacent properties					
Salene Mining (Pty) Ltd	*X*		*No comments received.*	*Were notified via either registered mail, and/or electronic correspondence during the project announcement process.* *Will be notified during the EIA Phase.*	*Section 7 and Appendix 6*
Kleinsmit Familie Trust					
M C Botha					
Barplats Mines (Pty) Ltd					
Madibeng Local Municipality					
Jo-Fana Roses CC					
National Housing Board					
Suid - Afrikaanse Ontwikkelings Trust					
Republic of South Africa Government					
GOSA					
Hernic Ferrochrome (Pty) Ltd					
Zilkaats Wildlife Estate					
Zolograph Investments (RF) (Pty) Ltd					
Bakwena N1 and N4 Toll Concession					
National Housing Board					
South African National Roads Agency SOC Ltd					
Municipal councillor					
Ward 21 – Eland Platinum situated in the Ward *Mr George Mokonoto*	*X*			*Was notified via electronic correspondence during the project announcement process.*	*Section 7 and Appendix 6*

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
				A one-on-one meeting was held on the 14th of February 2022 at the Mothotlung Community Building.	
Ward 13 – Surrounding Ward Cllr	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.* *Will be notified during the EIA Phase.*	
Ward 17 – Surrounding Ward Cllr					
Ward 18 – Surrounding Ward Cllr					
Ward 19 – Surrounding Ward Cllr					
Ward 20 – Surrounding Ward Cllr					
Ward 35 – Surrounding Ward Cllr					
Ward 31 – Surrounding Ward Cllr in Tshwane Metropolitan Municipality					
Municipality					
Bojanala Platinum District Municipality;	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.* *A copy of the DSR was provided to the BPDM and MLM.* *A copy of the DEIAR will be provided for comments.*	*Section 7 and Appendix 6*
Madibeng Local Municipality;					
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS etc.					
NWDEDECT	*X*			*Were notified via electronic correspondence during the project announcement process.* *A copy of the DSR was provided to the DWS, DMRE and NWDEDECT for comments.* *A copy of the DEIAR will be provided comments.*	*Section 7 and Appendix 6*
DHSWS		*8 February 2022*	*Letter received from Ms. Cornia Theunissen* *This office acknowledges the receipt of your documents regards to the above-mentioned on 8 February 2022 Task T50/2022). The officer responsible for this area is: Mr Herbert Kutama and can be contacted at 087 943 3741.* *Comments would be forwarded in due time.* *Thank you* *Ms C THEUNISSEN* *CHIEF ADMIN CLERK*		
DMRE			*No comments received.*		
SAHRA	*X*		*No comments received.*	*Was notified via electronic correspondence during the project announcement process.* *A copy of the DSR was uploaded on the SAHRIS System for comments.*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
				A copy of the DEIAR will be provided comments.	
Eskom	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.* *Will be notified during the EIA Phase.*	
*South African Weather Services ("**SAWS**")*					
South African National Defence Force					
Transnet					
Communities					
Damonsville Community	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process. Site notices were placed at the following places in the community:* - *Mmakau Police Station Notice Board;* - *Mothotlung Municipal Services Building;* - *Damonsville Community Library;* - *Easy-build Hardware Centre in DeWildt;* - *Oukasie Community Hall;* - *Moumong Store in Mmakau;* - *De Wild Helpmekaar Offices.*	*Section 7 and Appendix 6*
Mothotlung Community					
Moumong Community					
Mmakau Community					
De Wildt Community					
Traditional Leaders / Land Claimants					
Bakgatla-Ba-Mmakau Tribal Council	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.* *Will be notified during the EIA Phase.*	*Section 7 and Appendix 6*
Land Claimants for Portion 61 and Remainder of Portion 32					
Bakgatla ba Moiletswane					
Bakgatla Ba Rampakong					
Dept. Forestry , Fisheries and Environmental					
Director: Environmental Authorisations	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.* *A copy of the DSR was provided to the DFFE for comments.* *A copy of the DEIAR will be provided for comments.*	*Section 7 and Appendix 6*
Other Competent Authorities					
Department of Public Works Road and Transport	*X*		*No comments received.*	*Was notified via electronic correspondence during the project announcement process.* *A copy of the DSR was provided to the DALRRD for comments. A copy of the DEIAR will be provided comments.*	*Section 7 and Appendix 6*
DALRRD					
Department of Local Government and Traditional Affairs					
LCC		*3 February 2022*	*Letter received from the Office of the Regional Land Claims Commissioner:*	*Was notified via electronic correspondence during the project announcement process.*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
			North West, regarding a land claim enquiry – Portion 83 (Portions of 58) of the Farm Zilkaatsnek 439JQ. *We refer to your letter dated 25 January 2022.* *We confirm that there is an existing land claim against the property above; however, the claim was dismissed on the basis that it does not meet the requirements of Section 102 of the Restitution of Land Rights Act No 22 of 1994.* *Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:* *1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and* *2. Some claimants provided the geographic descriptions of the land they claim without mentioning the particular property description they claim dispossession of rights in land against.* *The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.* *If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.*	*Letter sent by Webber Wentzel Attorneys (Legal Counsel for EP) dated 25 January 2022.* *We act for Eland Platinum (Pty) Ltd. Kindly advise whether there are any land claims over the following properties:* *- Portion 37 (a portion of Portion 16) of Elandsfontein 440 JQ;* *- Portion 83 (a portion of Portion 58) of Zilkaatsnek 439 JQ; and* *- Portions 13 and 14 of Schietfontein 437 JQ.* *We look forward to hearing from you.* *Jaqui Pinto* *Senior Associate*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
			Yours faithfully. *Mr. LJ Bogatsu* *Chief Director*		
			<u>Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – Portion 13 and 14 of the Farm Schietfontein 437 JQ</u> *We refer to your letter dated 25 January 2022.* *We confirm that there is an existing land claim against the farm Schietfontein. The claim was lodged under Madibeng Local Municipality within Bojanala District. The information reflects on the database of claims between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act of 2014.* *Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:* *1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and* *2. Some claimants provided the geographic descriptions of the land they claim without mentioning the particular property description they claim dispossession of rights in land against.* *The Constitutional Court ordered that the claims that were lodged between 1 July 2014 and 27 July 2016 are validly lodged, but it interdicted the Commission from processing those claims until the*		

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
			Commission has finalised the claims lodged by 31 December 1998 or until Parliament passes a new law providing for the re-opening of lodgement of land claims. Parliament was given until 27 July 2018 to pass such a law. *The commission will therefore not be processing the above claims until it finishes claims lodged by 31 December 1998 or until Parliament passes a new law providing for the re-opening of lodgement of land claims.* *It is important to note that provisions of Section 11(7) of the Restitution of Land Rights Act, 1994 do not apply until after the Commission has accepted the claim for investigation and published its details in the Government Gazette. That will only be done once either event in the previous paragraphs has been finalised.* *The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.* *If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.* *Yours faithfully.* *Mr. LJ Bogatsu* *Chief Director*		
			Letter received from the Office of the Regional Land Claims Commissioner: North West, regarding a land claim enquiry – Portion 37 (a portion of Portion 16) of the Farm Elandsfontein 440JQ.		

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
			We refer to your letter dated 25 January 2022. *We confirm that there is an existing land claim against the farm Elandsfontein. The claim was lodged under Madibeng Local Municipality within Bojanala District. The information reflects on the database of claims between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act of 2014.* *Whilst the Commission takes reasonable care to ensure the accuracy of the information it provides, there are various factors that are beyond the Commission's control, particularly relating to claims that have been lodged but not yet gazetted such as:* *1. Some claimants referred to properties they claim dispossession of rights in land against using historical property descriptions which may not match the current property description; and* *2. Some claimants provided the geographic descriptions of the land they claim without mentioning the particular property description they claim dispossession of rights in land against.* *The Constitutional Court ordered that the claims that were lodged between 1 July 2014 and 27 July 2016 are validly lodged, but it interdicted the Commission from processing those claims until the Commission has finalised the claims lodged by 31 December 1998 or until Parliament passes a new law providing for the re-opening of lodgement of land claims. Parliament was given until 27 July 2018 to pass such a law.* *The commission will therefore not be processing the above claims until it finishes claims lodged by 31 December*		

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
			1998 or until Parliament passes a new law providing for the re-opening of lodgement of land claims. *It is important to note that provisions of Section 11(7) of the Restitution of Land Rights Act, 1994 do not apply until after the Commission has accepted the claim for investigation and published its details in the Government Gazette. That will only be done once either event in the previous paragraphs has been finalised.* *The commission therefore does not accept any liability whatsoever if through the process of further investigation of claims it is found that there is in fact a land claim in respect of the above property.* *If you are aware of any change in the description of the above property after 19 June 1913 kindly supply us with such description, to enable us to do further search.* *Yours faithfully.* *Mr. LJ Bogatsu* *Chief Director*		
Other Affected Parties					
Agri North West	X		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.* *Will be notified during the EIA Phase.*	*Section 7 and Appendix 6*
Madibeng Business Support Centre					
VTSD Forum					
Interested Parties					
Culverwell Group of Companies	X		*No comments received.*	*Was notified via electronic correspondence during the project announcement process.*	*Section 7 and Appendix 6*
De Wildt Farmers	X	*7 March 2022*	*Email received from Mrs. Elbie Louw (owner of Plot 100 Zilkaatsnek, Farm Road No. 23)* *Hi Suzette*	*Email sent on 7 March 2022 by JEMS* *Good day Mrs. Louw,* *Please note that any community complaints must please be send directly to the Eland Mine at the*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
			We have sound clips of the current noise pollution that occurs late hours of the evening. Who do I send it to? *Kind Regards,* *Elbie Louw*	*following email address: Envirocommunication-EL@norplats.co.za* *Thank you.* *Regards/Groete* *Stephan Barkhuizen*	
		15 February 2022	*<u>Email received from Mr Kemp (Landowner to the south of the EM)</u>* *Hi Stephan,* *Hope you are well.* *Please could you send me an electronic copy of the DSR.* *Thanks,* *James*	*<u>Email sent on 15 February 2022 by JEMS</u>* *Good day James,* *Thank you for your correspondence.* *Please note your comments are noted and hereby acknowledged.* *See attached the Draft Scoping Report as per your request. Can you please indicate the annexures that we must also send to you as they will have to be sent in separate emails due to email size constraints?* *Don't hesitate to contact us should you have any further comments or queries.* *Regards/Groete* *Stephan Barkhuizen*	
		5 February 2022	*<u>Email received from Mrs Jenny Ruddeck (Landowner to the south of the EM)</u>* *Hi Stephan.* *Verduidelik asb vir my in eenvoudige terme wat hierdie behels. Hoe raak dit my ouers.* *Baie dankie.* *Jenny Ruddeck*	*<u>Email sent by JEMS on 5 February 2022</u>* *Hi Jenny,* *Die myn beplan om twee son elektrisiteit fasiliteite te bou op die myn se grond.* - *Die een fasiliteit is 98 hektaar groot en gaan 40 Mega Watt elektrisiteit genereer.* - *Die ander fasiliteit is 18 hektaar groot en gaan 5 Mega Watt elektrisiteit genereer en gaan met 'n Waterstof Sel Energie Toestel gekoppel word, wat 5 Mega Watt elektrisiteit opwek.* *Die elektrisiteit is hoofsaaklik vir gebruik op die myn, waarvan oortollige elektrisiteit terug in die Nasionale Stelsel (ESKOM) geplaas gaan word.* *Ek glo nie dit gaan jou ouers direk affekteer nie, omdat al die fasiliteite binne die myn se grond gaan plaas vind.*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
				Maar daar is gewoonlik ekstra geraas en stof wat gegenereer word tydens konstruksie. *As jy voel dit is dalk nog steeds bietjie Frans, kan ek jou dalk kom sien vir 'n kort verduideliking volgende week?* *Ek hoor graag van jou.* *Regards/Groete* *Stephan Barkhuizen*	
DeWildt Helpmekaar Organisation	*X*	*7 March 2022*	*<u>Email received from DeWildt Helpmekaar Organisation</u>* *Good morning Stephan,* *We have only one comment to register regarding noise after hours and late at night. At times there is a lot of noise coming from the mine up to past midnight. We request that activities closest to the N4 be limited to daytime activities up to no later than 18:00. Noise levels measured by residents at their house south of the N4 after 21:00 at night is at times as much as 65 decibels. This is not acceptable and we request that the residents on the south of the N4 be respected and provided the opportunity to have a normal life after hours.* *Regards Suzette*	*<u>Email sent on 7 March 2022 by JEMS</u>* *Good day Suzette,* *We hereby acknowledge and take note of your comments and concerns.* *Please take note that the application in question doesn't comprise of mining activities although it is located within the Eland Mines' boundary. The potential impact of noise levels associated with the construction and operation of the Proposed PV Solar Project will be further assessed and addressed in the Environmental Impact Assessment (EIA) Phase of the project.* *The concerns of residents regarding noise levels from mining related activities is noted. We have directed the concerns and requests to the Eland Mine for formal response and feedback regarding the mining activities taking place closes to the N4.* *Any complaints or concerns of residents, landowners, stakeholders or organisations in terms of mining activities must please be send directly to the Eland Mine at the following Email address:* *Envirocommunication-EL@norplats.co.za* *Don't hesitate to contact us should you have any further comments or questions.* *Regards/Groete* *Stephan Barkhuizen*	
Conservation Areas and NGOs *MTN* *Vodacom*	*X*		*No comments received.*	*Were notified via electronic correspondence during the project announcement process.*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
Cell C *Neotel* *Multichoice* *Sentech* *Civil Aviation Authority*				*Will be notified during the EIA Phase.*	
Katemelo Projects	*X*	*5 February 2022*	*<u>Email received from Katlego Diremelo</u>* *Hi* *Can I get a copy of the DSR? Thanks.* *Kind Regards* *Katemelo Projects (Pty) Ltd* *Managing Director* *Katlego Diremelo*	*Good day Katlego,* *Thank you for your message.* *Please see attached a copy of the Draft Scoping Report. Let me know which annexures I can also send to you.* *Don't hesitate to contact us should you have any questions or queries.* *Regards/Groete* *Stephan Barkhuizen*	
Public Meeting held on the 1st of March 2022 at the Madibeng Townhall in Brits.	*X*	*1 March 2022*	*<u>Mr. Titus Mogomotsi</u>* *Requested a copy of the Public Meeting Presentation and DSR.*	*<u>Email sent by JEMS on 3 March 2022</u>* *Good day Titus,* *Thank you for attending the public meeting for the Environmental Authorisation Application for the Proposed Eland Mine PV Solar Energy Project (Ref No: NWP/EIA/103/2021).* *As per your request after the meeting, please see attached a copy of the Presentation as presented during the meeting and the Draft Scoping Report.* *Don't hesitate to contact us should you have any further questions or queries.* *Regards/Groete* *Stephan Barkhuizen*	
			<u>Mr. Mokoene and Mr. Mgotsi</u> *Requested a copy of the Public Meeting Presentation.*	*<u>Email sent by JEMS on 2 March 2022</u>* *Good day Mr. Mokoene and Mr. Mgotsi,* *Thank you for attending the public meeting for the Environmental Authorisation Application for the Proposed Eland Mine PV Solar Energy Project (Ref No: NWP/EIA/103/2021).*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAP's Response to the issues raised	Section and paragraph
				As per your request after the meeting, please see attached a copy of the Presentation as presented during the meeting. *Don't hesitate to contact us should you have any further questions or queries.* *Regards/Groete* *Stephan Barkhuizen*	

8. DESCRIPTION OF THE SOCIO-ECONOMIC AND BIOPHYSICAL ENVIRONMENT

This section describes the status quo and predicted environment that may potentially be affected by the EM PV Solar Project.

The purpose of this section is to provide not just a baseline description for the EM PV Solar Project Area and the surrounds, but status quo findings of the recently undertaken Specialist studies. The sources used include and are not limited to the following:

- Recently updated Specialist studies (Refer to Appendixes), namely:
  - Terrestrial Biodiversity Assessment;
  - Avifauna Specialist Assessment;
  - Update of the Soil and Land Capability Assessment;
  - Update of the Socio-Economic Assessment ("**SEIA**");
- Available information from the EM's environmental licences, particularly recently submitted EIARs;
- Specialist reports conducted on and around the PV Project Area for previous applications lodged, namely:
  - Groundwater Impact Assessment;
  - Freshwater Assessment;
  - NIAs;
  - HIAs;
  - AQIA; and
  - Hydrology Assessment.
- SAWS;
- South African National Biodiversity Institute ("**SANBI**");
- Statistics South Africa;
- MLM IDP;
- Existing information on the environmental parameters of the EM Surface Area and surrounds; and
- Stakeholder and I&AP comments received (from previous EA Applications and processes).

8.1 REGIONAL SETTING

The EM PV Solar Project will be taking place within the EM Surface Area. It falls within the MLM and is situated to the eastern part of BPDM (NWP). The town of Brits is located 10 km east of the EM and Tshwane Metropolitan (Pretoria) 60 km west. Neighbouring communities in proximity to the PV Project Area include Damonsville, Mothotlung, Moumong, DeWildt and Mmakau.

The PV Project Area is surrounded by the N4 Bakwena highway to the south and the R566 Brits-Rosslyn Provincial Road to the north. The EM PV Solar Project is located within Ward 21 of the MLM; and the nearby towns and residential areas are given in ***Table 11*** and ***Figure 10*** (line-of-sight distances). The PV Project Area is located within the EM mine area boundary. EM forms part of the PGM mining region, established along the Brits-Rustenburg N4 Bakwena highway, which includes several mining complexes (i.e., Hernic Ferrochrome, Sibanye Platinum, Crocodile River Mine, etc.). The DeWildt Solar Plant is located directly east of the PV Project Area.

Table 11: Line of sight distances to nearest towns in terms of the border of Project Area.

Town	Distance Km	Direction
Damonsville	1 Km	North of the EM Surface Area
Moumong	1.2 Km	North-east of the EM Surface Area
Mothotlung	2 Km	North of the EM Surface Area
Tshwara	2.1 Km	North-east of the EM Surface Area
Ramolapong	2.4 Km	North-east of the EM Surface Area
Mmakau	3.0 Km	North of the EM Surface Area
DeWildt	3.7 Km	East of the EM Surface Area
Ga-Kwate	3.7 Km	North-east of the EM Surface Area
Brits	10 Km	West of the EM Surface Area
Pretoria	60 Km	East of the EM Surface Area

8.1.1 Impact of the EM PV Solar Project on the Regional Setting

The PV Project Area will be undertaken within the boundaries of an existing disturbed mining operation, with a large section being undertaken on old-cultivated lands.

The established Solar Power Facility (DeWildt), communities, mining and industrial infrastructure, agriculture, conservation and other activities forms part of the Regional Setting.

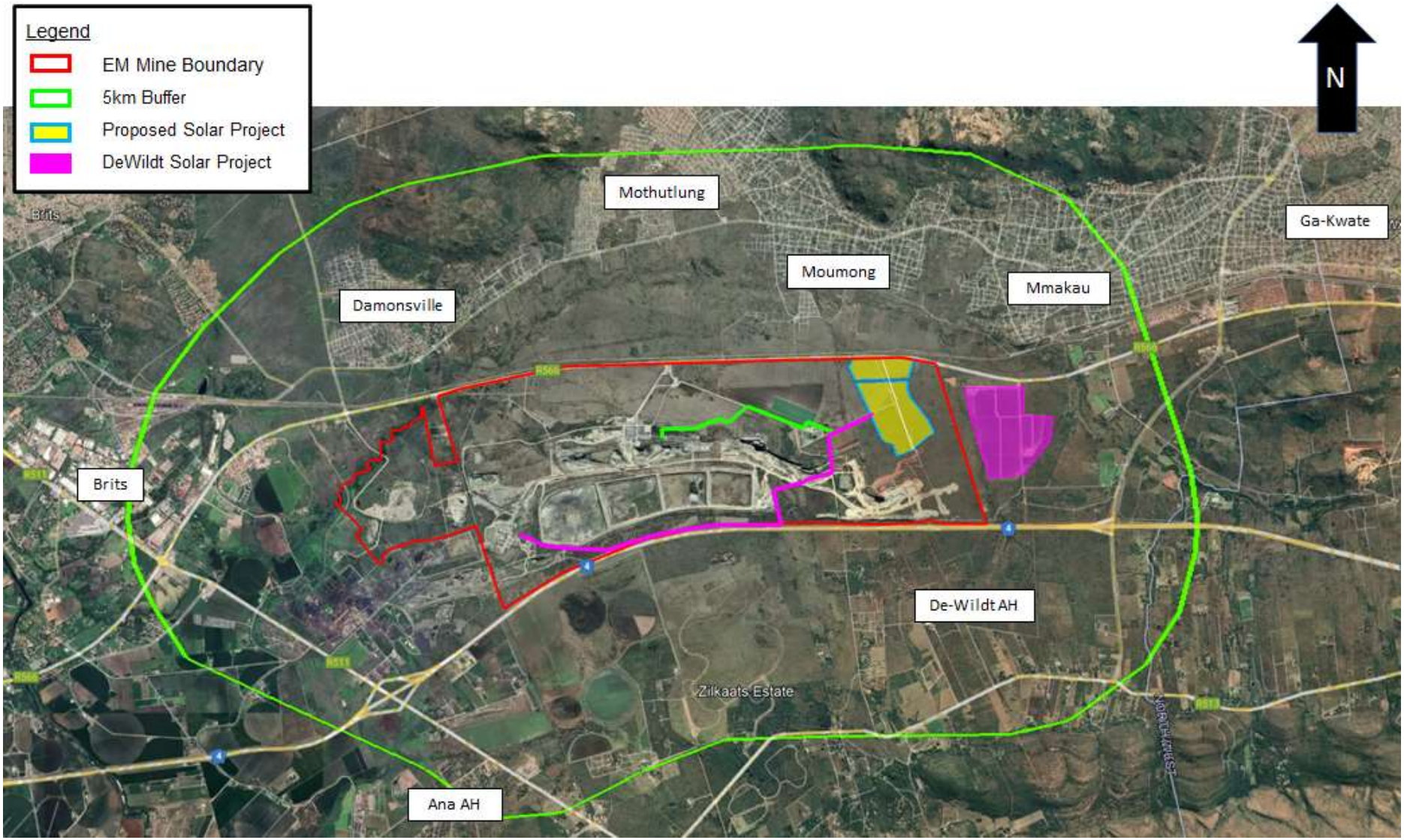


Figure 10: Line of sight of the nearest residential areas from the EM PV Solar Project

8.2 SOCIO ECONOMIC ENVIRONMENT

A SEIA was undertaken by Surveya (Refer to ***Appendix 10***).

8.2.1 North West Province

The PV Project Area is located within the NWP, which is bordered by the Northern Cape, Free State, Gauteng, and Limpopo Provinces, as well as Botswana. Comprising a total land area of 118 797 km², the NWP is the third smallest province in South Africa. It is predominately a rural province, and only 35% of its 4 108 816 inhabitants live in urban areas. (www.nwpg.gov.za).

The economy is dominated by mining, which generates more than half of the province's Gross Domestic Product ("**GDP**"). The Rustenburg and Brits districts produce 94% of South Africa's platinum, which is more than any other single area in the world. The NWP also produces a quarter of South Africa's gold, as well as granite, marble, fluorspar and diamonds. Mining in the NWP therefore provides jobs for a quarter of the NWP's workforce and contributes approximately 23% towards the South African mining industry (www.nwpg.gov.za).

The eastern and southern parts of NWP are crop-growing regions, where maize, sunflowers, tobacco, cotton, and citrus fruits are produced. The northern and western parts of NWP have many sheep farms, cattle and game ranches.

8.2.2 Bojanala Platinum District Municipality

The PV Project Area is located within the BPDM of the NWP. The district includes five Local Municipalities: Rustenburg (Marikana, Mooinooi, Phatsima and Tlhabane), Madibeng (Brits and Hartebeespoort), Moses Kotane (Mogwase and Madikwe), Kgetlengrivier (Derby, Koster and Swartruggens) and Moretele.

BPDM has a total population of 1 670 000 inhabitants, comprising 44% of the population of the NWP (BPDM, IDP, 2020/21). Its population comprises 52% males and 48% females, which is typical of districts with labour intensive industries, such as mining, and is projected to grow at an average annual rate of 1.5% from 1.67 million in 2016 to 1.8 million in 2021. (BPDM, IDP, 2020/21).

The 2016 employment statistics for BPDM show that 54% of the population, comprising 894,102 people, are employed and in 2016 the BPDM contributed 52% to the GDP of the NWP, amounting to R137bn (up from R 51.9 billion in 2006). The major sector contributions to the BPDM's GDP are mining 51.2%, financial 10.5%, trade 9.6%, tourism 5.6% and manufacturing 5.5%. BPDM is rich in mineral deposits; half of the RSA's chromite production

comes from it; and the area is the world's largest platinum producer. The MLM contributes the most to the GDP of the BPDM, with a total of R 46.5 billion or 37.41%. (BPDM, IDP, 2020/21).

It is expected that BPDM's economy will grow at an average annual rate of 1.76% from 2016 to 2021, which is slightly higher than the projected annual economic growth rate of 1.41% for the NWP, and 1.32% for the RSA. (BPDM, IDP, 2020/21).

In terms of tourism, BPMD is the most scenic region of the NWP. It is close to Gauteng and is host to the internationally renowned Lost City Sun City complex, and several game reserves and private game lodges, including the Pilanesberg National Park, Madikwe Game Reserve, Barakolalo Game Reserve and the Kgaswane Nature Reserve. The Hartbeespoort Dam is also a scenic and popular tourist attraction, providing water activities, mountain sports, hang gliding, parasailing, abseiling, hiking trails, angling, yachting, ballooning, cable way and other leisure activities. The district is also home to a large variety of historical tourism attractions including the Cradle of Humankind. (www.nwpg.gov.za).

8.2.3 Madibeng Local Municipality

The PV Project Area is located within the MLM in the NWP. The MLM is one of the five local municipalities in the BPDM. It covers a total land area of 3 839 km^2. It includes three towns (Brits, Hartbeespoort, and Mooinooi), rural areas, villages, farm portions and an established industrial area in Brits, which is MLM's main economic centre (MLM, IDP, 2017/21).

The MLM has 41 Wards and is governed by a Council, comprising eighty-one council members. Forty-one council members are allocated to Ward Councillors, elected by the Wards they represent, and the remaining forty seats are awarded to political parties in proportion to the number of votes received. (MLM, IDP, 2017/21).

8.2.3.1 Demographics

According to WEBHIS data (2020), the total population of the MLM is 574 491 inhabitants, comprising 229 672 households, with an average household size of 4 people per household. Men account for 53% of the population and females 47% (Community Survey, 2016). Children under the age of 14 account for 26% of the population; and 69% of the population are between the ages of 15 and 65 (Community Survey, 2016). This is higher than the BPDM, where 65% of the population are aged between 15 and 65 (BPDM, IDP, 2020/21). The racial composition of the MLM population comprises 92.23% Black Africans; 6.92% White; 0.54% Coloured; and Indian/Asian 0.3%. (MLM, IDP, 2017/21).

Some 55% of the MLM population speak Setswana. This is followed by Xitsonga, which is spoken by 9% of the population, Sepedi 7%, and Afrikaans 6%. Other languages spoken include Sesotho and Isizulu. (Community Survey, 2016).

8.2.3.2 Education

MLM's education statistics show that 4.3% of the population aged 20 or more have no schooling. While the literacy rate for the area is 89%, 15% of the population aged 20 or more have completed Grade 12; 37.9% have completed some primary schooling; and 33.9% have completed some secondary schooling (Community Survey, 2016). In 2016 2% of the MLM population had completed higher education; and 94% of children between the ages of 5 and 17 years were in school. (Community Survey, 2016).

8.2.3.3 Basic Services

The HIV/AIDS prevalence in the MLM is 45.5%, which is significantly higher than the NWP prevalence rate of 26.7% (MLM, IDP, 2017/21). Men and women between the ages of 26 and 35 seem to have higher infection rates than other age groups in the MLM population infection. The MLM has 28 registered NGOs rendering HIV/AIDS related programmes, including voluntary testing, counselling, and treatment services. (MLM, IDP, 2017/21).

According to the MLM IDP (2017/21), 15% of households do not have access to basic water supply. Of the 78% of households that have access to municipal water services (either bulk, full, intermediate, informal intermediate, or basic supply), 22.2% of these households have piped water inside their formal dwellings. Only 49% of households have access to basic sanitation (including flushing toilets, ventilated pit latrines, pit latrines or septic tanks) (MLM, IDP, 2017/21); and of these households 27.2% have a flush toilet.

Water resources in the MLM include the Crocodile River, Hartbeespoort Dam, Rooikoppies Dam and Klipvoor Dam. Three main wastewater treatment plants in the MLM are situated in Brits, Mooinooi, and Hartbeespoort. Due to increasing demand, the bulk water infrastructure's capacity (including WTPs) is insufficient to cater for the demand. As a result, the MLM has established or re-commissioned boreholes to augment the bulk water supply.

From available information, it is estimated that 81% of MLM households in urban areas have access to electricity for lighting. In the rural areas of MLM, it is estimated that only 30% of households make use of electricity for lighting. The use of lighting forms other than electricity is predominant in informal dwellings. (MLM, IDP, 2017/21).

Only 25.7% of the population have access to weekly refuse removal and waste removal in the MLM is a serious challenge. (MLM, IDP, 2017/21). The Hartbeespoort Regional Landfill Site,

which is located between the towns of Brits and Hartbeespoort, is the only licensed and operational landfill site in the MLM.

8.2.3.4 Housing

In the MLM 59.2% of the population reside in formal dwellings and 54.1% of these formal dwellings are either privately owned or paid off. (MLM, IDP, 2017/21). MLM has more than 34 informal settlements, which have about 48 212 households (excluding backyard dwellers). Almost 30% of the MLM population reside in informal settlements and, according to the MLM IDP (2017/21), the high number of informal settlements is a result of immigration due to mining in the area and farm evictions.

8.2.3.5 Economy

The MLM economy is primarily dependent on mining, agriculture, tourism, and industrial manufacturing. The mining sector in MLM contributes considerably to job creation in the local economy and mainly comprises PGM, chromium and intensive granite and sand mining. (MLM, IDP, 2017/21). In 2016 agriculture accounted for 17.7% of the GDP, manufacturing 13.3%, and tourism 11%. (MLM, IDP, 2017/21). According to the MLM IDP (2017/21), MLM's economy is projected to grow at an average annual rate of 2%.

The MLM has three major tourism attractions, including the Hartbeespoort Dam; Cradle of Humankind, which is a proclaimed World Heritage Site, and Magaliesberg Mountain Range. The MLM area is well known for privately owned game farms, holiday accommodation and camping sites. It also hosts the following four RCI Resorts: Magaliespark, Mount Amanzi, Seasons Spa and Dikhololo. (MLM, IDP, 2017/21).

8.2.3.6 Employment

MLM's employment statistics indicate that 45% of the working population are employed; 20% are unemployed; 4% are discouraged work seekers; and 31% are economically not active (Community Survey, 2016). According to the MLM IDP (2017/21), 23.3% of the population are poverty stricken, with no monthly income; 27.3% of the population earn up to R800 monthly; 43.3% between R800 and R6 500; and 6.3% earn more than R6 500.

Female headed households account for 30.3% of the MLM population. (MLM, IDP, 2017/21). Support provided to indigent households includes free basic services, social grants and job creation through the Expanded Public Works Programme.

8.2.3.7 Municipal priorities

The MLM IDP (2017/21) identifies the following service delivery priorities:

- Water and sanitation;
- Roads and storm water;
- Electricity;
- Social services;
- Land and housing; and
- Local economic development.

In addition, the MLM identifies the following development challenges facing it (SES, 2021):

- Water crisis in the MLM;
- Illegal connection in relation to water and electricity;
- Lack of resources and budget constraints;
- Lack of available land for residential purposes; and
- High level grant dependency.

8.2.4 Local Socio-Economic Baseline Description

The communities in proximity to the PV Project Area are (SES, 2021):

- Damonsville, a multi-cultural urban suburb, located 7km east of Brits and 1km north of the PV Project Area;
- Mothotlung, a well-established peri-urban settlement, 12km east of Brits and 2km north the PV Project Area;
- Mmakau, a semi-rural settlement falling under the Mmakau Tribal Office, located 16 km east of Brits and 3km north of the PV Project Area; and
- Oukasie, a well-established township, situated adjacent to the town of Brits, and 12km from the project area. Founded in 1931 Oukasie is one of the oldest Black townships in South Africa. In recent years it has become home to several African immigrants and is characterised by 13 sprawling informal settlements.

Communities that form part of the labour sender areas are located within 12km from the project area, as detailed in EM's Social Labour Plan (SLP).

8.2.4.1 Communities in proximity to the EM and the PV Project Area

Population figures for communities in proximity to the EM Surface Area ("**Local Communities**") were gathered in key informant interviews with clinic staff at Oukasie and Mmakau Clinics and verified using WEBHIS data, provided by Brits District Hospital (SES, 2020). ***Table 12*** provides an overview of the population figures for the Local Communities.

Oukasie is the largest community, as it accounts for 32% of the population of the Local Communities; this is closely followed by Mothotlung, which accounts for 31%.

Table 12: Population figures for communities in proximity to the PV Project Area.

Community	Population	Estimate Households
Oukasie	35 338	8 835
Damonsville	15 403	3 851
Mothotlung	34 289	8 572
Mmakau	24 539	6 135
Total	**109 569**	**27 392**

(Source: SES, 2021).

8.2.4.2 PV Project Area Demography

As in the BPDM and MLM, the Local Communities comprise more males than females, refer to ***Table 13***. This is likely due to more male than female job seekers moving to the area in search of employment opportunities.

Table 13: Age distribution of communities surrounding the Project Area.

Age	Oukasie	Mothotlung *(including Damonsville)*	Mmakau	Project Area
0 - 14 years	28.5%	25.4%	26.2%	26.7%
15 – 64 years	69.2%	69.3%	68.4%	68.9%
Elderly (+65)	2.3%	5.3%	5.4%	4.3%

(Source: Community Survey, 2016)

Although Tswana is the dominant ethnic group (59%) within the Local Communities, this does vary across the different communities. Refer to ***Table 14***. Tswana is followed by Pedi (10%), Tsonga (9%), and Zulu (4%). Few households speak Afrikaans or English within the Local Communities; and the dominant languages include Setswana, Xitsonga, and Sepedi.

Table 14: Local Communities Languages

Language	Oukasie	Mothotlung *(including Damonsville)*	Mmakau	Project Area
Afrikaans	2.5%	0.8%	0.5%	1.27%
English	2.1%	2.4%	2.4%	2.30%
IsiNdebele	2.4%	1.7%	1.9%	2.00%
IsiXhosa	1.9%	1.5%	1.0%	1.47%
IsiZulu	4.3%	3.4%	3.1%	3.60%
Sepedi	16.7%	6.1%	8.2%	10.33%
Sesotho	2.6%	2.5%	2.1%	2.40%
Setswana	39.9%	73.7%	63.0%	58.87%
Sign Language	0%	0.5%	0%	0.17%
SiSwati	1.2%	0.9%	0.7%	0.93%
Tshivenda	4.1%	0.8%	2.2%	2.37%
Xitsonga	14.9%	4.3%	7.8%	9.00%
Other	7.2%	1.3%	6.9%	5.13%

(Source: Community Survey, 2016).

8.2.4.3 Basic Services

MLM is tasked with providing water, sanitation, transportation facilities, electricity, primary health services, education, housing and security to Local Communities. As per the 2020 Socio-Economic Survey ("**SES**"), several social facilities were identified, as detailed in ***Table 15***.

Overall, the statistics on access to social services detailed in the MLM IDP (2017/21) present a strikingly different reality to what is experienced by households in the Local Communities. As with other municipalities in South Africa, MLM struggles with service delivery and efficient delivery of basic services to the Local Communities remains a challenge. Although most households have access to electricity, water and sanitation, high levels of unemployment lead to non-payment of municipal services. Service delivery is not only a challenge experienced at a household level. Schools and healthcare facilities in the area regularly experience water shortages and power outages for extended periods that further exacerbate the MLM's ability to provide basic services to the Local Communities.

Table 15: Social and commercial services surrounding the PV Project Area

Social Service	Oukasie	Damonsville	Mothotlung	Mmakau
Education				
Primary school	4	0	3	5
Secondary School	1	0	2	1
Combined school	0	1	0	0
Crèche/play school	Many	2	Many	Many
Library	1	1	1	0
Refuse removal				
Landfill site	0	0	0	0
Churches				
Church (estimate)	9	6	10	6
Social grants				
SASSA pay-out point	1	0	1	1
ATM	1	0	1	2
Post office	0	0	1	1
Commercial				
Spaza shops	Many	5	Many	Many
Liquor store	Many	0	Many	Many
Taverns	Many	5	Many	Many
Supermarket	Many	1	5	5
Petrol station	1	0	1	1
Community organisations				
Homebased care	21	Unknown	5	3
Farmers Association	0	0	0	1
Recreational				
Community Hall	1	1	1	1
Recreational park	1	1	4	1
Sports field	2	1	1	1
Security				
Police station	0	0	1	1
Municipal offices	1	0	0	0
Magistrates court	0	0	0	0
Health				
Clinic	1	1	1	1
Hospital	0	0	0	0
Cemetery	1	1	1	1

(Source: SES, 2020)

8.2.4.4 *Electricity*

In the Local Communities, electricity is the primary source of energy for cooking, heating, and lighting, Refer to ***Table 16***.

Table 16: Energy sources that communities surrounding the PV Project Area make use of for cooking, heating and lighting.

Purpose	Energy source	Oukasie	Mothotlung *(including Damonsville)*	Mmakau	Project Area
Cooking	Electricity	67.2%	97.3%	87.3%	83.93%
	Gas	0.8%	0.9%	0.5%	0.73%
	Paraffin	29.3%	1.3%	9.7%	13.43%
	Solar	0.2%	0.1%	0.1%	0.13%
	Candles	0%	0%	0%	0.00%
	Wood	1.8%	0.3%	1.7%	1.27%
	Coal	0.4%	0%	0.2%	0.20%
	Animal dung	0.1%	0.1%	0.1%	0.10%
	Other	0%	0%	0.1%	0.03%
	None	0.1%	0.1%	0.3%	0.17%
Heating	Electricity	49.8%	86%	69%	68.27%
	Gas	1.6%	3.8%	0.4%	1.93%
	Paraffin	10.4%	1.1%	4.7%	5.40%
	Solar	0.2%	0%	0.2%	0.13%
	Candles	0%	0%	0%	0.00%
	Wood	6.7%	0.5%	4.4%	3.87%
	Coal	2.7%	0.1%	1.7%	1.50%
	Animal dung	0%	0.2%	0.1%	0.10%
	Other	0%	0%	0%	0.00%
	None	28.6%	8.3%	19.5%	18.80%
Lighting	Electricity	49.8%	86%	69%	68.27%
	Gas	1.6%	3.8%	0.4%	1.93%
	Paraffin	10.4%	1.1%	4.7%	5.40%
	Solar	2.7%	0.1%	1.7%	1.50%
	Candles	6.7%	0.5%	4.4%	3.87%
	Wood	0%	0%	0%	0.00%
	Coal	0%	0%	0%	0.00%
	Animal dung	0%	0%	0%	0.00%
	Other	0%	0%	0%	0.00%
	None	0%	0.2%	0.1%	0.10%

(Source: CS 2016)

Often limited financial resources restrict households from making use of electricity for cooking, heating, and lighting. This is evident in Oukasie, where electricity is only used by 67% of the population for cooking, which is much lower than the study area average of 84%, and the MLM average of 81%.

Alternative energy sources in poorer households include paraffin, wood, and candles.

8.2.4.5 *Education facilities*

The MLM area has 12 primary schools, 4 secondary schools, and 1 combined school located. Education statistics for the area show that at least 20% of the population is illiterate and, of

the Local Communities, Oukasie has the most uneducated population (13.6%). 2.9% of Mothotlung' s population have received no schooling (SES, 2020). Refer to ***Table 17***.

Table 17: Education statistics for the Local Communities in relation to PV Project Area

Education	Oukasie	Mothotlung *(including Damonsville)*	Mmakau	Project Area
No schooling	13.6%	2.9%	6.1%	7.53%
Some primary	13.3%	9.6%	15.0%	12.63%
Completed primary	5.8%	4.1%	6.0%	5.30%
Some secondary	41.2%	34.5%	43.0%	39.57%
Completed Matric	24.2%	36.2%	25.9%	28.77%
Higher education	2%	12.7%	4.0%	6.23%

(Source: Community Survey, 2016)

8.2.4.6 Housing

The Local Communities have a variety of housing types and structures. Some housing types include large freestanding houses, comprising three or four bedrooms; others include RDP houses and shanties, erected from corrugated iron. Informal settlements are evident, particularly in Oukasie and in the areas between Damonsville and Mothotlung, where a few hundred shanties have been erected.

17.40% of the Local Communities own motorcars, 15.7% satellite television, and 13.70% computers (SES, 2020).

8.2.4.7 Development Challenges

Ward Councillors in MLM identified the following key development challenges (SES, 2020):

- High levels of unemployment;
- Immigration and the development of informal settlements;
- Poor support to agriculture development projects;
- Poor service delivery (i.e., electricity, roads, water and sanitation);
- Few SMME opportunities;
- Few skills development and training opportunities; and
- High prevalence of HIV and AIDS.

Although the Ward Councillors understand that the Local Government is responsible for service delivery and infrastructure development, they also feel that local businesses, and EP, have a role to play in improving the lives of the Local Communities.

8.2.5 Impact of the EM PV Solar Project on the Socio-Economic Environment

The following potential negative and positive social impacts of the EM PV Solar Project. These impacts were identified through the 2020 SEIA; and the Scoping phase stakeholder engagement process. In the identification, rating and mitigation of impacts, impacts are grouped according to the following impacts:

- Economic;
- Social; and
- Safety and health.

8.2.5.1 Economic impacts

I. Job creation and increased employment opportunities - Positive

It is expected that the EM PV Solar Project will generate approximately 225 direct employment opportunities over the next twenty-five years. During the construction phase taking place over a period of 12 months, this Project will employ approximately 200 low-skilled, semi-skilled and skilled employees. During the 30-year life of the EM PV Solar Project, it will result in employment of between 20 and 25 low-skilled, semi-skilled and skilled employees.

Currently 74% of EP employees are from the MLM area and this includes local community members residing in Oukasie (10%), Damonsville (7%), Mothotlung (17%), and Mmakau (20%) (EM SLP).

In keeping with the requirements set out in EM's SLP, the existing local recruitment procedures will be drawn on to source and appoint local workers during the construction and operational phases of the EM PV Solar Project.

II. Local procurement opportunities for SMMEs - Positive

Through procuring goods and services from local and BEE suppliers, the EM PV Solar Project can positively contribute to the development of SMMEs in neighbouring communities.

This can be achieved by drawing on EP's vendor database of registered local companies; and identifying procurement opportunities for local companies, with the aim to incorporate these companies into the official vendor database, thereby allowing local businesses to economically benefit from the Proposed Project.

III. Improved skills development and training - Positive

In communities neighbouring the EM PV Solar Project, skills development and training was identified as a priority community need for generating local employment. By investing in skills development and training, the EM PV Solar Project can contribute to local employment in the area, particularly amongst the youth.

Options to develop internship and bursary plans aimed to assist high-potential young students from surrounding communities with obtaining qualifications and the required skills and qualifications to work at the EM PV Solar project should be investigated.

IV. Reduce EM's reliance on the National Grid - Positive

If approved, the EM PV Solar Project will produce 40MW, thereby reducing EM's sole reliance on Eskom's national grid. This will also reduce the demand on an already challenged electricity supply; and potentially contribute towards improving electricity supply to essential services, for example, healthcare facilities and schools, which regularly struggle with power outages in communities neighbouring the PV Project Area.

Additional excess power produced by the EM PV Solar Project will be distributed to the national grid.

V. Improve Sustainable Mining Practices in the MLM - Positive

The proposed EM PV Solar Project will generate 40MV of renewable energy that will mainly be utilised by EM and will result in a reduction of the Scope 2 GHG emissions generated by the EM. This will likely result in positive effects on climate change and its associated impacts in the area.

Given that the EM PV Solar Project makes use of renewable energy source, it is in line with the MLM's objective of transforming into a greener economy, and the NCCAS, 2019, seeking to reduce SA's socio-economic and environmental vulnerabilities to climate change.

VI. Ensures EM remains economically viable - Positive

Given the electricity supply challenges in the MLM and nationally overall, to maintain EM's production at profitable levels, EP cannot solely rely on the national grid for energy supply.

If the No-Go Alternative is considered, it is likely that EP will lose productivity, thereby reducing the EM's ability to remain economically viable. This poses potential risks to: the livelihoods of approximately 1000 employees and core contractors working at EM, who are dependent on it; EM being able to implement SLP programmes; and a loss of revenue to the MLM. If the EA Application is not approved, this could therefore potentially decrease the MLM's ability to provide basic services to neighbouring communities and severely impact the lives of employees and their families.

VII. Tensions over limited employment opportunities and procurement contracts - Negative

Given that the EM PV Solar Project will during construction create 200 jobs over a period of 12 months, and between 20 to 25 jobs during operations, it is expected that, due to the high levels of unemployment in the MLM, this Project could potentially community tensions and protests.

As it currently stands, there is the perception amongst community members that EP is not creating enough local employment and employing foreign nationals rather than local community members.

Considering these negative community perceptions, the project developer should seek to reduce community tensions and protests by adopting fair and transparent recruitment procedures that do not prioritise certain communities or individuals for employment or local procurement opportunities. As such, the project developer should aim to source local suppliers and employ local workers from all neighbouring communities, and not just from Brits, for example.

8.2.5.2 Social impacts

I. Loss of the visual character of the landscape - Negative

Although the preferred PV Project Area alternative falls within the EM Consolidated MR Area, on land previously disturbed by mining and agricultural activities, visual impacts are expected to also occur and light pollution at night. Given the location of the EM PV Solar Project, it will be visible by:

- R566 road users;
- Neighbouring landowners; and

- Surrounding communities.

Given the size and scale of the EM PV Solar Project, the area will be visibly different, and thereby could affect neighbouring landowners and surrounding community members sense of place.

However, given the current visual appearance of the existing landscape, which includes extensive mining activity and the existing DeWildt solar facility. The activities applied for will not significantly increase the aesthetic impact in relation to the existing viewsheds. As such, the loss of the visual character of the landscape is likely to be a low impact. The mitigation measures proposed by the VIA must be considered during the development and operational phase.

II. Influx of job seekers to the Project Area - Negative

In countries where there are high levels of unemployment, such as the RSA, employment opportunities often result in project-induced influx by job seekers. This is often aggravated due to a lack of land management practices, which results in illegal squatting, and the formation of informal settlements. In the Local Communities there is evidence of illegal squatting; and, as such, is already impacted by opportunistic job seekers in search of employment opportunities.

If the EM PV Solar Project is awarded an EA, it is highly likely that this will result in the influx of job seekers into neighbouring communities. Opportunistic settlement will most likely be in the form of job seekers, informal vendors, and criminal opportunists. It is also likely that influx will peak during the construction phase, when the demand for unskilled labour is at its highest.

It is further anticipated that job seekers who do not secure employment will leave, however some may remain in hope of securing future employment opportunities. Often the influx of opportunistic job seekers causes the following impacts to occur:

- Emergence of informal settlements;
- Disruptions to established settlements, families and social networks;
- Increased strain on limited natural resources;
- Increased social pathologies;
- Increased strain on poorly resourced social services;
- Increased prevalence of communicable disease (i.e. TB and HIV);
- Increased petty theft, livestock theft, house breakings; and
- Conflict between long-term community members and in-migrants.

Given that there are numerous mines in the BPDM, it will be difficult to determine and isolate whether the EM PV Solar Plant is causing project-induced influx. As such, influx is typically a difficult cumulative impact to manage and/or mitigate; and, where possible, the project developer should seek to reduce influx by maintaining sound recruitment procedures that prevent contractors hiring casual labour without following the recruitment procedures.

8.2.5.1 Health and Safety impacts

III. Noise and air quality impacts - Negative

During construction, and in particular the clearing of vegetation for the EM PV Solar Project site establishment and construction of the access road, it is expected that dust and noise levels in and around the PV Project Area will temporarily increase during the construction phase.

Dust can have health impacts, and pose a nuisance factor by entering homes, settling on houses, clean washing, painted surfaces and roofs. However, it is not expected that the dust created during the construction phase of EM PV Solar Project will increase to levels significant enough to negatively affect neighbouring communities and landowners. Given extensive mining in the area, the increased dust levels caused by constructing the EM PV Solar Project, are likely to be more cumulative in nature.

IV. Increased traffic and road accidents

Due to the delivery of equipment and construction materials, and the transportation of workers, it is likely that during the construction phase there will be more vehicles using the R566. These impacts will significantly reduce during the operational phase of the EM PV Solar Project.

On assessing the potential socio-economic impacts, the SEIA concludes that the positive impacts of implementing a solar facility able to generate 40MV of renewable energy, which will assist with maintaining EM's economic viability and reduce its reliance on the national grid, outweigh the potential negative impacts caused by project-induced influx, and community tensions over limited job and SMME opportunities.

8.3 TOPOGRAPHY

The NWP, the sixth largest province in the RSA, occupies a total area of 116 320km^2 (9,5% of the total area of the RSA), refer to ***Figure 11***. It is geographically situated between 25° and 28° south of the equator and between 22° and 28° longitude east of Greenwich Meridian. With altitudes ranging from 920 m - 1782m above sea level, the NWP is professed to have the most uniform terrain of all provinces.

The topography of the PV Project Area is flat, with average slope of 0-3%. Koppies and hills are located to the north, and the Magaliesberg mountain range to the south of the PV Project Area (Refer to ***Figure 12***). The Hartbeespoort Dam is located approximately 11km south-west and the Crocodile River 12km west of the EM PV Solar Project.

8.3.1 Impact of the EM PV Solar Project on the topography

The average elevation of the PV Project Area ranges from 1 207m above mean sea level ("**mamsl**") in the north to 1 226mamsl in the south. The topography in parts of the PV Project Area was found to be ideal for the development of a PV facility. The PV Project Area has previously been altered by historic cultivation in the west of the site, the ESKOM Servitude that traverses the northern and southern section and existing infrastructure (i.e. security roads, boreholes and firebreaks). The PV Project Area consists of undisturbed land used to the east that was previously used for grazing. The PV Project Area should continue to be free draining after construction and re-vegetation must be encouraged to minimise possible erosion.

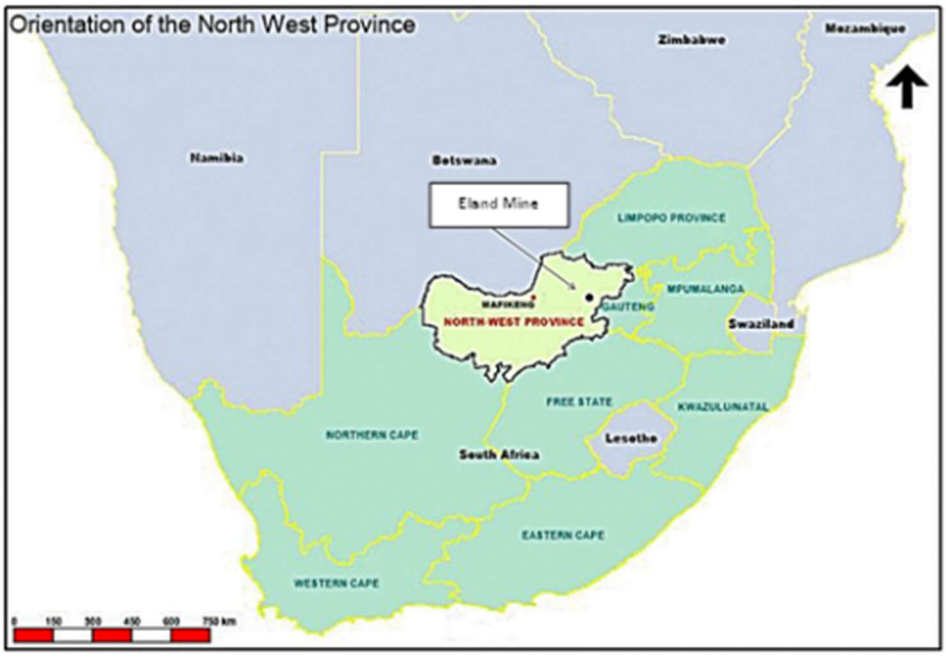


Figure 11: Orientation of the NWP – South Africa.

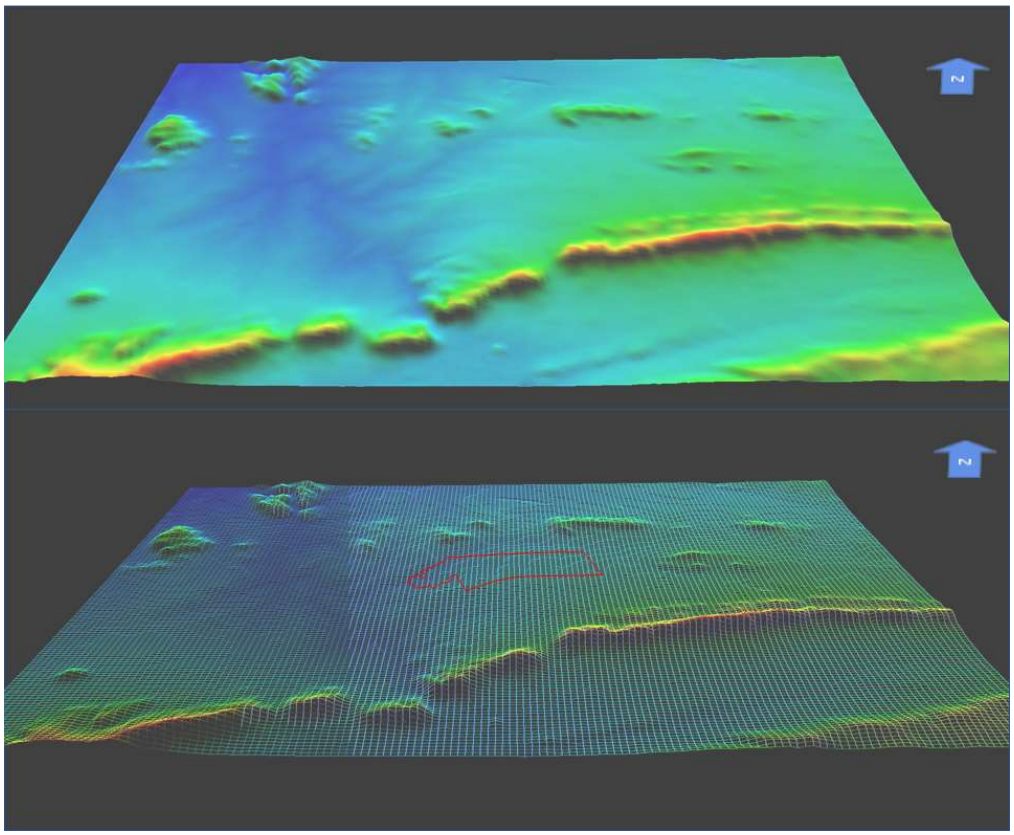


Figure 12: 3D Topographical presentation of the EM Surface Area and Surrounding Area.

8.4 CLIMATE

The PV Project Area falls within the Highveld Climatic Zone, as defined by Schulze (1974). The average climate for the PV Project Area is presented in ***Figure 13***, using the outcome of the investigation into rainfall and evaporation for the Area. While evaporation is showing as greatly exceeding rainfall, this is representative of the maximum A-Pan equivalent potential evapotranspiration that could occur, assuming no limitations are placed on evaporative demand. The combination of rainfall, evaporation and temperature results in a hot semi-arid climate, according to the Köppen climate classification. Detailed features of this climatic zone are outlined below:

- Temperatures in this climatic zone are generally mild, but low minima can be experienced in winter due to clear night skies. Average annual precipitation ranges from 650mm (west) to 900mm (east);
- Rain generally occurs in summer from October to March;
- 85% of the mean annual precipitation ("**MAP**") falls during summer thunderstorms. The thunderstorms generally occur every 3 to 4 days in summer and are of short duration and high intensity, accompanied by strong gusty south-westerly winds;
- Hail frequency is high tending to occur 4 to 7 times per season;
- Average of 75 storms occurs per year;
- Summer average daily temperatures range from 17 to 27°C, with maxima of 38°C. In winter average daily temperatures range from 0 to 13°C;
- Frosts may occur from May to September for about 120 days; and
- Light north-easterly and south-westerly winds prevail. However, strong gusty south westerly winds often accompany thunderstorms.

Various weather stations managed by both the SAWS and the DHSWS are located close to EM. The SAWS and DHSWS stations (A2E001) are located approximately 5km and 7.5km from the from the EM Surface Area, respectively. The DHSWS station has a rainfall record length of 91 years (1926 - 2017).

Lynch (2004) was also used as a source of rainfall data for the EM Surface Area and is the source of the MAP data. A comparison of DHSWS station A2E001 and Lynch (2004) average monthly rainfall is presented in ***Table 18***. MAP for DHSWS station A2E001 is 686mm. MAP from Lynch (2004) indicates a MAP at the centre of the EM's TSF of 552mm.

Winds vary diurnally and between seasons. The predominant wind direction in the Brits area is from the east, with frequent winds also occurring from the north-east and south. During the day there is an increase in winds from the north-west and north-east. At night, wind flow occurs

mainly from the east and south, with north-westerly and south-easterly winds decreasing at night. Night-time conditions also reflect a difference in wind speed ranging from 1-4m/s at night in comparison to daily wind speed, which ranges between 2 – 13m/s. During the summer months strong winds from the east and north-east dominate, with wind speeds of up to 17m/s from the east. In winter, winds from the east dominate, and strong and frequent winds from the south also occur.

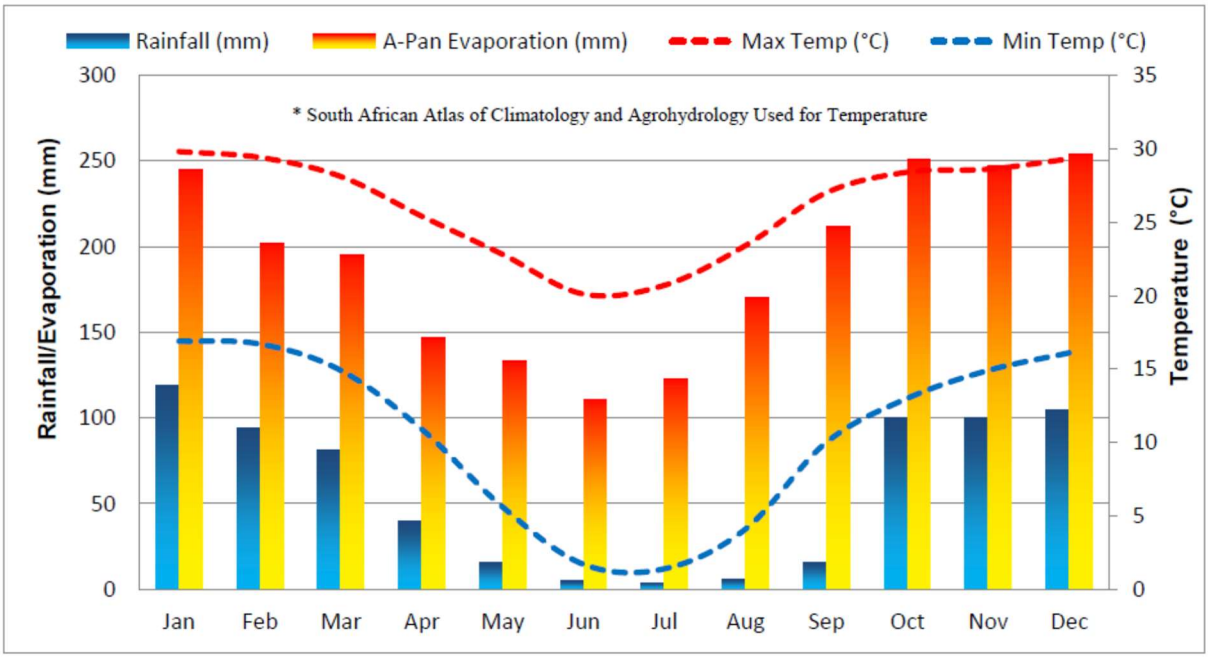


Figure 13: Average Monthly Climate for the PV Project Area (Highlands Hydrology, 2018).

Table 18: Average Monthly Rainfall Distribution (Highlands Hydrology, 2018).

Rainfall (mm)		
Month	**A2E001**	**Lynch (2004)**
Jan	126	119
Feb	94	94
Mar	86	81
Apr	45	40
May	19	16
Jun	8	5
Jul	5	4

Aug	6	6
Sep	15	16
Oct	60	100
Nov	108	100
Dec	114	105

8.4.1 Impact of the EM PV Solar Projects to the cumulative climate

The Global Horizontal Irradiation for the PV Project Area is between 1972 and 2118 kWh/m2/annum, which is favourable for solar projects. It is likely that the EM PV Solar Project will reduce the Scope 2 GHG emissions generated by the EM. This is in line with Northam's renewable energy strategy to reduce GHG emissions and supports the international and South African Government commitments to the Paris Climate Accord. The reduction of GHG emissions will also have environmental benefits for the local and provincial environmental health.

Existing opencast mining activities located to the south of the PV Project Area will potentially impact the EM PV Solar Project. This is due to fugitive dust emissions from mining activities (blasting, material handling and vehicular travel) open exposed areas, such as stockpiles and opencast areas likely leading to increased dust fall on the solar panels. Based on the prevailing wind fields for the period January 2017 to December 2019, emissions from activities associated will likely be transported towards the westerly and south-westerly sectors, depending on the season and time of day (Rayten, 2021). Increased wind speeds and mining activities will likely result in a higher frequency of panel cleaning.

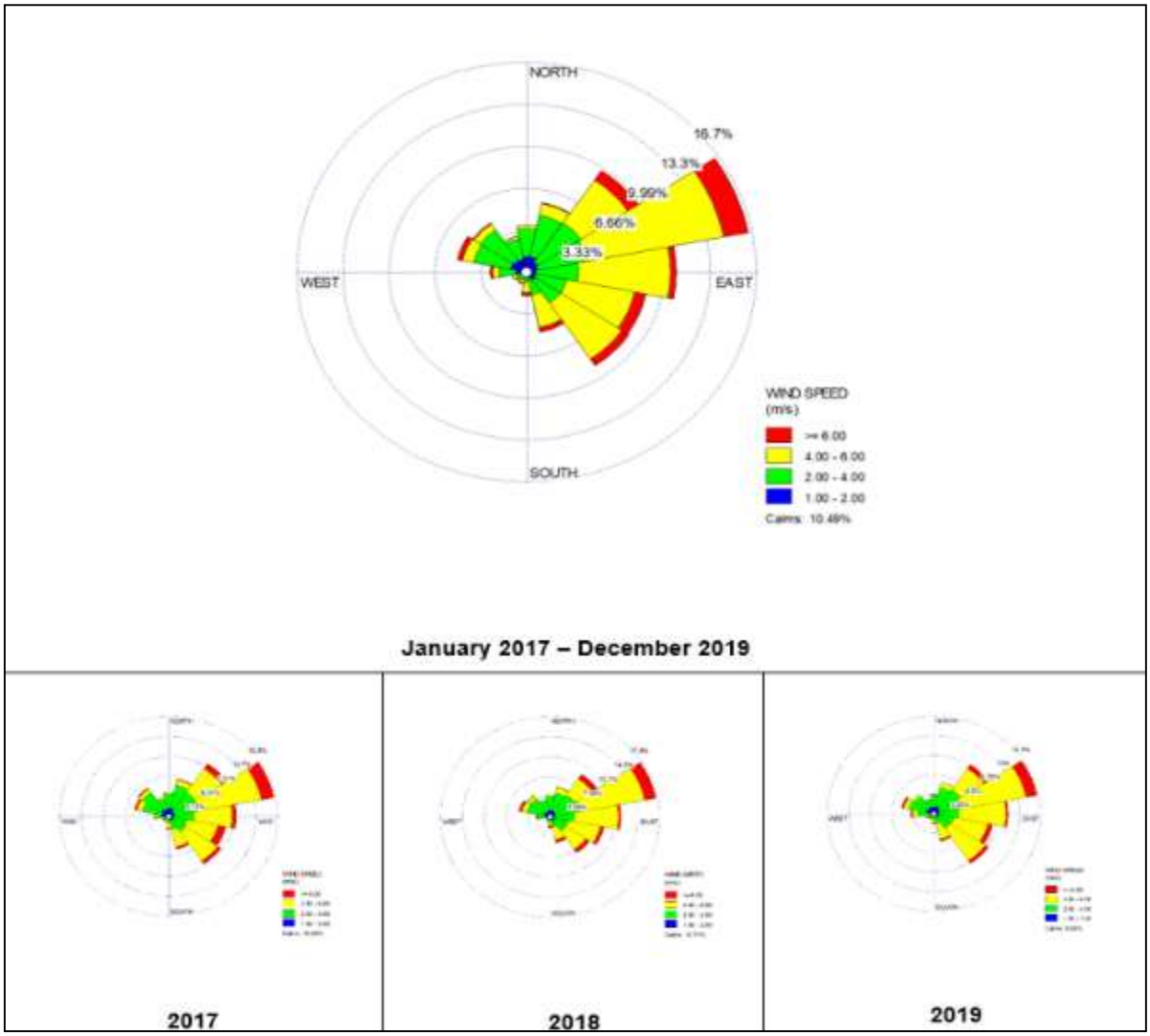


Figure 14: Period Wind Rose Plots for January 2017 - December 2019 (Rayten, 2021).

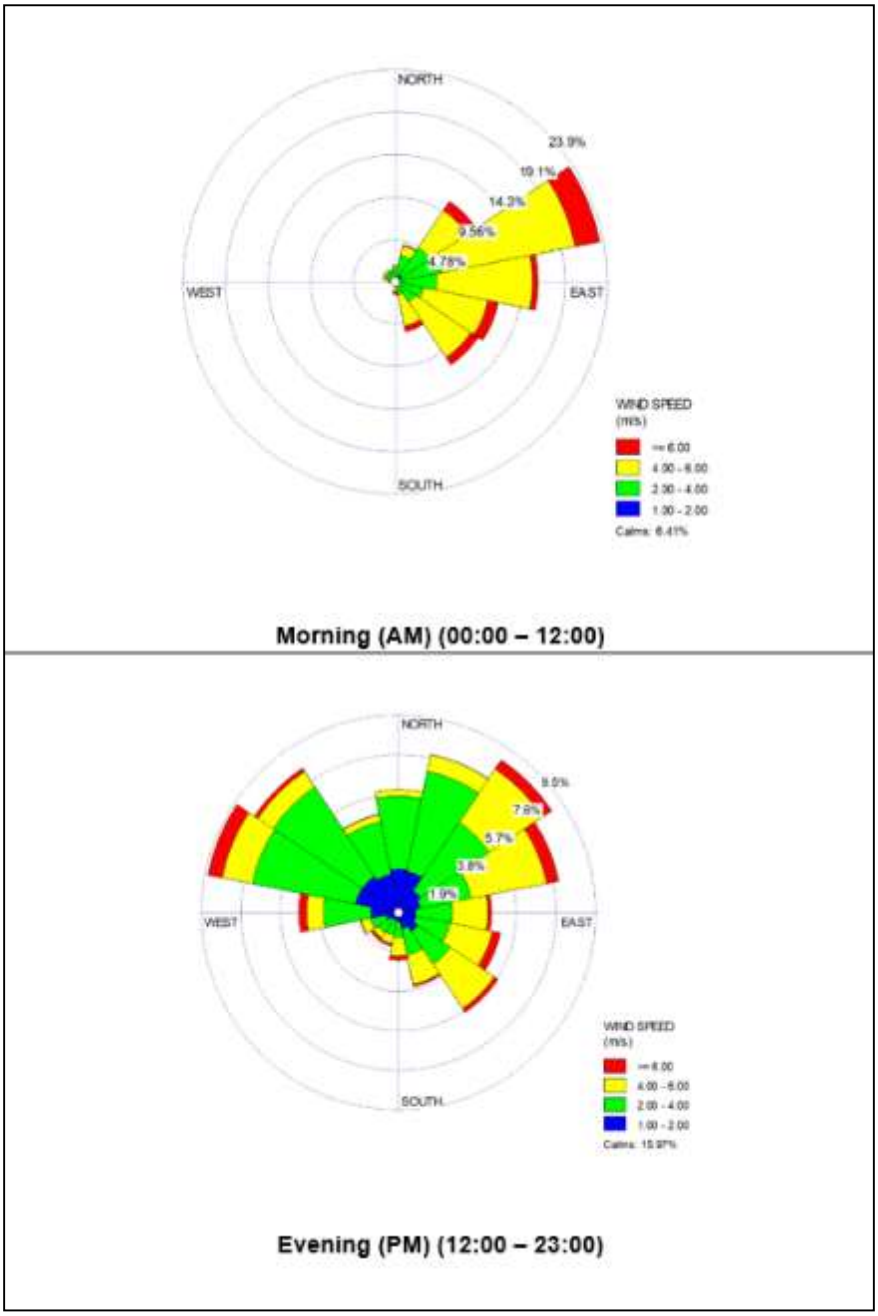


Figure 15: Morning (AM) (00:00 - 12:00) and Evening (PM) (12:00 - 23:00) Period Wind Rose Plots for January 2017 - December 2019 (Rayten, 2021).

8.5 GEOLOGY

8.5.1 Regional Geology

Southern Africa is characterised by the presence of large mafic to ultramafic layered complexes, the best known of which are the Great Dyke in the Zimbabwe Craton and Bushveld and Molopo Complexes in the Kaapvaal Craton (SLR, 2012). By far the largest, best-known and economically most important of these is the Bushveld Igneous Complex ("**BIC**"), which was intruded about 2060 million years ago into rocks of the Transvaal Supergroup, largely along an unconformity between the Magaliesberg quartzite of the Pretoria Group and overlying Rooiberg felsites. The total estimated extent of the BIC is some 66 000 km^2, of which about 55% is covered by younger formations. The Rustenburg Layered Suite ("**RLS**") comprises the mafic phase of the BIC and is host to several economically extracted minerals, such as chromite, vanadium and platinum group elements (PGM). The RLS is divided into five zones known as the Marginal, Lower, Critical, Main and Upper Zones from the base upwards (***Figure 16***). Both the Merensky Pyroxenite and UG2 Reef occur within the Upper Critical Zone.

The Critical Zone is divided into the Lower Critical and Upper Critical (***Figure 17***). The transition between the Lower and Upper Critical Zone is defined as the last occurrence of upper most Middle Group (MG) chromitite horizon, usually the MG4. The MG1 and MG2 chromitite layers are extensively mined for chrome.

The Upper Critical Zone is characterised by regular and often fine-scale rhythmic, or cyclic, layering of well-defined layers of cumulus chromite within pyroxenites and olivine-rich rocks.

The first important cycle is the lower of the two Upper Group Chromitite Layers (the UG1 Chromitite Layer). This unit consists of a chromitite layer and underlying footwall chromitite layers that are interlayered with anorthosite. The overlying UG2 chromitite is important because it contains economic concentrations of PGMs and is extensively mined.

The two uppermost cycles of the Critical Zone are the Merensky and Bastard cycles. The former is also of great economic importance, as it contains at its base the PGM-bearing Merensky Reef, a pegmatitic feldspathic pyroxenitic assemblage, with associated thin chromitite layers. The top of the Critical Zone is generally defined as the top of the robust anorthosite (the Giant Mottled Anorthosite) that forms the top of the Bastard cyclic unit.

The economically viable chromite reserves of the BIC, most of which are hosted in the Critical Zone, are estimated at 68% of the world's total, whilst the BIC also contains 56% of all known PGM.

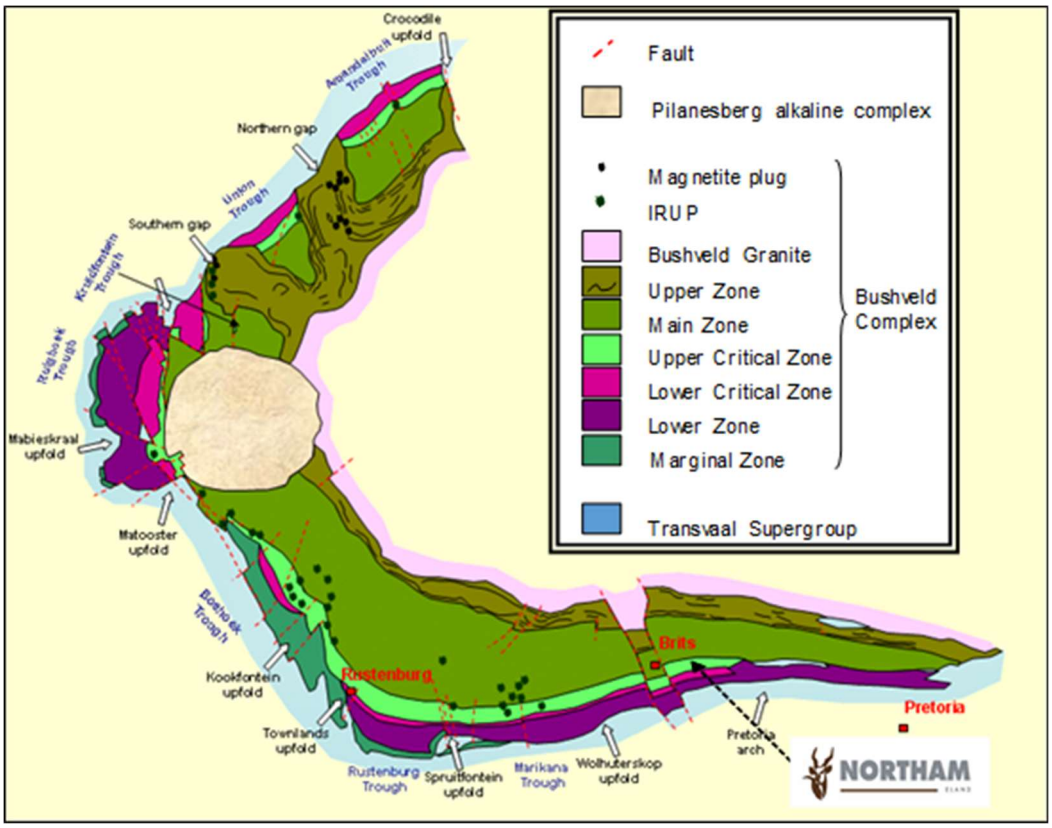


Figure 16: Generalised layout of the western Bushveld Complex

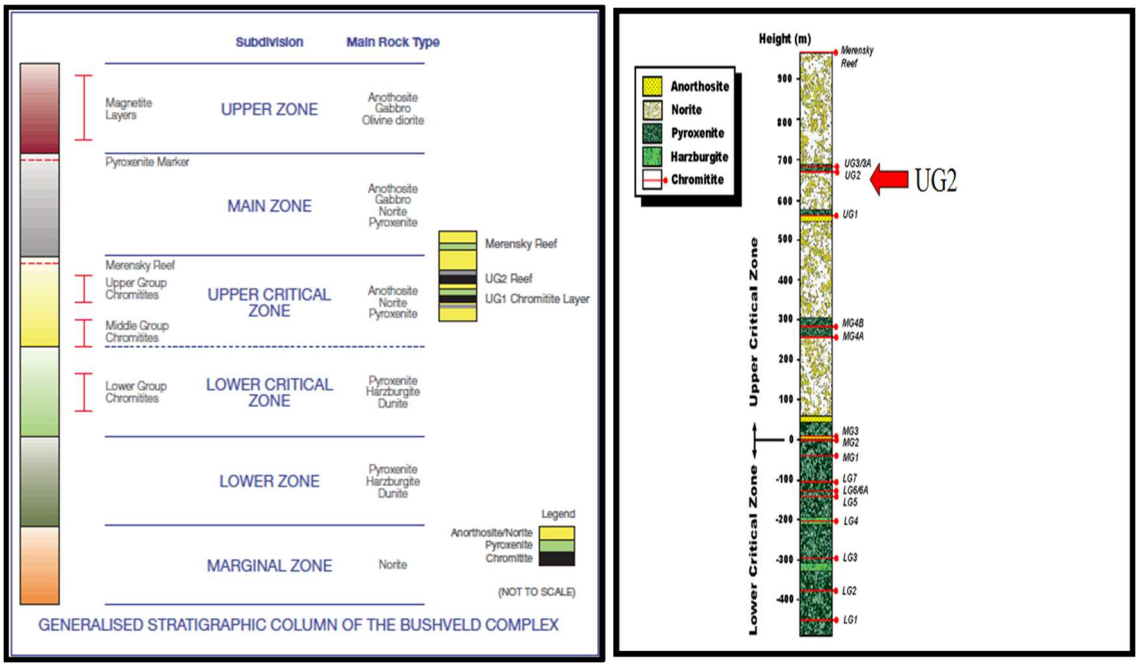


Figure 17: Generalised stratigraphy on the western Bushveld Complex

8.5.2 Local Geology

A generalized local stratigraphy at the EM Surface Area is provided in ***Figure 18*** below.

STRATIGRAPHIC COLUMN OF ELAND PLATINUM MINE			
MARKERS		**LITH**	**LOCAL STRAT**
END OF MAIN ZONE		GN (Gabbro Norite)	**MZ**
START OF CRITICAL ZONE		MA (Mottled Anorthosite)	**MH5a**
CAT FEET		SA (Spotted Anorthosite)	**MH5b**
GIANT MOTTLES		MA (Mottled Anorthosite)	**MH5c**
		AN (Anorthositic Nortite)	**MH4**
BASTARD REEF		PxN (Pyroxenitic Norite)	**MH3a**
		MA (Mottled Anorthosite)	**MH3b**
		N (Norite)	**MH2**
		MA (Mottled Anorthosite)	**MH1a**
		SA (Spotted Anorthosite)	**MH1b**
MERENSKY		PX (Pyroxenite)	**MR**
		MA (Mottled Anorthosite)	**MF1**
		N (Norite)	**MF2**
BOULDERS		MA (Mottled Anorthosite)	**MF3a**
		N/SA	**MF3b**
BANDED BSN		PxN (Pyroxenitic Norite)	**MF4**
		N (Norite)	**MF5**
		SA/MA	**MF6**
		SA (Spotted Anorthosite)	**U2H2**
		MA (Mottled Anorthosite)	
		SA (Spotted Anorthosite)	
		MA (Mottled Anorthosite)	
		SA/N	
		PX (Pyroxenite)	**U2H1a**
			U2H1b
UG2		CR (Chromitite)	**U2U**
		AN/PX/Cr (Anorthosite or Pyroxenite with chromitite stringers/lenses)	**IWP**
		CR (Chromitite)	**U2L**
		An/PPx (Pegmatoidal Pyroxenite)	**U2F1**
		N (Norite)	**U2F2**

Figure 18: Local Stratigraphic column of at the EM Surface Area.

8.5.3 Impact of the EM PV Solar Project on the geology

The EM PV Solar Project is not located close to or on shallow mineable ore and will not lead to sterilization of resources. The current mine layouts have been considered for the EM PV Solar Project's location and therefore there is no related resource sterilization or mining operational concerns. Vibrations due to blasting activities should be closely monitored to establish whether possible damage to PV panels may occur.

8.6 SOIL, LAND AND AGRICULTURAL CAPABILITY

A Soil and Agricultural Land Capability assessment was undertaken by Index (Refer to ***Appendix 11***)

8.6.1 Soil

A soil survey was done by ESS, 2006 for most of the central portion of the EM Mining Right Area; parts of the far eastern portion of the PV Project Area were surveyed by ARC, 2011; and a follow-up assessment was undertaken in 2020 by Index.

Soils are a significant component of most ecosystems. Soil acts as an ecological driver; and is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist.

The soil description for the PV Project Area is discussed in ***Table 19*** and depicted in ***Figure 19*** below.

The south-western part of the PV Project Area has deep reddish soils, with moderately to strongly developed blocky structure. The far southern part is reddish brown with rock outcrops. Some of the PV Project Area is potentially arable, notwithstanding the rock outcrops. However, due to the rocks and soil depth, the land has only moderate potential for arable agriculture.

The northern part of the EM PV Solar Project Area consists of dark coloured expansive clays. They tend to form deep cracks when they dry out, then close up again when water is introduced. The wetting cycle effectively seals the soil and retards water infiltration. These soils are successfully planted for particularly sunflower. Due to the high clay content the soil is moderately sensitive, as found by the DFFE Screening Tool.

Table 19. Soil descriptions

Map symbol	Description	Dominant soil form	Area (ha)
Ar500 Deep vertic	Deep dark coloured expansive clay soils, with prominent slickensides. The soils are poorly drained, with a low water infiltration rate. They tend to seal when irrigated. While not ideal for cultivation, they are nevertheless used successfully for crop production but tend to be difficult to work and are inaccessible when wet.	Arcadia, Rensburg	44,5
Sd500 Red structured	They are generally dark red to dark brown/black, with moderately developed blocky structure. The water infiltrating rate is moderate, with high water holding capability. The soil depth ranges from 200mm to more than 1 200mm. They generally occur on basic parent material.	Valsrivier Shortlands	19,4
Sd600/R Red rocky	This group has similar properties to the former but has scattered rock outcrops of andesite and other ultramafic rock.	Valsrivier Shortlands	8,7
Gs450/R Shallow rocky	The soil is shallow, with an effective rooting depth of 500 to 600mm. The major constraints are rockiness and limiting soil depth. The restrictive layer is hard partially weathered norite.	Glenrosa Hutton Milkwood	26,7

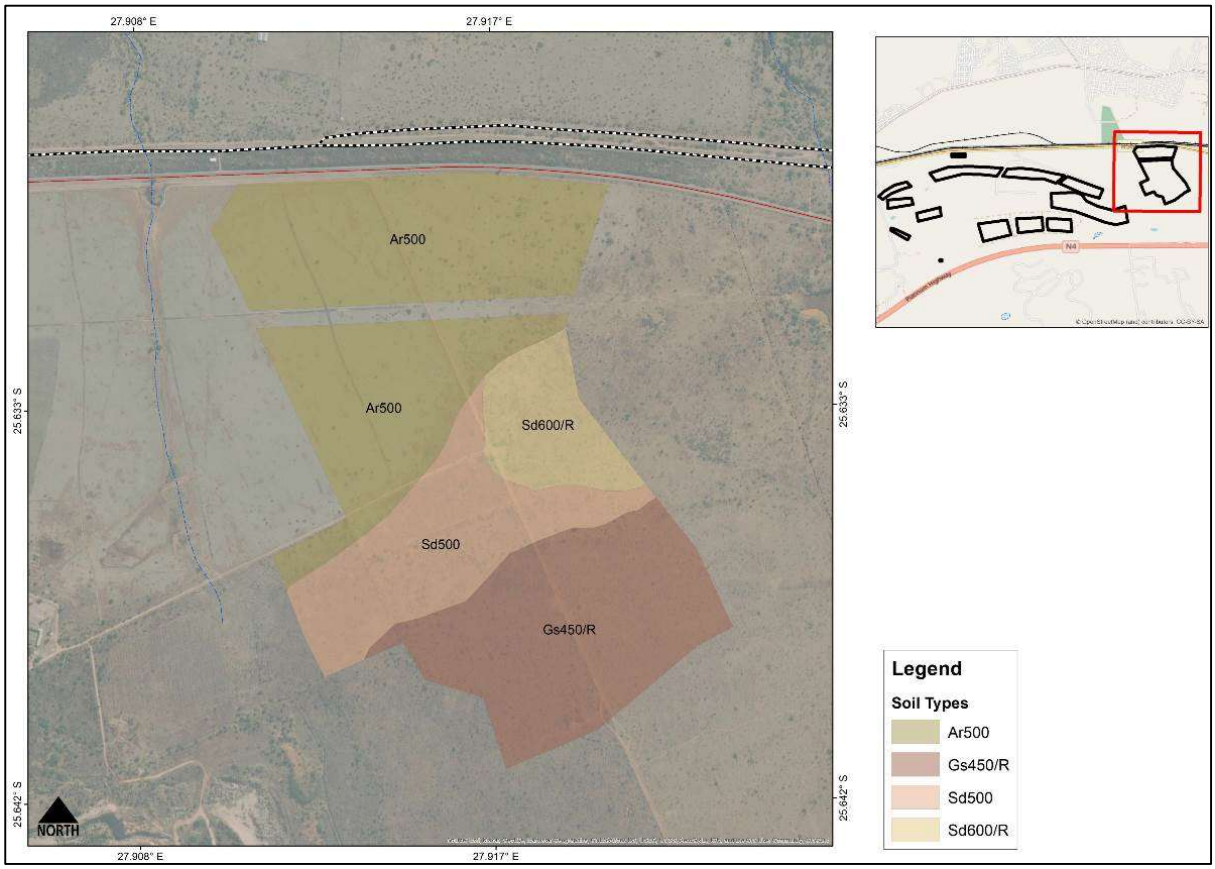


Figure 19: Generalised soil map (Index, 2022)

8.6.2 Agricultural Potential

The agricultural sensitivity description is according to the DFFE Screening Tool (Refer to ***Appendix 7***). The sensitivity indicated by the Tool is not perfect in terms of describing the impact because it is based on very broad information.

The Assessment Procedures provide the criteria for the assessment and reporting of impacts on agricultural resources for activities requiring EA. These assessments requirements are associated with a level of environmental sensitivity determined by the DFEE Screening Tool for agricultural resources. It is based on the most recent land capability evaluation, as provided by the DALRRD.

The site investigation found a deviation of the sensitivity, as indicated by the DFFE Screening Tool (Refer to ***Figure 20***).

- The southern portion of the PV Project Area is located on norite that has an abundance of stone and rock. According to the land use capability evaluation, the land has mechanical constraints that makes it of low sensitivity, in contradiction of the grading as 'very high' in the DFFE Sensitivity Tool. These soils are clearly not arable and the grazing potential less than that which is recommended by DALRRD.
- The 'high' sensitive land, which covers the north-western portion of the PV Project Area, is old cultivated land and is still now clear of trees. It is grassland. As with the portion to the east, which is also on black turf soil (classified as Arcadia), it is medium sensitive land.

8.6.3 Land Capability

Land capability classes are interpretive groupings of land with similar potential and limitations or similar hazards. It is considered by many as one of the few methods to describe the potential of land for development. The evaluation involves consideration of the following:

- Difficulties in land use owing to physical land characteristics;
- The risks of land damage from erosion and other causes; and
- Climate.

The Soil Management Directorate published a dataset in 2014 that evaluate soil properties, land characteristics and climate, which then culminates into land use capability classes. The main deciding criterion in the case of this site is the soil potential (or capability). According to the dataset, the soil has a moderate or high capability, refer to ***Figure 21*** that indicate the land use capability from this dataset (Index 2022). .

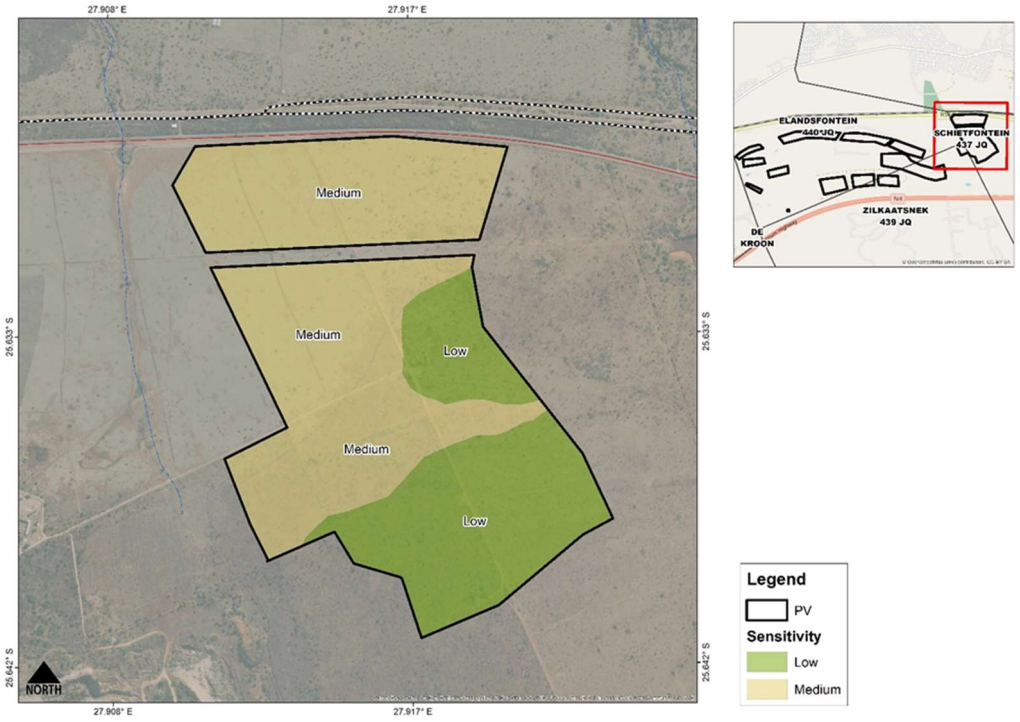


Figure 20: Agricultural sensitivity of EM PV Solar Project Area according to the site investigation

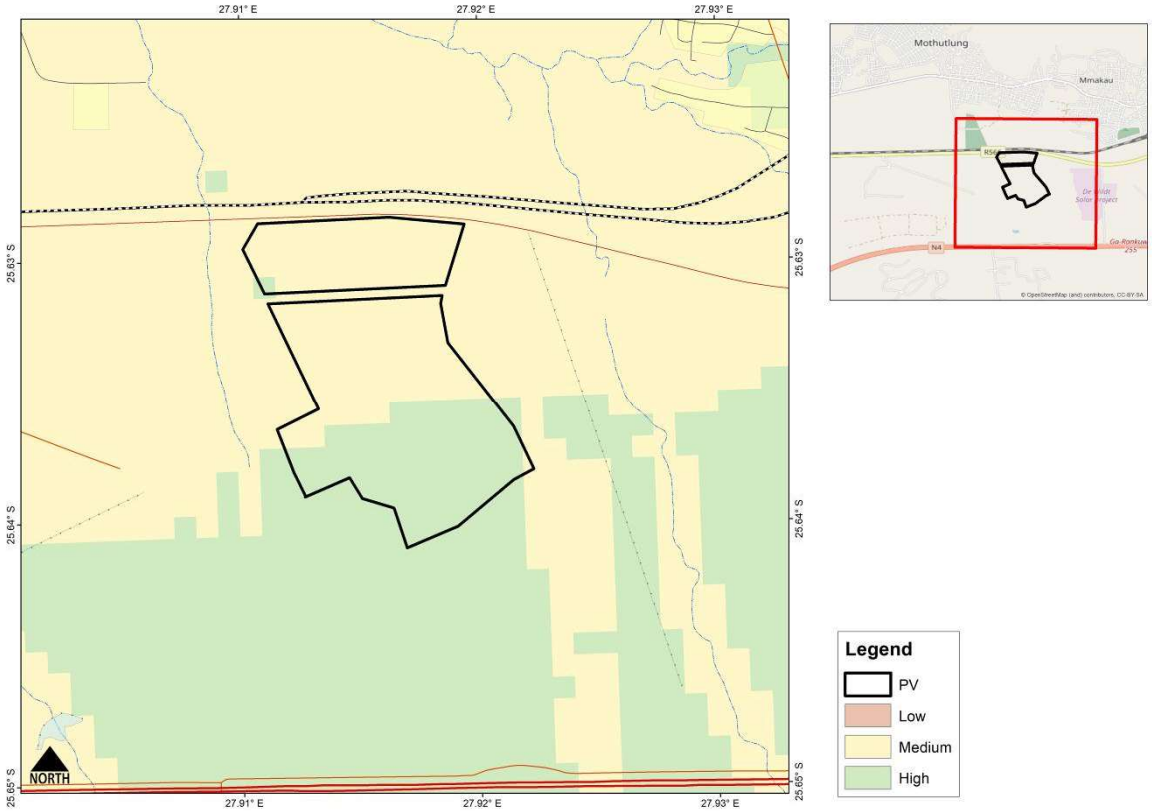


Figure 21: Land use capability (Index 2022).

The classic eight-class land capability system (Klingebiel & Montgomery, 1961) was adapted for use with Agriculture Geographic Information System (AGIS) in South Africa. Land capability is classified according to guidelines published by the National Department of Agriculture in AGIS.

Land capability is determined by the collective effects of soil, terrain and climate features and shows the most intensive long-term use of land for rain-fed agriculture. At the same time, it indicates the permanent limitations associated with the different land-use classes (Refer to ***Table 20***).

- Order A: Arable land – high potential land with few limitations (Classes i and ii)
- Order B: Arable land – moderate to severe limitations (Classes iii and iv)
- Order C: Grazing and forestry land (Classes v, vi and vii)
- Order D: Land not suitable for agriculture (Class viii)

Table 20. Land capability classes – intensity of land uses

LAND CAPABILITY			Wildlife	Grazing and Forestry			Crop production			
Order		Class		Forestry	Veld	Pastures	Limited	Moderate	Intensive	Very
Arable	A	i								
		ii								
	B	iii								
		iv								
Non arable	C	v								
		vi								
		vii								
	D	viii								

Note: the shaded area indicates the suitable land use

Table 21. Soil capability per category

			Hazard rating as per AGIS of DALRRD					
Soil type	Area (ha)	Land capability	Flood	Erosion	Depth	Texture	Drainage	Mechanical
Ar500	45,53	iv	0	0	3	3	2	0
Gs450/R	26,69	v	0	0	3	2	2	3
Sd600/R	8,66	iv	0	0	2	3	2	3
Sd500	18, 39	iii	0	0	2	3	2	1

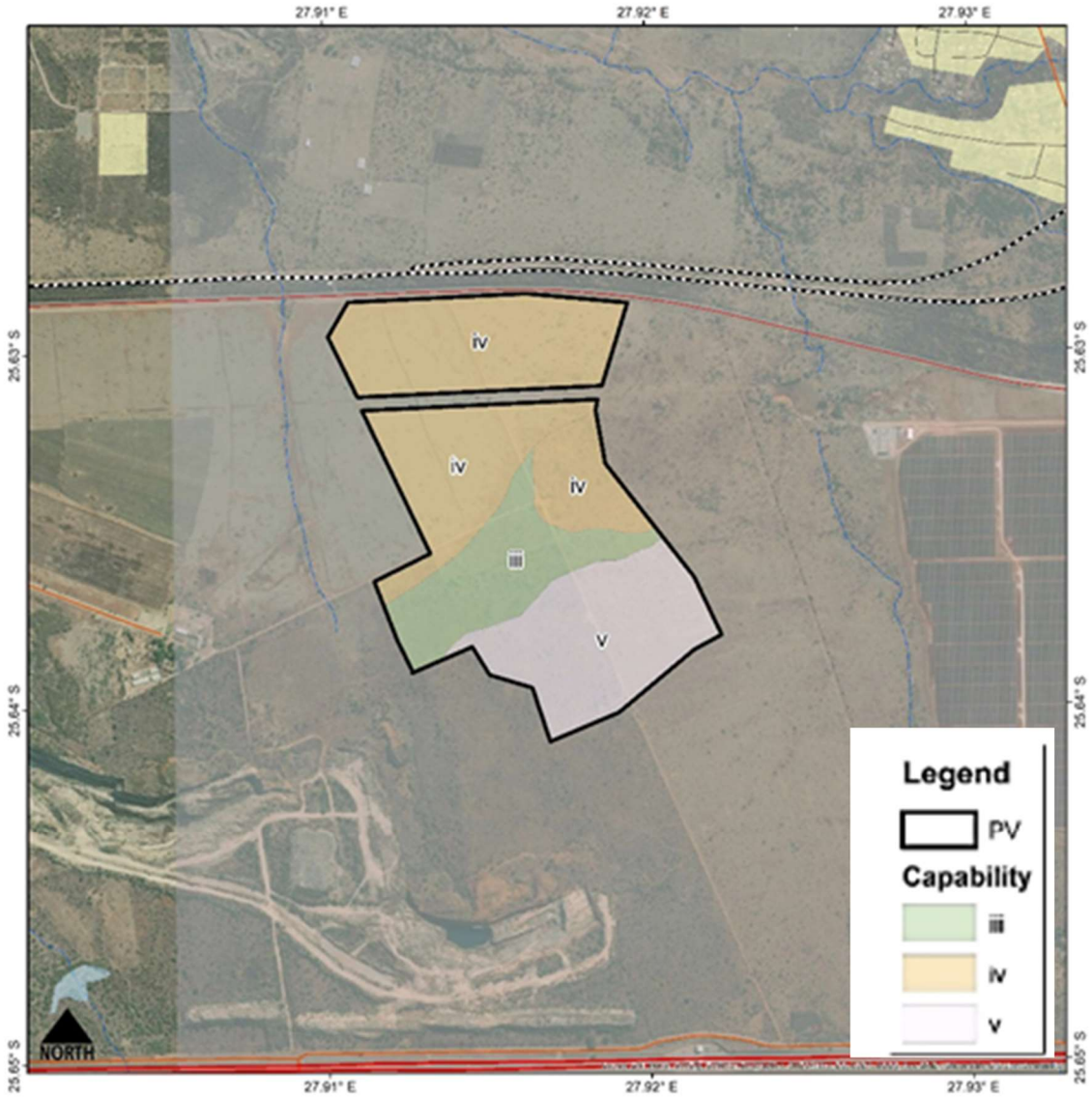


Figure 22. Land Capability for the PV Project Area (Index, 2022)

8.6.4 Impact of the EM PV Solar Project on the Soil, Agricultural Potential and Land

The analysis found that there is 19,4 ha high potential land of the PV Project Area that falls into Land Capability Class iii (Refer to ***Table 21***). The balance of the land is Class iv and poorer. The main constraints of Classes iv and v are soil texture and rock outcrops.

The PV Project Area is not used for farming purposes at present. There will be no loss of production. However, the land is suitable for grazing and a small portion for sunflower production. The extent of the arable land is small, and the impact was found to be acceptable. The Project Area is on low and medium sensitive land. The loss of agricultural resources is low. It is recommended that the EM PV Solar Project be approved for implementation by the Specialist.

8.7 LAND USE

Prior to mining activities, the PV Project Area was used mainly for growing sunflower crops. Currently the land is used for mining and mineral processing related processes, with areas of open veldt, agricultural lands and mining infrastructure. As noted above, the Plant Project Area was previously use for some agriculture and grazing, with areas disturbed by internal access roads. The EM PV Solar Project will be located within the existing EM Surface Area that has been fenced with access control (Refer to ***Figure 23*** for the EM Surface Infrastructure Plan).

Land surrounding the PV Project Area is mainly used for livestock grazing, agriculture, mining (Crocodile River Mine, Hernic Ferrochrome's Smelter and Mine, and granite mining further north); renewable power (De Wildt Solar Plant); and several community residential area and related activities. The Zilkaatsnek Eco-estate (mixed land-use development), small holdings and other businesses are located directly to the south (across the N4 highway), with several conservancy and protected areas further to south (i.e., Magaliesberg Biosphere Area, Peglerae Conservancy and De Wildt Cheetah Research Area, etc.) and resorts, such as the Tutuwedzo Lodge. Future land users also include the Q4 Filling Stations on Portions 41 and 21 of the Farm Schietfontein 437 JQ.

8.7.1 Impact of the EM PV Solar Project on the current and surrounding land-uses

The EM PV Solar Project will be located within the existing EM Surface Area, that has already been impacted by anthropogenic activities, such as mining and agricultural. The site infrastructure has to a large extent been established over the entire EM Surface Area. The EM is accessed by the R566 Provincial Road and the existing tarred and dirt roads on the EM Site.

The existing De Wildt Solar Plant is located directly east of the EM Surface Area and the EM PV Solar Project will therefore fit in with the surrounding land-uses. The Project will utilise a large section of land historically disturbed by crop production and land grazing, within the boundary of the EM Surface Area.

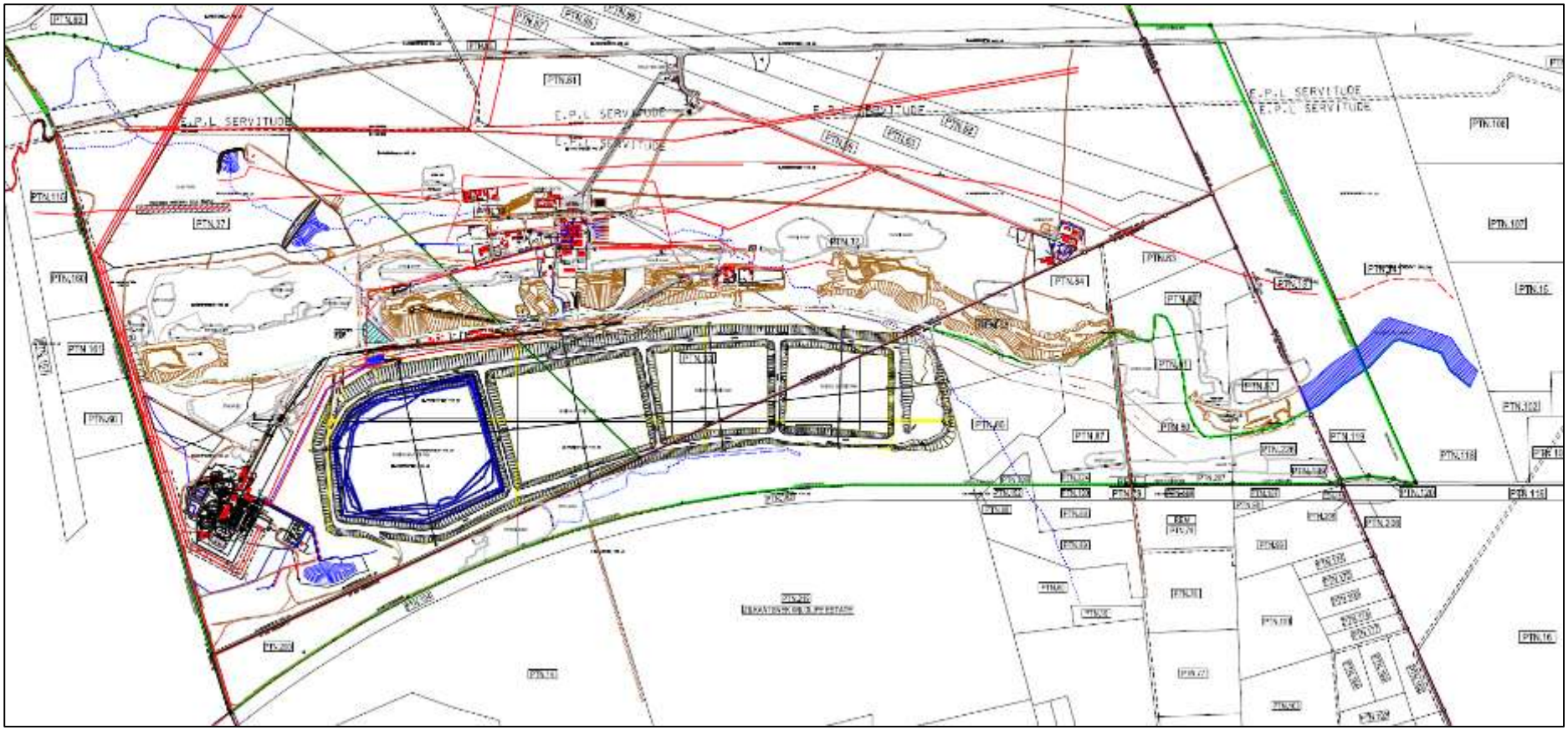


Figure 23: Surface Infrastructure Plan for EM

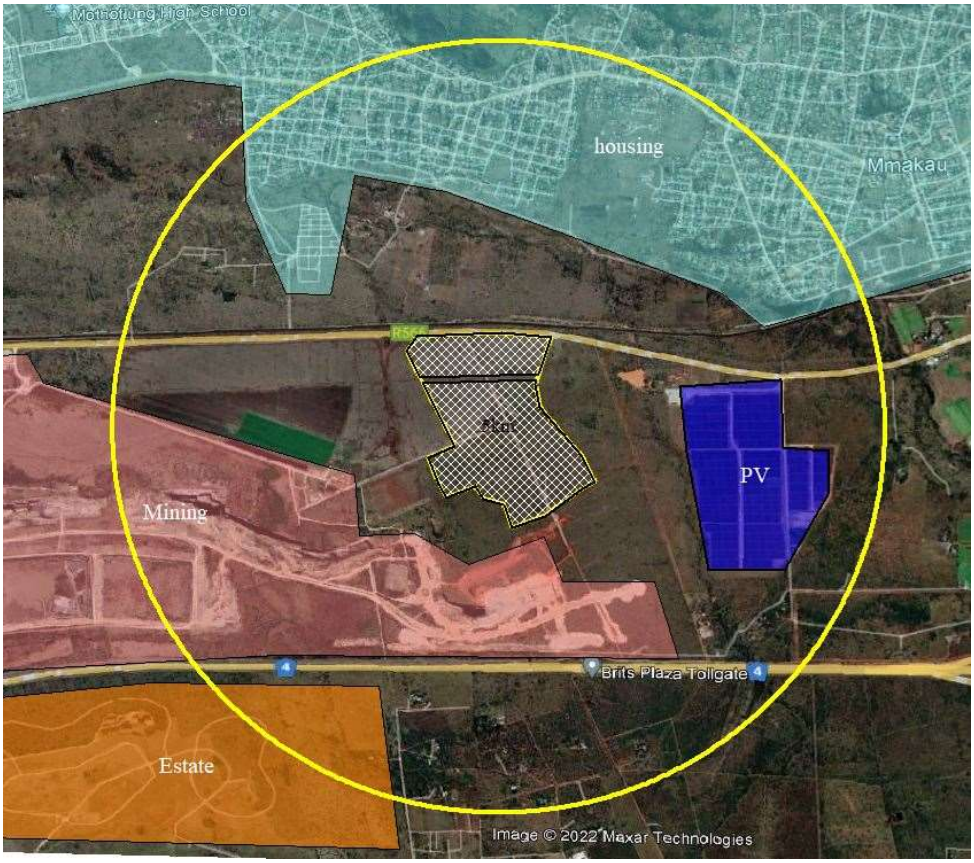


Figure 24: Regional Land-uses surrounding the PV Project Area (Index, 2022).

8.8 SURFACE WATER

The EM Surface Area falls within quaternary catchment A21J of the Crocodile River West Catchment, which is in the Limpopo Water Management Area (previously the Crocodile West Marico Water Management Area) (Highland Hydrology, 2018). Most of the drainage on the EM Surface Area is primarily by sheet flow in preferential storm water paths and mine-related stormwater control measures (Highland Hydrology, 2018). The general direction of flow across the EM Surface Area and its surrounding area occurs in a westerly direction.

Surface water quality in the region generally exhibits high levels of nitrate (Water Hunters, 2018), which are elevated above the recommended DWAF domestic use guidelines (DWAF Water Quality Guidelines, 1996). Water in the Crocodile River (the nearest perennial water source to the EM Surface Area) does not meet applicable irrigation standards for total dissolved solids and manganese concentrations (Water Hunters, 2018).

Surface water sampling is conducted by EM on set points in the non-perennial streams and watercourses surrounding the EM Consolidated MR Area. Sampling is undertaken monthly,

as required in other approvals and licenses held by EP. The sampling locations are illustrated on ***Figure 26.***

8.8.1 Impact of the EM PV Solar Project on the Surface Water

None of the PV Project Area is directly influenced by watercourses and wetlands. The PV Plant is located to the east of an existing ephemeral drainage area however, no infrastructure will be located within a 100m of the existing ephemeral drainage area. Stormwater management measures should be implemented to minimise erosion and sedimentation of downstream watercourses and infrastructure.

8.8.1.1 Stormwater Management

On the EM Consolidated MR Area, the GNR 704 stormwater management principles are ascribed; and an existing site-wide stormwater management plan ("**SWMP**") has been developed and implemented. Overall, the SWMP aims to minimise the dirty areas and to separate clean areas/run-off from mining impacted areas. The proposed EM PV Solar Project will be in a clean water area. Stormwater runoff must be correctly managed during all phases of the development, to reduce potential soil erosion and sedimentation. Special care needs to be taken during the construction phase to prevent surface stormwater containing sediments and other pollutants from being transported to the environmental. A SWMP should be developed once the layout plan has been finalised.

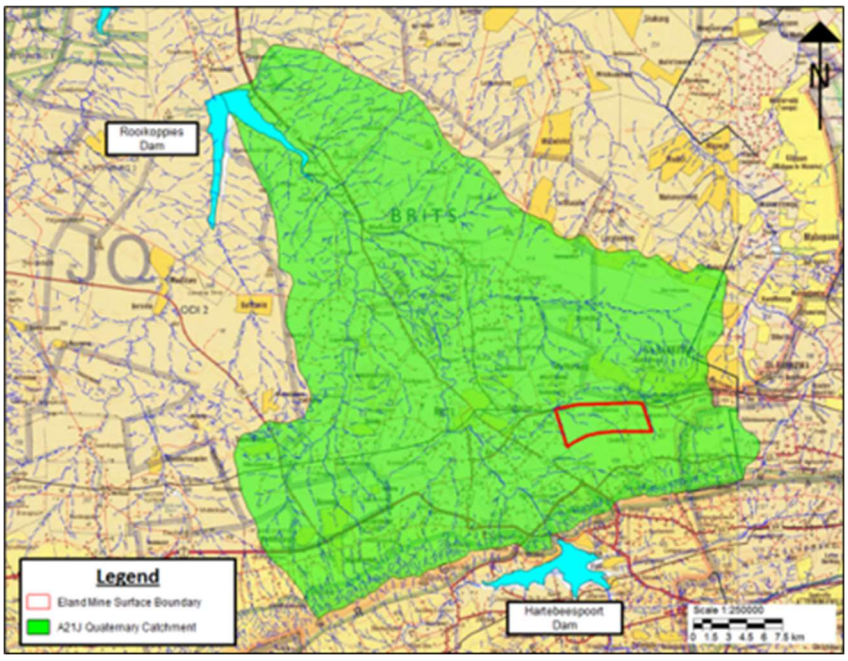


Figure 25: Location of the EM in relation to its catchment and receiving water bodies.

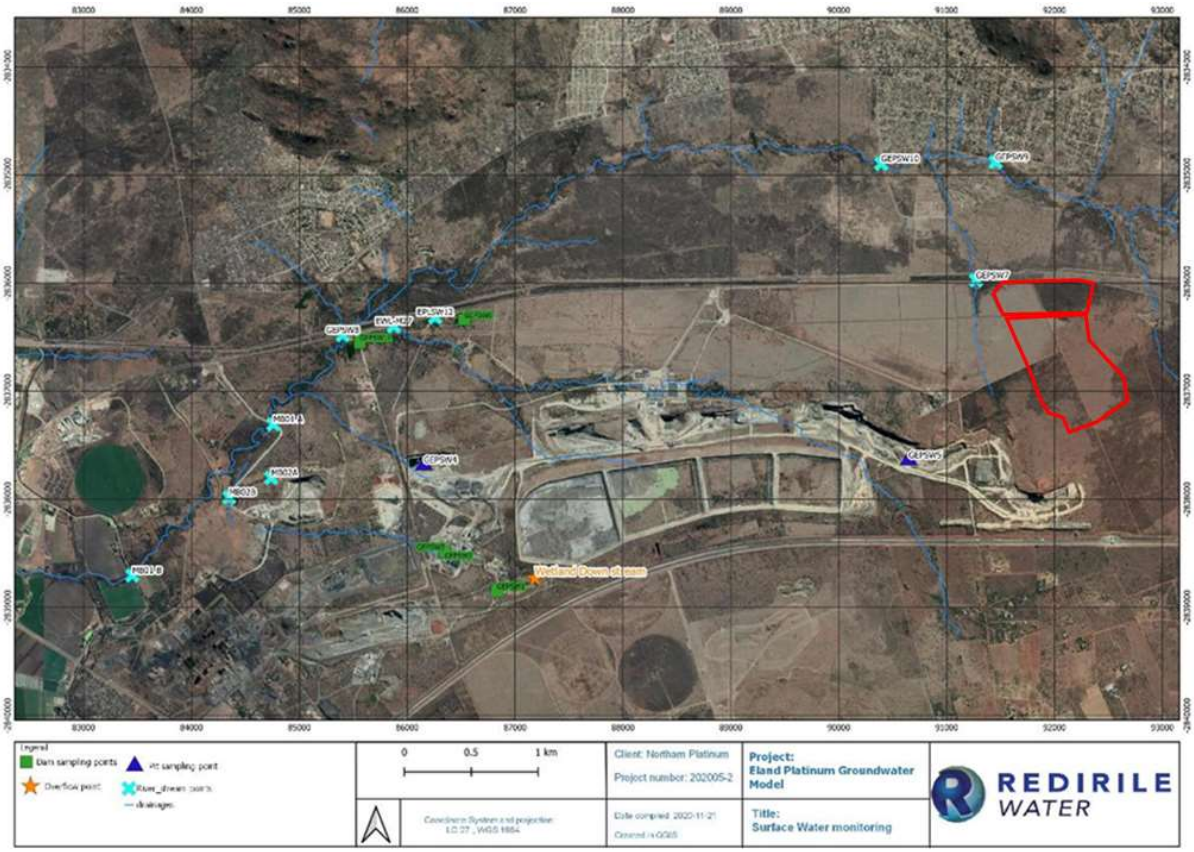


Figure 26: Aerial map of EM surface and process water monitoring localities (Redirile, 2021).

8.9 GEOHYDROLOGY

Groundwater is a valuable resource and is defined as water which is located beneath the ground surface in soil/rock pore spaces and in the fractures of lithological formations (Water Hunters, 2018). Groundwater in and surrounding the EM Surface Area and the EM PV Solar Project are used mainly for mining, domestic supply and agricultural irrigation.

8.9.1 Baseline Geohydrology for the EM Consolidated MR Area

8.9.1.1 Aquifer Classification

There are four aquifers present at the EM Consolidate MR area as detailed below (Water Hunters, 2018).

- The soil contains a layer of black turf clay in the uppermost horizons. The soil/alluvium layer is between 1 and 5m thick.

- The weathered zone of the gabbro, norite and anorthosite is overlain by hill wash and weathered quartzite from the Magalies Mountains, forming a semi-confined, shallow weathered zone aquifer between 5-30m.
- The weathered gabbro forms one of the low potential aquifers in the Area and it is underlain by solid and fractured bedrock.
- Fault zones in the weathered/fractured gabbro formations form preferential pathways for groundwater flow and there are two distinctive faults.

The aquifer beneath the EM Consolidated MR Area would classify as a Minor Aquifer (Parsons, 1995), due to the general yields of less than 2.5 l/s (Water Hunters, 2018). The fractured systems could form Major Aquifer zones within the larger Minor Aquifers. Refer to ***Figure 28*** below indicating the geological features of the EM Surface Area, including the surrounding boreholes***.***

8.9.1.2 Water Strike Depth

Based on drilling undertaken at the mine, records of water strikes were available from 10 boreholes drilled (ELW1-ELW10). The water strikes depths range from 16 – 185 mbgl.

8.9.1.3 Hydrocensus

A hydrocensus was carried out around the EM Consolidated MR Area in July 2020. Its aim was to identify groundwater boreholes, other than the monitoring boreholes, and inform the current groundwater conditions around the EM Consolidated MR Area (Redirile, 2020). From the 70 sites visited, a total of 27 groundwater levels were recorded, refer to ***Figure 29***. 16 boreholes were found equipped with submersible pumps and reported yields varying between 0.5 and 5 L/s.

8.9.1.4 Flow direction

The general groundwater flow direction is north-west, towards the major drainages and is driven by topography. Based on the available information, the mining activities i.e., opencast and underground mining, have little to no regional impact on groundwater levels in the shallow aquifer. Abstraction boreholes influence neighbouring boreholes for a limited period i.e., while abstraction occurs, however, this impact is mitigated once pumping ceases and water levels indicate a quick recovery.

8.9.1.5 Water Quality

A Piper plot is a trilinear plot, where the hydro-chemical composition of water samples is evaluated, determining the ratios of predominant cations and anions. The plot is divided into water facies depicting the dominant ratios. The calcium-magnesium-bicarbonate (left quarter)

of the Piper diagram is normally characterized by recently recharged water. The sodium-bicarbonate (bottom quarter) is typical of flow within the aquifer, with the sodium replacing the calcium and magnesium in solution. The sodium-chloride dominant (right quarter) is associated with stagnant or slow-moving groundwater, with little or no recharge. The sulphate dominant (top quarter) is typical of water impacted by the oxidation of pyrite, or other sulphate bearing sources.

The Piper diagram in ***Figure 27*** indicates that the local groundwater regime exhibits unaffected groundwater qualities. The diagram indicates that most of the boreholes plot within the calcium-magnesium-bicarbonate waters, indicating recently recharged water.

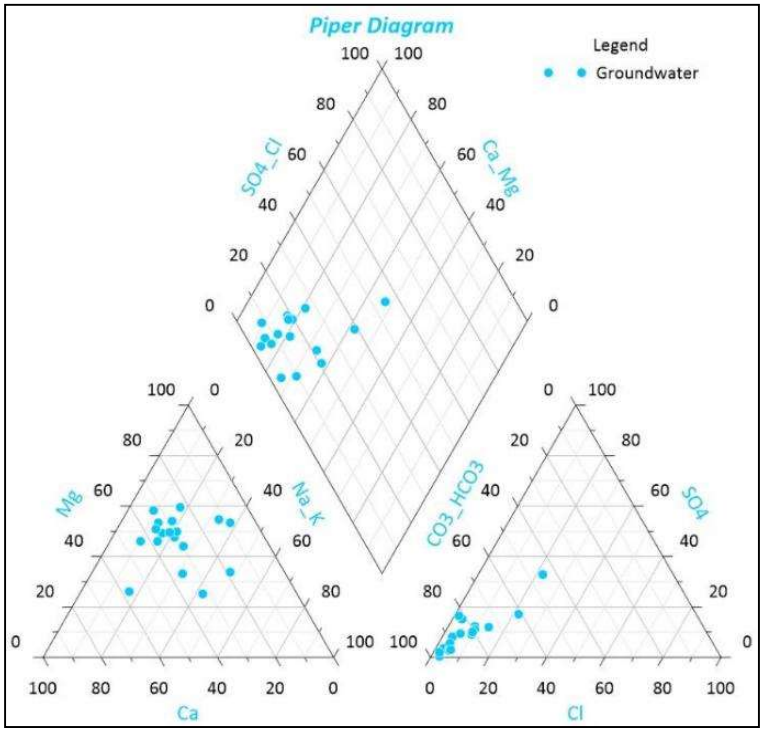


Figure 27: Piper Diagram for groundwater water based on May 2020 results (Redirile, 2021).

8.9.2 Impact of the EM PV Solar Project on the Geohydrology

The EM PV Solar Project will have little to no impact on the groundwater quality of the area. Due diligence needs to be applied during the construction and operational phase where chemicals, paints and hydrocarbons will be stored and utilised, refer to the EMPr for the mitigation measures.

EM has an extensive groundwater monitoring network. Any reduced groundwater quality is actively identified through the groundwater monitoring programme. Groundwater quality, levels and abstraction volumes are monitored quarterly, with information available from 2016 to present. A total of 30 monitoring boreholes exist, refer to ***Figure 30***.

It is proposed that a standalone borehole for the EM PV Solar Project will be drilled and utilised for construction and operational purposes. A General Authorisation (GA) will likely be applicable in terms of Section 39 of the NWA, 1998 for water abstraction and will need to be registered with the DHWS. During the construction phase water will be required for consumption and services; and dust suppression on the roads and within the construction area. An estimated 1 600 m^3 will be required for the construction phase. Water will be recycled/treated where possible.

The PV panels will require regular cleaning and maintenance activities (at least quarterly), to ensure optimal operation and generation of electricity. EP will implement environmentally friendly dry-cleaning methods, if possible and available, or use water to clean the panels. Dirty water will be re-used as far as possible. During the operational phase (minimum of 25 years) approximately 1 600m^3/annum of water will be used annually for the cleaning of panels; road maintenance, ablution and general employee usage.

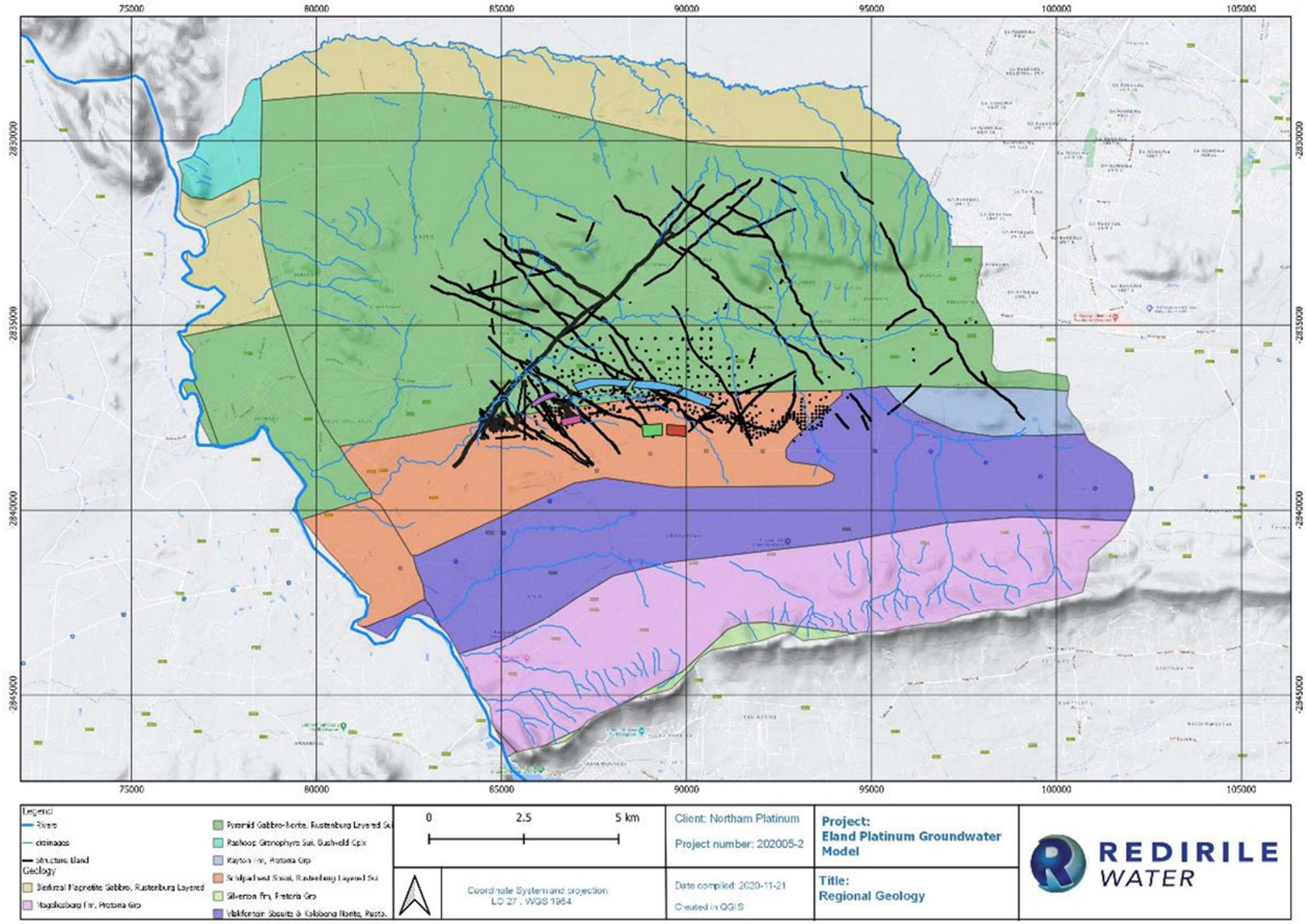


Figure 28: Geology and the surrounding boreholes (Redirile, 2021).

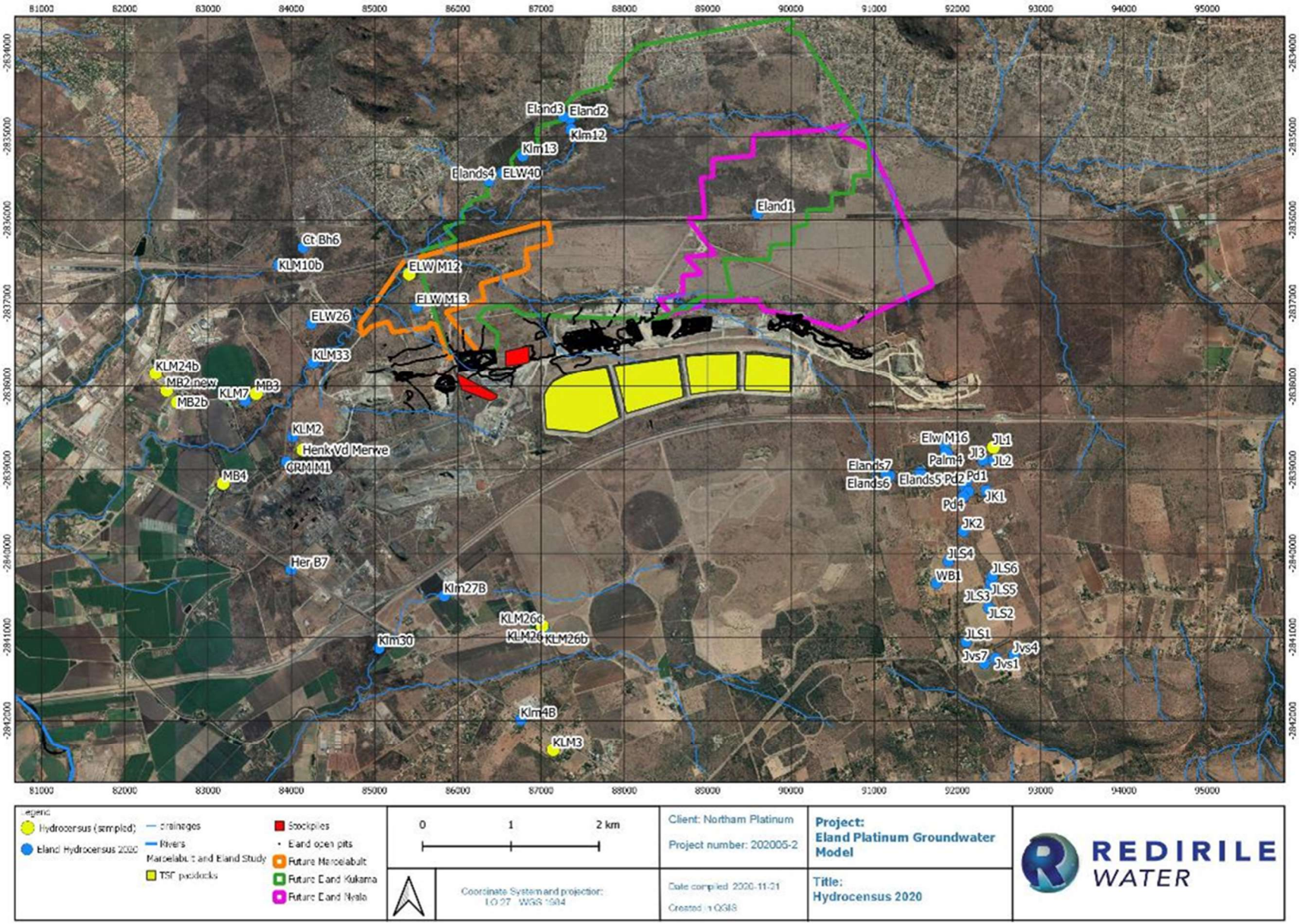


Figure 29: Hydrocensus data July 2020 (Redirile, 2021).

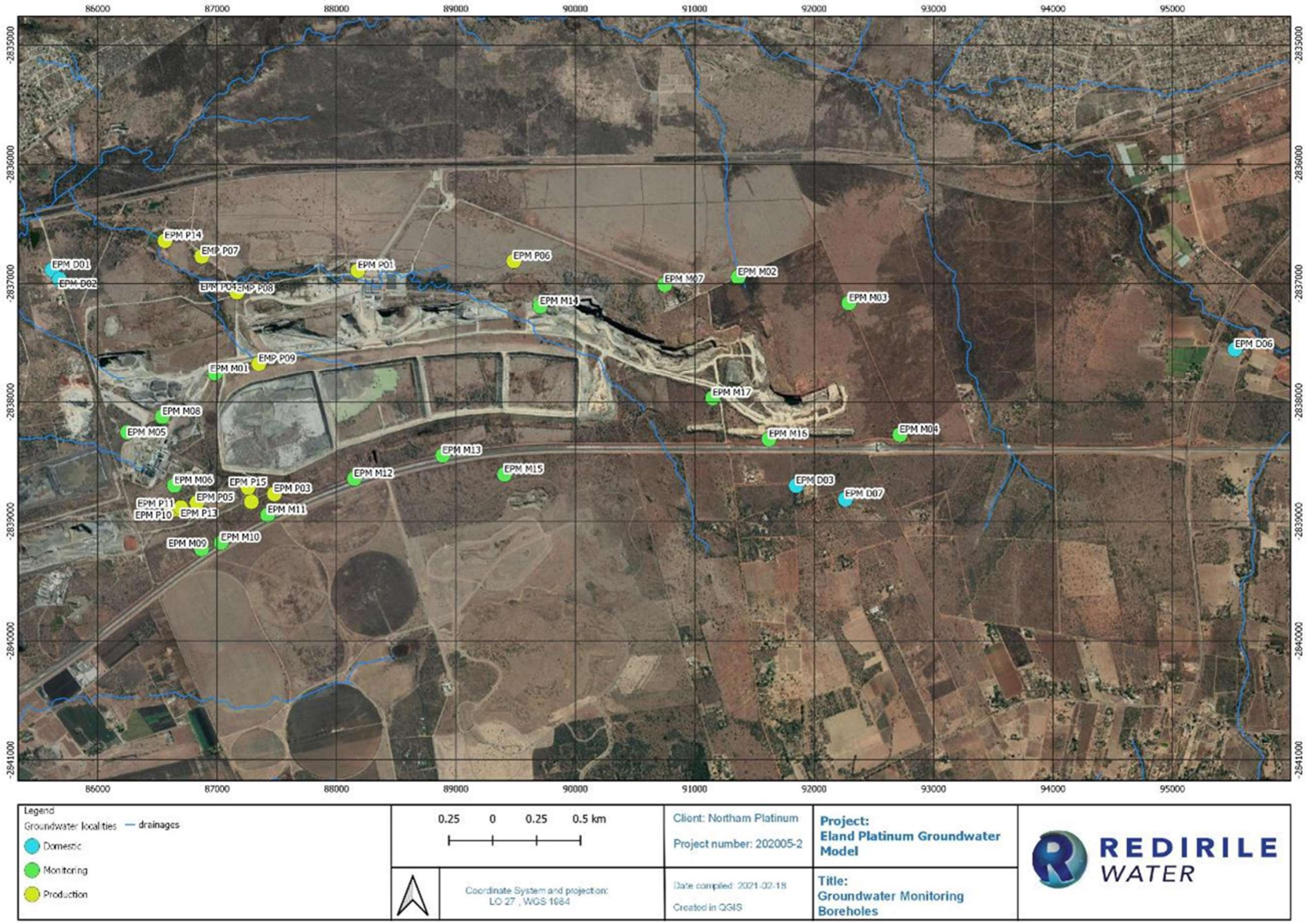


Figure 30: Location of monitoring boreholes (Redirile, 2021).

8.10 ECOLOGY

STS Environmental was appointed to undertake a Terrestrial (Fauna and Flora) and Avifauna Assessment (Refer to ***Appendix 12 and 13***).

The PV Project Area is located within the Savanna Biome and is depicted in ***Figure 31*** below (Rutherford & Westfall, 1994 and Mucina & Rutherford, 2006). The Savanna Biome is regarded as the spatially largest biome in South Africa, comprising some 32.5% of the country (Rutherford & Westfall, 1994). According to Mucina & Rutherford (2006), the Project Area falls in the Marikana thornveld and the Moot Plain Bushveld biome.

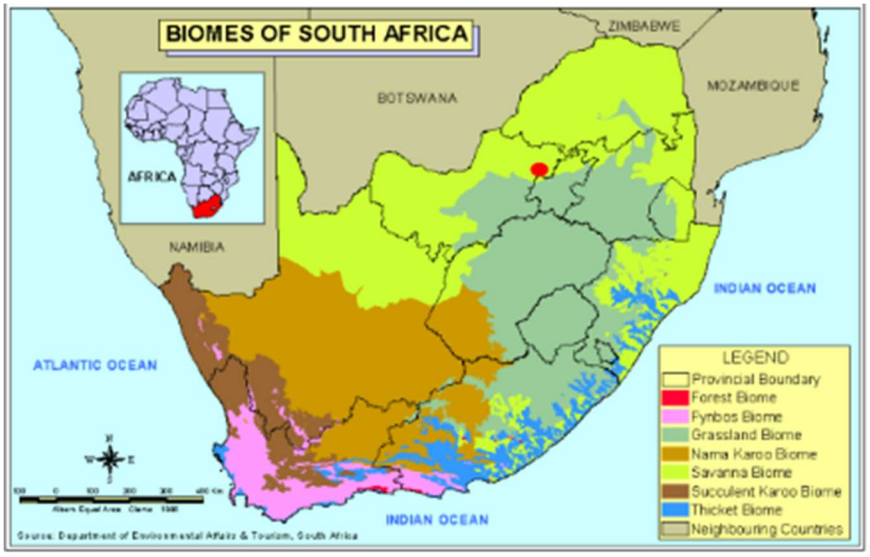


Figure 31: Biomes associated with the PV Project Area.

Table 22 contains data accessed as part of the desktop assessment. It is important to note, that although all data sources used provide useful and often verifiable high-quality data, the various databases do not always provide an entirely accurate indication of the EM Surface Area's actual biodiversity characteristics.

Table 22: Summary of the conservation characteristics for the EM PV Solar Project area within the wider EM Surface Area (SAS Environmental, 2018).

DETAILS OF THE PROJECT AREA IN TERMS OF THE VEGMAP PROJECT (SANBI, 2018A)		DESCRIPTION OF THE VEGETATION TYPE RELEVANT TO THE PROJECT AREA					
Biome	The Project Area is situated within the **Savanna Biome.**	**Vegetation Type**	Marikana Thornveld				
Bioregion	The Project Area is located within the **Central Bushveld Bioregion**	**Climate**	Summer rainfall with very dry winters				
Vegetation Type	The Project Area is situated within the **Marikana Thornveld**		**MAP* (mm)**	**MASMS*(%)**	**MAT* (°C)**	**MFD* (Days)**	**MAPE*(mm)**
Altitude (m)	1050 – 1450		682	76	19.4	21	2284
Distribution	North-West and Gauteng Provinces	**Conservation**	Endangered. Target 19%. Less than 1% statutorily conserved in, for example, Magaliesberg Nature Area. More conserved in addition in other reserves, mainly in De Onderstepoort Nature Reserve. Considerably impacted, with 48% transformed, mainly cultivated and urban or built-up areas. Most agricultural development of this unit is in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is a greater threat of land transformation. Erosion is very low to moderate. AIPs occur localised in high densities, especially along the drainage lines.				
Vegetation & landscape features	Open *Vachellia karroo* woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire.						
CONSERVATION DETAILS PERTAINING TO THE PROJECT AREA (VARIOUS DATABASES)							
National Biodiversity Assessment (2018)	The EM Surface Area falls within an endangered ("**EN**") vegetation type (Marikana Thornveld) that is currently poorly protected ("**PP**"); however, according to the 2018 database, scattered sections throughout the Area no longer occur in the remaining extent of the EN Marikana Thornveld.[3]						
National Threatened Ecosystems (2011)[4]	Most of the EM Surface Area no longer occurs in the remaining extent of the vulnerable ("**VU"**) Marikana Thornveld Ecosystem. More specifically, the southern section of the PV Project Area and sections of the Option 2 OHL occur in the VU ecosystem. The Option 1 OHL and the northern section of the PV Project Area is outside of the remaining extent. Much of the VU Marikana Thornveld Ecosystem is currently transformed due to mining activities. The NEMBA provides for listing threatened or protected ecosystems, in one of four categories: critically endangered ("**CR**"), EN, VU or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function, and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value. Note: The National List of Threatened Terrestrial Ecosystems published in terms of the NEMBA in 2011 remains in legal force. The data contained in NBA 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.						
SAPAD (2021_Q4)5; SACAD (2021_Q4)6; NPAES (2010)	The SAPAD (2021) and NPAES (2010) databases indicate that the Magaliesberg Protected Natural Environment ("**MPNE**") is situated within 3km south of the EM Surface Area both the SAPAD and NPAES indicate the same extent for the MPNE. SAPAD (2021) additionally indicates the Hartbeespoort Dam Nature Reserve to be located within 5km south-west of the Area and the M'Nandi Private Nature Reserve within 3km east of the EM Surface Area. According to SACAD, the EM Surface Area is in the north-eastern extent of the Magaliesberg Biosphere Reserve, the extent of which largely overlaps with the Magaliesberg Important Bird and Biodiversity Area ("**IBA**"), as discussed in the next row. The Magaliesberg Biosphere Management Plan indicates that the Area is in the transitional area of the biosphere reserve. "Biosphere zones						

[3] Ecosystem types are categorised as "not protected", "poorly protected", "moderately protected" and "well protected" based on the proportion of each ecosystem type that occurs within a protected area recognised in the NEMPAA; and compared with the biodiversity target for that ecosystem type. The ecosystem protection level status is assigned using the following criteria:

i. If an ecosystem type has more than 100% of its biodiversity target protected in a formal protected area either A or B, it is classified as Well Protected;
ii. When less than 100% of the biodiversity target is met in formal A or B protected areas, it is classified it as Moderately Protected;
iii. If less than 50% of the biodiversity target is met, it is classified it as Poorly Protected; and
iv. If less than 5% it is Hardly Protected.

[4] Note: The National List of Threatened Terrestrial Ecosystems published in terms of the NEMBA in 2011 remains in legal force. The data contained in NBA 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.

[5] **SACAD (2021):** The types of conservation areas that are currently included in the database are the following: 1. Biosphere reserves, 2. Ramsar sites, 3. Stewardship agreements (other than nature reserves and protected environments), 4. Botanical gardens, 5. Transfrontier conservation areas, 6. Transfrontier parks, 7. Military conservation areas and 8. Conservancies.

[6] **SAPAD (2021):** The definition of protected areas follows the definition of a protected area in the NEMPAA. Chapter 2 of the NEMPAA sets out the "System of Protected Areas", which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1 - 4 declared in terms of the NEMPAA); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the NFA; and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

	are an attempt to reduce conflicts arising between conservation and development. There are opportunities for conservation and sustainable development that may help mitigate the vulnerability of the biodiversity and marginalised communities within the biosphere.
IBA (2015)	The PV Project Area is located within the Magaliesberg IBA. The most important trigger species in the IBA is the globally threatened Cape Vulture. The number of breeding pairs in the Skeerpoort colony seems to be stable at 200 – 250. The Secretarybird (*Sagittarius serpentarius*) is the other globally threatened species in the IBA. Regionally threatened species are Lanner Falcon (*Falco biarmicus*), Half-collared Kingfisher (*Alcedo semitorquata*), African Grass Owl (*Tyto capensis*), African Finfoot (*Podica senegalensis*) and Verreauxs' Eagle (*Aquila verreauxii*).
Strategic Water Source Areas for Surface Water (2017)	The EM Surface Area is not within 10 km of a Strategic Water Source Area.
NORTH WEST BIODIVERSITY SECTOR PLAN (NWBSP, 2015)	
Critical Biodiversity Area (CBA) 2	The southern and eastern extents of the PV Project Area are in a CBA 2. Scattered, smaller sections of both Option 1 and Option 2 of the proposed OHL also occur in the CBA 2. CBAs are terrestrial or aquatic areas of the landscape that need to be maintained in a natural or near natural state, to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. The CBA 2 within the s EM Surface Area is important habitat within the Focus Wildlife Areas category. as it is an IBA (Magaliesberg IBA) in a natural state. It further forms part of the 5km Protected Areas buffer for the Hartbeespoort Dam Nature Reserve and the M'Nandi Private Nature Reserve.
Ecological Support Area (ESA) 1 & 2	Scattered sections of the proposed Option 1 and 2 OHLs are within an ESA 1 and ESA 2. The PV Project Area (A and B) are only within an ESA 2 (western extent of the Project Area). ESAs are terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which nevertheless play an important role in supporting the ecological functioning of CBAs and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The ESA 1 within the EM Surface Area is identified as an IBA (corresponds with the Magaliesberg Important Bird and Biodiversity Area). The ESA 2 areas form part of the 5km Protected Areas buffer that is not natural, with the north-eastern patches considered biodiversity corridors consisting of cultivated areas.

MAT = Mean annual temperature; MAPE = Mean annual potential evaporation; MFD = Mean Frost Days; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply).

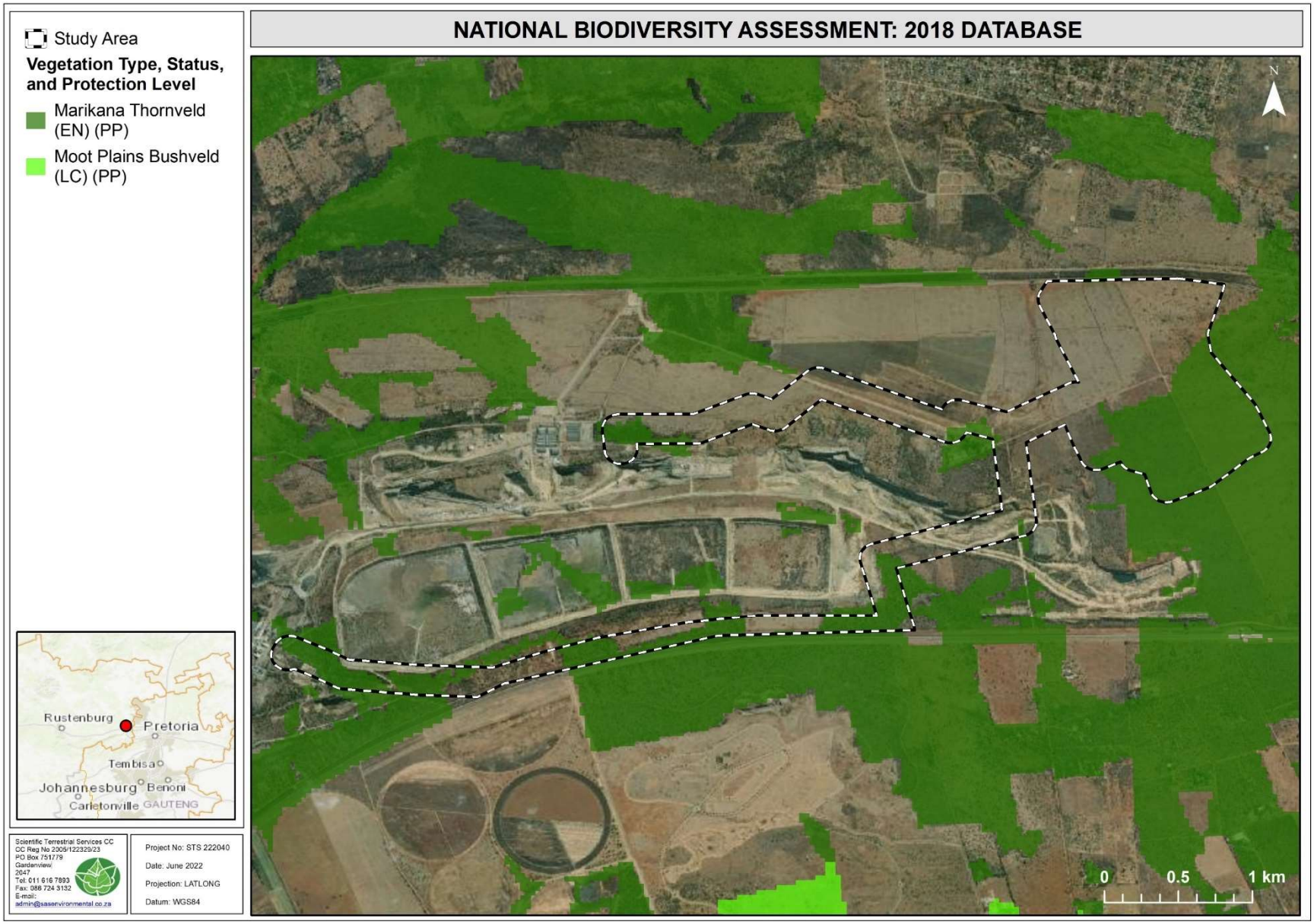


Figure 32: The EM Surface Area in relation to the remaining extent of the Marikana Thornveld Terrestrial Ecosystem (EN), according to the National Biodiversity Assessment (NBA, 2018).

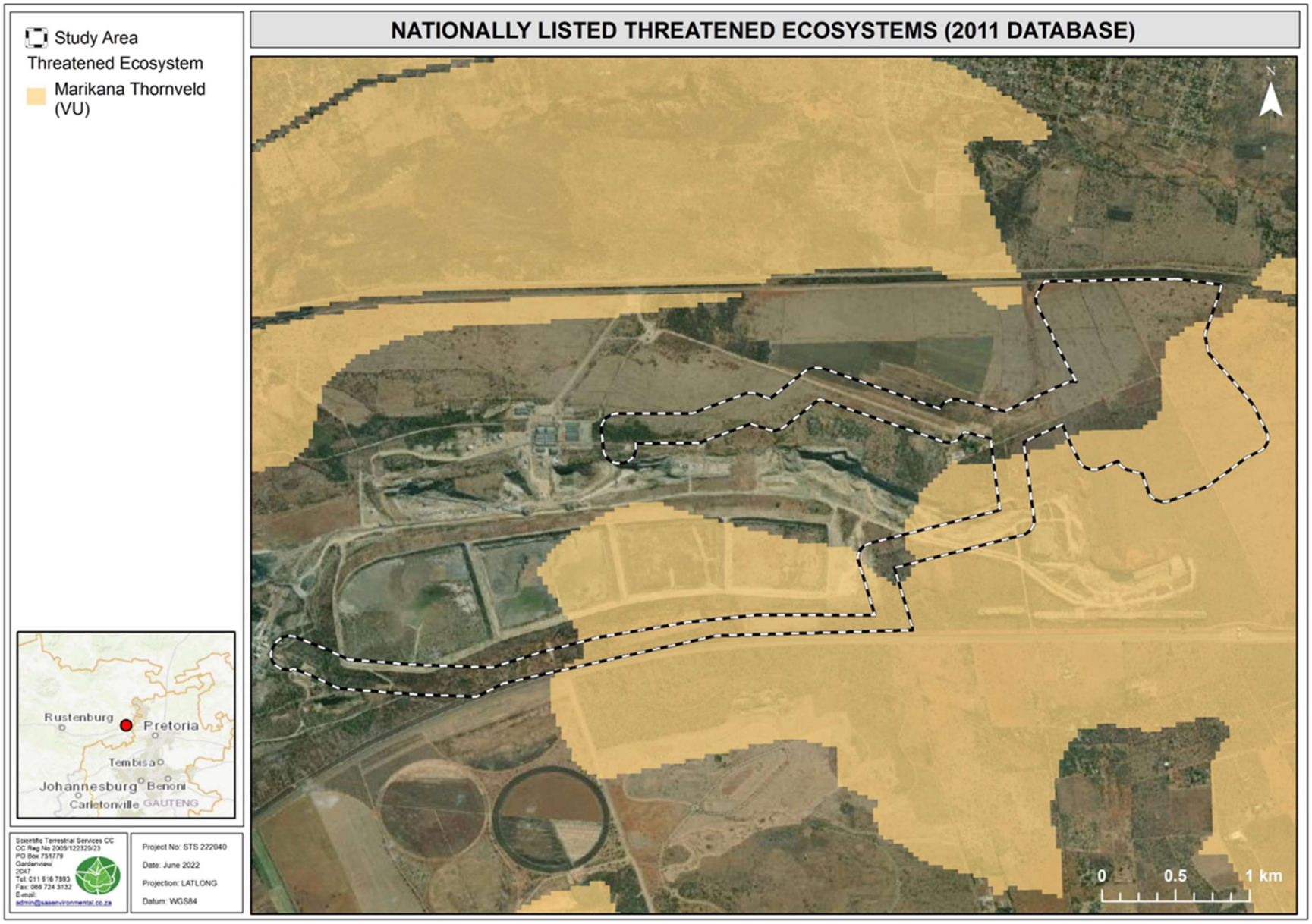


Figure 33: The remaining extent of the VU Marikana Thornveld terrestrial ecosystem in relation to the EM Surface Area (National Threatened Ecosystems, 2011).

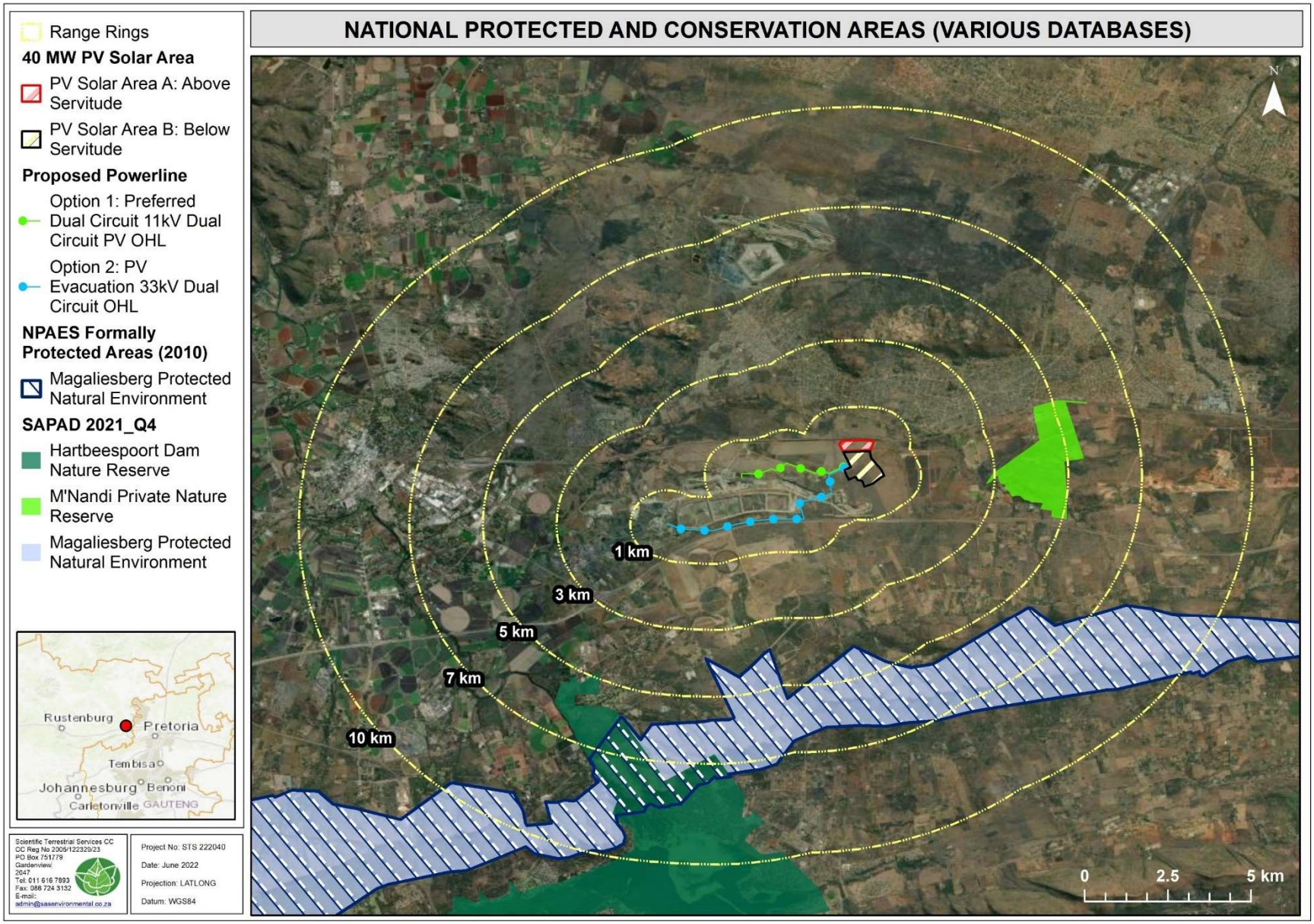


Figure 34: The nationally protected areas within a 10km radius of the EM Surface Area (various datasets).

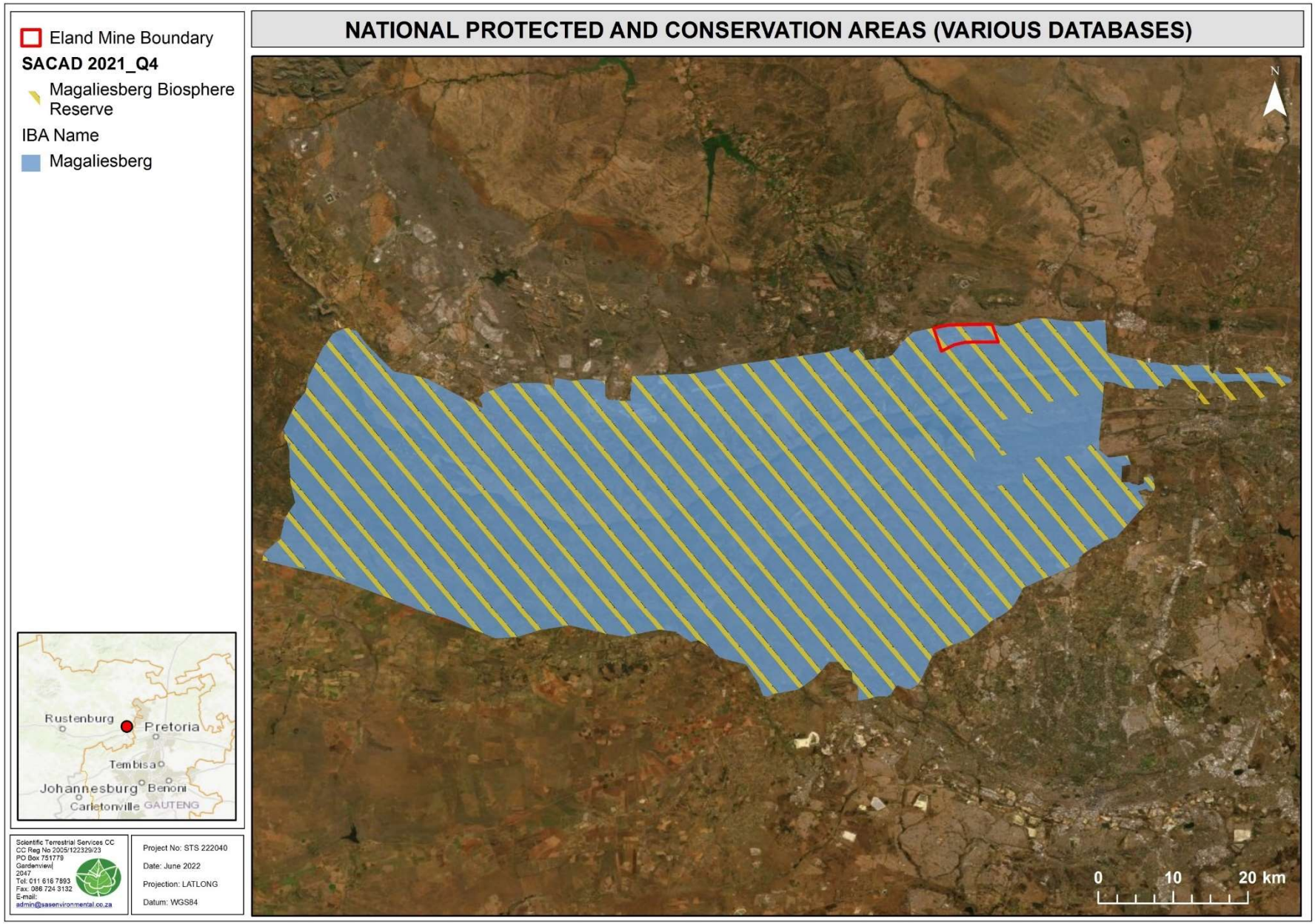


Figure 35: National conservation areas associated with the EM Surface Area (various databases).

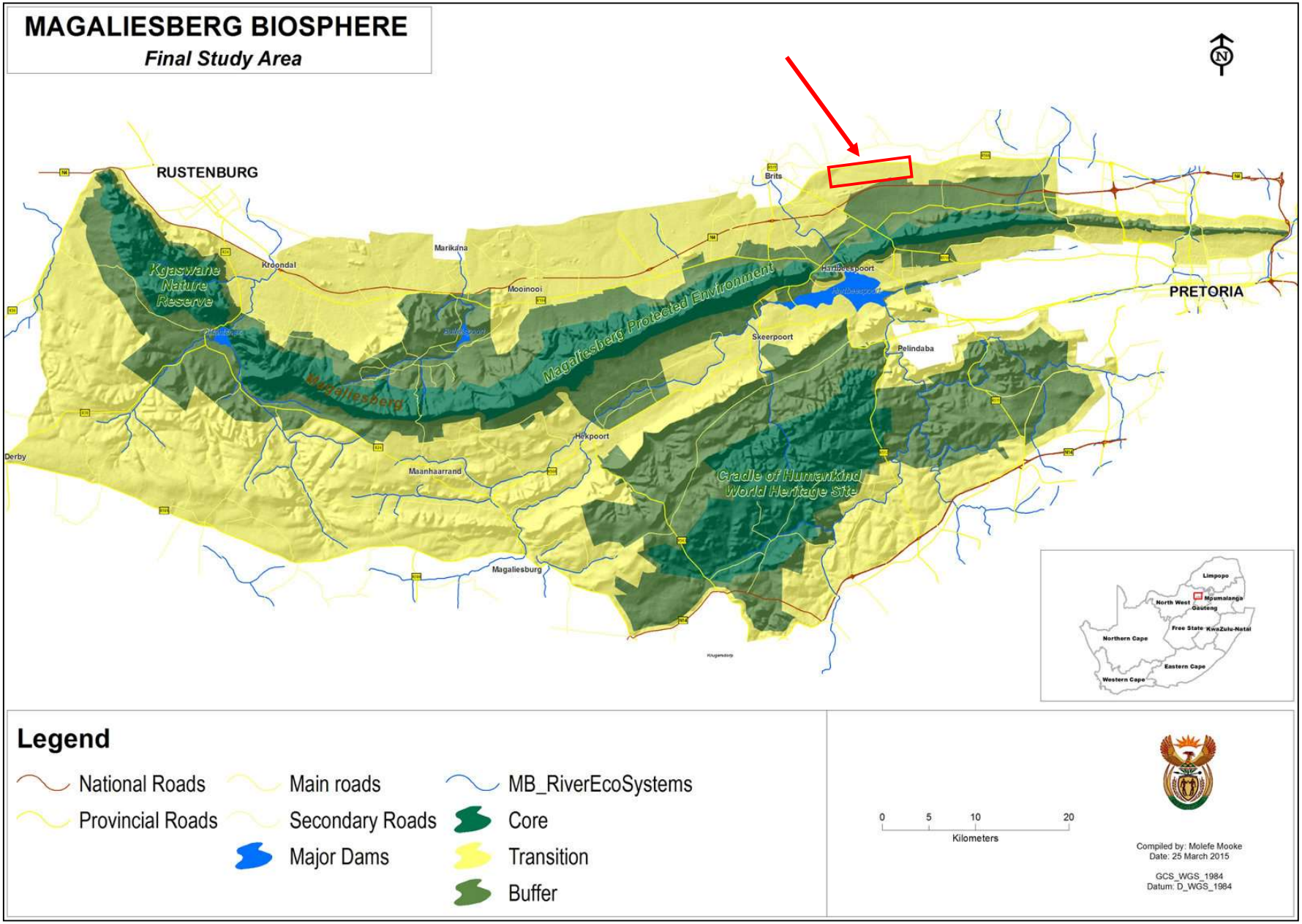


Figure 36: Core areas of the Magaliesberg Biosphere Reserve. The approximate locality of the EM Surface Area is indicated by the red block.

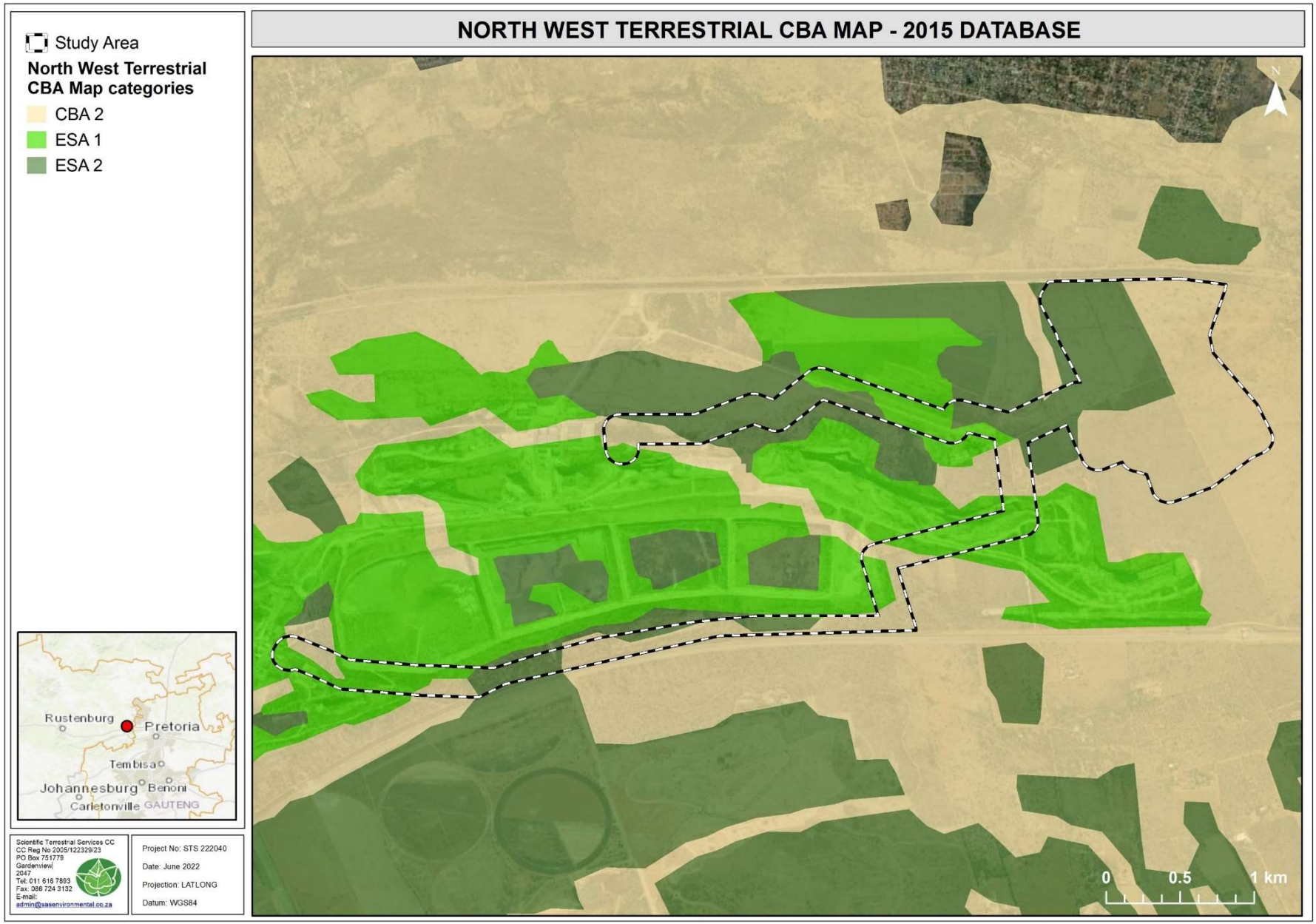


Figure 37: The EM Surface Area in relation to the North West Terrestrial CBA Map categories (2015 dataset).

8.10.1 Terrestrial Biodiversity

8.10.2 Flora

The EM PV Solar Project is located within the Marikana Thornveld, i.e., the reference vegetation type. The Marikana Thornveld is listed as endangered (EN) in Mucina and Rutherford (2006) and in the updated 2018 Vegetation Map of South Africa, Lesotho, and Swaziland (SANBI, 2018a).

Mucina and Rutherford (2006) describe the Marikana Thornveld as having *"...open Vachellia karroo woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire*".

8.10.2.1 Vegetation characteristics

Following the field assessments, four broad habitat units and eight finer-scale habitat units could be distinguished for the PV Project Area (***Figure 38*** and ***Figure 39***). The habitat units were determined based on species composition (including habitat suitable for floral SCC, vegetation structure, ecological function, biophysical environment, and habitat condition.

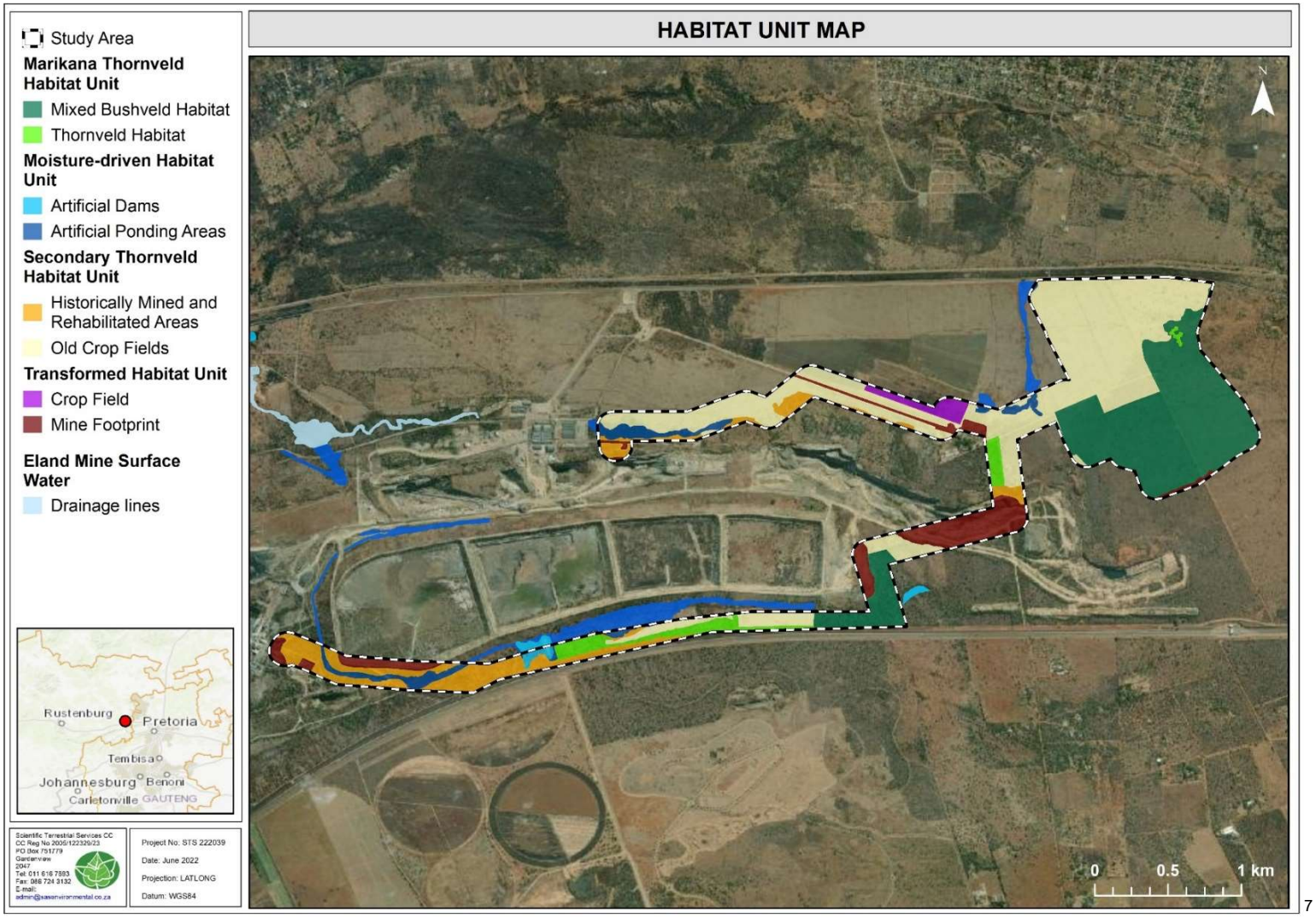
The four broad habitat units include:

1) Marikana Thornveld Habitat Unit (100 ha): This habitat unit includes sections within the EM Surface Area where vegetation has not been modified historically by mining or agricultural activities (as is the case for much of the habitat in the PV Project Area). As such, the Marikana Thornveld Habitat Unit conforms to the definition of "indigenous vegetation" as per the NEMA Listing Notices. Within this habitat unit, two finer scale subunits could be discerned, namely the microphyllous Thornveld Habitat (11 ha) (occurring in small patches in the PV Project Area) and the Mixed Bushveld Habitat (89 ha) (where the woody species composition includes a higher diversity of broad-leaf species than the Thornveld Habitat). The Thornveld Habitat and the Mixed Bushveld Habitat are also distinguished from each other based on differences in soil characteristics;
2) Moisture-driven Habitat Unit (12.3 ha): This habitat unit includes non-watercourse habitat that is of an artificial nature and thus not considered a true watercourse, as defined in the NWA. This habitat unit is associated with surface water areas; however, surface water in the Option 2 OHL corridor (southern extent of the PV Project Area) is no longer present, due to the source of water (i.e., pumping and discharging of groundwater from the underground mining areas) being removed. For the purposes of this report, the Moisture-driven Habitat is discussed as the Artificial Dams (1.3 ha) and

Artificial Ponding Areas (11 ha). Despite no longer being associated with surface water in all areas, the resulting vegetation communities are still indicative of ponding areas (e.g., in terms of species composition).

3. Secondary Thornveld Habitat Unit: These areas include two finer scale units, namely Old Crop Fields (125 ha) and the Historic Mine Footprint (35 ha). The key difference between these areas and the Transformed Habitat Unit (described in the next bullet point), is that the areas associated with the Secondary Thornveld Habitat Unit are no longer being used for mining or agriculture. These areas have been re-vegetated as part of rehabilitation efforts and are at varying stages of recovery; however, the recovered vegetation communities do not resemble the neighbouring natural vegetation nor the reference Marikana Thornveld vegetation type. The Old Crop Fields have been left uncultivated for more than 10 years and conform to the definition of "indigenous vegetation", as per the NEMA Listing Notices; and
4. Transformed Habitat Unit (34 ha): These areas include all currently built-up or transformed areas. Two finer-scale habitat units fall in this category, namely the Mine Footprint (29 ha) and an existing Crop Field (5 ha).

Much of the natural habitat in the western and southern extent of the PV Project Area, i.e., the Marikana Thornveld, Old Crop Fields, and Moisture-driven Habitat Units associated with the Option 2 OHL, is fragmented, and patchily distributed in-between the Transformed Habitat Unit. Within this assessed Option 2 OHL corridor, limited natural ecological corridors persist and much of the key ecological processes required to maintain savanna ecosystems, such as fire and grazing, have been altered over the years, resulting in a change in species composition and compromised habitat connectivity. Fire, for example, is not permitted in areas close to mining operations, and wildlife to maintain grazing drivers are almost entirely absent in this section of the PV Project Area. The habitat(s) associated with the Option 1 OHL and the proposed PV Project Area A & B, are less fragmented. Modified ecological processes persist in these sections of the PV Project Area, where herbivory from wildlife is reduced (but not absent), and fire regimes altered (but not absent).



[7]

Figure 38: Conceptual illustration of the refined habitat units associated with the PV Project Area.

[7] The Moisture-driven Habitat and additional drainage lines that extend beyond the PV Project Area and that have been identified within the greater EM Consolidated MR Area are also depicted on the maps.

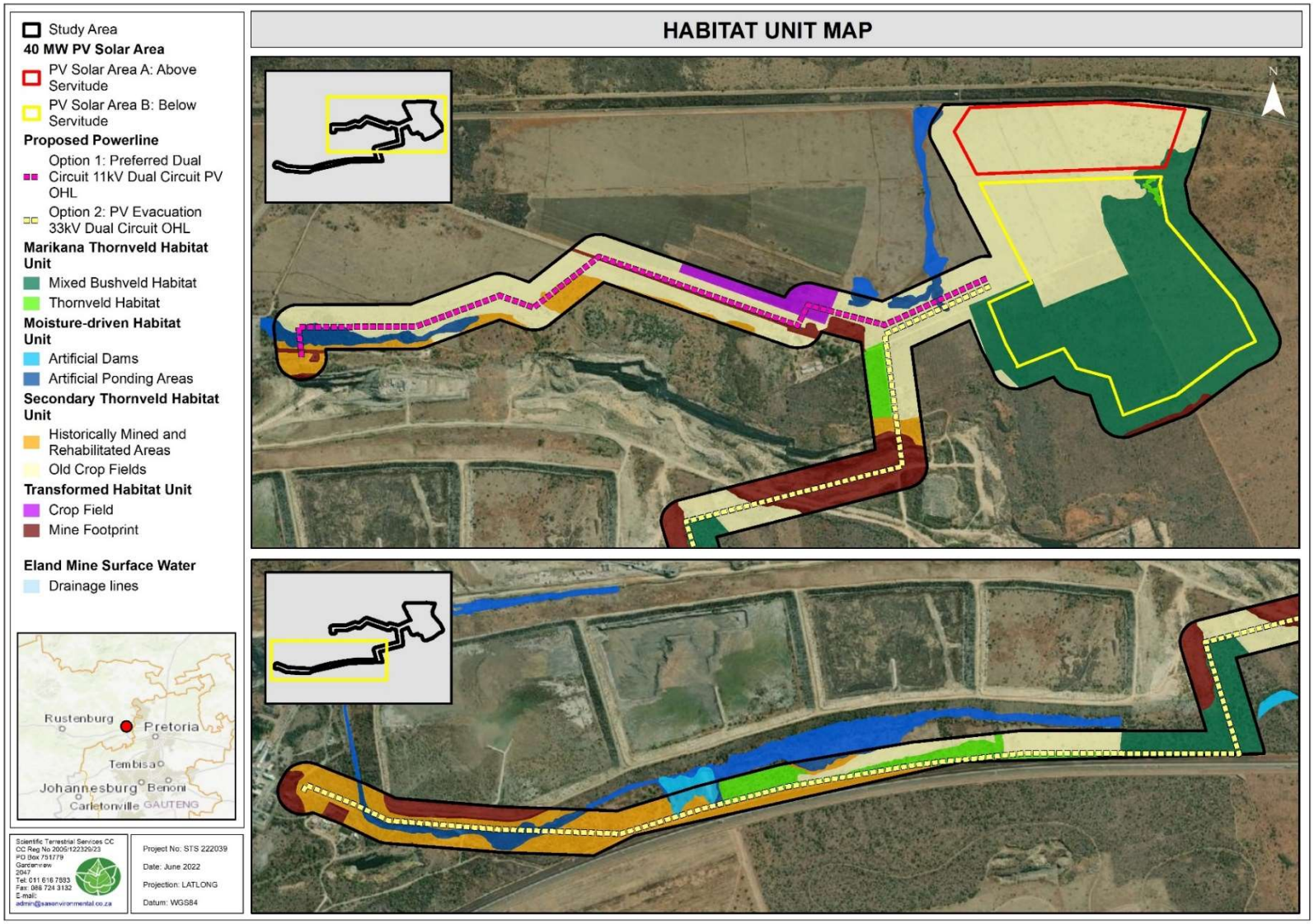


Figure 39: Conceptual illustration of the refined habitat units in relation to the PV Project Area [8]

[8] The Moisture-driven Habitat and additional drainage lines that extend beyond the PV Project Area and that have been identified within the greater EM Consolidated MR Area are also depicted on

8.10.2.2 Invader or exotic species

Of the declared invaders recorded during the field assessment, 22 species are listed under NEMBA category 1b, 2 species under NEMBA category 2 and 2 species under NEMBA category 3 (Refer to ***Appendix 12***). The Thornveld Habitat, Mixed Bushveld Habitat and the Old Crop Fields were least invaded by AIPs, whereas the Moisture-driven Habitat, the Transformed Habitat, and the Historically Mined Areas have a high abundance and diversity of AIPs.

8.10.2.3 Sensitive Mapping

Based on the ground-truthed results of the site visit, ***Table 23*** below presents the sensitivity of each identified habitat unit, along with an associated conservation objective and implications for development. Sensitivity is determined by the presence or potential for floral SCC; habitat integrity and levels of disturbance; threat status of the habitat type; the presence of unique landscapes; and overall levels of diversity (compared to a reference type). ***Figure 40*** and ***Figure 41*** conceptually illustrate the areas considered to be of varying floral ecological sensitivity and how they will be impacted by the EM Solar PV Project.

Table 23: A summary of the sensitivity of each habitat unit and implications for development from a flora perspective.

Habitat Sensitivity	Conservation objective	Habitat Unit	Key habitat characteristics
Low	Optimise development potential.	Transformed Habitat Unit (including both the existing mine footprint and the crop filed) & Secondary Thornveld Habitat (only the historically mined areas)	- Habitat transformed historically and presently due to anthropogenic activities (e.g., mining expansion and cultivation); - Indigenous floral diversity was low to absent; - AIP infestation is prominent; - Floral SCC are lacking and the potential for the habitat associated with these units to support viable populations of SCC is deemed low to improbable; - No protected species are associated with these habitat units; and - Significant biodiversity features, such as CBAs and ESAs, are absent from these habitat units.
Moderate Low	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.	Moisture-driven Habitat Unit (both artificial dams and artificial ponding areas) & Secondary Thornveld Habitat Unit (Old Crop Fields)	- The Moisture-driven Habitat is anthropogenically derived and in its current state supports a high abundance of AIPs. Poor representation of native species was recorded in these areas and no significant biodiversity features was confirmed for this habitat unit; - Poor recovery of the vegetation communities within the Old Crop Fields following historic transformation (intensive agricultural practices) was noted. Habitat integrity of the Old Crop Fields has been left modified and species diversity reduced. No significant biodiversity features were confirmed for the Old Crop Fields from a floral perspective; - The floral communities for these habitat units have shifted away from the reference vegetation type; - Floral SCC were only confirmed for the Old Crop Fields; and - No protected species confirmed for these units.
Intermediate	Preserve and enhance biodiversity of the habitat unit and surrounds, while optimizing development potential.	Marikana Thornveld Habitat Unit (both thornveld and mixed bushveld subunits)	- These subunits supported a moderate species diversity and although not prolifically infested by AIP species, several AIP species were recorded; - These subunits are in a fair ecological condition, although it has been subjected to some anthropogenic activities, including firewood harvesting; - Both subunits share an affinity with the reference Marikana Thornveld vegetation type (as per Mucina and Rutherford, 2006) in terms of species composition and, to a lesser degree, vegetation structure. However, the lack of required ecological drivers (fire, grazing, habitat connectivity) and the direct and indirect impacts from mining and agriculture in the area have resulted in both the habitat subunits to shift away from the reference state; - CBA habitat only associated with the Mixed Bushveld subunit. Functionality of the CBA is modified and sub-optimal, however, not irreversibly so; and - No SCC were recorded in these subunits. A NT species may occur in the Thornveld Habitat due to the suitability of this subunit. Protected species (TNCO and NFA) are associated with both subunits but occurred in low densities.

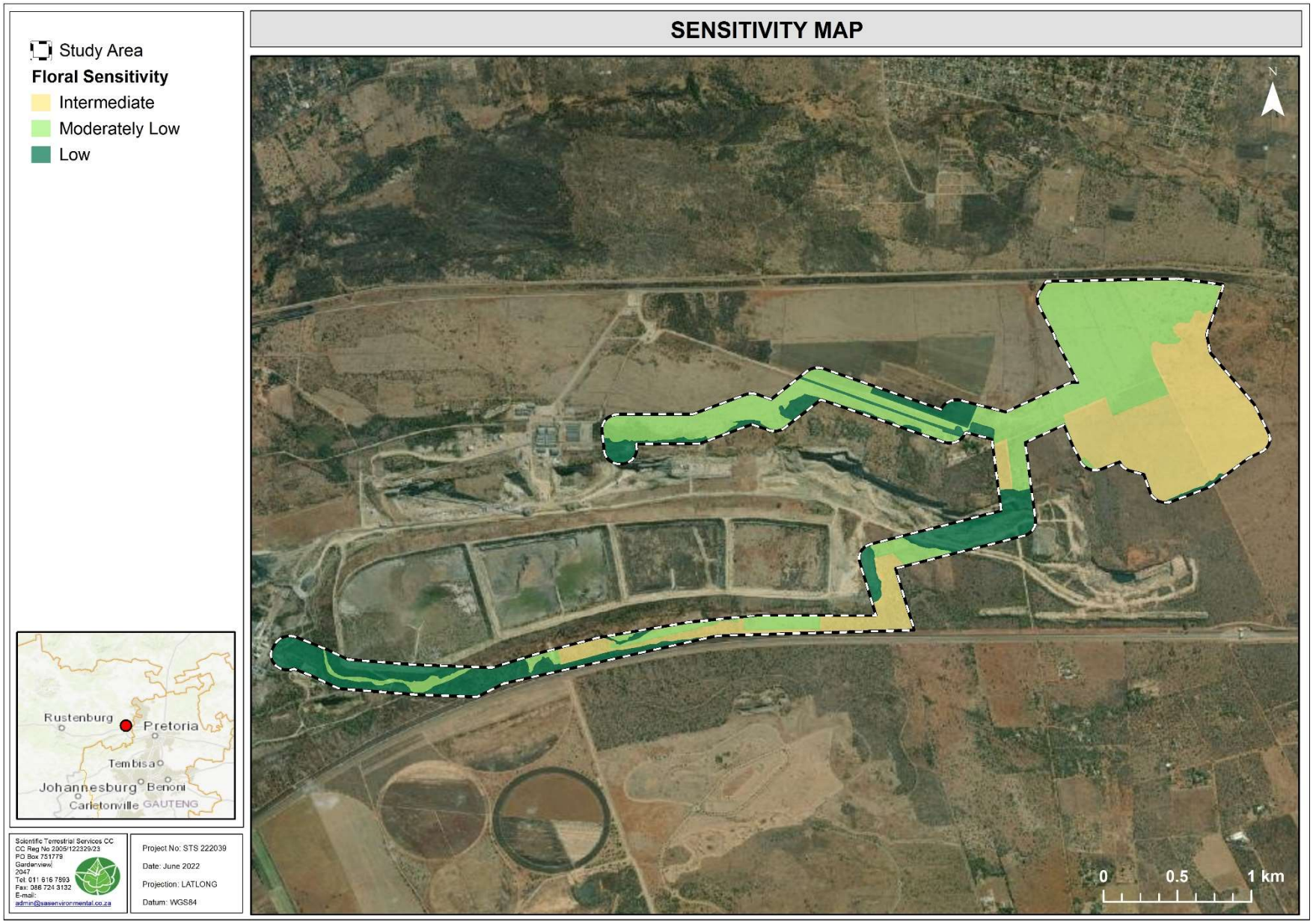


Figure 40: Sensitivity map for the EM Surface Area

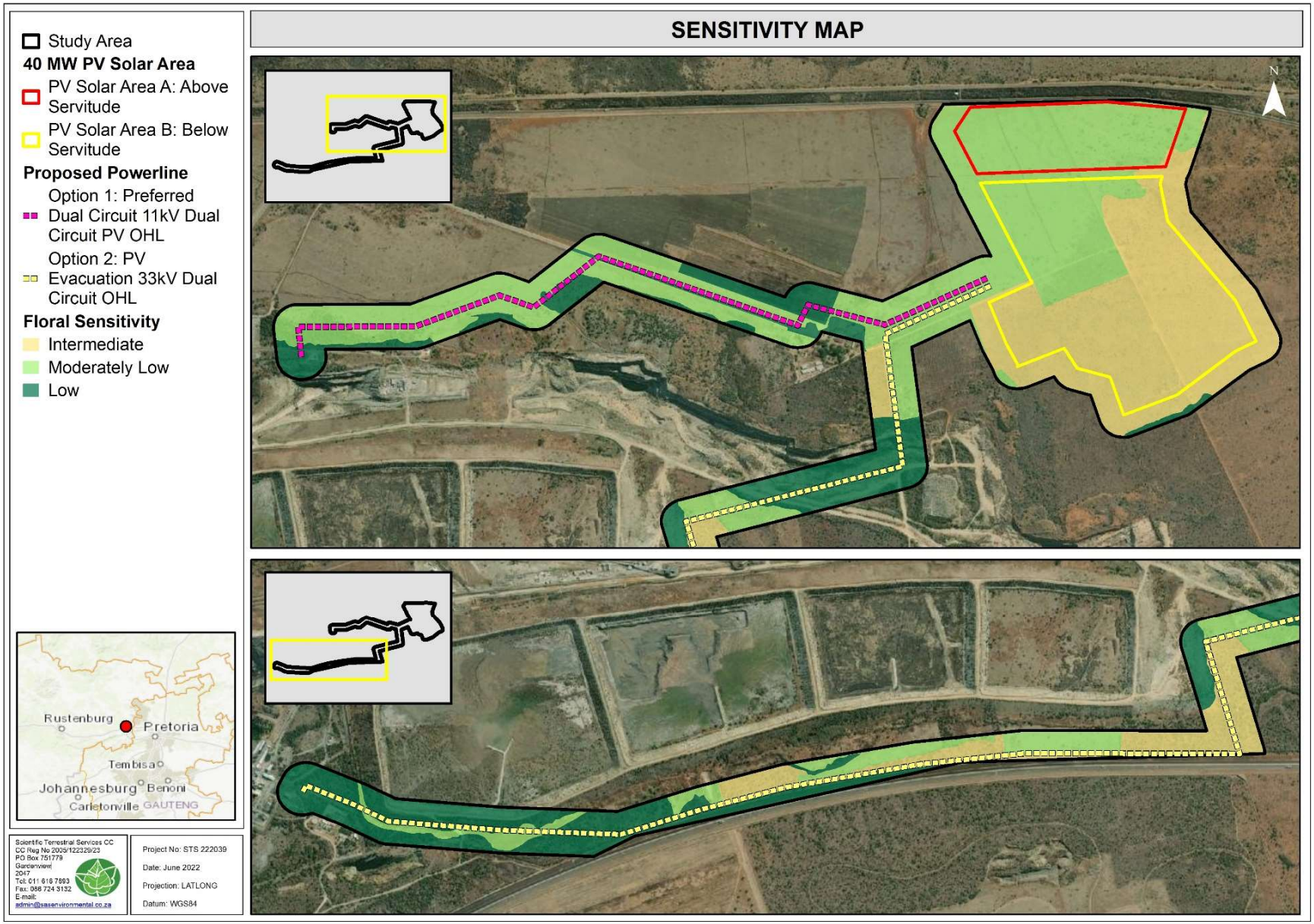


Figure 41: The proposed infrastructure areas as they relate to the sensitivity assigned to the various habitat units.

8.10.3 Fauna

In line with the Flora Section, four habitat units and accompanying sub-habitats were defined during the field assessment. From a Faunal habitat perspective, the habitat units can be briefly described below:

1) Marikana Thornveld Habitat

Several sections of the EM Surface Area have retained vegetation that has not been modified historically by either mining or agricultural activities. Of the remaining natural vegetation, two finer scale units could be discerned, namely Thornveld and Mixed Bushveld. These habitats have a greater diversity and abundance of faunal species in comparison to the other habitat units, largely since the greater floral species richness herein offers faunal species increased opportunities, while increased structural diversity offers suitable habitat for most fauna where shelter is available. Grazing and browsing potential are also higher in these locations.

2) Moisture-driven Habitat

This habitat unit is associated with all the surface water and ponding areas. These habitats are valuable as sources of drinking water for fauna and may provide water dependant fauna (mostly invertebrate, amphibian and avifaunal) with niche habitat. The increased moisture of this habitat also results in an increase in plant growth, providing valuable foraging areas (food resources) for herbivorous and granivorous faunal species. Similarly, predatory species may also favour this habitat, as it is a natural congregator area for prey species.

3) Transformed Habitat Unit

These areas include current built-up or transformed areas. Two finer scale habitat units fall in this category, namely the mine footprint and an existing crop field. The mine footprint is largely devoid of vegetation that will support faunal species. Some small reptiles may however still make use of these areas as the buildings provide ideal basking sites, whilst the lights attract insects, a valuable food resource. The crop fields may provide seasonal food resources to insects and small granivorous mammals on an *ad hoc* and seasonal basis.

4) Secondary Thornveld Habitat Unit

These areas include two finer scale units, namely old crop fields and the historic mine footprint. The key difference between these areas and the Transformed Habitat Unit, is that the Secondary Thornveld Habitat Unit are vegetated and/or recovering, albeit in differing stages of recovery. These areas are no longer being used for mining or agriculture and have been revegetated / rehabilitated to varying degrees, but do not resemble the neighbouring natural

vegetation. This habitat unit provides habitat for a diversity of faunal species, however as this habitat is still in a successionary process, the breadth of food resources in terms of plant diversity is limited for fauna.

8.10.3.1 Species Investigation

I. Mammals

Overall, the Plant Project Area exhibited a low mammal diversity. This is likely attributable to past and current land uses, which would have, and still do, preclude mammal species from the Area. Food resources for grazers, browsers and granivores is present within the Plant Project Area. The current land use has however led to a low abundance of these species. Much of the available food resources are therefore underutilized, as such food provisioning is not considered a limiting factor for mammal species herein. In addition to the species listed above, it is likely that the following species will also occur within this Area, either permanently or temporarily, *Chlorocebus pygerythrus* (Vervet monkeys), *Papio ursinus* (Chacma baboons), *Sylvicapra grimmia* (Grey Duiker), *Tragelaphus strepsiceros* (Greater Kudu), *Galago moholi* (Lesser Bushbaby), *Lepus saxatilis* (Scrub Hare), *Hystrix africaeaustralis* (Porcupine) and *Herpestes sanguinea* (Slender Mongoose). Several small burrows and runs belonging to small rodent species, such as *Rhabdomys* spp (Grass Mouse), were also observed. These small rodents, along with inverts and fruit/seeds, ensure that there are sufficient food resources to support mesopredators in the Plant Project Area.

Although the Plant Project Area itself is not fenced in, it is located within the greater EM Surface Area. As such, the EM Surface Area's fence does limit the movement of mammal species, impacting on habitat connectivity beyond the mining boundary. Within the EM Surface Area, and within the Plant Project Area itself, such hindrances are limited and are unlikely to impact up mammal species herein at present.

II. Herpetofauna

Herpetofaunal species are notoriously hard to detect, owing to their secretive nature and tendency to seek shelter at the first sign of danger. During the site visits, the cooler temperatures led to a notable decrease in reptile and amphibian species activity, further compounding observation rates. Taking into consideration the available data from online databases and knowledge of the Plant Project Area, it is anticipated that overall herpetofaunal diversity will limited. Three out of seven species recorded in the Plant Project Area's QDS:

Schismaderma carens (Red Toad), *Sclerophrys garmani* (Olive Toad) and *Sclerophrys gutturalis* (Guttural Toad) are likely to occur within the Plant Project Area. The abovementioned species are largely independent of water during non-breeding periods and may aestivate or forage some distance away from water. The SCC, *Pyxicephalus adspersus* (Giant African Bullfrog, P) is also known to travel extended distances from areas of surface water out of breeding season. The presence of this species within the Plant Project Area is however considered low, given the lack of suitable areas of surface water for breeding; and suitable soil substrate to bury into during periods of aestivation.

The Marikana Thornveld Habitat provides suitable habitat for reptile species, and whilst none were observed, onsite habitat conditions and suitable food resources suggest that the Plant Project Area is likely to be inhabited by several reptile species. According to the Animal Demography Unit (ADU), three reptile species have been previously recorded in the Quarter Degree Square and will likely occur on the Area. These species are *Agama atra* (Southern Rock Agama), *Meroles squamulosus* (Common Rough-scaled Lizard) and *Trachylepis punctatissima* (Speckled Rock Skink). The range and habitat of one reptilian SCC, *Python natalensi*s (Southern African Python, P) overlaps the EM Surface Area and, given that there is suitable habitat and food resources for this species within the EM Surface Area, there is an increased Probability of Occurrence ("**POC**") that this species may occur within the Plant Project Area. Herpetofaunal food resources in the Plant Project Area, in the form of invertebrates and small mammals, appear to be in adequate supply and are therefore not considered a limiting factor for herpetofaunal species.

The Plant Project Area is likely to host a limited diversity of amphibians, although several water-independent species may occur within this Area. Additionally, the Plant Project Area is likely to support a higher reptile diversity than what was observed, given the availability of suitable habitat and sufficient food resources. Increased movement of vehicles traveling to and from the Plant Project Area and increased conflict with humans will likely increase fatality risks for herpetofauna species. The presence of SCC within the Plant Project Area will more likely be associated with foraging species than individuals actively inhabiting and breeding within this Area itself.

III. Invertebrates

Observed invertebrate diversity was considerably lower than expected, significantly influenced by the winter season when most invertebrates have sought shelter and become less active or are in a dormant life cycle. Many insects are inactive during the winter, as they survive this period as pupae, or are in low abundances due to low temperatures, moisture and food

resources. When considering the available habitat and food resources, it is anticipated that invertebrate diversity will be substantially higher than that which was observed, most notably in the summer season. Most of the habitats may support an abundance of invertebrates, however diversity levels therein will vary depending on the levels of habitat degradation / transformation within each habitat unit. All invertebrates that were observed were common and widespread species. No SCC were observed during the field investigation, but it is possible that *Opistophthalmus* spp (Burrowing Scorpion) may occur within the Plant Project Area. These SCC are slow-moving and often do not venture far from their burrows or excavations beneath objects, thus earthworks, and vegetation clearance will pose a threat to such species.

The EM PV Solar Project may cause a localised loss of invertebrate habitat and food resources within the footprint areas, leading to the loss / displacement of invertebrate species from the Plant Project Area. A decline in the invertebrate population in the Plant Project Area and surrounding areas, although localised, may contribute to further long-term impacts to the functioning of the ecosystem. Invertebrates are considered a vital and important link in the ecosystem, fulfilling many ecological roles, including pollination; removal of carcasses and plant material; pest predation and parasitism; and clearing of dung and scat from mammals. Insect species, and to a degree arachnids, also provide a vital food resource for many of the other faunal species in the Plant Project Area .

8.10.3.2 Sensitive Mapping

Figure 42 and ***Figure 43*** conceptually illustrates the ecological sensitivity for the various habitat units from a faunal perspective. The habitat units are depicted according to their sensitivity in terms of the presence or potential for faunal SCC, habitat integrity, levels of disturbance and overall levels of diversity. ***Table 24*** below presents the sensitivity of each habitat unit, along with an associated conservation objective and implications for the EM PV Solar Project.

Table 24: A summary of the sensitivity of each habitat unit and implications for development from a Fauna Species perspective.

Habitat Sensitivity	Conservation objective	Habitat Unit	Key habitat characteristics
Low	Optimise development potential.	Transformed Habitat Unit (including both the existing mine footprint and the crop feild) & Secondary Thornveld Habitat (only the historically mined areas)	- Habitat transformed historically and presently due to anthropogenic activities (e.g., mining expansion and cultivation); - No faunal SCC are expected to occur within or make use of these habitat units; and - Development within these habitats will have limited impacts to faunal species
Moderate Low	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.	Moisture-driven Habitat Unit (both artificial dams and artificial ponding areas) & Secondary Thornveld Habitat Unit (Old Crop Fields)	- No faunal SCC were observed at the time of the assessment. This habitat unit is unlikely to be favourable to SCC; - The Moisture-driven Habitat is anthropogenically derived and as such, the presence of water may not always align with breeding periods of water dependant fauna, decreasing the suitability of this habitat unit; - This habitat unit likely supports a low diversity and abundance of fauna due to the suboptimal state of the habitat and increased presence of alien plant species; and - Development within these areas will result in loss of habitat and the displacement of common faunal species, however no notable loss of species diversity or important faunal habitat is expected.
Intermediate	Preserve and enhance biodiversity of the habitat unit and surrounds while optimizing development potential.	Marikana Thornveld Habitat Unit (both thornveld and mixed bushveld subunits)	- No SCC were observed in this habitat unit; however it is noted that some SCC may make use of this habitat for foraging purposes; - Habitat structure and plant diversity provides suitable habitat and food resources for a moderate diversity of faunal species; - This unit has not experienced any significant transformation and remains in a largely, albeit degraded, natural state; - Loss of habitat within this habitat will lead to the displacement of faunal species as well as the loss of food resources; and - Development in this habitat unit will contribute further to the loss of habitat connectivity in mining property.

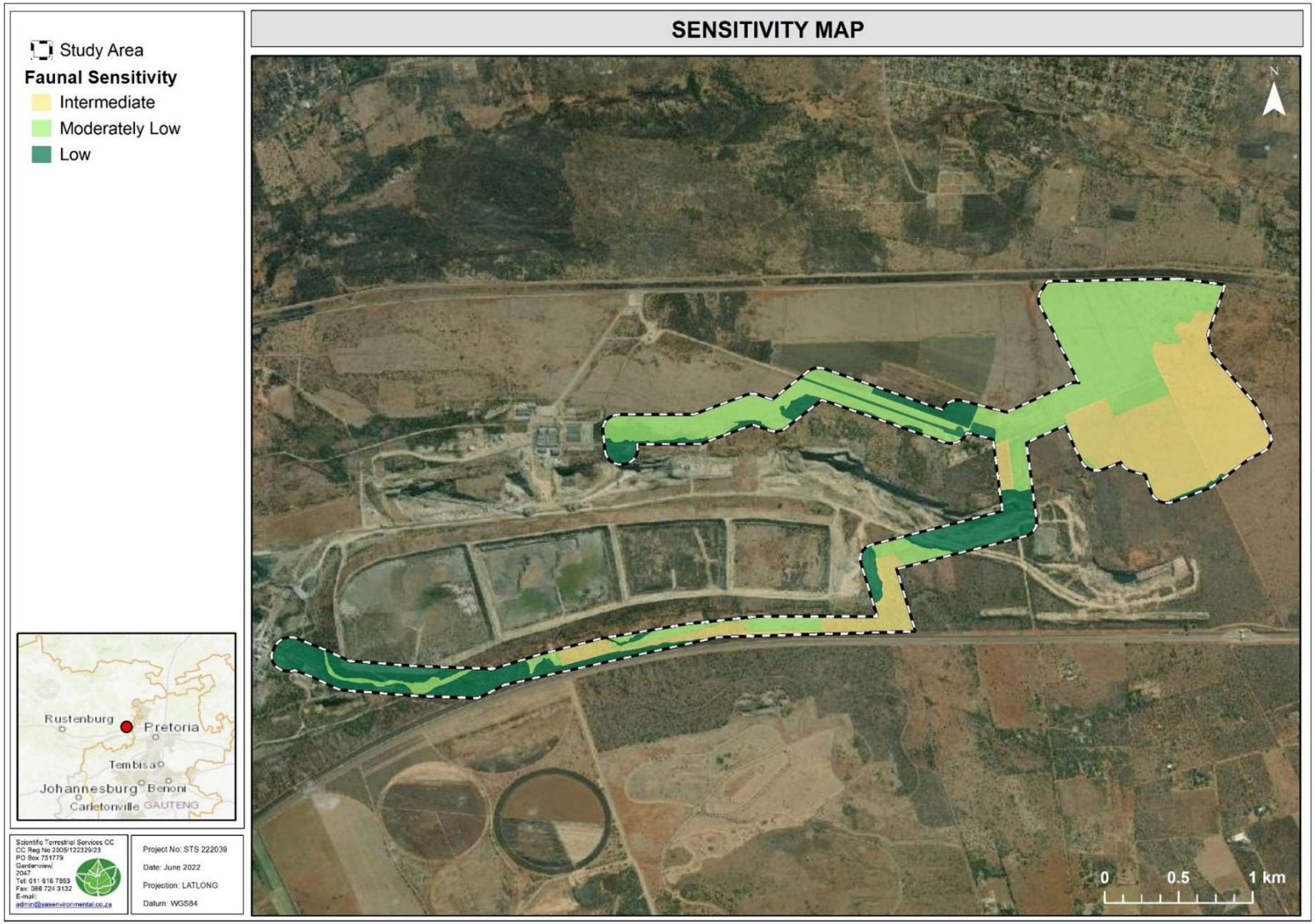


Figure 42: Sensitivity map for the EM Surface Area.

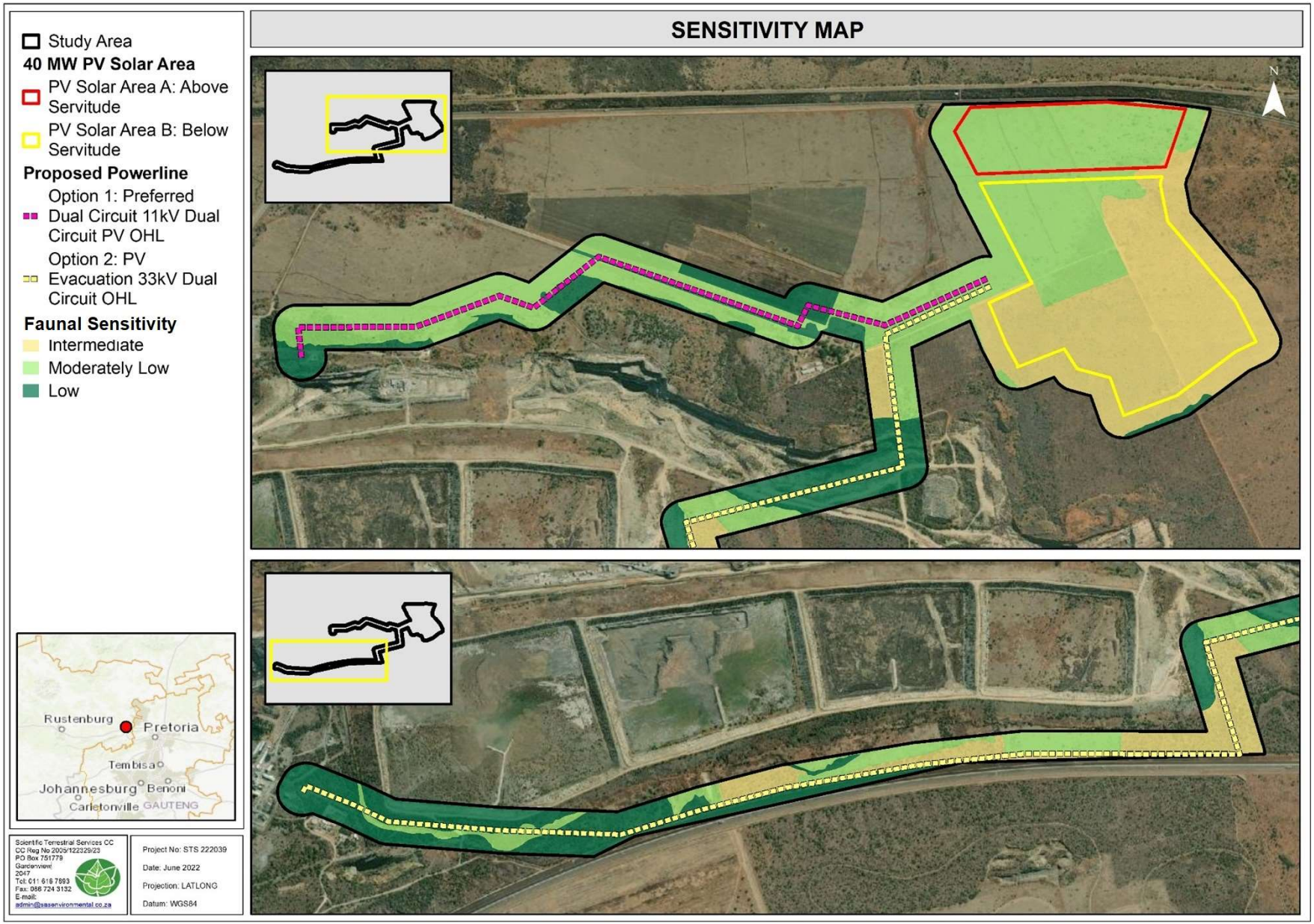


Figure 43: The PV Solar Area as it relates to the sensitivity assigned to the various habitat units.

8.10.4 Avifauna

The solar energy industry as a renewable power generation source is expanding rapidly in southern Africa. Experiences in other parts of the world however suggest that, like many other energy sources, solar power may affect birds in different ways, through the alteration of habitat, the displacement of populations from preferred habitat, collision and burn mortality associated with elements of the solar hardware and ancillary infrastructure. The nature and implications of these effects are poorly understood (STS, 2022).

Accordingly, the Birds and Renewable Energy Specialist Group, convened by BirdLife South Africa and the Endangered Wildlife Trust has developed a set of guidelines and monitoring protocols for evaluating utility-scale solar energy development proposals. The guidelines are aimed at EAPs, avifaunal specialists, developers and regulators and propose a tiered assessment process, including a number of different tiers of assessment and monitoring (Jenkins et al, 2017):

- Preliminary avifaunal assessment;
- Data collection;
- Impact Assessment; and
- Monitoring.

In the context of the PV Project Area, no high or medium sensitivity criteria are met in terms of the guideline, except for the presence of the Magaliesberg IBA. The most important trigger species in the IBA is the globally threatened Cape Vulture (*Gyps coprotheres*). The potential for Cape Vultures to however range onto the site is deemed very low, due to the high human activity and disturbance factor and the absence of livestock or game in the immediate vicinity of the development site. The north-western part of the EM Surface Area contains certain game species, but these occur at very low densities, so it is highly unlikely that vultures would be attracted to carcases on the property. The Secretarybird (*Sagittarius serpentarius*) is also present but, as discussed, there is a low likelihood of this species occurring regularly on the site due to habitat fragmentation and high level of human activity. Accordingly, considering the low level of possibility of the occurrence of SCC; absence of viable habitat for these species; and the high level of habitat fragmentation and human activity in the EM Surface Area, the avifaunal sensitivity of this Area is considered to be low.

8.10.4.1 Avifauna Assessment Results

A with the Flora and Fauna sections above, four habitats were identified as part of the PV Project Area.

During the field assessment, no SCC were observed within the EM Surface Area. The 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland indicates that several SCC have a distribution which encompasses the EM Surface Area and, based on the site assessment, on-site habitat characteristics for foraging, albeit marginal, exist for certain of these species. Abdim's Stork (*Ciconia abdimii*, NT), Lanner Falcon (*Falco biarmicus*, VU), Secretarybird (*Sagittarius serpentarius*, VU), European Roller (*Coracias garrulus*, NT) and Black-winged Pratincole (*Glareola nordmanni*, NT) may occasionally utilise the site, particularly the open woodland or grasslands, for foraging, should these species range into the EM Surface Area. There is a possibility that flocks of Yellow-throated Sandgrouse (*Pterocles gutturalis*, NT) could visit to forage in the actively cultivated fields on the EM Surface Area, especially when these are fallow. The Verreauxs' Eagle (*Aquila verreauxii*, VU) has a relatively high recording rate in the pentad in which the PV Project Area is located, however this eagle is likely to be largely restricted to the hilly areas to the north of this Area where its primary prey (Rock Hyrax - *Procavia capensis*) will be encountered, and the species is unlikely to range onto the Area. Historically, *Tyto capensis* (African Grass Owl, VU) had been recorded in the wetland in the north-eastern portion of the EM Surface Area, however habitat degradation and modification has resulted in the exclusion of this species from the Area.

The avifaunal habitat sensitivity for the EM Surface Area is considered to be low. The possibility of SCC ranging into / occurring within the Area on a regular basis is low and it is considered highly unlikely that any of the SCC will breed within this Area. The strong human disturbance factor over much of the landscape of the EM Surface Area is considered a very strong limiting factor for the occurrence of SCC.

Clearing of vegetation for the EM PV Solar Project will have a direct impact on habitat availability in the development footprint, leading to localised migration of many avifaunal species to adjacent habitats. The retention of relict habitat in the immediate surrounds of the PV Project Area will partially offset this by providing areas into which affected bird species can move. Avifaunal abundances within the PV Project Area will however dramatically decrease. Species that relocate into the surrounding areas will be subject to higher levels of competition for food resources and space. Impacts to avifaunal species within the EM Surface Area will result in the localised loss of habitat, diversity and avian abundance, whilst edge effects (such as noise, dust and footprint creep) will impact on avifaunal species in the immediate vicinity of the Project.

The OHL associated with the EM PV Solar Project could pose a threat to certain avifaunal species that are vulnerable to collisions, especially certain larger, less mobile birds, although the fragmentation of habitat and high human presence is likely to greatly limit the potential for

such species (e.g. bustards / korhaans and larger raptors). Selecting Option 1 (the shorter length of the OHL options) and the alignment alongside existing OHL, will limit the threat posed by this new OHL to collision-vulnerable species.

8.10.4.2 Sensitive Mapping

Figure 44 below conceptually illustrates the areas considered to be of increased ecological sensitivity. The areas are depicted according to their sensitivity, in terms of the presence or potential for avifaunal SCC, habitat integrity and levels of disturbance; threat status of the habitat type; the presence of unique landscapes; and overall levels of diversity. ***Table 25*** below presents the sensitivity of each identified habitat unit, along with an associated conservation objective and implications for development.

Table 25: A summary of the sensitivity of each habitat unit and implications for development from an Avifauna Species perspective.

Sensitivity	Conservation objective	Habitat Unit	Key habitat characteristics
Low	Optimise development potential.	Mine Footprint (Actively mined areas) & Historically Mined and Rehabilitated Areas	These habitats are deemed to be of low sensitivity for avifauna due to their altered state, absence of vegetation, lack of heterogeneity and intensive anthropogenic presence – presence of mining activities. Development within these areas is unlikely to lead to high impacts to avifaunal habitat or species diversity, provided mitigation measures are implemented.
Moderate Low	Optimise development potential, while improving biodiversity integrity of surrounding natural habitat and managing edge effects.	Crop Fields (Active), Old Crop Fields and Artificial Ponding Areas	The habitat sensitivity of this unit is considered moderately low, as it has been degraded due to historic and current agricultural activities and the impacts of previous mining activities. The unit comprises of homogenous vegetation, with limited forging and shelter opportunities for most avifauna. Additionally ponding appears to be periodic and dependent on the location of current mining activities, and was not observed in the area to the west of the PV Project Area. Development within these habitat units is not expected to have a significant negative impact on the local or regional ecology of the area, provided mitigation measures are adhered to.

Sensitivity	Conservation objective	Habitat Unit	Key habitat characteristics
Intermediate	Preserve and enhance biodiversity of the habitat unit and surrounds, while optimizing development potential.	Broadleaf Bushveld Habitat, Thornveld Habitat and Artificial Dams	Areas of intermediate sensitivity include those that have avoided impacts related to agriculture or mining activities or other landscape transforming factors ensuring natural habitat has persisted, with varying degrees of degradation due to historical land use practices. From an avifaunal perspective, it is likely that mostly common species who have broad habitat requirements are likely to utilise the woodland habitat units for foraging, roosting, breeding etc. It is assessed to be unlikely that any SCC would occur in the woodland habitats. The artificial dam(s) located in the southern part of the EM Surface Area would attract a variety of common waterfowl, if inundated (wet). Recent evidence from the Area indicates that the artificial dam and reedbed habitat located between the mining area and the N4 highway has not been wet / inundated in the recent past. In this case, the sensitivity of this habitat would be reduced; and no waterfowl would be likely to forage or occur in these parts of the site. Development within these areas is unlikely to have significant large-scale impacts on avifaunal communities within the wider area, with the most potential significant impact relating to transformation of habitat at a localised scale. It remains important that edge effect impacts on areas outside of the direct footprint be strictly managed to increase/maintain ecological functionality. Mitigation measures included within this report should be adhered to, to limit ecological impacts.
Moderately High	Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.	Drainage Lines	The only natural drainage lines are in the north-west part of the EM Surface Area and thus are not located close to any of the EM PV Solar Project components. As such, the PV Plant and associated OHL is unlikely to affect this habitat in any measurable manner.

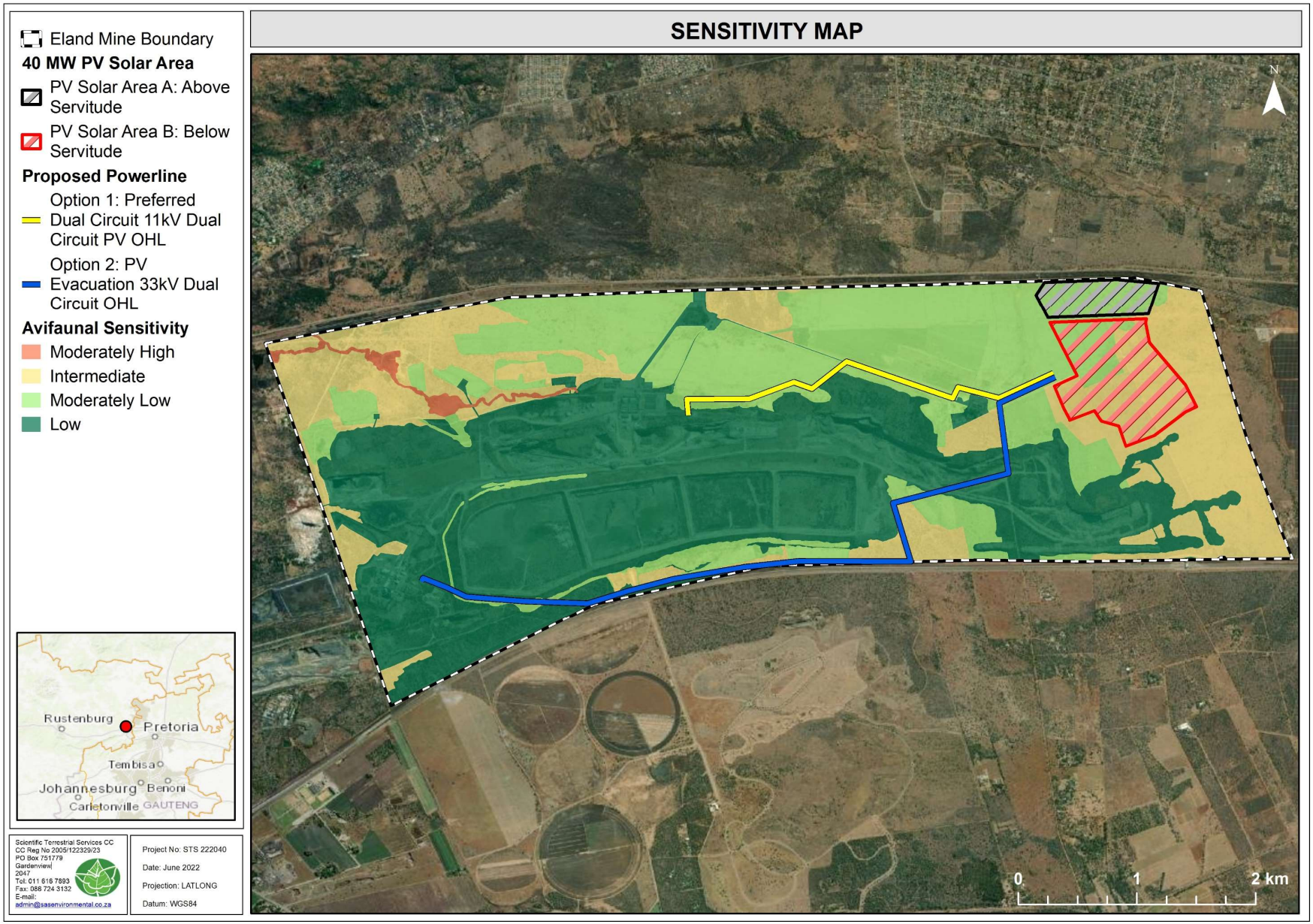


Figure 44: Avifaunal sensitivity map for the EM Surface Area.

8.10.5 Impact of the EM PV Solar Project on the Ecology

8.10.5.1 Flora

The EM PV Solar Project will directly and indirectly impact on floral habitat and infringe upon habitat where floral SCC and protected flora were observed during the site assessments. The significance of biodiversity impacts varied depending on the level of degradation of the Present Ecological State ("**PES**"); however, with mitigation measures efficiently implemented, the impacts on floral habitat, diversity, protected flora, and floral SCC can be acceptably reduced. A floral walkdown of the authorised footprint is required prior to construction to obtain exact numbers of floral SCC and protected species that will be impacted.

The PV Project area's northern section avoids loss of habitat of increased sensitivity, whereas the southern section will not fully avoid impacts to habitat of increased sensitivity and must, if the EM PV Solar Project is authorised, minimise loss of Mixed Bushveld Habitat through clearing vegetation only where absolutely required. It is recommended that vegetated corridors in-between the PV panels (and below the panels if feasible) be maintained to reduce habitat fragmentation. The project developer can attempt to avoid destruction of floral SCC and protected flora through planning of panel placement based on the floral walkdown. It is however understood that there may be limited flexibility in this regard and that avoidance of these species is not always a feasible option.

Both Option 1 OHL and Option 2 OHL mostly avoid habitat fragmentation by following existing roads and remaining close to the mine infrastructure. The proposed Option 2 OHL crossed over more habitat units and can therefore result in edge effect impacts to additional floral communities than the Option 1 OHL would. The Option 1 OHL is also shorter in extent and will reduce the required maintenance effort during the operational phase. For the proposed Option 1 and Option 2 OHL, it is deemed likely that pylon placement and servitude maintenance can avoid impacts to protected flora and floral SCC along the footprints. From a floral ecological management perspective, Option 1 is preferred.

A sub-optimally functioning CBA 2 was confirmed for the Mixed Bushveld Habitat and will be directly impacted by the assembly of the EM PV Solar Project at the PV Plant Area B. Avoidance must always be the first option; however, if this is not deemed feasible, compensation for loss of CBA habitat is recommended by: 1) controlling AIPs and indigenous bush encroachment in the footprint areas and surrounds; and 2) reinstatement of indigenous floral from the reference state in the PV Project Area's servitudes, with the aim that, over time, these species will disperse to the surrounding natural areas and allow diversification of floral communities and population genetics.

It was the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and ensure that the best long-term use of the ecological resources in the PV Project Area will be made in support of the principle of sustainable development. The needs for conservation and the risks to other spheres of the physical and socio-cultural environment need to be compared and considered, along with the need to ensure economic development of the country.

8.10.5.2 Fauna

Although no faunal SCC were directly observed during the site assessment, five faunal SCC have a medium POC for the PV Project Area, however this POC is associated strongly with potential foraging activities and not with direct habitation and / or breeding within this Area.

The EM PV Solar Project, including the OHL lines, will directly and indirectly impact on faunal habitat and species diversity. The significance of biodiversity impacts varied, depending on the ecological integrity and sensitivity levels of the various habitats. With mitigation measures efficiently implemented, the impacts on faunal habitat, diversity and faunal SCC can however be reduced. Whilst there will be habitat loss, many affected species will be able to relocate naturally to the surrounding habitats and are unlikely to be significantly affected by the Project.

8.10.5.3 Avifauna

Based on the findings of the avifaunal assessment, it is the opinion of the ecologists that from an avifaunal perspective, the proposed components of the development can be considered acceptable. The major impact anticipated to occur is the alteration of areas of natural habitat, reducing avian abundance and diversity within the PV Project Area. Impact scores are reduced, as no sensitive habitat is proposed to be developed (due mainly to the high anthropogenic disturbance factor); and as there is a very low likelihood of the occurrence of sensitive species beyond very intermittent ranging and foraging onto the EM Surface Area.

Further impacts that may result from the EM PV Solar Project are due to potential collisions and electrocutions with the proposed PV facilities and powerlines. It is anticipated that should the proposed mitigation measures be implemented the risk of collisions and electrocutions can be drastically reduced. Due to the low potential of occurrence of SCC, impacts to these priority species are not anticipated to be regionally significant. It is important that all essential mitigation measures and recommendations presented in Avifauna Specialist Assessment and EMPr should be adhered to, to ensure the ecology within the proposed construction areas and

surrounding zone of influence is protected or adequately rehabilitated and minimise the deviations from the PES as much as possible. As part of these mitigation measures, the Option 1 OHL should be considered for development due to its lower potential avifaunal impact as compared to Option 2.

8.11 AIR QUALITY

The Brits-Rustenburg Region is the industrial hub of the NWP, with all the platinum, chromium and vanadium mines located in this Region. The EM PV Solar Project falls within the WBNPA as contemplated in section 18(1) of NEM:AQA, 2004. As noted above, the WBNPA was established due to the exceedance of the ambient air quality standards or alternatively that a situation exists within the area which is causing or may cause a significant negative impact on air quality in the area and the area requires specific air quality management action to rectify the situation.

Existing key sources of air pollution surrounding the EM Surface Area were identified during a desktop exercise and include:

- Mining activity (north and south-west of the EM Surface Area);
- Vehicle dust entrainment on unpaved roads (surrounding areas);
- Commercial agricultural activities (surrounding areas);
- Industrial activity (west of the EM Surface Area);
- Domestic fuel burning at informal settlements (north and north-east of the EM Surface Area).

Dust-fall, PM10 and PM2.5 are key pollutants of concern associated with existing and proposed operations at the EM Surface Area and are emitted from the following key sources:

- Particulate Emissions:
- Wind erosion from exposed areas;
- Storage of material (stockpiles, TSF);
- Truck loading and offloading operations;
- Material handling (front-end-loaders / excavators);
- Blasting;
- Bulldozing material (moving material, shaping stockpiles, etc);
- Conveyor transfer points;
- Crushing and screening; and
- Vehicle dust entrainment on unpaved haul roads.

8.11.1 Impact of the EM PV Solar Project on the Air Quality

During construction, and in particular the clearing of vegetation for EM PV Solar Project's establishment, including the construction of the access road), it is expected that dust levels in and around the PV Project Area will temporarily increase during the construction phase.

Dust can have health impacts and pose a nuisance factor by entering homes, settling on houses, clean washing, painted surfaces and roofs. However, for the construction of the EM PV Solar Project, it is not expected that the dust created during the construction phase will increase to levels significant enough to negatively affect neighbouring communities and landowners. Given extensive mining in the area, the increased dust levels caused by constructing this Project are likely to be more cumulative in nature.

EP operates a network of single dust fallout monitoring buckets to monitor monthly fallout in and around the EM Surface Area. The monitoring network consists of 11 monitoring buckets located strategically in and surrounding this Area. The location of the existing dust fallout monitoring stations is illustrated in ***Figure 45***.

It is recommended that the dust monitoring network be expanded to the north-east corner of the EM Surface Area to measure potential dust fallout from the PV Solar Project during the construction phase.

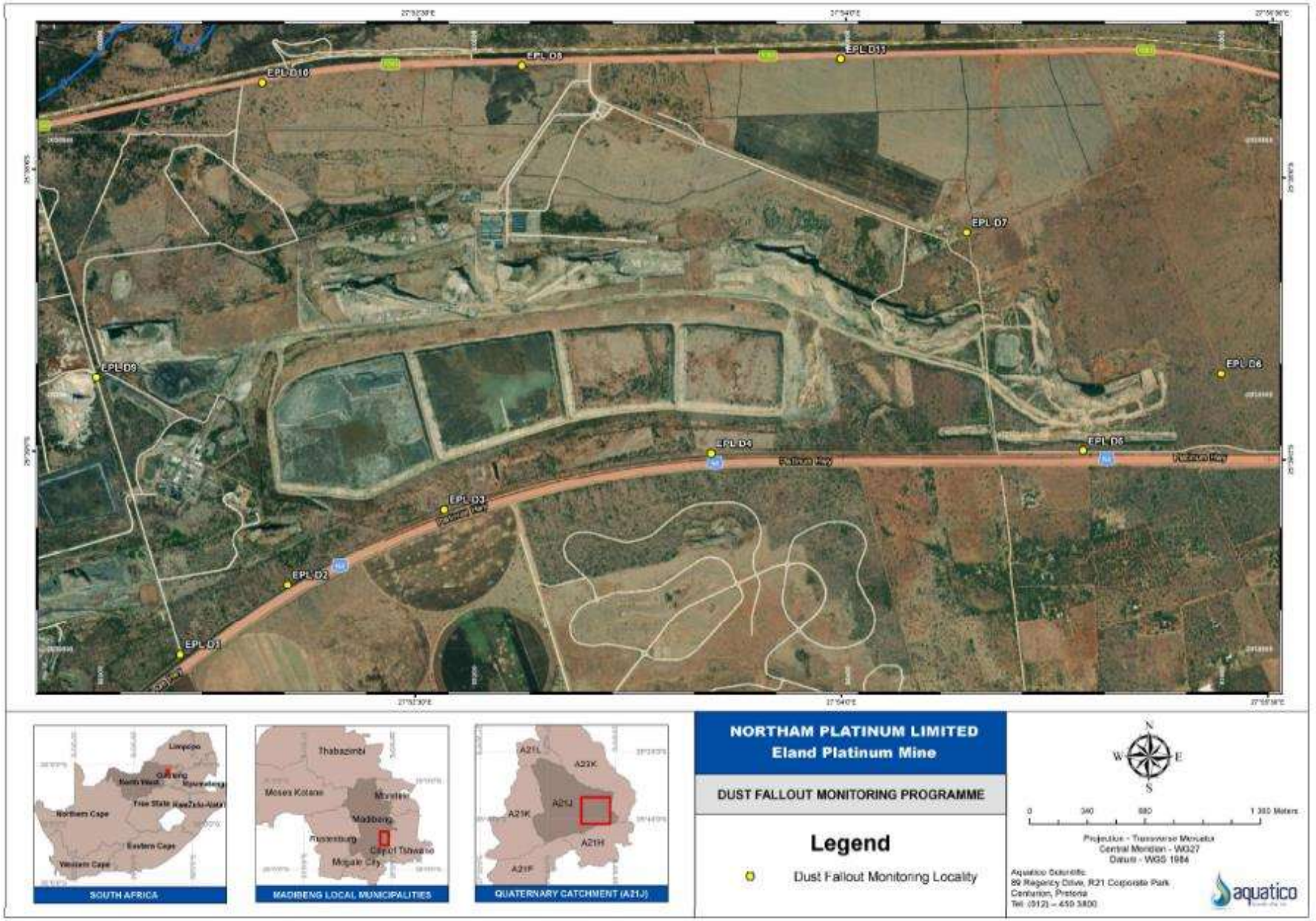


Figure 45: Monthly dust fallout monitoring locations for EM (Aquatico, 2020).

8.12 NOISE

The general noise climate in the PV Project Area and surrounds can be described as industrial / semi-rural (SLR, 2012). The noise climate in this Area is characterised by activities associated with farms and smallholdings, industrial and mining operations, national roads and local communities.

Ambient (background) noise levels were measured during February 2016 and September 2020, in accordance with SANS 10103:2008 *"The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication"* and the protocols defined in the DFFE Screening Tool.

The following noise levels were considered as part of the baseline noise levels of and around the EM:

- Traffic:
  - Internal and external traffic on the EM Surface Area and surrounding roads (i.e., N4 Highway and R566).
- Mining Activities:
  - Conveyors and hauling activities;
  - Concentrator Plant and auxiliaries;
  - Ventilation Shafts and associated activities; and
  - Other mining related activities.
- Surrounding land users:
  - Farming and agricultural processes
  - Construction activities

8.12.1 Impact of the EM PV Solar Project on the Ambient Noise Level

The potential noise impacts associated with the EM PV Solar Project during the construction phase will increase the combined ambient level of the EM, however it will be a temporary impact. The operational noise levels of the EM PV Solar Project will be low in comparison to the ambient noise levels of vehicular movement on the R566 and N4 Freeway and the existing EM operation.

Mitigation measures must focus on investigating and addressing possible noise annoyance complaints from sensitive receptors. The EMPr provides mitigation measures for possible noise impacts.

8.13 VISUAL QUALITY

JEMS was appointed to undertake a VIA (Refer to ***Appendix 14***).

Data on the visual resource was collected from 1:50 000 topographical maps and available satellite imagery for the site. EM is located within a “mining belt”, characterised by semi-industrial and mining related activities.

8.13.1 Landscape Character

The topography of the PV Project Area is relatively flat, with koppies and hills bordering this Area to the north, and the Magaliesberg mountain range to the south. The average elevation of land in and surrounding the Project Area is 1 170 mamsl. Mountain peaks in the nearest section of the Magaliesberg rise to 1 500 – 1 600 mamsl; and the Hartbeespoort Dam lies at an altitude of approximately 1 200 mamsl.

The EM Surface Area has been impacted by mining activities since it commenced in 2006 (SLR, 2012). Currently the PV Project Area (i.e. including the OHL Route) is used for mining activities and infrastructure, with some areas of open veldt and agricultural lands impacted by anthropogenic activities. The surrounding area is characterised by a mixture of agriculture, urban areas, mining and industrial activities. The EM PV Solar Project will be located within the EM Surface Area. EM has existing distinctive visual features, i.e., TSF, Concentrator Plant, WRDs and surface infrastructure.

8.13.2 Sense of Place

Sense of place is the unique value that is allocated to a specific place or area through the user or viewers’ cognitive experience of the area. The combination of the natural landscape (mountains, streams and the vegetation), together with the manmade structures (residential areas, roads, mining activities and OHLs), contribute to the sense of place for an area. It is these land uses that define the area and establish its identity.

The EM Consolidated MR Area is located within a “mining belt”, characterised by semi-industrial and mining related activities. The infrastructure that supports these activities dominates the area, which is otherwise featureless. Beyond the 8km radius around the PV Project Area, there are small koppies located to the north and west and the Magaliesberg mountain range to the south.

The overall sense of place can be described as moderate to weak. The immediate surrounding area (mining belt) has a weak sense of place, while the larger area has a stronger sense of place in terms of the rural agricultural setting. This is mainly due to a large section of the surrounding land uses comprising of small holdings, cultivated crops and livestock practices. It is notable that directly to the east of the EM Consolidated MR Area the DeWildt Solar Farm has been developed and north of the R566 housing expansion is taking place, including areas such as Mothutlung, Moumong and Damonsville.

8.13.3 Views

Some of the most sensitive receptors in the area include:

- People who live and work adjacent to the PV Project Area;
- Communities where development results in changes in the landscape setting or valued views enjoyed by the community;
- People travelling through or past the affected landscape on the R556; and
- Tourist and people using recreational facilities in the area.

The most sensitive viewing areas are along the koppies to the north of the EM PV Solar Project and the foothills of the Magaliesberg. The Magaliesberg and MPNE's boundary is situated approximately 3.4km from the PV Project Area (NLA, 2006). The EM PV Solar Project and supporting infrastructure will be visible from the surrounding communities situated to the north and travellers on the R556.

8.13.4 Impact of the EM PV Solar Project on the Visual Quality

The baseline conditions around the PV Project Area have already been impacted by mining and agricultural activities. The DeWildt Solar Facility has been constructed directly east of this Area.

The visual impacts during the EM PV Solar Project's construction and operational phases will be medium without mitigation, however, will be reduced to low with mitigation. Mitigation measures should be implemented to limit the impacts from vehicle movements and construction activities, but the visual impact from the operational phase will likely be found to be accepted by communities given the existing facility to the east.

8.14 HERITAGE ENVIRONMENT

Several other Phase 1 HIA have been undertaken over the EM Consolidated MR Area, including:

- Huffman, T.N. 2000. Archaeological survey of the Crocodile River Mine, Brits. Johannesburg: Unpublished report.
- Pistorius, J.C.C. 2006. A Phase 1 HIA for the new Eland Platinum Mines (Pty) Ltd (Land Mines) near Madibeng in the Central Bankenveld of the North-West Province of South Africa. Pretoria: Unpublished report.
- Pistorius, J.C.C. 2010. A Phase 1 HIA for Portion 86 of the Fam Zilkaatsnek 439JQ and Portions 13 and 14 of the farm Schietfontein 437JQ for Eland Platinum Mines (Pty) Ltd (Eland Mines) near Madibeng in the North-West Province. Pretoria: Unpublished report.
- Van Schalkwyk, J.A. 2020. Phase 1 HIA for the Eland Mine Consolidation Application, East of Brits in the Local Municipality of Madibeng, North West Province.
- Van Schalkwyk, J.A. 2021. Phase 1 HIA for the Eland Mine Expansion on Portion 14 of the Farm Schietfontein 437JQ, east of Brits in the Local Municipality of Madibeng, North West Province.

Given this and that these HIA included the PV Project Area, the EAP is of the opinion that a further HIA was not specifically required for the PV Project Area.

8.14.1 Cultural Landscape

The PV Project Area falls within a transitional environmental region in the NWP, known as the Bankenveld, situated between the Highveld in the south and the Pyramid Hills in the north. Due to peculiar geo-processes, in particular the formation of the BIC, a landscape comprising a latitudinal series of hills and valleys came into existence, which fostered early human settlement and later accommodated a series of communities and cultures.

After Magaliesberg's formation, a continuous process of weathering, erosion and faulting resulted in the formation of neks (such as Saartjiesnek) and poorts (such as Hartbeespoort). Hartbeespoort was considered ideal for the construction of a dam to store water, for irrigation by early white farmers, which eventually led to the construction of the present dam in the early 1920s.

The different periods associated with the region is as follow:

8.14.1.1 Stone Age

An abundance of water, lush natural vegetation, large numbers of game, mild climate and the presence of quartzite for making tools and weapons were factors that attracted Stone Age communities to the area about half a million years ago. Evidence of periodic occupation since the Early Stone Age ("**ESAg"**) is found at the Wonderboom Hand-Axe Site close to Wonderboom Nek in Pretoria. This site is one of the richest ESAg depositories in South Africa. Signs of occupation by Middle Stone Age groups have also been found on the Magaliesberg and along river courses. The Late Stone Age ("**LSA**") is also well represented in the area, probably because LSA communities preferred to occupy rock shelters like caves and cliffs. During the latter part of the LSA, the Hartbeespoort Dam area was probably occupied from time to time by the San (Bushman) people's ancestors. The larger region is known for its Stone Age sites, such as Rissik, Jubilee Shelter, Silkaatsnek, Elizabeth Shelter, Cave James, Serpent Quarry, Xanadu, Hope Hill Shelter and Kloofendal Shelter (Wadley 1988).

8.14.1.2 Iron Age

The expansion of early farmers, who, among other things, cultivated crops, raised livestock, made ceramic containers (pots), mined ore and smelted metals, occurred in this area between AD 400 and AD 1100 and brought the Early Iron Age ("**EIAg**") to South Africa. They settled in semi-permanent villages. These communities migrated from the Lowveld and coastal areas to the higher regions in the interior (such as the Bankenveld) during the latter part of the EIAg. An important early settlement site, with evidence of iron smelting and working, is located near Broederstroom (provincial heritage site) in the Brits area (Huffman 1993). Sites were found within 100m of water, either on a riverbank or at the confluence of streams.

New groups succeeded these EIAg communities about 600 years ago, speaking Bantu languages, like Nguni and Tswana-Sotho. By that time, groups of Tswana and Ndebele speaking people were moving into the area, occupying the different hills and outcrops, using the ample resources, such as grazing, game and metal ores. These Late Iron Age (**"LIA**") farmers were moving to new farming areas, like the Highveld and Bankenveld, where due to climate changes, grasslands provided enough grazing. Because of a lack of trees in many areas, settlements were built with natural stone, mud and thatch. Remains of such stonewalled settlements and kraals can be found all over the Magaliesberg.

In 1821 a Nguni group, led by Mzilikazi, left KwaZulu-Natal and moved to the regions north of the Vaal River. Their numbers increased when they absorbed other refugees and conquered some of the indigenous communities. This was the origin of the Matabele (Ndebele) empire. Having established themselves originally in Sekhukhuneland (Mpumalanga and Limpopo

Provinces), they relocated to the Tshwane region in the early 1830s and conquered the local Sotho, Tswana and Ndebele-speaking communities. It is possible that Mzilikazi established a major settlement, known as eKungwini, near Wonderboompoort. The Matabele relocated again to the Marico region (NWP) in the mid-1830s.

The difaqane coincided with the penetration of the interior of the RSA by travellers and hunters such as Cornwallis Harris and Andrew Smith, traders Robert Schoon and Andrew McLuckie, and missionaries James Archbell and Robert Moffat (Carruthers 2007).

8.14.1.3 Historic period

The Matabele conquest was followed by permanent occupation by white settler-farmers in the mid-1840s, and hence few traces of Iron Age occupation by earlier communities have been left behind. Voortrekker farmers established the farms that today form the area around Meerhof. These farms were subdivided many times over in more recent years and more farmsteads were established. Gradually the entire area was divided into farms. However, it was only since the 1880s that these farms were formally surveyed and mapped and when not only their names but also the names of rivers and other features became permanent fixtures on maps.

The Second South African War (1899-1902) Battle of Silkaatsnek (11 July 1900) took place in the area and some elements of the British garrisons guarding Silkaatsnek and Kommandonek were located where Melodie is today. Before the Second South African War, General Hendrik Schoeman (son of Stephanus Schoeman) constructed a primitive dam in the Crocodile River. The potential of damming the river at the poort was recognised after the War. Between 1905 and 1910 the Transvaal Department of Irrigation conducted various preliminary investigations, which led to the passing of the Hartbeespoort Irrigation Scheme (Crocodile River) Act (Act No. 32) of 1914. This Act authorised the construction of a large dam in the Hartbeespoort gorge. World War I delayed the project, which was successfully completed only in 1923.

Johan Schoeman, son of General Hendrik Schoeman and grandson of the first owner of the farm, now covered by the lake, established the townships of Kosmos, Schoemansville and Meerhof (the latter on the Farm Rietfontein 485 JQ) in 1923 on the shores of the lake. The existing railway line passing the EM Surface Area was originally completed in 1906, but, due to continuous increase in freight weight and usage, has been much upgraded in the past.

During the past 40 years, up until the early 1990s, the area north of the EM Surface Area has been part of the former Bophuthatswana, where large numbers of so-called “surplus” people were resettled after being removed from “white” areas. This led to the rapid increase in urban

development in the region. Several well-known townships were developed: GaRankuwa, Soshanguve, Winterveld, etc.

8.14.2 Site specific review

Five (5) Phase 1 HIAs have been conducted for the collective EM Consolidated MR Area to identify heritage resources and their conservation importance. ***Figure 46*** below provides an indication of heritage features surrounding the EM Consolidated MR Area.

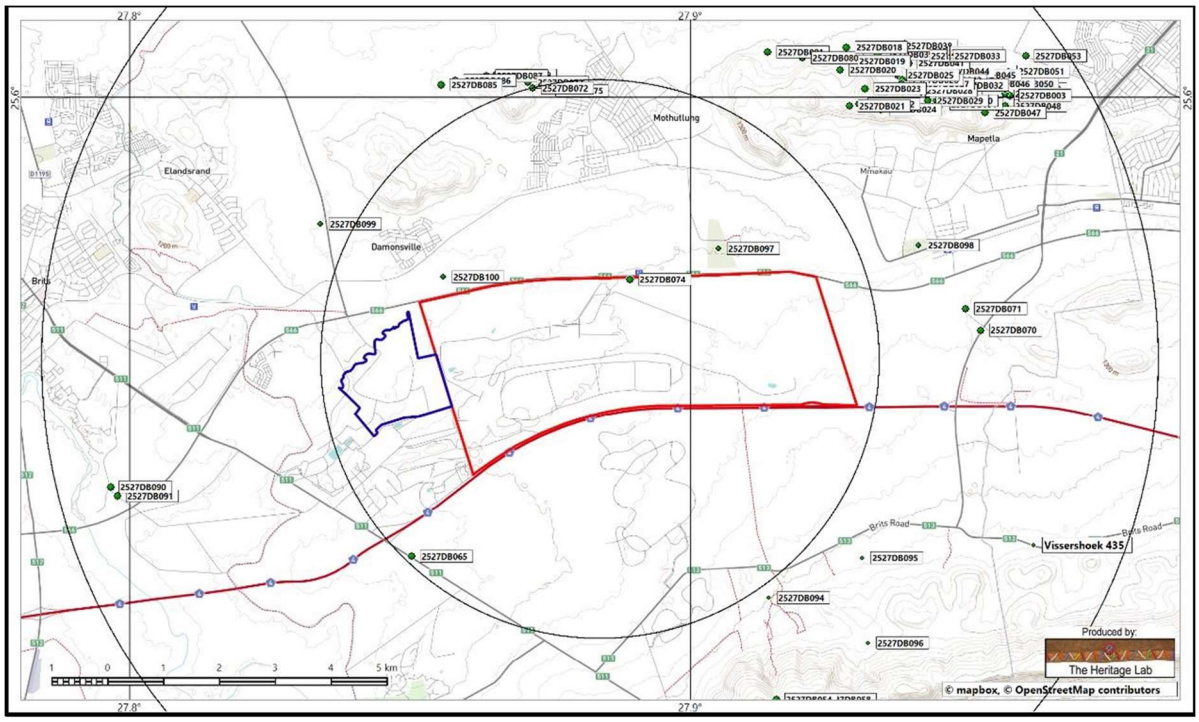


Figure 46: Location of known heritage sites and features in relation to the Consolidated MR Surface Area (Van Schalkwyk, 2020).

Older maps do not provide information on the region, its development and occupation. Jeppe's Map, dating to 1899, indicates that the region has been surveyed and divided into farms. A single road, travelling from Pretoria to Rustenburg, is indicated south of the EM Surface Area. A later map dating to 1925, shows the same road to the south and the railway line and various stations that were completed in 1906. However, it gives no other information.

During the 1960s/early 1970s, the railway line was rerouted, cutting out most of the bends. In addition, some of the stations/halts were relocated from their original position. The official aerial photographs shows that the EM Surface Area was subjected to intense farming (agricultural fields) activities. Some roads and tracks crisscross the Area, increasing from the older (1949) version to the more recent (1964) image. It is also possible to discern some non-agricultural activities, such as farmsteads and homesteads, which correspond to what is

indicated on the later topographic map dating to 1969. On this latter map, various homesteads are indicated at MM but no mining activities are indicated.

The latest two images, dating respectively to 2004 and 2020, show how the mining activities have increased in the EM Surface Area, in effect obliterating much of the previously identified (Huffman 2000; Pistorius 2006, 2010) built features. It should be stated clearly that the farmsteads and homesteads identified by both Huffman (2000) and Pistorius (2006, 2010) were accorded low significance by them and therefore mitigation measures, i.e., further documentation, was not required.

During the physical survey, the following sites, features and objects of cultural significance were identified in the EM Surface Area, refer to ***Figure 47***.

8.14.2.1 Stone Age

No sites, features or objects of cultural significance dating to the Stone Age were identified.

8.14.2.2 Iron Age

Huffman (2000) identified some LIA material, contemporary homesteads and possible graves. This site is located at MM, 7.5 km west of the Plant Project Area and there would therefore be no impact on them by the proposed development.

8.14.2.3 Historic period

Three burial sites were identified during the recent survey within the larger EM Consolidated MR Area, that are known to EP, which are listed below. None of these are within the PV Project Area. Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed:

- *Graveyard GY01 - Burial site situated on the Farm Elandsfontein 440 JQ: High significance – Grade IV-A*

Informal burial site with two, or possibly three, graves. The graves are only marked with stone cairns. The site is fenced off and has a gate for access

- *Graveyard GY02 - Burial site situated on the Farm Elandsfontein 440 JQ: High significance – Grade IV-A*

A large burial site with at least 70 graves. It is still in use and new graves were noticed. The site is fenced off and has a gate for access.

- *Graveyard GY03 - Burial site situated on the Farm Elandsfontein 440 JQ: High significance – Grade IV-A*

Informal burial site with two graves marked with headstone, and possibly two others, that are only marked with stone cairns. The site is fenced off and has a gate for access.

8.14.3 Impact of the EM PV Solar Project on Heritage Resources

The Palaeontological Sensitivity Map (SAHRIS) indicates that the EM Surface Area and the EM PV Solar Project have an insignificant to zero possibility of fossil remains to be found and therefore no palaeontological assessment was required.

For the EM PV Solar Project, the HIAs have determined that no sites, features or objects of heritage significance occur on the PV Solar Area. A graveyard (GY01) is located 100m south-west of the PV Project Area and a 50m buffer area must be maintained (Refer to ***Figure 47***).

If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision must be made regarding the application for relevant permits.

8.15 DESCRIPTION OF THE CURRENT LAND USES.

Refer to ***Table 7*** for the description of the properties on which the EM PV Solar Project will be located. The details of the properties and their respective ownership is detailed in ***Table 4.*** Other than the mining and mineral processing infrastructure situated on the properties, they are also utilised for agricultural uses (i.e., crop production as part of EP's SLP initiative, etc.) and services (i.e., electricity and roads).

Refer to ***Figure 23*** for the current EM Surface Area Infrastructure Plan and ***Figure 48*** for the land uses associated with the PV Project Area.

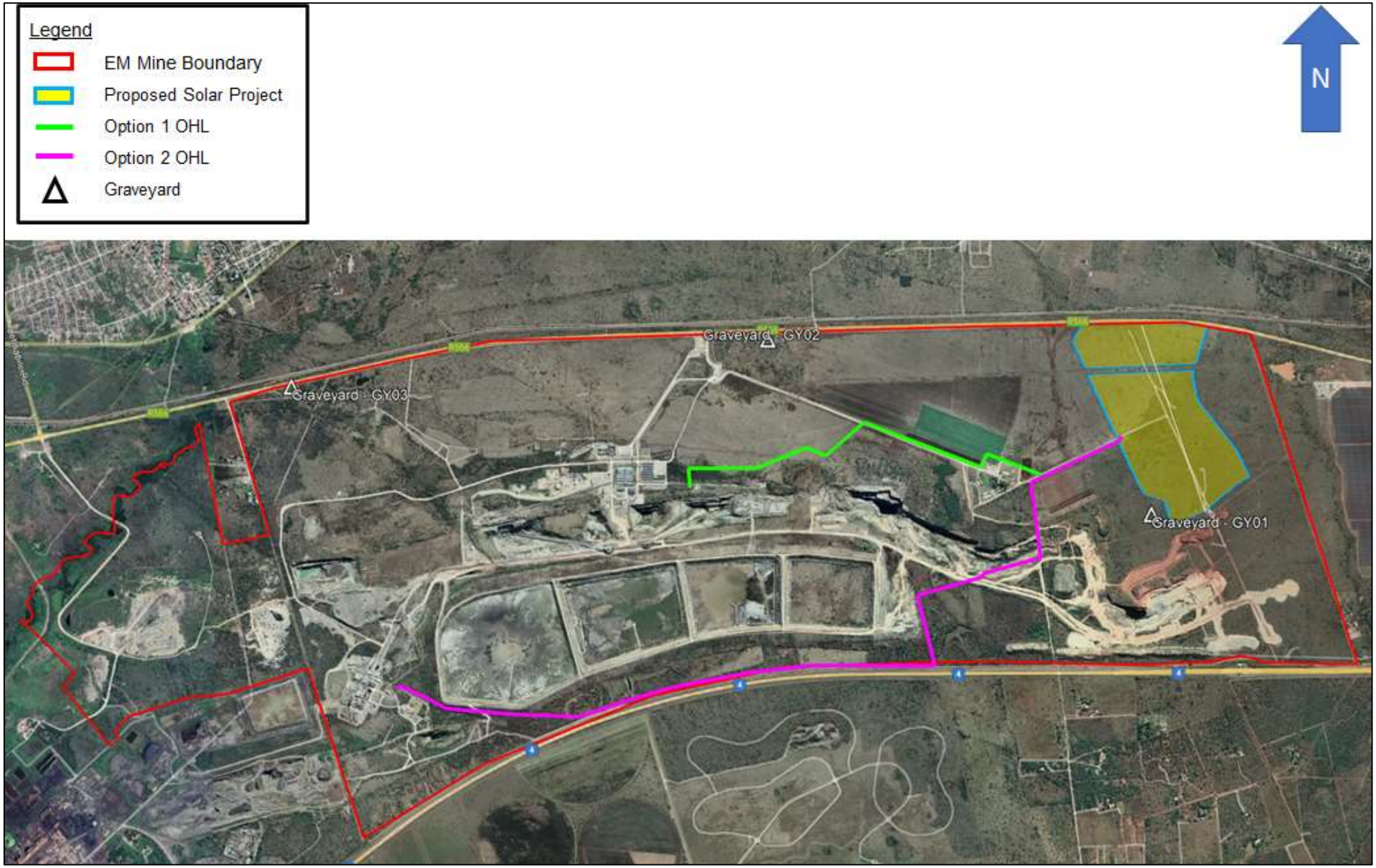


Figure 47: Location of heritage sites in the EM Surface Area (Van Schalkwyk, 2020).

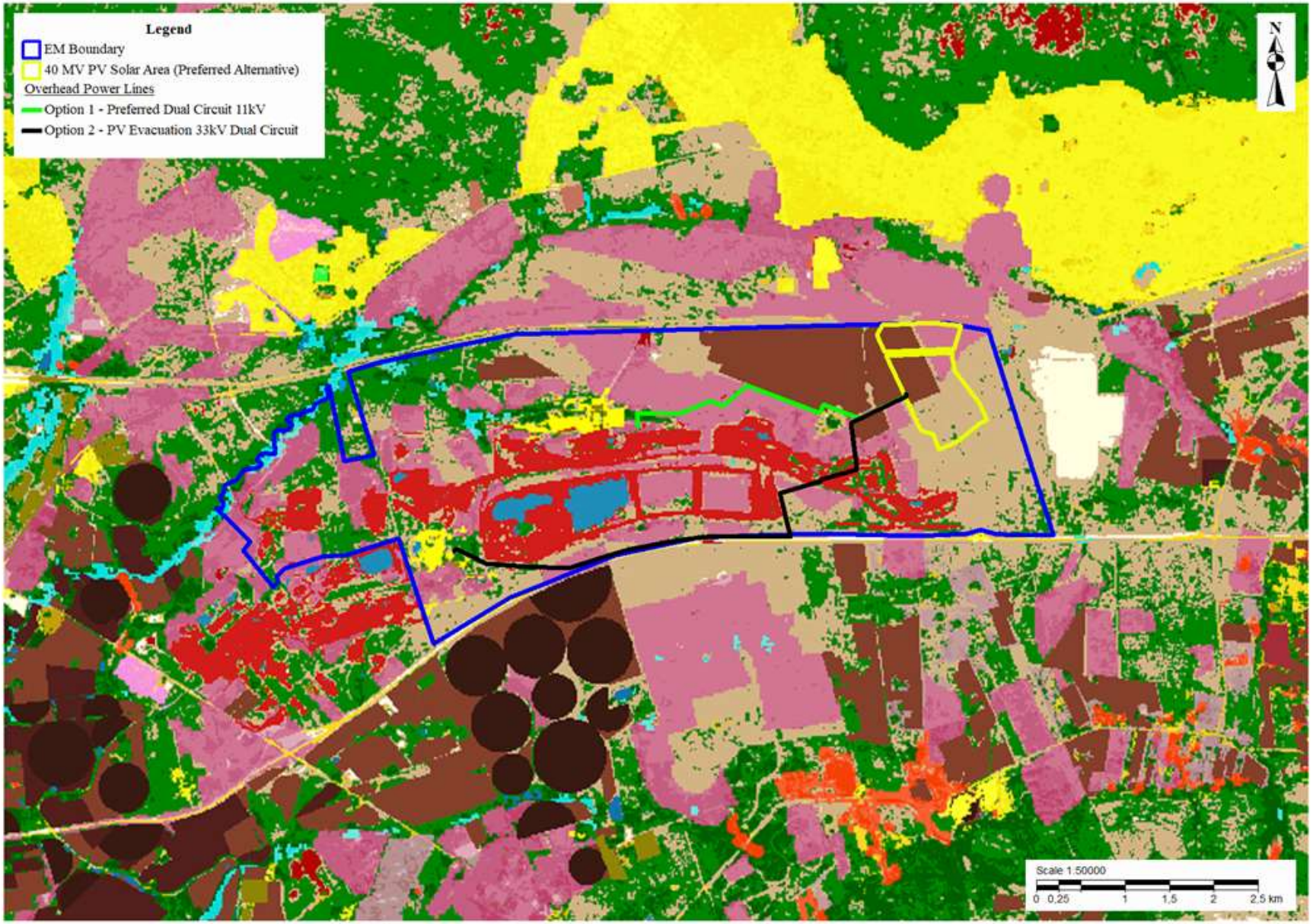


Figure 48: Land Cover Map for the PV Project Area

9. IMPACTS IDENTIFIED

This part of the document focuses on the identification of the major potential environmental and socio -economic impacts due to activities, processes and actions associated with the EM PV Solar Project on the surrounding environment (as required in terms of Regulation 21(3) of the 2014 EIA Regulations).

Only impacts related to new activities being applied for will be included in the impact and risk assessment as part of the EIAR. The EMPr Report (***Appendix 8*** of this document) is a standalone EMPr, providing mitigation measures only applicable to the development and operation of the EM PV Solar Project. Note: there will be possible impacts that will overlap with the existing consolidated EM EA and EMPR, these impacts should be holistically managed; and the EM HSEQ provide oversight and responsibility for duty of care.

Impacts were identified by looking at the following four phases of the EM PV Solar Project and the associated alternatives:

- Planning and Construction Phase;
- Operational Phase;
- Decommissioning and Closure Phase; and
- Post Closure Phase.

Potential cumulative and residual impacts have also been identified, where applicable.

9.1 ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

The preferred alternative for the EM PV Solar Project will comprise of the following:

- a 40MW PV Plant situated within 105 PV Project Area;
- Inverters and transformers;
- Up to 33 kV transmission lines and transmission towers (Option1);
- Cabling between project components;
- Access and internal roads;
- Borehole for the supply of water for construction and operation needs;
- On-site facility substation;
- Telecommunications mast;
- O&M buildings;
- Security, perimeter fencing and access control;
- Temporary offices and construction yard;
- Water and sewage pipelines; and

- Temporary laydown area.

The following activities and different project phases will likely lead or result in impacts:

9.1.1.1 Planning and Construction Phase

Activities that will be carried out during the Construction Phase include the following:

- Establishing of temporary construction camp and laydown area;
- Erection of a fenced area;
- Drilling and equipping of an abstraction borehole, with the purpose to supply water for construction and operational uses;
- Vegetation Clearance bulk earth moving activities;
- Earthworks, i.e., excavation and removal of soil and material;
- Concrete mixing and casting;
- Construction of the:
    - 40 MW PV Plant;
    - Inverter Station;
    - Transformer Station;
    - Substation complex;
    - O&M buildings (i.e., workshops; small storage areas; offices and ablutions facilities for staff, security and visitors; guard hut, services and ablution facilities; water storage tanks or covered lined ponds; pipelines; waste collection and storage area; and parking area).
    - Development of an access road from the R566;
    - Transmission lines; and
    - Access road.
- Construction or upgrading and expansion of internal roads for the transportation of material and general equipment movement;
- Expansion of existing and the development of new pipelines for the conveying of water and sewage;
- Managing building rubble and construction waste generated during the construction;
- Continued ground and surface water monitoring; and
- Dust suppression and monitoring.

9.1.1.2 Operational Phase

Activities that will be conducted in the Operational Phase include the following:

- Operation of the 40 MW PV Plant
- Maintenance of solar panels and distribution facilities;
- Continuous inspection of the proposed facilities, to ensure they meet the EA and other license requirements;
- Monitoring of the dust fallout, surface and groundwater for pollution;
- Continued ground and surface water monitoring; and
- Dust suppression and monitoring.

9.1.1.3 Decommissioning and Closure Phase

Decommissioning and closure activities will be conducted as per the closure plan for the EM Surface Area. A summary of the decommissioning and closure phase activities will included include the following:

- Identify the infrastructure (i.e., pipelines, channels, roads and other services); buildings (i.e., substation, offices and workshop); and post closure structures that will remain post closure of the mining operation;
- Decommissioning of infrastructure and structures as the closure of EM commences;
- Rehabilitation of the disturbed areas as per the Rehabilitation and Closure Plan; and
- Monitoring of environmental features as decommissioning activities continues (i.e., surface and groundwater, soil quality, contaminated land and dust fall-out monitoring).

This list is provisional and will be revised annually, with a focussed and detailed evaluation and revision five years before planned end of the EM PV Solar Project.

9.1.1.4 Post-Closure Phase

Post-closure activities will gradually be phased in during the decommissioning and closure phase, to ensure a stable post closure ecosystem. Possible activities that might be conducted during the post-closure phase include the following:

- Monitoring of surface and groundwater for pollution;
- Implementation of a judicious soil nutrient supplementation and grazing management system, to ensure the ground cover develops to a sustainable and acceptable level;

- Monitoring the rehabilitated areas for signs of erosion, poor vegetation growth, fertility etc. Including the sustainability of the rehabilitation; and
- Replacement of topsoil (if topsoil was lost due to erosion and remediation of the cause of the erosion).

9.1.2 Impacts identified

The main potential impacts preliminarily identified for the EM PV Solar Project are listed below; these impacts were identified by utilising best practice guidelines, the undertaking of investigation and studies by independent Specialists and possible concerns raised by I&APs (Refer to ***Table 26*** below that lists the potential impacts that have been identified as part of the proposed activities).

9.1.3 Cumulative Impacts

The proposed potential cumulative impacts, as presented in ***Table 27*** below, have been preliminarily identified and will be investigated further during the EIA phase.

Table 26: List of the potential impacts associated with the proposed activities

Feature	Impact	Timing
Air Quality	Dust and associated emissions during construction and decommissioning phases of the EM PV Solar Project.	Planning and Construction, Operational Closure and Post Closure.
	Dust emissions during operation, particularly associated with material handling and the transport of material via truck.	
	Dust emissions associated with the clearance of large areas.	
Visual	Potential visual impact on nearby communities and users of roads near PV Project Area.	Planning and Construction, Operational Closure.
	Post closure residual visual impact due to the land disturbed by decommissioning activities.	Post Closure
Surface water	Increased sedimentation and silt loads of stormwater and run-off.	Planning and Construction, Operational Closure
	Impacts on the stormwater and run-off quality.	
	Habitat modification of the established existing ephemeral drainage area to east of the PV Project Area.	
Groundwater	Possible groundwater contamination due to leakages of temporary ablution facilities, chemicals, paints and hydrocarbon spillages.	Planning and Construction, Operational
	Dewatering leading to the formation of a dewatering cone; and reduced groundwater levels and water availability.	
Noise	Nuisance noise impact from construction and decommissioning machinery and vehicles.	Planning and Construction,
Fauna and Flora	Loss of sensitive avifaunal habitat and avifaunal species.	Planning and Construction, Operational Closure and Post Closure.
	Loss of sensitive flora habitat and species.	
	Establishment of alien invasive plants	
	Loss of sensitive fauna habitat and species	
	Runaway fires leading to loss of habitat and species.	
	Impact on fauna species movement corridor	
Waste	Building rubble and construction waste will be generated during construction and decommissioning of the EM PV Solar Project.	Planning and Construction, Closure.
	Waste generated during the operational phase.	Operational
Land	Disturbance of the land capability on undisturbed footprints.	Planning and Construction, Operational
	Fragmentation of land	
Agricultural Potential	Loss of potential grazing land	Planning and Construction, Operational
	Loss of potential arable land	
	Loss of animal production	
Traffic	Increase in traffic leading to traffic incidents and accidents. Construction of a new access road will likely influence traffic flow patterns and result in delays.	Planning and Construction, Operational Closure.
Socio-economic	Tensions over limited employment opportunities and procurement contracts	Planning and Construction, Operational
	Loss of the visual character of the landscape	

Feature	Impact	Timing
	Influx of job seekers to the Project Area	Closure.
	Nuisance impacts associated with noise and dust generation	Planning and Construction,
Soil	Soil erosion by means of water and wind movement.	Planning and Construction, Operational Closure.
	Soil pollution due to hydrocarbon spillages.	
	Soil compaction due to vehicle and machinery movement.	
	Soil degradation due to lack of / or incorrect rehabilitation and potential erosion during the Closure Phase.	Closure and Post Closure
Heritage resources	Possible identification of resources with archaeological and heritage significance during the construction phase.	Planning and Construction
Other Services	Possible electromagnetic interference to other service providers within the area (e.g. telecommunication, radio, etc.) Possible impact on civil aviation.	Operational
Greenhouse Gases (positive)	Overall reduction of Scope 2 GHG Emissions for EM	Operational
Socio-Economic (Positive)	Reduce EM's reliance on the national grid	Operational
	Job creation and increased employment opportunities	
	Ensure the continued operation of EM and increase its competitiveness, by reducing energy cost to operate EM	
	Improved skills development and training	Planning and Construction, Operational
	Local procurement opportunities for SMMEs	
	Improve sustainable mining practices in the MLM	Operational
	Establishment of post mining land uses.	Closure

Table 27: Proposed potential cumulative impacts

Aspects originating to the Cumulative Impacts	Cumulative impacts
Biodiversity – Avifauna	
Impact on avifauna in the region	Potential loss of SCC located within the region.
Biodiversity-Alien species	
• IAP establishing on disturbed areas; • Soil compaction on stockpiles and un-vegetated areas;	Aspects will likely result in habitat degradation, which will likely reduce the fauna and flora specie distribution and diversity.
Groundwater	
Infiltration of hydrocarbon spillages into the groundwater.	Aspect can potentially have an impact on the groundwater quality of surrounding water users. Water users dependant on groundwater will likely impact their livelihood.
Surface Water	
• Increased sedimentation to soil disturbance; • High stormwater velocity flows; and • Contamination of drainage lines and watercourses.	Aspects will likely result in a cumulative impact on the downstream water quality, which will likely impact on water users (i.e., agriculture, industry, etc.).
Socio-economic	
Mine closure will raise unemployment levels in the region and would increase significantly as more mines close.	The EM PV Solar Project will be decommissioned in correlation with the closure of the EM. Closure of EM will result in the cessation of jobs and demand for goods and services.
Agricultural Potential	
Increased erosion and soil degradation	Loss of agricultural potential of the area.
Climate Change (positive impact)	
Reduced dependency on non-renewable energy sources for electricity generation and supply.	Electricity supplied to EM is sourced from Eskom that produces electricity by burning non-renewable fossil fuels, which produce high levels of GHG emissions that influence climate change.

9.2 ALTERNATIVE 2

Alternatives considered included the following:

9.2.1 Technology Alternatives

Different technology alternatives were investigated for energy generation by means of solar radiation. Solar PV was determined as the most suitable option considering the climatic conditions, topography and location of the EM. Savannah (2021) in another application for the Northam Group identified several other Solar PV technology alternatives, namely:

- Bifacial PV Panels;
- Monofacial PV Panels;
- Fixed mounted PV Systems (Static/fixed-tilt panels);
- Single or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and
- Monocrystalline modules, polycrystalline modules or thin film modules.

9.2.2 Energy Source Alternatives

As part of the initial feasibility of the EM PV Solar Project, different renewable and/or energy sources were investigated. The sources included HFC, wind, solar and combustible fuel burning. The wind and combustible fuel burning sources were found to be not feasible, based on the lack of adequate wind levels; the high emission levels associated with burning of fuels; and the sustainability of fuel sources in the long term. The HFC process was found not to be economic feasible, given its high capital and operation costs.

9.2.3 Site Alternatives

As part of the feasibility assessment of the EM PV Solar Project, several site alternatives within the EM Surface Area were considered, Refer to ***Figure 9***. The alternative locations were rejected during the Scoping Phase based on the location of sensitive features, security and vandalism risks; existing mining and operational infrastructure; and site constraints (i.e. dust, blasting and active mine areas) that would influence the Project's efficiency.

9.2.4 Route Alternatives for Infrastructure

Route alternatives for the 11 kV and 33 kV transmission lines and transmission towers were considered (Refer to ***Figure 9***). The OHL Route alternatives included a preferred northern route (Option 1) and an alternative southern route (Option 2). The impacts of the OHL Routes were found to be similar, with the exception that Option 2 was longer (higher maintenance component) and crossed over more habitat units (which would lead to edge effect).

10. METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The potential impacts were determined by evaluating the different phases associated with the establishment and development of the EM PV Solar Project.

Different impacts are associated with the different phases of the EM PV Solar Project. Potential impacts that may be/may have been caused by the Project were identified using the following key sources and tools:

- Views and inputs from the I&APs (local knowledge);
- Existing information and studies;
- Specialist investigations;
- Site visit with the project team; and
- Regulatory requirements.

10.1 SPECIALIST INVESTIGATIONS

10.1.1 DFFE Screening Tool

As discussed in the legislative table above, the submission of a Screening Report generated from the DFFE Screening Tool is compulsory for the submissions of EA applications. Refer to ***Appendix 7*** for the Screening Report generated for the EM PV Solar Project. The Table below provides a summary of the sensitivity themes that the Screening Tool identified and a motivation to the applicability of the themes in terms of the PV Project Area.

Table 28: DFFE Web Based Screening Tool Sensitive Rating and motivation for studies undertaken.

Specialist Assessment	Sensitive Rating as per the Screening Tool (relating to the need for the study)	Motivation
Agricultural Impact Assessment	Very High	A Soil and Land Capability Assessment was undertaken that focusses on the agricultural potential and impact of the EM PV Solar Project on the land capability of the PV Project Area (refer to Appendix 11).
Landscape / VIA		A VIA was undertaken as part of the project (refer to Appendix 14).
Archaeological and Cultural Heritage Impact Assessment	Low	Five separate HIAs have been undertaken over the larger EM Consolidated MR Area, which cover the PV Project Area. As such, the EAP is of the opinion that a further HIA was not required.
Palaeontology Impact Assessment	Medium	The HIAs undertaken and Palaeontological Sensitivity Map (SAHRIS) indicated that the Consolidated MR Surface Area and the proposed EM PV Solar Project has an insignificant to zero possibility of fossil remains being found and therefore no palaeontological assessment was deemed necessary by the EAP.
Terrestrial Biodiversity Impact Assessment	Very High	A Terrestrial Assessment was undertaken that includes a Fauna and Flora Component (Refer to Appendix) and complies with the Assessment Procedures.
Aquatic Biodiversity Impact Assessment	Low	A Terrestrial Assessment was undertaken that covered possible aquatic features located within or near to the PV Project Area (Refer to Appendix 12). It complies with the October 2020 Assessment Procedures.
Hydrology Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the boundaries of the larger EM Consolidated MR Area. Several Hydrology Assessments have been undertaken for the EM; and the recent Hydrology Assessment was updated in 2020. The relevance and possible impacts of the EM PV Solar Project were assessed based on the details of the existing Hydrology Assessments and it was deemed unnecessary to undertake a new project-specific Hydrology Assessment.
Noise Impact Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the larger EM Consolidated MR Area. Several NIAs have been undertaken for the EM; and the most recent Noise Assessment was updated in 2021. The relevance and possible noise impacts of the EM PV Solar Project was assessed based on the details of the recent updated NIA. It was found that the possible noise impact will be associated with temporary construction activities that was deemed similar to current mining activities. It was therefore deemed unnecessary to undertake a NIA.
Radioactivity Impact Assessment	No rating provided as part of the screening Report.	No radioactive material will be used as part of the EM PV Solar Project. A radioactivity impact assessment is therefore deemed not relevant.
Defence Assessment	Low	As per the March 2020 Assessment Procedures, no Defence Assessment is required where low sensitivity is determined.
Civil Aviation Assessment	Medium	The CAA has been consulted as part of the PPP. A Civil Aviation Assessment was deemed unnecessary; and no specific requirements for such assessments are included in the Assessment Procedures. EM will ensure that any required consent from the CAA is obtained prior to the commencement of any activities requiring such consent as part of the EM PV Solar Project.
Traffic Impact Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the EM Consolidated MR Area. A Traffic Impact Assessment has been undertaken for the EM. The applicant will ensure that, where relevant, the necessary permits and wayleaves will be obtained from the relevant roads authority prior to the commencement of the activity.
Geotechnical Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the EM Consolidated MR Area. A Geotechnical Assessment has been undertaken for the larger EM area. The EM has a dedicated Geologist on site, who provided inputs to the location and setting of the preferred location of the EM PV Solar Project.
Socio-Economic Assessment	No rating provided as part of the screening Report.	A SEIA was undertaken for the EM PV Solar Project (refer to Appendix 10).
Health Impact Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the EM Consolidated MR Area. The EM has an on-site clinic and dedicated Health, Safety, Environment and Community (HSEC) department. The EM PV Solar Project will not lead to any

Specialist Assessment	Sensitive Rating as per the Screening Tool (relating to the need for the study)	Motivation
		significant health impacts and the applicant will comply to OHSA and MHS requirements. A health impact assessment was deemed unnecessary.
Climate Impact Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project will likely reduce the Scope 2 GHG Emission of the EM and contribute positively to climate change reduction. A climate impact assessment was therefore deemed unnecessary.
Ambient Air Quality Impact Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the EM Consolidated MR Area. Several AQIAs have been undertaken for the EM; and the most recent AQIA was updated in 2020. The relevance and possible ambient air quality impact of the EM PV Solar Project was assessed based on the details of the recent updated AQIA. It was found that the possible ambient air quality impact will be associated with temporary construction activities (i.e. dust generation) that was deemed similar to current mining activities. An established dust monitoring network is located around the location of the EM PV Solar Project. It was therefore deemed not necessary to undertake an AQIA.
Seismicity Assessment	No rating provided as part of the screening Report.	The EM PV Solar Project is located within the EM Consolidated MR Area. Blasting Impact Assessments have been undertaken for the EM and concurrent seismic monitoring is undertaken by the EM. No blasting activities will be undertaken as part of the EM PV Solar Project. It was therefore deemed not necessary to undertake a seismicity assessment.
Plant Species Assessment	Medium	A Terrestrial Assessment was undertaken that includes a Fauna and Flora Component, which complies with the Assessment Procedures (Refer to Appendix 12).
Animal Species Assessment		

Specialist studies have been finalised for the EIA Phase of the EM PV Solar Project. The Specialist studies and the DEIAR / DEMPR will be made available for public comment. The following Specialist studies were undertaken for the EM PV Solar Project:

- Terrestrial Biodiversity Assessment – STS Environmental;
- Avifauna Impact Assessment - STS Environmental;
- Soil and Land Capability Assessment – Index;
- VIA – JEMS; and
- SEIA – Surveya.

In addition to the Specialist studies recently undertaken for the EM PV Solar Project, the following existing Specialist assessments and information from the EM Consolidated MR Area were utilised to determine the baseline and pertinency of possible impacts in relation to the EM PV Solar Project:

- EM's environmental licences, particularly recently submitted EIARs and environmental monitoring reports;
- Specialist reports conducted on and around the PV Project Area for previous applications lodged, namely:
    - Groundwater Impact Assessment – Water Hunters;
    - Freshwater and Aquatic Assessment – SAS Environmental;
    - NIA - Eares;
    - HIAs – Several Specialists (Dr Van Schalkwyk *et al.*);
    - AQIA (Rayten); and
    - Hydrology Assessment (Highlands Hydrology).

10.2 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

As part of the PPP for the EM PV Solar Project, an Issues and Response Report has been compiled, ***refer to Appendix 6***. This document records the issues of concern, questions and suggestions contributed by stakeholders during the Scoping and EIA Process. This report also includes the responses provided by relevant parties. Comments and issues raised were received through consultation sessions and written methods (emails and letter). Refer to ***Section 7.3*** for the issues raised by IAPs.

As part of the project announcement phase and DSR review period, the following concerns and issues raised by I&APs and stakeholders were summed-up to the following points:

- Nuisance impact associated with current mining activities (i.e. Noise, dust and blasting etc.);
- Possible job and business opportunities; and

- Socio-economic impact of EM on the surrounding community and businesses.

During the EIA phase I&APs and Stakeholders will be given an opportunity to review the DEIAR and DEMPr. Material concerns raised by I&APs and Stakeholders will be addressed in the FEIAR.

10.3 PROCESS USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The potential impacts were determined by evaluating the different phases associated with the Proposed Project. These phases were determined to be as follow:

- Pre-Construction Phase (I);
- Construction Phase (C);
- Operational Phase (O); and
- Closure and Post-Closure Phase (P).

The 2014 EIA Regulations requires that all identified potential impacts associated with the EM PV Solar Project be assessed in terms of their overall potential significance on the biophysical and socio-economic environment. The criteria identified in the 2014 EIA Regulations include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated;
- Cumulative impacts; and
- Residual Impacts

The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented below.

The significance was determined by calculating the extent (i.e., physical extent affected by the potential impact); duration (i.e., timeframe that the potential impact will be in effect); intensity (i.e., expected amplitude of the impact); and reversibility (of the impact's severity) . Once the significance of the impact has been determined, the quantifiable likelihood or probability of the impact is given a percentage value that represents the significance of the impact. The environmental and socio-economic risk is determined by multiplying the significance with the probability of the impact occurring.

A description of the parameters used in this impact assessment is given in

Table 29 and ***Table 30*** below.

Table 29: Impact Assessment Methodology.

Parameter	Description
Extent:	Physical extent affected by the potential impact: ■ *Direct* – Actual footprint of the activity (weight value – 1) ■ *Onsite* – Within specific mine/development boundary (weight value – 2) ■ *Local* – Within municipal boundary (weight value – 3) ■ *Regional* – Outside municipal boundary (weight value – 4) ■ *National/International* – Two or more provinces and ultimately outside the RSA (weight value – 5)
Duration:	Timeframe that the potential impact will be in effect ■ *Immediate* - 1 Year or less (weight value – 1) ■ *Short term* – 1-2 Years (weight value – 2) ■ *Medium term* – 2-5 Years (weight value –3) ■ *Long term* – 5-15 Years (weight value – 4) ■ *Permanent* – 15 years and beyond (weight value – 5)
Intensity:	The expected amplitude of the impact: ■ *Minor* - The activity will only have a minor impact on the affected environment in such a way that the natural processes or functions are not affected (weight value – 1) ■ *Low* – The activity will have a low impact on the affected environment (weight value – 2) ■ *Medium* – The activity will have a medium impact on the affected environment, but function and process continue, albeit in a modified way (weight value – 3) ■ *High* – The activity will have a high impact on the affected environment, which may be disturbed to the extent where it temporarily or permanently ceases (weight value – 4) ■ *Very High* - The activity will have a remarkably high impact on the affected environment, which may be disturbed to the extent where it temporarily or permanently ceases (weight value – 5)
Reversibility	The reversibility of an impact is the severity of the impact ■ *Completely reversible* - The impact is reversible without any mitigation measures and management measures (weight value -1) ■ *Nearly completely reversible* - The impact is reversible without any significant mitigation and management measures. Some time and resources required - (weight value -2) ■ *Partly reversible* - The impact is only reversible with the implementation of mitigation and management measures. Substantial time and resources required (weight value -3) ■ *Nearly irreversible* - The impact can only marginally be reversed with the implementation of significant mitigation and management measures. Significant time and resources required to ensure impact is on a controllable level (weight value -4) ■ *Irreversible* - The impact is irreversible - (weight value -5)
Significance of Impact / Consequence	Significance is determined through a combination of the various impact characteristics and represents the combined effect of the Extent, Duration, Intensity and Reversibility Significance = Extent + Duration + Intensity+ Reversibility
Probability:	The likelihood of an impact occurring: ■ I*mprobable* - 0 – 25% chance (weight value – 1) ■ *Low* – 26 – 50% chance (weight value – 2) ■ *Medium* – 51 – 75% chance (weight value – 3) ■ *High* – 76 – 100% chance (weight value – 4)
Environmental Risk Refer to the table below	Multiplication of the impact's significance by the probability of the impact occurring produces a conclusion of the overall risk that an impact poses to the surrounding environment. Significance of Impact X Probability = High/Medium/Low Environmental Risk

Table 30: Environmental risk and impact significance matrix.

Significance of Impact				
		Low Impact (4-8)	Medium Impact (9-15)	High Impact (16-20)
Probability	Definite / Highly Likely 4	16-32	36-60	64-80
	Medium 3	12-24	27-45	48-60
	Low 2	8-16	18-30	32-40
	Improbable/ Unlikely 1	4-8	9-15	16-20

Environmental Risk	Guidelines for Control Strategies
(H) – High	Proactively reduce risk level, short-term response.
(M - H) - Medium to High	Proactively reduce risk level, short-term response.
(M) – Medium	Management strategies to reduce -risk level, short to medium term response.
(L - M) - Low to Medium	Management strategies to reduce risk level, short to medium term response, operational control and housekeeping.
(L) – Low	Operational control and housekeeping.

10.4 THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

The EIA process is based on the grounds that impacts and risks identified will be mitigated with measures that are necessary to avoid, minimize or offset predicted adverse impacts and, where appropriate, to incorporate these into an environmental management plan or system (DEAT, 2004). The following **objectives/ criteria** were utilised during the mitigation measures development and identification process were identified during the EIA Phase, to:

- Find more environmentally sound ways of undertaking specific activities;
- Enhance any environmental and social benefits of a proposed activity;
- Avoid, minimise or remedy negative environmental impacts;
- Apply a lifecycle approach to resources and products (cradle to cradle); and
- Ensure that any residual negative environmental impacts are environmentally acceptable.

The mitigation measures selection process was conducted in a hierarchal manner, namely:

1. Preventative measures will be identified to avoid, where possible, negative impacts that may arise due to the proposed activity;

2. Measures will be identified to minimise and/or reduce the negative impacts to “as low as practicable” levels; and

3. Measures will be identified to compensate or remedy residual negative impacts that are unavoidable and cannot be minimised or reduced any further (DEA, 2006).

Proposed mitigation measures will be communicated to the applicant, Stakeholders and I&APs for review as part of compiling the draft EMPr. The parties will comment on the feasibility and practicality of implementing the mitigation measures. The mitigation measures may be adjusted based on the comments received.

11. ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

Refer to the Sections below providing the Impact and Risk Assessment and significance rating for activities that would be undertaken prior to and after the implementation of mitigation measures. This section focuses on the specific socio-economic and biophysical aspects associated with the EM PV Solar Project.

11.1 AIR QUALITY

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Dust and associated emissions due to the following activities: ▪ Vegetation clearance of large areas ▪ Wind erosion from exposed areas (i.e. vegetation clearance); ▪ Material handling, including loading and off-loading; and ▪ Vehicle dust entrainment on internal roads	I, C, CC,	3	2	2	2	9	3	27	• EM should continue to monitor dust impacts, as per the current dust monitoring protocol. • Earthworks should be limited on windy climatic conditions, where possible, and dust suppression measures increased. • Employ good housekeeping, both inside and outside the construction site, including cleaning up rubbish and debris, sweeping and hosing down paved and tarred roadways. • Dust suppression methods currently utilised on the EM Surface Area should be applied where required. • Revegetation of rehabilitation areas, to minimise wind erosion impacts and establish self-sustaining ecosystems. • Long-term topsoil stockpiles will be revegetated as soon as practically possible. • Conduct regular site inspections, to ensure the dust mitigation measures are being implemented. Regular visual site inspections are recommended, to assess whether further mitigation is required for any of the dust emission sources. • Maintain a complaints procedure at the PV Project Area. Investigate, mitigate and follow-up on complaints received and maintain records of actions taken and correspondence received.	2	2	1	1	6	2	12

11.2 VISUAL

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Potential visual impact on nearby communities and users of roads near proposed infrastructure during the construction phase due to the following activities: ▪ Clearing of vegetation; ▪ Civil Works; and ▪ Installation of the Solar Panels and associated infrastructure.	C,	4	1	2	2	9	3	27	• Remove the minimum amount of vegetation necessary and retain as much natural vegetation as possible. • Implement dust suppression on all dirt roads. • Limit construction activities to reasonable hours. • Rehabilitate all disturbed areas immediately after the completion of construction works. • Lighting will be directed downwards with containment shields to prevent light shining directly away from the proposed operations. Security flood lighting and operational lighting will only be used where absolutely necessary and carefully directed, preferably away from sensitive viewing areas. • Implement good housekeeping procedures for the Project, to ensure the site is kept clean of debris, garbage, graffiti, fugitive trash, or waste generated onsite. • Utilise non-shiny structures for the construction camp, park and toilets, i.e., avoid unpainted roofs.	3	1	1	2	7	2	14
Visual impact of EM PV Solar Project to road users and landowners during the operational phase.	O	4	5	2	1	12	2	24	• Maintain the general appearance of the facility as a whole. • Adjust tilt angles of the panels, if glint and glare issues become evident. • If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site. • Repair and rehabilitate visual signs of erosion. • Maintain a complaints procedure at the PV Project Area. Investigate, mitigate and follow-up on complaints received and maintain records of actions taken and correspondence received. • Continuously maintain infrastructure.	4	5	1	1	11	1	11
Post closure residual visual impact due to the land disturbed by decommissioning activities.	CC PC	3	2	2	1	9	2	18	• Restore the landscape to the development topography, as far as practical and in-line with the closure plan. • Ensure that the final landform is free draining. • Manage rehabilitated areas (e.g., remove AIPs, etc.). • Repair and rehabilitate visual signs of erosion and surface subsidence. • Monitor vegetation establishment for at least 2 seasons, to ensure effective rehabilitation.	1	2	1	1	5	2	10

11.3 SOIL, AGRICULTURAL POTENTIAL LAND CAPABILITY

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Soil potential loss due to the following: ▪ Soil erosion by means of water and wind movement. ▪ Soil pollution due to chemicals, paints and hydrocarbon spillages. ▪ Soil compaction due to vehicle and machinery movement.	I,C, O, C	1	1	3	3	8	3	24	• Remove the minimum amount of vegetation necessary and retain as much natural vegetation as possible. • Energy dissipaters must be constructed at points where there are concentrated discharges of water into the environment (such as culverts and outflows of water from diversion berms or canals). • Adequate ablution facilities must be provided for contractors during the construction phase and in areas away from formal sewage facilities. • Spill kits must be provided at all appropriate locations or machinery, to mitigate spillages effects, should they occur. • There should be an incident management system, including procedures and training for dealing with incidents. Major spillage incidents must be reported to the relevant authorities. • If spills do occur and soils become contaminated, the appropriate remedial measures must be identified, in consultation with an appropriately qualified specialist. • Polluted soils should be remediated in-situ. • Chemicals, solvents, paints and hydrocarbons must be stored in bunded areas, with a 110% capacity on impermeable surfaces. • Spill kits must be provided at all appropriate locations or machinery, to mitigate spillages effects, should they occur. • Safety Data Sheets must be kept for chemicals, solvents, paints and hydrocarbons stored on-site.	1	1	2	1	5	2	10
Disturbance of the land capability on undisturbed footprints, potentially leading to loss of: - high potential land; - grazing land; - fragmentation of land; and - agricultural production.	O	1	4	2	2	9	2	18	• There is no high potential land that will be lost, no mitigation required. • 98Ha can potentially be used for grazing although the land is now vacant. Once the PV Plant has been decommissioned, the area will be rehabilitated and likely revert to grazing. The land is not currently used for grazing, thus no loss and no mitigation required. • No crops are produced on the PV Project Area currently, thus no loss of crop production.	1	1	2	1	2	2	10

11.4 SURFACE WATER

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Increased sedimentation and silt loads of storm water and run-off impacting the water quality of stormwater.	C CC	3	2	3	3	11	2	22	• Continue to undertake monthly monitoring of surface water points, as per the EM monitoring programme. • Implement stormwater management practices that focuses on separating clean and dirty water areas. • Stormwater runoff must be correctly managed during all phases of the development to reduce potential soil erosion. • A SWMP should be developed once the layout plan has been finalised. • Energy dissipaters should be implemented at points of run-off concentration to reduce the velocity and flow of water. • Ensure paved and tarred surfaces are free of sand, soil and debris.	2	2	1	2	7	2	14
Habitat modification of the established existing ephemeral drainage area to east of the PV Project Area.	I C O CC PC	2	5	3	3	13	3	39	• Maintain a 100m buffer area from the ephemeral drainage area. • The ephemeral drainage area may not be crossed by construction vehicles. • A SWMP should be developed once the layout plan has been finalised. • Water impacted by possible 'dirty' processes must not be discharged into the environment.	2	5	2	2	11	2	22

11.5 GROUNDWATER

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Possible groundwater contamination due to leakages of temporary ablution facilities, septic tanks/lilliput systems, chemicals, paints and hydrocarbon spillages.	C O CC PC	2	5	3	3	13	2	26	• Chemicals, solvents, paints and hydrocarbons must be stored in bunded areas with a 110% capacity on impermeable surfaces. • Spill kits must be provided at all appropriate locations or machinery, to mitigate spillages effects, should they occur. • There should be an incident management system, including procedures and training for dealing with incidents. Major spillage incidents must be reported to the relevant authorities. • If spills do occur and soils become contaminated, the appropriate remedial measures must be identified, in consultation with an appropriately qualified specialist. • Safety Data Sheets must be kept for chemicals, solvents, paints and hydrocarbons stored on-site. • Temporary ablution facilities and operational sewage systems must not be located within 100m buffer area of the ephemeral drainage area. • Septic tanks and other sewage systems that will be used during the operational phase must be approved by DWS. • EM must continue to monitor the groundwater of the larger EM Consolidated MR Area and communicate groundwater quality impacts to the operator of the EM PV Solar Project.	2	5	2	2	10	1	10
Dewatering leading to the formation of a dewatering cone; and reduced groundwater levels and water availability.	C O	2	5	3	3	13	3	39	• Undertake yield testing prior to commissioning the borehole to determine the yield and sustainable supply of the borehole. • Obtain approval from DWS before boreholes are equipped for water supply. • Equip all dewatering boreholes with flow meters and maintain a record of volumes abstracted. • Include the borehole as a monitoring point for the larger EM Consolidated MR Area. • Should the borehole be used for potable supply, annual SANS 241 Drinking water quality analysis must be undertaken to ensure the water quality. • Maintain a complaints procedure at the PV Project Area. Investigate, mitigate and follow-up on complaints received and maintain records of actions taken and correspondence received.	2	5	2	2	10	2	20

11.6 NOISE

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Nuisance noise impact from construction and decommissioning machinery and vehicles.	I C CC	3	1	2	2	7	3	21	• Construction vehicles and equipment must be maintained to limit noise emissions. • Adequate Personal Protective Equipment ("**PPE**") must be used. • Limit construction activities to reasonable hours. • Maintain a complaints procedure at the PV Project Area. Investigate, mitigate and follow-up on complaints received and maintain records of actions taken and correspondence received.	3	1	1	2	6	2	12

11.7 HERITAGE

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Possible identification of resources with archaeological and heritage significance during the construction phase.	I C	1	1	3	4	9	2	18	• Existing graveyards situated on the EM Consolidated MR Area must be avoided. A 50m buffer must be maintained around these features. • On discovery of heritage resources the operations must be stopped. Do not further disturb the area before the below is undertaken. • Notify the ECO. The ECO must arrange an assessment of the resource. If confirmed significant, the ECO must liaise with National, Cultural and History Museum. • Work must only recommence when cleared by ECO. • Maintain a complaints procedure at the PV Project Area. Investigate, mitigate and follow-up on complaints received and maintain records of actions taken and correspondence received.	1	1	2	2	6	2	12

11.8 OTHER SERVICES

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Possible electromagnetic interference to other service providers within the area (e.g. telecommunication, radio, etc.) Possible impact on Civil Aviation.	I O	3	5	2	1	11	2	22	• Consultation with other service providers regarding possible electromagnetic interference must be undertaken prior to the construction of communication masts. • Appropriate markings of project infrastructure >45m above ground level. • An obstacle approval (or confirmation that no approval is required) would be obtained from the CAA..	3	5	1	1	10	1	10

11.9 BIODIVERSITY (FAUNA AND FLORA)

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Impact on floral habitat and diversity	C O CC PC	2	5	3	2	12	4	48	**<u>Planning Phase:</u>** • Minimise loss of indigenous vegetation and natural habitat, where possible, through adequate planning and ,where necessary, by incorporating the sensitivity of the Biodiversity Impact Assessment and other Specialist studies includes in this EIA; • OHLs must be designed in such a way that habitat fragmentation is minimised; • If possible, it is recommended that solar panels be mounted on pile driven or screw foundations (e.g., post support spikes), rather than heavy foundations, (e.g. trench-fill or mass concrete foundation) to reduce the negative effects on natural soil functioning, including its filtering and buffering characteristics, while maintaining habitats for both below and aboveground biodiversity;	1	5	2	2	10	2	20

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									• Access roads should as far as possible be kept to existing roads (several roads already exist), to reduce fragmentation of natural habitat outside of the authorised footprint; • It is recommended that prior to the commencement of construction activities that the construction servitude be clearly demarcated, to prevent footprint creep into areas beyond the authorised footprints; • Develop a rehabilitation plan that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the O&M phase of the project; • Ensure sound stormwater management planning; • Prior to the commencement of construction activities, an AIP Management/Control Plan should be in place for implementation; • Removal of AIPs species should preferably commence during the planning phase and continue throughout all project phases. AIPs should be cleared within the construction footprints before any vegetation clearing activities commence, thereby ensuring that no AIP propagules are spread with construction rubble or native vegetation; or soils contaminated with AIP seeds during the construction phase; • An AIP Management/Control Plan should be implemented by a qualified professional. No uncertified chemical use for AIP control may take place. All required PPE to be used during chemical and mechanical AIP clearing and control. • Alien vegetation monitoring should take place across the PV Project Area to identify sites that should be prioritised for AIP control. The clearing and management of AIP priority areas should be monitored for re-emerging alien vegetation. • Monitoring of all the natural areas should continue throughout the O&M phase, to ensure these areas are not adversely affected by the proposed project activities, especially regarding edge effect impacts that can stem from alien vegetation proliferation or from a fragmented landscape. **<u>Construction Phase</u>** • The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management); • Removal of vegetation must be restricted to what is absolutely necessary; and should remain within the approved development footprint; • Avoid soil sealing (i.e., the destruction or covering of the ground by an impermeable material). Ensure that a vegetation layer is maintained below PV panels to promote soil health, vegetation establishment, reduced habitat							

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									fragmentation, and resources for fauna. In this regard, where a vegetation layer is maintained below and between the PV panels, use of indigenous plants from the reference vegetation type is recommended for best biodiversity outcomes; • Maintain vegetation corridors between the PV panels and along the OHL servitudes. Contributing towards conserving the regional genetic diversity of plants in these areas must be ensured through revegetating with indigenous species from the area. AIP control in revegetated sections must take place. By using native seeds/propagules and plants that are suitable for the site and have been collected from within a defined source region, it is possible to reduce loss of regional plant genetic diversity; • Ensure fire management is in place. Use of firebreaks is recommended; • Vehicles must be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction must be limited to what is absolutely necessary; and the footprint thereof kept to a minimal; • No collection of floral SCC or protected flora must be allowed by construction personnel; • Informal fires by construction personnel should be prohibited; and no uncontrolled fires whatsoever should be allowed; • Care must be taken during the construction of the proposed development to limit edge effects to surrounding natural habitat. This can be achieved by: - Demarcating all footprint areas during construction activities; - No construction rubble or cleared AIP species are to be disposed of outside of demarcated areas, and/or should be taken to a registered waste disposal facility; - All soils compacted because of construction activities should be ripped and profiled and reseeded; - Suppress dust to mitigate the impact of dust on flora close to construction activities; - Minimise the risk of erosion by limiting the extent of disturbed vegetation and exposed soil; and - Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas; • No dumping of litter, rubble or cleared vegetation on site should be allowed. • No temporary dump sites allowed in areas with natural vegetation. • Vegetation cuttings must be carefully collected and disposed of at a separate waste facility or in a designated and demarcated area outside of any natural vegetation;							

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									• If any spills occur, they should be immediately cleaned up, to avoid soil contamination that can hinder floral rehabilitation later down the line. • Upon completion of construction activities, it must be ensured that no bare areas remain; and that indigenous species be used to revegetate the disturbed area. • Edge effects arising from the EM PV Solar Project, such as erosion and AIP proliferation, which may affect adjacent natural areas, must be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020); • Ongoing AIP clearing/control should take place throughout the construction phase of the EM PV Solar Project; and • Alien vegetation that is removed must not be allowed to lay on unprotected ground, as seeds might disperse upon it. All cleared AIP material to be disposed of at a licensed waste facility which complies with legal standards, or within designated and demarcated areas within the EM boundary, if it is outside of any natural habitat. **<u>Operational Phase:</u>** • Disturbed areas are to be rehabilitated to a similar state as that of pre-disturbance conditions. Where this is not possible due to O&M requirements, it is recommended that, at a minimum, a suitable herbaceous layer (indigenous species) is maintained within the footprint of the powerline and PV facility servitude, to ensure that no erosion occurs; • At a minimum, a short herbaceous layer should preferably be maintained around all powerline towers and the PV Plant Area for reinstating a semblance of floral habitat in these areas, to promote connectivity; • Ongoing monitoring of the state of the biodiversity associated with PV Project Area, and the vegetation surrounding it, must continue throughout the O&M of the EM PV Solar Project, to ensure that detrimental residual impacts are detected early enough to be reversed/prevented; • Monitor and maintain the vegetation corridors that were created between the PV panels and along the OHL Route to contribute to reduced habitat fragmentation, and improved regional plant genetics; • Fire management should be in place; • Avoid barrier effects resulting from security fencing around PV Project Area. It is recommended that regular passages and a ground clearance under the fence of at least 10 - 15cm be created to allow for movement of smaller mammals through the PV Project Area (reducing loss of movement corridors							

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									and overall habitat fragmentation; and conserving functional relationships between the fenced-in PV Plant Area and the surrounding area). This will allow a semblance of natural herbivory and natural dispersal of plants by animals, promoting improved vegetation conditions inside and outside of the PV Plant Area; and • No vehicles are allowed to indiscriminately drive through sensitive habitat and natural areas. All vehicles must stick to designated roads and no additional roads may be developed, unless absolutely necessary. • Edge effects arising from the O&M activities of the EM PV Solar Project, such as erosion and AIP proliferation, which may affect adjacent natural areas, need to be strictly managed., particularly Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020) (see also Terrestrial Assessment report); • Ongoing AIP monitoring and clearing/control should take place throughout the operational phase; and the project perimeters should be regularly checked for AIP establishment, to prevent spread into surrounding natural areas; and • AIP that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which complies with legal standards; or within a demarcated and secluded area in the EM boundary, where no spread of the AIP material can occur.							
Impacts on Floral SCC and Protected Flora	C	1	2	4	3	10	4	40	**<u>Planning Phase</u>** • Both floral SCC (NT Stenostelma umbelluliferum and potentially species under the NEMBA TOPS list) as well as TNCO- and NFA-protected flora are associated with the habitat in which the EM PV Solar Project will take place. A walkdown of the PV Project Area must take place before construction activities commence, where all anticipated floral SCC/protected species are searched for and marked, to determine the number of individuals that will be impacted. Based on the outcome of the walkdown, the appropriateness of rescue and relocation initiatives must be determined; and a rescue and relocation plan may be required. The following permit application may be necessary: ○ Where floral SCC will be impacted, permits/authorisation from DFFE are required; ○ Where NFA-protected trees will be impacted, permits from DFFE are required; and	1	1	2	2	6	2	12

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									○ Where TNCO-protected species will be impacted, permits from the North West DEDECT will be required. • For the proposed Option 1 and Option 2 OHLs, avoidance of impacts to floral SCC and protected flora must be pursued, i.e., placement of powerline pylons must consider SCC and protected species localities and avoid impacting these species. Maintenance activities below the powerlines must ensure that floral SCC and protected flora will not be adversely impacted. **Construction phase:** • All Red Data List (RDL) plant species that will be lost due to vegetation clearance must be replaced, either during rehabilitation initiatives or through translocation to suitable habitat surrounding the disturbance footprint. The relocation site will need to be fenced-off (or somehow barricaded) and monitoring of relocated / transplanted species will be essential until it is evident that the species have successfully established; • For NFA-protected tree species, attempting to relocate mature individuals is often too expensive and/or results in unsuccessful re-establishment (due to unavoidable damage to their root systems during their excavation). Where possible, seedlings of affected tree species should be targeted for relocation; and seeds must be harvested prior to vegetation clearance, to use in rehabilitation activities or as part of vegetation maintenance surrounding the PV and OHL footprints. It is important that seedlings and seeds be harvested close to an area to be impacted, to prevent alteration of population genetics; and • Geophytes and succulents are good candidates for rescue and relocation, and these should be targeted for such initiatives. • Floral SCC and protected species that have been relocated must be monitored. **Operational Phase** • Monitoring of relocation success should continue for at least three years after completing the construction phase; or until it is evident that the species have established self-sustaining populations; and • Collection of floral SCC and protected flora by O&M teams must be prohibited.							
Impact on Fauna habitat and diversity	I C O CC	2	5	3	2	12	3	36	**Planning Phase:** • Minimise loss of faunal habitat (indigenous vegetation and natural habitat) where possible through adequate planning and, where necessary, by	1	5	2	2	10	2	20

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									incorporating the sensitivity of the Biodiversity Impact Assessment and other Specialist studies; • It must be ensured that, as far as possible, all proposed infrastructure, including temporary infrastructure, is placed outside of habitat units with increased sensitivity; • OHLs must be designed in such a way that habitat fragmentation is minimised; • If possible, it is recommended that solar panels be mounted on pile driven or screw foundations (e.g. post support spikes), rather than heavy foundations (trench-fill or mass concrete foundation) to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both below and above-ground biodiversity ; • Access roads should be kept to existing roads where possible (several roads already exist) to reduce fragmentation of natural habitat outside of the authorised footprint. This will exclude the new access road which will be constructed.; • It is recommended that prior to commencing construction activities that the construction servitude be clearly demarcated, to prevent footprint creep into areas beyond the authorised footprints; • Develop a rehabilitation plan that will promote habitat reinstatement in disturbed sites and allow for increased habitat connectivity during the O&M phase of the EM Solar PV Project; • Ensure sound stormwater management planning; • Prior to commencing construction activities, an AIP Management/Control Plan should be in place for implementation. **<u>Construction Phase:</u>** • Vegetation clearance should be undertaken in a phased manner, from one side of the footprint area to the other. This will enable species to move away ahead of the disturbance; • Should any snakes be encountered during construction activities, a nominated snake handler from the construction team, mine or an external person should be contacted to safely remove the snake, should it not move off on its own; • Smaller scorpions, skinks and lizards encountered should be carefully and safely moved to similar habitat outside of the development footprint. • No snakes, scorpions or other faunal species are to be killed if they are encountered on site.							

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									• No hunting or trapping of faunal species must be allowed by construction personnel; **<u>Operational Phase:</u>** • Ongoing monitoring of the state of the biodiversity associated with the PV Project Area and OHL Route, and the vegetation surrounding the footprint areas must continue throughout the O&M of the EM PV Solar Project, to ensure that detrimental residual impacts are detected early enough to be reversed/prevented; • Should any snakes be encountered, a nominated snake handler from the operational team, mine or an external person should be contacted to safely remove the snake, should it not move off on its own; • Smaller scorpions, skinks and lizards encountered should be carefully and safely moved to similar habitat outside of the development footprint, if they pose a threat to staff or a risk to equipment; • No snakes, scorpions or other faunal species are to be killed if they are encountered on site; • No hunting or trapping of faunal species must be allowed by construction personnel; • Informal fires by operational personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed; • If the Plant Project Area is to be fenced, it is important to avoid barrier effects resulting from security fencing. It is recommended that fences with sufficient gaps for species to pass through is used; and regular passages under the fence of at least 10 - 15 cm are created, to allow for movement of smaller fauna into and out of the Plant Project Area (reducing loss of movement corridors and overall habitat fragmentation and conserving functional relationships between the solar plant and the surrounding area). This will allow a semblance of natural herbivory and faunal species movement; and • No vehicles are allowed to indiscriminately drive through sensitive habitat and natural areas. All vehicles must make use of the designated roads and no additional roads may be developed unless absolutely necessary.							
Loss of Fauna SCC	I C O CC	2	5	3	2	12	3	36	**<u>Planning Phase</u>** • A walk down of the footprint areas, notably the PV Plant be undertaken, to identify and mark any possible occurring faunal SCC, notably those species which have a medium POC for the PV Project Area. This walkdown should coincide with the floral SCC walkdown to optimise time and resources on the ground.	2	1	2	2	7	2	14

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									• For the proposed Option 1 and Option 2 OHLs, avoidance of habitats of increased sensitivity (placement of pylon footprints within these areas) should be done as far as possible; • Avoid placement of pylon footprints within the moisture-driven habitats, as far as possible; and • Should any SCC be observed, they are to be relocated to an area of similar habitat outside of the disturbance footprint but within the mining property. The relevant provincial and national permits should be obtained, where necessary. **Construction phase** • No hunting / trapping of faunal SCC must be allowed by construction personnel; and • Edge effect control needs to be implemented to prevent further degradation of the surrounding natural habitats. **Operational Phase** • No hunting / trapping of faunal SCC must be allowed by construction personnel; • Outside lighting must be kept to a minimum and external lights downward facing, ideally inwards to the solar facility. Bright external lights will attract insects and consequently predatory bats, some of which are SCC. These bats may collide with the solar facilities infrastructure, leading to injuries or potentially increased rates of mortality;							

Impacts of Avifauna SCC	I C O CC	2	5	3	2	12	3	36	• It is recommended that the Option 1 OHL alignment be selected for development, as this route is shorter and largely runs adjacent to existing OHLs, thus reducing the potential for the new OHL to be associated with bird collisions and fatalities. • Construction should preferably occur in the drier winter months when most bird species are not breeding; and many granivores tend to become nomadic in nature and less territorial; • No collection or hunting of any fauna species is to be allowed by personnel during the construction phase, especially with regards to avifaunal SCC (if encountered and not part of a rescue/relocation plan); • Anti roosing spikes / diverters must be fitted to the solar panels; • Bird diverter devices (flappers) must be aligned along the new OHL as a mitigatory measure to lessen the possibility of bird collisions with the new OHL; • Monitoring of the solar arrays and OHL alignment for bird fatalities must occur at regular intervals during the operational phase of the EM PV Solar Project, in line with the BLSA Birds and Solar Energy Guideline. • The OHL Route must not be indiscriminately cleared of woody vegetation, rather woody vegetation above the minimum clearance height must be pruned.	2	1	2	2	7	2	14

11.10 SOCIO ECONOMIC

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Job creation and increased employment opportunities (positive)	C O CC	3	5	3	4	15	4	60	• Ensure Contractors' Agreements provide for contractors to hire locals if the skills required are locally available; • Continue working with community representatives, to develop open and transparent recruitment procedures that are disclosed to community members and business forums; • As with current practice, continue using various mechanisms to advertise job opportunities in local communities; and • Continue providing skills development training for local people, through internships, scholarships, and/or vocational and skills training programmes.	3	5	3	4	15	4	60
Local procurement opportunities for SMMEs (positive)	C O CC	3	5	3	4	15	4	60	• Prioritise contracting local and BEE companies; • Work with EP to formalise local procurement procedures in Supply Chain processes (Supply Chain Management Plan); • Use various mechanisms to advertise tender opportunities in local communities, including disclosing tender opportunities to local business forums; and • Provide training and support to local SMMEs.	3	5	3	4	15	4	60
Improved skills development and training (positive)	O	3	5	3	4	15	4	60	• Assisting skilled community members with acquiring certificates and qualifications for formal employment; • Developing and implementing skills development and training programmes that target the broader local population, including Oukasie, Damonsville, Mothotlung, and Mmakau; and • Working with EP to assist local youth with scholarships, and/or vocational and skills training programmes.	3	5	3	4	15	4	60
Reduce EM's reliance on the National Grid (positive)	O	5	5	3	4	17	4	68	• No mitigation required, as it is a positive impact for EP.	5	5	3	4	17	4	68
Improve Sustainable Mining Practices in the MLM (positive)	O	3	5	3	4	15	4	60	• No mitigation required, as it is positive impact for the MLM.	3	5	3	4	15	4	60
Increase the competitiveness of EM, by reducing energy cost to operate EM (positive)	O	5	5	3	4	17	4	68	• No mitigation required, as it is a positive impact for EP.	5	5	3	4	17	4	68
Tensions over limited employment opportunities and procurement contracts	C O CC	3	3	4	4	14	3	42	• Maintain open, fair, and transparent recruitment procedures that are widely disclosed across all neighbouring communities;	2	3	3	3	11	2	22

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
									• Use various mechanisms to advertise employment opportunities in neighbouring communities; • Ensure recruitment procedures prioritise the employment of local community members in proximity to the PV Project Area; • Provide employment options that allow a range of skilled and non-skilled people to benefit from employment opportunities; • Ensure contractors hire local community members, where feasible; • Maintain recruitment and employment records, distributing short-term opportunities to as many community members as possible; and • Continue to regularly provide feedback to communities, including disclosing any updates to employment figures.							
Loss of the visual character of the landscape	O	4	5	2	1	12	2	24	• Implement the recommendations from the VIA. • Where feasible, the EM PV Solar Project should seek to reduce clearing trees and shrubs close to the R566. This will reduce the visual impacts of the PV Plant, particularly for R566 road users. • Following project closure, the PV Project Area must be rehabilitated to allow for natural vegetation growth.	4	5	1	1	11	1	11
Influx of job seekers to the Project Area	C O CC	3	4	4	3	14	4	56	• Ensure contractors, especially during the construction phase of the Project, correctly recruit local employees; and avoid hiring casual labour without following the recruitment procedures.	3	2	3	3	11	3	33

11.11 WASTE

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Building rubble and construction waste will be generated during the construction and decommissioning of the EM PV Solar Project.	I, C	1	2	3	3	9	4	36	• Provide suitable containers and temporary storage areas, as close to the point of generation as practically possible. • Re-use waste during construction, where possible. • Separate waste at source and recycle wherever possible. • Ensure unusable waste is disposed of in an environmentally responsible manner at licensed disposal facilities only (“cradle to grave” responsibility). • An approved waste removal contractor should transport and dispose of the general waste at the nearest Landfill Site. Safe disposal certificates must be kept for record purposes.	1	2	2	2	7	2	14
Waste generated during the operational phase.	O	1	5	2	2	10	4	40	• Develop a waste management procedure for the operational phase that conforms to the waste management hierarchy of controls. • Littering must be discouraged; and waste management training must be provided to employees. • Separate waste at source and recycle wherever possible; • Ensure unusable waste is disposed of in an environmentally responsible manner at licensed disposal facilities only (“cradle to grave” responsibility); • An approved waste removal contractor will transport and dispose of the general waste at the Brits Landfill site. Safe disposal certificates must be kept for record purposes.	1	5	2	2	10	1	10

11.12 TRAFFIC

Impact	Phase	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk	Proposed Mitigation Measures	Extent	Duration	Intensity	Reversibility	Significance	Probability	Environmental Risk
	Before Mitigation									After Mitigation						
Increase in traffic leading to traffic incidents and accidents.	C, CC	3	2	3	2	10	3	30	• Increased traffic volumes will be experienced during the construction and closure phases. During the operational phase traffic volumes will normalise. • Provision must be made for road safety signs and early warning demarcation. • Delivery vehicles and heavy equipment companies and operators must be requested to make use of dedicated routes and ensure road users' safety. • Implementation of a traffic safety programme. • Education and awareness training of workers. • Placement of signage to create awareness. • Implement emergency response procedure. • Limit construction equipment and vehicular movement to off-peak hours. • Maintain a complaints procedure at the PV Project Area. Investigate, mitigate and follow-up on complaints received and maintain records of actions taken and correspondence received.	3	2	1	1	7	2	14
Construction of new access roads will likely influence traffic flow patterns and result in delays.	I, C	3	1	3	2	9	3	27	• Appropriate design that has been approved by the Provincial and Local Roads Authorities, as required, must be in place prior to developing the new R566 access route to the Plant Project Area. • Provision must be made for road safety signs and early warning demarcation. • Implementation of a traffic safety programme to the satisfaction of the Road Authority.	3	1	1	1	6	3	18

12. ENVIRONMENTAL IMPACT STATEMENT

12.1 SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The EM PV Solar Project activities will be undertaken within the boundaries of the existing EM Consolidated Surface Area, that was established in the early 2000's. The Projects can be expected to have the following overall impacts, refer to ***Table 31:*** Summary of the Environmental Risk before and After Mitigation for every phase of the development.

A total of twenty-five negative impacts were identified and assessed for the EM PV Solar Project. In addition, six positive impacts were also identified.

None of the impacts had a high significance rating, after mitigation. The high, medium to high impacts were positive impacts, relating to the socio-economic and sustainable resource management benefits of the EM PV Solar Project.

No "fatal flaw" or adverse impacts that cannot be adequately mitigated are anticipated with the EM PV Solar Project.

The EM PV Solar Project will be located on area historically used for crop production and grazing. The long-term potential impacts identified, which include potential visual impacts, have all been found to be acceptable, given that this Project falls in-line with existing land-uses (DeWildt Solar Plant).

Environmental impacts will occur in EM PV Solar Project construction and operational phases. To avoid/manage the EM PV Solar Project potential negative and cumulative impacts, an EMPr has been compiled. The EMPr forms the basis for the management and mitigation of impacts and risks associated with the existing mining activities. It also states the proposed management and mitigation measures; the responsible party for ensuring the mitigation measures are complied with; and the frequency of compliance monitoring to be undertaken. The EMPr should be updated regularly.

The EM PV Solar Project with the Option 1 OHL are considered the preferred alternative by the EAP.

Table 31: Summary of the Environmental Risk before and After Mitigation for every phase of the development.

Phase	Environmental Risk									
	Before Mitigation					After Mitigation				
	High	Medium to High	Medium	Low to Medium	Low	High	Medium to High	Medium	Low to Medium	Low
Negative										
Overall Construction Operational Decommission and Closure		6	9	9				1	6	18
Total		6	9	9				1	6	18
Positive										
Overall Construction Operational Decommission and Closure	2	4				2	4			
Total	2	4				2	4			

12.2 FINAL SITE MAP

The final site map is attached under Appendix 4.

12.3 SUMMARY OF POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES.

12.3.1 Proposed Alternative 1:

The EM PV Solar Project has the following associated negative and positive impacts:

12.3.1.1 Negative:

There are negative impacts and risks associated with the EM PV Solar Project. The negative risks and impacts identified were associated with the surrounding and direct environmental and socio-economic aspects. The negative risks and impacts associated with the proposed alternative are relative to the following aspects:

- Air Quality;
- Topography;
- Visual Quality;
- Traffic;
- Noise;
- Waste;
- Groundwater;
- Surface water;
- Biodiversity;
- Land and Soil;
- Heritage; and
- Socio-Economic.

A large section of the EM PV Solar Project will be undertaken on existing and previously anthropogenic impacted footprints (i.e., mining or agriculture) within the existing EM Surface boundary. The larger EM Surface Area activities has been authorised with established impact management/mitigation measures (i.e., clean and dirty water system, EMPRs, etc.); and an established extensive monitoring programme (i.e., Dust, Biomonitoring, Ground- and Surface Water) that is continuously being implemented. Similar development on undisturbed land, lacking the current management measures available at EM, would be rated significantly higher.

The negative impacts will be managed and mitigated to a reasonable level, provided that the recommendations from the Specialist and the EAP are implemented.

12.3.1.2 Positive:

The positive and or benefits associated with the EM PV Solar Project are mainly due to the socio-economic and electricity resource/sustainability opportunities for potential stakeholders and the applicant. The EM PV Solar Project will have the following positive impacts that are in line with the NDP, Paris Climate Accord, NCCAS, NWP Spatial Development Framework and Northam‘s renewable energy strategy:

- Continuation of the surrounding land use;
- Reduce EM’s reliance on the National Grid;
- Local procurement opportunities for SMMEs;
- Promotion of sustainable development by proficiently utilising natural resources;
- Job Creation;
- Improve sustainable mining practices in the MLM
- Increase the competitiveness of EM, by reducing energy cost to operate EM
- Skills development and training opportunities.

12.3.2 Alternative 2 :

Alternative 2 include layout, technology and the southern OHL Route 2.

12.3.2.1 Site Alternatives

As part of the feasibility assessment of the EM PV Solar Project, several site alternatives within the EM Surface Area were considered, Refer to ***Figure 9***). The positive impacts for the Site alternatives would be similar to the preferred Site Alternative 1. The negative impacts, however, would rate significantly higher in terms of environmental, socio-economic and land-use risks. This is based on the location of sensitive features, security and vandalism risks, existing mining and operational infrastructure and site constraints (i.e. dust, blasting and active mine areas). The site alternatives were therefore rejected.

12.3.2.2 Technology Alternatives

Different technology and renewable energy sources alternatives were investigated for energy generation. Solar PV was determined as the most suitable option, considering the climatic

conditions, topography and location of the EM. Several other solar PV technology alternatives were considered, namely:

- Bifacial PV Panels;
- Monofacial PV Panels;
- Fixed mounted PV Systems (Static/fixed-tilt panels);
  Single or double axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement); and
- Monocrystalline, polycrystalline or thin film modules.

Monofacial and bifacial panels was considered as the preferred technology for the EM PV Solar Project.

12.3.2.3 Energy Source Alternatives

As part of the initial feasibility of the EM PV Solar Project, different renewable and/or energy sources were investigated. The sources included HFC, wind, solar and combustible fuel burning. The wind and combustible fuel burning sources were found to not feasible based on the lack of adequate wind levels, high emission levels associated with burning of fuels and sustainability of fuel sources in the long term. The HFC process was found not to be economic feasible, given its high capital and operation costs.

12.3.2.4 Route Alternatives for the Overhead Power Lines (OHL)

Route Alternatives for the up to 33 kV OHL and transmission towers were considered (Refer to ***Figure 9***). The route alternatives included a preferred northern (Option 1) and an alternative southern route (Option 2). The impacts were found to be similar to the preferred alternative (Option 1), with the exception that the alternative route (Option 2) had a higher negative risk rating in terms of possible Fauna and Flora Habitat and Specie loss. This is due to Option 2 having a longer route (higher maintenance component) and crossing over more habitat units that could lead to edge effect.

12.3.3 No-Go Alternative

The no-go option entails that the EM PV Solar Project will not be undertaken. South Africa in general and the mining sector currently experience two major problems, namely: constant electricity supply challenges due to electricity load curtailing and high levels of unemployment.

The EM PV Solar Project has the potential to mitigate the above challenges to a degree by achieving the following:

- Reduce economic losses sustained by EP from load reductions/ operational downtime; maintaining its economic viability and increasing its competitiveness, by reducing its reliance on Eskom supply and its energy costs, whilst promoting sustainable self-energy generation and demand management.
- Create temporary (construction phase) and a limited number of permanent (operational phase) job opportunities. Both skilled and unskilled temporary employment opportunities would be created through the Project. This will have a beneficial impact on the local economy through salaries, skills development and local spending.

In addition to the above, the EM PV Solar Project will likely reduce the Scope 2 GHG emissions generated by the EM, which will likely have a beneficial knock-on impact on reducing climate change.

Should the No-Go option be authorised, the current challenges in terms of energy supply and the high levels of unemployment could potentially be further exasperated. Refer to ***Table 9*** for the risks associated with the No-Go Alternative.

12.4 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

Refer to ***Section 11*** for the impact management objectives and outcomes that will be included as part of the EMPr (Refer to ***Appendix 8***). Specialist recommendations which could be included as conditions have been discussed under ***Section 11***. Specialist management measures and the impacts' significance prior and post-mitigation are provided under ***Section 11*** that was contained in the respective studies.

13. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.

A summary of the assumptions and limitations applicable to specific to the assessment process and mitigation measures proposed in specific Specialist studies have been attached to the EIAR (Refer to ***Appendix 15*** for the Limitations and Assumptions provided by the

Specialist). In terms of the EA process, the following assumptions and limitations were identified in the studies undertaken:

- The EAP has compiled the EIAR based on the information provided by the applicant. The accuracy of the technical specification and layout details cannot be assured by the EAP.
- It is assumed that electrical specifications and associated infrastructure were designed according to SABS Standards and engineer specification.
- It is assumed that EP will act in a responsible manner and take action when incidents occur, to determine the cause and/or rectify the cause of the problem.
- That the available GIS data, including topographical maps, geological maps and database information, are reasonably accurate given the credibility of the sources.
- That all information extracted from historic specialist studies, EMPR(s) and Reports are correct.
- Only impacts related to the EM PV Solar Project were included in the impact and risk assessment as part of the EIAR, and that existing impacts and mitigation measures associated with the EM and its operations are managed according to approved EMPr(s), EA(s) and License(s) and have been excluded from the EM PV Solar Project EIAR and EMPr.

14. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

14.1 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON.

EM is an existing mining operation, with its associated social and economic impacts. It is estimated that the EM PV Solar Project can potentially lead to high positive and low to medium negative socio-economic impacts during the construction and operational phases. The beneficial impacts associated with this Project relates to beneficial attributes in terms of GHG emission reduction, electricity demand management, increased competitiveness and reputational gains. The negative impacts relate to possible tensions over limited employment opportunities and procurement contracts; loss of the visual character of the landscape; influx of job seekers to the PV Project Area; and nuisance impacts (i.e. noise and dust)

The socio-economic impacts were assessed and addressed under ***Section 8.2*** and in the SEIA (Refer to ***Appendix 10***: Socio-Economic Impact Assessment).

14.2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NHRA

Refer to ***Section 8.14***. No features of cultural or heritage significance will be affected by the EM PV Solar Project.

14.3 OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

Not applicable, please refer to ***Section 6.3*** for a description of alternatives.

15. DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY

The 5MW PV Plant, which would have been coupled with a hydrogen fuel cell installation, that formed part of the initial application and Scoping Phase has been excluded from the EM PV Solar Project, due to it not being feasible. The PV Study Area has also been slightly altered with Portion 83 (a portion of Portion 58) of the Farm Zilkaatsnek 439JQ being excluded from the initial application area.

16. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

The EM PV Solar Project will be undertaken as part of the current and approved activities t EM. The purpose of the proposed EM PV Solar Project is to generate electricity for use at the EM's offices, workshops, Concentrator Plant, laboratory, other auxiliaries, etc. Any excess power produced will be distributed to the national grid.

The infrastructure will likely be decommissioned at end of the LOM of the EM Operation. The EA will thus for a minimum be required for an estimated thirty-year period for the LOM of EM.

However, the possibility remains that the EM PV Solar Project will continue to be utilised further post the LOM of the EM .

17. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

17.1 REASONS WHY THE ACTIVITY SHOULD BE AUTHORIZED.

The EM PV Solar Project activities will be undertaken within the boundaries of the existing EM Surface Area. A large section of the PV Plant Area has been disturbed by past agricultural activities and internal access roads and the OHL Routes also by mining activities. There is an established Solar PV Project (DeWildt Solar Plant) located directly east of the PV Plant Area.

Considering this and the relatively low to medium nature of the potential impacts post mitigation, the EM PV Solar Project will be a suitable land use in terms of environmental aspects and socio-economic cost-benefits. The foreseen environmental impact can be considered as manageable and will sustain the EM's LoM and competitiveness.

Not authorising the EM PV Solar Project will potentially have a significant socio-economic impact. The findings of the Specialist studies, undertaken within this EIAR/EMPR, assess both the benefits and potential negative impacts anticipated due to the EM PV Solar Project. The findings conclude that, provided the recommended mitigation and management measures are implemented, there are no environmental fatal flaws that, with implementation of the proposed mitigation measures, should prevent the EM PV Solar Project from proceeding.

EM also has an extensive monitoring programme (i.e., air, ground- and surface water) currently and continuously taking place around and close to the Project Area. This is beneficial, as the baseline of the air, ground- and surface water is known, and potential socio-economic, future water or air quality degradation trends can be determined beforehand.

Please refer to ***Section 12*** for the impact statements.

17.1 REASONS WHY THE ACTIVITY SHOULD NOT BE AUTHORIZED.

The No-Go Alternative impacts were considered as part of the EIA Process. It is evident that the beneficial impacts of the EM PV Solar Project are greater than the beneficial impacts of the No-Go alternative (refer to ***Section 12.3.3***).

18. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

The following conditions must be included as part of the Authorisation:

- The developer and operator of the EM PV Solar Project must take all necessary and reasonable steps to adequately safeguard and protect the environment and its associated features relating to the larger EM Consolidated MR Area and the PV Project Area.
- The developer and operator of the EM PV Solar Project or any person/s using or entering the project area must comply with the EA and EMPr conditions.
- Monitoring undertaken by EM for the larger EM Consolidated MR Area must continue and the information must be shared with the developer and operator of the EM PV Solar Project, to ensure coherent communication and early identification of environmental impacts and deviations from the baseline conditions.
- Appropriate design that has been approved by the Provincial and Local Roads Authority must be in place prior to the development of the new R566 access route to the EM PV Solar Project.
- All solid waste to be disposed of at an authorised and correctly lined waste facility.
- The developer and operator of the EM PV Solar Project EM should allocate a dedicated Environmental Control Officer to ensure the conditions of the EA and EMPr are adhere to.
- Strict monitoring and enforcement of the EA and EMPr conditions must be undertaken, to ensure that employees, contractors and operators adhere to them.
- Monthly ECO Audits should be undertaken on the developers compliance to the EA and EMPr conditions during the construction phase; and annually during the operational phase by an external auditor.

19. CONCLUSION AND RECOMMENDATIONS

The preceding scoping phase, public participation process and subsequent DEAR have been undertaken in accordance with the NEMA, the 2014 EIA Regulations and best practices/guidelines. The interaction and symbiotic relationship between all involved (I&APs and Stakeholders), by means of inputs and guidance received, contributed to the rationale of the DEIAR.

The EM PV Solar Project has been subjected to a comprehensive Scoping / EIA process and the potential socio-economic and environment impacts have been identified, investigated, assessed and will be subsequently mitigated in accordance with the 2014 EIA Regulations. Potential positive impacts associated with the EM PV Solar Project include the following:

- Increase Competitiveness of Eland Mine by means of independent energy generation and minimisation of downtime as a result of national electricity load reduction;
- Reduction of the Scope 2 GHG Emissions generated by EM;
- Climate change knock-on benefits by means of GHG Emission Reduction;
- Continuance of the surrounding land use (DeWildt Solar Project) within an existing mining operations;
- Potential economic benefit associated with the existing MM operation's rejuvenation that has been under care and maintenance for almost a decade;
- Socio-economic benefits associated with job creation; skills development; capital and operational expenditure on Local procurement opportunities for SMMEs, materials and equipment; and downstream spending; and
- Promotion of sustainable development by proficiently utilising renewable resources.

The potential negative impacts identified include the following aspects:

- Socio-economic effects associated with the current local economic and social constraints;
- Loss of floral and faunal/avifauna habitat and potential SCC;
- Visual and noise intrusion and nuisance to surrounding land users;
- Air Quality Impacts, relating to dust fallout;
- Groundwater quantity;
- Loss of soil and land with agricultural potential;
- Land degradation associated with erosion and AIP establishment.

However, from the Specialist studies commissioned and the impact assessment undertaken for the PV Project Area, it has been determined that the potential negative impacts associated with the preferred alternative can be mitigated to an acceptable level.

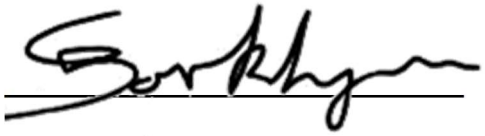
Based on the outcomes of the impact and risk assessments conducted, coupled with the Specialists' recommendations, the EAP has established that the EM PV Solar Project will contribute positively to the national, local and regional socio-economic sphere. The EM PV Solar Project has the potential to reduce the electricity supply challenges experienced by the EM by alleviating its sole reliance on electricity generated by non-renewable resources. In addition, this Project will result in a reduction of the Scope 2 GHG emissions generated by the

EM, which will likely have a positive impact on climate change and its associated impacts. This will likely ensure the competitiveness/sustainability of the EM,; and the potential negative environmental impacts will be managed in accordance with the mitigation measures and Specialists' recommendations.

The EAP therefore finds it rational to recommend that the EM PV Solar Project be authorised to proceed as it is the most preferred option, subsequent to the satisfaction of the regulatory processes and collaboration of the authorities, I&APs and stakeholders.

20. UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I ***G.S. Barkhuizen*** herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties have been correctly recorded in the report.

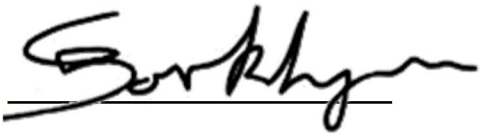


Signature of the EAP

DATE: 14-7-2022

21. UNDERTAKING REGARDING LEVEL OF AGREEMENT

I ***G.S. Barkhuizen*** herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders have been correctly recorded and reported herein.



Signature of the EAP

DATE: 14-7-2022

22. REFERENCES

- CHEMC Environmental, 2019. Environmental Impact Assessment Report and Environmental Management Programme Report for the Eland Start-up Project. Report No. CHEMC-Eland-DEIAR-Rev1.
- Department of Environmental Affairs, 2009.National Environmental Management: Waste Act (59/2008): List of waste management activities that have or are likely to have a detrimental effect on the environment. Government Gazette 37083, Government Notice 921 of 29 November 2013, Government Printer, Pretoria.
- Department of Environmental Affairs, 2013. National Environmental Management Act: Waste Act, Act No. 107 of 1998. Waste Classification and Management Regulations. Government Gazette 36784, Government Notice R 634 of 23 August 2013, Government Printer, Pretoria.
- Department of Environmental Affairs, 2014. National Environmental Management Act, 1998 (Act 107 of 1998). Environmental Impact Assessment Regulations. Government Gazette 38282, Government Notice R 982 of 4 December 2014, Government Printer, Pretoria.
- Department of Environmental Affairs, 2014. National Environmental Management Act, 1998 (Act 107 of 1998). Listing Notice 1: List of activities and competent authorities identified in terms of Section No. 24(2) and 24D. Government Gazette 38282, Government Notice R 983 of 4 December 2014, Government Printer, Pretoria.
- Department of Environmental Affairs, 2014. National Environmental Management Act, 1998 (Act 107 of 1998). Listing Notice 2: List of activities and competent authorities identified in terms of Section No. 24(2) and 24D. Government Gazette 38282, Government Notice R 984 of 4 December 2014, Government Printer, Pretoria.
- Department of Environmental Affairs, 2015. EIA Guideline for Renewable Energy Projects. Department of Environmental Affairs, Pretoria, South Africa.
- Department of Environmental Affairs, 2015. National Environmental Management: Waste Act, Act No 59 of 2008: Amendments to the list of waste management activities that have, or are likely to have, a detrimental effect on the environment. Government Gazette 39020, Government Notice R 633 of 24 July 2015, Government Printer, Pretoria.
- DWAF, 2006. Best Practice Guideline G1 Storm Water Management, s.l.: Department of Water Affairs and Forestry.
- Eland Mine, Environmental authorization from the Department of Economic Development, Environment, Conservation and Tourism (DEDECT) in terms of the old Environment Conservation Act, 73 of 1989 (ECA), for listed activities associated with the initial mine development. Reference No. EIA 518/2005NW. Dated 13 March 2007.
- Eland Mine, Mining right from the Department of Mineral Resources (DMR) covering the farm Elandsfontein 440JQ in terms of the MPRDA. Reference No. (NW) 30/5/1/2/3/2/1/280EM. Dated 21 December 2006.
- Eland Mine, Section 102 amendment and update of the EMP to include Portions 84 and 97 of the Farm Zilkaatsnek 439 JQ. Reference No. (NW) 30/5/1/2/3/2/1/280EM. Dated 19 November 2010.
- Eland Mine, Section 102 amendment and update of the EMP to include Portions 13 and 14 of the Farm Schietfontein 439 JQ into the existing mining right in respect of the

remainder of Portion 58, 80, 81, 82, 84, 87 and 97 of the Farm Zilkaatsnek 439 JQ. Reference No. (NW) 30/5/1/2/3/2/1/341EM. Dated 19 March 2013.

- Eland Mine, water use license from the Department of Water Affairs (DWA) under Section 21 of the NWA for water uses associated with the Elandsfontein site including the planned concentrator expansion project. License No: 03/A21J/ABCGIJ/1547. Dated 23 October 2012.
- Eland Mine, Environmental authorization submitted for listed activities associated with the concentrator expansion project. Reference No. NWP/EIA/441/2007. Dated August 2012. Decision still pending.
- IUCN, 2013. IUCN Red List. [Online] Available at: http://www.iucnredlist.org/
- Madibeng Local Municipality. (2017_2021). Integrated Development Plan - 5-year IDP (2017-2021).
- Mucina, L. & Rutherford, M., 2006. The Vegetation of South Africa, Lesotho and Swaziland., Pretoria: South Africa National Biodiversity Institute.
- South Africa, Republic, 1998. National Environmental Management Act, Act No. 107 of 1998. Government Gazette 19519, Government Printer, Pretoria.
- South Africa, Republic, 1998. National Environmental Management Act: Waste Act, Act No. 107 of 1998. Government Gazette 32000, Government Printer, Pretoria.
- South Africa, Republic, 1998. National Water Act, Act No. 36 of 1998. Government Gazette 19182, Government Printer, Pretoria.
- South Africa, Republic, 2008. Mineral and Petroleum Resources Development Amendment Act, Act No 49 of 2008. Government Gazette 32151, Government Printer, Pretoria.
- SLR, 2012. Updated Environmental Impact Assessment and Environmental Management Programme for Elandsfontein Mining Right. DMR Reference Number: NW 30/5/1/2/3/2/1/280MR. Project No. 710.05003.00026. December 2012.